

Construction Materials Testing Equipment

A collection of various construction materials and test specimens arranged on a white surface with a red diagonal stripe. The materials include several concrete cylinders of different sizes, a large concrete block, a dark, porous material (possibly expanded polystyrene or a specific type of concrete), a pile of light-colored gravel, a pile of brown soil or sand, a pile of dark, irregularly shaped aggregates, and a small pile of light-colored, irregularly shaped aggregates. The background features a white grid pattern with a red diagonal stripe running from the bottom left towards the top right.

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The Humboldt logo and tagline. The tagline "Testing Equipment for" is on the left, followed by a red diamond-shaped logo with a white "H" inside, and "Construction Materials" on the right. Below this, the word "HUMBOLDT" is written in large, bold, black capital letters.





Understanding **PRODUCT LISTINGS** in the Humboldt Catalog

ITEM NAME

Hydrometer Jar Bath

ASTM D422; AASHTO T88; UNE 103.102

The Humboldt hydrometer jar bath is designed to provide a 68°F (20°C) ambient temperature throughout the unit by using a microprocessor-based temperature control with integral heater and chiller. The control processor in the H-4239A provides a consistent bath temperature of 68°F (20°C) accurate to within 0.1% of input span $\pm 1^\circ\text{F}$, which makes it an ideal bath for storing hydrometer jars in accordance with the standards listed above. The Hydrometer bath also can be used for many other processes within a lab and can be set to maintain temperatures within its temperature range of 50°F (10°C) and 120°F (49°C).

DESCRIPTION

This section describes the product, which can include how it is used; what is included with it; dimensions; features and benefits, and any notes or warnings.

INFORMATION BAR

This section indicates the standard shipping method and weight. It also includes other information like repair and calibration service availability, as well as CE compliance.

Hydrometer Jar Bath, 120V 60Hz

H-4239A

Hydrometer Jar Bath, 220V 50/60Hz

H-4239A.4F



Shipping wt. 155lbs (70 kg)



SPECIFICATIONS

This section lists what specifications the item complies with; ASTM; AASHTO; BS; UNE; EN; ISO, etc.

MODEL NUMBERS

Lists the different model numbers for the item. This includes different voltages and other information, such as quantity, packaging, etc. Humboldt uses the following suffix codes to differentiate between different electrical requirements:

| | |
|-------------------|-------|
| 220V-230V 60Hz | .2F |
| 220V 60Hz 3ph | .2F.3 |
| 120V-220V 50/60Hz | .3F |
| 220V 50/60Hz | .4F |
| 220V 50Hz | .5F |
| 110v-220 60Hz | .6F |
| 400V 50Hz | .7F |
| 400V 50Hz 3ph | .7F.3 |
| 208V 60Hz 1ph | .8F |
| 208V 60Hz 3ph | .8F.3 |
| 460V 60Hz 1ph | .9F |
| 460V 60Hz 1ph | .9F.3 |
| 120-220 50Hz | .35F |
| 120-220 60Hz | .36F |



www.humboldtmfg.com

1.800.544.7220 • 708.468.6300

hmc@humboldtmfg.com



WORLDWIDE DEALER LOCATOR:

Visit our website: and click
CONTACT at the top of the page.



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About Us



Who we are

Humboldt Mfg. Co., located in the United States, is a long-standing, leading manufacturer and supplier of testing equipment used for evaluating construction and civil engineering materials. Our equipment is used extensively throughout the world for testing soil, concrete, cement, asphalt and aggregate materials. This testing involves evaluations of materials, which are used in construction projects ranging from roads, bridges and tunnels to dams, earthworks, airports, railways, etc.

Humboldt equipment has been an integral partner in providing accurate and reliable testing results in a multitude of major projects worldwide while helping to deliver dependable infrastructure projects that adhere to project specifications. Users of our testing equipment include road contractors; governmental agencies; materials laboratories; cement plants; asphalt plants; universities; ready-mix concrete and precast producers, and consultants.

Dennis Burgess, Humboldt CEO





Inside Domestic Sales

Humboldt is known globally for manufacturing high-quality, competitively-priced equipment primarily designed to comply with ASTM and AASHTO testing standards, as well as other global standards.

Domestic Sales

Through our e-commerce website, Humboldt's domestic customers have the advantage of being able to browse our website for the testing equipment they need and ordering directly from us. We also provide a group of inside sales people for those who want to

deal directly with a person, need assistance in selecting equipment for specific applications or require a quote. Our sales people have years of industry experience and are available during working hours for your assistance. We have people located in both our Elgin, Illinois and Raleigh, North Carolina facilities. Humboldt also has a group of outside domestic sales people who visit with our customers and help with large quotes, as well as assist in installations and product support.

International Sales

For the International market, Humboldt products are available worldwide through an



International Sales



extensive network of experienced and knowledgeable dealers. These dealers can assist customers in choosing the correct equipment for their needs, as well as help with installations and training. International customers can contact their local dealers through our contact page on our website, or they can request a quote for products placed into a cart through our website's Quote Cart system.

Facilities

Humboldt is headquartered in a 70,000 sq. ft. facility in Elgin, IL, as well as a 15,000 sq. ft building located in Raleigh, NC, which houses Humboldt Scientific, our technical center for electronics and software development and location of the manufacture of specific products, such as the nuclear and electrical density gauges. Humboldt's Elgin facility provides extensive production and warehousing capacity, which supports our belief in maintaining a constant stock of products to meet our customers' demands for the quick and efficient supply of testing equipment.

History

Humboldt began operations in 1909 as a manufacturer of cement testing equipment in the Humboldt Park neighborhood of Chicago, IL — establishing from the beginning, a solid reputation for producing high-quality, scientific products, as well as providing excellent customer



service. During World War II, Humboldt expanded its manufacturing operations to meet the demand for general laboratory equipment and began manufacturing a line of top-quality labware, which included Bunsen and high-temperature burners. These products were the beginning of Humboldt's general laboratory equipment line of laboratory burners, stands and clamps. Since 1990, under the direction of Dennis Burgess, Humboldt has consistently grown, introducing new equipment, expanding into new testing equipment markets and expanding our sales and dealer channels. During these years Humboldt has transformed into the company we are today, an employee-owned company, focused on the development, manufacturing and distribution of construction materials testing equipment throughout the world.

Quality

Humboldt has always been dedicated to manufacturing and distributing high-quality testing equipment to the materials testing lab market. To this end since 2003, we have maintained a quality management system in accordance with ISO standards. This system is based on the constant monitoring and continuous improvement of the company's processes and products.

Currently, Humboldt maintains ISO certifications for ISO 9001: 2015 and ISO/IEC 17025: 2017. These certification can be viewed on our websites: www.humboldtmg.com and www.humboldtsscientific.com. As Humboldt goes forward, our focus will be on the continual improvement of our testing equipment and maintaining diligent customer service.



Electronics Department



Technical Services







SOIL-FIELD

| | | | |
|-------------------------------------|-------|---------------------------------|-------|
| Acidity | 38 | Nuclear Density Gauge | 8-15 |
| Bearing Capacity | 19 | Penetrometers, Cone | 31 |
| CBR | 26-27 | Plate Load Testers | 19 |
| CBR, Field | 29 | Pocket Penetrometers | 30 |
| Color | 38 | Probes | 35 |
| Compaction Uniformity | 22-23 | Resistivity | 37 |
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| DMDCP | 26-27 | Sampling Augers | 32,34 |
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Nuclear Gauges

Choose from Two,
High-Quality
Gauge Models



HS-5001SD



HS-5001EZ

Humboldt's Moisture/Density Gauges Provide:

- High-quality gauges — built to take a beating
- Truly, field-serviceable with parts readily available
- Third-party calibration with no added costs from Humboldt
- Exceptional calibration, leak test and repair services



Why Humboldt...



All Humboldt nuclear gauges are built rugged for the day-to-day rigors of construction projects. These gauges are built to last using high-quality Noryl® PPO material, which is one of the most dimensionally stable thermoplastics available. This produces a gauge housing that is less brittle than the competition resulting in less breakage. Humboldt also pays strict attention to sealing our gauges against dirt and dust, providing a better design and less electronic problems due to dust.

Humboldt gauges are also "Field Serviceable". If you have a problem with your Humboldt gauge, chances are we can quickly get a part out to you, which you can install on your own, saving you lots of time and money. Other manufacturers require you to send your gauge back to the factory for calibration. We don't. You can send your gauge back to us or you can allow a third party to calibrate your gauge without incurring any charges from Humboldt.

With Humboldt, you get:

- High-quality gauges, built to take a beating
- Truly, field serviceable with parts readily available
- Third-party calibration with no added costs from Humboldt
- Exceptional calibration, leak test and repair services

Humboldt nuclear gauges are available in two models: the SD and EZ Gauges. The SD Gauge, which provides more efficient operation, data collection and processing than any other gauge in its class. Using state-of-the-art technology, the SD gauge brings you a host of features aimed at making your job easier. Featuring a 4.3" touch-screen, the SD Gauge provides intuitive operation of all gauge operations. It also provides touch-pad operation as an alternative control method.

Our EZ gauge is not only easy to use, but is proven to be the most rugged gauge in the industry. It's been used for years in many tough and demanding applications. It has always proven to be easy-to-operate, easy-to-power and easy-to-service. The EZ gauge features a menu-driven control panel with easy-to-use, built-in test routines and auto features, making testing a quick and accurate operation. It also features our innovative trigger release handle that eliminates pinched fingers while providing smooth operation. Unlike some competitors, all Humboldt nuclear gauges are manufactured with 100% new parts — no refurbished parts, sold as new.



CHOOSE FROM ONE OF THESE FOUR GAUGE CONFIGURATIONS:



8 x 1

200mm 25mm

HS-5001SD081
HS-5001EZ081

Measure to 8" (200mm) depth
in 1" (25mm) increments

8 x 2

200mm 50mm

HS-5001SD082
HS-5001EZ082

Measure to 8" (200mm) depth
in 2" (50mm) increments

12 x 1

200mm 25mm

HS-5001SD121
HS-5001EZ121

Measure to 12" (300mm) depth
in 1" (25mm) increments

12 x 2

200mm 50mm

HS-5001SD122
HS-5001EZ122

Measure to 12" (300mm) depth
in 2" (50mm) increments


**Test Result App
Coming Soon!**



HS-5001SD

Humboldt's HS-5001SD Moisture/Density Gauge provides more efficient operation, data collection and processing than any other gauge in its class. Using state-of-the-art technology, the HS-5001SD brings you a host of new features aimed at making your job easier. Featuring a 4.3" touch-screen, the SD Gauge provides intuitive operation of all gauge operations. It also provides touch pad operation as an alternative control method.

The SD's versatility allows it to measure density through direct transmission and backscatter modes, as well as including thin lift and trench modes, and moisture determinations. The gauge uses an advanced micro-processor-based technology to provide highly-accurate measurements of density and moisture that are automatically computed for direct read-outs of wet density, dry density, moisture content, percent of moisture, percent of compaction (Proctor or Marshall), void ratio and air voids. The SD Gauge complies with all pertinent standards: ASTM D6938, D2950, C1040 and AASHTO T310, T355 and is calibrated by the Five-block calibration method ASTM D7013, D7759.

 **Touch Screen Operation**

 **WiFi Enabled**

 **GPS Equipped**



HS-5001SD

Touch-Screen or Touch Pad—



You have your choice with the Humboldt HS-5001SD Moisture/Density Gauge. The gauge features a 4.3" touch-screen, which provides complete control or you can also use the menu-driven touch pad.

Easy to Power—



The SD Touchscreen Gauge is powered by a rechargeable NiMH battery, which provides up to 60 hrs. of runtime. In addition, the gauge can also be powered by its six standard AA alkaline batteries for backup. Car charger available.

GPS—



The SD Gauge is equipped with GPS, which keeps track of the actual location of the measuring device to ensure locations and validity of tests.

WiFi Enabled —



The SD gauge can connect to your PC for downloading test results via wireless technology. No more cables and gauges on your desk. Our wireless function provides a reliable and secure connection up to 30 feet.

USB Port—



The SD gauge also has a USB slot, which provides a convenient way to capture test data and take it with you, as well as provide an easy way to upgrade the gauge's firmware. Firmware upgrades are available via the internet from our website.

Easy Self Repairs—



The SD Gauge's modular design enables it to be serviced in the field by you, if necessary. No need to send the gauge in for repair, we'll send you the necessary components and walk you through many of the repair procedures if assistance is needed.

HS-5001EZ

Humboldt's HS-5001EZ Moisture/Density Gauge is just that — easy. Easy to operate, easy to power and easy to service. The EZ gauge features a menu-driven control panel with easy-to-use, built-in test routines and auto features, making testing a quick and accurate operation. It also features our innovative trigger release handle that eliminates pinched fingers while providing smooth operation.

The EZ's versatility allows it to measure density through direct transmission and backscatter modes, as well as including thin lift and trench modes, as well as moisture determinations. The gauge uses an advanced microprocessor-based technology to provide highly-accurate measurements of density and moisture that are automatically computed for direct readouts of wet density, dry density, moisture content, percent of moisture, percent of compaction (Proctor or Marshall), void ratio and air voids. The EZ Gauge complies with all pertinent standards: ASTM D6938, D2950, C1040 and AASHTO T310, T355 and is calibrated by the Five-block calibration method.



EZ Menu-Driven



Direct Readouts



**AA batteries
(1400hrs)**



HS-5001EZ



Easy to Operate—

Humboldt's HS-5001EZ Moisture/Density Gauge is just that— easy to operate. The EZ gauge features a menu-driven control panel with easy-to-use, built-in test routines and auto features, making testing a quick and accurate operation.



Easy to Power—

The EZ is powered by six standard AA alkaline batteries, which provide up to 1400 hrs of service. No chargers are needed and you can buy batteries almost anywhere, including the corner convenience store.



Easy Self Repairs—

The EZ gauge also uses a modular design, which allows it to be serviced in the field, if ever necessary. With this gauge, you don't have to send it back to the factory for repairs, we'll send you the necessary components and walk you through many of the repair procedures if assistance is needed.

SPECIFICATIONS

Mechanical

| | |
|------------------------|---|
| Operating Temperature: | 14 to 158°F (-10 to 70°C) ambient, 347°F (175°C) Material Surface |
| Storage Temperature: | -70 to 185°F (-55 to 85°C) |
| Humidity: | 98% without condensation, Rain-Resistant Construction |
| Vibration: | 0.1" (2.5mm) at 12.5 Hz |
| Materials: | |
| Shielding: | Tungsten Powder Alloy |
| Source Rod: | 440C Stainless steel, Induction, heat treated to 55 Rockwell C |
| Gauge Base: | Computer-Machined 6061-T6 Aluminum, Hard-Coated and PTFE Impregnated |
| Post and Frame: | Computer-Machined 6061-T6 Aluminum, Anodized for Anti-corrosion |
| Index Rod: | 7075 aluminum, Hard Coated and PTFE Impregnated |
| Top Shell: | Injection-Molded Noryl with Integral Color |
| Bearing: | Relieved Bronze with Neoprene Seals |
| Screws/Fittings: | Stainless Steel and Brass |

Measurement: Density at 125 pcf (2000 kg/m³)

| | | | |
|---|----------------------|--------------------|---------------------|
| Direct Transmission, 6" (150mm) | 15 seconds (Fast) | 1 minute (Std.) | 4 minutes (Slow) |
| Precision, pcf (kg/m³) | ±0.5 (8) | ±0.25 (4) | ±0.13 (2) |
| Chemical Error, pcf (kg/m³) | ±1.0 (16) | ±1.0 (16) | ±1.0 (16) |
| Surface Error, pcf (kg/m³) | -0.5 (8) | -0.5 (8) | -0.5 (8) |
| Measurement Depth: 2 to 12" (50 to 300mm) | | | |
| Backscatter, 3.5" (88mm) | 15 seconds (Fast) | 1 minute (Std.) | 4 minutes (Slow) |
| Precision, pcf (kg/m³) | ±1.0 (16) | ±0.5 (8) | ±0.25 (4) |
| Chemical Error, pcf (kg/m³) | ±2.5 (40) | ±2.5 (40) | ±2.5 (40) |
| Surface Error, pcf (kg/m³) | -3.0 (48) | -3.0 (48) | -3.0 (48) |
| Measurement Depth: 3.5" (88mm) | | | |
| Moisture at 10pcf (160kg/m³) | 15 seconds (Fast) | 1 minute (Std.) | 4 minutes (Slow) |
| Precision, pcf (kg/m³) | ±0.5 (8) | ±0.25 (4) | ±0.13 (2) |
| Surface Error, pcf (kg/m³) | -0.25 (4) | -0.25 (4) | -0.25 (4) |
| Measurement Depth: 4-8" (100 to 200mm) | | | |

Dimensions/Weight

| | |
|---------------------------------|---|
| Gauge: | |
| Dimensions (base): | 15.75" x 8.66" x 5.5" (400 x 220 x 140mm) |
| Handle Height: | 18" or 21.5" (450 or 550mm) |
| Weight: | 30 lbs (13.6kg) |
| Reference Standard: | |
| Dimensions: | 13.8" x 7.8" x 3" (350 x 200 x 75mm) |
| Weight: | 10 lbs (4.5kg) |
| Transit Case: | |
| Dimensions: | 31" x 14" x 19.5" (787 x 356 x 495mm) |
| Weight: | 31 lbs (11.8kg) |
| Accessory Case (loaded): | |
| Dimensions: | 19.7" x 9.8" x 5" (500 x 250 x 125mm) |
| Weight: | 16 lbs (7.3kg) |
| Total Shipping Weight: | 90 lbs (41kg) |

Radioactive Materials Data Needed for License Application

| Radioactive Material | Chemical/Physical Form | Maximum Amount |
|----------------------|-----------------------------------|--|
| Cesium-137 | Sealed Source Humboldt 2200064 | Not to exceed 11 millicuries per source |
| Americium-241:Be | Sealed Source Humboldt 2200067 | Not to exceed 44 millicuries per source |

Electrical

| | |
|-------------------------|---|
| Displays— | |
| HS-5001SD: | TFT, color LCD with back-light, 16:9, 480 x 272 pixel |
| HS-5001EZ: | 4 lines x 20 alphanumeric w/ backlit liquid crystal display |
| Timer Stability: | 0.01% |
| Power Supply Stability: | 0.10% |
| Power Source— | |
| HS-5001SD: | NiMH battery (AA battery optional) |
| HS-5001EZ: | Six (6) alkaline AA-size batteries |
| Power Consumption— | |
| HS-5001SD: | Active—110mA — Battery Life—60 hours runtime |
| HS-5001EZ: | Active—6.5mA — Battery Life—1400 hours |
| Power Protection: | Main Batteries—Circuit Breaker Regulated Supplies—Short Circuit Proof |
| Low Battery Condition: | LOBAT Alarm and Auto Shutoff for low and dead battery conditions |
| Battery Life | Remaining Battery Life Automatically Estimated at Power-up by activating TEST routine |

Radiological

| | |
|----------------------------|--|
| Gamma Source | |
| Material, Type and Amount: | Cs-137, 370MBq (10mCi) |
| Special Form Registration: | USA/0356/S-96 Rev 12 |
| ANSI and ISO Class: | ANSI 77C66535 |
| Neutron Source | |
| Material, Type and Amount: | Am-241: Be, 1.48GBq (40mCi) |
| Neutron Yield: | 70 Knps ±10% |
| Special Form Registration: | CZ/1009/S-96 Rev 1 |
| ANSI and ISO Class: | ANSI 77C66545 |
| Source | |
| Type: | Sealed Source, Special Form |
| Housing: | Stainless Steel, Double Encapsulated |
| Surface Dose Rates | 18.7 mrem/hr Maximum (Neutron and Gamma) |
| Transit (shipping) Case | DOT 7A, Type A, Yellow II Label, 0.2 TI |



CALIBRATION and repairs

Fast and EaZy, Full-Service Nuclear Gauge Calibration, Leak Tests and Repairs

To support our customers and their use of our nuclear gauges, Humboldt maintains a complete **ISO/IEC 17025:2017** accredited repair and calibration facility at Humboldt Scientific in Raleigh, North Carolina. Here we provide repair and calibration services for Humboldt gauges, as well as those of the other manufacturers. All services are performed by experienced and certified technicians with over 25 years of experience. Our services are built upon providing fast and reliable turn-around of your gauge calibration and repairs while maintaining competitive prices. Humboldt nuclear gauge calibration complies or exceeds ASTM and AASHTO standards by providing five-block calibration for all gauge calibrations. We maintain multiple sets of calibration blocks, which are traceable to master NIST standards.

These blocks are set up in isolated, temperature-controlled bays to reduce interference during calibration. Documentation and certificates for calibrations conform to NIST procedures and requirements.

We also provide leak test analysis services, gauge rental and disposal services.

EaZy Shipping Program

And, to make using our services as easy as possible, we have designed our EaZy shipping program. Just go to our web-site and fill out the calibration/repair form and we'll handle the rest. We will send you the completed shipping papers your gauge will need to have for shipping to us and directions on how to prepare and pack your gauge for shipment. We will contact the shipper and have them pick up your gauge from your designated location and ship it back to you when the calibration is completed.

Radiation Safety and Certification Classes

Learn quickly with these exclusive training courses.

Call 1.800.537.4183

or go to

www.humboldtscientific.com/classes.html

**Need to ship your gauge to us
for calibration or repairs?
Let us handle it!**

Just fill out our online form, and we'll take care of the rest!



Tool Set
HS-200112

HS-000176



HS-200145



HS-200315



HS-000177



HS-200153



HS-200541



HS-001067



HS-001057



HS-200152



HS-000185

Nuclear Gauge Tool Set

Tool kit includes: rod guide/scrapper plate, drill pin, four-pound hammer, pin extraction tool and zippered accessory case.

Nuclear Gauge Tool Set **HS-200112**
Ship wt. 16lbs (7.2kg)

Drill Rod

Drill rod used to create hole for Humboldt nuclear gauges to take reading. Rod measures 0.875" x 20" L.

Drill Rod **HS-200130**
Ship wt. 4lb (1.8kg)

Rod Extraction Tool

Tool used to extract drill rod from compacted soil.

Rod Extraction Tool **HS-200145**
Ship wt. 2lb (0.95kg)

Scrapper Plate/Rod Guide

Template Plate used as a locator for driving Drill Rod into compacted soil, as well as a guide for Gauge positioning and a Scrapper Plate to level the test site.

Scrapper Plate/Rod Guide **HS-200127**
Ship wt. 8lbs (3.6kg)

Hammer, 4 lb., Double-Faced

Hammer used to drive Drill Rod into compacted soil.

Hammer, 4 lb., Double-Faced **HS-000176**
Ship wt. 5lb (2.2kg)

Data Cable-USB/RS232

Cable for connecting Humboldt Nuclear Gauge to a computer or printer via USB or RS232. For EZ or C models only.

Data Cable-USB/RS232 **HS-200315**
Ship wt. 1lb (0.45kg)

Leak Test Kit

Each leak test kit contains all of the materials necessary for users to perform a leak test on sealed source devices. These test kits include analysis service from Humboldt. Humboldt Scientific, Inc. provides leak test kits and analysis services for both portable and fixed nuclear gauges in accordance with Wipe Test Procedures. Humboldt is licensed by the North Carolina Division of Radiation Protection license # 092-0750-1 to provide sealed-source leak testing on any radioactive material with atomic number 3-105 inclusive; and, has National reciprocity recognition. State-of-the-art leak testing equipment, low cost, and prompt turn-around service ensure accurate and convenient measurement of your samples.

Leak Test Kit, 10-pack **HS-200177**
Leak Test Kit, 2-pack **HS-200185**
Ship wt. 1lb (0.45kg)

Replacement Case for Humboldt Nuclear Gauge

Durable case, built to stand up to the rigors of everyday usage. Holds nuclear gauge and all tools and paperwork.

Replacement Case **HS-200681**
Ship wt. 36lb (16.3kg)

Padlock

Padlock, which can be keyed so a set uses the same key.

Padlock **HS-000177**
Ship wt. 1lb (0.07kg)

Sign, Caution Radioactive Material

8 x 10" metal sign with Radioactive Symbol and Caution.

Sign, Caution Radioactive Material **HS-001057**
Ship wt. .011lb (0.004kg)

Transit Label – Yellow II

DOT, Type 7A Radioactive materials transport label required for transporting nuclear density gauges.

Transit Label – Yellow II **HS-200153**
Ship wt. 0.011lb (0.004kg)

Cargo Aircraft Only Label

Label that is required when shipping nuclear gauges by aircraft. This label needs to appear on 2 sides of the transport case.

Cargo Aircraft Only Label **HS-001067**
Ship wt. 0.011lb (0.004kg)

Type A Label

DOT, Type 7A Radioactive materials transport label required for transporting nuclear density gauges.

Type A Label **HS-200152**
Ship wt. 0.011lb (0.004kg)

Security Seal

Security seal for nuclear density gauge transport cases.

Security Seal **HS-000185**
Ship wt. 1lb (0.07kg)

Humboldt S/N Label for HS-5001 Cases

Required serial number plate for gauge case.

Humboldt S/N Label **HS-200541**
Ship wt. 1lb (0.07kg)



HS-200800— Containment
Boxes include mounting bracket



HS-200820
(Does not include Case or Padlock)



HS-130508



HS-130512

Nuclear Gauge Containment System

The NUX safety containment box is an enhanced field security system for nuclear gauges. Constructed of heavy-duty aluminum diamond plate, the NUX can be securely mounted to a host vehicle using the locking hinge pin. The box features a titanium series, high-strength lock assembly, which provides a secure storage enclosure for your gauge in its factory protective container. In addition, the NUX tilting feature makes accessing your gauge an easy operation. Help prevent theft, damage, back injuries, misuse of equipment, improper or unauthorized access to equipment or other misguided actions, which may result in unforeseen costs to your company.

| | |
|------------------------------|-----------|
| NUX Case for Humboldt Gauges | HS-200800 |
| NUX Case for Troxler Gauges | HS-200802 |
| NUX Case for CPN Gauges | HS-200803 |
| Ship wt. 65lbs (29.4kg) | |

NOTES

When the metal transportation box is mounted in a vehicle it effectively becomes part of the vehicle. It is not part of the TYPE A package nor is it an overpack as defined by U.S. DOT. Therefore, the mounted transportation box is not subject to HAZMAT labeling requirements and no radiation warning markings are required on it.

Mounting Bracket
for all NUX Boxes

HS-200801

Security Restraint for Nuclear Gauge Case

Cable security restraint effectively locks containment box to vehicle or other structure. One-piece cable web drops easily over box and allows user to lock cables directly to containment box closures to prevent opening, as well as securing the complete box to prevent removal. Web is easily moved from vehicle to vehicle and collapses for easy storage when not in use. Allows for visibility of security labels on case when in use. A minimum of three padlocks are required, but not included.

| | |
|--------------------------------------|-----------|
| Security Restraint for Nuclear Gauge | HS-200820 |
| Ship wt. 8.4lbs (3.8kg) | |

Radiation Alert Monitor 200

The HS-130508 Monitor 200 measures alpha, beta, gamma, and x-rays. Its digital display shows readings in your choice of CPM, CPS, $\mu\text{Sv/hr}$, mR/hr, or in accumulated counts. It has a digital display, a red count light, and a beeper that sounds with each count detected. Other features include an adjustable timer, and selectable alert. With the free Observer USB Software Family, you can set computer alarms, calibrate your instrument, and download your collected data from the internal memory for easy reporting. Includes: Carrying Case, Xtreme Boot, Stand, Mini-USB Cable, Observer USB Software Download, Certificate of Conformance.

| | |
|--------------------|---|
| Operating Range | mR/hr - .001 (1 μR) to 100 mR/hr; $\mu\text{Sv/hr}$ - .01 to 1000; CPM - 0 to 350,000; CPS - 0 to 5000; Total/Timer - 1 to 9,999,000 cts. |
| Gamma Sensitivity | 1000 CPM/mR/hr referenced to Cs-137 |
| Accuracy | $\pm 10\%$ typical (NIST), $\pm 15\%$ maximum |
| Energy Sensitivity | Detects alpha down to 2.5 MeV; typical detection efficiency at 3.6 MeV is greater than 80%. Detects beta at 50 keV with typical 35% detection efficiency. Detects beta at 150 keV with typical 75% detection efficiency. Detects gamma and x-rays down to 10 keV typical through the window, 40 keV minimum through the case. Normal background is 5-20 CPM. |

Monitor 200
Monitor 200, NIST Traceable

HS-130508
HS-130508C

Ship wt. 2lbs (0.9kg)

Radiation Survey Meter, Analog

The HS-130512 survey meter is a compact, general purpose meter capable of detecting alpha, beta, gamma, and x-rays over 3 selectable ranges. A red count light flashes and a beep sounds with each event detected. Uses one 9-volt alkaline battery. Battery life is up to 2,000 hours at normal background radiation levels.

| | |
|--------------------|--|
| Operating Range | 0-.5, 0-5, 0-50 mR/hr; 0-500, 0-5,000, 0-50,000 CPM or 0-500 $\mu\text{Sv/hr}$ 0-50 mR/hr. |
| Gamma Sensitivity | 1000 CPM/mR/hr referenced to Cs-137 |
| Accuracy | $\pm 15\%$ of reading (referenced to Cs-137) |
| Energy Sensitivity | Detects alpha down to 2.5 MeV; typical detection efficiency at 3.6 MeV is greater than 80%. Detects beta at 50 keV with typical 35% detection efficiency. Detects beta at 150 keV with 75% typical detection efficiency. Detects gamma and x-rays down to 10 keV typical through the window, 40 keV minimum through the sidewall of the detector. Normal background is approximately 10-20 CPM. |

| | |
|--------------------------------------|------------|
| Survey Meter, Analog | HS-130512 |
| Survey Meter, Analog, NIST Traceable | HS-130512C |
| Ship wt. 2lbs (0.9kg) | |

NOTES

For Recalibration and NIST-traceable calibration of meters, contact Humboldt Scientific at:
1.800.537.4183



Electrical Density Gauge

ASTM D7698

The Electrical Density Gauge (EDG) is a nuclear-free alternative for determining the moisture and density of compacted soils used in road beds and foundations. The EDG is a portable, battery-powered instrument capable of being used anywhere without the concerns and regulations associated with nuclear safety. Its user-friendly, step-by-step menu guides the user through each step of the testing procedure and cautions the user when values do not correspond to established curves for the material being tested.

Easy-to-use, the EDG can be used as a construction aid to monitor day-to-day compaction operations by providing performance and measurement results highly comparable to those achieved with

traditional methods, including the nuclear gauge and/or a sand-cone and oven moisture test combination. When conducting a test, the EDG measures and displays the results for wet and dry density, gravimetric moisture content and percent compaction.

The advantages of using the EDG are:

- It does not require a highly-trained or licensed technician
- It does not require special handling for shipping or the regulatory compliance for hazardous materials
- It is easy-to-learn and easy-to-use with its step-by-step menu

- Lightweight and easily transportable
- It is accurate and repeatable with results that mirror known testing methods

The EDG Gauge includes: Console/Case; 4-tapered 6" darts; hammer; soil sensor and cables; dart template, temperature probe, battery charger, field verifier.

Electrical Density Gauge

H-4114SD.3F

Ship wt. 35lbs (15.8kg)



Touch-Screen/Touch Pad—

You have your choice with the new Humboldt H-4114SD EDG. The gauge features a 4.3" touch-screen, which provides complete control or you can also use the menu-driven touch pad.

The EDG measures the electrical dielectric properties and moisture levels of compacted soil using high, radio frequency traveling between darts driven into the soil being tested. The dart's depth of penetration positively determines the depth of measurement. Darts are available in 4", 6", 8", 10" and 12" lengths. In addition, the darts have been designed with a taper, which ensures a continual positive contact with the soil for accurate measurements.

During the testing procedure, four tapered electrodes (darts) are driven into the ground in a cross pattern using the supplied template. Between the two sets of two tapered darts, four point-to-point electrical measurements are made and the electrical characteristics averaged. The dielectric properties that are measured by the unit are compared to a "soil model", which has been developed and programed into the unit prior to testing. These soil models are required only once for each soil type. The soil model is used as a calibration reference during the testing procedure. It is developed by establishing a curve of measured dielectric properties for different densities and moisture combinations of the actual soil to be tested or a similar material. This soil model is used by the unit through a proprietary correction algorithm to automatically determine the wet and dry density, gravimetric moisture content and percent compaction values for the material being tested. Soil models can be named using the unified soil classifications listed

in the drop-down menu or unique names can be entered using the alpha-numeric keypad. In addition, the temperature probe, which is inserted into the material being tested ensures accurate results by compensating for changes in recorded temperatures. Similar to nuclear gauges, proctor numbers for optimum compaction may be input into the gauge, which would allow for percent compaction to be automatically calculated and displayed at the end of each test. The Proctor numbers would be input into the gauge during the development of the soil model. When determined, this value is entered into the EDG to enable the computation of percent compaction.

Power—

The EDG is powered by a rechargeable NiMH battery, which provides up to 60 hrs. of runtime. A car charger is available, order H-4114SD.100



GPS—

The EDG is equipped with GPS, which keeps track of the actual location of your measuring device to ensure locations and validity of tests.



WIFI-Enabled—

The new EDG gauge can connect to your PC for downloading test results via its wireless technology. No more cables and gauges on your desk. Wireless provides a reliable and secure connection up to 30 feet.



USB Port—

The EDG also has a USB slot, which provides a convenient way to capture test data and take it with you, as well as provide an easy way to upgrade the gauge's firmware. Firmware upgrades will be available via the internet from our website.



EDG

| Specifications | |
|----------------------------|--|
| Wet Density Range | typical compacted earth sites range |
| Dry Density Accuracy | within 3% of standard tests |
| Moisture Content Range | typical compacted earth sites range |
| Moisture Content Accuracy | within 2% of standard tests |
| Operating Temperature | 0-50°C |
| Ambient Operating Humidity | 5-90%, non-condensing |
| Power | NiMH battery – 6-pack |
| Battery Life | approx. 60 hrs. of runtime |
| Battery Charger | 110-240 V 50/60Hz |
| Dimensions | 21" x 17" x 8" (533 mm x 432 mm x 203mm) |
| GPS | ± 3m |

EDG Software

EDG Software will allow you to communicate effortlessly with your EDG gauges and only requires minimal setup by the user. EDG Software provides a complete solution for the acquisition, storing, and presentation of Job and Soil Model data. EDG Software works in conjunction with Microsoft Excel to present test data in easy-to-read Excel workbook format files, which can be evaluated directly or sent to any computer using Microsoft Excel. Jobs can be grouped together within projects for organization and reporting.

EDG Software Features:

- Communicate with all your EDG gauges.
- Download Job Data.
- Create customized reports from downloaded job data.
- Download Soil Model Data.
- Create reports from downloaded soil model data.
- Upload soil models to any EDG.
- Input proctor data for use in job data or soil model data.
- View maps of test locations, using Google Earth.
- Time/Date, GPS stamps for each test determined, this value is entered into the EDG to enable the computation of percent compaction.

Darts for Electrical Density Gauge

Darts are designed in various lengths to correspond to different lift heights. They can be sold individually, and (4) are required.

| | |
|------------------|-----------|
| 4" (102mm) Dart | H-4114.4 |
| 6" (152mm) Dart | H-4114.6 |
| 8" (203mm) Dart | H-4114.8 |
| 10" (254mm) Dart | H-4114.10 |
| 12" (305mm) Dart | H-4114.12 |

Shipping wt. 1.5 lbs (.68kg)

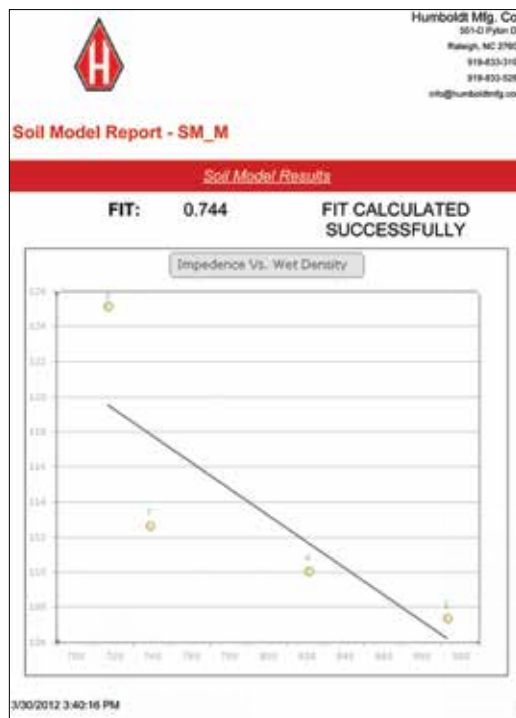
Calibration Verifier for EDG

Calibration unit for EDG to carry out verification or calibration of the EDG.

Calibration Verifier for EDG H-4114.MCU

Shipping wt. 4 lbs (1.8kg)

| Replacement Parts | Model |
|------------------------|------------|
| Soil sensor with cable | H-4114.250 |
| Temperature sensor | H-4114.900 |
| AC charger | H-4114.600 |
| Cables with clamps (2) | H-4114.700 |



| Soil Model Data | | | | | |
|-----------------|-----------------------|-------------------|-------------------|----------|---------------|
| Soil Test | Test Time | Wet Density (pcf) | Dry Density (pcf) | Moisture | Optim. Moist. |
| 1 | 1/1/2001 12:00:00 AM | 107.4 | 99.6 | 19.9 | 20.0 |
| 2 | 1/1/2001 12:00:00 AM | 114.6 | 94.3 | 21.6 | 20.0 |
| 3 | 1/1/2001 12:00:00 AM | 125.2 | 101.6 | 23.2 | 20.0 |
| 4 | 1/1/2001 12:00:00 AM | 110.1 | 93.1 | 16.2 | 20.0 |
| 6 | 1/1/2001 12:00:00 AM | 112.7 | 93.9 | 20.0 | 20.0 |
| 7 | 1/1/2001 12:00:00 AM | 112.7 | 93.9 | 20.0 | 20.0 |
| 8 | 1/1/2001 12:00:00 AM | 112.7 | 93.9 | 20.0 | 20.0 |
| 9 | 1/1/2001 12:00:00 AM | 0.0 | 0.0 | 0.0 | 20.0 |
| 10 | 1/1/2001 12:00:00 AM | 105.0 | 105.0 | 0.0 | 20.0 |
| 11 | 3/30/2012 12:23:51 PM | 0.0 | 0.0 | 0.0 | 20.0 |

EDG

NUCLEAR
FREE
DENSITY
MOISTURE



Darts for EDG



H-4114.MCU



Humboldt Plate Bearing Tester

ASTM D1195, D1196

The Humboldt Plate Bearing Tester is a field test used for determining the bearing capacity of soil under varying loading conditions. It can also be used to evaluate designs of airport and highway pavements.

This Plate Bearing Tester consists of a hydraulic jack complete with hand pump and rubber; fast-connect hose, large pressure dial gauge; seat plate; (3) precision dial gauges (2.5" dia. -1" x 0.0004 (25 x 0.01mm); 8' (2.4m) complete mounting hardware for gauges, Plate Set (HD-4605) and case for gauges, pump and jack.

The Plate Bearing Tester is available in three (3) capacities: 100kN, 200kN and 500kN.

Features:

- Long piston travel to accommodate setup of reaction loading system
- Double-delivery hand pump for fast approach in setup with reaction loading system
- High-precision dial gauges
- Heavy-duty, rigid measuring bridge

Plate Bearing Tester, 100kN HD-4600

Plate Bearing Tester, 200kN HD-4601

Plate Bearing Tester, 500kN HD-4602

Ship wt. 70lbs (31.7kg)

Plate Bearing Plate Set

ASTM D1195, D1196

ASTM plate set includes: 6", 12", 18" 24" and 30" (152, 305, 457, 610, 762mm) steel plates with eye bolts for transporting and placement of plates with a steel rod.

Plate Bearing Plate Set HD-4605

Shipping wt. 65lbs (29.4kg)

Static, Plate Load Tester

DIN 1834; BS1377

The Static Plate Load Test can be utilized in earthworks and foundation engineering, as well as road construction in order to determine load settlement lines and by this to evaluate the deformability and the load capacity of the soil.

When using the static load tester to evaluate a soil layer, the circular load plate is repeatedly loaded and relieved by means of a load device, a hydraulic pump and pneumatic cylinder. This load is applied to the plate in 6 to 8 equal loading steps. Settlement of the plate is measured by the tester consisting of a carrier frame with a sensing arm and dial gauge. As a counterbalance, a heavy-weight vehicle is used.

The indentation of the load plate into the soil, generated with every load step, is indicated via the dial gauge. The settlement of every load step and the corresponding mean normal stress below the load plate appear as test values. Subsequent to the last load step the relief and a second loading similar to the first loading takes place. For the test evaluation these values are shown in a corresponding diagram as load settlement lines.

The modulus of deformation E_v is determined from the load settlement line of the first load (E_{v1}) and the second load (E_{v2}). By comparing the initial deformation from E_{v1} and the subsequent deformation of E_{v2} provides an indication of the compaction attained.

The test results and the load settlement lines can be read with the HD-4139.3F Plate Load tester directly on the display and can be printed out immediately at the site via thermal printer or be reviewed later in the office on a PC.

The HD-4139.3F Plate Load tester features:

- Handy measuring instrument with extra large illuminated display, which is easily viewed in all light conditions and a thermal printer within a aluminum case
- Automatic data transfer, Data-Secure, error-free automatic interpretation
- Intuitive menu navigation with a clearly arranged display
- Evaluation, displaying and printout immediately at the site shows E_{v1} , E_{v2} , E_{v1}/E_{v2} and settlement curve
- PC-connection, Software for creation of professional test protocols
- USB interface for easy data transfer, GPS for accurate localization of the measuring point
- Modular design provides flexibility in use

Static Plate Load Tester

HD-4139.3F

Ship wt. 244lbs (17.4kg)

Printer Paper

Replacement paper for use with Plate Load Tester and LWD.

Printer Paper

HD-4129.5

Shipping wt. 2 lbs (0.9kg)

HD-4139.3F shown with transport cases, which are included.





LIGHTWEIGHT Deflectometer

Fast, accurate and easy compaction control!

Areas of application:

- Quality control in road and railway construction
- Quality assurance in earth works and canal construction
- Compaction monitoring in pipe trenches and cable ducts
- Testing of pavement bedding, foundation backfill

Lightweight Deflectometers

ASTM E2835-11; TP BF-StB B8.3; TB 10102-2004

Lightweight Deflectometers (LWDs) are increasingly being used to determine overall compaction quality of all types of earthworks through their use as a QC/QA field test. LWDs provide a rapid determination of elastic modulus, which is an essential factor in mechanistic design and can be used as an accurate assessment of compaction. An LWD is used for measuring the bearing capacity (deflection) of subgrade/subsoils and unbound base layers, granular layers and backfilling materials, according to ASTM E2835-11. Based on the static plate load test requiring a load vehicle, the LWD provides a simple, fast and repeatable test providing an accurate assessment of compaction parameters. Applications for this non destructive method of testing include bearing capacity and compaction include road construction, pipeline and cable backfill, railway track beds, airport runway/taxiways, dam construction, embankments, foundations and other earthworks.

HD-4129.3F



Humboldt offers two models, a 10kg and a 15kg, in two versions a deluxe and a standard, of Lightweight Deflectometers from HMP—a deluxe models, the HD-4129.3F or HD-4159.3F and a basic models, the HD-4130.3F or HD-4149.3F.

Both units are the same mechanism and differ only in the controller used with each one.

The HD-4129.3F and the HD-4159.3F feature a deluxe controller that includes:

- A large, 3.5" colorful display
- Light sensor-controlled backlighting that provides the optimum readability even in bright sunlight
- Easy menu navigation

- Integrated GPS
- Integrated WIFI-enabled
- Interface for a thermal printer and USB
- Help function
- Efficient and fast 32-bit processor

The graphic interface of the deluxe controller provides an intuitive menu, which guides the user through the testing procedure and provides real-time test results. Measured data is presented in tabular, as well as curve formats with date, time and GPS location clearly depicted.



HD-4130.3F

HD-4129.05A
(case only)HD-4129.01A
(cart only)

This data can be exported from the control unit via USB or wirelessly directly into the Cloud or to your PC for archiving and further processing. This allows personnel in any office to have access to data while you are still on site testing. It is also possible to print out results to a small portable printer on site. Use of the web-based evaluation software: HMPReport, provides the ability to produce professional reports for each measuring point, which can include your logo and contact details. This software allows you to work with your data from the

Cloud or your PC. The software also enables you to store the data in a database with easy-to-use search and editing options.

Units include:

The LWD; magnetic base plate; portable printer (USB); GPS; PC Software and Android App (HD-4129.3F and HD-4159.3F only) Units are 120/220V 50/60Hz

Light Weight Deflectometer, 10kg, Deluxe HD-4129.3F

Light Weight Deflectometer, 10kg, Standard HD-4130.3F

Light Weight Deflectometer, 15kg, Deluxe HD-4159.3F

Light Weight Deflectometer, 15kg, Standard HD-4149.3F

Ship wt. 127lbs (57.6kg)

Transport Cart

Cart allows for easy moving of LWD.

Transport Cart

HD-4129.01A

Shipping wt. 20 lbs (9kg)

Transport Case

Wooden case for storage and transport

Transport Case

HD-4129.05A

Shipping wt. 157 lbs (6.8kg)

Printer Paper

Replacement paper for use with Plate Load Tester and LWD.

Printer Paper

HD-4129.5

Shipping wt. 2 lbs (0.9kg)

| Lightweight Deflectometers | HD-4129.3F HD-4159.3F | HD-4130.3F HD-4149.3F |
|---|--------------------------|--------------------------|
| Electronic settlement measuring instrument: | | |
| Settlement measuring range 0.1 bis 2.0 mm \pm 0.02 mm | ✓ | ✓ |
| Measuring range Evd < 225 MN/m ² | ✓ | ✓ |
| Temperature range 0 to 40 °C | ✓ | ✓ |
| Very robust, splash-water proof, connection cable with high-quality LEMO connectors | ✓ | ✓ |
| Graphic display in mm | 56 x 73 | 38 x 68 |
| Colorful, light sensor-controlled and illuminated | ✓ | |
| Black/white | | ✓ |
| Help function | ✓ | |
| Fast, efficient 32-bit processor | ✓ | |
| WIFI-enabled, USB, thermal printer interface | ✓ | ✓ |
| GPS | ✓ | ✓ |
| Dimensions | 210 x 100 x 31mm | 211 x 100 x 26mm |
| Storage capacity, internal in measurement series | 1000 | 500 |

| Lightweight Deflectometers | HD-4129.3F HD-4159.3F | HD-4130.3F HD-4149.3F |
|---|--------------------------|--------------------------|
| Power supply: | | |
| High-performance rechargeable lithium-polymer-battery 3.7 V, 6300 mAh | ✓ | |
| (4) R6 Batteries | | ✓ |
| Menu navigation (18 languages available) | ✓ | ✓ |
| Loading Mechanism | | |
| Total weight: 15kg (HD-4129 & HD-4130) | | |
| Drop weight: 10kg (HD-4129 & HD-4130) | | |
| Total weight: 20kg (HD-4159 & HD-4149) | | |
| Drop weight: 15kg (HD-4159 & HD-4149) | | |
| Max. impact force 7.07 kN | ✓ | ✓ |
| Duration of impact 17.0 \pm 1.5 ms | ✓ | ✓ |
| Material: zinc coated/hard-chrome plated steel | ✓ | ✓ |
| Spring element 17 disk springs | ✓ | ✓ |
| Load plate | | |
| Diameter 300 mm, Plate thickness 20.0 mm | ✓ | ✓ |
| Total weight 15kg Material: zinc coated steel | ✓ | ✓ |



H-4140 with Case

GeoGauge

ASTM D6758

The GeoGauge is a unique, QC/QA field tool that can be used to measure the uniformity of unbound pavement layers by measuring the variability in stiffness throughout a structure. It is an excellent tool for identifying construction anomalies that would otherwise go undetected during construction where only density or percent compaction measurements were used. By measuring stiffness, the GeoGauge can reveal and thus help reduce variabilities in layer properties, which density measurements may miss, thus allowing corrective actions to be taken during construction to ensure that the highest quality base and subgrade are achieved despite variations in materials used.

The GeoGauge is the perfect companion instrument for density measuring devices such as nuclear gauges and the electrical density gauge. Density measuring devices can be used to ensure that proper compaction is achieved and the GeoGauge can be used to verify that the stiffness/modulus values assumed in the design specifications of new or rehabilitated pavement structures

are met. Compacting and monitoring pavement layers directly to design requirements of structural layer stiffness or material modulus in addition to percent compaction during the construction process establishes the means to effectively control structural uniformity, strength and deflection, as well as enabling the monitoring and control of the construction quality of various materials. This leads to better smoothness and longer lasting pavement surfaces at lower cost.

The GeoGauge works by applying a vibrating force at 25 specific frequencies, which produce small deflections in the material. The resulting displacement is measured by the GeoGauge and displayed as stiffness determined by the ratio of the force to deflection. The GeoGauge produces stress and strain levels common for pavement, bedding and foundation applications. In addition, Young's and shear modulus can be determined from GeoGauge measurements if a Poisson's ratio is assumed. This dynamic technology used by the GeoGauge simulates real in-use conditions. This factor allows the GeoGauge to directly measure in-place engineering properties during the construction process. The GeoGauge supports and

directly links the in-place engineering properties of compacted materials with Mechanistic-Empirical Design for effective QC/QA. Successful control of compaction creates a quality functional structure with the desired engineering properties for the application and life intended.

Applications include subgrade, sub-base, base, monitoring the strength gain of lime, cement, fly-ash and polymer stabilized materials, monitoring the re-compaction of underground utility backfills to previous properties matching surrounding undisturbed materials, monitoring the compaction of asphalt and cold in-place recycling to peak properties to prevent wasted effort and damaging over-compaction.

GeoGauge

H-4140

Shipping wt. 40 lbs (18.1kg)





H-4140 Face Detail



H-4140.20



H-4140.C

Features Include:

- Dynamically measures in-place engineering properties using structural layer stiffness, MN/m (klbf/in) and Young's modulus of a material, MPa (kpsi)
- In-place QC/QA links compaction and material performance directly to design requirements while advancing mechanistic-empirical pavement design
- Enables maximum lift stiffness with minimum compactive effort
- Facilitates uniform stress transmission and distribution from pavement to subgrade resulting in longer pavement life, reduced maintenance costs and longer lasting surface smoothness.
- Enables reduced structural variability in construction
- In-place QC/QA of the strength gain of stabilized materials
- Data base development supporting mechanistic-empirical design and performance specifications
- Portable, fast, simple, reliable, non-invasive

- Other compaction applications include: lime, cement, fly-ash and polymer stabilized materials, cement-treated and rehabilitated bases, large particle aggregate bases, as well as underground utility backfills
- Gauge includes simple, easy-to-use software application, which provides download and storage of test data. Application allows printing of data reports, as well as saving information in other formats (.pdf, .csv and rich text) for importing data into other programs

Specifications

| | |
|----------------------------|---|
| Layer Stiffness | 17 to 400 klbf/in (3 to 70 MN/m) |
| Young's Modulus (in-place) | 4 to 90 kpsi (26 to 610 MPa) |
| Measuring Depth | 9 to 12 inches (230 to 310 mm) |
| Measuring Duration | 75 seconds |
| Power | six D-cell batteries (1000 to 1500 measurements) |
| Dimensions | gauge only: 11" dia. x 10.5" high (280 mm x 270 mm) carrying case: 18.5" x 16.5" x 13" (470 x 420 x 330 mm) |
| Net Weight | gauge only: 22 lbs. (10 kg) with case: 34 lbs. (15.5 kg) |

Verifier Mass

10kg Mass used to verify calibration of gauge.

Verifier Mass**H-4140.20**

Shipping wt. 25.7 lbs (11.7kg)

Calibration Platen

10kg Platen used to allow gauge to self-calibrate. Gauge is bolted onto platen with a torque wrench, which is included.

Calibration Platen**H-4140.C**

Shipping wt. 30 lbs (13.6kg)

Data Cable, Infrared

Infrared (IR) serial-interface, adapter cable with spreadsheet software template

Data Cable, Infrared**H-4140.12**

Shipping wt. 2 lbs (0.9kg)



H-4245, H-4245M



H-4249



H-4238, H-4238M



H-4238L



H-4246



H-4249P



H-4248



H-3821



H-4117

Sand Cone Apparatus Set, 6.5" (165mm)

ASTM D1556; AASHTO T191

The sand cone apparatus determines the in-place density of soils having a maximum particle size of up to 2" (51mm) using test hole volumes of approximately 0.1ft³ (2.8L). The set is comprised of a 1-gal. (3.79L) threaded plastic jar; a COE detachable double cone, which is threaded on one end; and, has a 6.5" (165mm) dia.. flanged opening on the other, which fits the opening of the H-4246 sand cone plate. (order separately). The cone has a brass cylindrical valve with a 0.5" (12.7mm) dia.. orifice and stops that prevent the valve from rotating past the completely open or completely closed positions.

Sand Cone Apparatus Set, 1 gal. Jar H-4245

Sand Cone Apparatus Set, 5L Jar H-4245M

Shipping wt. 3 lbs (4.5kg)

Sand Cone Apparatus Set, 4.5" (114mm)

ASTM D1556; AASHTO T191

The 4.5" sand cone apparatus can be used when it is desired to collect a smaller sample or when gathering a sample is difficult due to extremely hard compacted soil. The cone also determines the in-place density of soils having a maximum particle size of up to 2" (51mm) using test hole volumes of approximately 0.1ft³ (2.8L). The set is comprised of a 1-gal. (3.79L) threaded plastic jar; a detachable double cone, which is threaded on one end for attaching the threaded plastic jar; and, has a 4.5" (114mm) dia.. flanged opening on the other, which fits the opening of the H-4249P sand cone plate.

(order separately). The cone has a brass cylindrical valve with a 0.5" (12.7mm) dia.. orifice and stops that prevent the valve from rotating past the completely open or completely closed positions.

Sand Cone Apparatus Set

H-4249

Shipping wt. 6 lbs (4.5kg)

Sand Cone Plate

ASTM D1556; AASHTO T191

Used with sand cone apparatus to simplify removal of soil from test hole and act as template to control hole diameter. Cast aluminum alloy. Both plates have an overall dimension of 12 x 12" (305 x 305 mm). The H-4246 has a 6.5" hole and the H-4249P has a 4.5" hole.

Sand Cone Plate, 6.5" (165mm) Hole H-4246

Sand Cone Plate, 4.5" (114mm) Hole H-4249P

Shipping wt. 4.5 lbs (2.1kg)

Replacement Jar for Sand Cone

ASTM D1556; AASHTO T191

1-gal (3.79L) capacity, threaded-plastic replacement jar is the same as furnished with the H-4245 and H-4249 sand cone apparatus set.

Replacement Jar for Sand Cone, 1 gal. Jar H-4238

Replacement Jar for Sand Cone, 5L H-4238M

Shipping wt. 1.5 lbs (0.5kg)

Replacement Lid for Plastic Sand Cone Jar

Replacement lid for use with 1-gal (3.79L) capacity, threaded-plastic jar.

Replacement Lid for Sand Cone Jar H-4238L

Shipping wt. 0.6 lbs (7.3kg)

Sand Cone, Large, 12" (165mm)

ASTM D1556; AASHTO T191, COE

For determining in-place density of gravel and coarse soils. Features two identical cones with a

large valve between them and a circular density plate for support on the bottom. A clear plastic cover on the top cone allows for viewing sand flow. The unit also has handles for easier carrying. Flange that fits the lower cone allows apparatus to be used on holes up to 12" (305mm) dia. Complies with U.S. Army Corps of Engineers specifications.

Sand Cone, Large, 12" (165mm)

H-4248

Shipping wt. 50 lbs (23kg)

Density Sand

ASTM D1556; AASHTO T191, COE

Clean, dry, free-flowing uncemented sand has few, if any, particles passing the No. 200 (75mm) or retained on the No. 10 (2.00mm) sieves. The sand's variation in bulk density does not vary greater than 1 percent. Comes in a 50lb. box with a heavy reinforced inner bag.

Density Sand

H-3821

Shipping wt. 55 lbs (25kg)

Sand Cone Accessory Kit

Accessory kit for use with sand density cones and voluverssels. Includes: 100 plastic, 10" x 18" Sample bags and ties, a pocket dial thermometer, a bristle brush, a stainless steel spoon, a steel chisel and a rubber mallet. Does not include sand.

Sand Cone Accessory Kit

H-4117

Shipping wt. 9.5 lbs (4.3kg)

Sample Bags and Ties

100 plastic, 10" x 18" Sample bags and ties.

Sample Bags and Ties

H-4201

Shipping wt. 6 lbs (4.5kg)



Voluessel

ASTM D2167; AASHTO T205

Voluessels determine the in-place density of compacted or firmly-bonded soils using a rubber balloon apparatus viewed through a graduated, direct-reading clear plastic cylinder. Humboldt's voluessel is designed with a plastic cylinder, which screws into the density plate with the pump assembly mounted on top. Both voluessels include a pressure-vacuum pump assembly, pressure gauge, quick-coupler valve, double-graduated cylinder, 10 balloons and a density plate. Voluessels are not suitable for soft soils that deform under a slight pressure or where the volume of the hole cannot be maintained at a constant value. The Voluessels are individually calibrated before leaving the factory to ensure direct readings on the scale are accurate without the need for calculations. H-4166 is used with max.-sized soil particles of 0.5" (13mm) and H-4167 is used with max.-sized soil particles of 1" (25mm).

| | |
|--|--------|
| Voluessel, 1/20 ft ³ (1600ml) | H-4166 |
| Voluessel, 1/13 ft ³ (2230ml) | H-4167 |
| Shipping wt. 15.7 lbs (7.3kg) | |

Voluessel Saddle Weights

ASTM D2937

Weights used to ensure uniform and repeatable weight is applied during testing for accurate readings. Can be used with all Voluessels.

| | |
|----------------------------|---------|
| Voluessel Saddle weights | H-4166S |
| Shipping wt. 72 lbs (33kg) | |

Balloons, 10pk

Package of 10 balloons for Voluessel.

| | |
|-------------------------------|-----------|
| Balloons, 10pk | H-4166.10 |
| Shipping wt. 0.2 lbs (0.09kg) | |

Pump Assembly, Replacement

Rubber-bulb, pump assembly for all Voluessels.

| | |
|-------------------------------|-----------|
| Pump Assembly, all units | H-4166.10 |
| Shipping wt. 0.6 lbs (0.27kg) | |

Voluessel Base

ASTM D2167; AASHTO T205

Base for Voluessels, H-4166 and H-4167. Cast aluminum alloy. Plate has an overall dimension of 12 x 12" (305 x 305 mm). and a 4.5" hole.

| | |
|------------------------------------|---------|
| Sand Cone Plate, 4.5" (114mm) Hole | H-4249P |
| Shipping wt. 4.5 lbs (2.1kg) | |

Voluessel Cylinder Seal Gasket

Replacement seal gasket for Voluessels.

| | |
|---------------------------------|----------|
| Voluessel Base, H-4166 & H-4167 | H-4166.5 |
| Shipping wt. 3 lbs (4.5kg) | |

Voluessel w/ Metal Guard

ASTM D2167; AASHTO T205

This Voluessel features a base-mounted pump and a metal guard for the graduated plastic cylinder which provides an integral metal handle. Each unit includes a double-graduated cylinder, base plate, pressure/vacuum pump assembly with quick-coupler, ten balloons, and an integral gauge for controlling pressure during calibration and testing. The H-4116 Voluessel is used with max.-sized soil particles of 0.5" (13mm).

| | |
|--|--------|
| Voluessel, 1/20 ft ³ (1600ml) | H-4116 |
| Shipping wt. 14 lbs (6.8kg) | |

Density Drive Sampler

ASTM D2937

For determining in-place density of soil by driving a thin-walled tube into the soil mass to obtain a relatively undisturbed sample. Typically used to verify compacted fill placement, or to obtain samples from the bottom of shallow excavations. Zinc-plated, steel drive head and sliding weight hammer used with separately ordered drive tubes. Drive head, 10 lb., has shock reducing spring to guard against fatigue failure.

| | |
|-------------------------------------|----------|
| Density Drive Sampler, 3" (76.2mm) | H-4203.3 |
| Density Drive Sampler, 4" (101.6mm) | H-4203.4 |
| Shipping wt. 20 lbs (11kg) | |

Drive Tubes for Density Drive Sampler

ASTM D2937

Individual drive tubes for use with the density drive sampler. Tubes are available in two sizes: 3" (76.2mm) x 2.75" (69.9mm) length, (3" x 0.01 ft³) for use with the H-4203.3 drive sampler and 4" (101.6mm) x 5" (127mm) length, (4" x 0.033 ft³) for use with the H-4203.4 drive sampler.

| | |
|----------------------------------|-------------|
| Density Drive Tube, 3" (76.2mm) | H-4203DT.3 |
| Density Drive Tube, 4" (101.6mm) | H-4203DT.4A |
| Shipping wt. 0.6 lbs (0.6kg) | |



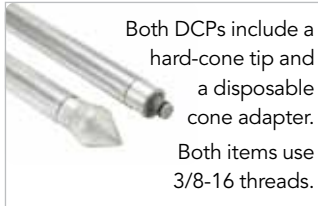
H-4219T



Threaded Ends



Both include a pelican case



Both DCPs include a hard-cone tip and a disposable cone adapter. Both items use 3/8-16 threads.



H-4219QC



Quick-Connect Ends

Dual-Mass Dynamic Cone Penetrometers

ASTM D6951

Developed by the Army Corps of Engineers, Dual-Mass Dynamic Cone Penetrometers (DMD-CPs) provide a low-cost, efficient test method for quickly determining in-situ CBR values of pavement base, sub base and sub grades. DMDCPs are primarily used to determine in-place soil shear strength in road construction with CBR values from less than 0.5 to 100% and bearing values ranging from 430 to 10,800 psf. They can readily be used for depths from 30 inches to 6 foot with optional drive rods and extensions. All Humboldt DMD-CPs comply with ASTM D6951 specifications and come with a chart in the manual to compute CBR values, as well as a internet link to a Excel spreadsheetw template, which automatically charts the test results.

Humboldt's DMDCPs are known for their high quality manufacturing and reliability, and, are available with either threaded connections or a quick-connect design. Both Humboldt DMDCPs feature our exclusive easy-grip hammer that provides a finger grip machined into the back side of the hammer flange, which provides easy, non-slip lifting when performing a test.

Humboldt DMDCPs consist of a drive hammer and steel extension shaft assembly with a 60° hardened cone tip attached at one end. The cone tip is driven into the pavement or sub grade by means of a sliding dual-mass hammer. The diameter at the base of the cone is 20 millimeters, which is 8 millimeters larger than that of the extension shaft. Hammer weight is 17.7 lbs and the hammer drop distance is 22.6" (574mm). Humboldt DMDCPs can also quickly convert to a single-mass unit for use in weaker soils having low CBR values or foundation evaluations by removing the outer sleeve from the dual-mass hammer.

Dual-Mass DCP, Quick-Connect Ends H-4219QC

Ship wt. 60lbs. (29.5kg)

Dual-Mass DCP, Threaded Ends H-4219T

Ship wt. 66lbs. (29.5kg)

Included with the H-4219QC DCP:

| Description | Model |
|--|-------------|
| Dual-Mass DCP Hammer, Quick-Connect Connection | H-4219QC.1 |
| Drive Rod, Quick-Connect, 37.75" (959mm) | H-4219QC.2 |
| Quick-Connect Pins (2) | H-4219QC.18 |
| Disposable Cone Adapter | H-4219.5 |
| Hard Cone Tip | H-4219.4 |
| Disposable Cones (pkg of 25) | H-4219.25 |
| Scale, 48" | H-4219.2 |
| Single-User Scale Guide Set | H-4219.17 |
| Wrench Set (Quick-Connect) | H-4219QC.7 |
| User Manual | H-4219.MAN |
| Go, No-Go Gauge | H-4219.3 |
| Pelican Case | H-4219.16 |

| Accessories | Model |
|--|-------------|
| Drive Rod, 12-inch Threaded | H-4219T.12 |
| Drive Rod, 12-inch Quick-Connect | H-4219QC.12 |
| Extension Rod, 24-inch, Threaded (For use with both Quick-Connect and Threaded models) | H-4219.8 |
| Disposable Cones (100 pk.) | H-4219.100 |
| Disposable Cones (25 pk.) | H-4219.25 |
| Disposable Cone Adapter | H-4219.5 |
| Hard Cone Tip | H-4219.4 |

DCP Extractor Jack

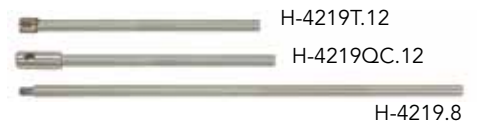
Extractor Jack provides easy, one-man operation for extracting DCP Rods out of the ground.

DCP Extractor Jack H-4219.40

Ship wt. 25lbs. (11.3kg)

Included with the H-4219T DCP:

| Description | Model |
|---|------------|
| Dual-Mass DCP Hammer, Threaded Connection | H-4219T.1 |
| Drive Rod, Threaded, 37.75" (959mm) | H-4219T.2 |
| Disposable Cone Adapter | H-4219.5 |
| Hard Cone Tip | H-4219.4 |
| Disposable Cones (pkg of 25) | H-4219.25 |
| Scale, 48" | H-4219.2 |
| Single-User Scale Guide Set | H-4219.17 |
| Wrench Set (Threaded) | H-4219T.7 |
| User Manual | H-4219.MAN |
| Go, No-Go Gauge | H-4219.3 |
| Pelican Case | H-4219.16 |





H-4219.30



H-4220F

Smart DCP for Dual-Mass Dynamic Cone Penetrometers

ASTM D6951

The SmartDCP makes collecting soil data with your Dynamic Cone Penetrometer much easier by automatically counting blows and eliminating the need for tape, pencils, paper and at times a second operator. It also provides vastly improved accuracy and ease of collecting and transferring data from the field to the office.

The SmartDCP Achieves This by:

- Automatically counting blows;
- Recording the change in depth with each blow
- Tracking the total depth of the probe
- Recording data on Apple iOS and Android smart devices via WIFI
- Eliminating the need for a ruler, pencil, and paper
- Transferring data via e-mail or USB from the smart device

The SmartDCP kit can be mounted to most hand held DCPs on the market and is easily operated by a single person. The investment cost associated with the SmartDCP is quickly realized through the reduction in time spent doing field tests, as well as the increased accuracy and ease of transferring data and creating reports. Users have repeatedly doubled the number of completed tests with increased accuracy when compared to the traditional manual data collection method of using a scale and paper log.

In the field the SmartDCP records data on a smart App. The App is free and available for download at the iOS App store for iPhones or Google Play for Android phones. The SmartDCP App immediately provides real time CBR%, depth change between

blows, as well as total depth of penetration with each data point. Completed tests can be graphed on the smart device in the field for quick analysis or sent via email to the investigation lead to review in the office

A complimentary desktop application for Windows systems is also available. The desktop application can be used to quickly graph your field data and keep your data organized using the application and Windows Explorer. This program can be downloaded from the following link:

<http://www.vertecpcpt.com/dcp-handheld-and-adcp> or via electronic transmittal.

SmartDCP Features:

- Touchscreen user interface (Android only)
- Real-time display of test data
- Data transfer to computer via WIFI or USB
- Displays mm per blow; blow counts vs. delta distance per blow (mm)
- Displays depth plot; depth (0-100cm) vs. number of blows
- Displays CBR plot; depth (0-100cm) vs. CBR%
- Fast setup / fast deployment
- Uses wireless WIFI laser depth transducer
- ANDROID OS version 2.2 or higher
- WIFI-enabled ANDROID smart phone or tablet
- SD card

The H-4219.30 SmartDCP Includes:

carry bag; Leica Disto E7100i Laser Range Finder with batteries; Baseplate with laser mount; laser target; smart device arm band; stamped wrench and 1" combination set, and a manual.

SmartDCP

H-4219.30



Ship wt. 27lbs. (12kg)

Foundation, Single-Mass DCP, Quick-Connect

The H-4220F single-mass (10.1 lbs.), foundation DCP is used to estimate the shear strength of weak soil with a CBR less than 20 and psf less than 4000. It can be used to assess the in-place strength of undisturbed soil and/or compacted materials. It can also be used to estimate the CBR (California bearing ratio), shear strength and thickness of the material. The H-4220F is ideal for horizontal construction applications, such as shallow foundations, footings and pavement shoulders. Typically it is used to assess material properties to a depth of 36" (914 mm) below the surface. Also, with the use of 24" extensions this depth can be increased to 6 ft. (2 m).

The H-4220F comes with a 37.75" drive rod that is marked in 2" increments; a single-mass, 10.1 lb (4.5kg), sliding hammer and a reusable, hardened point. The drive rod and hammer are connected with a quick-connect pin. The Hammer drop is 22.6" (575mm) with a tolerance of 0.039in. (1.0mm). The hardened point has a 60° angle with a tolerance of 1°. The tip base diameter is 0.790" (20mm) with a tolerance of 0.010" (0.25mm).

Foundation, Single-Mass DCP

H-4220F



Ship wt. 27lbs. (12kg)

| Accessories | Model |
|--|-------------|
| Drive Rod, 12-inch Quick-Connect | H-4219QC.12 |
| Extension Rod, 24-inch, Threaded (For use with both Quick-Connect and Threaded models) | H-4219.8 |



Dynamic Cone Penetrometer for Shallow In-situ Tests

The dynamic cone penetrometer (DCP), originally developed by George Sowers, uses a 15 lb steel mass falling 20" to strike an anvil to penetrate a 1.5" diameter 45° (vertex angle) cone that has been seated in the bottom of a hand-augered hole. The DCP can be used effectively in augered holes in nearly all types of soils to depths of 15 to 20 ft. (4.6 to 6.1m). Components are zinc-plated and cones are heat-treated. The cone can be replaced with a Drive Tube Assembly (H-4202.7A) for collection of 3" x 10" (7.6 x 25.4 cm) tube samples from hand-augered holes.

This penetrometer is used to determine a penetration resistance relationship with the standard penetration resistance of virgin soils. As with all field tools used in foundation evaluations, this method should never be used as the sole means for determining foundation conditions. It should be used in conjunction with previously established field and laboratory data, such as the split-spoon standard penetration test, density, shear strength or consolidation data.

The H-4202A set includes; (1) standard hammer assembly (H-4202.1), (1) heat-treated 45° cone penetrometer point with a 1 ft. adapter rod (H-4202.3), (4) 2.5 ft. E drill rod extensions (H-4202.225), (1) auger head (H-4202.6), (1) auger T-handle (H-4202.4), (4) 36" auger extensions (H-4202.5).

The 4202A DCP test set is also available with a H-4202.1A sleeved drive hammer for easier and safer operation.

Dynamic Cone Penetrometer Test Set H-4202A
DCP Test Set with Sleeved Hammer H-4202AS
 Ship wt. 78lbs. (36kg)

Sleeved Hammer for Dynamic Cone Penetrometer
 Alternate hammer for H-4202 DCP test set. Hammer provides a safer and easier alternative to the standard hammer.

Sleeved Hammer for DCP H-4202.1A
 Ship wt. 30.2lbs. (15kg)

Dynamic Cone Penetrometer Individual Items

| Description | Model |
|--|-------------|
| Standard drive hammer | H-4202.1 |
| Sleeved drive hammer | H-4202.1A |
| E drill rod extension 1 ft. | H-4202.21 |
| E drill rod extension 2 ft. | H-4202.22 |
| E drill rod extension 2.5 ft. | H-4202.225 |
| E drill rod extension 5 ft. | H-4202.25 |
| Drive point (45° cone), 1 ft. Rod | H-4202.3 |
| Drive point (45° cone), No Rod | H-4202.3DP |
| Auger assembly: (Head, (2) pins, T-handle, (1) extension | H-4202.6A |
| Auger T-handle | H-4202.4 |
| Auger T-handle, SS | H-4202.4SS |
| Auger extension. 36" | H-4202.5 |
| Auger extension, SS, 36" | H-4202.5SS |
| Auger head, standard 3.25" | H-4202.6 |
| Auger head, SS, 3.25" | H-4202.6SS |
| Windowed auger head, 3.25" (heat-treated carbon steel). | H-4202.6W |
| Windowed auger head, standard (stainless steel) 3.25" | H-4202.6WSS |
| Shelby Tube Drive Head, 3" E Rod | H-4202.7A |
| Replacement connector pin. | H-4202.8 |
| Replacement connector pin, SS | H-4202.8SS |

E drill rod is 1-15/16" in diameter

DCP Test Set without Augers

The H-4202X DCP test set without the augers includes; (1) standard hammer assembly (H-4202.1), (1) heat-treated 45° cone penetrometer point with a 1 ft. adapter rod (H-4202.3), (4) 2.5 ft. E drill rod extensions (H-4202.225). This set is also available with the H-4202.1A sleeved hammer.

DCP Test Set without Augers H-4202AX
Sleeved Hammer for DCP, No Augers H-4202SX
 Ship wt. 65lbs. (29.5kg)

Shelby Tube Drive Head

Drive head for Shelby tubes for use with H-4202.1 or H-4202.1A drive hammers with 3" "E" rod connection. (See page 33 for Shelby tubes.)

Sleeved Hammer for DCP H-4202.7A
 Ship wt. 5.9lbs. (2.7kg)

Proctor Penetrometer Set

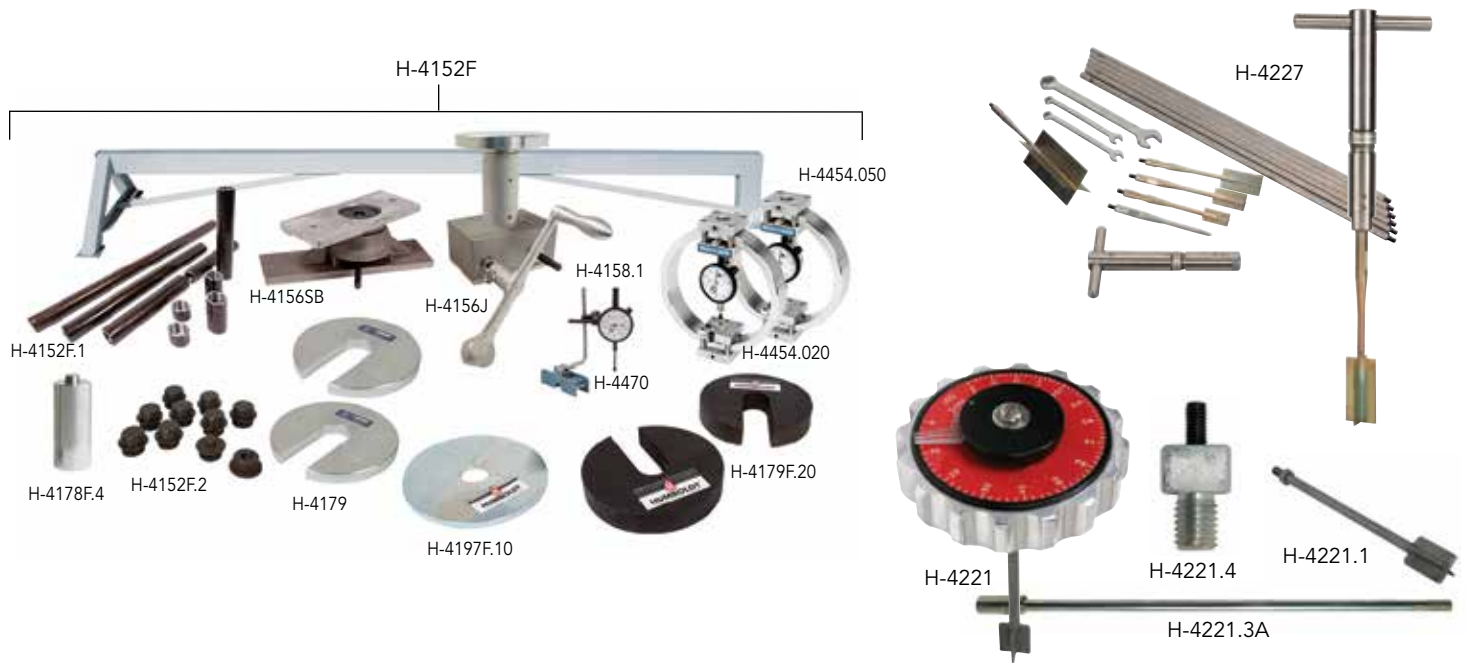
ASTM D1558

Establishes the moisture-penetration resistance relations of fine-grained soils. Includes these interchangeable needles (area in sq. in. or sq. cm): 1" 2 (6.45cm²), 3/4" 2 (4.84cm²), 1/2" 2 (3.22cm²), 1/3" 2 (2.15cm²), 1/5 in. 2 (1.29cm²), 1/10" 2 (.65cm²), 1/20" 2 (0.32cm²) 1/30" 2 (0.22cm²) and 1/40" 2 (0.16cm²). Replacement needles available below.

Proctor Penetrometer H-4139
 Ship wt. 17lbs. (7.7kg)

Proctor Penetrometer Needles

| Description | Model |
|---|------------|
| Resistance Needle Set | H-4143N |
| 1 sq. in. (6.45 cm ²) needle | H-4143.1 |
| 3/4 sq. in. (4.84 cm ²) needle | H-4143.75 |
| 1/2 sq. in. (3.22 cm ²) needle | H-4143.50 |
| 1/3 sq. in. (1.29 cm ²) needle | H-4143.33 |
| 1/5 sq. in. (2.15 cm ²) needle | H-4143.20 |
| 1/10 sq. in. (0.65 cm ²) needle | H-4143.10 |
| 1/20 sq. in. (0.32 cm ²) needle | H-4143.05 |
| 1/30 sq. in. (0.22 cm ²) needle | H-4143.033 |
| 1/40 sq. in. (0.16 cm ²) needle | H-4143.025 |

**CBR Field Test Set**

ASTM D4429

The CBR field test set is designed for making CBR determinations in the field and is built around a modified H-4156 load frame. CBR field testing can quickly yield a relative strength determination without having to rely on lab tests. Field tests involve forcing a piston into the soil and comparing the depth of penetration in relation to the load placed on the piston. Typically, the reaction load used for field testing is a heavy piece of equipment, such as a loaded dump truck. Gear box is 2-speed model with a 10,000lbf (45kN) capacity and 3.5 inches of lift. The use of the extension and connector set provides sufficient flexibility for almost any type of height requirement. The CBR field test set includes:

| Part # | Description |
|------------|--|
| H-4156J | (1) 2-sp. gear box, handle & platen |
| H-4156SB | (1) Swivel base |
| H-4454.020 | (1) 2200 lbf load ring |
| H-4454.050 | (1) 5500 lbf load ring |
| H-4152F.1 | (1) CBR extension set |
| H-4152F.2 | (1) CBR connector set |
| H-4158.1 | (1) Dial indicator, 1.000" x 0.001" |
| H-4152F.8 | (1) Steel bridge support |
| H-4179F.10 | (1) Surcharge weight, 10lb, 10" |
| H-4179 | (2) Slotted surcharge weight, 10lb |
| H-4179F.20 | (2) Slotted surcharge weight, 20lb, 8.5" |
| H-4470 | (1) Magnetic indicator mount |
| H-4178F.4 | (1) Penetration piston, 4" |

CBR Field Test Set **H-4152F**
 CBR Field Test Set, Metric Indicators **H-4152FM**

Ship wt. 289 lbs. (131kg)

Vane Inspection Set

The Vane Inspection Set provides a rapid check of the stability of foundations, excavations and trenches in clay. The total range is 0 to 260kPa (0 to 2.6 ton/sq. ft.). The scale built into the handle holds the peak value until reset. Accuracy is $\pm 10\%$. Four different sized vanes are included with the set (16 x 32, 20 x 40, 25.4 x 50.8mm and 50.8 x 101.6mm). The effective ranges are 0 to 260, 0 to 130, 0 to 65 and 0 to 8kPa. (0 to 2.6, 0 to 1.3, 0 to 0.65 and 0 to 0.08tsf). A "dummy" vane is also included to calibrate the six 0.5 meter long extension rods for effects of soil friction. All items come in a compartmentalized vinyl carrying case with three wrenches.

Vane Inspection Set**H-4227**

Ship wt. 15.6lb (6kg)

Vane Inspection Kit Replacement Parts

| Description | Model |
|--------------------------|-----------|
| Vane: 50.8 x 101.6mm | H-4227.2 |
| Vane: 16 x 32mm | H-4227.3 |
| Vane: 25.4 x 50.7mm | H-4227.4 |
| Vane: 20 x 40mm | H-4227.5 |
| Vane: Calibration | H-4227.7 |
| Vane Inspection T-Handle | H-4227.10 |
| Extension Rod, 0.5 meter | H-4227.1 |

Geovane Soil Shear Strength Tester

The geovane is a hand-held instrument used for determining soil shear strength providing the reading in kPa. The device is simple to use. A 19mm vane blade is screwed into the base of the geovane and the vane is pushed into the soil. Simply rotate the geovane at a rate of 1 revolution per minute and take a reading off the face when the soil fails. The pointer stays in place when failure occurs, allowing you to look up the indicated reading on the supplied calibration chart to get your reading in kPa from zero to 200. Through the use of the optional 33mm vane, readings can be measured between the range of zero to 40 kPa. Extension rods are available to increase the depth measurement capabilities of the unit. The H-4221.4 Adapter is needed to attach extension rods to the geovane. The geovane is supplied complete with a 19mm vane blade, wrenches and a carrying case.

Geovane Soil Shear Strength Tester**H-4221**

Ship wt. 7lb (3kg)

Geovane Accessories and Replacement Parts

| Description | Model |
|-----------------------------|-----------|
| Vane Blade (33mm) | H-4221.1 |
| Extension Rod 12" (300mm) | H-4221.2A |
| Extension Rod 19.7" (500mm) | H-4221.3A |
| Extension Rod Adapter | H-4221.4 |



H-4212MH



H-4212



H-4205



H-4200

H-4200M



H-4195


H-4200F
H-4195F

Pocket Shear Vane, Metal

The Humboldt H-4212MH pocket shear vane Tester provides a quick and efficient method for determining shear strength values of cohesive soils. The pocket shear vane is widely used for taking on-site measurements of excavations, including trenches and test pits. It is also used for taking readings from thin-wall or split core soil samples. It can also be used in the laboratory for evaluations. The device is widely used by safety and OSHA inspectors, back hoe operators, field testing technicians, consulting engineers, etc.

The Humboldt shear vane device comes with three vanes, which are easily attached or removed from the device with the included hex-wrench. We also include a custom, heavy-duty, nylon bag for storage, which can be quickly attached to your belt with its belt clip, as well as a laminated instructions card, so you always have instructions to refer to when doing tests.

The pocket shear vane can be used to gather a large number of readings including those from different failure planes without the need to prepare and trim samples. The device can be used on any reasonably flat surface that is slightly larger than the vane surface being used. The pocket shear vane can be used with fully-saturated, fine-grained soils with an undrained strength independent of normal pressure, including a wide range of clays from soft to stiff consistency. Readings can be made from 0 to 2.5 TSF (1 kg/cm²). The dial on the unit reads in 0.05 TSF (0.05 kg/cm²) increments.


Pocket Shear Vane, Metal **H-4212MH**
 Ship wt. 0.8lb (0.4kg)

Pocket Shear Vane, Plastic

The H-4212 pocket shear vane tester provides a quick and efficient method for determining shear strength values of cohesive soils. The pocket shear vane is widely used for taking on-site measurements of excavations, including trenches and test pits. It is also used for taking readings from thin-wall or split core soil samples. It can also be used


in the laboratory for evaluations. The device is widely used by safety and OSHA inspectors, back hoe operators, field testing technicians, consulting engineers, etc. This device comes with three vanes, which are easily attached or removed. The torvane shear tester is molded plastic and comes in a plastic molded case.

The pocket shear vane can be used to gather a large number of readings including those from different failure planes without the need to prepare and trim samples. The device can be used on any reasonably flat surface that is slightly larger than the vane surface being used. The pocket shear vane can be used with fully-saturated, fine-grained soils with an undrained strength independent of normal pressure, including a wide range of clays from soft to stiff consistency. Readings can be made from 0 to 2.5 TSF (1 kg/cm²). The dial on the unit reads in 0.05 TSF (0.05 kg/cm²) increments.

Pocket Shear Vane, Plastic **H-4212**
 Ship wt. 1.3lbs (0.6kg)


Soil Penetrometer, Dial-Type

A sophisticated pocket penetrometer offering greater capacity and sensitivity than others. Maximum value is retained on the dial until released via push-button. Inner dial scale 0 to 6.0, with 0.1 divisions in tsf and kg/cm². Outer scale gives load strength over 0 to 11.0 with 0.1 divisions in kg. This reading is used with charts (included) to estimate safe bearing pressures, depending on plunger used and soil type. Values indicated relate to the standard 0.25" dia.. plunger. In addition, readings with four other included plungers (10, 15, 20, 25mm) indicate safe bearing pressures for foundations in consolidated soils over a range of sandy to clay-type soils. The 2.5" (63mm) dia.. dial can be easily recalibrated using register plates (included) and any readable scale of 10-15 lbs. capacity. Includes data tables, register plates, instructions, and carrying case.

Soil Penetrometer, Dial-Type **H-4205**
 Ship wt. 1lb (0.5kg)


Humboldt Soil Penetrometer (Tire-Gauge Design)

For use by field personnel to check visual classification of soils. Verifies whether excavation side walls require shoring, based on OSHA cohesive soils classifications. Indicates consistency, shear strength, and approximate unconfined shear strength. Both models provide a direct-reading scale, which corresponds to equivalent unconfined compressive strength. The H-4200 reads in ton/ft² and the H-4200M reads in ton/m². Range: 0 to 4.5 ton/ft.² (0-45ton/m²). High-quality construction. Includes belt-loop style carrying case and operating instructions. Should not replace laboratory testing or field analysis, or be used to produce foundation design data.

Humboldt Soil Penetrometer, ton/ft² **H-4200**
Humboldt Soil Penetrometer, ton/m² **H-4200M**
 Ship wt. 0.4lb (0.2kg)


Soil Penetrometer, Pocket-Type

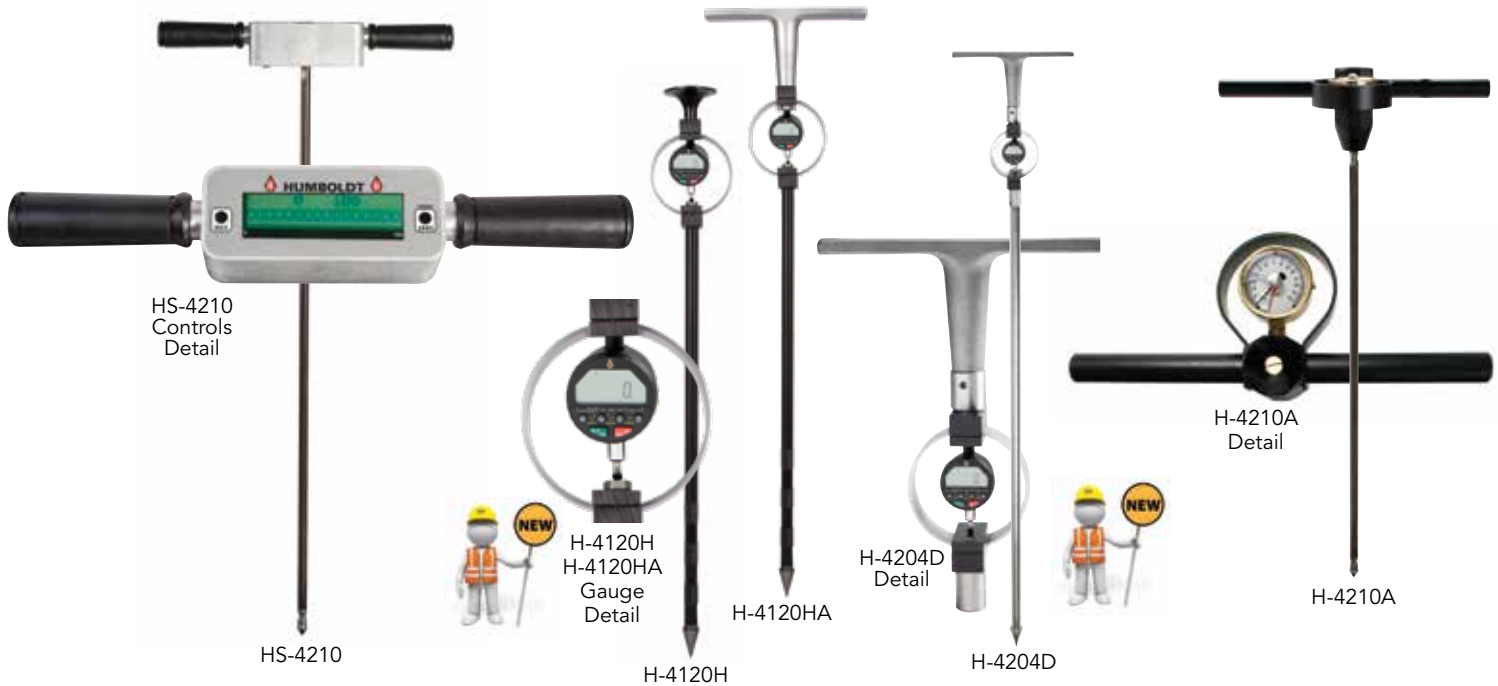
For use by field personnel to check visual classification of soils. Verifies whether excavation side walls require shoring, based on OSHA cohesive soils classifications. Indicates consistency, shear strength, and approximate unconfined shear strength. Direct-reading scale—in tons/ft², or kg/cm²—corresponds to equivalent unconfined compressive strength. Indicator sleeve retains reading after piston is released.

Soil Penetrometer, Pocket-Type **H-4195**
 Ship wt. 0.8lb (0.4kg)

Penetrometer, Low-Strength Soil Adapter Foot

Adapter foot is recommended when testing extremely low strength cohesive soils. 1" (25mm) dia.. foot, compared to the 0.25" (6.35mm) penetrometer piston, increases the effective area measured by 16 times. Divide by 16 to obtain correct unconfined compressive strength when the reading in tons per square foot or kilograms per square centimeter is on the low-load side.

Adapter Foot for H-4200 and H-4200M **H-4200F**
Adapter Foot for H-4195 **H-4195F**
 Ship wt. 0.4lb (0.2kg)



Digital Static Cone Penetrometer

The HS-4210 digital, static cone penetrometer (DSCP), with its large, digital readout, makes testing and recording readings easy. The DSCP can be used to evaluate soil consistency by determining the soil's level of compaction and/or the bearing capacity. The DSCP is especially useful in evaluating shallow foundations and pavement sub-grades where fine-grained and soft soils are being used. The DSCP can also be used to aid technicians in quickly selecting sites for testing, as well as correlating with other tests, based on local conditions, such as standard or modified Proctor, CBR or bearing capacity. The DSCP uses a dual-rod design, which eliminates the need to correct for soil friction on the rod as the cone is pushed through the material. Penetration resistance is read directly from the cone tip and registered on the digital display. The unit comes with a 30" starter rod and a 60° cone with a 1.5cm² area and reads in lbs., TSF or kg/cm².

Digital Static Cone Penetrometer **HS-4210**
 Ship wt. 9lbs. (4kg)

HS-4210 Replacement Parts

| Description | Model |
|---|-------------|
| Extension Rod, 30" | HS-4210.2 |
| Starter Rod, 30" | HS-4210.3 |
| Inside Push Rod, (29.875") For Starter Rod | HS-4210.3.1 |
| 60° Cone, 1.5cm ² max area | H-4210.1 |
| 60° Cone, 3cm ² max area | H-4210.3 |

Cone Penetrometer, Corps of Engineers

IL DOT 502

Designed to evaluate soil trafficability and manufactured to Corps of Engineers specifications. The factory calibrated dial indicator reads directly in psi. Includes 30° cone with 0.5 in². base area; 150 lb capacity proving ring; a dial indicator calibrated direct 0–300psi in 5psi increments; extension rod .625" (15.8mm) dia. x 19" (483mm), and the handle.

Cone Penetrometer, Corps of Engineers **H-4120H**
Cone Penetrometer, COE, T-Handle **H-4120HA**
 Ship wt. 4lbs. (1.8kg)

H-4120H Replacement Parts

| Description | Model |
|-------------------------------|-----------|
| 30° Cone, 0.5 in ² | H-4120H.4 |
| Penetration Rod, 19" x .625" | H-4120H.3 |

Cone Penetrometer, Direct-Read, Digital

Used to determine the bearing capacity of sub-grades, or to measure soil compaction. It's light and easy-to-handle in the field, and provides a rapid means of determining the penetration resistance of soil in shallow exploration surveys. This penetrometer features a direct-read, digital gauge that is calibrated directly to a master load cell with an accuracy of 0.1 psi. This direct-read feature eliminates computations and charts to determine what the psi readings are. The penetrometer comes with a 30°, 1 in². (6.45 cm²) cone; a 37.25" x 0.75" (19mm) dia. shaft, graduated at 6" (152mm) intervals, and a cast-aluminum, two-hand-style handle.

Cone Penetrometer, Direct-Read, Digital **H-4204D**
 Ship wt. 15.2lbs. (6.8kg)

H-4204 Replacement Parts

| Description | Model |
|---|----------|
| 30° Cone, 1in ² (6.45cm ²) | H-4204.3 |
| Extension Rod, 37.25" | H-4204.4 |

Static Cone Penetrometer

Used in fine-grained, soft soils at shallow foundation and pavement sub-grades to evaluate for soil consistency, level of compaction and bearing capacity. Unmatched for accuracy, reliability and ease of use. Pressure gauge with 0-70kg/cm² is scaled for direct reading of cone stress, eliminating proving ring conversions. Dual-rod design eliminates soil friction factor. High strength aluminum and steel construction. Standard model includes a 60° cone with 1.5cm². max. area, a 24" (0.6m) starter rod assembly rated at 250 lbf axial force max., and a pressure gauge.

Static Cone Penetrometer **H-4210A**
 Ship wt. 6.3lbs. (2.9kg)

H-4210 Replacement Parts

| Description | Model |
|---------------------------------------|------------|
| 60° Cone, 3cm ² max area | H-4210.3 |
| 60° Cone, 1.5cm ² max area | H-4210.1 |
| Extension rod, 24" (0.6m) | H-4210E.2A |
| Starter rod, 24" (0.6m) | H-4210.2A |
| Replacement O-ring | H-4210.9 |



NOTES

The use of static cone penetrometers should not replace laboratory testing of field analysis or be used to produce foundation design data.



Augers, Quick-Connect

Augers, Threaded



H-4442QC

H-4442TH

Augers, Bucket-Type, Quick-Connect

Quick-connect, button-and-hex coupling system allows components to connect and disconnect faster and with less hassle than threaded systems. Quick-connect connections, are not compatible with slide hammers. Bucket augers offer outstanding durability and allow access to deeper depths. The regular auger bit is designed for ordinary soil sampling. The sand auger bit is used for dry, sandy soils. Mud auger bits are designed for sampling heavy, wet soil or clay samples; opening facilitates removal of wet samples. Heat treated, high carbon steel bits with tungsten carbide hard-surfaced edges. Bits are welded to a stainless steel cylinder, topped with a carbon steel ball.

| Augers, Bucket-Type, Quick-Connect | | | |
|------------------------------------|----------|----------|----------|
| Size | Regular | Sand | Mud |
| 2" | H-4410QC | H-4430QC | H-4420QC |
| 2.25" | H-4411QC | H-4431QC | H-4421QC |
| 2.75" | H-4412QC | H-4432QC | H-4422QC |
| 3.25" | H-4413QC | H-4433QC | H-4423QC |
| 4" | H-4414QC | H-4434QC | H-4424QC |

Augers, Bucket-Type, Quick-Connect **See Chart**
 Ship wt. 3lb (1.37kg)

Augers, Extensions, Quick-Connect

Extensions for use with the Augers above.

| Auger Extensions, Quick-Connect | |
|---------------------------------|----------|
| Description | Model |
| 2 ft. (610mm), Extension | H-4442QC |
| 3 ft. (914mm), Extension | H-4443QC |
| 4 ft. (1219mm), Extension | H-4444QC |
| 5 ft. (1524mm), Extension | H-4445QC |

Auger Extensions, Quick-Connect **See Chart**
 Ship wt. 3lb (1.3kg)

Augers, Bucket-Type, Threaded

Threaded connections use standard, national course, threads. 5/8" connections are the most common and least expensive. Augers, core samplers, probes, slide hammers, hammer-head handles, and kits are available with threaded connections. Bucket augers offer outstanding durability and allow access to deeper depths. The regular auger bit is designed for ordinary soil sampling. The sand auger bit is used for dry, sandy soils. Mud auger bits are designed for sampling heavy, wet soil or clay samples; opening facilitates removal of wet samples. Heat treated, high carbon steel bits with tungsten carbide hard-surfaced edges. Bits are welded to a stainless steel cylinder, topped with a carbon steel ball.

| Augers, Bucket-Type, Threaded | | | |
|-------------------------------|----------|----------|----------|
| Size | Regular | Sand | Mud |
| 2" | H-4410TH | H-4430TH | H-4420TH |
| 2.25" | H-4411TH | H-4431TH | H-4421TH |
| 2.75" | H-4412TH | H-4432TH | H-4422TH |
| 3.25" | H-4413TH | H-4433TH | H-4423TH |
| 4" | H-4414TH | H-4434TH | H-4424TH |

Augers, Bucket-Type, Threaded **See Chart**
 Ship wt. 3lb (1.3kg)

Augers, Extensions, Threaded

Extensions for use with the Augers above.

| Auger Extensions, Threaded | |
|----------------------------|----------|
| Description | Model |
| 2 ft. (610mm), Extension | H-4442TH |
| 3 ft. (914mm), Extension | H-4443TH |
| 4 ft. (1219mm), Extension | H-4444TH |
| 5 ft. (1524mm), Extension | H-4445TH |

Auger Extensions, Threaded **See Chart**
 Ship wt. 3lb (1.3kg)

**Auger Handles, Quick-Connect**

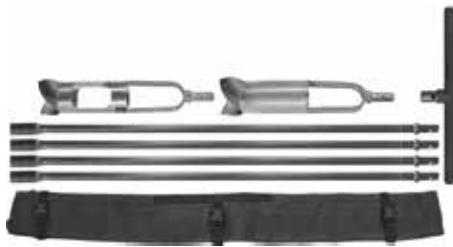
Cross handles with quick-connect, button-and-hex coupling system connect and disconnect faster and with less hassle than threaded systems.

Auger, Cross-Handle, Padded **H-4447QC**
 Auger, Cross-Handle, 16" Ratcheting **H-4449QC**
 Ship wt. 2.6lb (1.3kg)

Auger Handles, Threaded

Cross handles with threaded connections use standard, national course, threads. 5/8" connections are the most common and least expensive handle attachment method.

Auger, Cross-Handle, Padded **H-4447TH**
 Auger, Cross-Handle, 16" Ratcheting **H-4449TH**
 Ship wt. 3lb (1.3kg)



H-4418.23



H-4419.23



H-4416.2



H-4449



H-4451



H-4452

Basic Soil Sampling Kits. 5/8" Threaded

Basic sampling kits provide everything you'll need to auger to a target depth as deep as 12ft and obtain a relatively undisturbed soil core sample. The kits are used worldwide by construction companies, consultants and engineering firms for site investigations. They are available with 5/8" threaded components with either 2.25" or 3.25" augers. Each kit comes with (1) regular, (1) mud, and (1) sand auger. The kits also include (3) 4' extensions, (1) 18" rubber-coated cross handle, (1) regular slide hammer, (1) core sampler (1.5" x 6" or 2" x 6"), (1) plastic liner, (2) plastic end caps, (1) cleaning brush, (1) universal slip wrench, and (2) adjustable wrenches. All the components fit securely in a foam-lined, poly-reinforced deluxe carrying case with handles and wheels for added portability.

2.25" Basic Soil Sampling Kit H-4416.2

3.25" Basic Soil Sampling Kit H-4416.3



Ship wt. 56lb (26kg)

Soil Auger Kits, Threaded

These soil auger kits are complete, compact setups for augering to depths of 12' or 16'. Soil auger kits include (1) regular and (1) mud auger, (4) extensions, an 18" rubber-coated cross handle, and a flexible, poly-canvas carrying case for easy transport and storage. These are supplied with 5/8" threaded connections.

2.25" Augers with (4) 3' Extensions H-4419.23

2.25" Augers with (4) 4' Extensions H-4419.24

3.25" Augers with (4) 3' Extensions H-4419.33

3.25" Augers with (4) 4' Extensions H-4419.34



Ship wt. 22lb (8.2kg)

Soil Auger Kits, Quick-Connect

These soil auger kits are complete, compact set-ups for augering to depths of 12' or 16'. Soil auger kits include (1) regular and (1) mud auger, (4) extensions, an 18" rubber-coated cross handle, and a flexible, poly-canvas carrying case for easy transport and storage. These are supplied with quick-connect connections.

2.25" Augers with (4) 3' Extensions H-4418.23

2.25" Augers with (4) 4' Extensions H-4418.24

3.25" Augers with (4) 3' Extensions H-4418.33

3.25" Augers with (4) 4' Extensions H-4418.34



Ship wt. 21lb (8.6kg)

Rock Breaker Set

Pair of rock breaking attachments for auger sets. 5/8" threaded-end for attaching to extensions and slide hammers. Used to split or chip rocks and stones found in an augered hole. These rock breakers are alloy-steel, sharp-edged chisels designed for use with slide hammers. Used to break up obstructions in augered holes.

Rock Breaker



H-4449

Ship wt. 3lb (1.3kg)

Slide Hammers

Slide hammers are used for easier penetration and extraction of soil samplers and probes. The Hammer consists of steel tubing that slides over a hardened steel rod, which is threaded to 5/8" NC to accommodate drive rods and extensions. Soft, baked-on rubber coating and ball-grip handle reduces shock to operator's hands and increases comfort.

Regular Slide Hammer, 5/8" Threaded H-4451

Compact Slide Hammer, 5/8" Threaded H-4452



Ship wt. 9lb (4.1kg)



H-4208



H-4209

H-4206

H-4207



H-4207A

Universal Slip (Strap) Wrench

Great tool for the field. Can be used to loosen or uncouple auger and penetrometer extensions, as well as any other round or irregular-shaped tools and test apparatus.

Universal Slip (Strap) Wrench



H-4453

Ship wt. 3lb (1.3kg)

Sample Bags, Plastic-Lined

Heavy-duty material, plastic-lined sample bag. Bag has draw-cord closure and can be used for various applications involving soils, aggregates, sands and similar materials.

Sample Bags, 10" x 18" (254 x 457mm) H-4208

Sample Bags, 17" x 32" (432 x 813mm) H-4209



Ship wt. 0.7lbs. (0.31kg)

Sample Bags

Heavy-duty material, unlined sample bag. Bag has draw-cord closure and can be used for various applications involving soils, aggregates, sands and similar materials.

Sample Bags, 10" x 18" (254 x 457mm) H-4206

Sample Bags, 17" x 32" (432 x 813mm) H-4207



Ship wt. 0.5lbs. (0.22kg)

Sample Bags, Economy

Heavy-duty material, unlined sample bag. Bag has draw-cord closure and can be used for various applications involving soils, aggregates, sands and similar materials.

Sample Bags, 10" x 19" (254 x 483mm) H-4206A

Sample Bags, 15" x 29" (381 x 737mm) H-4207A



Ship wt. 0.25lbs. (0.1kg)

**Soil Sampling Auger, Spiral-Type**

ASTM D1452

For use in sampling soils, auger has 1.5" dia. x 4" long (38mm x 102mm) spiral-type auger bit. Features graduation marks every 6" (152mm). Overall length is 36" (914mm), including handle. Screw-on handle permits attachment of H-4251 extension for sampling beyond 36" depths.

Soil Sampling Auger, Spiral-Type

H-4250

Ship wt. 5lbs (2.7kg)

| Description | Model |
|------------------------------|--------|
| Auger Extension, 36" (914mm) | H-4251 |

Auger Set, Quick-release Handle and Bucket

Set includes a 3.25" windowed, auger head of zinc-plated steel, auger T-handle, 36" (914mm) auger extension and (2) Quick-release connector Pins.

Auger Set, QR Handle and Bucket

H-4202.6A

Ship wt. 8lbs (2.2kg)

| Description | Model |
|---|----------|
| Auger Extension, 36" (914mm) with Connect Pin for H-4202.6A | H-4202.5 |
| Attachment Pins | H-4202.8 |

T-Handle Auger, Iwan-Type

ASTM D1452

T-handle augers are also known as post-hole, Iwan-type or non-adjustable augers. Feature 36" (914mm) long steel shaft and hardwood cross handle. Available 2" (51mm) to 6" (152mm) diameter. Overall length 48" (1219mm).

| | |
|------------------------------------|----------|
| Auger, Iwan-Type- 2" Dia.. (51mm) | H-4252.2 |
| Auger, Iwan-Type- 3" Dia.. (76mm) | H-4252.3 |
| Auger, Iwan-Type- 4" Dia.. (102mm) | H-4252.4 |
| Auger, Iwan-Type- 6" Dia.. (152mm) | H-4252.6 |

Ship wt. 8lbs (3.2kg)

| Description | Model |
|---|-----------|
| Auger Extension, 36" (914mm), includes coupling for H-4252.2 | H-4252.2E |
| Auger Extension, 36" (914mm), includes coupling for H-4252.3, H-4252.4 and H-4252.6 | H-4252E |

Soil Sampling Auger Tube Set

Set contains auger and sampling tube. Components are plated steel to resist abrasive action of soil. Includes 1.25" (25mm) dia. by 12.5" (318mm) long auger, 1" (approx. 25mm) OD by 12.5" (318mm) long sampling tube, two 12" (305mm) extension rods, handle and a fiberboard carrying case.

Soil Sampling Auger Tube Set

H-4268

Ship wt. 5.4lbs (3.2kg)

Soil Sampling Tube Set

Tube sets are helpful and functional for agricultural and other soil-testing procedures. Sampling tube will produce 15" (381mm) core of soil. Includes 18" (457mm) long, 7/8" (22mm) ID sampling tube, handle and carrying case.

Soil Sampling Tube Set

H-4269

Ship wt. 2.7lbs (1.4kg)

Footstep Soil Sampler

Footstep Soil Sampler is a 36" one-piece soil sampler with a welded-on footstep. It has a 12" soil tube, which uses replaceable, screw-on soil tips. A 5" handle is welded on to the probe for convenience. The 36" height makes it easy on your back. The sampler provides a 9" x 0.75" sample. The tube is marked in 6" intervals and provides easy unloading of the sample.

Soil Sampling Tube

H-4261

Ship wt. 4.2lbs (2.2kg)

Classic Soil Sampler

Soil Sampler is a 36" one-piece soil sampler, with an 8" handle. It provides a 9" x 0.75" sample. The tube is marked in 6" intervals and provides easy unloading of the sample. It has a 12" soil tube, which uses replaceable, screw-on soil tips.

Soil Sampling Tube

H-4362

Ship wt. 4.2lbs (2.2kg)

Soil Sampler Replacement Tips

Soil tips are replaceable and work on the following Sampling Tubes: H-4261, H-4362, H-4268 and H-4269. Buying extra tips for your soil sampling tool can be a convenient and economic way to increase the lifespan of your equipment. Tips are 0.75" in diameter and nickel plated to add extra strength and resist corrosion.

The Regular Soil Tip was specially designed for use in areas with many different soil and moisture types. This is an "all purpose" tip, so if you aren't sure which tip to get, this is a great option.

Dry Soil Tip was specially designed for use in areas with sand or very dry soil.

Wet Soil Tip was designed for use in clay, mud, or very wet soil and moisture types. It has a thicker ridge on the inside to help hold onto the wet soil better.

The Heavy Duty Soil Tip was designed for use in areas with hard soil, gravel or other difficult soil types.

| | |
|---------------------|----------|
| Regular Soil Tip | H-4268.1 |
| Dry Soil Tip | H-4268.2 |
| Wet Soil Tip | H-4268.3 |
| Heavy-Duty Soil Tip | H-4268.4 |

Ship wt. 1lbs (0.45kg)

**Probe Rod, Steel**

Ideal for locating buried pipes, tanks and utility lines. Zinc-plated steel, 36" (914mm) x 0.5" (12.7mm) shaft.

Probe Rod, Steel**H-4188**

Ship wt. 8lbs (2.2kg)

Probe Rod, Fiberglass

Ideal for locating buried pipes, tanks and utility lines. Light, non-conductive fiberglass 48" (1219mm) x 0.5" (12.7mm) shaft.

Probe Rod, Fiberglass**H-4188F**

Ship wt. 8lbs (2.2kg)

Power Mechanical Earth Drill

For soil sampling, construction and more, earth augers are gasoline powered and portable. Using one operator, they allow fast and easy drilling. They feature snap-on or screw-on augers and extensions. Engine mounted on wheel-base carrier keeps motor noise and fumes away from the operator. Torque tube eliminates counter torque. Features such as the carrier and torque tube offer greater mobility, beneficial in areas inaccessible to large equipment, on slopes and horizontal drilling, various standard sampling methods to obtain material samples. Recoil starter and spring-loaded throttle-in-handle assembly provide fingertip control. Centrifugal clutch, heavy-duty flexible shaft connects to the motor and provides for a smooth operation. Blades and points are tool steel, hard-surfaced and heat treated. Blades are reversible for longer life. Most augers are snap-on design; smaller diameter augers are screw-on. Auger has either 5HP or 8HP, 4-cycle engine with 10:1 gear ratio, complete with wheel kit and torque tube. Order augers and extensions separately. For augers 1.5" to 6" dia., maximum depth is 18' (38 to 152mm, 5.5m deep).

Power Mechanical Earth Drill, 5hp**H-4050****Power Mechanical Earth Drill, 8hp****H-4051**

Ship wt. 225lb (102 kg)

42" Snap-On Augers

| Description | Model |
|------------------------------|-----------|
| 1.5" (38mm) Snap-On Auger | H-4052A.1 |
| 2" (51mm) Snap-On Auger | H-4052A.2 |
| 3" (76mm) Snap-On Auger | H-4052A.3 |
| 4" (102mm) Snap-On Auger | H-4052A.4 |
| 6" (152mm) Snap-on Extension | H-4052A.6 |

42" Long augers dig a 36" deep hole.

36", Full-flighted Snap-On Extensions

| Description | Model |
|-------------------------------|----------|
| 1.5" (38mm) Snap-On Extension | H-4053.1 |
| 2" (51mm) Snap-On Extension | H-4053.2 |
| 3" (76mm) Snap-On Extension | H-4053.3 |
| 4" (102mm) Snap-On Extension | H-4053.4 |
| 6" (152mm) Snap-On Extension | H-4053.6 |

Tube Extensions

| Description | Model |
|---------------------------------------|----------|
| 36" Tube extension for 3 to 6" Augers | H-4053.7 |
| 18" Tube extension for 3 to 6" Augers | H-4053.8 |

Replacement Points & Blades

| Description | Model |
|---|----------|
| Point, Screw-on, 1.5" (38mm) | H-4055.1 |
| Point, Screw-on, 2" (51mm) | H-4055.2 |
| Point, Screw-on, 3" (76mm) | H-4055.3 |
| Point, For 4" (102mm) and 6" (152mm) Blades | H-4055 |
| Blade, 4" (102mm) | H-4056 |
| Blade, 6" (152mm) | H-4057 |

Shelby Tubes

ASTM D1587

Shelby tube samplers are thin-walled, hollow steel tubes, which are driven into the ground to extract a relatively undisturbed soil sample for use in laboratory tests used to determine density, permeability, compressibility and strength. Each tube has one end that is chamfered to form a cutting edge and the upper end includes holes for securing the tube to a drive head. Shelby tubes are useful for collecting soils that are particularly sensitive to sampling disturbance, including fine cohesive soils and clays. The tubes can also be used to transport samples back to the lab as well. **Note: Size is OD.** All tubes are 16 gauge steel.

| Description | Model |
|-----------------------------------|------------|
| 2" dia. x 30" long, (wt.2.5lbs) | H-4210.230 |
| 2" dia. x 36" long, (wt.3.2lbs) | H-4210.236 |
| 2.5" dia. x 30" long, (wt.4.2lbs) | H-4210.253 |
| 2.5" dia. x 36" long, (wt.5.5lbs) | H-4210.256 |
| *3" dia. x 10" long, (wt.1.9lbs) | H-4210.10 |
| *3" dia. x 12" long, (wt.1.9lbs) | H-4210.12 |
| *3" dia. x 18" long, (wt.3.0lbs) | H-4210.18 |
| *3" dia. x 24" long, (wt.3.8lbs) | H-4210.24 |
| *3" dia. x 30" long, (wt.5.1lbs) | H-4210.30 |
| *3" dia. x 36" long, (wt.6.2lbs) | H-4210.36 |
| 3.5" dia. x 30" long, (wt.5.5lbs) | H-4210.353 |
| 3.5" dia. x 36" long, (wt.6.3lbs) | H-4210.356 |
| *5" dia. x 24" long, (wt.11.8lbs) | H-4210.524 |
| *5" dia. x 30" long, (wt.17.5lbs) | H-4210.530 |
| *5" dia. x 36" long, (wt.19.5lbs) | H-4210.536 |

* galvanized

Shelby Tubes

See Table

Ship wt. See Table

**Caps for Shelby Tubes**

Plastic end caps for protecting tube and sample.

| Description | Model |
|----------------------|------------|
| 2" Plastic End Cap | H-4210.2C |
| 2.5" Plastic End Cap | H-4210.25C |
| 3" Plastic End Cap | H-4210.3C |
| 3.5" Plastic End Cap | H-4210.35C |
| 5" Plastic End Cap | H-4210.5C |

Caps for Shelby Tubes

See Table

Ship wt. See Table

Expansion Packer for Shelby Tubes

Expanding plugs to seal samples in Shelby tubes for transport.

| Description | Model |
|-----------------------|------------|
| 2" Expansion Packer | H-4210.2P |
| 2.5" Expansion Packer | H-4210.25P |
| 3" Expansion Packer | H-4210.3P |
| 5" Expansion Packer | H-4210.5P |

Expansion Packer for Shelby Tubes

See Table

Ship wt. See Table

Sealing Wax

ASTM D109

Sealing wax to seal ends of shelby tubes for transport. 10 lb. box.

Sealing Wax

H-4210W

Ship wt. 11lb (5.4 kg)

Shelby Tube Head, 3" Tubes

Shelby Tube Head for 3" shelby tubes for use with H-4202.1 or H-4202.1A drive hammers with "E" rod connection (sold separately, see page 28).

Shelby Tube Head, 3" Tubes

H-4202.7A

Ship wt. 5.9lb (2.7 kg)

Shelby Tubes Heads

Various heads for different sized Shelby tubes.

| Description | Model |
|---------------------------|-------------|
| 2" for AW Rod (wt.4lbs) | H-4210.2AW |
| 2" for AWJ Rod (wt.5lbs) | H-4210.2AWJ |
| 2.5" for AW Rod (wt.6lbs) | H-4210.25AW |
| 3" for AW Rod (wt.13lbs) | H-4210.3AW |
| 3" for AWJ Rod (wt.11lbs) | H-4210.3AWJ |
| 3" for NW Rod (wt.9lbs) | H-4210.3NW |
| 5" for NW Rod (wt.28lbs) | H-4210.5NW |

Shelby Tubes Heads

See Table

Ship wt. See Table

AW= 3 threads per inch

AWJ= 5 threads per inch

**ACCESSORIES**

For Knives, Go to page 359.

For Pans, Go to pages 354-355.

Water Level Indicator

The Water Level Indicator determines water levels in drainage operations, dams, reservoirs, embankments, wells, bore holes, underground cavities, or any hydrological/geological work. Works well with small openings, holes & shafts that are not always straight. Compact, self-contained units feature a jointed design for easy access to difficult openings. Weighted probe is

lowered into the opening via high-strength, flexible cable. Buzzer & light indicate when water level has been reached. Readings taken from marked cable to very tip of probe so less than 1 ml of water is displaced. Probe resists false readings caused by cascading water. Standard models have cables marked in feet, metric models marked in centimeters.

| | |
|-------------------------------|-------------|
| Water Level Indicator, 150ft. | H-4040.150 |
| Water Level Indicator, 300ft. | H-4040.300 |
| Water Level Indicator, 500ft. | H-4040.500 |
| Water Level Indicator, 50m | H-4040.50M |
| Water Level Indicator, 100m | H-4040.100M |
| Water Level Indicator, 150m | H-4040.150M |

Ship wt. 6 to 12lbs (3 to 5kg)

Water Level Meter

The Water Level Meter is designed to measure groundwater levels, especially in small diameter tubes and piezometers, or where a flexible assembly is needed to get past downhole instrumentation. Units include a 3/8" dia. x 2.75" (10 x 70mm) stainless steel probe with 10 stainless steel weights, weighing 6.14oz. (174g). This probe is ideal for the majority of water level measurement applications. The flexible weight assembly allows easy well access and keeps the cable hanging straight in monitoring wells. The coaxial cable used has a durable polyethylene jacket with permanent markings precisely etched on the cable every 1/100ft.

| | |
|---------------------------|-------------|
| Water Level Meter, 100ft. | H-4041.100 |
| Water Level Meter 200ft. | H-4041.200 |
| Water Level Meter, 300ft. | H-4041.300 |
| Water Level Meter, 500ft. | H-4041.500 |
| Water Level Meter, 30m | H-4041.30M |
| Water Level Meter, 60m | H-4041.60M |
| Water Level Meter, 100m | H-4041.100M |
| Water Level Meter, 150m | H-4041.150M |

Ship wt. 6 to 12lbs (3 to 5kg)

**ACCESSORIES**

For Melting Pots, Go to page 183.

**Resistivity Meter, Digital**

ASTM G187, G57; AASHTO T-288

The digital resistivity meter provides soil resistivity readings at the push of a button. It provides a direct read-out of resistance without a need to select ranges or adjust dials. The resistance range is from 0.01Ω to $10M\Omega$ (auto-ranging). The meter provides a high-resolution digital display and is housed in a rugged, hard plastic case— safe for use on wet ground. It provides a blue-tooth interface for optional data logging via a blue-tooth-enabled PC. Resistance measurements are unaffected by any stray interference signals, which may be present in the soil during readings, due to the use of narrow band-pass filters centered at 82.2Hz (the unit's operating frequency). Runs on a set of replaceable D-cell alkaline batteries with no need to periodically recharge the unit or to plug it into a power source. Performs 10,000 single readings on a fresh set of batteries. For data logging capabilities, the meter is supplied with an "over-the pipe" soil resistivity survey program, known as "ProCP soil resistivity", based on the 4-Pin Wenner methodology.

Accuracy:

0.01Ω to $1M\Omega$ range: $\pm 1.6\% \pm 1LS$ Display Digit
 $1M\Omega$ to $10M\Omega$ range: $\pm 5\% \pm 1LS$ Display Digit

Resistivity Meter, Digital

H-4385D

Ship wt. 10.5lbs (5kg)

Resistivity Meter, Analog

ASTM G187, G57; AASHTO T-288

The resistivity meter can be easily used to measure resistivity of soil in-situ using the 2, 3, or 4 electrode method or with a soil box to measure resistivity of soil or water in the range of distilled to sea water. Resistance measurement range is from 0.01Ω to $1.1M\Omega$ and resistance measurements are unaffected by any stray interference signals that may be present in the earth during measurement, due to use of narrow band-pass filters. It

has a rugged, lightweight weatherproof case with an IP67 rating for dust and water intrusion. The lid can be removed to facilitate use and movement of the meter to new locations without removing test leads. Runs on a set of C-cell alkaline batteries eliminating recharging and plugged-in power sources.

Resistivity Meter

H-4385

Ship wt. 10lbs (5kg)

Soil Box

The Soil Box can be used with both resistivity meters for a quick and accurate measurement of resistivity of a soil or water sample in the field or laboratory. Construction is clear plastic with stainless steel current plates and brass potential pins. The dimensions are such that the measured resistivity with the Resistivity Meter, when the box is filled level, can be expressed in ohm-centimeter, making calculations unnecessary. The box can also be used with other meters. H-4386: $8.75" \times 1.5" \times 1.25"$ ($222 \times 38 \times 32mm$) and H-4386SM: $4.375" \times 1.125" \times 1.5"$ ($111 \times 29 \times 38mm$).

Soil Box, 280ml Capacity

H-4386

Soil Box, 75ml Capacity

H-4386SM

Ship wt. 1.3lb (0.5kg)

Soil Cylinder

ASTM G187; AASHTO T-288

The Soil Cylinder can be used to satisfy either of the 2-electrode methods— ASTM G187 or AASHTO T-288 Standards. The body of the Soil Cylinder is made of clear acrylic with PVC components and the distribution plates (conducting end plates) are stainless steel. Rubber O-rings provide sealing for the two end caps. Accommodates large sample volumes [approximately $2,714 cm^3$ (2.714 liters)] and can accommodate crushed-rock samples, as well as regular soils and liquids. Water can be added in-situ for sample saturation (de-ionized water, simulated rain water etc.).

Field-collected samples can be immediately "installed" in the cylinder, as opposed to filling a separate container for transportation. This means that resistance readings taken at a later stage will be representative of the "as-found" sample.

Soil Cylinder

H-4385.5

Ship wt. 4.6lbs (2.3kg)

Resistivity Test Reel with Soil Pins

ASTM G187, ASTM G57, AASHTO T288

Four pin, test reel set for attaining 1-20 ft. depth measurements. Can be used with any 4-terminal meter. Uses 4-electrode Wenner method. Includes 4 separate, color-coded wires of varying lengths from 5 to 65 ft. Jumper leads (2-foot) are supplied for connection to meter.

Resistivity Test Reel with Soil Pins

H-4388

Ship wt. 6.7lbs (3.2kg)

Soil Pins (Electrodes)

Set of 4 soil pins for use with resistivity meters. Pins measure $1/4" \times 20"$ ($1.9 \times 51cm$).

Soil Pins (Electrodes)

H-4388.1

Ship wt. 3.9lbs (1.8kg)

Soil Box Leads, set of 4

Set of 4 wire leads for use with resistivity meters to connect to soil boxes. Leads are 4 ft. (122 cm) long.

Soil Box Leads, set of 4

H-4387

Ship wt. 0.7lbs (0.3kg)

Resistivity Meter Test Kit

ASTM G187, G57; AASHTO T-288

The Soil resistivity test kit is designed to conveniently store and carry all that is necessary to perform the Wenner Four-Pin Method, as outlined in the ASTM G57-06 Standard, as well as the Soil-Box Method. The kit includes: (1) large Soil Box; Soil container test leads set, (1) set of 4-Pin Test Reel leads; 4-Pin soil resistivity test reel, (4) Heavy-duty, stainless steel, 18" long, T-handle, Soil pins and carrying case. **Order Resistivity Meter separately.**

Resistivity Meter Test Case

H-4385.1

Ship wt. 10lbs (6kg)



HM-4502



HSM-2100



H-4377



H-4368A

Double Ring Infiltrometer

ASTM D3385

Ideal for field testing, as well as lab use. The Double-Ring Infiltrometer provides actual field measurements of the rate of infiltration of water or other liquid through soils, especially fine-grained soils. The test provides reliable data for use in environmental and other geotechnical studies, such as liquid waste disposal; leaching; drainage; irrigation requirements, and canal or reservoir leakage.

The Infiltrometer is comprised of two stainless steel rings measuring 12" and 24" dia. x 20"H (304.8 and 609.6 dia. x 508mm). These rings are driven into the soil in a concentric arrangement using the included driving plate.

The rings are filled with water and the water level is maintained by the use of constant-head Mariotte reservoir cylinders, which provide a constant head of water for the duration of the test. The velocity of liquid passing into the soil from the inner ring is equivalent to the infiltration rate. Water between the two rings promotes one-dimensional vertical flow beneath the inner ring.

A mariootte tube provides a constant head of water for flow tests. Graduations on the side of the tube used to determine flow rate. Sealed adjusting tube raises or lowers the head inside the infiltrometer ring. There is a main flow valve in the base platform and a bleed valve next to the adjusting tube seal. Includes: 0.5" thick (12.7mm) aluminum driving cap with centering pins; two, 6" square (152.4mm) neoprene splash guards; and two mariootte tubes with 3,000 ml and 10,000 ml capacities with support stands, flexible tubing and rubber splash guards.

Double Ring Infiltrometer

HM-4502

Ship wt. 148lbs (72.5kg)

Guelph Permeameter Kit

ASTM D5126

The Guelph Permeameter is an easy-to-use instrument to quickly and accurately measure in-situ hydraulic conductivity. Accurate evaluation of soil hydraulic conductivity, soil absorptivity, and matrix flux potential can be made in all types of soils.

The equipment can be transported, assembled, and operated easily by one person. Measurements can be made in 10.5 to 2 hours, depending on soil type, and requires only about 2.5 liters of water. Measurements can be made in the range of 15 to 75cm below the soil surface.

The Guelph Permeameter is a complete kit consisting of the permeameter, field tripod, well auger, well preparation and cleanup tools, collapsible water container, and vacuum test hand pump, all packaged in a durable carrying case. Accessory attachments are available for extending the measurement capability of the permeameter. Depth attachments increase the depth of operation by 80cm. The maximum practical operating depth is 315cm. Ring attachments allow ring infiltrometer measurements from 10 and 20cm diameter rings. A tension adapter allows measurements to be made under tensional and very low head conditions. The Guelph Permeameter Kit, consists of: permeameter field tripod, well auger, well preparation and cleanup tools, collapsible water container, and vacuum test hand pump, in a durable carrying case.

Guelph Permeameter Kit

HSM-2100

Ship wt. 33lbs (14.9kg)

Acidity and Moisture Tester

Provides the ability to make on-the-spot in field or lab tests for soil acidity in moist soil. Measures pH and moisture content (% relative saturation). The Kelway tester operates on the principle of electrical potential between two dissimilar metal plates - without batteries or any external power

source. When inserted into moist soil it registers the degree of acidity on the upper scale. The lower scale shows degree of moisture (% saturation) when the switch button is held in. Tester is supplied with belt-loop case, two 3" x 4" (76 x 102mm) conditioning film sheets and instructions. Not for use with liquids.

Acidity and Moisture Tester

H-4377

Ship wt. 2lbs (1kg)

Acidity and Moisture Tester Conditioner Film

Conditioning film sheets for Acidity and Moisture Tester. Package of 12.

Conditioner Film (12 pk)

H-4377.1

Ship wt. 1lbs (0.5kg)

Soil Color Charts

Munsell soil color charts were developed with the U.S. soil conservation service for classifying soil color, but may also be used for rocks, archaeological specimens, and other natural products. Munsell charts are a standard tool for geologists, civil engineers, and soil scientists. The tabbed charts include 10R, 7.5R, 5R, 2.5YR, 5Y, 7.5YR, 10YR, 2.5Y, 5Y and 10Y-5GY color ranges. Charts for tropical and semitropical soils, and for Australia, SE Asia are now included. A two page Gley chart for submerged soils covers weak chromas and neutrals of blue and green hues. A white page is used to describe carbonate, silica, gypsum, soluble salt participates and more. Openings between chips allow easy visual comparison with soil samples. Illustrations of soil grain structures, charts for estimating proportions of mottles and coarse fragments, color name diagrams, and instructions are furnished. Color chips are mounted on neutral gray, 7.25 x 4.25" (184 x 108mm) water resistant pages in an 8 x 6" (203 x 152mm) loose-leaf binder.

Soil Color Charts

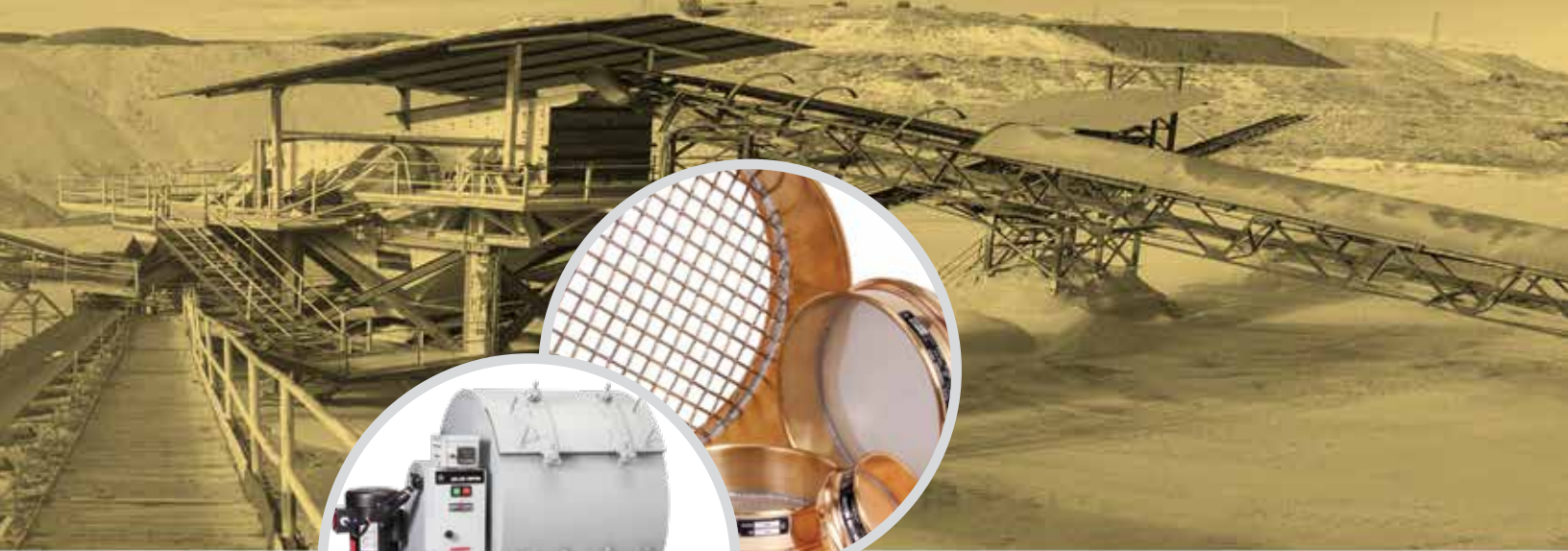
H-4368A

Ship wt. 1.5lbs (0.5kg)

**Looking for
Moisture Testing
Equipment?**
See pages 70-71.







AGGREGATE

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H-3962, H-3964



H-3980, H-3985

H-3966, H-3987, H-3989,
H-3990, H-3992H-3970,
H-3975

Humboldt Sample Splitter Specifications

| Model | Material Size (max.) | Chutes Number Width | | Hopper L x W inches (mm) | Pans (incl.) | Ship wgt. lbs. (kg) | Steel Pan | | Stainless Steel Pan | | |
|---|-------------------------|------------------------|-------------------|---------------------------------|-----------------|---------------------------|---------------------------------------|--|---------------------|--|--|
| | | | | | | | Pan Model # | L x W x H" (mm) | Pan Model # | L x W x H" (mm) | |
| One-Piece Construction Sample Splitters | | | | | | | Replacement Pans for Sample Splitters | | | | |
| H-3962 | 0.25" (6.3mm) | 14 | .375" (9.52mm) | 8" x 6.75" (203 x 171mm) | 4 | 2 lb (6.3 kg) | H-3981 | 8.0" x 5.25" x 4.25" (133 x 203 x 108mm) | H-3981S | 6.5" x 5.875" x 4.5" (165 x 149 x 114mm) | |
| H-3964 | 0.33" (8.4mm) | 14 | .500" (12.7mm) | 11" x 6.75" (279 x 171mm) | 4 | 2.7 lb (7.7 kg) | H-3986 | 5.5" x 10.5" x 4.5" (140 x 267 x 114mm) | H-3986S | 11.25" x 6.5" x 5.5" (286 x 165 x 140mm) | |
| H-3966 | 0.50" (12.7mm) | 14 | .750" (19mm) | 14.75" x 6.75" (375 x 171mm) | 4 | 3 lb (12.3 kg) | NA | NA | H-3967S | 13.25" x 5.125" x 6.625" (337x 130 x 168mm) | |
| H-3987 | 0.66" (16.9mm) | 16 | 1.00" (25.4mm) | 20" x 9" (508 x 229mm) | 4 | 5.9 lb (14.1 kg) | H-3988 | 6.375" x 19" x 4.875" (162 x 483 x 124mm) | H-3988AS | 16.375" x 6.5" x 5.25" (416 x 165 x 133mm) | |
| H-3989 | 1.33" (33.8mm) | 8 | 2.00" (50.8mm) | 19.5" x 9.5" (495 x 241mm) | 4 | 5.9 lb (12.3 kg) | H-3988 | 6.375" x 19" x 4.875" (162 x 483 x 124mm) | H-3988AS | 16.375" x 6.5" x 5.25" (416 x 165 x 133mm) | |
| H-3990 | 1.00" (25.4mm) | 10 | 1.50" (38.1mm) | 20" x 9" (508 x 229mm) | 4 | 5.9 lb (22.7 kg) | H-3988 | 6.375" x 19" x 4.875" (162 x 483 x 124mm) | H-3988AS | 16.375" x 6.5" x 5.25" (416 x 165 x 133mm) | |
| H-3992 | 1.67" (42.3mm) | 8 | 2.50" (63.5mm) | 24" x 9" (610 x 229mm) | 4 | 4.5 lb (22.7 kg) | NA | NA | H-3993S | 22" x 5.125" x 6.75" (559 x 130 x 171mm) | |
| Removable Hopper Sample Splitters | | | | | | | | | | | |
| H-3980 | 0.33" (8.4mm) | 12 | .500" (12.7mm) | 11" x 8.5" (279 x 216mm) | 4 | 2 lb (8.2 kg) | H-3981 | 5.25" x 8.0" x 4.25" (133 x 203 x 108mm) | H-3981S | 6.5" x 5.875" x 4.5" (165 x 149 x 114mm) | |
| H-3985 | 0.50" (12.7mm) | 12 | .75" (19mm) | 14" x 8.5" (356 x 216mm) | 4 | 2.7 lb (9.5 kg) | H-3986 | 5.5" x 10.5" x 4.5" (140 x 267 x 114mm) | H-3986S | 11.125 x 6.5 x 5.5" (283 x 165 x 140mm) | |
| Enclosed Sample Splitters | | | | | | | | | | | |
| H-3970 | 0.25" (6.3mm) | 14 | .375" (9.52mm) | 8" x 6.5" (203 x 165mm) | 2 | 2.1 lb (10 kg) | NA | NA | H-3977S | 7" x 5.75" x 3.75" (178 x 146 x 95mm) | |
| H-3975 | 0.25" (6.3mm) | 24 | .375" (9.52mm) | 11" x 4.5" (279 x 114mm) | 2 | 5.5 lb (12.7 kg) | NA | NA | H-3976S | 11.875" x 5" x 6.125" (302 x 127 x 156mm) | |



H-3994



H-4135



H-3971C



H-3973



H-3974

Micro and Precision Splitter Specifications

| Chutes | | Hopper Size L x W— inches (mm) | Hopper Volume cu. inch (mm) | Pans (furnished) | Pan Capacity cu. inch (mm) | Ship wt. lbs. (kg) | Model | Pan |
|--------|-------------------|-----------------------------------|--------------------------------|---------------------|-------------------------------|-----------------------|---------|----------|
| Number | Width in. (mm) | | | | | | | |
| 16 | .125" (3.2) | 4.5" x 4.5" (114 x 114mm) | — | 2 | — | 3.7 lbs (3.2 Kg) | H-3971C | H-3972 |
| 32 | .25" (6.4) | 8.9" x 8.3" (226 x 211mm) | 160 | 2 | 160 | 15 lbs (10.4 Kg) | H-3973 | H-3973.1 |
| 22 | .375" (9.5) | 8.5" x 7.0" (216 x 178mm) | 100 | 2 | 100 | 15 lbs (10.4 Kg) | H-3978 | H-3973.1 |
| 16 | .5" (13) | 8.8" x 8.0" (224 x 203mm) | 150 | 2 | 150 | 13 lbs (9.5 Kg) | H-3974 | H-3973.1 |

Humboldt Sample Splitters (See Previous Page)

ASTM B215, C136, C702, C778, D421, D424, D457, D806, AASHTO T27, T144, T248

Riffle-type sample splitters divide or halve dry materials such as cement, gravel, powdered ores, coal, coke, sand, soils, etc. Material poured into the hopper is divided into two equal portions by a series of chutes that discharge the material alternately in opposite directions into separate pans. Humboldt splitters are stainless steel. Pans are either stainless or cold-rolled steel. See chart to the left for quantity and construction of pans included. Also refer to the chart for ordering replacement or extra pans. All splitters include pans, scoop and cleaning brush. See chart for product details on specific models.

One-Piece Construction Sample Splitters

For rapid, single-step reduction of large sample volumes— ideal for field applications. See models: H-3962, H-3964, H-3966, H-3987, H-3989, H-3990, H-3992.

Removable Hopper Sample Splitters

Same design as the one-piece splitters except these have a removable hopper for easier cleaning. See models: H-3980 and H-3985.

Enclosed Sample Splitters

Enclosed sample splitters are ideal for dusty samples, including coal, coke and chaff. See models: H-3970 and H-3975.

16-1 Sample Reducer

ASTM C136, C702, C778, D75; AASHTO T27, T248

The Sample reducer is used to cut a 1/16th representative sample of a larger material sample by eliminating parts of the sample as it flows down an adjustable 45° or 60° incline. The adjustable 0.25ft³ (7.1L) hopper can be used in batch mode or left open when larger samples are needed.

Produces a 10-lb., or greater, representative sample with a maximum particle size of .5" (13mm).

Reducer cuts out 1/16th of the material fed through the unit in one pass. (a one-pound sample can be obtained from a 256-pound original sample by passing it through twice). Overall dimensions are: 27" x 18" x 36" (686 x 457 x 914mm)

Unit is supplied without sample containers. Order containers below.

16-1 Sample Reducer

H-3994

Shipping wt. 29.3 lbs (13kg)

Container Set for 16-1 Sample Reducer

Container set includes heavy, painted steel "reject" pan that measures: 22" x 13" x 11" (559 x 330 x 279mm) and a lightweight 12 qt. (11L) polyethylene sample container, 10" dia. x 11.5" H (254 x 292mm) with lid.

Container Set for 16-1 Sample Reducer

H-3996S

Shipping wt. 12 lbs (5.4kg)

Micro and Precision Riffle Splitters & Pans

Micro and precision riffle splitters (Jones Type) are designed to reduce bulk material into a convenient representative sample for laboratory analysis. A hopper, with a manual control gate, receives the material to be split, then upon opening the gate, the material flows through a series of equally divided compartments or chutes, sending 50% of the sample to the left-side pan and 50% of the sample to the right-side pan. These splitters consist of a stainless steel hopper with a manually actuated flow gate, stainless steel and anodized aluminum riffle bank, and stainless steel frame with support legs. Two (2) stainless steel high-back (notched L-shape) pans are supplied with the H-3971C micro splitter and two (2) aluminum sample pans are supplied with the H-3973, H-3974 and H-3978 precision splitters.

Micro & Precision Splitters

see chart

Shipping wt. see chart

Quartering Canvas

ASTM C702; AASHTO T248

Heavy-duty quartering canvas for use in selecting and quartering soils and aggregates. All edges are seamed and stitched. H-4135 does not comply with ASTM or AASHTO specs.

6' x 8' (2m x 2.4m) ASTM Canvas

H-4136

5' x 5' (1.5m) Square Canvas

H-4135

Shipping wt. 4.5 lbs (2kg)



H-4393

H-4288
H-4288FC

H-4289



H-4290

Sample Splitter Specifications

| Model | Gilson # | Maximum Particle Size in. (mm) | Hopper Capacity ft ³ (L) | Chute Bar Size in. (mm) | Chute Bar Quantity | Chute Slope | Dimensions L x W x H inches (mm) | Pans Replacements |
|----------|----------|--------------------------------|-------------------------------------|-------------------------|--------------------|-------------|--------------------------------------|-------------------|
| H-4393 | SP-0 | 6 (152) | 3.5 (99.1) | 1 (25) | 48 | 60° | 56 x 26 x 41 (1422 x 660 x 1041) | H-4393.2 |
| H-4288 | SP-1 | 4 (102) | 1 (28.3) | 0.5" (13) | 48 | 45° | 29 x 19 x 39 (737 x 483 x 991) | H-4288.2 |
| H-4288FC | SP-1C | 4 (102) | 1 (28.3) | 0.5" (13) | 10 Fixed | 45° | 29 x 19 x 39 (737 x 483 x 991) | H-4288.2 |
| H-4289 | SP-2 | 2 (51) | 0.55 (15.6) | 0.5" (13) | 36 | 45° | 22 x 14.5 x 20.5 (559 x 368 x 521) | H-4289.1 |
| H-4290 | SP-2.5 | 0.75 (19) | 0.28 (7.9) | 0.25" (6) | 48 | 60° | 15.5 x 12.5 x 17.5 (394 x 318 x 445) | H-4290.1 |
| H-4291 | SP-3 | 0.25 (6) | 0.06 (1.7) | 0.125" (3) | 48 | 60° | 9.5 x 8.5 x 13.5 (214 x 216 x 343) | H-4291.1 |
| H-4293 | SP-10 | 0.25 (6) | 0.06 (1.7) | 0.125" (3) | 48 | 60° | 29 x 19 x 39 (737 x 483 x 991) | H-4288.2 |

Universal Splitter

ASTM C136, C702, C778, D75; AASHTO T27, T248

The H-4393 universal splitter is built for large-volume bulk aggregate or raw coal samples. Other large samples with particle sizes up to 6" (152mm) can be accurately reduced with this rugged divider. Each split is evenly distributed to two pans on each side of the splitter. All four pans are included. The H-4393.1 lift cart is recommended for handling fully-loaded pans.

Universal Splitter

H-4393

Shipping wt. 68 lbs (31kg)

Universal Sample Splitter

ASTM C136, C702, C778, D75; AASHTO T27, T248

The universal sample splitter is a rugged, large-capacity floor model for laboratory or field use with materials with particle sizes up to 4" (102mm). The convenient size and a wide range of available accessories make the H-4288 a very versatile splitter. See next page for accessories.

Universal-Sample Splitter

H-4288

Shipping wt. 135 lbs (75kg)

Universal, Fixed Chute Sample Splitter

ASTM C136, C702, C778, D75; AASHTO T27, T248

Fixed chute version of the H-4288 universal sample splitter. Features ten, 2.25" (57mm) fixed-width chutes. Includes gate release 1 ft³ (28.3L) hopper. Includes 2 pans. See chart for more information.

Universal-Sample Splitter

H-4288FC

Shipping wt. 136 lbs (75kg)

Universal Splitter

ASTM C136, C702, C778, D75; AASHTO T27, T248

The H-4289 universal splitter is compact and more durable than conventional portable splitters. Lightweight with ample hopper capacity of 0.55 ft³ (15.6 liters) for materials up to 1.5" (38.1mm). It is convenient to use in floor or bench-top positions. This splitter provides accurate, representative samples of a wide range of materials.

Porta-Splitter

H-4289

Shipping wt. 66 lbs (31kg)

Versa-Splitter

ASTM C136, C702, C778, D75; AASHTO T27, T248

The Versa-Splitter can be used for fine aggregates up to .75" (19mm) aggregate. Contact parts and pans are stainless steel except for aluminum chute bars, which are anodized for corrosion resistance. Includes 2 pans. See chart for more information.

Versa-Splitter

H-4290

Shipping wt. 40 lbs (18kg)

Sample Splitter Chute Specifications

| Number of Chutes (openings) | Model | Chute Width - inches | | | | | | | | | | |
|--------------------------------|--------|----------------------|-----|------|----|-----|----|-----|----|---|---|---|
| | | .125 | .25 | .375 | .5 | .75 | 1 | 1.5 | 2 | 3 | 4 | 6 |
| | H-4291 | 48 | 24 | 16 | 12 | 8 | 6 | 4 | - | - | - | - |
| | H-4290 | - | 48 | - | 24 | 16 | 12 | 8 | 6 | 4 | - | - |
| | H-4289 | - | - | - | 36 | - | 18 | 12 | - | 6 | - | - |
| | H-4288 | - | - | - | 48 | - | 24 | 16 | 12 | 8 | 6 | 4 |
| | H-4293 | - | - | - | 48 | - | 24 | 16 | 12 | 8 | 6 | 4 |



H-4291



H-4293



H-4287



H-4394

Mini-Splitter

ASTM C136, C702, C778, D75; AASHTO T27, T248

The smallest of the bench-top units is all stainless steel except for aluminum chute bars and pans. Can be used to split powders to .25" (6.4mm) aggregate. The 104".³ (1.7L) hopper has a .375" (9.5mm) bottom opening with a spring-loaded gate release. Includes 2 pans. See chart for more information.

Mini-Splitter **H-4291**
Shipping wt. 12 lbs (7kg)

Totally Enclosed Splitter

ASTM C136, C702, C778, D75; AASHTO T27, T248

A totally enclosed version of the H-4288 universal splitter. Hinged doors provide access to hopper and pans while keeping dust to a minimum. Unlike other enclosed splitter designs, the H-4293 is designed so that all splitting operations are done in the enclosed splitter, including initial dumping of the sample pan. Bottom pans are also enclosed.

Totally Enclosed Splitter **H-4293**
Shipping wt. 370 lbs (168kg)

Lift Cart Accessory for H-4393

Recommended lift cart for handling fully-loaded pans.

Lift Cart Accessory **H-4393.1**
Shipping wt. 15 lbs (6.8kg)

Dust Enclosures

Optional dust enclosure accessory consists of two stainless steel panels held to front and back of the unit by springs.

Dust Enclosure for H-4288 **H-4288.7**
Dust Enclosure for H-4290 **H-4290.5**
Dust Enclosure for H-4291 **H-4291.5**
Shipping wt. 20 lbs (6.8kg)

60° Chute Adapter Kit

Adapts 45° chutes to 60° for more efficient processing of difficult samples.

60° Adapter Kit for H-4288 **H-4288.4**
60° Adapter Kit for H-4289 **H-4290.4**
Shipping wt. 8 lbs (3.6kg)

Bag Loading Chute Attachment

Replaces one pan to permit direct loading of material into a bag or container.

Bag Loading Chute for H-4288 **H-4288.3**
Shipping wt. 6 lbs (2.7kg)

Fixed Chute Accessory

Converts H-4288 into a fixed-chute splitter with ten, 2.25" (57mm) fixed-width chutes.

Fixed Chute Accessory **H-4288.8**
Shipping wt. 15 lbs (6.8kg)

Porta Wheels for H-4288

Set of two wheels.

Porta Wheels for H-4288 **H-4288.1**
Shipping wt. 4 lbs (1.8kg)

California Sample Splitter

CalTrans C201

Designed and constructed for the California Department of Transportation. For use with 1.125" (28.6mm) to sand-sized aggregate. Large capacity, 1.9 Cu. Ft. (53.8L) gate release hopper. Ten 2.25" (57.2mm) fixed chutes process particle sizes up to 1.125" (28.6mm). Sturdy, heavy-gauge steel frame with painted and baked finish is built for extended service life under heavy use. Four swivel casters permit mobility and easy storage in busy, crowded labs. Two 1.2 Cu. Ft. (34L) capacity, welded-steel sample pans are included. Reinforced pans have sturdy handles at each end for safe and convenient handling of heavy samples. Overall dimensions: 29" x 28" x 46" (737 x 711 x 1168mm).

California Sample Splitter, steel pans **H-4287**
California Splitter, aluminum pans **H-4287.AL**
Shipping wt. 244 lbs (111kg)

California Sample Pans

Sample pans for California sample splitter.

Steel Pan **H-4287.1**
Aluminum Pan **H-4287.2**
Shipping wt. 20 lbs (9kg)

Quadri-Splitter

ASTM C702, D346, D2013, E276, E389, E877

The H-4394 Quadri-Splitter efficiently divides free-flowing material into four representative fractions in a single pass. The totally enclosed design controls dust and reduces moisture loss, while sample loss is minimized by fewer passes and less handling. Units yield four representative samples for a total sample capacity of 1.6ft³ (45.3L). The unique tilt-feeding mechanism lifts and rotates the removable feed pan to the hopper opening where it seals to the hopper inlet as the material is dumped. Sample pans are sealed to splitter body, yet easily slide out. Hinged doors on both sides of the body allow inspection and cleaning of chute sections.

The three chute decks each have fourteen chutes of 1" (25.4mm) width and 60° slope for smooth sample flow, making the H-4394 ideal for coal and coke testing. One pass yields four 1/4 fractions, each of which can be split again if needed to reduce bulk samples to amounts required for lab tests. Three passes will yield a 1/64 sample that is still representative of the whole. H-4394 Quadri-Splitters have all quality stainless steel contact parts (chutes and pans). Other parts are heavy gauge galvanized steel, spot welded, riveted and painted for long life and durability.

Quadri-Splitter **H-4394**
Shipping wt. 330 lbs (150kg)



H-4283A



H-4276A



H-4273B

H-4283SE

Testing Screens

ASTM E11; ISO 565

Testing screens are ideal for particle size determinations on large samples of aggregate, slag, ores, and many other coarse materials. Batch sizes up to one cubic foot (0.028m³) or more can be processed into six fractions in as little as three to five minutes, depending on material type. Vibration and amplitude characteristics are fixed at optimum settings for mineral aggregates in the 4" (101mm) to No.4 (4.75mm) size range, but options and accessories are available to optimize machine performance when testing finer samples or special materials. The standard testing screen can be used to process material all the way down to No.200 (75µm) if less efficient separations are acceptable.

These testing screens are available in two variations of clamping mechanism: a manually-operated, screw-type clamping handle, which is more economical, but slightly more labor-intensive for continuous use; and, a quick-acting hydraulic pump system used to clamp the screen trays in place. Trays are quickly secured and released using the same single handle. This more efficient model is recommended for labs with a steady workload of particle size testing.

Both models use an enclosed drive mechanism for added safety. The powerful 1/2hp capacitor-type motor is operated through a starting switch with built-in overload protection. Testing screens are designed to be mounted to a solid, rigid floor system. Securing with anchor bolts to a concrete floor is recommended. Dimensions for anchor bolt placement are available upon request. Overall Dimensions: 23" x 31" x 43" (584 x 787 x 1,092mm), W x D x H.

Testing screens are sold without screen trays or dust pans, which need to be purchased separately for operation. Specify sizes when ordering. In both models, the dust pan may optionally be placed on the bottom shelf of the unit, freeing up an additional slot for a screen tray.

Screen Trays for the Testing Screens feature a generous 14.75" x 22.75" (375 x 578mm), 2.33ft³ (0.22m³) clear screen area. Optional dustpan configurations can be ordered for increased capacity, reduced dust output, or dispensing of fines directly into outside bag or container. Other accessories to facilitate sample handling, dust and noise control and separation performance are listed separately. **These models feature 6-tray slots and a bottom shelf, which allows for up to 6 trays and a dust pan to be used. Order screen trays and dust pans separately.**

Hydraulic-Clamping, 120V 60Hz H-4283A
Hydraulic-Clamping, 220V 50Hz H-4283A.5F

Manual-Clamping, 120V 60Hz H-4276A
Manual-Clamping, 220V 50Hz H-4276A.5F
Shipping wt. 485 lbs (220kg)

Test-Master® Screen

ASTM E11; ISO 565

The redesigned Test-Master® testing screen now features an easily controlled, integrated hopper for easier introduction of sample material and vertically-hinged front panel doors for improved access and clearance. The 1.6ft³ (45.3L) hopper is hinged at the rear and allows the sample to be introduced incrementally as the machine is running. When the hopper is closed, a panel blocks dust from escaping through the opening. The narrower panel doors require less space to open and fold flat across the front of the unit. The doors also feature a safety interlock switch that disables the Test-Master® when open.

Test-Master screen shakers are available in a six and a seven-screen tray capacity models. Both units feature the same reliable counterbalanced drive assembly, fully enclosed operation and electronic digital controller as our previous models. Sample vibration characteristics are identical to Testing Screen Shakers and the screen trays are interchangeable. Internal rotating counterweights of the Test-Master® drive system equalize the vertical screening action to assure smooth, quiet operation and prevent transfer of vibrations to other lab instruments.

Gilson Test-Master® screens are sold without screen trays or dust pans, which need to be purchased separately for operation. Specify sizes when ordering. In both models, the dust pan may optionally be placed on the bottom shelf of the unit, freeing up an additional slot for a screen tray.

Screen trays for the Test-Master® screens feature a generous 14.75" x 22.75" (375 x 578mm), 2.33ft³ (0.22m³) clear screen area. Optional Dustpan configurations can be ordered for increased capacity, reduced dust output, or dispensing of fines directly into outside bag or container. Other accessories to facilitate sample handling, dust and noise control and separation performance are listed separately. **H-4273B models feature 6-tray capacity and H-4274B models feature 7-tray capacity. Order screen trays and dust pans separately.**

Hydraulic-Clamping, 6-Tray, 120V 60Hz H-4273B
Hydraulic-Clamping, 6-Tray, 220V 50Hz H-4273B.5F

Hydraulic-Clamping, 7-Tray, 120V 60Hz H-4274B
Hydraulic-Clamping, 7-Tray, 220V 50Hz H-4274B.5F
Shipping wt. 700 lbs (318kg)



H-4285



H-4283P3



H-4273DP



H-4283P4



H-4283SE



H-4288.1



H-4273CP



H-4284, H-4284.5



H-4307



H-4286


H-4295A
H-4297A

Screen Shakers

| Model | Gilson No. | Material Size | Maximum Capacity | Overall Tray Size | Dimensions inches (mm) |
|---------|------------|--------------------------------------|---|------------------------------|---|
| H-4283A | TS1 | 4" (104mm) to No. 200 mesh (14.75mm) | 1 cu.ft. (0.3m ³) 80 lbs (36kg) | 18" x 26" (457 x 660mm) | 23" x 31" x 33" (584 x 787 x 838) |
| H-4276A | TS2 | | | | |
| H-4273B | TM5 | 4" (104mm) to No. 200 mesh (14.75mm) | | | 27" x 33" x 45" (686 x 838 x 1143) |
| H-4274B | TM6 | | | | |
| H-4295A | PS4 | 2" (51mm) to No. 200 (75mm) | .75 cu.ft. (0.23m ³) 60 lbs (27kg) | 16" x 16.5" (406 x 419mm) | 19" x 16.5" x 48.3" (483 x 419 x 1222) |
| H-4297A | PS3 | | | | 19" x 16.5" x 42" (483 x 419 x 1067) |

Porta-Screen® Screen Shaker

ASTM E11; ISO 565

The H-4295A and H-4297A Porta-Screen® screen shakers have long been the accepted standard portable screens for field control of construction aggregates and quality control of asphalt and ready to mix plants. These units are also useful for size separations of many other materials. Capacity depends on test material, but may range up to 60 lb (27.3 kg) per test. Vibration of both models is mechanically counterbalanced for smooth, stable operation with no required mounting.

Porta-Screen models are designed for performance durability, yet are light enough to be portable. Trays are quickly secured for operation by dual hand clamp levers. When levers are released, trays are individually removable for emptying, cleaning and weighing.

The vibrating assembly is held top and bottom on hardened guide pins. The 1/4hp motor, drive shaft, and connecting rod are synchronized with a rotating weight counterbalance system. All are enclosed by the enameled steel protective outer case.

The H-4295A model features slots for 7 trays and a pan while the H-4297A features slots for 5 trays and a pan. Order screen trays and dust pans separately.

Porta-Screen® (8 slots), 120V 60Hz H-4295A
Porta-Screen® (8 slots), 220V 50Hz H-4295A.5F

Porta-Screen® (6 slots), 120V 60Hz H-4297A
Porta-Screen® (6 slots), 220V 50Hz H-4297A.5F

Shipping wt. 255 lbs (116kg)

Screen Shaker Accessories

| Item | Part No. | Item | Part No. |
|---|----------|--|----------|
| 2" (50mm) Standard Dustpan for Screen Shakers (not for use with Porta-Screen model) | H-4283P | Manual Hydraulic Clamp Conversion Kit (serial # 13825 and lower) | H-4284.5 |
| 3" (75mm) Deep Dustpan for Screen Shakers | H-4283P3 | Storage Tray Rack | H-4285 |
| 4" Deep Dustpan for Screen Shakers | H-4283P4 | Door Enclosure for H-4283, H-4276 Screen Shakers | H-4286 |
| Two-Piece, Stationary Dustpan with Adapter for H-4273B and H-4276A | H-4273DP | Clean-N-Weigh Accessory | H-4307 |
| Inclined Chute Pan | H-4273CP | Digital Timer | H-4296A |
| Manual to Hydraulic Clamp Conversion Kit (serial # 13826 and higher) | H-4284 | Sound Enclosure | H-4283SE |

Porta-Screen Accessories

| Item | Part No. |
|----------------------------|----------|
| Porta Sample Pan | H-4306 |
| Porta Cover | H-4305 |
| Porta Wheels | H-4288.1 |
| Porta Screen Dust Pan Tray | H-4302 |

Screen Trays for Testing Screens

Use these tables to order replacement screen trays, wire cloth and round hole plate screens for Gilson testing screens, Test-Masters and Porta-Screens— Models: **H-4283A, H-4276A, H-4273B, H-4274B, H-4295A, H-4297A.**

ASTM sizes are manufactured to comply with wire cloth specifications of ASTM E11 and AASHTO M92. Cloth is designated S for plain steel or SS for stainless steel. Replacement wire cloth is cut to size for specified machines. Trays with cloth No. 16 (1.18mm) and finer incorporate lateral support ribs or coarse backup cloth to support mesh. **Backup cloth may be added to trays with or without support ribs as desired; and, blank trays (with no cloth) are also available, call 1.800.544.7220.**



Standard ASTM Testing Screen Trays and Cloth

| ASTM Sizes | Cloth Material | 18" x 26" (457 x 660mm) Models: H-4273B, H-4274B, H-4276A, H-4283A | | 16" x 16.5" (406 x 419mm) Models: H-4295A, H-4297A, | |
|------------|----------------|---|--------------|--|---------------|
| | | Tray/Cloth | Cloth only | Tray/Cloth | Cloth only |
| 125mm | 5" | S | H-4278C5.000 | NA | NA |
| 106mm | 4.24" | SS | H-4278C4.240 | NA | NA |
| 100mm | 4" | S | H-4278C4.000 | NA | NA |
| 90mm | 3.5" | S | H-4278C3.500 | NA | NA |
| 75mm | 3" | S | H-4278C3.000 | INQUIRE | INQUIRE |
| 63mm | 2.5" | S | H-4278C2.500 | INQUIRE | INQUIRE |
| 53mm | 2.12" | SS | H-4278C2.120 | INQUIRE | INQUIRE |
| 50mm | 2.00" | S | H-4278C2.000 | H-4398C2.000 | H-4398WC2.000 |
| 45mm | 1.75" | S | H-4278C1.750 | H-4398C1.750 | H-4398WC1.750 |
| 37.5mm | 1.50" | S | H-4278C1.500 | H-4398C1.500 | H-4398WC1.500 |
| 31.5mm | 1.25" | S | H-4278C1.250 | H-4398C1.250 | H-4398WC1.250 |
| 26.5mm | 1.06" | SS | H-4278C1.060 | H-4398C1.060 | H-4398WC1.060 |
| 25.0mm | 1.00" | S | H-4278C1.000 | H-4398C1.000 | H-4398WC1.000 |
| 22.4mm | .875" | S | H-4278C.875 | H-4398C.875 | H-4398WC.875 |
| 19.0mm | .750" | S | H-4278C.750 | H-4398C.750 | H-4398WC.750 |
| 16.0mm | .625" | S | H-4278C.625 | H-4398C.625 | H-4398WC.625 |
| 13.2mm | .530" | SS | H-4278C.530 | H-4398C.530 | H-4398WC.530 |
| 12.5mm | .500" | S | H-4278C.500 | H-4398C.500 | H-4398WC.500 |
| 11.2mm | .438" | S | H-4278C.438 | H-4398C.438 | H-4398WC.438 |
| 9.5mm | .375" | S | H-4278C.375 | H-4398C.375 | H-4398WC.375 |
| 8.0mm | .312" | S | H-4278C.312 | H-4398C.312 | H-4398WC.312 |
| 6.7mm | .265" | SS | H-4278C.265 | H-4398C.265 | H-4398WC.265 |
| 6.3mm | .250" | S | H-4278C.250 | H-4398C.250 | H-4398WC.250 |
| 5.6mm | No. 3-1/2 | SS | H-4278F3-1/2 | H-4398F3-1/2 | H-4398WF3-1/2 |
| 4.75mm | No. 4 | S | H-4278F4 | H-4398F4 | H-4398WF4 |
| 4.00mm | No. 5 | SS | H-4278F5 | H-4398F5 | H-4398WF5 |
| 3.35mm | No. 6 | SS | H-4278F6 | H-4398F6 | H-4398WF6 |
| 2.80mm | No. 7 | SS | H-4278F7 | H-4398F7 | H-4398WF7 |
| 2.36mm | No. 8 | SS | H-4278F8 | H-4398F8 | H-4398WF8 |
| 2.00mm | No. 10 | SS | H-4278F10 | H-4398F10 | H-4398WF10 |
| 1.70mm | No. 12 | SS | H-4278F12 | H-4398F12 | H-4398WF12 |
| 1.40mm | No. 14 | SS | H-4278F14 | H-4398F14 | H-4398WF14 |
| 1.18mm | No. 16 | SS | H-4278F16 | H-4398F16 | H-4398WF16 |
| 1.00mm | No. 18 | SS | H-4278F18 | H-4398F18 | H-4398WF18 |
| 850µm | No. 20 | SS | H-4278F20 | H-4398F20 | H-4398WF20 |
| 710µm | No. 25 | SS | H-4278F25 | H-4398F25 | H-4398WF25 |
| 600µm | No. 30 | SS | H-4278F30 | H-4398F30 | H-4398WF30 |
| 500µm | No. 35 | SS | H-4278F35 | H-4398F35 | H-4398WF35 |
| 425µm | No. 40 | SS | H-4278F40 | H-4398F40 | H-4398WF40 |
| 355µm | No. 45 | SS | H-4278F45 | H-4398F45 | H-4398WF45 |
| 300µm | No. 50 | SS | H-4278F50 | H-4398F50 | H-4398WF50 |
| 250µm | No. 60 | SS | H-4278F60 | H-4398F60 | H-4398WF60 |
| 212µm | No. 70 | SS | H-4278F70 | H-4398F70 | H-4398WF70 |
| 180µm | No. 80 | SS | H-4278F80 | H-4398F80 | H-4398WF80 |
| 150µm | No. 100 | SS | H-4278F100 | H-4398F100 | H-4398WF100 |
| 125µm | No. 120 | SS | H-4278F120 | H-4398F120 | H-4398WF120 |
| 106µm | No. 140 | SS | H-4278F140 | H-4398F140 | H-4398WF140 |
| 90µm | No. 170 | SS | H-4278F170 | H-4398F170 | H-4398WF170 |
| 75µm | No. 200 | SS | H-4278F200 | H-4398F200 | H-4398WF200 |
| 63µm | No. 230 | SS | H-4278F230 | H-4398F230 | H-4398WF230 |
| 53µm | No. 270 | SS | H-4278F270 | H-4398F270 | H-4398WF270 |
| 45µm | No. 325 | SS | H-4278F325 | H-4398F325 | H-4398WF325 |
| 38µm | No. 400 | SS | H-4278F400 | H-4398F400 | H-4398WF400 |

ISO Testing Screen Trays and Cloth

| ISO Sizes | Cloth Material | ISO SCREENS | |
|-----------|----------------|--------------|-------------|
| | | Tray/Cloth | Cloth only |
| 112mm | SS | H-8900TC.112 | H-8900C.112 |
| 80mm | SS | H-8900TC.80 | H-8900C.80 |
| 56mm | SS | H-8900TC.56 | H-8900C.56 |
| 40mm | SS | H-8900TC.40 | H-8900C.40 |
| 28mm | SS | H-8900TC.28 | H-8900C.28 |
| 20mm | SS | H-8900TC.20 | H-8900C.20 |
| 18mm | SS | H-8900TC.18 | H-8900C.18 |
| 14mm | SS | H-8900TC.14 | H-8900C.14 |
| 10mm | SS | H-8900TC.10 | H-8900C.10 |
| 9mm | SS | H-8900TC.9 | H-8900C.9 |
| 5mm | S | H-8900TC.5 | H-8900C.5 |
| 2.5mm | SS | H-8900TC.25 | H-8900C.25 |
| 1.25mm | SS | H-8900TC.125 | H-8900C.125 |
| 900µm | SS | H-8900TC.900 | H-8900C.900 |
| 400µm | SS | H-8900TC.400 | H-8900C.400 |
| 160µm | SS | H-8900TC.160 | H-8900C.160 |



NOTES

Non-ASTM sizes— .125" and .0125"— are available, please inquire: 1-800-544-7220.

U.S.A. Standard Sieve Sizes and Equivalents

| Alternative Number | Nominal Opening | Standard (mm) |
|--------------------|-----------------|---------------|
| 4" | 4.000 | 100mm |
| 3.5" | 3.500 | 90mm |
| 3" | 3.000 | 75mm |
| 2.5" | 2.500 | 63mm |
| 2.12" | 2.120 | 53mm |
| 2" | 2.000 | 50mm |
| 1.75" | 1.750 | 45mm |
| 1.5" | 1.500 | 37.5mm |
| 1.25" | 1.250 | 31.5mm |
| 1.06" | 1.060 | 26.5mm |
| 1" | 1.000 | 25.0mm |
| .875" | 0.875 | 22.4mm |
| .75" | 0.750 | 19.0mm |
| .625" | 0.625 | 16.0mm |
| .530" | 0.530 | 13.2mm |
| .500" | 0.500 | 12.5mm |
| .434" | 0.434 | 11.2mm |
| .375" | 0.375 | 9.5mm |
| .312" | 0.312 | 8.0mm |
| .265" | 0.265 | 6.7mm |
| .25" | 0.250 | 6.3mm |
| .125" | 0.125 | 3.17mm |
| No. 3-1/2 | 0.223 | 5.6mm |
| No. 4 | 0.187 | 4.75mm |
| No. 5 | 0.157 | 4.00mm |
| No. 6 | 0.131 | 3.35mm |
| No. 7 | 0.110 | 2.80mm |
| No. 8 | 0.094 | 2.36mm |
| No. 10 | 0.078 | 2.00mm |
| No. 12 | 0.066 | 1.70mm |
| No. 14 | 0.055 | 1.40mm |
| No. 16 | 0.046 | 1.18mm |
| No. 18 | 0.039 | 1.00mm |
| No. 20 | 0.033 | 850µm |
| No. 25 | 0.027 | 710µm |
| No. 30 | 0.023 | 600µm |
| No. 35 | 0.019 | 50µm |
| No. 40 | 0.016 | 425µm |
| No. 45 | 0.013 | 355µm |
| No. 50 | 0.011 | 300µm |
| No. 60 | 0.009 | 250µm |
| No. 70 | 0.008 | 212µm |
| No. 80 | 0.007 | 180µm |
| No. 100 | 0.005 | 150µm |
| No. 120 | 0.0049 | 125µm |
| No. 140 | 0.0041 | 106µm |
| No. 170 | 0.0035 | 90µm |
| No. 200 | 0.0029 | 75µm |
| No. 230 | 0.0024 | 62µm |
| No. 270 | 0.0020 | 53µm |
| No. 325 | 0.0017 | 45µm |
| No. 400 | 0.0014 | 38µm |
| No. 450 | 0.0012 | 32µm |
| No. 500 | 0.0009 | 25µm |
| No. 635 | 0.0007 | 20µm |
| No. 850 | 0.0004 | 10µm |
| No. 1000 | 0.00008 | 2µm |

U.S.A. Standard Sieve Series

Looking for sieves? Humboldt stocks an extensive offering of sieves for use in all types of sieve testing applications, from sampling and classification of soils, aggregates and other powdered and granular materials to specific ASTM standard tests. Humboldt carries an extensive inventory of sieves in all popular sizes and mesh/frame material configurations. We try to maintain a complete stock of 8" and 12" sieves in both full and half heights for quick turnaround, as well as keeping a large inventory of other sieve sizes and frame and mesh configurations.

Our sieves are of the highest quality to ensure consistent fit, accurate specifications and durable construction. All our sieves comply with ASTM E11 and AASHTO M92; and are given individual serial numbers for traceability. Certified sieves are also available as an option. Please inquire.

Humboldt sieves are available in brass frame with stainless steel mesh or stainless steel frame and mesh. Sieve frames are seamless spun brass or stainless steel with rigid rolled edges and extended bottoms (skirts) to ensure a good fit between frames, pans and separators of the same diameter— ensuring that your set of sieves stack properly.

All sieves include a permanently attached metal plate that includes the sieve number, micron size and the nominal opening in millimeters and inches. Sieve covers, bottom pans and separator pans are also in stock and ready for shipment.



USA Standard ASTM Test Sieves



| Sieve Size | Brass Frame Stainless Mesh | | Stainless Frame Stainless Mesh | |
|-----------------|-------------------------------|--------------------------|-----------------------------------|--------------------------|
| | Full Height 2" (50mm) | Half Height 1" (25mm) | Full Height 2" (50mm) | Half Height 1" (25mm) |
| 4" (100mm) | H-3920CS4.000 | H-3910CS4.000 | H-3920CSS4.000 | H-3910CSS4.000 |
| 3-1/2" (90mm) | H-3920CS3.500 | H-3910CS3.500 | H-3920CSS3.500 | H-3910CSS3.500 |
| 3" (75mm) | H-3920CS3.000 | H-3910CS3.000 | H-3920CSS3.000 | H-3910CSS3.000 |
| 2-1/2" (63mm) | H-3920CS2.500 | H-3910CS2.500 | H-3920CSS2.500 | H-3910CSS2.500 |
| 2.12" (53mm) | H-3920CS2.120 | H-3910CS2.120 | H-3920CSS2.120 | H-3910CSS2.120 |
| 2" (50mm) | H-3920CS2.000 | H-3910CS2.000 | H-3920CSS2.000 | H-3910CSS2.000 |
| 1-3/4" (45mm) | H-3920CS1.750 | H-3910CS1.750 | H-3920CSS1.750 | H-3910CSS1.750 |
| 1-1/2" (37.5mm) | H-3920CS1.500 | H-3910CS1.500 | H-3920CSS1.500 | H-3910CSS1.500 |
| 1-1/4" (31.5mm) | H-3920CS1.250 | H-3910CS1.250 | H-3920CSS1.250 | H-3910CSS1.250 |
| 1.06" (26.5mm) | H-3920CS1.060 | H-3910CS1.060 | H-3920CSS1.060 | H-3910CSS1.060 |
| 1" (25.0mm) | H-3920CS1.000 | H-3910CS1.000 | H-3920CSS1.000 | H-3910CSS1.000 |
| 7/8" (22.4mm) | H-3920CS.875 | H-3910CS.875 | H-3920CSS.875 | H-3910CSS.875 |
| 3/4" (19.0mm) | H-3920CS.750 | H-3910CS.750 | H-3920CSS.750 | H-3910CSS.750 |
| 5/8" (16.0mm) | H-3920CS.625 | H-3910CS.625 | H-3920CSS.625 | H-3910CSS.625 |
| 0.530" (13.2mm) | H-3920CS.530 | H-3910CS.530 | H-3920CSS.530 | H-3910CSS.530 |
| 1/2" (12.5mm) | H-3920CS.500 | H-3910CS.500 | H-3920CSS.500 | H-3910CSS.500 |
| 7/16" (11.2mm) | H-3920CS.438 | H-3910CS.438 | H-3920CSS.438 | H-3910CSS.438 |
| 3/8" (9.5mm) | H-3920CS.375 | H-3910CS.375 | H-3920CSS.375 | H-3910CSS.375 |
| 5/16" (8.0mm) | H-3920CS.312 | H-3910CS.312 | H-3920CSS.312 | H-3910CSS.312 |
| 0.265" (6.7mm) | H-3920CS.265 | H-3910CS.265 | H-3920CSS.265 | H-3910CSS.265 |
| 1/4" (6.3mm) | H-3920CS.250 | H-3910CS.250 | H-3920CSS.250 | H-3910CSS.250 |
| 1/8" (3.17mm) | H-3920CS.125 | H-3910CS.125 | H-3920CSS.125 | H-3910CSS.125 |

STANDARD

8"

203mm



| | | | | |
|-------------------|---------------|---------------|----------------|----------------|
| No. 3-1/2 (5.6mm) | H-3920FS3-1/2 | H-3910FS3-1/2 | H-3920FSS3-1/2 | H-3910FSS3-1/2 |
| No. 4 (4.75mm) | H-3920FS4 | H-3910FS4 | H-3920FSS4 | H-3910FSS4 |
| No. 5 (4.0mm) | H-3920FS5 | H-3910FS5 | H-3920FSS5 | H-3910FSS5 |
| No. 6 (3.35mm) | H-3920FS6 | H-3910FS6 | H-3920FSS6 | H-3910FSS6 |
| No. 7 (2.80mm) | H-3920FS7 | H-3910FS7 | H-3920FSS7 | H-3910FSS7 |
| No. 8 (2.36mm) | H-3920FS8 | H-3910FS8 | H-3920FSS8 | H-3910FSS8 |
| No. 10 (2.00mm) | H-3920FS10 | H-3910FS10 | H-3920FSS10 | H-3910FSS10 |
| No. 12 (1.70mm) | H-3920FS12 | H-3910FS12 | H-3920FSS12 | H-3910FSS12 |
| No. 14 (1.40mm) | H-3920FS14 | H-3910FS14 | H-3920FSS14 | H-3910FSS14 |
| No. 16 (1.18mm) | H-3920FS16 | H-3910FS16 | H-3920FSS16 | H-3910FSS16 |
| No. 18 (1.0mm) | H-3920FS18 | H-3910FS18 | H-3920FSS18 | H-3910FSS18 |
| No. 20 (850µm) | H-3920FS20 | H-3910FS20 | H-3920FSS20 | H-3910FSS20 |
| No. 25 (710µm) | H-3920FS25 | H-3910FS25 | H-3920FSS25 | H-3910FSS25 |
| No. 30 (600µm) | H-3920FS30 | H-3910FS30 | H-3920FSS30 | H-3910FSS30 |
| No. 35 (500µm) | H-3920FS35 | H-3910FS35 | H-3920FSS35 | H-3910FSS35 |
| No. 40 (425µm) | H-3920FS40 | H-3910FS40 | H-3920FSS40 | H-3910FSS40 |
| No. 45 (355µm) | H-3920FS45 | H-3910FS45 | H-3920FSS45 | H-3910FSS45 |
| No. 50 (300µm) | H-3920FS50 | H-3910FS50 | H-3920FSS50 | H-3910FSS50 |
| No. 60 (250µm) | H-3920FS60 | H-3910FS60 | H-3920FSS60 | H-3910FSS60 |
| No. 70 (212µm) | H-3920FS70 | H-3910FS70 | H-3920FSS70 | H-3910FSS70 |
| No. 80 (180µm) | H-3920FS80 | H-3910FS80 | H-3920FSS80 | H-3910FSS80 |
| No. 100 (150µm) | H-3920FS100 | H-3910FS100 | H-3920FSS100 | H-3910FSS100 |
| No. 120 (125µm) | H-3920FS120 | H-3910FS120 | H-3920FSS120 | H-3910FSS120 |
| No. 140 (106µm) | H-3920FS140 | H-3910FS140 | H-3920FSS140 | H-3910FSS140 |
| No. 170 (90µm) | H-3920FS170 | H-3910FS170 | H-3920FSS170 | H-3910FSS170 |
| No. 200 (75µm) | H-3920FS200 | H-3910FS200 | H-3920FSS200 | H-3910FSS200 |
| No. 230 (63µm) | H-3920FS230 | H-3910FS230 | H-3920FSS230 | H-3910FSS230 |
| No. 270 (53µm) | H-3920FS270 | H-3910FS270 | H-3920FSS270 | H-3910FSS270 |
| No. 325 (45µm) | H-3920FS325 | H-3910FS325 | H-3920FSS325 | H-3910FSS325 |
| No. 400 (38µm) | H-3920FS400 | H-3910FS400 | H-3920FSS400 | H-3910FSS400 |
| No. 450 (32µm) | H-3920FS450 | H-3910FS450 | H-3920FSS450 | H-3910FSS450 |
| No. 500 (25µm) | H-3920FS500 | H-3910FS500 | H-3920FSS500 | H-3910FSS500 |
| No. 635 (20µm) | H-3920FS635 | H-3910FS635 | H-3920FSS635 | H-3910FSS635 |
| No. 850 (10µm) | H-3920FS850 | H-3910FS850 | - | - |
| No. 1000 (2µm) | H-3920FS1000 | H-3910FS1000 | - | - |

USA Standard ASTM Test Sieves

| Sieve Size | Brass Frame Stainless Mesh | | | Stainless Frame Stainless Mesh | |
|-----------------|-------------------------------|----------------------------|------------------------------|-----------------------------------|------------------------------|
| | Full Height 3" (75mm) | Inter. Height 2" (50mm) | Half Height 1.625" (41mm) | Full Height 3" (75mm) | Half Height 1.625" (41mm) |
| 4" (100mm) | H-3912CS4.000 | H-3922CS4.000 | H-3932CS4.000 | H-3912CSS4.000 | H-3932CSS4.000 |
| 3-1/2" (90mm) | H-3912CS3.500 | H-3922CS3.500 | H-3932CS3.500 | H-3912CSS3.500 | H-3932CSS3.500 |
| 3" (75mm) | H-3912CS3.000 | H-3922CS3.000 | H-3932CS3.000 | H-3912CSS3.000 | H-3932CSS3.000 |
| 2-1/2" (63mm) | H-3912CS2.500 | H-3922CS2.500 | H-3932CS2.500 | H-3912CSS2.500 | H-3932CSS2.500 |
| 2.12" (53mm) | H-3912CS2.120 | H-3922CS2.120 | H-3932CS2.120 | H-3912CSS2.120 | H-3932CSS2.120 |
| 2" (50mm) | H-3912CS2.000 | H-3922CS2.000 | H-3932CS2.000 | H-3912CSS2.000 | H-3932CSS2.000 |
| 1-3/4" (45mm) | H-3912CS1.750 | H-3922CS1.750 | H-3932CS1.750 | H-3912CSS1.750 | H-3932CSS1.750 |
| 1-1/2" (37.5mm) | H-3912CS1.500 | H-3922CS1.500 | H-3932CS1.500 | H-3912CSS1.500 | H-3932CSS1.500 |
| 1-1/4" (31.5mm) | H-3912CS1.250 | H-3922CS1.250 | H-3932CS1.250 | H-3912CSS1.250 | H-3932CSS1.250 |
| 1.06" (26.5mm) | H-3912CS1.060 | H-3922CS1.060 | H-3932CS1.060 | H-3912CSS1.060 | H-3932CSS1.060 |
| 1" (25.0mm) | H-3912CS1.000 | H-3922CS1.000 | H-3932CS1.000 | H-3912CSS1.000 | H-3932CSS1.000 |
| 7/8" (22.4mm) | H-3912CS.875 | H-3922CS.875 | H-3932CS.875 | H-3912CSS.875 | H-3932CSS.875 |
| 3/4" (19.0mm) | H-3912CS.750 | H-3922CS.750 | H-3932CS.750 | H-3912CSS.750 | H-3932CSS.750 |
| 5/8" (16.0mm) | H-3912CS.625 | H-3922CS.625 | H-3932CS.625 | H-3912CSS.625 | H-3932CSS.625 |
| 0.530" (13.2mm) | H-3912CS.530 | H-3922CS.530 | H-3932CS.530 | H-3912CSS.530 | H-3932CSS.530 |
| 1/2" (12.5mm) | H-3912CS.500 | H-3922CS.500 | H-3932CS.500 | H-3912CSS.500 | H-3932CSS.500 |
| 7/16" (11.2mm) | H-3912CS.438 | H-3922CS.438 | H-3932CS.438 | H-3912CSS.438 | H-3932CSS.438 |
| 3/8" (9.5mm) | H-3912CS.375 | H-3922CS.375 | H-3932CS.375 | H-3912CSS.375 | H-3932CSS.375 |
| 5/16" (8.0mm) | H-3912CS.312 | H-3922CS.312 | H-3932CS.312 | H-3912CSS.312 | H-3932CSS.312 |
| 0.265" (6.7mm) | H-3912CS.265 | H-3922CS.265 | H-3932CS.265 | H-3912CSS.265 | H-3932CSS.265 |
| 1/4" (6.3mm) | H-3912CS.250 | H-3922CS.250 | H-3932CS.250 | H-3912CSS.250 | H-3932CSS.250 |
| 1/8" (3.17mm) | H-3912CS.125 | H-3922CS.125 | H-3932CS.125 | — | H-3932CSS.125 |



STANDARD

12"

305mm

| | | | | | |
|-------------------|---------------|---------------|---------------|----------------|----------------|
| No. 3-1/2 (5.6mm) | H-3912FS3-1/2 | H-3922FS3-1/2 | H-3932FS3-1/2 | H-3912FSS3-1/2 | H-3932FSS3-1/2 |
| No. 4 (4.75mm) | H-3912FS4 | H-3922FS4 | H-3932FS4 | H-3912FSS4 | H-3932FSS4 |
| No. 5 (4.0mm) | H-3912FS5 | H-3922FS5 | H-3932FS5 | H-3912FSS5 | H-3932FSS5 |
| No. 6 (3.35mm) | H-3912FS6 | H-3922FS6 | H-3932FS6 | H-3912FSS6 | H-3932FSS6 |
| No. 7 (2.80mm) | H-3912FS7 | H-3922FS7 | H-3932FS7 | H-3912FSS7 | H-3932FSS7 |
| No. 8 (2.36mm) | H-3912FS8 | H-3922FS8 | H-3932FS8 | H-3912FSS8 | H-3932FSS8 |
| No. 10 (2.00mm) | H-3912FS10 | H-3922FS10 | H-3932FS10 | H-3912FSS10 | H-3932FSS10 |
| No. 12 (1.70mm) | H-3912FS12 | H-3922FS12 | H-3932FS12 | H-3912FSS12 | H-3932FSS12 |
| No. 14 (1.40mm) | H-3912FS14 | H-3922FS14 | H-3932FS14 | H-3912FSS14 | H-3932FSS14 |
| No. 16 (1.18mm) | H-3912FS16 | H-3922FS16 | H-3932FS16 | H-3912FSS16 | H-3932FSS16 |
| No. 18 (1.0mm) | H-3912FS18 | H-3922FS18 | H-3932FS18 | H-3912FSS18 | H-3932FSS18 |
| No. 20 (850µm) | H-3912FS20 | H-3922FS20 | H-3932FS20 | H-3912FSS20 | H-3932FSS20 |
| No. 25 (710µm) | H-3912FS25 | H-3922FS25 | H-3932FS25 | H-3912FSS25 | H-3932FSS25 |
| No. 30 (600µm) | H-3912FS30 | H-3922FS30 | H-3932FS30 | H-3912FSS30 | H-3932FSS30 |
| No. 35 (500µm) | H-3912FS35 | H-3922FS35 | H-3932FS35 | H-3912FSS35 | H-3932FSS35 |
| No. 40 (425µm) | H-3912FS40 | H-3922FS40 | H-3932FS40 | H-3912FSS40 | H-3932FSS40 |
| No. 45 (355µm) | H-3912FS45 | H-3922FS45 | H-3932FS45 | H-3912FSS45 | H-3932FSS45 |
| No. 50 (300µm) | H-3912FS50 | H-3922FS50 | H-3932FS50 | H-3912FSS50 | H-3932FSS50 |
| No. 60 (250µm) | H-3912FS60 | H-3922FS60 | H-3932FS60 | H-3912FSS60 | H-3932FSS60 |
| No. 70 (212µm) | H-3912FS70 | H-3922FS70 | H-3932FS70 | H-3912FSS70 | H-3932FSS70 |
| No. 80 (180µm) | H-3912FS80 | H-3922FS80 | H-3932FS80 | H-3912FSS80 | H-3932FSS80 |
| No. 100 (150µm) | H-3912FS100 | H-3922FS100 | H-3932FS100 | H-3912FSS100 | H-3932FSS100 |
| No. 120 (125µm) | H-3912FS120 | H-3922FS120 | H-3932FS120 | H-3912FSS120 | H-3932FSS120 |
| No. 140 (106µm) | H-3912FS140 | H-3922FS140 | H-3932FS140 | H-3912FSS140 | H-3932FSS140 |
| No. 170 (90µm) | H-3912FS170 | H-3922FS170 | H-3932FS170 | H-3912FSS170 | H-3932FSS170 |
| No. 200 (75µm) | H-3912FS200 | H-3922FS200 | H-3932FS200 | H-3912FSS200 | H-3932FSS200 |
| No. 230 (63µm) | H-3912FS230 | H-3922FS230 | H-3932FS230 | H-3912FSS230 | H-3932FSS230 |
| No. 270 (53µm) | H-3912FS270 | H-3922FS270 | H-3932FS270 | H-3912FSS270 | H-3932FSS270 |
| No. 325 (45µm) | H-3912FS325 | H-3922FS325 | H-3932FS325 | H-3912FSS325 | H-3932FSS325 |
| No. 400 (38µm) | H-3912FS400 | H-3922FS400 | H-3932FS400 | H-3912FSS400 | H-3932FSS400 |
| No. 450 (32µm) | H-3912FS450 | H-3922FS450 | H-3932FS450 | H-3912FSS450 | H-3932FSS450 |
| No. 500 (25µm) | H-3912FS500 | H-3922FS500 | H-3932FS500 | H-3912FSS500 | H-3932FSS500 |
| No. 635 (20µm) | H-3912FS635 | H-3922FS635 | H-3932FS635 | H-3912FSS635 | H-3932FSS635 |
| No. 850 (10µm) | H-3912FS850 | H-3922FS850 | H-3932FS850 | — | — |
| No. 1000 (2µm) | H-3912FS1000 | H-3922FS1000 | H-3932FS1000 | — | — |



USA Standard ASTM Inspection Test Sieves

Inspection Test Sieves are used when accuracy and repeatability are paramount. Inspection Test Sieves start with our Standard ASTM Sieves and include an added Inspection level verification. This verification specifies the number of openings in each sieve after the cloth has been mounted to the frame. Inspection Test Sieves provides a 99% level of confidence that the standard deviation of these openings is within the maximum allowed by ASTM. An Inspection verification is provided with each sieve.

INSPECTION

8"

203mm



| Sieve Size | Brass Frame Stainless Mesh | | Stainless Frame Stainless Mesh | |
|-----------------|-------------------------------|--------------------------|-----------------------------------|--------------------------|
| | Full Height 2" (50mm) | Half Height 1" (25mm) | Full Height 2" (50mm) | Half Height 1" (25mm) |
| 4" (100mm) | HI-3920CS4.000 | HI-3910CS4.000 | HI-3920CSS4.000 | HI-3910CSS4.000 |
| 3-1/2" (90mm) | HI-3920CS3.500 | HI-3910CS3.500 | HI-3920CSS3.500 | HI-3910CSS3.500 |
| 3" (75mm) | HI-3920CS3.000 | HI-3910CS3.000 | HI-3920CSS3.000 | HI-3910CSS3.000 |
| 2-1/2" (63mm) | HI-3920CS2.500 | HI-3910CS2.500 | HI-3920CSS2.500 | HI-3910CSS2.500 |
| 2.12" (53mm) | HI-3920CS2.120 | HI-3910CS2.120 | HI-3920CSS2.120 | HI-3910CSS2.120 |
| 2" (50mm) | HI-3920CS2.000 | HI-3910CS2.000 | HI-3920CSS2.000 | HI-3910CSS2.000 |
| 1-3/4" (45mm) | HI-3920CS1.750 | HI-3910CS1.750 | HI-3920CSS1.750 | HI-3910CSS1.750 |
| 1-1/2" (37.5mm) | HI-3920CS1.500 | HI-3910CS1.500 | HI-3920CSS1.500 | HI-3910CSS1.500 |
| 1-1/4" (31.5mm) | HI-3920CS1.250 | HI-3910CS1.250 | HI-3920CSS1.250 | HI-3910CSS1.250 |
| 1.06" (26.5mm) | HI-3920CS1.060 | HI-3910CS1.060 | HI-3920CSS1.060 | HI-3910CSS1.060 |
| 1" (25.0mm) | HI-3920CS1.000 | HI-3910CS1.000 | HI-3920CSS1.000 | HI-3910CSS1.000 |
| 7/8" (22.4mm) | HI-3920CS.875 | HI-3910CS.875 | HI-3920CSS.875 | HI-3910CSS.875 |
| 3/4" (19.0mm) | HI-3920CS.750 | HI-3910CS.750 | HI-3920CSS.750 | HI-3910CSS.750 |
| 5/8" (16.0mm) | HI-3920CS.625 | HI-3910CS.625 | HI-3920CSS.625 | HI-3910CSS.625 |
| 0.530" (13.2mm) | HI-3920CS.530 | HI-3910CS.530 | HI-3920CSS.530 | HI-3910CSS.530 |
| 1/2" (12.5mm) | HI-3920CS.500 | HI-3910CS.500 | HI-3920CSS.500 | HI-3910CSS.500 |
| 7/16" (11.2mm) | HI-3920CS.438 | HI-3910CS.438 | HI-3920CSS.438 | HI-3910CSS.438 |
| 3/8" (9.5mm) | HI-3920CS.375 | HI-3910CS.375 | HI-3920CSS.375 | HI-3910CSS.375 |
| 5/16" (8.0mm) | HI-3920CS.312 | HI-3910CS.312 | HI-3920CSS.312 | HI-3910CSS.312 |
| 0.265" (6.7mm) | HI-3920CS.265 | HI-3910CS.265 | HI-3920CSS.265 | HI-3910CSS.265 |
| 1/4" (6.3mm) | HI-3920CS.250 | HI-3910CS.250 | HI-3920CSS.250 | HI-3910CSS.250 |
| 1/8" (3.17mm) | HI-3920CS.125 | HI-3910CS.125 | HI-3920CSS.125 | HI-3910CSS.125 |

| | | | | |
|-------------------|----------------|----------------|-----------------|-----------------|
| No. 3-1/2 (5.6mm) | HI-3920FS3-1/2 | HI-3910FS3-1/2 | HI-3920FSS3-1/2 | HI-3910FSS3-1/2 |
| No. 4 (4.75mm) | HI-3920FS4 | HI-3910FS4 | HI-3920FSS4 | HI-3910FSS4 |
| No. 5 (4.0mm) | HI-3920FS5 | HI-3910FS5 | HI-3920FSS5 | HI-3910FSS5 |
| No. 6 (3.35mm) | HI-3920FS6 | HI-3910FS6 | HI-3920FSS6 | HI-3910FSS6 |
| No. 7 (2.80mm) | HI-3920FS7 | HI-3910FS7 | HI-3920FSS7 | HI-3910FSS7 |
| No. 8 (2.36mm) | HI-3920FS8 | HI-3910FS8 | HI-3920FSS8 | HI-3910FSS8 |
| No. 10 (2.00mm) | HI-3920FS10 | HI-3910FS10 | HI-3920FSS10 | HI-3910FSS10 |
| No. 12 (1.70mm) | HI-3920FS12 | HI-3910FS12 | HI-3920FSS12 | HI-3910FSS12 |
| No. 14 (1.40mm) | HI-3920FS14 | HI-3910FS14 | HI-3920FSS14 | HI-3910FSS14 |
| No. 16 (1.18mm) | HI-3920FS16 | HI-3910FS16 | HI-3920FSS16 | HI-3910FSS16 |
| No. 18 (1.0mm) | HI-3920FS18 | HI-3910FS18 | HI-3920FSS18 | HI-3910FSS18 |
| No. 20 (850µm) | HI-3920FS20 | HI-3910FS20 | HI-3920FSS20 | HI-3910FSS20 |
| No. 25 (710µm) | HI-3920FS25 | HI-3910FS25 | HI-3920FSS25 | HI-3910FSS25 |
| No. 30 (600µm) | HI-3920FS30 | HI-3910FS30 | HI-3920FSS30 | HI-3910FSS30 |
| No. 35 (500µm) | HI-3920FS35 | HI-3910FS35 | HI-3920FSS35 | HI-3910FSS35 |
| No. 40 (425µm) | HI-3920FS40 | HI-3910FS40 | HI-3920FSS40 | HI-3910FSS40 |
| No. 45 (355µm) | HI-3920FS45 | HI-3910FS45 | HI-3920FSS45 | HI-3910FSS45 |
| No. 50 (300µm) | HI-3920FS50 | HI-3910FS50 | HI-3920FSS50 | HI-3910FSS50 |
| No. 60 (250µm) | HI-3920FS60 | HI-3910FS60 | HI-3920FSS60 | HI-3910FSS60 |
| No. 70 (212µm) | HI-3920FS70 | HI-3910FS70 | HI-3920FSS70 | HI-3910FSS70 |
| No. 80 (180µm) | HI-3920FS80 | HI-3910FS80 | HI-3920FSS80 | HI-3910FSS80 |
| No. 100 (150µm) | HI-3920FS100 | HI-3910FS100 | HI-3920FSS100 | HI-3910FSS100 |
| No. 120 (125µm) | HI-3920FS120 | HI-3910FS120 | HI-3920FSS120 | HI-3910FSS120 |
| No. 140 (106µm) | HI-3920FS140 | HI-3910FS140 | HI-3920FSS140 | HI-3910FSS140 |
| No. 170 (90µm) | HI-3920FS170 | HI-3910FS170 | HI-3920FSS170 | HI-3910FSS170 |
| No. 200 (75µm) | HI-3920FS200 | HI-3910FS200 | HI-3920FSS200 | HI-3910FSS200 |
| No. 230 (63µm) | HI-3920FS230 | HI-3910FS230 | HI-3920FSS230 | HI-3910FSS230 |
| No. 270 (53µm) | HI-3920FS270 | HI-3910FS270 | HI-3920FSS270 | HI-3910FSS270 |
| No. 325 (45µm) | HI-3920FS325 | HI-3910FS325 | HI-3920FSS325 | HI-3910FSS325 |
| No. 400 (38µm) | HI-3920FS400 | HI-3910FS400 | HI-3920FSS400 | HI-3910FSS400 |
| No. 450 (32µm) | HI-3920FS450 | HI-3910FS450 | HI-3920FSS450 | HI-3910FSS450 |
| No. 500 (25µm) | HI-3920FS500 | HI-3910FS500 | HI-3920FSS500 | HI-3910FSS500 |
| No. 635 (20µm) | HI-3920FS635 | HI-3910FS635 | HI-3920FSS635 | HI-3910FSS635 |
| No. 850 (10µm) | HI-3920FS850 | HI-3910FS850 | - | - |
| No. 1000 (2µm) | HI-3920FS1000 | HI-3910FS1000 | - | - |

USA Standard ASTM Inspection Test Sieves

Inspection Test Sieves are used when accuracy and repeatability are paramount. Inspection Test Sieves start with our Standard ASTM Sieves and include an added Inspection level verification. This verification specifies the number of openings in each sieve after the cloth has been mounted to the frame. Inspection Test Sieves provides a 99% level of confidence that the standard deviation of these openings is within the maximum allowed by ASTM. An Inspection verification is provided with each sieve.

| Sieve Size | Brass Frame Stainless Mesh | | | Stainless Frame Stainless Mesh | |
|-----------------|-------------------------------|----------------------------|------------------------------|-----------------------------------|------------------------------|
| | Full Height 3" (75mm) | Inter. Height 2" (50mm) | Half Height 1.625" (41mm) | Full Height 3" (75mm) | Half Height 1.625" (41mm) |
| 4" (100mm) | HI-3912CS4.000 | HI-3922CS4.000 | HI-3932CS4.000 | HI-3912CSS4.000 | HI-3932CSS4.000 |
| 3-1/2" (90mm) | HI-3912CS3.500 | HI-3922CS3.500 | HI-3932CS3.500 | HI-3912CSS3.500 | HI-3932CSS3.500 |
| 3" (75mm) | HI-3912CS3.000 | HI-3922CS3.000 | HI-3932CS3.000 | HI-3912CSS3.000 | HI-3932CSS3.000 |
| 2-1/2" (63mm) | HI-3912CS2.500 | HI-3922CS2.500 | HI-3932CS2.500 | HI-3912CSS2.500 | HI-3932CSS2.500 |
| 2.12" (53mm) | HI-3912CS2.120 | HI-3922CS2.120 | HI-3932CS2.120 | HI-3912CSS2.120 | HI-3932CSS2.120 |
| 2" (50mm) | HI-3912CS2.000 | HI-3922CS2.000 | HI-3932CS2.000 | HI-3912CSS2.000 | HI-3932CSS2.000 |
| 1-3/4" (45mm) | HI-3912CS1.750 | HI-3922CS1.750 | HI-3932CS1.750 | HI-3912CSS1.750 | HI-3932CSS1.750 |
| 1-1/2" (37.5mm) | HI-3912CS1.500 | HI-3922CS1.500 | HI-3932CS1.500 | HI-3912CSS1.500 | HI-3932CSS1.500 |
| 1-1/4" (31.5mm) | HI-3912CS1.250 | HI-3922CS1.250 | HI-3932CS1.250 | HI-3912CSS1.250 | HI-3932CSS1.250 |
| 1.06" (26.5mm) | HI-3912CS1.060 | HI-3922CS1.060 | HI-3932CS1.060 | HI-3912CSS1.060 | HI-3932CSS1.060 |
| 1" (25.0mm) | HI-3912CS1.000 | HI-3922CS1.000 | HI-3932CS1.000 | HI-3912CSS1.000 | HI-3932CSS1.000 |
| 7/8" (22.4mm) | HI-3912CS.875 | HI-3922CS.875 | HI-3932CS.875 | HI-3912CSS.875 | HI-3932CSS.875 |
| 3/4" (19.0mm) | HI-3912CS.750 | HI-3922CS.750 | HI-3932CS.750 | HI-3912CSS.750 | HI-3932CSS.750 |
| 5/8" (16.0mm) | HI-3912CS.625 | HI-3922CS.625 | HI-3932CS.625 | HI-3912CSS.625 | HI-3932CSS.625 |
| 0.530" (13.2mm) | HI-3912CS.530 | HI-3922CS.530 | HI-3932CS.530 | HI-3912CSS.530 | HI-3932CSS.530 |
| 1/2" (12.5mm) | HI-3912CS.500 | HI-3922CS.500 | HI-3932CS.500 | HI-3912CSS.500 | HI-3932CSS.500 |
| 7/16" (11.2mm) | HI-3912CS.438 | HI-3922CS.438 | HI-3932CS.438 | HI-3912CSS.438 | HI-3932CSS.438 |
| 3/8" (9.5mm) | HI-3912CS.375 | HI-3922CS.375 | HI-3932CS.375 | HI-3912CSS.375 | HI-3932CSS.375 |
| 5/16" (8.0mm) | HI-3912CS.312 | HI-3922CS.312 | HI-3932CS.312 | HI-3912CSS.312 | HI-3932CSS.312 |
| 0.265" (6.7mm) | HI-3912CS.265 | HI-3922CS.265 | HI-3932CS.265 | HI-3912CSS.265 | HI-3932CSS.265 |
| 1/4" (6.3mm) | HI-3912CS.250 | HI-3922CS.250 | HI-3932CS.250 | HI-3912CSS.250 | HI-3932CSS.250 |
| 1/8" (3.17mm) | HI-3912CS.125 | HI-3922CS.125 | HI-3932CS.125 | - | HI-3932CSS.125 |

| | | | | | |
|-------------------|----------------|----------------|----------------|-----------------|-----------------|
| No. 3-1/2 (5.6mm) | HI-3912FS3-1/2 | HI-3922FS3-1/2 | HI-3932FS3-1/2 | HI-3912FSS3-1/2 | HI-3932FSS3-1/2 |
| No. 4 (4.75mm) | HI-3912FS4 | HI-3922FS4 | HI-3932FS4 | HI-3912FSS4 | HI-3932FSS4 |
| No. 5 (4.0mm) | HI-3912FS5 | HI-3922FS5 | HI-3932FS5 | HI-3912FSS5 | HI-3932FSS5 |
| No. 6 (3.35mm) | HI-3912FS6 | HI-3922FS6 | HI-3932FS6 | HI-3912FSS6 | HI-3932FSS6 |
| No. 7 (2.80mm) | HI-3912FS7 | HI-3922FS7 | HI-3932FS7 | HI-3912FSS7 | HI-3932FSS7 |
| No. 8 (2.36mm) | HI-3912FS8 | HI-3922FS8 | HI-3932FS8 | HI-3912FSS8 | HI-3932FSS8 |
| No. 10 (2.00mm) | HI-3912FS10 | HI-3922FS10 | HI-3932FS10 | HI-3912FSS10 | HI-3932FSS10 |
| No. 12 (1.70mm) | HI-3912FS12 | HI-3922FS12 | HI-3932FS12 | HI-3912FSS12 | HI-3932FSS12 |
| No. 14 (1.40mm) | HI-3912FS14 | HI-3922FS14 | HI-3932FS14 | HI-3912FSS14 | HI-3932FSS14 |
| No. 16 (1.18mm) | HI-3912FS16 | HI-3922FS16 | HI-3932FS16 | HI-3912FSS16 | HI-3932FSS16 |
| No. 18 (1.0mm) | HI-3912FS18 | HI-3922FS18 | HI-3932FS18 | HI-3912FSS18 | HI-3932FSS18 |
| No. 20 (850µm) | HI-3912FS20 | HI-3922FS20 | HI-3932FS20 | HI-3912FSS20 | HI-3932FSS20 |
| No. 25 (710µm) | HI-3912FS25 | HI-3922FS25 | HI-3932FS25 | HI-3912FSS25 | HI-3932FSS25 |
| No. 30 (600µm) | HI-3912FS30 | HI-3922FS30 | HI-3932FS30 | HI-3912FSS30 | HI-3932FSS30 |
| No. 35 (500µm) | HI-3912FS35 | HI-3922FS35 | HI-3932FS35 | HI-3912FSS35 | HI-3932FSS35 |
| No. 40 (425µm) | HI-3912FS40 | HI-3922FS40 | HI-3932FS40 | HI-3912FSS40 | HI-3932FSS40 |
| No. 45 (355µm) | HI-3912FS45 | HI-3922FS45 | HI-3932FS45 | HI-3912FSS45 | HI-3932FSS45 |
| No. 50 (300µm) | HI-3912FS50 | HI-3922FS50 | HI-3932FS50 | HI-3912FSS50 | HI-3932FSS50 |
| No. 60 (250µm) | HI-3912FS60 | HI-3922FS60 | HI-3932FS60 | HI-3912FSS60 | HI-3932FSS60 |
| No. 70 (212µm) | HI-3912FS70 | HI-3922FS70 | HI-3932FS70 | HI-3912FSS70 | HI-3932FSS70 |
| No. 80 (180µm) | HI-3912FS80 | HI-3922FS80 | HI-3932FS80 | HI-3912FSS80 | HI-3932FSS80 |
| No. 100 (150µm) | HI-3912FS100 | HI-3922FS100 | HI-3932FS100 | HI-3912FSS100 | HI-3932FSS100 |
| No. 120 (125µm) | HI-3912FS120 | HI-3922FS120 | HI-3932FS120 | HI-3912FSS120 | HI-3932FSS120 |
| No. 140 (106µm) | HI-3912FS140 | HI-3922FS140 | HI-3932FS140 | HI-3912FSS140 | HI-3932FSS140 |
| No. 170 (90µm) | HI-3912FS170 | HI-3922FS170 | HI-3932FS170 | HI-3912FSS170 | HI-3932FSS170 |
| No. 200 (75µm) | HI-3912FS200 | HI-3922FS200 | HI-3932FS200 | HI-3912FSS200 | HI-3932FSS200 |
| No. 230 (63µm) | HI-3912FS230 | HI-3922FS230 | HI-3932FS230 | HI-3912FSS230 | HI-3932FSS230 |
| No. 270 (53µm) | HI-3912FS270 | HI-3922FS270 | HI-3932FS270 | HI-3912FSS270 | HI-3932FSS270 |
| No. 325 (45µm) | HI-3912FS325 | HI-3922FS325 | HI-3932FS325 | HI-3912FSS325 | HI-3932FSS325 |
| No. 400 (38µm) | HI-3912FS400 | HI-3922FS400 | HI-3932FS400 | HI-3912FSS400 | HI-3932FSS400 |
| No. 450 (32µm) | HI-3912FS450 | HI-3922FS450 | HI-3932FS450 | HI-3912FSS450 | HI-3932FSS450 |
| No. 500 (25µm) | HI-3912FS500 | HI-3922FS500 | HI-3932FS500 | HI-3912FSS500 | HI-3932FSS500 |
| No. 635 (20µm) | HI-3912FS635 | HI-3922FS635 | HI-3932FS635 | HI-3912FSS635 | HI-3932FSS635 |
| No. 850 (10µm) | HI-3912FS850 | HI-3922FS850 | HI-3932FS850 | - | - |
| No. 1000 (2µm) | HI-3912FS1000 | HI-3922FS1000 | HI-3932FS1000 | - | - |

INSPECTION

12"
305mm



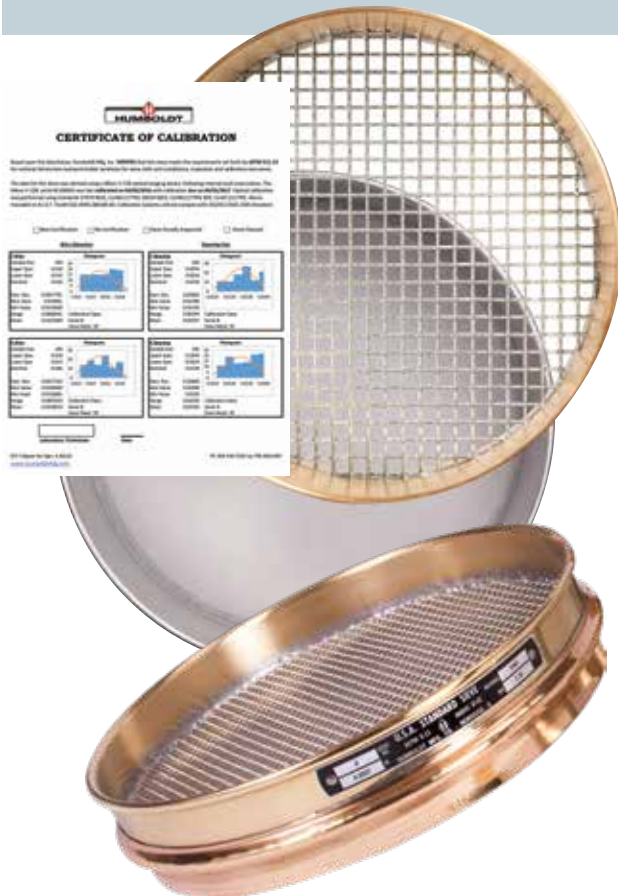
USA Standard ASTM Calibration Test Sieves

Calibration Test Sieves are used when the application demands the highest accuracy and repeatability available. Calibration Test Sieves start with our Standard ASTM Sieves and include an added calibration level verification. This verification measures about twice as many openings in the sieve as is done for an Inspection Sieve. Calibration Test Sieves provide a 99.73% level of confidence that the standard deviation of these openings is within the maximum allowed by ASTM. A Calibration verification is provided with each sieve.

CALIBRATION

8"

203mm



| Sieve Size | Brass Frame Stainless Mesh | | Stainless Frame Stainless Mesh | |
|-----------------|-------------------------------|--------------------------|-----------------------------------|--------------------------|
| | Full Height 2" (50mm) | Half Height 1" (25mm) | Full Height 2" (50mm) | Half Height 1" (25mm) |
| 4" (100mm) | HC-3920CS4.000 | HC-3910CS4.000 | HC-3920CSS4.000 | HC-3910CSS4.000 |
| 3-1/2" (90mm) | HC-3920CS3.500 | HC-3910CS3.500 | HC-3920CSS3.500 | HC-3910CSS3.500 |
| 3" (75mm) | HC-3920CS3.000 | HC-3910CS3.000 | HC-3920CSS3.000 | HC-3910CSS3.000 |
| 2-1/2" (63mm) | HC-3920CS2.500 | HC-3910CS2.500 | HC-3920CSS2.500 | HC-3910CSS2.500 |
| 2.12" (53mm) | HC-3920CS2.120 | HC-3910CS2.120 | HC-3920CSS2.120 | HC-3910CSS2.120 |
| 2" (50mm) | HC-3920CS2.000 | HC-3910CS2.000 | HC-3920CSS2.000 | HC-3910CSS2.000 |
| 1-3/4" (45mm) | HC-3920CS1.750 | HC-3910CS1.750 | HC-3920CSS1.750 | HC-3910CSS1.750 |
| 1-1/2" (37.5mm) | HC-3920CS1.500 | HC-3910CS1.500 | HC-3920CSS1.500 | HC-3910CSS1.500 |
| 1-1/4" (31.5mm) | HC-3920CS1.250 | HC-3910CS1.250 | HC-3920CSS1.250 | HC-3910CSS1.250 |
| 1.06" (26.5mm) | HC-3920CS1.060 | HC-3910CS1.060 | HC-3920CSS1.060 | HC-3910CSS1.060 |
| 1" (25.0mm) | HC-3920CS1.000 | HC-3910CS1.000 | HC-3920CSS1.000 | HC-3910CSS1.000 |
| 7/8" (22.4mm) | HC-3920CS.875 | HC-3910CS.875 | HC-3920CSS.875 | HC-3910CSS.875 |
| 3/4" (19.0mm) | HC-3920CS.750 | HC-3910CS.750 | HC-3920CSS.750 | HC-3910CSS.750 |
| 5/8" (16.0mm) | HC-3920CS.625 | HC-3910CS.625 | HC-3920CSS.625 | HC-3910CSS.625 |
| 0.530" (13.2mm) | HC-3920CS.530 | HC-3910CS.530 | HC-3920CSS.530 | HC-3910CSS.530 |
| 1/2" (12.5mm) | HC-3920CS.500 | HC-3910CS.500 | HC-3920CSS.500 | HC-3910CSS.500 |
| 7/16" (11.2mm) | HC-3920CS.438 | HC-3910CS.438 | HC-3920CSS.438 | HC-3910CSS.438 |
| 3/8" (9.5mm) | HC-3920CS.375 | HC-3910CS.375 | HC-3920CSS.375 | HC-3910CSS.375 |
| 5/16" (8.0mm) | HC-3920CS.312 | HC-3910CS.312 | HC-3920CSS.312 | HC-3910CSS.312 |
| 0.265" (6.7mm) | HC-3920CS.265 | HC-3910CS.265 | HC-3920CSS.265 | HC-3910CSS.265 |
| 1/4" (6.3mm) | HC-3920CS.250 | HC-3910CS.250 | HC-3920CSS.250 | HC-3910CSS.250 |
| 1/8" (3.17mm) | HC-3920CS.125 | HC-3910CS.125 | HC-3920CSS.125 | HC-3910CSS.125 |

| | | | | |
|-------------------|----------------|----------------|-----------------|-----------------|
| No. 3-1/2 (5.6mm) | HC-3920FS3-1/2 | HC-3910FS3-1/2 | HC-3920FSS3-1/2 | HC-3910FSS3-1/2 |
| No. 4 (4.75mm) | HC-3920FS4 | HC-3910FS4 | HC-3920FSS4 | HC-3910FSS4 |
| No. 5 (4.0mm) | HC-3920FS5 | HC-3910FS5 | HC-3920FSS5 | HC-3910FSS5 |
| No. 6 (3.35mm) | HC-3920FS6 | HC-3910FS6 | HC-3920FSS6 | HC-3910FSS6 |
| No. 7 (2.80mm) | HC-3920FS7 | HC-3910FS7 | HC-3920FSS7 | HC-3910FSS7 |
| No. 8 (2.36mm) | HC-3920FS8 | HC-3910FS8 | HC-3920FSS8 | HC-3910FSS8 |
| No. 10 (2.00mm) | HC-3920FS10 | HC-3910FS10 | HC-3920FSS10 | HC-3910FSS10 |
| No. 12 (1.70mm) | HC-3920FS12 | HC-3910FS12 | HC-3920FSS12 | HC-3910FSS12 |
| No. 14 (1.40mm) | HC-3920FS14 | HC-3910FS14 | HC-3920FSS14 | HC-3910FSS14 |
| No. 16 (1.18mm) | HC-3920FS16 | HC-3910FS16 | HC-3920FSS16 | HC-3910FSS16 |
| No. 18 (1.0mm) | HC-3920FS18 | HC-3910FS18 | HC-3920FSS18 | HC-3910FSS18 |
| No. 20 (850µm) | HC-3920FS20 | HC-3910FS20 | HC-3920FSS20 | HC-3910FSS20 |
| No. 25 (710µm) | HC-3920FS25 | HC-3910FS25 | HC-3920FSS25 | HC-3910FSS25 |
| No. 30 (600µm) | HC-3920FS30 | HC-3910FS30 | HC-3920FSS30 | HC-3910FSS30 |
| No. 35 (500µm) | HC-3920FS35 | HC-3910FS35 | HC-3920FSS35 | HC-3910FSS35 |
| No. 40 (425µm) | HC-3920FS40 | HC-3910FS40 | HC-3920FSS40 | HC-3910FSS40 |
| No. 45 (355µm) | HC-3920FS45 | HC-3910FS45 | HC-3920FSS45 | HC-3910FSS45 |
| No. 50 (300µm) | HC-3920FS50 | HC-3910FS50 | HC-3920FSS50 | HC-3910FSS50 |
| No. 60 (250µm) | HC-3920FS60 | HC-3910FS60 | HC-3920FSS60 | HC-3910FSS60 |
| No. 70 (212µm) | HC-3920FS70 | HC-3910FS70 | HC-3920FSS70 | HC-3910FSS70 |
| No. 80 (180µm) | HC-3920FS80 | HC-3910FS80 | HC-3920FSS80 | HC-3910FSS80 |
| No. 100 (150µm) | HC-3920FS100 | HC-3910FS100 | HC-3920FSS100 | HC-3910FSS100 |
| No. 120 (125µm) | HC-3920FS120 | HC-3910FS120 | HC-3920FSS120 | HC-3910FSS120 |
| No. 140 (106µm) | HC-3920FS140 | HC-3910FS140 | HC-3920FSS140 | HC-3910FSS140 |
| No. 170 (90µm) | HC-3920FS170 | HC-3910FS170 | HC-3920FSS170 | HC-3910FSS170 |
| No. 200 (75µm) | HC-3920FS200 | HC-3910FS200 | HC-3920FSS200 | HC-3910FSS200 |
| No. 230 (63µm) | HC-3920FS230 | HC-3910FS230 | HC-3920FSS230 | HC-3910FSS230 |
| No. 270 (53µm) | HC-3920FS270 | HC-3910FS270 | HC-3920FSS270 | HC-3910FSS270 |
| No. 325 (45µm) | HC-3920FS325 | HC-3910FS325 | HC-3920FSS325 | HC-3910FSS325 |
| No. 400 (38µm) | HC-3920FS400 | HC-3910FS400 | HC-3920FSS400 | HC-3910FSS400 |
| No. 450 (32µm) | HC-3920FS450 | HC-3910FS450 | HC-3920FSS450 | HC-3910FSS450 |
| No. 500 (25µm) | HC-3920FS500 | HC-3910FS500 | HC-3920FSS500 | HC-3910FSS500 |
| No. 635 (20µm) | HC-3920FS635 | HC-3910FS635 | HC-3920FSS635 | HC-3910FSS635 |
| No. 850 (10µm) | HC-3920FS850 | HC-3910FS850 | - | - |
| No. 1000 (2µm) | HC-3920FS1000 | HC-3910FS1000 | - | - |

USA Standard ASTM Calibration Test Sieves

Calibration Test Sieves are used when the application demands the highest accuracy and repeatability available. Calibration Test Sieves start with our Standard ASTM Sieves and include an added calibration level verification. This verification measures about twice as many openings in the sieve as is done for an Inspection Sieve. Calibration Test Sieves provide a 99.73% level of confidence that the standard deviation of these openings is within the maximum allowed by ASTM. A Calibration verification is provided with each sieve.

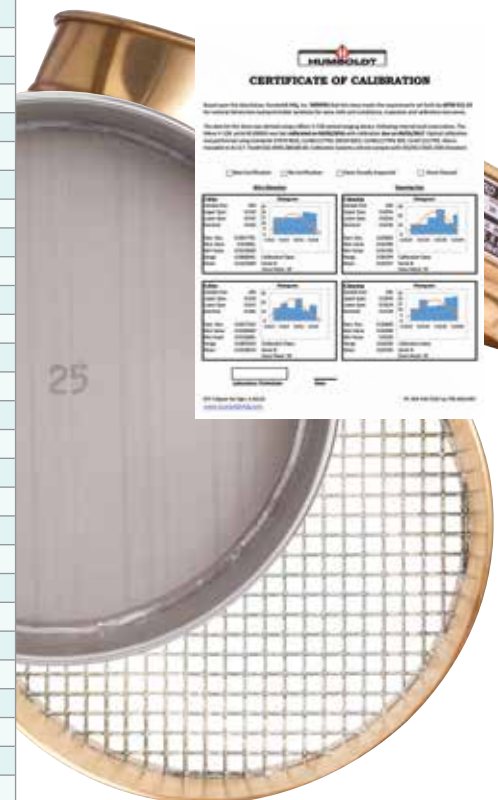
| Sieve Size | Brass Frame Stainless Mesh | | | Stainless Frame Stainless Mesh | |
|-----------------|-------------------------------|----------------------------|------------------------------|-----------------------------------|------------------------------|
| | Full Height 3" (75mm) | Inter. Height 2" (50mm) | Half Height 1.625" (41mm) | Full Height 3" (75mm) | Half Height 1.625" (41mm) |
| 4" (100mm) | HC-3912CS4.000 | HC-3922CS4.000 | HC-3932CS4.000 | HC-3912CSS4.000 | HC-3932CSS4.000 |
| 3-1/2" (90mm) | HC-3912CS3.500 | HC-3922CS3.500 | HC-3932CS3.500 | HC-3912CSS3.500 | HC-3932CSS3.500 |
| 3" (75mm) | HC-3912CS3.000 | HC-3922CS3.000 | HC-3932CS3.000 | HC-3912CSS3.000 | HC-3932CSS3.000 |
| 2-1/2" (63mm) | HC-3912CS2.500 | HC-3922CS2.500 | HC-3932CS2.500 | HC-3912CSS2.500 | HC-3932CSS2.500 |
| 2.12" (53mm) | HC-3912CS2.120 | HC-3922CS2.120 | HC-3932CS2.120 | HC-3912CSS2.120 | HC-3932CSS2.120 |
| 2" (50mm) | HC-3912CS2.000 | HC-3922CS2.000 | HC-3932CS2.000 | HC-3912CSS2.000 | HC-3932CSS2.000 |
| 1-3/4" (45mm) | HC-3912CS1.750 | HC-3922CS1.750 | HC-3932CS1.750 | HC-3912CSS1.750 | HC-3932CSS1.750 |
| 1-1/2" (37.5mm) | HC-3912CS1.500 | HC-3922CS1.500 | HC-3932CS1.500 | HC-3912CSS1.500 | HC-3932CSS1.500 |
| 1-1/4" (31.5mm) | HC-3912CS1.250 | HC-3922CS1.250 | HC-3932CS1.250 | HC-3912CSS1.250 | HC-3932CSS1.250 |
| 1.06" (26.5mm) | HC-3912CS1.060 | HC-3922CS1.060 | HC-3932CS1.060 | HC-3912CSS1.060 | HC-3932CSS1.060 |
| 1" (25.0mm) | HC-3912CS1.000 | HC-3922CS1.000 | HC-3932CS1.000 | HC-3912CSS1.000 | HC-3932CSS1.000 |
| 7/8" (22.4mm) | HC-3912CS.875 | HC-3922CS.875 | HC-3932CS.875 | HC-3912CSS.875 | HC-3932CSS.875 |
| 3/4" (19.0mm) | HC-3912CS.750 | HC-3922CS.750 | HC-3932CS.750 | HC-3912CSS.750 | HC-3932CSS.750 |
| 5/8" (16.0mm) | HC-3912CS.625 | HC-3922CS.625 | HC-3932CS.625 | HC-3912CSS.625 | HC-3932CSS.625 |
| 0.530" (13.2mm) | HC-3912CS.530 | HC-3922CS.530 | HC-3932CS.530 | HC-3912CSS.530 | HC-3932CSS.530 |
| 1/2" (12.5mm) | HC-3912CS.500 | HC-3922CS.500 | HC-3932CS.500 | HC-3912CSS.500 | HC-3932CSS.500 |
| 7/16" (11.2mm) | HC-3912CS.438 | HC-3922CS.438 | HC-3932CS.438 | HC-3912CSS.438 | HC-3932CSS.438 |
| 3/8" (9.5mm) | HC-3912CS.375 | HC-3922CS.375 | HC-3932CS.375 | HC-3912CSS.375 | HC-3932CSS.375 |
| 5/16" (8.0mm) | HC-3912CS.312 | HC-3922CS.312 | HC-3932CS.312 | HC-3912CSS.312 | HC-3932CSS.312 |
| 0.265" (6.7mm) | HC-3912CS.265 | HC-3922CS.265 | HC-3932CS.265 | HC-3912CSS.265 | HC-3932CSS.265 |
| 1/4" (6.3mm) | HC-3912CS.250 | HC-3922CS.250 | HC-3932CS.250 | HC-3912CSS.250 | HC-3932CSS.250 |
| 1/8" (3.17mm) | HC-3912CS.125 | HC-3922CS.125 | HC-3932CS.125 | — | HC-3932CSS.125 |

| | | | | | |
|-------------------|----------------|----------------|----------------|-----------------|-----------------|
| No. 3-1/2 (5.6mm) | HC-3912FS3-1/2 | HC-3922FS3-1/2 | HC-3932FS3-1/2 | HC-3912FSS3-1/2 | HC-3932FSS3-1/2 |
| No. 4 (4.75mm) | HC-3912FS4 | HC-3922FS4 | HC-3932FS4 | HC-3912FSS4 | HC-3932FSS4 |
| No. 5 (4.0mm) | HC-3912FS5 | HC-3922FS5 | HC-3932FS5 | HC-3912FSS5 | HC-3932FSS5 |
| No. 6 (3.35mm) | HC-3912FS6 | HC-3922FS6 | HC-3932FS6 | HC-3912FSS6 | HC-3932FSS6 |
| No. 7 (2.80mm) | HC-3912FS7 | HC-3922FS7 | HC-3932FS7 | HC-3912FSS7 | HC-3932FSS7 |
| No. 8 (2.36mm) | HC-3912FS8 | HC-3922FS8 | HC-3932FS8 | HC-3912FSS8 | HC-3932FSS8 |
| No. 10 (2.00mm) | HC-3912FS10 | HC-3922FS10 | HC-3932FS10 | HC-3912FSS10 | HC-3932FSS10 |
| No. 12 (1.70mm) | HC-3912FS12 | HC-3922FS12 | HC-3932FS12 | HC-3912FSS12 | HC-3932FSS12 |
| No. 14 (1.40mm) | HC-3912FS14 | HC-3922FS14 | HC-3932FS14 | HC-3912FSS14 | HC-3932FSS14 |
| No. 16 (1.18mm) | HC-3912FS16 | HC-3922FS16 | HC-3932FS16 | HC-3912FSS16 | HC-3932FSS16 |
| No. 18 (1.0mm) | HC-3912FS18 | HC-3922FS18 | HC-3932FS18 | HC-3912FSS18 | HC-3932FSS18 |
| No. 20 (850µm) | HC-3912FS20 | HC-3922FS20 | HC-3932FS20 | HC-3912FSS20 | HC-3932FSS20 |
| No. 25 (710µm) | HC-3912FS25 | HC-3922FS25 | HC-3932FS25 | HC-3912FSS25 | HC-3932FSS25 |
| No. 30 (600µm) | HC-3912FS30 | HC-3922FS30 | HC-3932FS30 | HC-3912FSS30 | HC-3932FSS30 |
| No. 35 (500µm) | HC-3912FS35 | HC-3922FS35 | HC-3932FS35 | HC-3912FSS35 | HC-3932FSS35 |
| No. 40 (425µm) | HC-3912FS40 | HC-3922FS40 | HC-3932FS40 | HC-3912FSS40 | HC-3932FSS40 |
| No. 45 (355µm) | HC-3912FS45 | HC-3922FS45 | HC-3932FS45 | HC-3912FSS45 | HC-3932FSS45 |
| No. 50 (300µm) | HC-3912FS50 | HC-3922FS50 | HC-3932FS50 | HC-3912FSS50 | HC-3932FSS50 |
| No. 60 (250µm) | HC-3912FS60 | HC-3922FS60 | HC-3932FS60 | HC-3912FSS60 | HC-3932FSS60 |
| No. 70 (212µm) | HC-3912FS70 | HC-3922FS70 | HC-3932FS70 | HC-3912FSS70 | HC-3932FSS70 |
| No. 80 (180µm) | HC-3912FS80 | HC-3922FS80 | HC-3932FS80 | HC-3912FSS80 | HC-3932FSS80 |
| No. 100 (150µm) | HC-3912FS100 | HC-3922FS100 | HC-3932FS100 | HC-3912FSS100 | HC-3932FSS100 |
| No. 120 (125µm) | HC-3912FS120 | HC-3922FS120 | HC-3932FS120 | HC-3912FSS120 | HC-3932FSS120 |
| No. 140 (106µm) | HC-3912FS140 | HC-3922FS140 | HC-3932FS140 | HC-3912FSS140 | HC-3932FSS140 |
| No. 170 (90µm) | HC-3912FS170 | HC-3922FS170 | HC-3932FS170 | HC-3912FSS170 | HC-3932FSS170 |
| No. 200 (75µm) | HC-3912FS200 | HC-3922FS200 | HC-3932FS200 | HC-3912FSS200 | HC-3932FSS200 |
| No. 230 (63µm) | HC-3912FS230 | HC-3922FS230 | HC-3932FS230 | HC-3912FSS230 | HC-3932FSS230 |
| No. 270 (53µm) | HC-3912FS270 | HC-3922FS270 | HC-3932FS270 | HC-3912FSS270 | HC-3932FSS270 |
| No. 325 (45µm) | HC-3912FS325 | HC-3922FS325 | HC-3932FS325 | HC-3912FSS325 | HC-3932FSS325 |
| No. 400 (38µm) | HC-3912FS400 | HC-3922FS400 | HC-3932FS400 | HC-3912FSS400 | HC-3932FSS400 |
| No. 450 (32µm) | HC-3912FS450 | HC-3922FS450 | HC-3932FS450 | HC-3912FSS450 | HC-3932FSS450 |
| No. 500 (25µm) | HC-3912FS500 | HC-3922FS500 | HC-3932FS500 | HC-3912FSS500 | HC-3932FSS500 |
| No. 635 (20µm) | HC-3912FS635 | HC-3922FS635 | HC-3932FS635 | HC-3912FSS635 | HC-3932FSS635 |
| No. 850 (10µm) | HC-3912FS850 | HC-3922FS850 | HC-3932FS850 | — | — |
| No. 1000 (2µm) | HC-3912FS1000 | HC-3922FS1000 | HC-3932FS1000 | — | — |

CALIBRATION

12"

305mm



Deep, USA Standard ASTM Test Sieves



STANDARD

4"

101mm

12"

305mm

| Sieve Size | 4" Diameter | | 12" Diameter | |
|-----------------|-----------------------------|---------------|-----------------------------|---------------|
| | Brass Frame, Stainless Mesh | | Brass Frame, Stainless Mesh | |
| | 1.5" Deep | 4" Deep | 4" Deep | 8" Deep |
| 4" (100mm) | - | - | H-3928CS4.000 | H-3938CS4.000 |
| 3-1/2" (90mm) | - | - | H-3928CS3.500 | H-3938CS3.500 |
| 3" (75mm) | - | - | H-3928CS3.000 | H-3938CS3.000 |
| 2-1/2" (63mm) | - | - | H-3928CS2.500 | H-3938CS2.500 |
| 2.12" (53mm) | - | - | H-3928CS2.120 | H-3938CS2.120 |
| 2" (50mm) | - | - | H-3928CS2.000 | H-3938CS2.000 |
| 1-3/4" (45mm) | - | - | H-3928CS1.750 | H-3938CS1.750 |
| 1-1/2" (37.5mm) | - | - | H-3928CS1.500 | H-3938CS1.500 |
| 1-1/4" (31.5mm) | - | - | H-3928CS1.250 | H-3938CS1.250 |
| 1.06" (26.5mm) | - | - | H-3928CS1.060 | H-3938CS1.060 |
| 1" (25.0mm) | H-3914CS1.000 | H-3924CS1.000 | H-3928CS1.000 | H-3938CS1.000 |
| 7/8" (22.4mm) | H-3914CS.875 | H-3924CS.875 | H-3928CS.875 | H-3938CS.875 |
| 3/4" (19.0mm) | H-3914CS.750 | H-3924CS.750 | H-3928CS.750 | H-3938CS.750 |
| 5/8" (16.0mm) | H-3914CS.625 | H-3924CS.625 | H-3928CS.625 | H-3938CS.625 |
| 0.530" (13.2mm) | H-3914CS.530 | H-3924CS.530 | H-3928CS.530 | H-3938CS.530 |
| 1/2" (12.5mm) | H-3914CS.500 | H-3924CS.500 | H-3928CS.500 | H-3938CS.500 |
| 7/16" (11.2mm) | H-3914CS.438 | H-3924CS.438 | H-3928CS.438 | H-3938CS.438 |
| 3/8" (9.5mm) | H-3914CS.375 | H-3924CS.375 | H-3928CS.375 | H-3938CS.375 |
| 5/16" (8.0mm) | H-3914CS.312 | H-3924CS.312 | H-3928CS.312 | H-3938CS.312 |
| 0.265" (6.7mm) | H-3914CS.265 | H-3924CS.265 | H-3928CS.265 | H-3938CS.265 |
| 1/4" (6.3mm) | H-3914CS.250 | H-3924CS.250 | H-3928CS.250 | H-3938CS.250 |
| 1/8" (3.17mm) | H-3914CS.125 | H-3924CS.125 | H-3928CS.125 | H-3938CS.125 |

| | | | | |
|-------------------|---------------|---------------|---------------|---------------|
| No. 3-1/2 (5.6mm) | H-3914FS3-1/2 | H-3924FS3-1/2 | H-3928FS3-1/2 | H-3938FS3-1/2 |
| No. 4 (4.75mm) | H-3914FS4 | H-3924FS4 | H-3928FS4 | H-3938FS4 |
| No. 5 (4.0mm) | H-3914FS5 | H-3924FS5 | H-3928FS5 | H-3938FS5 |
| No. 6 (3.35mm) | H-3914FS6 | H-3924FS6 | H-3928FS6 | H-3938FS6 |
| No. 7 (2.80mm) | H-3914FS7 | H-3924FS7 | H-3928FS7 | H-3938FS7 |
| No. 8 (2.36mm) | H-3914FS8 | H-3924FS8 | H-3928FS8 | H-3938FS8 |
| No. 10 (2.00mm) | H-3914FS10 | H-3924FS10 | H-3928FS10 | H-3938FS10 |
| No. 12 (1.70mm) | H-3914FS12 | H-3924FS12 | H-3928FS12 | H-3938FS12 |
| No. 14 (1.40mm) | H-3914FS14 | H-3924FS14 | H-3928FS14 | H-3938FS14 |
| No. 16 (1.18mm) | H-3914FS16 | H-3924FS16 | H-3928FS16 | H-3938FS16 |
| No. 18 (1.0mm) | H-3914FS18 | H-3924FS18 | H-3928FS18 | H-3938FS18 |
| No. 20 (850µm) | H-3914FS20 | H-3924FS20 | H-3928FS20 | H-3938FS20 |
| No. 25 (710µm) | H-3914FS25 | H-3924FS25 | H-3928FS25 | H-3938FS25 |
| No. 30 (600µm) | H-3914FS30 | H-3924FS30 | H-3928FS30 | H-3938FS30 |
| No. 35 (500µm) | H-3914FS35 | H-3924FS35 | H-3928FS35 | H-3938FS35 |
| No. 40 (425µm) | H-3914FS40 | H-3924FS40 | H-3928FS40 | H-3938FS40 |
| No. 45 (355µm) | H-3914FS45 | H-3924FS45 | H-3928FS45 | H-3938FS45 |
| No. 50 (300µm) | H-3914FS50 | H-3924FS50 | H-3928FS50 | H-3938FS50 |
| No. 60 (250µm) | H-3914FS60 | H-3924FS60 | H-3928FS60 | H-3938FS60 |
| No. 70 (212µm) | H-3914FS70 | H-3924FS70 | H-3928FS70 | H-3938FS70 |
| No. 80 (180µm) | H-3914FS80 | H-3924FS80 | H-3928FS80 | H-3938FS80 |
| No. 100 (150µm) | H-3914FS100 | H-3924FS100 | H-3928FS100 | H-3938FS100 |
| No. 120 (125µm) | H-3914FS120 | H-3924FS120 | H-3928FS120 | H-3938FS120 |
| No. 140 (106µm) | H-3914FS140 | H-3924FS140 | H-3928FS140 | H-3938FS140 |
| No. 170 (90µm) | H-3914FS170 | H-3924FS170 | H-3928FS170 | H-3938FS170 |
| No. 200 (75µm) | H-3914FS200 | H-3924FS200 | H-3928FS200 | H-3938FS200 |
| No. 230 (63µm) | H-3914FS230 | H-3924FS230 | H-3928FS230 | H-3938FS230 |
| No. 270 (53µm) | H-3914FS270 | H-3924FS270 | H-3928FS270 | H-3938FS270 |
| No. 325 (45µm) | H-3914FS325 | H-3924FS325 | H-3928FS325 | H-3938FS325 |
| No. 400 (38µm) | H-3914FS400 | H-3924FS400 | H-3928FS400 | H-3938FS400 |
| No. 450 (32µm) | H-3914FS450 | H-3924FS450 | H-3928FS450 | H-3938FS450 |
| No. 500 (25µm) | H-3914FS500 | H-3924FS500 | H-3928FS500 | H-3938FS500 |
| No. 635 (20µm) | H-3914FS635 | H-3924FS635 | H-3928FS635 | H-3938FS635 |
| No. 850 (10µm) | H-3914FS850 | H-3924FS850 | H-3928FS850 | H-3938FS850 |
| No. 1000 (2µm) | H-3914FS1000 | H-3924FS1000 | H-3928FS1000 | H-3938FS1000 |

| Sieve Size | Brass Frame, Stainless Mesh | | | |
|-----------------|-----------------------------|--------------------------|--------------------------|-------------------------|
| | 3" Diameter 1" Deep | 5" Diameter 1.5" Deep | 6" Diameter 1.5" Deep | 10" Diameter 3" Deep |
| 4" (100mm) | - | - | - | H-3919CS4.000 |
| 3-1/2" (90mm) | - | - | - | H-3919CS3.500 |
| 3" (75mm) | - | - | - | H-3919CS3.000 |
| 2-1/2" (63mm) | - | - | - | H-3919CS2.500 |
| 2.12" (53mm) | - | - | - | H-3919CS2.120 |
| 2" (50mm) | - | - | - | H-3919CS2.000 |
| 1-3/4" (45mm) | - | - | - | H-3919CS1.750 |
| 1-1/2" (37.5mm) | - | - | - | H-3919CS1.500 |
| 1-1/4" (31.5mm) | - | - | - | H-3919CS1.250 |
| 1.06" (26.5mm) | - | - | - | H-3919CS1.060 |
| 1" (25.0mm) | H-3913CS1.000 | H-3915CS1.000 | H-3916CS1.000 | H-3919CS1.000 |
| 7/8" (22.4mm) | H-3913CS.875 | H-3915CS.875 | H-3916CS.875 | H-3919CS.875 |
| 3/4" (19.0mm) | H-3913CS.750 | H-3915CS.750 | H-3916CS.750 | H-3919CS.750 |
| 5/8" (16.0mm) | H-3913CS.625 | H-3915CS.625 | H-3916CS.625 | H-3919CS.625 |
| 0.530" (13.2mm) | H-3913CS.530 | H-3915CS.530 | H-3916CS.530 | H-3919CS.530 |
| 1/2" (12.5mm) | H-3913CS.500 | H-3915CS.500 | H-3916CS.500 | H-3919CS.500 |
| 7/16" (11.2mm) | H-3913CS.438 | H-3915CS.438 | H-3916CS.438 | H-3919CS.438 |
| 3/8" (9.5mm) | H-3913CS.375 | H-3915CS.375 | H-3916CS.375 | H-3919CS.375 |
| 5/16" (8.0mm) | H-3913CS.312 | H-3915CS.312 | H-3916CS.312 | H-3919CS.312 |
| 0.265" (6.7mm) | H-3913CS.265 | H-3915CS.265 | H-3916CS.265 | H-3919CS.265 |
| 1/4" (6.3mm) | H-3913CS.250 | H-3915CS.250 | H-3916CS.250 | H-3919CS.250 |
| 1/8" (3.17mm) | H-3913CS.125 | H-3915CS.125 | H-3916CS.125 | H-3919CS.125 |

USA Standard ASTM Test Sieves



STANDARD

3" 5" 6" 10"

76mm 127mm 152mm 254mm

| | | | | |
|-------------------|---------------|---------------|---------------|---------------|
| No. 3-1/2 (5.6mm) | H-3913FS3-1/2 | H-3915FS3-1/2 | H-3916FS3-1/2 | H-3919FS3-1/2 |
| No. 4 (4.75mm) | H-3913FS4 | H-3915FS4 | H-3916FS4 | H-3919FS4 |
| No. 5 (4.0mm) | H-3913FS5 | H-3915FS5 | H-3916FS5 | H-3919FS5 |
| No. 6 (3.35mm) | H-3913FS6 | H-3915FS6 | H-3916FS6 | H-3919FS6 |
| No. 7 (2.80mm) | H-3913FS7 | H-3915FS7 | H-3916FS7 | H-3919FS7 |
| No. 8 (2.36mm) | H-3913FS8 | H-3915FS8 | H-3916FS8 | H-3919FS8 |
| No. 10 (2.00mm) | H-3913FS10 | H-3915FS10 | H-3916FS10 | H-3919FS10 |
| No. 12 (1.70mm) | H-3913FS12 | H-3915FS12 | H-3916FS12 | H-3919FS12 |
| No. 14 (1.40mm) | H-3913FS14 | H-3915FS14 | H-3916FS14 | H-3919FS14 |
| No. 16 (1.18mm) | H-3913FS16 | H-3915FS16 | H-3916FS16 | H-3919FS16 |
| No. 18 (1.0mm) | H-3913FS18 | H-3915FS18 | H-3916FS18 | H-3919FS18 |
| No. 20 (850µm) | H-3913FS20 | H-3915FS20 | H-3916FS20 | H-3919FS20 |
| No. 25 (710µm) | H-3913FS25 | H-3915FS25 | H-3916FS25 | H-3919FS25 |
| No. 30 (600µm) | H-3913FS30 | H-3915FS20 | H-3916FS20 | H-3919FS20 |
| No. 35 (500µm) | H-3913FS35 | H-3915FS35 | H-3916FS35 | H-3919FS35 |
| No. 40 (425µm) | H-3913FS40 | H-3915FS40 | H-3916FS40 | H-3919FS40 |
| No. 45 (355µm) | H-3913FS45 | H-3915FS45 | H-3916FS45 | H-3919FS45 |
| No. 50 (300µm) | H-3913FS50 | H-3915FS50 | H-3916FS50 | H-3919FS50 |
| No. 60 (250µm) | H-3913FS60 | H-3915FS60 | H-3916FS60 | H-3919FS60 |
| No. 70 (212µm) | H-3913FS70 | H-3915FS70 | H-3916FS70 | H-3919FS70 |
| No. 80 (180µm) | H-3913FS80 | H-3915FS80 | H-3916FS80 | H-3919FS80 |
| No. 100 (150µm) | H-3913FS100 | H-3915FS100 | H-3916FS100 | H-3919FS100 |
| No. 120 (125µm) | H-3913FS120 | H-3915FS120 | H-3916FS120 | H-3919FS120 |
| No. 140 (106µm) | H-3913FS140 | H-3915FS140 | H-3916FS140 | H-3919FS140 |
| No. 170 (90µm) | H-3913FS170 | H-3915FS170 | H-3916FS170 | H-3919FS170 |
| No. 200 (75µm) | H-3913FS200 | H-3915FS200 | H-3916FS200 | H-3919FS200 |
| No. 230 (63µm) | H-3913FS230 | H-3915FS230 | H-3916FS230 | H-3919FS230 |
| No. 270 (53µm) | H-3913FS270 | H-3915FS270 | H-3916FS270 | H-3919FS270 |
| No. 325 (45µm) | H-3913FS325 | H-3915FS325 | H-3916FS325 | H-3919FS325 |
| No. 400 (38µm) | H-3913FS400 | H-3915FS400 | H-3916FS400 | H-3919FS400 |
| No. 450 (32µm) | H-3913FS450 | H-3915FS450 | H-3916FS450 | H-3919FS450 |
| No. 500 (25µm) | H-3913FS500 | H-3915FS500 | H-3916FS500 | H-3919FS500 |
| No. 635 (20µm) | H-3913FS635 | H-3915FS635 | H-3916FS635 | H-3919FS635 |
| No. 850 (10µm) | H-3913FS850 | H-3915FS850 | H-3916FS850 | H-3919FS850 |
| No. 1000 (2µm) | H-3913FS1000 | H-3915FS1000 | H-3916FS1000 | H-3919FS1000 |



SIEVE PANS & COVERS



H-3903



H-3902

Sieve Separator Pans

| Description Dia x Depth | Brass | Stainless |
|----------------------------|-----------|-----------|
| 3" x 1" | H-3913SP | — |
| 3" x 3" | H-3913DSP | — |
| 4" x 1.5" | H-3914SP | — |
| 4" x 4" | H-3924SP | — |
| 5" x 1" | H-3915SP | — |
| 6" x 1.625" | H-3916SP | — |
| 8" x 1" | H-3955SP | H-3955SSP |
| 8" x 2" | H-3956SP | H-3956SSP |
| 8" x 4" | H-3945SP | — |
| 8" x 6" | H-3946SP | — |
| 8" x 8" | H-3947SP | — |
| 10" x 8" | H-3919SP | — |
| 12" x 1" | H-3932SP | H-3932SSP |
| 12" x 2" | H-3922SP | H-3922SSP |
| 12" x 3.25" | H-3912SP | H-3912SSP |
| 12" x 4" | H-3928SP | — |
| 12" x 6" | H-3929SP | — |
| 12" x 8" | H-3938SP | — |

Sieve Bottom Pans

| Description Dia x Depth | Brass | Stainless |
|----------------------------|----------|-----------|
| 3" x .625" | H-3913HP | H-3913SS |
| 3" x 1" | H-3913P | — |
| 4" x 1.5" | H-3914P | — |
| 5" x 1" | H-3915P | — |
| 6" x 1.625" | H-3916P | — |
| 8" x 1" | H-3960P | H-3960SS |
| 8" x 2" | H-3920P | H-3950SS |
| 10" x 2" | H-3919P | — |
| 12" x 1" | H-3932P | H-3932PSS |
| 12" x 2" | H-3922P | — |
| 12" x 3" | H-3912P | H-3912SS |

Sieve Covers with Ring Handle

| Description Dia x Depth | Brass | Stainless |
|----------------------------|----------|-----------|
| 3" | H-3913BC | H-3913SC |
| 4" | H-3914BC | — |
| 5" | H-3915BC | — |
| 6" | H-3916BC | — |
| 8" | H-3930BC | H-3930SC |
| 10" | H-3919BC | — |
| 12" | H-3912BC | H-3912SC |

Sieve Set, Soil Analysis, 5" Dia.

These sieves are used by agricultural engineers for their accuracy and ease of handling. Frames are seamless brass with rolled edges and extended skirts for nesting. Set includes: (1) ea of: No. 10, 20, 40, 60, 80, 100 pan and cover.

Sieve Set, Soil Analysis, 5" Dia.

H-3903



Shipping wt. 7 lbs (4.5kg)

Replacement Screens for Soil Analysis Sieves

| Screen No. | Model |
|--------------|------------|
| #10 | H-3903.10 |
| #20 | H-3903.20 |
| #30 | H-3903.30 |
| #40 | H-3903.40 |
| #50 | H-3903.50 |
| #60 | H-3903.60 |
| #80 | H-3903.80 |
| #100 | H-3903.100 |
| Cover | H-3903C |
| Pan, 1" deep | H-3903P |

Soil Analysis Sieve Set, 5" Dia. Perforated Plate

Set includes pan, cover and five metric perforated, plate sieves. Screening surfaces are perforated brass plate with 0.5mm, 1mm, 2mm, 3mm and 5mm size openings. Frames are 5" (127mm) dia. by 1.5" (38mm) deep.

Soil Analysis Sieve Set, Perforated Plate

H-3902



Shipping wt. 7 lbs (4.5kg)



H-4100 Series

18" Dia. Brass Frame, Riddle Sieves

ASTM E11, AASHTO M92

Brass frame riddles (sieves), which are 4.5" deep, are made with stainless steel wire cloth and are used to wash, sift and strain samples used to drain off liquids and separate aggregates and dry materials in the sieve analysis of concrete and other materials.

| Screen No. | Mesh Size | Model |
|------------|-----------|-----------|
| 4" | 100mm | H-4109.4 |
| 3.5" | 90mm | H-4109A |
| 3" | 75mm | H-4109 |
| 2.5" | 63mm | H-4108 |
| 2.0" | 50mm | H-4107 |
| 1.5" | 37.5mm | H-4106 |
| 1.25" | 31.5mm | H-4105A |
| 1" | 25.0mm | H-4105 |
| .875" | 22.4mm | H-4104A |
| .75" | 19.0mm | H-4104 |
| .625" | 16.0mm | H-4103A |
| .5" | 12.5mm | H-4103 |
| .375" | 9.5mm | H-4102 |
| .25" | 6.3mm | H-4101 |
| No. 3.5 | 5.60mm | H-4100.3 |
| No. 4 | 4.75mm | H-4100.4 |
| No. 5 | 4.00mm | H-4100.5 |
| No. 6 | 3.35mm | H-4100.6 |
| No. 7 | 2.80mm | H-4100.7 |
| No. 8 | 2.36mm | H-4100.8 |
| No. 10 | 2.00mm | H-4100.10 |
| No. 12 | 1.70mm | H-4100.12 |
| No. 14 | 1.40mm | H-4100.14 |
| No. 16 | 1.18mm | H-4100.16 |
| No. 18 | 1.00mm | H-4100.18 |
| No. 20 | 0.85mm | H-4100.20 |
| Cover | | H-4100C |
| Bottom Pan | | H-4100P |

18" Brass Frame, Riddle Sieves

See chart



H-3880

H-3881

Aggregate Washer

ASTM C117

Aggregate washers automatically wash soil and aggregate samples, removing fines passing a 200 sieve. Water is continuously fed into the revolving, inclined stainless steel drum via a permanent regulated connection, and the sample is gently agitated until overflow is clear. Overflow water is directed onto sieves to prevent loss of oversize material. Angle of drum is fixed. Waste water is directed to a nearby drain. Aggregate washer allows processing of large aggregate and soil samples up to 15lb. (7kg). Stainless steel drum size is 12" diameter x 13" high (304x330mm). Equipped with totally enclosed gear motors for drum rotation and include 6ft (1.8M) power cords with GFCI plugs.

Order USA Standard Sieve, 200 mesh separately from the chart below.

Aggregate Washer, 120V 60Hz H-3881
 Aggregate Washer, 220V 50Hz H-3881.4F
 Shipping wt. 116 lbs (52kg)

Aggregate Washer, Table-Top Model

ASTM C117

This lightweight, table-top aggregate washer has a capacity of 8lb (3.6kg) and is designed to be located near a sink drain on a laboratory counter top. The easily removable drum that measures 9" diameter by 10.75" deep (229 x 273mm) is manufactured from stainless steel for rust and corrosion resistance. In operation, the washer applies a gentle agitation to the sample in the revolving drum until all particles are washed, separated and the overflow water runs clear. The unit is supplied complete with a permanent water connector with regulator valve, tubing, saddle valve, stainless steel goose-neck water tube with swivel connection and a 6-ft. power cord with GFCI plug for operator safety. **Order USA Standard Sieve, 200 mesh separately from the chart below.**

Aggregate Washer, 120V 60Hz H-3880
 Aggregate Washer, 220V 50/60Hz H-3880.4F

Shipping wt. 33.1 lbs (18kg)



H-3949

Aggregate Washer, Heavy Duty, Adjustable

ASTM C117

Heavy-duty aggregate washer with 15lb. (6.8kg) capacity removes clay, aggregate particles and water-soluble materials by the decanted wash water. Specimen is agitated sufficiently to completely separate all particles. Revolving drum is 10.75" dia. x 13" D (27 x 33cm) and locks in four tilting angled positions. Includes valve and .375" goose-neck water tube. Overall dimensions are 30" x 20" x 32" H (76 x 51 x 81cm). **Order USA Standard Sieve, 200 mesh separately from the chart below.**

Aggregate Washer, 120V 60Hz H-3949
 Aggregate Washer, 220V 50Hz H-3949.5F
 Shipping wt. 33.1 lbs (18kg)

Sieves for use with Aggregate Washers

| Model | Description |
|-------------|---|
| H-3920FS200 | Standard, Full Height, No. 200 Mesh, 8" dia. Sieve |
| H-3912FS200 | Standard, Full Height, No. 200 Mesh, 12" dia. Sieve |
| H-3920FS16 | Standard, Full Height, No.16 Mesh, 8" dia. Sieve |
| H-3912FS16 | Standard, Full Height, No. 16 Mesh, 12" dia. Sieve |



H-4328
H-4328.2 (Bucket and
Sieves not included)



H-3806



H-4391



H-3948

Wet/Dry Sieve Shaker

Lightweight cast aluminum, electrically operated portable sieve shaker is designed for use with one or two 8" diameter full-height or four half-height testing sieves. Used for wet or dry screening of solid particles. When placed over a bucket or sink, the unit provides the necessary shaking motion and frees the operator from a fatiguing task.

The sieve shaker has the advantage of being portable for making dry, gross separations and is convenient in making reproducible wet separations. The sieves are held firmly in place by a friction fit of the sieve's nesting ring, so a pan having a nesting ring can be used in lieu of one sieve. All PVC-coated, 115V 60Hz for intermittent duty, 3-wire cord and plug, on-off switch, and a neoprene wet-protective motor cap. The H-4328.5F version includes the H-4328.1, a 220V 50Hz transformer.

Wet/Dry Sieve Shaker, 120V 60Hz H-4328

Wet/Dry Sieve Shaker, 220V 50Hz H-4328.5F
Shipping wt. 8.5 lbs (5kg)

Bucket, 5-gallon for H-4328

Bucket is notched to securely hold the H-4328 sieve shaker in place.

Bucket, 5-gallon for H-4328 H-4328.2
Shipping wt. 3 lbs (1.4kg)

Wet Washing Sieve Apparatus

ASTM C430, D1514, AASHTO T192 and Controls spray and water pressure. Includes valve, pressure gauge, piping and H-3808 spray nozzle.

Wet Washing Sieve Apparatus H-3806
Shipping wt. 2.8 lbs (1.4kg)

Spray Nozzle Replacement H-3808
Shipping wt. 1 lb (.45kg)

Gauge Replacement H-3806.1
Shipping wt. 1 lb (.45kg)

Sieve Set, Rocker-Type

For sieve analysis of coarse aggregates and other materials. Consists of a 12" (305mm) square frame with handles mounted on a collector box with rockers. Includes 3" (76.1mm), 2" (50.8mm), 1.5" (38.1mm), 1" (25.4mm), .75" (19.0mm), .5" (12.7mm), .375" (9.51mm) and No. 4 ASTM wire screen plates with square openings

Screen plates finer than No. 20 mesh are not recommended for this unit. Screens are held in place with two locking devices on opposite sides. All screens can be clamped into frame for carrying or storage. OD 15.25" x 12.25" x 10" (387 x 311 x 354mm). Replacement screens are available, see chart below.

Replacement Screens for Rocker-Type Sieves

| Screen No. | Mesh Size | Model |
|------------|-----------|-------------|
| 4" | 100mm | H-4391.004 |
| 3.5" | 90mm | H-4391.008 |
| 3" | 75mm | H-4391.010 |
| 2.5" | 63mm | H-4391.012 |
| 2.0" | 50mm | H-4391.020 |
| 1.5" | 37.5mm | H-4391.250 |
| 1.25" | 31.5mm | H-4391.312 |
| 1" | 25.0mm | H-4391.375 |
| .875" | 22.4mm | H-4391.438 |
| .75" | 19.0mm | H-4391.500 |
| .625" | 16.0mm | H-4391.625 |
| .5" | 12.5mm | H-4391.750 |
| .375" | 9.5mm | H-4391.1000 |
| .25" | 6.3mm | H-4391.1250 |
| No. 3.5 | 5.60mm | H-4391.1500 |
| No. 8 | 2.36mm | H-4391.2500 |
| No. 10 | 2.00mm | H-4391.3500 |
| No. 12 | 1.70mm | H-4391.4000 |

Sieve Set, Rocker-Type

H-4391
Shipping wt. 24 lbs (19kg)

Corps of Engineers Wash Screen Assembly

ASTM E11, AASHTO M92

Wash screen assembly is used to wash out fines from samples of base coarse materials. It is used for a rapid check of minus No. 200 fines in aggregate and soil samples. Assembly has a 10 to 12 lb. (4.5 to 5.4kg) capacity. It includes a 12" (305mm) dia. x 10" deep (254mm) brass frame with a No. 200 mesh detachable screen with a No. 10 backup screen for support. The assembly also includes a lift-out, No. 10 overload screen at midpoint. Easily disassembles for cleaning and replacing mesh.

COE Wash Screen Assembly H-3948
Shipping wt. 10 lbs (5kg)

No. 10 Lift-out, Overload Screen H-3948M10
Shipping wt. 2.3 lbs (.1kg)

No. 200 Mesh H-3948M200
Shipping wt. 0.7 lb (.5kg)

NOTES

All Wet Wash Sieves are available from 50-400 mesh.

Call 1-800-544-7220 to order mesh sizes not listed.



H-3945



H-3942, H-3943



H-3807

Wet-Wash Sieves, Deep Frame

ASTM E11, AASHTO M92

Wet-wash sieves are used in the determination of fines content or to wash away fines when preparing samples for particle size testing. They are available in 8" and 12" diameters with depths of 4", 6" and 8". Sieves are constructed of brass frames with either stainless steel cloth or stainless steel cloth with a back-up cloth for durability. These sieves can also be ordered in almost any size mesh material 20 mesh and finer, call 1.800.544.7220 for availability. The chart below lists the most popular sizes.

No. 200 SS Mesh Wet Wash Sieves, Deep Frame (other mesh sizes available, inquire: 1.800.544.7220)

| Size in. (mm) | Model (w/back-up cloth) | Ship wt. lbs. (kg) |
|---------------------------|--------------------------------|-----------------------|
| 8" x 4" (203 x 102mm) | H-3945 (H-3945RC) | 3.5 (3.2) |
| 8" x 6" (203 x 152mm) | H-3946 (H-3946RC) | 2.7 (3.6) |
| 8" x 8" (203 x 203mm) | H-3947 (H-3947RC) | 3.7 (4.0) |
| 12" x 4" (305 x 102mm) | H-3928FS200 (H-3928FS200RC) | 4.1 (5.0) |
| 12" x 6" (305 x 152mm) | H-3929FS200 (H-3929FS200RC) | 5.1 (5.9) |
| 12" x 8" (305 x 203mm) | H-3938FS200 (H-3938FS200RC) | 5.8 (6.3) |

Wet Washing Sieves, Deep Frame

See chart

Wet Wash Sieves, Replaceable Mesh

ASTM E11, AASHTO M92

These sieves feature cost-effective, replaceable sieve cloth and mesh backups, which extend cloth life, as well as allow quick replacement of damaged screens. Sieves are available in either No. 200 or 325 mesh sizes with a No. 10 backup screen included. Screen material is held securely

between rubber gaskets and bolted to the frame. Replacement sieve material is available in sizes 20 mesh and finer— call for availability.

No. 200 SS Mesh and back-up cloth

| Size in. (mm) | Model | Ship wt. lbs. (kg) |
|--------------------------|--------|-----------------------|
| 8" x 4" (203 x 102mm) | H-3942 | 2.8 (3.2) |
| 8" x 6" (203 x 152mm) | H-3943 | 6 (3.6) |

No. 325 SS Mesh and back-up cloth

| Size in. (mm) | Model | Ship wt. lbs. (kg) |
|--------------------------|-------------|-----------------------|
| 8" x 4" (203 x 102mm) | H-3942FS325 | 2.8 (3.2) |
| 8" x 6" (203 x 152mm) | H-3943FS325 | 6 (3.6) |

8" Replacement Mesh only

| Mesh Size | Model | Ship wt. lbs. (kg) |
|--------------|------------|-----------------------|
| No. 200 SS | H-3942.200 | 0.25 (.5) |
| No. 325 SS | H-3942.325 | |

Wet Wash Sieves, Replaceable Mesh

See chart

Replacement Gasket for wet wash sieve

| Mesh Size | Model | Ship wt. lbs. (kg) |
|--------------|---------|-----------------------|
| 8" (203mm) | H-3942G | 0.25 (.5) |

Cement Wet Washing Sieves

ASTM E11; AASHTO M92

Stainless steel mesh sieves with nickel-plated brass frame have replaceable mesh and solderless construction. Sieves include three, screwed-on legs for support and to facilitate sample drying on hot plates and in ovens. Legs are quick and easy to remove to facilitate mesh replacement. These sieves are available in all mesh sizes from 50 to 400 mesh, for those not listed, contact Humboldt: 1.800.544.7220.

| Model | Description |
|------------|--|
| H-3807 | 2" x 3" high (52 x 76mm) with No. 325 replaceable mesh |
| H-3804 | 3" x 3.5" H (76 x 89mm) w/ No. 200 replaceable mesh |
| H-3803 | 4" x 4.5" H (102 x 114mm) w/ No. 200 replaceable mesh |
| H-3809 | 4" x 4.5" H (102 x 114mm) w/ No. 325 replaceable mesh |
| H-3807.325 | 2" dia. No. 325 replacement mesh disk |
| H-3804.200 | 3" dia. No. 200 replacement mesh disk |
| H-3809.200 | 4" dia. No. 200 replacement mesh disk |
| H-3807.4 | Replacement Leg |
| H-3807.5 | Replacement Screw |

Cement, Wet Washing Sieves

See chart



NOTES

Other Mesh sizes available, inquire: 1-800-544-7220.

HN-3952



H-4329.5



H-2813



H-3802



H-3799



H-3770



H-3773



H-3774



H-3772

NIST Reference Materials — Glass Beads

This Standard Reference Material (SRM) is intended primarily for use in evaluating and calibrating particle size measurement instrumentation, in this case, sieves. It consists of a single bottle containing approximately 200g of solid spherical soda-lime glass beads. Typical use is in the evaluation of wire cloth test sieves for conformity and accuracy in the range from #20 (2.00mm) through #635 (20µm). Percent of glass beads retained on each sieve is calculated, and effective opening of each of the sieves is determined from calibration data on the NIST Certificate supplied with the bead material.

NIST Reference Glass Beads

| Range | Model |
|----------------------------|---------|
| No. 10 – 20 (2450 – 750µm) | HN-3950 |
| No. 25 – 60 (750 – 220µm) | HN-3951 |
| No. 45 – 140 (400 – 100µm) | HN-3952 |
| No. 120 – 270 (125 – 53µm) | HN-3953 |
| No. 400 – 635 (38 – 20µm) | HN-3954 |
| No. 30 – 635 (600 – 45µm) | HN-3955 |

Sieve Balls

General-purpose, rubber balls that resists oil, grease, and abrasion are used in aiding in or cleaning sieve material. Test results may also benefit, due to less clumping of material.

Sieve Ball, 1" - Package of 1 H-4329.1
 Sieve Balls, 0.625" - Package of 10 H-4329.5
 Shipping wt. 0.5 lbs (.25kg)

Magnifying Comparator

The magnifying comparator is ideal for use in examining sieve mesh for size verification, as well as general inspection for damage. The instrument is supplied complete with four interchangeable scales:

- #121— .5 x .005" Ruler line scale
- #122— 15 x .1mm Ruler line scale
- #172— .5 x 0.1" Parallel line scale
- #173— .5 x 1/64" Parallel line scale

Magnifying Comparator H-2813
 Shipping wt. 0.8 lbs (.45kg)

Clean-N-Stor, for 8" Sieves

The clean-n-stor accessory is a handy, time-saving device for emptying, cleaning and weighing sieves. Inverting an 8" sieve on the stainless steel funnel allows quick emptying of the contents into a receiving scoop or pan. Includes scoop and soft, horsehair sieve brush. The adjustable height clean-n-stor is for use with taller sieves.

Clean-N-Stor Sieve Accessory H-3802
 Clean-N-Stor, Adjustable Height H-3801
 Shipping wt. 6 lbs (2.6kg)

Sieve Brushes

Horsehair, wood handle; 2.75" x 1.125" x .75" (70 x 29 x 19mm), 10.5" (267mm) overall length.
 Horsehair Sieve Brush, Oval Shape H-3799
 Shipping wt. 1 lbs (.45kg)

Horsehair, wood handle; 2.5" x 1" x .375" (64 x 25 x 10mm), 10.5" (267mm) overall length.
 Horsehair Sieve Brush for Fine Mesh H-3770
 Shipping wt. 1 lbs (.45kg)

Wire, plastic handle; 1.5" x 1.25" dia. (38 x 32mm), 5.25" (133mm) overall length.
 Wire Sieve Brush for Fine Mesh H-3773
 Shipping wt. 1 lbs (.45kg)

Horsehair, wood handle; 1.5" x 1.25" dia. (38 x 32mm), 5.25" (133mm) overall length.
 Horsehair Sieve Brush for Fine Mesh H-3774
 Shipping wt. 1 lbs (.45kg)

Wire, wire loop handle; 1.5" x .75" x .125" (38 x 19 x 3mm), 5.5" (140mm) overall length.
 Wire Sieve Brush for Coarse Mesh H-3772
 Shipping wt. 1 lbs (.45kg)

NOTES

For additional brushes,
 Go to page 361.



HA-4325, HA-4330



HA-4325V, HA-4330V



H-4325



H-4330

Sieve Shaker, Digital Timer

ASTM C136

The Humboldt digital shaker allows the user to set a time of up to 60 minutes with automatic shutoff. It features an easy-to-use digital interface with an accuracy of 0.5%. The HA-4325 sieve shaker builds upon the economical and time-proven design of the Humboldt Sieve Shaker, which has been providing dependable service for many years. This sieve shaker can be used with 3", 5" and 8" sieves and can handle up to ten 8" sieves, twelve 5" sieves, sixteen 3" full-height sieves or eighteen half-height 8" sieves.

The large version, HA-4330, can be used with 8", 10" and 12" sieves. It can handle up to eleven 8" sieves, seven 10" sieves, seven 12" full-height sieves, nineteen half-height 8" sieves or thirteen half-height 12" sieves.

This shaker uses a 1/4 hp motor with a 60-minute timer. Unit should be bolted to bench for correct operation. Dimensions: 15" w x 15" d x 45" h (380 x 380 x 1143mm).

| | |
|--|------------|
| Sieve Shaker, Digital Timer, 120V 60Hz | HA-4325 |
| Sieve Shaker, Digital Timer, 220V 60Hz | HA-4325.2F |
| Sieve Shaker, Digital Timer, 220V 50Hz | HA-4325.5F |
| Shipping wt. 72 lbs (32.6kg) | |

| | |
|--|------------|
| Large Sieve Shaker, Digital, 120V 60Hz | HA-4330 |
| Large Sieve Shaker, Digital, 220V 60Hz | HA-4330.2F |
| Large Sieve Shaker, Digital, 220V 50Hz | HA-4330.5F |
| Shipping wt. 95 lbs (43kg) | |

Variable-Speed Sieve Shaker, Digital Timer

ASTM C136

Humboldt's variable-speed, digital, sieve shaker builds upon the economical and time-proven design of the Humboldt Sieve Shaker, by adding a variable-speed option. The variable-speed dial provides a wide range of settings that can be easily set. And, also features an easy-to-use digital interface with an accuracy of 0.5%.

This sieve shaker can be used with 3", 5" and 8" sieves and can handle up to ten 8" sieves, twelve 5" sieves, sixteen 3" full-height sieves or eighteen half-height 8" sieves.

The large version, HA-4330V, can be used with 8", 10" and 12" sieves. It can handle up to eleven 8" sieves, seven 10" sieves, seven 12" full-height sieves, nineteen half-height 8" sieves or thirteen half-height 12" sieves.

Both shakers use a 1/3hp DC motor with a 60-minute timer. Unit should be bolted to bench for correct operation. Dimensions: 15" w x 15" d x 45" h (380 x 380 x 1143mm).

| | |
|---|-------------|
| Variable Speed Shaker, Digital, 120V 60Hz | HA-4325V |
| Variable Speed Shaker, Digital, 220V 60Hz | HA-4325V.2F |
| Variable Speed Shaker, Digital, 220V 50Hz | HA-4325V.5F |

| | |
|---|-------------|
| Large Shaker, Digital, Variable 120V 60Hz | HA-4330V |
| Large Shaker, Digital, Variable 220V 60Hz | HA-4330V.2F |
| Large Shaker, Digital, Variable 220V 50Hz | HA-4330V.5F |
| Shipping wt. 72 lbs (29.5kg) | |

Humboldt, Economy Sieve Shaker

ASTM C136

The Humboldt economy sieve shaker can be used with 3", 5" and 8" sieves. It can handle up to ten 8" sieves, twelve 5" sieves, sixteen 3" full-height sieves or eighteen half-height 8" sieves. It features a 30 minute, easy-to-use, mechanical timer and durable construction, which has been proven over many years of daily use. This shaker uses a 1/4 hp motor with a 30-minute timer. Unit should be bolted to bench for correct operation. Dimensions: 15" w x 15" d x 45" h (380 x 380 x 1143mm).

| | |
|---------------------------------|-----------|
| Economy Sieve Shaker, 120V 60Hz | H-4325 |
| Economy Sieve Shaker, 220V 60Hz | H-4325.2F |
| Economy Sieve Shaker, 220V 50Hz | H-4325.5F |
| Shipping wt. 72 lbs (29.5kg) | |

Humboldt, Large, Economy Sieve Shaker

ASTM C136

The Humboldt large economy sieve shaker can be used with 8", 10" and 12" sieves. It can handle up to eleven 8" sieves, seven 10" sieves, seven 12" full-height sieves, nineteen half-height 8" sieves or thirteen half-height 12" sieves. It features a 30 minute, easy-to-use, mechanical timer and durable construction, which has been proven over many years of daily use. This shaker uses a 1/4 hp motor with a 30-minute timer. Unit should be bolted to bench for correct operation. Dimensions: 21" w x 18" d x 47" h (533 x 4570 x 1194mm).

| | |
|---------------------------------|-----------|
| Large Economy Shaker, 120V 60Hz | H-4330 |
| Large Economy Shaker, 220V 60Hz | H-4330.2F |
| Large Economy Shaker, 220V 50Hz | H-4330.5F |
| Shipping wt. 95 lbs (38.5kg) | |



H-4310



H-4326



H-4315A



H-4316



H-4317

Humboldt, Hand-Operated Sieve Shaker

ASTM C136

The Humboldt, hand-operated sieve shaker can be used with 3", 5" and 8" sieves. It can handle up to ten 8" sieves, twelve 5" sieves, sixteen 3" full-height sieves or eighteen half-height 8" sieves. Unit should be bolted to bench for correct operation. Dimensions 15" w x 15" d x 45" h (380 x 380 x 1143mm).

Humboldt, Hand-Operated Sieve Shaker H-4310
Shipping wt. 54 lbs (22kg)

Sieve Shaker for 3" Sieves

Small, simple shaker for use with 3" sieves. Unit vibrates at 2000 vpm and creates a cyclonic effect, which produces a sieving action. Will accommodate up to six 3" sieves and uses a 1/20 hp motor.

Sieve Shaker, 3" Sieves, 115V 60Hz H-4326
Sieve Shaker, 3" Sieves, 220V 50Hz H-4326.5F
Shipping wt. 9.7 lbs (2.7kg)

Silent Sifters®

ASTM C136

Silent Sifters® significantly reduce noise levels of sieving operations with no loss in performance and accuracy. The higher quality materials and innovative design reduce noise levels inherent to particle sizing more than other rotary sifters or sieve shakers. They also provide faster conversion sieve sizes and are easier to set up, and quieter to run. Sieve stack capacity ranges from six 12" dia. full-height sieves with pan, or up to twenty 8" dia. half-height sieves with pan. Particle size range is No. 4 to No. 635 (4.75mm to 20µm).

Hammer assemblies are constructed of 6061 aluminum alloy with Ultra-High Molecular Weight (UHMW) Polyethylene heads. The rugged painted case is dense, impact-resistant MDF board and is mounted on a sturdy, powder-coated ASTM A513

heavy steel tubing stand. The system is driven by a dependable 1/4hp continuous-duty motor. Enclosed cabinets allow safe, dust-free operation. Sieve stacks are simply placed inside and the cabinet is rotated back to the testing position using an ergonomic knob, with no clamping required. Six rubber-covered stainless steel drive rollers continuously rotate the sieve stack, and particle separations are assisted by tapping against the stack.

The Silent Sifter® provides noise levels 7-10dB lower than any other rotary sifter for enhanced worker protection and no loss in performance or accuracy.

The Silent Sifter® II is the newest and most unobtrusive member of the Rotary Sifter line. This Sifter uses advanced soundproofing materials and techniques for models 16 - 18dB quieter than standard rotary sifters and 8-10dB quieter than the Silent Sifter®.

Silent Sieve Sifter® II, 120V 60Hz H-4316
Silent Sieve Sifter® II, 220V 50Hz H-4316.5F
Silent Sieve Sifter®, 120V 60Hz H-4317
Silent Sieve Sifter®, 220V 50Hz H-4317.5F
Shipping wt. 140 lbs (64kg)

UltraQuiet™ Mary Ann Laboratory Sifter

ASTM C136

The UltraQuiet™ Mary Ann® Laboratory Sifter continues to be the industry standard for accurately sifting aggregates into proper particle sizes. The new generation Mary Ann units are UltraQuiet™, with wheels for easy relocation and a SieveRack™ under the unit for easy storage of sieves. Inside a handmade enclosure 8" or 12" sieves can be stacked up to 26" in height and placed inside the Mary Ann without clamping. The Mary Ann features wood hammers that preserve the integrity of your sieves, helping you avoid sieve inspection failures. The inclined, rotating stack of sieves provides a gentle and thorough tumbling

action, which allows the particles to pass through the mesh. The sifting process is repeated on the smaller meshed sieve—and so on down through the stack. Assembled Sifter requires 18" x 40" (457 x 1016mm) of floor space. Unit Dimensions: 18" x 26" x 58" (457 x 660 x 1473mm).

UltraQuiet™ Mary Ann® Sifter, 120V 60Hz H-4315A
UltraQuiet™ Mary Ann® Sifter, 230V 50Hz H-4315A.5F
Shipping wt. 150 lbs (68kg)

Ro-Tap® Sieve Shaker, 8" Sieves

ASTM C136

The Ro-Tap sieve shaker provides a compact design and aggressive sieving action. This shaker provides 278 oscillations and 150 taps per minute to produce an effective sieving action. It is powered by a 1/4 hp motor and provides a built-in 99 minute step-down timer. Unit holds up to six, 8" full-height (2") sieves, plus a full-height pan. Dimensions: 28" x 21" x 25" (711 x 533 x 635mm).

Ro-Tap® 8" Sieve Shaker, 120V 60Hz H-4320
Ro-Tap® 8" Sieve Shaker, 220V 60Hz H-4320.2F
Ro-Tap® 8" Sieve Shaker, 230V 50Hz H-4320.5F
Shipping wt. 172 lbs (86kg)

Ro-Tap® Sieve Shaker, 12" Sieves

ASTM C136

The Ro-Tap sieve shaker provides a compact design and aggressive sieving action. This shaker provides 278 oscillations and 150 taps per minute to produce an effective sieving action. It is powered by a 1/4 hp motor and provides a built-in 99 minute step-down timer. Unit holds up to six, 12" intermediate-height (2") sieves, plus a 2" pan. Dimensions: 28" x 21" x 25" (711 x 533 x 635mm).

Ro-Tap® 12" Sieve Shaker, 120V 60Hz H-4322
Ro-Tap® 12" Sieve Shaker, 220V 60Hz H-4322.2F
Ro-Tap® 12" Sieve Shaker, 230V 50Hz H-4322.5F
Shipping wt. 172 lbs (86kg)





H-4320, H-4322

Sound Enclosure, Ro-Tap®

This sound enclosure can be used with either 8" or 12" Ro-Tap shakers (H-4320 and H-4322). Cabinet is lined with 1" (25.4mm) of foam for sound deadening. Air vents are built in.

Sound Enclosure, Ro-Tap® **H-4324**
Shipping wt. 120 lbs (41kg)

Shaker Stand

Sturdy lightweight, aluminum stand can be used with either 8" or 12" Ro-Tap shakers (H-4320 and H-4322).

Shaker Stand for Ro-Tap® **H-4320.4**
Shipping wt. 50 lbs (13kg)



H-4321, H-4327

Dura Tap™, Motorized Sieve Shaker

ASTM C136

Designed for use with 8" sieves, this industrial-strength Sieve Shaker is engineered with rugged steel and alloy materials ready to withstand everyday, harsh duty cycles. Grease fittings are provided to ensure longer life for your bearings, and each unit is "burned in" by continuously running it for over 4 hours, guaranteeing performance right out of the box. Unit holds six full-height 8" sieves, plus one pan and cover or fourteen, half-height sieves, plus one pan and cover. Uses a vertically-mounted, enclosed 1/4 hp electric motor and a built-in digital timer (+/- 2 seconds over 24 hours). Dimensions: 28" x 21" x 25" (711 x 533 x 635 mm).

Dura Tap™ Sieve Shaker, 120V 60Hz **H-4321**
Dura Tap™ Sieve Shaker, 220V 60Hz **H-4321.2F**
Dura Tap™ Sieve Shaker, 220V 50Hz **H-4321.5F**
Shipping wt. 225 lbs (102kg)

Dura Tap™, Motorized Sieve Shaker

ASTM C136

Designed for use with 12" sieves, this industrial-strength sieve shaker is engineered with rugged steel and alloy materials, ready to withstand everyday, harsh duty cycles. Grease fittings are provided to ensure longer life for your bearings, and each unit is "burned in" by continuously running it for over 4 hours, ensuring performance right out of the box. Unit holds four, full-height 12" sieves, plus one pan and cover or eight, half-height sieves, plus one pan and cover. Uses a vertically-mounted, enclosed 1/4 hp electric motor and a built-in digital timer (+/- 2 seconds over 24 hours). Dimensions: 28" x 21" x 25" (711 x 533 x 635 mm).

Dura Tap™ Sieve Shaker, 120V 60Hz **H-4327**
Dura Tap™ Sieve Shaker, 220V 60Hz **H-4327.2F**
Dura Tap™ Sieve Shaker, 220V 50Hz **H-4327.5F**
Shipping wt. 225 lbs (102kg)

Sieve Shaker Comparison Chart

Use the chart below to check and compare specifications between the various Sieve Shakers.

| Description | Model | Sieve dia. | | Sieve capacity* | | | ASTM | Timer minutes | Requires Mounting | Motor HP | Dimensions W x D x H |
|---|------------------|------------|-----|-----------------|--------|------|------|----------------|-------------------|----------|---|
| | | in. | mm | full | inter. | half | | | | | |
| Humboldt Sieve Shaker, Digital Timer | HA-4325 | 3 | 76 | 16 | | | C136 | 60 | Yes | 1/4 | 15" x 15" x 45" (381 x 381 x 1143mm) |
| Humboldt Sieve Shaker, Digital, Variable | HA-4325V | 5 | 127 | 12 | | | | 60 | | | |
| Humboldt, Economy Sieve Shaker | H-4325 | 8 | 203 | 10 | | 18 | | 30 | | | |
| Large Sieve Shaker, Digital Timer | HA-4330 | 8 | 203 | 11 | | 19 | C136 | 60 | Yes | 1/4 | 21" x 18" x 47" (533 x 457 x 1194mm) |
| Large Sieve Shaker, Digital, Variable | HA-4330V | 10 | 254 | 7 | | | | 60 | | | |
| Large Economy Sieve Shaker | H-4330 | 12 | 305 | 7 | 11 | 13 | | 30 | | | |
| 8" Hand Sieve Shaker | H-4310 | 3 | 76 | 16 | | | C136 | 30 | Yes | 1/4 | 15" x 15" x 45" (381 x 381 x 1143mm) |
| | | 5 | 127 | 12 | | | | | | | |
| | | 8 | 203 | 10 | | 18 | | | | | |
| UltraQuiet™ Mary Ann Sieve Sifter | H-4315A | 8 | 203 | 10 | | 20 | C136 | 99 Digital | No | 1/3 | 18" x 40" footprint (457x 1016mm) |
| | | 12 | 305 | 6 | 11 | 13 | | | | | |
| Silent Sieve Sifter® Silent Sieve Sifter® II | H-4316 H-4317 | 8 | 203 | 10 | | 20 | C136 | 99 Digital | No | 1/3 | 19" x 24" x 58" (483 x 610 x 1473mm) |
| | | 12 | 305 | 6 | | 12 | | | | | |
| Ro-Tap® Sieve Shaker | H-4320 | 8 | 203 | 6 | | 13 | C136 | 99 Digital | No | 1/4 | 28" x 21" x 25" (711 x 533 x 635mm) |
| Ro-Tap® Sieve Shaker | H-4322 | 12 | 305 | 4 | 6 | | C136 | 99 Digital | No | 1/4 | 28" x 21" x 25" (711 x 533 x 635mm) |
| Dura-Tap™ Sieve Shaker | H-4321 | 8 | 203 | 7 | | 14 | C136 | 24 hr. Digital | No | 1/4 | 28" x 21" x 25" (711 x 533 x 635mm) |
| Dura-Tap™ Sieve Shaker | H-4327 | 12 | 203 | 4 | 7 | 8 | C136 | 24 hr. Digital | No | 1/4 | 28" x 21" x 25" (711 x 533 x 635mm) |

* Includes top cover and pan.



Mikro Air-Jet Sieve MAJSx

Effective single sieve for dry powders, fragile samples or material that can't be wet sieved, Micron air-jet sieve shaker uses 200mm dia. sieve drums, with 2mm to 20 μ particle size range. Unit adapts to 75mm diameter electro-formed sieves in 90mm drums for 45 μ to 5 μ . Timer and vacuum controls allow reproducibility of the results. Filter attachment, micro-mesh sieve or cyclone collector accessories may be used to recover fines. Includes 200mm cast aluminum sieve drum housing unit, acrylic lid, 15W slotted brass air nozzle, 0-15 minute rotary timer switch. **Vacuum and Sieves are not included.** Accessories and air-jet sieve drums are available; call for details and pricing.

Mikro Air-Jet Sieve MAJSx, 120V 60Hz H-4334A.3F
Shipping wt. 168 lbs (30kg)

Standard HEPA Vacuum for Mikro Air-Jet Sieve

Standard vacuum for basic operation. Replacement bags and HEPA cartridges are available. Not recommended for samples with lots of fines.

Mikro Air-Jet Sieve MAJSx, 120V 60Hz H-4334A.2
Shipping wt. 22 lbs (9.9kg)

HEPA Air Jet Vacuum System for Mikro Air-Jet

Three-stage filtration system includes a Dacron pre-filter bag, a disposable paper filter bag, and a drop-in, pleated HEPA Filter Assembly with a minimum efficiency rating of 99.91% at 0.3 μ m.

HEPA Air Jet Vacuum System, 120V 60Hz H-4334A.3
Shipping wt. 168 lbs (30kg)

High-Efficiency Cyclone

The high efficiency cyclone device is a laboratory scale particle collection device, which is installed after the vacuum to recover up to 98% of materials over 10 μ m.

High-Efficiency Cyclone H-4334A.4
Shipping wt. 24 lbs (11kg)

Micron Air-Jet Sieves

ASTM E11

For use with Air-Jet sieving systems. Stainless steel frame and cloth mesh. 7.875" dia. (200mm) frame with rubber seal. Overall height: 1.75" (44.5mm). Depth to cloth: 1.125" (28.6mm). Each sieve is supplied with a serial number and matching "Test Sieve Certificate" for traceability.

Micron Air Jet Sieves

see chart

Shipping wt. 2 lbs (1kg)

| U.S. Std. Mesh | Micron | Model |
|----------------|--------|------------|
| No. 8 | 2360 | H-4335F8 |
| No. 10 | 200 | H-4335F10 |
| No. 12 | 1700 | H-4335F12 |
| No. 14 | 1400 | H-4335F14 |
| No. 16 | 1180 | H-4335F16 |
| No. 18 | 850 | H-4335F18 |
| No. 20 | 850 | H-4335F20 |
| No. 25 | 710 | H-4335F25 |
| No. 30 | 600 | H-4335F30 |
| No. 35 | 500 | H-4335F35 |
| No. 40 | 425 | H-4335F40 |
| No. 45 | 355 | H-4335F45 |
| No. 50 | 300 | H-4335F50 |
| No. 60 | 250 | H-4335F60 |
| No. 70 | 212 | H-4335F70 |
| No. 80 | 180 | H-4335F80 |
| No. 100 | 150 | H-4335F100 |
| No. 120 | 125 | H-4335F120 |
| No. 140 | 106 | H-4335F140 |
| No. 170 | 90 | H-4335F170 |
| No. 200 | 75 | H-4335F200 |
| No. 230 | 63 | H-4335F230 |
| No. 270 | 53 | H-4335F270 |
| No. 325 | 45 | H-4335F325 |
| No. 400 | 38 | H-4335F400 |
| No. 450 | 32 | H-4335F450 |
| No. 500 | 25 | H-4335F500 |
| No. 635 | 20 | H-4335F635 |

Specific Gravity of Fine Aggregate Kit,

ASTM C128; AASHTO T84

Kit designed to provide you with the basic equipment to do specific gravity and absorption of fine aggregate testing. The kit includes a H-3360 conical mold and tamper; H-3381 pycnometer top and 1 qt. (.95L) glass jar, HB-4533A .1g readability, 2600 gram scale; H-30120 lab oven, and H-3966 .75" (19mm) sample splitter.

Specific Gravity Kit, 120V 60Hz H-3373A
Specific Gravity Kit, 230V 50/60Hz H-3373A.4F
Shipping wt. 132 lbs (60kg)

Pycnometer Top and Glass Jar

ASTM C128

Pycnometer top and 1qt. (.95L) glass jar set for determining specific gravity of fine aggregate. Top is spun brass with .375" (10mm) hole in one end; threaded end fits 1- or 2-qt. (1 or 2L) glass jar. Includes rubber gasket that fits on jar mouth to prevent fine particles from becoming deposited in the threads. Order additional jars below.

Pycnometer Top and Glass Jar H-3381
Glass Jar, 1qt. (.95L) H-3380.2
Pycnometer Top Only H-3380
Shipping wt. 2 lbs (1kg)

Conical Mold and Tamper

ASTM C128; AASHTO T84

Used for determination of bulk and apparent specific gravity and absorption of fine aggregate. Brass mold is 40mm ID at top, 90mm ID at bottom, 75mm high. Steel tamper weighs 12 oz (340g) and has 1" dia. (25mm) flat circular tamping face.

Conical Mold and Tamper H-3360
Conical Mold Only H-3361
Tamper Only H-3362
Shipping wt. 1.8 lbs (1kg)



Deluxe Specific Gravity Bench

ASTM C20, C127, C642, C830, D1188, D2041, D2726; AASHTO T85, T166, T209, T275

Our specific gravity weighing bench is 46" (1168mm) tall with a 31" x 25" (787 x 635mm) platform top, which includes a hole to accommodate the weigh-below scale; and, a crank-operated shelf that lets you bring the water tank up to the sample, making for easier sample immersion. **Bench ONLY.**

Specific Gravity Bench H-2710A.1
Shipping wt. 116 lbs (52kg)

Deluxe Specific Gravity Bench Set

ASTM C20, C127, C642, C830, D1188, D2041, D2726; AASHTO T85, T166, T209, T275

The deluxe specific gravity bench set includes our deluxe bench, a H-2712A specific gravity tank kit with heater and circulating pump.

Order a weigh-below scale and sample containers separately.

Specific Gravity Set, 120V 60Hz H-2713B
Specific Gravity Set, 220V 50/60Hz H-2713B.4F
Shipping wt. 110 lbs (48kg)

Specific Gravity Tank with Heater & Circulator

ASTM C20, C127, C642, C830, D1188, D2041, D2726; AASHTO T85, T166, T209, T275

26 gal. (98.4L) polyethylene tank, which measures 18" x 18" x 18" and comes with a drain valve and overflow port. It also comes with a H-2712A.6, 200-watt, durable tank heater and circulating pump, both of which are attached to a stainless steel mounting bracket that holds both securely to the tank.

Tank w/ Heater & Circulator
120V 60Hz H-2712A
220V 50/60Hz H-2712A.4F
Shipping wt. 18 lbs (8kg)

Heater/Circulator Assembly

Comprised of a 200-watt, durable tank heater and circulating pump attached to stainless steel bracket that hangs on specific gravity tank to maintain constant temperature bath.

Heater/Circulator Assembly
120V 60Hz H-2712A.6
220V 50/60Hz H-2712A.6.4F
Shipping wt. 3.5 lbs (2kg)

Compact Specific Gravity Bench Set

ASTM C20, C127, C642, C830, D1188, D2041, D2726; AASHTO T85, T166, T209, T275

The compact specific gravity bench set includes our compact bench, which measures 15.75" x 19.75" x 39" High (400 x 502 x 991mm) and includes a hole to accommodate the weigh-below scale. It includes a 10-gallon polyethylene tank with internal dimensions of 12" x 12" x 18" (305 x 305 x 457mm) The tank comes with a drain valve and overflow port. It also comes with a H-2712A.6, 200-watt, durable tank heater and circulating pump, both of which are attached to a stainless steel mounting bracket that holds both securely to the tank. The compact specific gravity bench includes two sample containers, a 7.5" dia x 7.4" tall (191 x 191mm) container and a 5.5" x 8.25" (140 x 210mm) open, wired holder.

Order a weigh-below scale separately.

Specific Gravity Set, 120V 60Hz H-2717
Specific Gravity Set, 220V 50/60Hz H-2717.4F
Shipping wt. 110 lbs (48kg)

Compact Specific Gravity Tank with Heater & Circulator

ASTM C20, C127, C642, C830, D1188, D2041, D2726; AASHTO T85, T166, T209, T275

Includes a 10-gallon polyethylene tank with internal dimensions of 12" x 12" x 18" (305 x 305 x 457mm) The tank comes with a drain valve and overflow port. It also comes with a H-2712A.6, 200-watt, durable tank heater and circulating pump, both of which are attached to a stainless steel mounting bracket that holds both securely to the tank. This model also comes with the basket and the metal bracket hanger pictured.

Compact Tank w/ Heater & Circulator
120V 60Hz H-2716
220V 50/60Hz H-2716.4F
Shipping wt. 18 lbs (8kg)



NOTES

Recommended scales for use with specific gravity benches can be found on the next page.



HB-3515



HB-4506A



HB-4545B



H-3371



H-3351



H-3353



H-3354, H-3357, H-3358



H-2715

H-3355
H-3356

H-3372

RECOMMENDED SCALES:

Ohaus Ranger 7000 High-Capacity Balance

The Ranger 7000 balance has been designed for industrial applications. The HB-3515 features a 15,000g capacity with a readability of 0.1g. and a weigh-below hook.

15,000g x 0.1g Balance, 120V 60Hz HB-3515
15,000g x 0.1g Balance, 220V 50/60Hz HB-3515.4F
Ship wt. 32lbs. (13.4kg)

Ohaus Explorer High-Capacity Balance

The Explorer high-capacity balance provides a durable and accurate solution to this application. It features internal calibration and an integral weigh-below hook. The HB-4508A features a 24,000g capacity with a readability of 0.1g.

12,000g x 0.1g Balance, 120V 60Hz HB-4506A
12,000g x 0.1g Balance, 220V 50/60Hz HB-4506A.4F
24,000g x 0.1g Balance, 120V 60Hz HB-4508A
24,000g x 0.1g Balance, 220V 50/60Hz HB-4508A.4F
Ship wt. 29lbs. (12.5kg)

Adam Nimbus High-Capacity Balance

Innovative design creates a smaller footprint, so the Nimbus occupies minimal space on the lab bench. Order a weigh-below hook, HB-4545B.1.

12,000g x 0.1g Balance, 120V 60Hz HB-4543B
12,000g x 0.1g Balance, 220V 50/60Hz HB-4543B.4F
16,000g x 0.1g Balance, 120V 60Hz HB-4545B
16,000g x 0.1g Balance, 220V 50/60Hz HB-4545B.4F
Ship wt. 29lbs. (12.5kg)



ACCESSORIES

For additional choices in balances for use in this application, See pages 327-336.

Sample Container

ASTM C88; AASHTO T104

For use in testing aggregate soundness, the container is used to immerse samples of coarse aggregate in solution and then transfer samples to an oven for uniform drying in minimum time. No. 4 stainless steel wire mesh, bottom soldered to frame after fabricating. Overall dimension: 10" x 4" dia. (254 x 102mm) with .125" (3mm) round wire handle.

Sample Container

H-3351

Shipping wt. 2.3 lbs (1.04kg)

Sample Container

ASTM C88; AASHTO T104

Used to immerse samples of coarse aggregates in solution and transfer samples to oven. No. 8 stainless steel wire mesh, bottom-soldered to frame after fabrication. Overall dimension: 5.5" x 4" dia. (140 x 102mm).

Sample Container

H-3353

Shipping wt. 6 lbs (2.7kg)

Drain Down Baskets

Stainless steel wire mesh baskets feature reinforced construction and bail-type handle. Dimensions: 4.25" x 5.5" dia. (108 x 140mm).

Drain Down Basket, 0.25" mesh

H-3354

Drain Down Basket, #8 mesh

H-3357

Drain Down Basket, #16 mesh

H-3358

Shipping wt. 2.7 lbs (1.2kg)

Specific Gravity Basket

ASTM C127

Stainless steel No. 8 wire stainless steel mesh basket features reinforced construction and bail-type handle. Dimensions: 8" x 8" dia. (203 x 203mm).

Specific Gravity Basket

H-3371

Shipping wt. 2.7 lbs (1.2kg)

Specific Gravity Sieve #4

Designed for use in specific gravity test applications. Heavy-gauge brass construction.

8" Specific Gravity Sieve #4

H-3355

12" Specific Gravity Sieve #4

H-3356

Shipping wt. 3lbs (1.4kg)

Hollow Tube Specific Gravity Cradle

Through this unique, yet simple stainless steel hollow tube designed, water displacement is virtually eliminated for improved accuracy in specific gravity test applications.

Hollow Tube Specific Gravity Cradle

H-2715

Shipping wt. 2.4 lbs (1.1kg)

Utility Bucket

ASTM C127

Heavily galvanized utility bucket has wire-reinforced top edge, bail-type handle and 14-qt. (13L) capacity.

Utility Bucket

H-3372

Shipping wt. 4 lbs (1.6kg)



Specific Gravity Flask (Phunque Flask)

AASHTO T354

The phunque flask is the key element in a method for conducting specific gravity/absorption determinations for aggregate. This method has been designed to eliminate the inherent guess work built into ASTM C128 and AASHTO T84—the current cone and tamper methods in use today. This is easy to perform, easy to understand and easily reproducible between technicians and labs. The test is very easy to run and can be reliably run in the field. This can be especially helpful in asphalt operations where specific gravities can make a big impact on pay factors. This test lets the contractor check specific gravities on the material he is currently using, not lab tests, which may not be current. The H-3388F is for fine aggregate and has a neck approximately 1" in diameter. The H-3388L is used for coarse aggregate and has a neck approximately 2" in diameter. The scale on both items is readable to 0.1 grams; Both include an excel calculation sheet and a swabbing utensil to keep the neck of the flask dry during loading.

Fine Aggregate Flask H-3383F
Coarse Aggregate Flask H-3383L

Shipping wt. 12 lbs (7kg)

Volumetric Flasks

ASTM D854; AASHTO T100

Glass flasks used in specific gravity determinations are calibrated to contain the rated capacity at 20°C within permissible tolerances. Available with and without a stopper.

100ml Volumetric Flask H-3391
250ml Volumetric Flask H-3392
250ml Volumetric Flask with Stopper H-3394
500ml Volumetric Flask H-3393
500ml Volumetric Flask with Stopper H-3395

Shipping wt. 1 lbs (0.45kg)



Specific Gravity Flask (Le Chatelier)

ASTM C128, C188; AASHTO T133

For determining the specific gravity of hydraulic cement, dust, sand and other fine materials. The body holds approximately 250ml. The oval bulb in the neck holds 17ml. Volume below the bulb is graduated from 0 to 1.0ml in 0.1ml subdivisions, with an additional 0.1 subdivision below the 0 and above the 1.0ml mark. The neck is graduated from 18 to 24ml in 0.1ml subdivisions above the bulb (white graduations). The stopper is a number 13.

Specific Gravity Flask (Le Chatelier) H-3400
Specific Gravity Flask, Calibrated H-3400C

Shipping wt. 1.8 lbs (1kg)

Specific Gravity Flask (Chapman)

ASTM C70; AASHTO T142

The Chapman flask has a wide base and two bulbs and is used in the determination of moisture content in fine aggregate by displacement in water. It can also be used to adjust the aggregate mass for moisture content and to determine surface moisture contribution to mixing water in portland cement concrete. Graduated at 200ml between the bulbs, and from 375ml to 450ml in 1ml divisions in the neck.

Specific Gravity Flask (Chapman) H-3460

Shipping wt. 2.5 lbs (1kg)



Specific Gravity Bottles (Pycnometers)

ASTM D854; AASHTO T100

Adjusted bottle for routine commercial testing, fitted with ground-in perforated stopper. Capillary vent stopper design allows stopper to be inserted to fixed depth in the bottle's neck. Small hole in center of stopper allows emission of air and surplus water. Volume of the bottle has been adjusted at 20°C.

Specific Gravity Bottle, 100ml H-3387
Specific Gravity Bottle, 50ml H-3386
Specific Gravity Bottle, 25ml H-3385

Shipping wt. 0.3 lbs (0.2kg)

Hubbard-Carmick Specific Gravity Bottle

ASTM D70, D115, D2343; AASHTO T228, T43

Modified 24ml, wide-mouth Hubbard-Carmick, Erlenmeyer-style bottle allows easy filling and cleaning and is very stable.

Hubbard-Carmick Specific Gravity Bottle H-2660
Shipping wt. 0.4 lbs (0.2kg)

Hubbard 24ml Specific Gravity Bottle

ASTM D70, D115, D1963; AASHTO T228

Hubbard-form 24ml bottle for determination of specific gravity of semi-solid bituminous materials, asphalt cements, soft tar pitches and emulsions. Features ground-in stopper with 1.6mm hole.

Hubbard 24ml Specific Gravity Bottle H-2640
Shipping wt. 0.3 lbs (0.15kg)



H-4967
(Includes pelican case, reagent not included)

H-4965A

H-4966

H-4978

Speedy® 2000 Moisture Tester, 20g

ASTM D4944; AASHTO T217; Florida FM5-507

The Series 2000 Speedy moisture tester is a portable system for measuring the moisture content of a wide range of materials including soils, aggregates, dust and powders (and liquids). The system consists of a low pressure vessel fitted with a pressure gauge and an electronic scale and test accessories. Moisture measurements are made by mixing a weighed sample of the material with a calcium carbide reagent in the sealed pressure vessel. The reagent reacts chemically with water in the sample, producing acetylene gas that in turn increases the pressure within the vessel. The pressure increase in the vessel is proportional to the amount of water in the sample, the moisture content can be read directly from the calibrated pressure gauge. The tester is supplied complete with heavy-duty plastic carrying case, electronic balance, beaker, cleaning cloth, cap, washer, scoop, steel pulverizing balls and cleaning brushes. **Does not include calcium carbide reagent, See hazardous material warning on this page.**

Specifications

| | Description |
|------------|---|
| Accuracy | Within 0.5% on most materials |
| Test Speed | 45 sec. to 3 min., depending on material |
| Gauge | Calibrated from 0-20% moisture based on wet weight |
| Balance | Electronic; 0-7 oz (0-200g) range; battery operated |

Speedy® 2000 Moisture Tester, 20g H-4967
Shipping wt. 16.6 lbs (5.9kg)

Speedy® 2000 Moisture Tester, 6g

The Series 2000 Speedy 6g moisture tester provides moisture testing for smaller 6g samples of material. The tester is supplied complete with heavy-duty plastic carrying case, electronic balance, beaker, cleaning cloth, cap, washer, scoop and cleaning brushes. **This model is not ASTM compliant and does not include the steel pulverizing balls. Does not include calcium carbide reagent, See hazardous material warning.**

Speedy® 2000 Moisture Tester, 6g H-4968
Shipping wt. 15 lbs (5.9kg)



HAZARDOUS WARNING

Danger of explosion/fire may result if Moisture Testing Reagent is allowed contact with moisture. Calcium carbide forms flammable acetylene gas when wet so it must be kept sealed and dry. Provide adequate ventilation and use away from sparks and flame.

U.S. shipping regulations now require truck shipment for all quantities of calcium carbide. For this reason we no longer provide testing reagent (calcium carbide) with Speedy Moisture Testers. To purchase calcium carbide for use with Speedy testers, please order H-4966, which is a case of 24, 1 lb. (0.5kg) canisters. This item requires shipment by truck.

International shipping regulations require separate purchase of reagent, which requires "dangerous goods" papers and packing. For this reason, Speedy Moisture Testers do not contain reagent, order separately.

Moisture Tester Reagent

Calcium carbide reagent for Speedy® Moisture Testers. Carton of 24-1 lb. (0.5kg) containers. Shipped via motor freight only. **See Hazardous Warning.**

Moisture Testing Reagent H-4966
Ship wt. 28lbs (11.7kg)

Calibration Kit, Speedy Tester

A self-contained unit designed to enable an operator to check the accuracy of the Speedy moisture tester. The unit is comprised of a master dial, integral air pump, control connections and tools for checking gauge accuracy and pressure leaks, with instructions for simple re-calibrations. Includes case.

Calibration Kit, Speedy Tester H-4965A
Shipping wt. 20 lbs (9kg)

Replacement Parts for Speedy

| Description | Model |
|-----------------------------|------------|
| Portable Scale, 200g x 0.1g | H-4967.1 |
| Beaker, 60ml Plastic | H-4967.2 |
| Gauge, replacement | H-4963G |
| Gauge, gasket- 0.75" OD | H-4963.11 |
| Speedy Scoop | H-4963.15 |
| Speedy Brush, wire handle | H-4963.16A |
| Brush, for scale pan | H-4963.14 |
| Pulverizer, steel ball | H-4963B |

Aggrameter (Trident)

Formerly known as the Trident, the Aggrameter utilizes the latest microwave and microprocessor technology to measure moisture content in various fine and coarse-grained materials. The prongs of the probe are inserted into the material to be tested and the percentage of moisture content is instantaneously shown on the easy to read display. The Aggrameter comes calibrated for both sand and aggregate, and can be programmed by the user for up to ten different materials. The Aggrameter can store more than 150 readings – complete with time and date for future reference. The maximum aggregate particle size to be tested is approximately 3/8" (or 9.5mm) in diameter.

Aggrameter H-4978
Shipping wt. 5lbs (2.3kg)



HO-4976.3F



HO-4975.3F

HO-4972



HO-4971



PMB Moisture Analyzers

With simple operation and rapid response time, PMB moisture analyzers offer the top value in their class. The HO-4975 and HO-4976 feature a readability of 0.01g / 0.05%. Pan size is 3.9" (100mm) and the following weighing units: g, %M, %S, ATRO %M, ATRO %S. It features a Back-lit LCD screen with 0.9"/ 24mm-high digits and external calibration. The automatic test-setting function enables easy recall for frequent testing of the same items without additional user programming. The automatic test-setting function enables easy recall for frequent testing of the same items without additional user programming. USB and RS-232 interfaces provide computer and printer connections to store test programs and results. No additional software is needed to take readings, giving users total freedom to collect data on a production floor or in the field. There is no need for additional software to take readings, giving users total freedom to collect data on a production floor or in the field. A single 400-watt halogen bulb heats samples in 1 °C selectable increments. Three heating options give users the flexibility to customize test methods and temperatures for different materials. This PMB moisture analyzer can be used to accurately determine the moisture content in aggregates, soils and powder materials, such as cement.

| Model | HO-4975, HO-4976 |
|------------------------|--|
| Capacity | 160g / 200g |
| Readability | 0.01g / 0.05g% |
| Sample Size | 50g to 160 / 200g |
| Heating Tech | 400 watt Halogen |
| Power | 110/220V, 50/60 HZ |
| Operating Temp | 0° to 40°C / 32° to 104°F |
| Display Type | Backlit LCD |
| Weighing Units | g, %M, %S, ATRO %M, ATRO %S |
| Pan Size | 3.9" / 100mm |
| Dimensions (W x D x H) | 9.8" x 14.2" x 7.3" 250 x 360 x 185mm |

PMB Moisture Analyzer, 200g HO-4976.3F
PMB Moisture Analyzer, 160g HO-4975.3F
Shipping wt. 18 lbs (8kg)

Moisture Analyzer, Basic-Halogen, 90g

Measuring moisture content has never been easier than with the HO-4972 Moisture Analyzer. The HO-4972's halogen heating distributes heat uniformly over the sample and speeds up the drying process—delivering fast and precise measurements. Designed for tool-free cleaning, this analyzer's components can be easily removed for quick and easy maintenance. The HO-4972 is intuitive with an icon-driven menu navigation on the touchscreen display. It provides outstanding Halogen Heating for fast and precise results and it's precisely controlled halogen heating dries samples quickly ensuring uniform heating to yield fast, precise and repeatable results of 0.01% readability.

Effortless maintenance with tool-free cleaning with its removable pan handler and heating chamber components that make cleaning quick and easy. Its halogen heating dries samples in seconds and performs up to 40% faster than traditional infrared methods, providing uniform drying for precise, repeatable results. The reflective sample chamber ensures uniform heating of samples to yield reliable results of 0.01% readability. Features a full operating temperature range of 40–200 °C in 1° increments.

| Model | HO-4972 |
|------------------------|---|
| Capacity | 90g |
| Readability | 0.01% / 0.001g |
| Sample Size | 3g to 20g typical, 0.5g min. |
| Heating Tech | Halogen |
| Power | 100 to 240V, 50/60 HZ |
| Temp. Range | 104° 392°F (40–200°C) |
| Display Type | 4.3 in/109 mm, QVGA, TFT touch screen |
| Weighing Units | %moisture, %solids, %regain weight (g), temperature, time |
| Pan Size | 3.5" / 90mm |
| Dimensions (W x D x H) | 8.3" x 14" x 7.7" 211 x 355 x 180mm |

Moisture Analyzer, Basic-Halogen, 90g HO-4972
Shipping wt. 18.4 lbs (8.35kg)

Moisture Analyzer-Pro Analytical, 120g

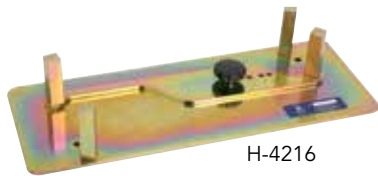
The HO-4971 delivers functionality and precision that you can rely on, and is easy to operate and clean—you can test more samples in less time! Advanced features such as a temperature guide help to analyze optimum drying temperature, and methods and results storage allows statistical analysis of measurements. Three levels of user management ensure data safety—set up and lock temperature settings and method parameters with administrator access.

The HO-4971 provides advanced functionality for professional moisture analysis, while its temperature guide analyzes a sample and determines the optimal drying temperature. Precise and fast results with halogen heating increases efficiency in the lab. Precisely-controlled halogen heating dries samples uniformly, producing repeatable results of 0.01% readability. Four drying profiles and seven shut-off criteria help to perform customized sample tests. Easy tool-free cleaning and intuitive operation with the icon-driven menu navigation. The HO-4971 features a removable pan handler and sample chamber for easy cleaning.

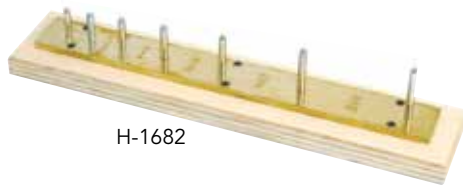
Operating the HO-4971 is intuitive—simply follow the guided instructions on the touchscreen display.

| Model | HO-4971 |
|------------------------|---|
| Capacity | 120g |
| Readability | 0.01% / 0.001g |
| Sample Size | 3g to 20g typical, 0.5g min. |
| Heating Tech | Halogen |
| Power | 100 to 240V, 40/60 HZ |
| Temp. Range | 104° 397°F (40–203°C) |
| Display Type | 4.3 in/109 mm, QVGA, TFT touch screen |
| Weighing Units | %moisture or %solids or weight (g), temperature, time |
| Pan Size | 3.5" / 90mm |
| Dimensions (W x D x H) | 6.5" x 11" x 5" 170 x 250 x 140mm |

Moisture Analyzer-Pro Analytical, 120g HO-4971
Shipping wt. 18.4 lbs (8.35kg)



H-4216



H-1682



H-1684



H-1686



H-1680A



Flakiness Sieves

Proportional Caliper Device

ASTM D4791

Use to determine the percentage of flat particles, elongated particles, or both flat and elongated particles in coarse aggregates. Steel construction for strength and durability, plated for corrosion resistance. 6" x 16" (152.4 x 406.4mm) base plate with four rubber feet for stability, and for convenience in tabletop testing. Ratio desired is obtained by selecting one of four adjustable positions: 2 = 1:2; 3 = 1:3; 4 = 1:4; or 5 = 1:5. It is recommended that the desired procedure be reviewed carefully prior to conducting the test.

Proportional Caliper Device

H-4216

Shipping wt. 10 lbs (4kg)

Elongation Index for Aggregate Classification

BS 812

For determining elongation index. Particle is elongated when its length (longest dimension) is more than 1.8 of the mid-size of the sieve fraction. Aggregate to be classified is separated into seven sieve fractions from 63 to 6.3mm, and each fraction is examined separately. Six labeled openings between pairs of metal pins measure particle from each of the six sieve cuts below 50mm. The mass of all elongated particles (failing to pass between pins) as percent of the sample is the elongation index.

Elongation Index

H-1682

Shipping wt. 3 lbs (1kg)

Flakiness Gauge for Classification of Aggregate

BS 812

For determining flakiness index. Particle is flaky when its thickness (smallest dimension) is less than 0.6 of the mid-size of the sieve fraction. Gauge has seven, labeled slots for manual evaluation of particles in the seven openings. The mass of all flaky particles (passing appropriate slots) as percent of the sample is the flakiness index. Gauge is enameled sheet metal with clearly marked sieve fraction ranges for each slot.

Flakiness Gauge for Aggregate

H-1684

Shipping wt. 3 lbs (1kg)

Void Content Apparatus, Coarse Aggregate

AASHTO T326

Used to determine the void content of uncompacted coarse aggregate used in HMA applications. When used on aggregate of a known size, the void content provides the user with an indication of the angularity, sphericity and surface texture as compared to other coarse aggregate of the same grading. In operation, the aggregate is allowed to free-fall 115mm from the funnel bottom into a 154mm diameter by 160mm high cylindrical measure. The excess heaped aggregate is struck off using the included bar, the mass is measured, and the void content is computed. The apparatus consists of a stainless steel hopper, stand, measure and strike-off bar and a 170mm square glass plate for calibration of the measure.

Void Content Apparatus, Coarse

H-1686

Shipping wt. 30 lbs (14kg)

H-1686 Accessories

| Item | Part No. |
|-----------------------------------|----------|
| Overflow Pan, 12" x 1.5" Aluminum | H-4940.6 |
| Material Handling Scoop | H-3731 |
| Glass Plate, 170mm | H-1686.2 |

Void Content Apparatus, Fine Aggregate

ASTM C1252; AASHTO TP33

Used to determine the uncompacted void content of a fine aggregate sample. Indicates the angularity, sphericity, and workability of fine aggregate in a mixture. Includes 100 ml brass cylindrical measure, funnel assembly, funnel stand, and glass plate for calibration. **Order overflow pan, scoop and strike-off spatula separately.**

Void Content Apparatus

H-1680A

Shipping wt. 3 lbs (1kg)

H-1680A Accessories

| Item | Part No. |
|-----------------------------------|----------|
| Overflow Pan, 12" x 1.5" Aluminum | H-4940.6 |
| Material Handling Scoop | H-3731 |
| Spatula, 6-inch | H-4906 |
| Glass Plate, 4" x 4" x .0375" | H-3049 |

Flakiness Sieves Set

BS 812

Complete set of flakiness sieves. These sieves are used to determine if aggregate is flaky. Aggregate is considered flaky if its thickness is less than 0.6 of nominal size. Set is comprised of Sieves listed in the chart below. **Sieves can be ordered separately as well.**

| Model | Size (W x L) | Passing | Retained |
|-------------|--------------|---------|----------|
| H-4392.4.9 | 4.9 x 30mm | 10mm | 6.3mm |
| H-4392.7.2 | 7.2 x 40mm | 14mm | 10mm |
| H-4392.10.2 | 10.2 x 50mm | 20mm | 14mm |
| H-4392.14.4 | 14.4 x 60 mm | 28mm | 20mm |
| H-4392.19.7 | 19.7 x 80mm | 37.5mm | 28mm |
| H-4392.26.3 | 26.3 x 90mm | 50mm | 37.5mm |
| H-4392.33.9 | 33.9 x 100mm | 63mm | 50mm |

Flakiness Sieves Set

H-4392

Shipping wt. 33 lbs (15.8kg)



H-3860D


H-3860.100
(Shown with H-3860D, not included)


HM-4100A.2



HM-4100A

Los Angeles Abrasion Machine

ASTM C131, C535; AASHTO T96

The Los Angeles abrasion machine is used to measure the degradation of mineral aggregate of standard gradings resulting from a combination of actions including abrasion or attrition, impact and grinding in a rotating steel drum containing a specified number of steel spheres. The test is widely used as an indicator of the relative quality of various sources of aggregate having similar mineral compositions.

Humboldt's design follows the ASTM-preferred design and features a welded, structural-steel frame, fabricated .5"-thick (913mm) abrasion-resistant steel drum, a removable shelf, bolted to the drum and a balanced drum assembly for easy rotation by hand. The enclosed chain drive rotates the drum without a conventional slip clutch. This positive drive delivers greater accuracy. The self-contained worm-drive motorized speed reducer has anti-friction bearings and sealed lubrication. The 1hp, electronically-controlled motor is equipped with large, push-button controls and an automatic overload cutoff. The controls can be removed from the Abrasion Machine and mounted outside a sound enclosure or mounted on a nearby wall. Unit includes user-configured, revolution counter, a material catch pan and one abrasion charge consisting of 12 hardened-steel balls. Dimensions: 39" x 29" x 37" (991 x 737 x 940mm).

LA Abrasion Machine, 120V 60Hz H-3860D
LA Abrasion Machine, 220V 60Hz H-3860D.2F
LA Abrasion Machine, 220V 50Hz H-3860D.5F

Shipping wt. 870 lbs (394kg)

Abrasion Charge

ASTM C131, C535; AASHTO T96

Replacement abrasive charge for H-3860 Los Angeles abrasion machine. Consists of 12 hardened-steel balls.

Abrasion Charge H-3865
Shipping wt. 12 lbs (6kg)

Materials Catch Pan for LA Abrasion

Replacement pan for use with LA abrasion machine. Dimensions: 24" x 24" x 4" (609 x 609 x 101mm), tapered sides.

Materials Pan for LA Abrasion H-3860.19
Shipping wt. 20.9 lbs (9kg)

Sound Enclosure for LA Abrasion Machine

Full enclosure designed to cut down on noise generated while using the LA abrasion machine. Unit is steel construction with foam lining for noise reduction. Pre-drilled holes accommodate mounting controller on outside of enclosure.

Sound Enclosure for LA Abrasion H-3860.100
Shipping wt. 250 lbs (113kg)

Retrofit Kit for Digital Counter

Kit for retrofitting Digital Counter to older models of LA Abrasion Machines.

Retrofit Kit for Digital Counter H-3860D.CRK
Shipping wt. 4 lbs (1.8kg)

Slake Durability Apparatus

ASTM D4644

The Slake durability apparatus is used to determine the durability of rocks and the probable amount of deterioration of weak rocks, over a period of time, after simulated exposure to nature's continual wetting and drying cycles. The apparatus consists of a base-mounted, motor-drive unit with two mesh drums and two water tanks with quick-release drive assemblies. The drums rotate at a speed of 20 revolutions per minute. Options include two extra drums and tanks for running up to four tests simultaneously. To aid in sample preparation, additional mesh drums are recommended. Dimensions: 48" x 14" x 9.25" (1,219 x 355 x 235mm).

Slake Durability, 120V 60Hz HM-4100A
Slake Durability, 220V 50Hz HM-4100A.5F
Shipping wt. 78 lbs (32kg)

Slake Wire Mesh Drums

ASTM D4644

Set of two wire mesh drums for use with Slake durability apparatus.

Slake Wire Mesh Drums HM-4100A.1
Shipping wt. 20 lbs (9.1kg)

Drum and Tank Assembly

ASTM D4644

Set of two wire mesh drums and water tank assemblies.

Drum and Tank Assembly HM-4100A.2
Shipping wt. 45lbs (20.4kg)

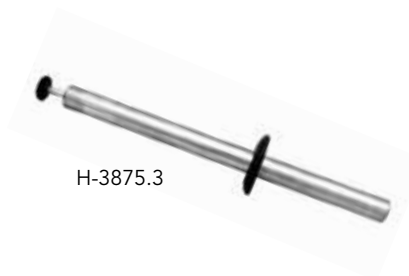


H-3875.35F
H-3875.36F



H-3875.1

H-3875.2



H-3875.3



Micro-Deval Apparatus

ASTM D6928, D7428; AASHTO T327; Texas 845-49-40; Ontario LS-618

The micro-deval test measures abrasion resistance and durability of mineral aggregates. An aggregate sample is placed in a sealed stainless steel jar with an abrasive charge of up to 5,000g of 9.5mm diameter stainless steel balls and water, then rotated at 100rpm for two hours. Aggregate quality is determined by percentage loss in gradation results at completion. The micro-deval's smaller size, smaller sample quantities and simpler procedure make this test method easier and less costly to perform than traditional methods.

The micro-deval meets current ASTM, AASHTO, and Canadian test methods, as well as more stringent Texas DOT requirements. This contemporary version of the micro-deval test should not be confused with older versions originating in Europe which use different equipment and test protocol. A sophisticated electronic controller with optical sensing system accurately tracks test time, total revolutions and rpm of jars. Test duration may be controlled by either elapsed time or total revolutions. Jars stop within a fraction of one revolution at test termination. Jar revolution and speed data may also be used as a verification of machine performance.

Sample jars revolve behind polycarbonate doors equipped with safety interlocks, so no moving parts are exposed during operation as opposed to older designs, which used unguarded open rollers. The micro-deval machine is a two-tier unit with sturdy steel frame. Each tier carries one stainless steel 5 liter sample jar, which has a 194mm ID and a 170mm internal height with locking cover. Power

to the rubber-covered rollers is supplied by a 3/4hp, electric motor through a gear transmission and chain drive. The unit is supplied with two jars and two 5,500g abrasive charges. A magnet is included to assist in removing the abrasive charge after the test is complete. For additional sample preparation capacity and greatly reduced testing times, it is recommended that additional sample jars and abrasive charges be used.

Overall dimensions are: 20.5" x 13.5" x 38"
(521 x 343 x 965mm).

Micro-Deval, 120V 60Hz

H-3875.35F

Micro-Deval, 230V 50Hz

H-3875.36F

Shipping wt. 248 lbs (113kg)

Micro-Deval 5L Sample Jar

ASTM D6928, D7428; AASHTO T327; Texas 845-49-40; Ontario LS-618

Five liter sample jar with locking cover for use with Micro Deval.

Micro-Deval 5L Sample Jar

H-3875.1

Shipping wt. 13 lbs (6kg)

Micro-Deval Abrasive Charge

ASTM D6928, D7428; AASHTO T327; Texas 845-49-40; Ontario LS-618

For additional sample preparation capacity and greatly reduced testing times, order additional abrasive charges.

Micro-Deval Abrasive Charge

H-3875.2

Shipping wt. 13 lbs (6kg)

Micro-Deval Abrasive Charge Magnet

Magnet is used to assist in removing the abrasive charge from the sample slurry after the Micro-Deval test is complete.

Micro-Deval Abrasive Charge Magnet

H-3875.3

Shipping wt. 13 lbs (6kg)

Sieves for Micro-Deval Testing

ASTM D6928, D7428; AASHTO T327; Texas 845-49-40; Ontario LS-618

Sieves are required for use in conjunction with micro-deval testing, and are ordered separately. Below are the required mesh sizes called for by the ASTM specifications. Order 8" sieves from page 50 and 12" sieves from page 51. Wet wash sieving can be useful at completion of the abrasion cycle, see pages 60-61 for wet-sieving accessories.

Sieves for Micro-Deval Testing

| Coarse Aggregate ASTM D6928 | Fine Aggregate ASTM D7428 |
|--------------------------------|------------------------------|
| .75" (19mm) | No. 4 (4.75mm) |
| .625" (16mm) | No. 8 (2.36mm) |
| .5" (12.5mm) | No. 16 (1.18mm) |
| .375" (9.5mm) | No. 30 (600μ) |
| .265" (6.3mm) | No. 100 (150μ) |
| No. 4 (4.75mm) | No. 200 (75μ) |



Equotip 550

Extensively used for rock hardness and for investigating weathering effects on rocks. Can be used for correlation to unconfined or uniaxial compressive strength (UCS); testing on weak rocks, porous rocks and those with thin weathering crusts; cores; rectangular blocks and investigations of hardness near edges of samples. The impact energy of the Device D is approximately 1/200th that of the Type N rebound hammer. This makes it very suitable for testing on historical sites, very soft types of rock that cannot be tested with a rebound hammer and also on brittle rock cores that would be damaged by a rebound hammer. The impact Device S features the same impact energy, but with a much more durable ceramic impact body that is more suited to heavy users on harder rock. The Basic Unit includes: Equotip Touchscreen incl. Battery, Power Supply, USB Cable, Surface Roughness Comparator Plate, DVD with Software, Documentation, Carrying Strap and Carrying Case. **Order Device D or Device S separately. Both devices come with the appropriate calibration blocks.**

Equotip 550 Basic Unit **H-3417**
Shipping wt. 4.9 lbs (2.2kg)

Equotip Accessories

| Item | Part No. |
|--|----------|
| Equotip Leeb Impact Device S with calibration blocks | H-3417.1 |
| Equotip Leeb Impact Device D with calibration blocks | H-3417.2 |
| Device Cable 5 ft (1.5m) | H-3418.3 |
| Device Cable 15 ft (5m) | H-3418.4 |

RockSchmidt

ASTM D5873,

The RockSchmidt is a variation of the SilverSchmidt rebound hammer, which has been adapted specifically for rock testing applications, such as UCS correlations or the prediction of penetration rates for tunnel boring machines and rotary drum cutters.

The following features of the hammer make it ideal for rock testing applications:

Impact Angle Independence: The rebound value is independent of the impact direction.

Optimized for Field Work: Tighter sealing against dirt and dust intrusion for longer life. Significantly lighter and more ergonomic than the classic Schmidt hammer. A large number of readings can be saved and downloaded later to a PC.

Preset Statistics: Statistics methods recommended by ISRM and ASTM are implemented into the hammer for automatic calculation of the rebound number. The option is also there to define a user specific statistics method.

Unconfined Compressive Strength: ISRM recommends a correlation between UCS and the rebound value based on the formula $UCS = aebR$ (where R is the rebound value). A correlation in this format may be defined in the PC software and downloaded onto the RockSchmidt.

Young's (E-) Modulus: ISRM recommends a correlation between elastic modulus and the rebound value based on the formula $E_t = cedR$ (where R is the rebound value). A correlation in this format may be defined in the software and downloaded to the RockSchmidt.

Weathering Grade: Impacting on the same location twice can be used to correlate to weathering grade. The ISRM recommended method has been included in the device. RockSchmidt,

includes battery charger with USB cable, DVD with PC software, carrying strap, grinding stone, documentation and carrying bag.

| RockSchmidt Specifications | |
|----------------------------|--------------------------|
| Impact energy | N: 2.207Nm — L: 0.735 Nm |
| Max. Impacts | 99 per series |
| Battery Life | 5000 impacts |
| IP Classification | IP54 |

RockSchmidt Hammer **H-3419A**
Shipping wt. 4.9 lbs (2.2kg)

Moh's Scale of Hardness

Designed to determine mineral hardness by the scratch test method. Set includes 9 specimens, from talc to carborundum. Numbered specimens are keyed to descriptions inside box cover.

Moh's Scale of Hardness **H-3422**
Shipping wt. 2 lbs (1kg)

Scratch Hardness Tester

Determines quantity of soft particles in coarse aggregates on basis of scratch hardness. Apparatus consists of 0.0125" (1.6mm) dia. brass rod with rounded point inserted into plunger. Overall weight of brass point and plunger is 2 ± 0.1 lbs (8.9 ± 0.4N). Plunger is mounted on support stand, permitting plunger to lower and raise freely. Furnished with (1) replacement brass rod.

Scratch Hardness Tester **H-3420**
Shipping wt. 16 lbs (7kg)

Accessories

| Item | Part No. |
|------------------------------------|----------|
| Brass Rods (pkg. of 10) for H-3420 | H-3421 |



HS-4157

Point Load Tester

ASTM D5731; EN 1997,

This apparatus is used to determine the strength values of a rock specimen, both in the field and in the laboratory. It consists of a load frame for applying loads up to 55kN, a mounted hydraulic ram and a pressure gauge with 0.001kN precision for maximum load indication. An upper conical platen is fixed on the frame and a lower one on the jack piston. A graduated scale is fixed on the frame and indicates the specimen diameter. The pressure gauge indicator can be read in kN, N, t, kg and bar. The digital display continuously monitors applied load and direct reading of the specimen diameter. Unit is portable and accepts core specimens of up to 4" (101.6mm) in diameter.

Point Load Tester, LB and BAR

HS-4157

Point Load Tester, kN and N

HS-4157M



Shipping wt. 33 lbs (15kg)



HS-4158

Aggregate Impact Value

Used to determine the impact value of aggregates and select them for a given application. The device has a trip-action hammer release, blow counter device and a built-in operator safety device. Heavy-duty construction with hardened steel surfaces for minimum wear. The complete assembly is cadmium plated for corrosion protection. Includes counter, mold and tamping rod.

Aggregate Impact Value

HS-4158

Shipping wt. 36 lbs (16.5kg)

HS-4170
HS-4171**Aggregate Crushing Value**

The aggregate crushing value provides a relative measure of the resistance of an aggregate to crushing under a gradually applied compressive load. Consists of a piston, piston cover, base plate, tamping rod and measure. Available in two sizes 150mm and 75mm.

Aggregate Crushing Value, 75mm

HS-4170

Aggregate Crushing Value, 150mm

HS-4171



Shipping wt. 33 lbs (15kg)



HCM-4000iHA

HCM-5070

HS-4160

Typical Hoek Cell Compression Machine and Controller Setup

Hoek Cells

Hoek cells are used to measure the strength of cylindrical rock specimens, which are subjected to triaxial compression. They comprise a steel body and two steel end caps, which are screwed to the body of the cell when in use. The body has two, self-sealing couplings; one of them is for connecting to the hydraulic pressure system, the other is for de-airing the cell chamber and the attachment of a pressure measurement device. Four sizes are available.

| | |
|-----------------|---------|
| Hoek Cell, 30mm | HS-4159 |
| Hoek Cell, 42mm | HS-4160 |
| Hoek Cell, 55mm | HS-4161 |
| Hoek Cell, 1.5" | HS-4162 |



Shipping wt. 33 lbs (15kg)

Hoek Cell Membranes

Flexible membranes for use with Hoek Cells.

| | |
|--------------------------|-----------|
| Hoek Cell Membrane, 30mm | HS-4159.1 |
| Hoek Cell Membrane, 42mm | HS-4160.1 |
| Hoek Cell Membrane, 55mm | HS-4161.1 |
| Hoek Cell Membrane, 1.5" | HS-4162.1 |



Shipping wt. 36 lbs (16.5kg)



HP-1108

HP-1160

Weight per Gallon Cup

ASTM D244

Weight per Gallon Cups are used to quickly and accurately determine the weight per gallon, and also the specific gravity of paints, etc. Capacity of 83.2cc. Includes cover.

Weight per Gallon Cup



HP-1108

Shipping wt. 0.5 lbs (0.2k)

Falling Sand Abrasion Tester

ASTM D333, D968, D1395, D2205

The falling sand test determines the abrasion resistance of coatings, such as paint, varnish, lacquer and related products. The test panel is enclosed in a receptacle with a window. Ottawa natural silica sand is considered the standard use in this test because of its known characteristics. Order H-3820 Ottawa silica test sand separately.

Falling Sand Abrasion Tester



HP-1160

Shipping wt. 110 lbs (50kg)





SOIL-LAB

| | | | |
|--|---------|-----------------------------------|---------|
| Atterberg Limits | . 91-93 | Molds | . 83 |
| Atterberg Limits - Cone Penetrometer | . 92 | Permeability | 97-102 |
| Atterberg Limits - Liquid Limit | . 91 | Plastic and Shrinkage | . 93 |
| Compaction | . 85-86 | pH Meters | . 94 |
| Expansion. | . 103 | Sample Extraction | . 82 |
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| Hydrometer Analysis | . 95-96 | Soil Processors | . 80-81 |
| Load Frames, CBR | . 87-89 | Unconfined Soil Testers | . 98 |
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H-4215



H-4198



H-4197



H-4199

Rapid Soil Processor

Processing soil for soil compaction tests has never been easier than when using Humboldt's Rapid Soil Processor. It automatically processes semi-moist, moist and even samples close to optimum moisture content to minus #4 screen size more than five times faster than any other method available. Samples of up to 30 pounds of fat and tough clays at field moisture levels can be processed in less than 15 minutes. For those drying back samples or taking up to 24hrs to prepare samples for five-point moisture/density relationship tests, the rapid soil processor can accomplish this preparation in about 5 hours. Other test preparations can also benefit from the rapid soil processor, reducing prep time to almost nothing. If you use field expedient methods, such as "rapid compaction" or "family of curves" testing, the rapid soil processor is a must.

In addition, while processing a sample, rocks in the sample of up to 0.75" in size are automatically separated from the soil, preventing damage to the screen.

The rapid soil processor features heavy-duty, all-metal construction, which provides years of dependable service under constant use. The off-set rotating drum is motor driven and requires no preset adjustments. Automatic operation frees up technician's time allowing them to do other tasks while processing soil samples. Easy-to-install, replacement screens are available, as are replacement parts. Overall dimensions: 32" x 36" x 53" (813 x 915 x 1346mm).

Rapid Soil Processor, 120V 60Hz H-4215
 Rapid Soil Processor, 220V 60Hz H-4215.2F
 Rapid Soil Processor, 220V 50Hz H-4215.5F

Shipping wt. 406 lbs (184kg)

Replacement Screens for Rapid Soil Processor

| Description | Model |
|---|-----------|
| Replacement Screen, 11.875" (302mm) height (for units sold after March, 1995) | H-4215.32 |
| Replacement Screen, 13" (330mm) height (Old Style, for units sold before March, 1995) | H-4215.26 |

Electric, Disk Grinding Mill

ASTM C409

The H-4198 Electric Disk Grinding Mill is used in testing labs around the world and complies with ASTM C409 for sample preparation of Hardgrove Grindability specimens. This grinding mill features a 1/3hp single-phase, geared motor, which is mounted to a rigid, cast-aluminum base with rubber feet for stability. The grinding mill head construction is made of sturdy, durable cast iron. The grinding mill head can be easily removed and disassembled for cleaning without the use of any special tools. The grinding plates are made of a hard iron alloy designed for clog resistance and long life. Plate-to-plate clearance is easily adjusted by hand in order to change the mesh size range desired. Output capacity is up to 40lbs (18kg) per hour with dry material and the material hopper provides 50in³ (820ml) approximately 2lb (0.9kg) of material. Grinding mill is sold with the dry grinding feeder and disk set—a wet grinding feeder and disk set is available as an accessory (H-4198.1). The complete unit ships in two boxes.

Soil Grinder, 120V 60Hz H-4198
 Soil Grinder, 220V 60Hz H-4198.2F
 Soil Grinder, 220V 50Hz H-4198.5F

Shipping wt. 55 lbs (25kg)

| Description | Model |
|---------------------------|----------|
| Coarse Grinding Plate Set | H-4198.1 |

Soil Grinder, Humboldt

This table-top unit prepares soil samples to designated particle size for accurate, repeatable test results. Grinds one-pint sample in 15 seconds. Stainless steel construction. Includes a No. 10 perforated stainless plate.

Soil Grinder, 120V 60Hz H-4199
 Soil Grinder, 220V 50Hz H-4199.5F

Shipping wt. 28 lbs (12.7kg)

Soil Grinder Accessories

| Description | Model |
|-----------------------------|----------|
| No. 4 Perforated, SS Plate | H-4199.A |
| No. 10 Perforated, SS Plate | H-4199.B |
| No. 35 Perforated, SS Plate | H-4199.C |
| 2mm Perforated, SS Plate | H-4199.D |
| Beater Assembly | H-4199.7 |

Disk Grinding Mill, Hand-operated

Hand-operated Grinding Mill mounts to bench top up to 1.5" (38.1mm) thick with an integral c-clamp for fast grinding of samples. The mill is made of sturdy, durable, painted cast iron. Mill head can be easily disassembled for cleaning without the use of any special tools. The grinding plates are made of a hard iron alloy designed for clog resistance and long life. Unit is sold with dry grinding feeder and disk set, but wet grinding set up is available as an accessory. Output capacity is up to 40lbs (18kg) per hour with dry material and an energized cranker. The material hopper provides 50in³ (820ml) approximately 2lb (0.9kg) of material.

Disk Grinding Mill, Hand-operated H-4197

Shipping wt. 12.5 lbs (5.7kg)

| Description | Model |
|-----------------|----------|
| Revolving Plate | H-4197.1 |

**Soil Mortar**

ASTM D421; AASHTO T87

Heavy porcelain mortar, glazed outside surface and unglazed inside; for use with H-4258 pestle to break up soil particle aggregates for testing. Mortar is 3.5" (90mm) ID x 2.25" (57mm) H.

Soil Mortar**H-4257**

Shipping wt. 1.5 lbs (0.7kg)

Soil Pestle

ASTM D421; AASHTO T87

Rubber-tipped 8" (203mm) long pestle, made for gently grinding soils without breaking individual particles.

Soil Pestle**H-4258**

Shipping wt. 0.7 lbs (0.32kg)

Mixer, 5-Qt.

Mixer for mixing material samples. The H-3839 operates on the principle of planetary action where the beater reaches every part of a batch, rotating on its axis in opposite directions as it moves around the bowl. This mixer thoroughly blends, mixes and aerates all ingredients for a consistent, predictable finished batch. Selective agitator transmission has 3 speed settings: 139, 285 and 591 RPM. Direct gear drive and a heavy-duty motor ensure constant mixing speeds under load. A locking hand-lever provides precise raising and lowering of the mixing bowl. Base dimensions: 10.375 x 15" (264 x 381mm). Height: 17" (432mm). The mixer includes a stainless steel bowl, wire whip, dough hook and an aluminum flat beater. It is suggested that a stainless steel beater or a Humboldt extreme-duty whisk be purchased for materials mixing applications for improved beater life.

Mixer, 5-Qt. (4.73L), 120V 60Hz H-3839**Mixer, 5-Qt. (4.73L), 230V 60Hz H-3839.2F****Mixer, 5-Qt. (4.73L), 230V 50Hz H-3839.5F**

Shipping wt. 55 lbs (25kg)

**Humboldt Laboratory Mixer, 5-Qt.**

Humboldt's NEW 5-Qt. Laboratory Mixer has been designed to provide material testing labs with a step up in quality from the typical lab mixer. This mixer has been designed specifically for the demands of cement and soil mixing and not as a kitchen-prep machine. This new mixer, with its clear safety cover provides a sealed mixing design, which allows for material, water and other additives to be easily added to the mix via a port at the top of the mixer. The clear safety cover is attached to the mixer, independent of the bowl and can be removed for cleaning. The mixer features lightweight aluminum construction and comes with a stainless steel stirrer and mixing bowl.

The HC-3858.3F promotes extremely safe operation and complies with CE standards. It provides enclosed operation, an emergency stop button and stops automatically when the bowl is lowered during the mixing process. Its design is optimized for easy handling including its easy-lowering bowl mechanism. The mixer provides two mixing speeds: 140 ± 5 U/min and 285 ± 10 U/min. Dimensions are: 9.25" x 15.5" x 22.4" (235 x 396 x 568mm).

Mixer, 5-Qt. (4.73L), 120/230V 50/60Hz H-3858.3F

Shipping wt. 66lbs (30kg)

Soil and Mortar Mixer, 5L (5.3qt)

This excellent, alternative to the Hobart mixer features two-speed, manual-control with a very robust design, expressly made for the efficient mixing of cement pastes and mortar. The mixer offers two speeds: 140 rpm for revolving with 62 rpm planetary action and 285 rpm revolving with 15 planetary action.

This mixer features a heavy-duty design, which provides excellent stability when placed on a counter top. Provides open mixing bowl for easy visual consistency control. Simple distance control between stirrer paddle and mixing bowl maintains standard distance between bowl and stirrer.



HC-3851

H-3842A
H-3843A**ACCESSORIES**

For Mixer Accessories, please see page: 280.

Hoisting mechanism can also be used to lower the mixing bowl. Quick-clamping system allows mixing bowl to be attached to the mixer easily. Provided with standard stainless steel bowl and standard beater.

Mortar Mixer, 5L (5.3qt), 120V 60Hz HC-3851**Mortar Mixer, 5L (5.3qt), 230V 60Hz HC-3851.2F**

CE Shipping wt. 125lbs. (56kg)

Laboratory Bench Mixers

These mixers are designed with larger bowls for larger samples or busier labs. They feature a direct gear drive and a heavy-duty 1/2hp motor to ensure constant mixing speeds under load. A locking hand-lever provides precise raising and lowering of the mixing bowl. These mixers thoroughly blend, mix and aerate all ingredients for a consistent, predictable finished batch. Selective agitator transmission has 3 fixed speed settings and a stir speed, these are: 107, 198 and 365 and 59 RPM. Its 15-minute SmartTimer provides ease of use and consistency. Bowl Interlock ensures mixer bowl is properly in place for mixer to operate and bowl lift is an ergonomic hand crank operated, which self-locks in the top and bottom positions. Includes stainless-steel bowl, flat-type aluminum grid beater, whip and aluminum dough hook.

Base Dimensions of the 12 Qt. Mixer are: 14.75" x 20" x 29.6125" (375 x 508 x 750mm).

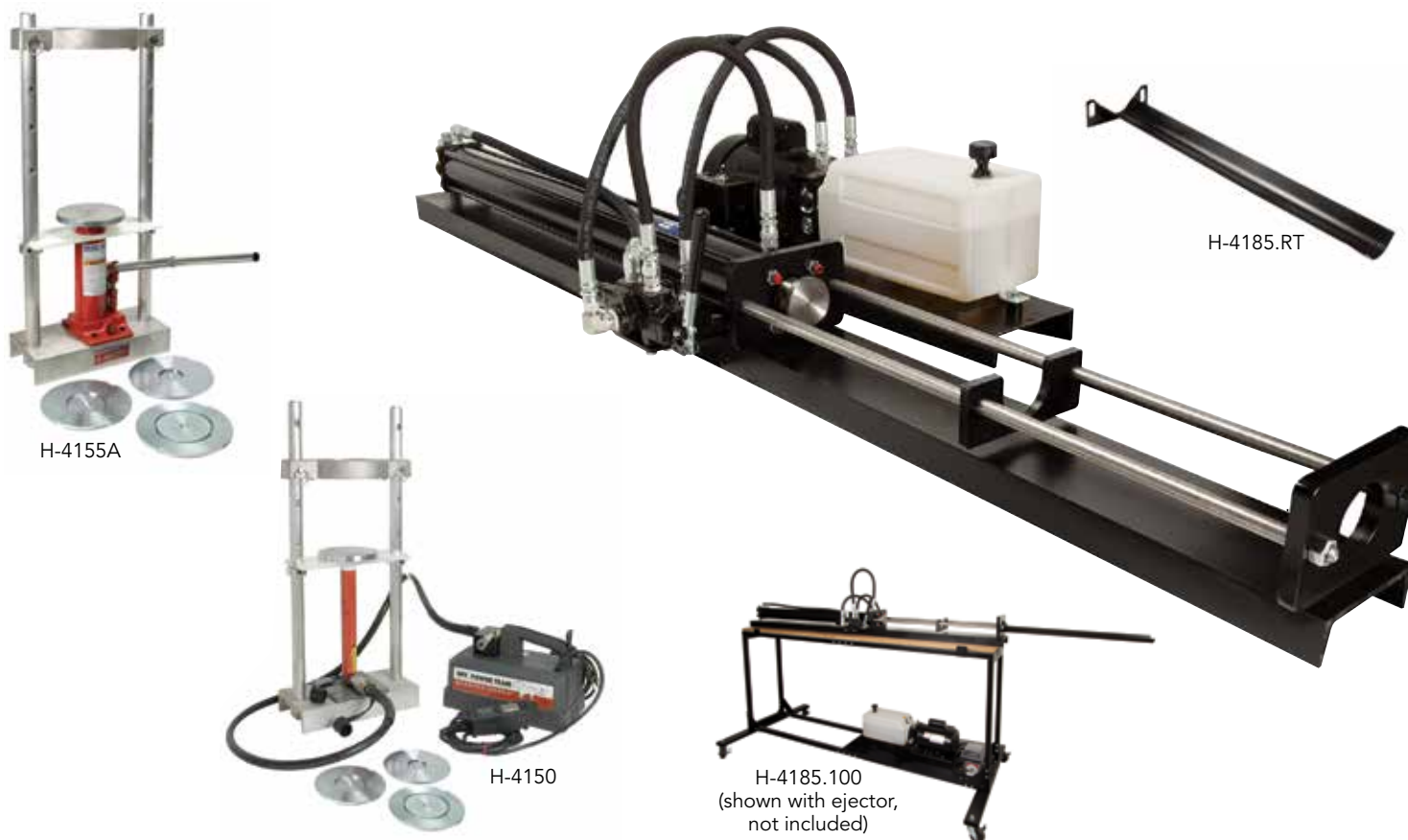
Base Dimensions of the 20 Qt. Mixer are: 21" x 21.5" x 41.25" (533 x 546 x 1048mm).

Bench Mixer, 12Qt, 120V 60Hz H-3842A**Bench Mixer, 12Qt, 230V 50/60Hz H-3842A.4F**

CE Shipping wt. 185 lbs (84kg)

Bench Mixer, 20Qt, 120V 60Hz H-3843A**Bench Mixer, 20Qt, 230V 50/60Hz H-3843A.4F**

CE Shipping wt. 230 lbs (104kg)



Sample Ejector, Hand-Operated

Designed for lab and field use to extract soil samples from 4" and 6" compaction molds, as well as 2" and 2.8" tube samples. The ejection force is generated by means of a 3-ton (27.7kN) capacity, hand-operated hydraulic jack. The cast-aluminum ejector head assembly can be positioned at different heights through the use of quick release pins. This enables the operator to easily match the ejection travel to the height of the mold being used. Piston stroke is 8" (235mm). Overall dimensions 13"W x 6"D x 27"H (330 x 152 x 686mm).

Sample Ejector, Hand-Operated **H-4155A**
 Shipping wt. 56 lbs (25.5kg)

Sample Ejector, Motorized

Designed for lab and field use to extract soil samples from 4" and 6" compaction molds, as well as 2" and 2.8" tube samples. This sample ejector features the use of a 5-ton capacity, motorized hydraulic pump and ram assembly. The unit incorporates extended upright rods in order to accommodate standard 4" and 6" compaction molds, as well as 2" and 2.8" sample tubes. Piston stroke is 9.25" (184mm). Overall dimensions, excluding pump, 13"W x 6"D x 29"H (330 x 152 x 737mm).

Sample Ejector, Motorized, 120V 60Hz **H-4150**
Sample Ejector, Motorized, 220V 50/60Hz **H-4150.4F**
 Shipping wt. 90 lbs (40kg)

Horizontal Sample Ejector

Hydraulically driven horizontal sample ejector designed for rapid ejection of 3" (76.2mm) x 30" (762mm) thin-wall sample tubes (Shelby tubes). The horizontal sample ejector provides a smooth and easily controlled piston stroke providing easy and rapid handling of ejected samples. The unit's hydraulic system accurately controls the horizontal piston's 5600lbf (24.9kN) force to eject samples smoothly. The ejector uses 1.7gpm hydraulic pump powered by a 1hp electric motor. Hydraulic oil reservoir provides 2.5gal (9.5L) capacity.

This ejector can also be used with 2 or 2.5" Shelby tube samples using the corresponding conversion kit, see chart below. The ejector comes with (1) sample trough to support ejected samples. Overall dimensions w/o sample trough are: 84" (2134mm) L x 23" (584mm) W x 18" (457mm) H.

Horizontal Sample Ejector, 120V 60Hz **H-4185**
Horizontal Sample Ejector, 220V 60Hz **H-4185.2F**
Horizontal Sample Ejector, 220V 50Hz **H-4185.5F**
 Shipping wt. 310 lbs (140kg)

Accessories for H-4185

| | |
|-------------------------------------|-----------|
| Sample Trough, Round Bottom | H-4185.RT |
| Conversion Kit for 2" Sample Tube | H-4185.2 |
| Conversion Kit for 2.5" Sample Tube | H-4185.3 |

Portable Stand for Horizontal Sample Ejector

Sturdy, mobile stand accommodates H-4185 horizontal sample ejector. Complete with shelf for pneumatic pump and reservoir. Large wheels provide easy maneuverability. Top allows sample ejector to be bolted to it for added stability. Requires longer hoses (included) to reach pump and reservoir. Some assembly required.

Portable Stand for Sample Ejector **H-4185.100**
 Shipping wt. 170 lbs (77kg)



H-4141



H-4225



H-4162



H-4161A



H-4151



H-4149



H-4159



H-4163



H-4142

Standard Proctor Compaction Mold, 4"

ASTM D558, D559, D560, D698, D1557, D1558, AASHTO T99, T134, T135, T136, T180, T220

Soil mold used where a compacted sample is required, such as standard proctor density/moisture tests. Mold volume is 1/30 ft³. Cold-rolled steel tubing, plated for rust resistance. Mold dimensions are 4" ID x 4.584" H with a 2" detachable collar. Includes detachable base plate, studs and wing nuts. **Compatible with H-4169 compactor.**

Standard Proctor Compaction Mold, 4" H-4141
Shipping wt. 14 lbs (6.3kg)

Standard Proctor Mold, Split Design, 4"

ASTM D558, D559, D560, D698, D1557, D1558, AASHTO T99, T134, T135, T136, T180, T220

Mold volume of 1/30 ft³. Cold-rolled steel tubing, plated for rust resistance. Includes detachable base plate, studs and wing nuts. Mold has vertical split in body with 2 quick-acting clamps for easy removal of specimen. Mold dimensions are 4" ID x 4.584" H with a 2" detachable collar. Includes detachable base plate, studs and wing nuts. **Compatible with H-4169 compactor.**

Standard Proctor Mold, Split-Design, 4" H-4225
Shipping wt. 13 lbs (5.9kg)

Modified Proctor Compaction Mold, 6"

ASTM D558, D559, D560, D698, D1557, D1558, AASHTO T99, T134, T135, T136, T180, T220

Soil mold used for modified proctor density/Moisture tests. Mold volume of 1/13.33 ft³. Cold-rolled steel tubing, plated for rust resistance. Mold dimensions are 6" ID x 4.584" H with a 2" detachable collar. Includes detachable base plate, studs and wing nuts. **Compatible with H-4169 compactor.**

Modified Proctor Compaction Mold, 6" H-4162
Shipping wt. 19 lbs (8.6kg)

Modified Proctor Mold, Split Design, 6"

ASTM D558, D559, D560, D698, D1557, D1558, AASHTO T99, T134, T135, T136, T180, T220

Mold volume of 1/13.33 ft³, cold-rolled steel tubing, plated for rust resistance. Includes detachable base plate, studs and wing nuts. Mold has vertical split in body with 2 quick-acting clamps for easy removal of specimen. Mold dimensions are 6" ID x 4.584" H with a 2" detachable collar. Includes detachable base plate, studs and wing nuts. **Compatible with H-4169 compactor.**

Modified Proctor Mold, Split Design, 6" H-4161A
Shipping wt. 18.3 lbs (8.3kg)

CBR Mold with Perforated Base, 6"

ASTM D1883; AASHTO T193

CBR mold with a volume of .1145 ft³. Cold-rolled steel tubing, plated for rust resistance. Collar extension and perforated base plate can be clamped on either end of cylinder. Mold dimensions are 6" ID x 7" H with a 2.5" detachable collar. Includes detachable base plate, studs and wing nuts. **Compatible with H-4169 compactor.**

CBR Mold with Perforated Base, 6" H-4151
Shipping wt. 23.2 lbs (10.5kg)

CBR Mold with Solid Base, 6"

ASTM D1883; AASHTO T193

CBR mold with a volume of .1145 ft³. Cold-rolled steel tubing, plated for rust resistance. Collar extension and solid base plate can be clamped on either end of cylinder. Mold dimensions are 6" ID x 7" H with a 2" detachable collar. Includes detachable base plate, studs and wing nuts. **Compatible with H-4169 compactor.**

CBR Mold with Solid Base, 6" H-4149
Shipping wt. 22 lbs (10kg)

Compaction Mold, 6"

ASTM D1883; AASHTO T193

Compaction mold with a volume of 1/10th ft³. Cold-rolled steel tubing, plated for rust resistance. Mold dimensions are 6" ID x 6.1" H with a 2.5" detachable collar. Includes detachable base plate (8" x 8" x 0.5" thick), studs and wing nuts. **Compatible with H-4169 compactor.**

Compaction Mold, 6" H-4159
Shipping wt. 21 lbs (9.5kg)

LBR Mold, 6"

FM 1-T 180, FM 5-515

Compaction mold with a volume of 1/13.33 ft³, cold-rolled steel tubing, plated for rust resistance. Mold dimensions are 6" ID x 6.1" H with a 2.5" detachable collar. Collar extension and perforated base plate can be clamped on either end of cylinder. **Compatible with H-4169 Compactor.** LBR test requires H-4147 spacer disc, sold separately, see next page.

LBR Mold, 6" H-4163
Shipping wt. 22 lbs (10kg)

Compaction Split Mold, 2.8"

Compaction mold with a volume of .0214 ft³. Cold-rolled steel tubing, plated for rust resistance. Mold dimensions are 2.8" ID x 4" H with a 2" detachable collar. Mold has vertical-split body with 2 quick-acting clamps for easy removal of specimen. Not compatible with H-4169 compactor.

Compaction Split Mold, 2.8" H-4142
Shipping wt. 7.8 lbs (3.5kg)

Compaction Mold, California 216

CA Method 216B

Compaction mold 6" ID x 2.875" H with a 2.5" detachable collar. For use with H-4169.CA Compactor.

Compaction Mold, 6" H-4169.4CA
Shipping wt. 21 lbs (9.5kg)

**Cutting Edge**

Machined from seamless tubing with a sharpened edge to enable undisturbed samples to be taken in the field. Cutting edge is plated for rust resistance and has a 6" (152mm) ID and 2" (51mm) high. Recess in upper section allows edge to be mounted at either end of a H-4149 or H-4151 mold to facilitate sample removal in the field.

Cutting Edge**H-4174**

Ship wt. 2 lbs. (0.9kg)

Swell Plate

Perforated 5.875" (149mm) dia. base with adjustable stem. Contact end of the stem is easily locked in place with a knurled nut.

Swell Plate**H-4172**

Ship wt. 5 lbs. (2.3kg)

Swell Tripod Attachment

Metal Tripod supports dial gauge for measuring the amount of swell during soaking. Attachment is used with H-4172 swell plate. Order dial indicator separately.

Swell Tripod Attachment**H-4158**

Ship wt. 0.8 lbs. (0.3kg)

Dial Indicator

Dial indicator has 1.000" operating range, graduated in 0.001" divisions, clockwise movement and revolution counter. Recommended for use with H-4158 tripod attachment. Metric version, H-4465.25 is 25mm x 0.01mm.

Dial Indicator**H-4158.1****Dial Indicator, Metric****H-4465.25**

Ship wt. 1.3 lbs. (0.5kg)

Surcharge Weight, 5 lb.

Used in the application of surcharged loads on the soil's surface during soaking and penetration. Rust-resistant, plated annular disk weighs 5 lbs. (2.3kg), 5.875" (149mm) OD with a 2.125" (54mm) ID hole in center.

5 lb. Surcharge Weight**H-4175**

Ship wt. 5.7 lbs. (2.5kg)

Surcharge Weight, 10 lb.

10 lb. (4.5kg) Field surcharge weight, made in two parts; 5.875" (149mm) OD; 2.125" (54mm) ID.

10 lb. Surcharge Weight**H-4177**

Ship wt. 12 lbs. (5kg)

Slotted Surcharge Weight, 5 lb.

Used in the application of surcharged loads on the soil's surface during soaking and penetration. Rust-resistant, plated annular disk weighs 5 lbs. (2.3kg), 5.875" (149mm) OD with a 2.125" (54mm) slot.

5 lb. Slotted Surcharge Weight**H-4176**

Ship wt. 6 lbs. (3kg)

Slotted Surcharge Weight, 10 lb.

10 lb. (4.5kg) slotted, field surcharge weight, 8.5" (216mm) dia.

Slotted Surcharge Weight, 10 lb.**H-4179**

Ship wt. 11 lbs. (5kg)

Spacer Disk

Disk is used as a false bottom in a soil mold during the compaction process. Plated, rust-resistant steel disk is 2.416" (36mm) high, 5-15/16" (152mm) dia.

Spacer Disk**H-4153**

Ship wt. 20 lbs. (9kg)

Spacer Disk LBR 6"

For use with the H-4163 LBR mold. Compatible with H-4169 Compactor. Disk is used as a false bottom in a soil mold during the compaction process. Plated, rust-resistant steel disk is 1.416" (36mm) high, 5-15/16" (152mm) dia.

Spacer Disc. LBR**H-4147**

Ship wt. 12.2 lbs. (5.5kg)

Filter Paper

100 pack of coarse grade filter paper used to separate spacer disc and soil in the CBR mold during compaction operation, or over the top surface of the soil when the compaction operation is completed.

Filter Paper**H-4154FP**

Ship wt. 0.3 lbs. (0.13kg)

Filter Screen

100 mesh stainless screen is 5-15/16" (152mm) dia.

Filter Screen**H-4154**

Ship wt. 0.1 lbs. (0.04kg)

Dial Indicator Bracket

Bracket used to attach a dial indicator to the penetration piston.

Dial Indicator Bracket**H-4178BR**

Ship wt. 0.8 lbs. (0.36kg)

Penetration Piston

CBR penetration piston has 3 sq. in. (19.35cm²) base area and is about 7.5" (191mm) long. Designed for use in conjunction with weights H-4175 and H-4176 to apply penetration surcharge loads.

Penetration Piston**H-4178**

Ship wt. 7 lbs. (3kg)



H-4169



H-4169.100-B



H-4169.2415



H-4169.2416

**NOTES**

For Compaction Molds,
see page 83.

Mechanical Compactor, Automatic

ASTM D558, D559, D560, D698, D1557; AASHTO T99, T134, T135, T180

The mechanical compactor automatically compacts and rotates mold after each blow while keeping track of the number of hammer blows and shutting off once a preset number of blows is reached. The start/stop function of the compactor is independent of the counter. The unit can be used to perform standard or modified compaction tests using a 5.5 lb. (2.5kg) hammer with 12" (305mm) height of drop or a 10 lb. (4.5kg) hammer with 18" (457mm) drop. Hammer lift compensates the height of the drop for soil thickness in the mold during compaction. Hammer weight is concentrated at the foot, allowing free fall of the hammer. Hammer changes are made from in front of the compactor, making maintenance/adjustments easier without moving machine away from mounted location.

Included with the compactor are: (1) 5.5 lb (2.5kg) hammer; (1) 10 lb. (4.5kg) pie-shaped hammer; (1) hammer surcharge weight to convert hammers to 10lb (4.5kg); (1) hammer safety device; (1) 4" (102mm) mold, and (1) 6" (152mm) mold. Overall dimensions: 56"H x 16.5"W x 30"D (1422 x 419 x 762mm). Max. height in operation: 66" (1677mm).

Mechanical Compactor, 120V 60Hz H-4169

Mechanical Compactor, 230V 50/60Hz H-4169.4F



Shipping wt. 387 lbs (175kg)

Mechanical Compactor Safety Cage

Cage provides protection from moving parts during compaction. Cage is hinged to allow access to mold and hammer.

Mechanical Compactor Safety Cage H-4169.100-B



Shipping wt. 8 lbs (3.6kg)

California Mechanical Auto Compactor

Model complies with California method 216 and is supplied with a 2" round 10 lb hammer and corresponding piston and rod. Required split mold is available upon request. Use with H-4169.4CA Mold.

California Mechanical Auto Compactor H-4169.CA



Shipping wt. 432 lbs (195kg)

Calibration Kit for Mechanical Compactor

ASTM D2168

For use with H-4169 automatic mechanical compactor. Calibration kit includes lead deformation apparatus, micrometer and 50 lead calibration cylinders.

Calibration Kit for Mechanical Compactor H-4169CK



Shipping wt. 4.9 lbs (2.2kg)

Replacement Hammers

| | |
|--------------------------|-------------|
| 4" Round, New Style* | H-4169.2415 |
| 6" Pie-Shape, New Style* | H-4169.2416 |
| 4" Round, Old Style* | H-4169.415 |
| 6" Pie-Shape, Old Style* | H-4169.416 |

*Hammers do not include weights. New Style Hammers are only threaded in the middle of the shaft. Old Style Hammers are threaded almost to the end of the shaft.

**NOTES**

Replacement parts are available.
Please inquire and include Unit Serial
Number.

Compaction Hammer, Standard, Manual

ASTM D558, D698; AASHTO T99

Manual, moisture/density hammer meets ASTM and AASHTO specs. It incorporates a 5.5 lb (2.54kg) weight and a drop of 12" (305mm) with a 2" (51) face. Guide sleeve has four vent holes in each end of sleeve to release built-up air pressure. Machined steel, plated for rust resistance. Features resilient rubber ball handle.

Standard Compaction Hammer, Manual H-4160B



Shipping wt. 9.2 lbs (4.2kg)

Compaction Hammer, Modified, Manual, AASHTO

AASHTO T180

Manual, moisture/density hammer meets AASHTO specs. It incorporates a 10 lb (4.5kg) weight and a drop of 18" (457mm) with a 2" (51) face. Guide sleeve has four vent holes in each end of sleeve to release built-up air pressure. Machined steel, plated for rust resistance. Features resilient rubber ball handle.

Compaction Hammer, Modified H-4170B



Shipping wt. 15 lbs (7kg)

Compaction Hammer, Manual, Corps of Engineers

EM1110-1-1804

Hammer incorporates a 5.5 lb (2.54kg) weight and a drop of 12" (305mm) with a 2" (51) face. Hammer is guided on shaft. Length of drop is slightly adjustable. Foot assembly has recoil mechanism to reduce impact fatigue on parts. Tamping face is removable and replaceable.

Compaction Hammer, Manual, COE H-4173



Shipping wt. 11 lbs (4.9kg)

Compaction Hammer, 10lb, COE

Manual, moisture/density hammer, which incorporates a 10 lb (4.5kg) weight and a drop of 12" (305mm) with a 2" (51) face.

Compaction Hammer, 10lb, COE H-4171



Shipping wt. 18 lbs (8.3kg)



Relative Density Apparatus

ASTM D4253, D4254

Apparatus determines the relative density of cohesion-less, free-draining soils and provides well-defined results on soils that do not respond well to conventional moisture-density impact compaction testing. Soils for which this method is appropriate may contain up to 12 percent of soil particles passing a No. 200 (75µm) sieve, depending on the distribution of particle sizes, which causes them to have free-draining characteristics. Relative density of cohesion less soils uses vibratory compaction to obtain maximum density and pouring to obtain minimum density. Complete set includes: vibrating table H-3756.2F, relative density mold sets H-3757 and H-3758 and relative density gauge set H-3759. Both models are 12 amps 1ph AC.

Relative Density Apparatus, 230V 60Hz H-3750.2F
Relative Density Apparatus, 230V 50Hz H-3750.5F
Shipping wt. 925 lbs (420kg)

Vibrating Table with Controller

Vibrating table for use with the relative density mold sets or other processes requiring vibratory compaction. Table is 30" x 30" (762 x 762mm), and vibration is provided by an electromagnetic vibrator rated above 100lbs (45.5kg). Capacity for table is 750 lbs (341kg) and height is 21" (533mm).

Vibrating Table/Controller, 230V 60Hz H-3756.2F
Vibrating Table/Controller, 230V 50Hz H-3756.5F
Shipping wt. 605 lbs (275kg)

Relative Density Mold Set, 0.1 ft³

0.1 cu. ft. capacity mold set for use with relative density apparatus. Mold set comes with detachable guide sleeve and clamp assembly. Includes surcharge base plate with removable handle and surcharge weight with handle. Mold is 6" (152.4mm) ID x 6.112" (155.2mm) H.

Relative Density Mold Set, 0.1 ft³ H-3757
Shipping wt. 103 lbs (46kg)

Relative Density Mold Set, 0.5 ft³

0.5 cu. ft. capacity mold set for use with relative density apparatus. Mold set comes with detachable guide sleeve and clamp assembly. Includes surcharge base plate with removable handle and surcharge weight with handle. Mold is 11" (279.4mm) ID x 9.092" (230.9mm) H.

Relative Density Mold Set, 0.5 ft³ H-3758
Shipping wt. 280 lbs (127kg)

Pouring Funnel Set

Used for filling loose .375" (9.5mm) or finer soils into relative density mold. Includes two 6" (152mm) dia. x 12" (305mm) long metal cylinders, each with a integral funnel at the end. Orifices are 1" (25.4mm and 0.5" (12.7mm).

Pouring Funnel Set H-3750FS
Shipping wt. 25 lbs (11kg)

Gauge Set, Relative Density

Gauge set for use with relative density molds. Designed to fit guide brackets of either the H-3757 or H-3758 mold sets. Set includes a 2" (50.8mm) dia., 2.0 x 0.001" mechanical dial gauge. A metal, 3 x 12 x .125" (76 x 305 x 3.2mm), calibration bar is also included.

Gauge Set, Relative Density H-3759
Shipping wt. 8 lbs (4kg)

Vibration Indicator, Tachometer Type

Precision, pen-sized tachometer provides accurate readings even on hard-to-reach equipment. Scale gives readings from 2,000 to 21,000.

Vibration Indicator, Tachometer Type H-3753
Shipping wt. 0.5 lbs (0.2kg)

Vibration Compaction Frame and Hammer Set

ASTM D7382-08

Vibration compaction set used to compact soil samples for use in tests referencing ASTM D7382-08 methods. This method refers to the determination of the maximum dry unit weight and water content range for the effective compaction of granular soils using a vibrating hammer. The test set includes a heavy-duty frame designed specifically

for easily mounting a vibration hammer. A vibration hammer, which includes a 5.75" tamper and a 12" long mounting shank. The set also includes an 11" split, compaction mold. The vibrating hammer test method may be performed in the field or in the laboratory.

Vibration Compaction Frame/Hammer Set H-4115
Shipping wt. 368 lbs (167kg)

Compaction Frame Only

Mounting frame for compaction hammer set up. Does not include hammer or mold.

Compaction Frame H-4115.2
Shipping wt. 269 lbs (122kg)

Vibration Compaction Hammer with Tamper

ASTM D7382-08

Includes hammer, 5.75" (146mm) Tamper and 12" (305mm) long mounting shank.

Compaction Hammer with Tamper H-4115.3
Shipping wt. 35 lbs (15.8kg)

Compaction Molds

ASTM D7382-08

Split compaction molds for use with vibration compaction mold set.

11-Inch Compaction Mold H-4115.4
6-Inch Compaction Mold H-4161A
Shipping wt. 60 lbs (27kg)

Tamper for Compaction Hammer

ASTM D7382-08

Replacement tamper and foot for compaction hammer.

Tamper and Foot H-4115.5
Shipping wt. 14 lbs (6kg)



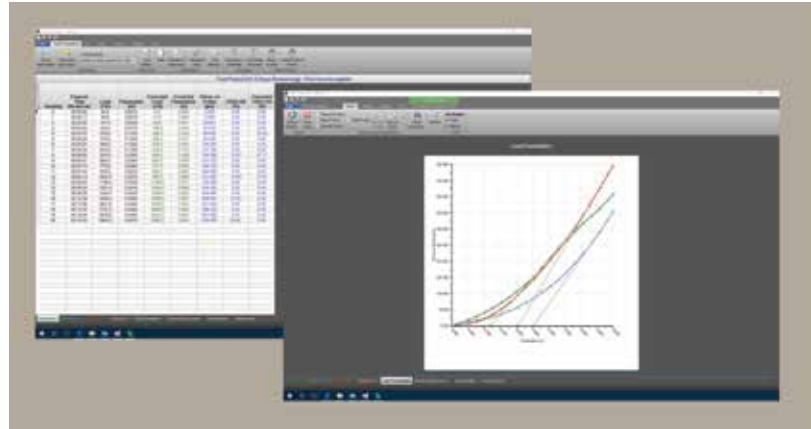
Typical CBR/LBR Setup for HM-5030.3F

| Part # | Description |
|-------------|--|
| HM-2300.100 | (1) S-type load cell, 10,000lbf (50kN) |
| HM-2310.10 | (1) Strain Transducer, 1" (25mm) |
| H-4178 | (1) Penetration piston with stud |
| HM-4178BRT | (1) Displacement transducer bracket |
| HM-5001SW | (1) CBR/LBR reporting software |

Shown with H-4151 CBR Mold.

**NOTES**

HM-5030.3F Load Frame is sold as a load frame only. (Shown with typical CBR setup). For more information on the HM-5030 Master Loader, See pages 126-129.



The California Bearing Ratio (CBR) test was developed by The California state highway department and is widely used to determine the resistance strength of sub-grade and sub-base materials. The test is basically a simple penetration test using a load frame and a standard, compacted CBR test mold of the material to be tested. The results of the test are then compared and evaluated to known standards already established for the material being tested.

LBR or lime-rock bearing ratio is a variation of the CBR test. Developed primarily in Florida, it is used on materials with a high lime content. Humboldt offers several CBR/LBR testing solutions based on your overall testing needs and budget, from the advanced HM-5030.3F load frame with computer interface using our NEXT software to a simple, hand-operated H-4156 load frame suitable for lab or field use.

Humboldt MasterLoader CBR/LBR Solution

ASTM D1883; AASHTO T193; BS 1377 Part 4

Designed for applications requiring multi-purpose loading systems, such as road construction projects in either mobile or fixed labs, educational institutions and consulting firms, the HM-5030 Master Loader is ideal for just about any application from road construction to high-volume commercial and educational laboratories.

While the HM-5030 has been specifically designed for soil testing labs conducting multiple testing operations including: UU, CU and CD triaxial, UC, CBR and LBR, it is also perfect for running Marshall, Hveem, TSR and SCB asphalt tests as well. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5030 to perform any tests required up to its load capacity of 11000 lbf (50kN).

Like all Elite Series load frames, the HM-5030 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

MasterLoader, 110/220V 50/60 Hz HM-5030.3F

Shipping wt. 300 lbs (136kg)

NEXT CBR/LBR Software Module

ASTM D1883; AASHTO T193; BS 1377 Part 4

Humboldt's NEXT software is used to control the operation of Humboldt's testing machines, as well as provide data acquisition and reporting of test data. The software provides a computer-based platform with the ability to configure testing machines and the testing process; specify testing parameters and limits, operate the machine during the testing and provide detailed reports of the data collected in tabular or graphical formats.

From controlling a single operation to a complete geotechnical lab, Humboldt's NEXT data acquisition software, in conjunction with compatible Humboldt testing equipment, provides a complete solution for the acquisition, recording and presentation of test data. NEXT software is included with many of Humboldt's load frames, consolidation and direct shear machines; providing robust machine control, data acquisition and report generation for those using a computer to control load frame operations.

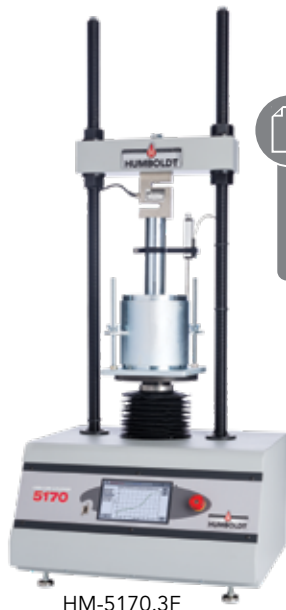
- Test-specific setup, which guides you through the process and includes selecting data collection parameters that best fit the specific test
- Input specific project information for each test, such as project name, client information, etc
- All test-specific initial, intermediate, and final parameters required by ASTM and BS standards are dynamically calculated for you, based on your input of specimen information, such as size, weight, etc
- Tabulated test data, graphs and all test-specific calculations are provided in real time, allowing you to monitor tests in process
- Generate test-specific reports that include all graphs and data presented in a project

NEXT CBR/LBR Software Module HM-5001SW[Download](#)**NOTES**

For more information on Humboldt's NEXT Software. See pages 108-109.



HM-5150.3F



HM-5170.3F



NOTES

HM-5150.3F and HM-5170.3F Load Frames are sold as load frames only. (shown with typical CBR setup.)



NOTES

HM-2850.3F Load Frame is sold as a load frame only. See page 89 for a typical HM-2850/3F CBR setup.



HM-2850.3F

CBR/LBR Specific Automatic Load Frame

ASTM D1883; AASHTO T193; BS 1377 Part 4

Humboldt provides these two Elite Series Load Frames for doing CBR and LBR applications. **The two machines are identical except that the HM-5170 can also do Marshall and TSR tests for those also doing asphalt testing.**

The HM-5150 and HM-5170 Load Frames have been specifically designed to handle CBR and LBR applications. Their heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service. From educational institutions and consulting firms to high-volume commercial labs and construction projects, the Load Frames can perform these applications with ease.

Like all Elite Series Load Frames, the HM-5150 and HM-5170 are built around Humboldt's integral, data logger with touch-screen control, which allows the load frames to be used as standalone devices capable of full test control and data logging, as well as controlled from a network computer.

Standalone Control

The waterproof, touch screens featured on these load frames provide a colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine during the testing procedure. Test data can then be transferred to a computer for use with Humboldt's NEXT Software for report generation.

Computer Control

Humboldt's Next software is included with the all Elite Series Load Frames. This software provides robust machine control, data acquisition and report generation for those using a computer to control testing operations.

In addition, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, while also providing report generating capabilities using NEXT software and the test-specific software modules.

A CBR-specific software module is available for use with the NEXT software, which provides CBR-specific setup and formatting, rather than the generic formatting provided with the basic NEXT software.

HM-5150 and HM-5170 Specifications

| | |
|--------------------|--|
| Load Capacity | 11000 lbf (50kN) |
| Speed Range | Both Machines: 0.05 in/min (1.27mm/min) and 1.00 mm/min HM-5170.3F ALSO: 2 in/min. (50.8mm/min.) |
| Data Channels | 2 |
| Data Storage | 1000 tests and up to 3000 readings per test |
| Platen Size Travel | 8" (203mm) / 4" (100mm) |
| Clearance | 27" (686mm) Vertical 11" (279mm) Horizontal |

CBR, LBR Load Frame, 110/220V 50/60 Hz HM-5150.3F

Shipping wt. 300 lb (136kg)

CBR, LBR, and Asphalt tests Load Frame 110/220V 50/60 Hz

HM-5170.3F

Shipping wt. 300 lbs (136kg)

CBR/LBR Setup: HM-5150.3F and HM-5170.3F

| Part # | Description |
|-------------|--|
| HM-2300.100 | (1) S-type load cell, 11,000lbf (50kN) |
| HM-2305.10 | (1) Strain Transducer, 1" (25mm) |
| H-4178 | (1) Penetration piston with stud |
| HM-2305BRT | (1) Displacement transducer bracket |
| HM-5001SW | (1) NEXT CBR/LBR software module |

Multi-Speed Load Frame

ASTM: D1883, D2850, D2166, D4767, D5581 and D6927 AASHTO: T193, T296, T297, T208, T245, and T246; BS 1377: Part 4: 1990, BS 1377: Part 7: 1990, BS 1377: Part 8: 1990, BS 598: Part 107

The HM-2850 Multi-speed Load Frame is designed for those who want a high-quality, but simple, multi-purpose load frame without built-in data acquisition capabilities. The HM-2850 is ideal for applications where the operator is either not concerned with data acquisition; or, already has or is planning to construct their own data acquisition system. With its large 7" color, touchscreen, the HM-2850 provides the operator with the ability to precisely select any speed with five decimal accuracy within the machine's speed range.

The HM-2850 features a quiet, direct drive, stepper motor that provides a range of loading speeds from 0.00001 to 2.00000 (0.00001 to 50.80000 mm/min). This speed range is more than adequate for the majority of standard soil tests. The HM-2850 can also be used for asphalt Marshall and TSR testing and features a rapid travel speed of 2/25 in/min. for moving the platen into position quickly.

HM-2850.3F Specifications

| | |
|----------------------|---|
| Load Capacity | 11000 lbf (50kN) |
| Speed Range | 0.05 to 2.00000 inch/min .00000-50.800000 mm/min |
| Platen Size [Travel] | 8" (203mm) [4" (100mm)] |
| Clearance | 32" (812mm) Vertical 11" (279mm) Horizontal |
| Current | 9 Amps @ 125V (4.5 @250V) |
| Dimensions | 17 x 22 x 51" (432 x 559 x 1295mm) |

Multi-Speed Load Frame, 110/220V 50/60 Hz HM-2850.3F

Shipping wt. 258 lbs (117kg)





H-4156MA



H-4156



H-4152

Typical CBR Setup for HM-2850.3F (page 88)

| Part # | Description |
|------------|----------------------------------|
| H-4454.100 | (1) Load ring, 11,000lbf (50kN) |
| H-4158.1 | (1) Dial gauge 1.000" x .001" |
| H-4178 | (1) Penetration piston with stud |
| H-4178BR | (1) Dial indicator bracket |


CBR/LBR Specific Load Frame

ASTM D1883; AASHTO T193; BS 1377 Part 4

The H-4156MA load frame has been designed as a low-cost solution to doing CBR testing. It features one-speed operation with a preset speed specifically for CBR tests. The CBR speed is set at 0.050 inches/minute (1.27 mm/minute), ASTM D1883. Maximum piston travel is 3.5" (88mm). The H-4156MA is sold as a set with items in the chart below. Overall dimensions are: 18" x 18" x 38.5" H (457 x 457 x 978mm).

CBR Setup included with H-4156MA

| Part # | Description |
|------------|----------------------------------|
| H-4156MA | (1) CBR-specific load frame |
| H-4454.100 | (1) Load ring, 10,000lbf (50kN) |
| H-4158.1 | (1) Dial gauge 1.000" x .001" |
| H-4178 | (1) Penetration piston with stud |
| H-4178BR | (1) Dial indicator bracket |

CBR/LBR Load Frame, 120V 60 Hz H-4156MA
 CBR/LBR Load Frame, 220V 50/60 Hz H-4156MA.4F
 Ship wt. 265lbs. (120kg)

CBR Mechanical Loading Press

ASTM D1883; AASHTO T193

The H-4156 loading press (load frame) uses a two-position mechanical jack to provide steady test speeds, as well as rapid travel of the platen for positioning of the sample. Overall dimensions: 18" x 12" x 34" (45.8 x 30.5 x 86.4cm). The following items in the chart below are included for testing CBR.

CBR Setup included with H-4156

| Part # | Description |
|------------|----------------------------------|
| H-4156 | (1) CBR-specific load frame |
| H-4454.100 | (1) Load ring, 10,000lbf (50kN) |
| H-4158.1 | (1) Dial gauge 1.000" x .001" |
| H-4178 | (1) Penetration piston with stud |
| H-4178BR | (1) Dial indicator bracket |

CBR Mechanical Loading Press

H-4156



Ship wt. 132lbs. (60kg)

Mechanical, Two-Speed Loading Jack

Mechanical, two-speed loading jack used in the H-4156 and H-4156M loading presses.

Mechanical, Two-Speed Loading Jack

H-4156J



Ship wt. 42lbs. (19kg)

CBR Mechanical Test Set

ASTM D1883; AASHTO T193

Complete mechanical test set used for CBR testing. Includes a complete complement of test equipment for performing CBR testing. The test set features the H-4156 loading press (load frame), which uses a two-position mechanical jack to provide steady test speeds, as well as rapid travel of the platen for positioning of the sample. The press, includes a H-4454.100, 11,000lbf (48.8kN) calibrated load ring, a H-4178, 1.95" (49.5mm) dia. (3 in² area) penetration piston, a H-4158.1, 1.000" x .001, dial indicator and a H-4178BR dial indicator bracket, Overall dimensions: 18" x 12" x 34" (45.8 x 30.5 x 86.4cm). The CBR test set includes:

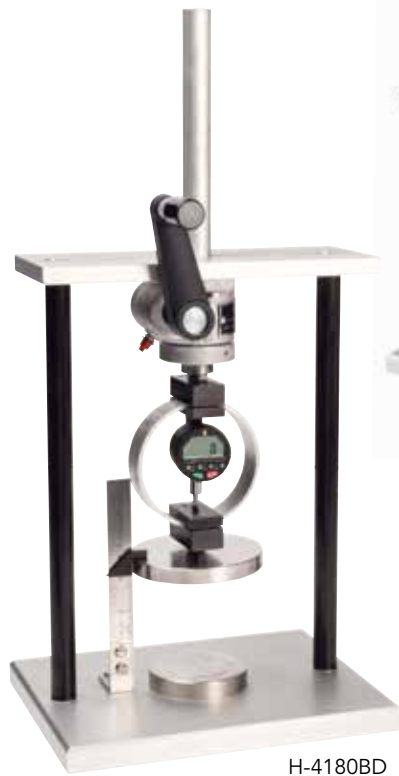
| Part # | Description |
|-----------|-------------------------------|
| H-4156 | (1) Mechanical loading press |
| H-4151 | (4) Mold |
| H-4153 | (1) Spacer disk |
| H-4154 | (4) Filter screens |
| H-4172 | (2) Swell plates |
| H-4158 | (1) Tripod attachment |
| H-4175 | (4) Surcharge weights |
| H-4176 | (4) Slotted surcharge weights |
| H-4170B | (1) Proctor Hammer, AASHTO |
| H-4144.12 | (1) Straight edge, 12-inch |
| H-4174 | (1) Cutting edge |

CBR Mechanical Test Set

H-4152



Ship wt. 379lbs. (172kg)



Unconfined Soil Testers

ASTM D2166

These Unconfined soil testers with digital gauges allow for quick and accurate determination of unconfined compressive strength of cohesive soils in the field or lab. The digital H-4180BD Tester is designed to be a replacement for the now defunct "Rimac" tester. They can be used for on-site pile tonnage or foundation bearing capacity estimates. The light and compact design of these testers provide great portability for everyday field use. These digital models feature a quality digital indicator, which provides readings to 1.0lb precision. The load ring readout of the H-4180AD and H-4180BD provides fast and easy-to-read direct load values in pounds. The "vertical daylight" of the H-4180BD is 5.125", the other two models this is 6.375". Total gearbox travel for all models is 5". All of these testers are sturdily made of light and durable aluminum and feature a geared, hand-wheel loading system. All include a load ring and platen. The H-4180BD and H-4180AD feature an adjustable height scale. The H-4180DD features a dial indicator to determine vertical travel. This dial gauge is supplied with a calibration chart for precise measurement readings.

Digital Unconfined Soil Tester, 300lb (1.33kN) H-4180BD

Unconfined Soil Tester, 500lb (2.22kN) H-4180AD

Unconfined Soil Tester, 1000lb (4.45kN) H-4180DD

Shipping wt. 18 lbs (8.2kg)

Unconfined Soil Sample Trimmer

Used to cut soil samples to length for use with Unconfined Soil Testers.

Unconfined Soil Sample Trimmer

HM-4144

Shipping wt. 6.1 lbs (2.7kg)

Preparation Knife

Used for sample preparation and general lab work, knife has 6" long thin blade with wood handle.

Preparation Knife

H-4973

Shipping wt. 6.1 lbs (2.7kg)

Calcium Carbonate Content Chamber

This test method covers the quantitative determination of the calcium carbonate (CaCO_3) content of soils. It is a gasometric method that utilizes a simple portable apparatus. The test method is quickly performed for soils containing calcium carbonate. The acrylic chamber is 2.5" ID x 5.5" long and sealed with anodized end caps. The unit comes complete with 10psi test gauge, bleed valve and a 20ml cup with handle.

Calcium Carbonate Content Chamber

HM-4501

Shipping wt. 6.1 lbs (2.7kg)

Harvard Miniature Compaction Apparatus

Used for moisture density tests using small samples, its compaction action duplicates the kneading action of a sheep's foot roller. Mold is 1.2625" (33mm) ID by 2.816" (71mm) H. Unit is designed so collar remover and specimen ejector are consolidated into one piece. Set includes specimen ejector, collar remover with spacer plate, mold holder, 1/454 ft³ (129m³) volume mold and collar, compaction tamper with 20 lb. (9.07kg), 37.5 lb. (17kg), and 40 lb. (18.2kg) spring and operating instructions. Mold is machined from seamless tubing. Unit weight in pounds per ft³ m³ and the net weight of a compacted specimen in grams are figuratively equal.

H-4165 Individual Components

| | |
|------------------|------------|
| Mold assembly | H-4165.15 |
| Tamper assembly | H-4165.16 |
| Spring, 20 lb. | H-4165.20 |
| Spring, 37.5 lb. | H-4165.375 |
| Spring, 40 lb. | H-4165.40 |

Harvard Miniature Compaction Apparatus H-4165

Shipping wt. 28 lbs (12.6kg)

Test Set
H-4234Test Set
H-4235

H-4230



H-4228



H-4226

Atterberg Limits (Liquid Limit Testing)

Liquid limit testing determines the water content at which soil changes from a liquid to a plastic state. It is determined using the devices on this page. To perform, a soil sample is placed into the cup of the liquid limit machine and separated into two halves using a grooving tool. The crank on the machine is then rotated so that the cup holding the sample strikes the base of the test machine. The number of blows is recorded until the two halves flow together and close the groove.

ASTM Liquid Limit Test Set

ASTM D4318; AASHTO T89, T90

Recommended for performing liquid limit test in accordance with ASTM specifications. Includes 1 ea. of: H-4230 ASTM liquid limit machine, H-4930.250 mixing dish, H-4904 spatula, H-4915.025 graduated cylinder and a H-1350.3A 48 sample cans pack.

ASTM Liquid Limit Test Set **H-4234**
Shipping wt. 11 lbs (5kg)

ASTM Liquid Limit Test Set with Counter

ASTM D4318; AASHTO T89, T90

Same set as above except it has machine with counter. Includes 1 ea. of: H-4228 ASTM liquid limit machine, H-4930.250 mixing dish, H-4904 spatula, H-4915.025 graduated cylinder and a H-1350.3A 48 sample cans pack.

ASTM Liquid Limit Test Set w/ Counter **H-4235**
Shipping wt. 15 lbs (7kg)

ASTM Liquid Limit Machine

ASTM D4318; AASHTO T89, T90

Unit consists of brass cup, cam mechanism, carriage and crank mounted on a hard rubber base. Includes H-4229 ASTM grooving tool and gauge block. Crank can be shifted to right- or left-hand operation.

ASTM Liquid Limit Machine **H-4230**
Shipping wt. 5.5 lbs (2.5kg)

ASTM Liquid Limit Machine with Counter

ASTM D4318; AASHTO T89, T90

Hand-operated liquid limit machine features mechanical revolution counter attached to the shaft to register the number of drops in the liquid limit cup. Includes H-4229 ASTM grooving tool and gauge block. Crank can be shifted for left or right-hand operation.

ASTM Liquid Limit Machine with Counter **H-4228**
Shipping wt. 6 lbs (2.7kg)

ASTM Liquid Limit Machine, Motorized

ASTM D4318; AASHTO T89, T90

Motorized liquid limit machine gives uniform testing with greater degree of accuracy. Unit is comprised of H-4230 ASTM liquid limit machine with geared motor to give proper operating speed and automatic counter. Machine is attached to metal plate with rubber feet. Includes H-4229 ASTM grooving tool and gauge block.

Liquid Limit Machine, 120V 60Hz **H-4226**
Liquid Limit Machine, 220V 50Hz **H-4226.5F**
Shipping wt. 14 lbs (6.4kg)

**ACCESSORIES**

For Liquid Limit Accessories
and Replacement Parts,
please see page 93.



H-5236



H-5237



H-4236



H-4237

Cone Penetrometer (Liquid Limit Testing)

The cone penetrometer test method for liquid limit is based on the relationship between the moisture content and the penetration of a cone into a soil sample. This method eliminates test results dependent upon operator skills and provides a visual measurement of penetration. Two cone penetrometer models are available. One, a manual operation model, and the other an automatic model, which releases the cone for a set amount of time and then locks the movement of the cone, registering the result.

Cone Penetrometer, Digital

BS 1337-2, NF P94-052,1; CEN ISO/TS 17892

The H-5236 digital cone penetrometer features an aluminum base with leveling screws and a spirit level for maintaining a level testing position. The digital readout provides readings in 0.1mm resolution in either mm or inches. The chromed support rod features micro-metric vertical displacement for accurate positioning with a brass slider that provides smooth free fall, a stop and release button and an automatic zero set. Includes a stainless steel penetration test cone: 35mm long with a 30° angle, weighing 20g. Two brass cups are included (55 x 35mm and 70 x 45mm). This cone penetrometer can also be used to measure the shear undrained strength of undisturbed and reconstituted soil samples per CEN ISO/TS 17892-06. Overall dimensions are: 8.6" x 6.7" x 16.1" (220 x 170 x 410mm).

Cone Penetrometer, Digital H-5236

Shipping wt. 19 lbs (8.6kg)

Cone Penetrometer, Digital, Semi-Automatic

BS 1337-2, NF P94-052,1; CEN ISO/TS 17892

The H-5237 semi-automatic cone penetrometer is equipped with a magnetic controller device with an electronic, digital, programmable timer that automatically releases the plunger head and ensures free falling of the cone during the five second test. The digital readout provides readings in 0.1mm resolution in either mm or inches. The chromed support rod features micro-metric vertical displacement for accurate positioning with a brass slider that provides smooth free fall, a stop and release button and an automatic zero set. Includes a stainless steel penetration test cone: 35mm long with a 30° angle, weighing 20g. Two brass cups are included (55 x 35mm and 70 x 45mm). This cone penetrometer can also be used to measure the shear undrained strength of undisturbed and reconstituted soil samples per CEN ISO/TS 17892-06. Overall dimensions are: 8.6" x 6.7" x 16.1" (220 x 170 x 410mm).

Cone Penetrometer, Digital Semi-Auto

120V 60Hz H-5237
230V 50Hz H-5237.5F

Shipping wt. 33 lbs (15kg)

Cone Penetrometer, Dial Indicator

BS 1337-2, NF P94-052,1; CEN ISO/TS 17892

The H-4236 cone penetrometer with dial indicator features a 6" (150mm) diameter dial gauge, which is easily readable and is graduated in 0.1mm divisions. Overall dimensions are: 8.6" x 6.7" x 16.1" (220 x 170 x 410mm).

Cone Penetrometer, Dial Indicator H-4236

Shipping wt. 21.6 lbs (9.8kg)

Cone Penetrometer, Semi-Automatic

BS 1337-2, NF P94-052,1; CEN ISO/TS 17892

The H-4237 semi-automatic cone penetrometer with dial indicator is equipped with the same magnetic controller device as the digital version, H-5237. Its electronic, digital, programmable timer automatically releases the plunger head and ensures a free-falling cone during the five second test. Overall Dimensions: 8.6" x 6.7" x 16.1" (220 x 170 x 410mm).

Cone Penetrometer, 120V 60Hz H-4237

Cone Penetrometer, 220V 50Hz H-4237.5F

Shipping wt. 25 lbs (11.3kg)

| Accessories / Replacement Parts | |
|---|----------|
| Test cone, 35mm long, 30° angle | H-4236.1 |
| Test cone, 60° angle w/ 60g weight | H-4236.5 |
| Sample cup, brass, 70 x 45mm | H-4236.2 |
| Sample cup, brass, 55 x 35mm | H-4236.3 |
| Weight, 20g | H-4236.4 |
| Weight, 320g (shear strength for 400g total weight) | H-4236.6 |
| Test gauge, 30° angle (cone point check) | H-4236.7 |
| Test gauge, 60° angle (cone point check) | H-4236.8 |
| Mirror (for height adjustment) | H-4236.9 |



Liquid Limit Accessories

| Accessories | |
|--|------------|
| ASTM metal grooving tool and gauge block | H-4229 |
| ASTM plastic grooving tools (10 pk) | H-4229P |
| AASHTO liquid limit metal grooving tool | H-4232 |
| Mixing dish | H-4930.250 |
| Spatula | H-4904 |
| Graduated cylinder (25ml) | H-4915.025 |
| Sample cans, 2.5 oz. (48 pk.) | H-1350.3A |

Resiliency Tester

ASTM D4318; AASHTO T89, T90

Used to test resiliency of hard rubber base of liquid limit machines, which should be done at 90-day intervals to ensure base is in compliance with ASTM D4318 standard.

Resiliency Tester **H-4233**
Shipping wt. 1.2 lbs (0.5kg)

Durometer (D Scale)

ASTM D4318, D2240; AASHTO T89, T90

As required by ASTM D4318, a durometer is used to test the hardness of the base of a liquid limit machine. Sealed springs maintain load deflection rate to a tolerance of .0004". Other models are also available, see page 362.

Durometer (D Scale) **H-4222D**
Shipping wt. 1.7 lbs (0.7kg)

Liquid Limit Replacement Parts

| Replacement Parts | |
|---|----------|
| Brass cup w/ screws for liquid limit machines | H-4231 |
| Brass cup w/ screws and cam follower | H-4231.1 |
| Stainless steel cup w/ screws (non ASTM) | H-4231.2 |
| Base | H-4230.1 |

Shrinkage Limit Set

Apparatus recommended to perform shrinkage limit test in accordance with specifications. Set includes: (1) H-4256 monel shrinkage dish; (1) H-4930.250 mixing dish; (1) H-4254C crystallizing dish; (1) H-4255A shrinkage prong plate, (1) H-4256 shrinkage dish, and (1) H-4915.025 graduated cylinder All components are also available individually.

Shrinkage Limit Set **H-4254**
Shipping wt. 3 lbs (1.3kg)

Plastic Limit Set

ASTM D4318; AASHTO T90

Includes all apparatus recommended to perform plastic limit test in accordance with specifications. Set includes the following: (1) H-4253.1 plastic limit plate, 12 x 12 x .375" (305 x 305 x 9.5mm) thick; (1) H-4930.250 mixing dish; (1) H-4904 spatula; (1) H-4915.025 graduated cylinder, and (1) H-1350.3A Pkg. of 48 sample cans All components are also available individually.

Plastic Limit Set **H-4253**
Shipping wt. 11 lbs (5kg)

Plastic Limit Roller

ASTM D4318; AASHTO T90; TX DOT 105-E

Easily repeatable mechanical technique produces consistent test results and saves time. Includes integral top plate/handle, one (H-4262P) pad of 50 sheets of special adhesive backed paper to cover contact surfaces (paper will not introduce fibers into soil samples), and instructions. Rigid acrylic 8 x 4.5 x 1.25" (203 x 114 x 32mm).

Plastic Limit Roller **H-4262**
Shipping wt. 3 lbs (1.3kg)

Adhesive Paper

Pad of 50 sheets of special adhesive backed paper for plastic limit.

Adhesive Paper **H-4262P**
Shipping wt. 0.5 lbs (0.2kg)



| Model | HO-4930 | HO-4940 | HO-4941 | HO-4943 | HO-4960 |
|-------------|---|--------------------------------|----------------------|--------------------------------|---|
| Range | 0.00 to 14.0 pH | 0.00 to 14.00 pH | 0.00 to 14.00 pH | 0-1999 $\mu\text{S}/\text{cm}$ | -2.00 to 16.00 pH -1999 to 1999 mV |
| Resolution | 0.01 pH 1 mV 0.1 $^{\circ}\text{C}$ | 0.01 pH | 0.01 pH | 1 $\mu\text{S}/\text{cm}$ | 0.01 pH 1 mV 0.1 $^{\circ}\text{C}$ |
| Accuracy | $\pm 0.01 \text{ pH} \pm 1 \text{ mV} \pm 0.5 \text{ }^{\circ}\text{C}$ | $\pm 0.05 \text{ pH}$ | $\pm 0.1 \text{ pH}$ | $\pm 1.5\% \text{ FS}$ | $\pm 0.01 \text{ pH} \pm 1 \text{ mV} \pm 0.5 \text{ }^{\circ}\text{C}$ |
| Calibration | 3 Points 1 Predefined Buffer Group | 3 Points | N/A | N/A | Up to 3 Points 3 Predefined Buffer Groups |
| Temp. Range | 0 $^{\circ}\text{C}$ to 100 $^{\circ}\text{C}$ | 0.0 to 99.0 $^{\circ}\text{C}$ | N/A | N/A | -5 $^{\circ}\text{C}$ to 110 $^{\circ}\text{C}$ |

Portable pH Meter

The HO-4930 portable pH meter marries portability with precise pH measurement. An ORP or temperature electrode can also be easily connected to provide additional functionality.

- Auto buffer recognition stores calibration data and helps to avoid errors during the calibration process
- Automatic and manual temperature compensation helps ensure accurate readings

The OHAUS Starter Series of portable water quality & electro-chemistry meters was created with versatility in mind. They can be operated in the lab with the support of the built-in stands or in the field thanks to their lightweight design. With a crisp, well-organized LCD screen and five clearly marked keys, utilizing the OHAUS Starter Series is simple for students and teachers alike. The portable OHAUS Starter Series also boasts IP54 protection which shields the meter from damage by water and dust particles and also offers an integrated labeling area which can be customized for quick identification. Each meter can store 30 sets of data memory and has the ability to quickly recall calibration data and stored information with one quick touch.

Includes HO-4964 Plastic Gel, non-refillable electrode (0-14pH) and a pH buffer powder sachet.

Portable pH Meter **HO-4930**
Ship wt. .39lbs. (.18kg)

pH and Temp. Analysis Pens

These pH/Temp. Analysis Pens offer a convenient way to measure pH, or the relative acidity or alkalinity of a sample at a given temperature. The pH pen can be completely operated with just one hand, freeing up your other hand to handle samples. Analysis pen meters provide what should be expected of a small pen meter: simple, fast, straightforward, no-frills yet highly accurate operation time and time again. With durable plastic housing, a protective cap that safeguards the sensor and an automatic shutdown feature to preserve battery life, Analysis Pen meters can endure consistent use in rugged environments. The electrodes are also replaceable, which extends

the meters' usable life considerably. Equipped with a wrist strap that helps to prevent unintentional dropping, Analysis Pen meters are constructed with an IP67 waterproof design that can prevent water damage when accidentally dropped into liquid.

pH and Temp. Analysis Pen **HO-4940**
pH Analysis Pen **HO-4941**

Ship wt. .39lbs. (.18kg)

pH Bench Meter w/Electrode

The HO-4960 pH Bench Meter offers premium features at a cost-effective price point for reliable and convenient pH and ORP measurements.

- Starter 3100's intuitive software includes three point calibration, three buffer groups, automatic and manual endpoint functions, as well as a 99 item library
- Among Starter 3100's user-friendly features that support ease-of-use are an adjustable stand-alone electrode holder and large backlit LCD display
- Documenting measurement data is made simple through the RS232 which can be used to connect peripheral devices such as printers or computers to the meter

Includes HO-4963, 3-in-1 plastic, refillable pH electrode, pH Buffer Powder Sachet and In-Use Cover.

pH Bench Meter w/Electrode **HO-4960**
Ship wt. 3.8lbs. (1.7kg)

| Electrodes | Model |
|--|---------|
| Electrode, pH only, refillable, BNC | HO-4962 |
| Electrode, pH/temp., refillable, BNC | HO-4963 |
| Electrode, pH/temp., non-refillable, BNC | HO-4964 |
| Electrode, Temperature | HO-4965 |

Conductivity Pen

This conductivity pen meter is a great choice for basic testing needs of the total ionic concentration within a solution.

Conductivity Pen **HO-4943**
Ship wt. .39lbs. (.18kg)

Buffer Solutions

Buffer solutions for meters with 0.01 resolution are standardized against NIST-traceable pH references within 0.01 pH at 77°F (25°C). Store buffers away from direct sunlight. Sold in single, 1 pint bottles.

Buffer Solutions **See Table**
Ship wt. 2lbs. (0.9kg)

| Buffer Solutions | Model |
|------------------------------------|------------|
| pH 10.0 \pm pH Accuracy, 1-pint | H-4360A.10 |
| pH 12.45 \pm pH Accuracy, 1-pint | H-4360A.12 |
| pH 1.68 \pm pH Accuracy, 1-pint | H-4360A.2 |
| pH 4.01 \pm pH Accuracy, 1-pint | H-4360A.4 |
| pH 7.00 \pm pH Accuracy, 1-pint | H-4360A.7 |
| Soil Prep Solution, 500ml | H-4360A.1 |

Buffer Solution, Singles

These convenient pH buffer packs are sealed against light, air, and other contaminants for fast, accurate results. Each pack contains enough buffer solution for one calibration.

Buffer Solution, Singles **See Table**
Ship wt. 1.5lbs. (.68kg)

| Buffer Solutions, Singles | Model |
|------------------------------------|------------|
| pH 10.0 \pm pH Accuracy, 20 pack | H-4361A.10 |
| pH 4.01 \pm pH Accuracy, 20 pack | H-4361A.4 |
| pH 7.00 \pm pH Accuracy, 20 pack | H-4361A.7 |
| Deionized Water, 20 pack | H-4361A.00 |



Hydrometer Analysis Set

ASTM D7928; AASHTO T88

This complete hydrometer analysis setup includes the Humboldt hydrometer jar bath combined with hydrometer analysis accessories to provide a complete testing set. Set includes:

| Components | |
|---------------------------------|----------|
| Hydrometer jar bath | H-4239A |
| Soil hydrometer A | H-4241 |
| Soil hydrometer B | H-4242 |
| Hydrometer jars, (8) | H-4244 |
| Soil dispersion mixer | H-4260A |
| Stopper for Hydrometer Jar (8) | H-4244RS |
| Sodium Hexametaphosphate (1lb.) | H-4247 |

Hydrometer Analysis Set, 120V 60Hz H-4263A
Hydrometer Analysis Set, 220V 50/60Hz H-4263A.4F

Shipping wt. 225lbs (102 kg)

Hydrometer Jar Bath

ASTM D7928; AASHTO T88; UNE 103.102

The Humboldt hydrometer jar bath is designed to provide a 68°F (20°C) ambient temperature throughout the unit by using a microprocessor-based temperature control with integral heater and chiller. The control processor in the H-4239A provides a consistent bath temperature of 68°F (20°C) accurate to within 0.1% of input span $\pm 1^\circ\text{F}$, which makes it an ideal bath for storing hydrometer jars in accordance with the standards listed above. The Hydrometer bath also can be used for many other processes within a lab and can be set to maintain temperatures within its temperature range of 50°F (10°C) and 120°F (49°C).

The H-4239A jar bath is fully-insulated and includes a circulating pump, which ensures a constant water temperature throughout bath. The H-4239A can accommodate (8) hydrometer jars at a time. All models include a stainless steel shelf, which supports specimens while allowing 2" of free circulating water above and below specimens.

Tank volume: 20.5 gallons (77.6 Liters).

Bath dimensions: ID: 37" L x 8" W x 16" D

(940 x 203 x 406 mm).

Overall dimensions: 48" L x 11" W x 19" D

(1220 x 280 x 483 mm)

Hydrometer Jar Bath, 120V 60Hz H-4239A

Hydrometer Jar Bath, 220V 50/60Hz H-4239A.4F

Shipping wt. 195lbs (88 kg)

Hydrometer Jar

ASTM D7928; AASHTO T88

Graduated glass cylinder used in determining amount of soil in dispersed suspensions contains 1000ml at 20°C (68°F). Open end is fire-polished without pour-out. Dimensions: 18" (457mm) x 2.5" OD (64mm). Base is 4.333" (110mm).

Hydrometer Jar H-4244



Shipping wt. 2lbs (1 kg)

Soil Hydrometer A

ASTM D7928; AASHTO T88

Seamless, symmetrical stem and bulb do not vary in diameter. One-piece ballast is secured to lower part of the body. Guaranteed calibration accuracy eliminates errors due to variable dilution. H-4241 uses ASTM 152 H scale, graduated to read in grams per liter (g/L) of suspension and has a range of -5 to +60g/L in 1g/L divisions at 68°F (20°C). Total length: 11" (280mm).

Soil Hydrometer A H-4241



Shipping wt. 2lbs (1kg)

Soil Hydrometer B

ASTM D7928; AASHTO T88

Seamless, symmetrical stem and bulb do not vary in diameter. One-piece ballast is secured to lower part of the body. Guaranteed calibration accuracy eliminates errors due to variable dilution. H-4242 uses ASTM 151 H scale, graduated to read specific gravity with a range of 0.995 to 1.038 in 0.001 divisions at 68°F (20°C). Total length: 11" (280mm).

Soil Hydrometer B H-4242



Shipping wt. 1.3lbs (0.59 kg)

Soil Dispersion Mixer

ASTM D7928; AASHTO T88

Modified mixer to meet specifications is used for dispersing soil suspensions used in hydrometer method of testing sub-grade soils. Heavy-duty mixer operates at a speed above 10,000 RPM (no load). Includes stirring apparatus with H-4266 stainless steel paddle and H-4265 chrome-plated dispersion cup with 4 sets of permanent interior baffles. Rounded cup bottom prevents soil accumulation. Furnished with 5' cord and 3-prong plug. Dimensions: 20" x 6.5" x 7" (508 x 165 x 178mm).

Soil Dispersion Mixer, 120V 60Hz H-4260A

Soil Dispersion Mixer, 230V 50/60Hz H-4260A.4F



Shipping wt. 17lbs (7.7 kg)

Dispersion Cup

Chrome-plated dispersion cup for use with H-4260 mixer.

Dispersion Cup H-4265



Shipping wt. 1.1lbs (0.49 kg)

Stirring Paddle

Stirring paddle with 3 blade surfaces, 0.75" (19mm) dia. for H-4260A mixer. Shaft threads onto mixer.

Stirring Paddle H-4266



Shipping wt. 0.1lbs (0.45 kg)

Sodium Hexametaphosphate

Dispersing agent used in combination with gradation analysis of soils.

1 lb (0.5kg) H-4247

10 lb (4.5kg) H-4247.10



Shipping wt. 1.6lbs (0.7kg) 11.6lbs (5.2 kg)

Stopper for Hydrometer Jar

Rubber stopper for hydrometer jars

Stopper (Hydrometer Jar) H-4244RS



Shipping wt. 0.2lbs (0.09 kg)



H-4270



H-4264

H-4379
(shown with
H-4374.C cover)

H-4374



H-4340



H-4378

Air Jet Dispersion Tube

ASTM D7928; AASHTO T88

Alternative method for dispersing soil suspensions used in hydrometer method of testing sub-grade soils. Uses air bubbles to disperse soil samples. Comparative tests show the unique air jet action achieves better dispersion of clays with less degradation of soft particles like micas. Provides easier method, as samples are dispersed right in the sedimentation cylinder, eliminating the mess and sample loss from moving samples from one container to the other. Used by U.S. government agencies, State DOTs and consulting geotechnical engineers. **Shown with hydrometer jar, Not included.**

Air Jet Dispersion Tube

H-4270

Shipping wt. 6 lbs (2.72kg)

Dispersion Hand Stirrer

ASTM D7928; AASHTO T88

Inexpensive hand stirrer for dispersing soil suspensions used in hydrometer method of testing sub-grade soils. **Shown with hydrometer jar, Not included.**

Dispersion Hand Stirrer

H-4264

Shipping wt. 2 lbs (0.9kg)

Sand Equivalent Testing

Sand equivalent tests serve as rapid field-correlation tests to show relative proportions of clay-like or plastic fines and dusts in granular soils and fine aggregates. The test separates sand and clay, a comparative reading is determined between the suspended clay and the settled sand in the measuring cylinder. Tests may be done in the laboratory or the field.

Sand Equivalent Shaker, Digital Timer

ASTM D2419; AASHTO T176

Motorized sand equivalent shaker features a digital timer, which can be set from 0 to 60 minutes with automatic shutoff. It features an easy-to-use digital interface with an accuracy of 0.5% to increase accuracy and ease of operation. It is recommended for samples in the laboratory. The consistent, repeatable oscillation of the apparatus eliminates operator-caused variation. Shaking operation delivers an 8" (203mm) stroke at a speed of 175 ± 2 strokes per minute. Dimensions: 12" x 24" x 24"H (31 x 61 x 61cm).

Sand Equivalent Shaker, 120V 60Hz

H-4379

Sand Equivalent Shaker, 220V 50Hz

H-4379.5F

Shipping wt. 125 lbs (56.6kg)

Sand Equivalent Shaker, Motorized

ASTM D2419; AASHTO T176

Motorized sand equivalent shaker features two separate electronic timers (one preset at 45 seconds and the other preset at 10 minutes) to increase accuracy and ease of operation compared to a spring-type timer. It is recommended for samples in the laboratory. The consistent, repeatable oscillation of the apparatus eliminates operator-caused variation. Shaking operation delivers an 8" (203mm) stroke at a speed of 175 ± 2 strokes per minute. Dimensions: 12" x 24" x 24"H (31 x 61 x 61cm).

Sand Equivalent Shaker, 120V 60Hz

H-4374

Sand Equivalent Shaker, 220V 50Hz

H-4374.5F

Shipping wt. 125 lbs (56.6kg)

Cover for Motorized Sand Equivalent Shaker

Clear acrylic cover encloses the sand equivalent shaker for safer operation. The cover swings back out of the way for loading.

Cover for Sand Equivalent Shaker

H-4374.C

Shipping wt. 8 lbs (3.7kg)

Sand Equivalent Test Set

ASTM D2419; AASHTO T176

The Humboldt sand equivalent test set includes all items required to perform a sand equivalent test except for a shaker. Be sure to choose a shaker from those offered on this page. These test sets include:

| Components | |
|---------------------------------|------------|
| Measuring cylinder, plastic | H-4340.1 |
| Latex Tubing (ft.) | H-4340.2.2 |
| Rubber stopper | H-4340.5 |
| Irrigator tube | H-4340.2.6 |
| Weighted foot assembly | H-4340.3 |
| Siphon assembly | H-4340.2 |
| Wide-mouth funnel | H-4340.4 |
| Measuring can (3.0 oz.) | H-1350.3SP |
| Standard stock solution (8 oz.) | H-4342 |

Sand Equivalent Test Set with Case

H-4340

Sand Equivalent Test Set without Case

H-4341

Shipping wt. 25.1 lbs (11kg)

Sand Equivalent Shaker, Manual Operation

ASTM D2419; AASHTO T176

Manually operated sand equivalent shaker is ideal for use on job site to give more uniform shaking action. Shaker consists of mounting bracket with cylinder holder and two spring steel straps, stroke indicator and counter mounted on one end. Uniform shaking action is accomplished by pushing the top frame by a simple stroke of the hand. Portable unit features removable wooden carrying case. Dimensions: 21" x 6.5" x 26.375" (53 x 17 x 67cm).

Sand Equivalent Shaker, Manual Operation

H-4378

Shipping wt. 26 lbs (11.7kg)

**Sand Equivalent Stock Solution**

ASTM D2419; AASHTO T176

Standard stock solution, made from anhydrous calcium chloride, glycerin and formaldehyde. Use diluted with distilled water in ratio of 85ml solution per/gal. distilled water.

Sand Equivalent Stock Solution, 8oz (.24L) H-4342
Sand Equivalent Stock Solution, 1G (3.8L) H-4342.2



Shipping wt. 0.8 lbs (0.36kg)

Pin Hole Dispersion Apparatus

ASTM D4647

This test is used for evaluating clay soils for erodibility by flowing water through a small hole that is drilled through the compacted specimen. The test chamber has a unique clamping ring for holding the stainless steel mold to the base while compacting the sample. Included with the chamber are screens, base stand, constant head reservoir, tubing, connections, pipette and a tool for drilling the pinhole. The end cap has a pilot hole for drilling the 1.0mm (.040") hole through the sample. All aluminum parts are anodized for corrosion resistance.

Pin Hole Dispersion Apparatus**HM-3930**

Shipping wt. 6.6 lbs (3kg)

Falling Head Permeameter Cells

ASTM D2434; BS 1377 Part 5

For use with granular soils in determining the coefficient of permeability via the falling-head method for laminar flow of water. Compact and portable unit includes a spring incorporated into top cap to apply 5-10 lbs. force against screen to prevent soil density changes. End caps and clamping ring are anodized aluminum. Each cell comes complete with valves and perforated screens. **9" (229mm) cells are made to order.**

Permeameters without manometer outlets

| | |
|--------------------------------|----------|
| Permeameter Cell, 2.5" (63mm) | HM-5891A |
| Permeameter Cell, 3.0" (76mm) | HM-5892 |
| Permeameter Cell, 4.5" (114mm) | HM-5893 |
| Permeameter Cell, 6" (152mm) | HM-5894 |
| Permeameter Cell, 9" (229mm) | HM-5895 |



Shipping wt. 3-33 lbs (1.3 - 14.9kg)

Shelby Tube Permeameter

The Shelby tube permeameter allows you to perform permeability tests within a Shelby tube without removing the sample. Ideal for cohesion-less materials and sands. It is suggested that the specimen be ejected at test conclusion and examined for voids or large aggregate, which possibly could affect the test results. Two sets of end caps fit over a Shelby tube liner up to 6" long. End caps each contain valve to control flow of permeants through the specimen, along with a porous stone to prevent material from flowing into and clogging the valve. End caps are anodized aluminum. Includes o-rings, connecting rods, clamping knobs, and tubing. Shelby tube not included.

| | |
|-------------------------------|---------|
| Shelby Tube Permeameter, 2" | HM-3913 |
| Shelby Tube Permeameter, 2.5" | HM-3914 |
| Shelby Tube Permeameter, 3" | HM-3915 |



Shipping wt. 6 lbs (2.72kg)

Constant Head Permeameter Cells

ASTM D2434; BS 1377 Part 5

Use to determine the coefficient of permeability by the constant head method for laminar flow of water through granular soils. Two manometer ports are grooved & screened on the inside. Distance between ports is always equal to diameter. 100 mesh screens used to prevent migration of material through valves & tubing during test. Acrylic chamber permits viewing sample. Spring incorporated into top cap to apply 5-10 lbs. force against screen to prevent soil density changes. End caps and clamping ring are anodized aluminum. Each cell comes complete with valves and perforated screens. **9" (229mm) cells are made to order.**

Permeameters with manometer outlets

| | |
|--------------------------------|---------|
| Permeameter Cell, 2.5" (63mm) | HM-5801 |
| Permeameter Cell, 3.0" (76mm) | HM-5802 |
| Permeameter Cell, 4.5" (114mm) | HM-5803 |
| Permeameter Cell, 6" (152mm) | HM-5804 |
| Permeameter Cell, 9" (229mm) | HM-5805 |



Shipping wt. 3-33 lbs (1.3 - 14.9kg)

Permeameter Replacement Parts

| | |
|---|-----------|
| HM-5801 Replacement Screen Strips 8.75" long for HM-5801 (set of 2) | HM-5801.7 |
| HM-5801 & HM-5891A Replacement Screens 2.485" (3) | HM-5801.8 |
| Perforated Plate 2.5" | HM-5801.9 |

Tubing for use with Permeameter Cells

Flexible, clear PVC tubing for use with Permeameter cells. 0.25" ID x 0.375" OD.

Tubing, 0.25" ID x 0.375" OD, 25ft. HM-003349



Shipping wt. 0.5 lbs (0.2kg)



Dual Manometer Tube Stand

ASTM D2434

Economical manometer tube setup for use with Constant Head Cells. Two acrylic tubes with valves mounted on aluminum rail, with scale for monitoring flow volumes. Scale is 100cm long with cm and mm graduations. Each tube has its own valve to allow running two tests. Choose wall mount or free standing. Includes tubing.

Dual, Manometer Stand, Wall Mount **HM-5860**

Dual, Manometer Stand, Free Standing **HM-5861**

Shipping wt. 8 lbs (3.7kg)

Single Manometer Tube Stand

ASTM D2434

Economical manometer tube setup for use with Falling Head Cells. Single acrylic tube with valves mounted on aluminum rail, with scale for monitoring flow volumes. Scale is 100cm long with cm and mm graduations. Choose wall mount or free standing. Includes funnel and tubing.

Single, Manometer Stand, Wall Mount **HM-5890**

Manometer Stand, Free Standing **HM-5896**

Shipping wt. 8 lbs (3.7kg)

Constant Head Tank

Acrylic tank with regulating valve for flow control of water and a porous media on bottom to filter out air bubbles. Maintains constant water head via an overflow port. Includes: saddle valve for connection to either de-aired or tap water source and tubing for hook-up to test chamber. Tank measures 5.625" diameter x 5.25" height.

Constant Head Tank, 1500cc **HM-5880**

Shipping wt. 5 lbs (2.2kg)

Compaction Permeameters

ASTM D5856

For determining permeability of clay, sand, and gravel soils. Uses Proctor plasticity compaction method. Two-piece cylindrical mold includes: upper plate with valve; water inlet/outlet; filter base plate; and filter stones. 6"W x 6"D x 12"H.

Compaction Permeameters, 4" **H-4145**

Compaction Permeameters, 6" **H-4146**

Shipping wt. 25.9 lbs (11.7kg)

Permeameter Replacement Parts

| | |
|------------------------------|-------------|
| Filter stone for H-4146 | H-4148X |
| Filter stone for H-4145 | H-4148 |
| Porous stone for H-4146 | H-4148.6 |
| Porous stone for H-4145 | HM-4184.100 |
| Spring for H-4146 and H-4145 | H-4145.8 |

Permeameter Accessories

| | |
|---|---------------------------|
| High Vacuum Pump | H-1763A or H-1763A.4F |
| Material Scoop, #2 Round | H-3731 |
| Mixing Bowl, 8qt (7.6L) 12.5" x 5.5" (318 x 140mm) | H-4938 |
| Graduated Cylinder, 250mL, Glass or Plastic | H-4915.250 H-4916P.250 |

Compaction Hammer

Rod with sliding weights on a 2" (51mm) dia foot. Stop allows adjusting height of drop up to 8" (203mm). Includes one .25 lb. (100g) and one 2.25 lb. (1kg) weight.

Compaction Hammer **HM-3701**

Shipping wt. 6 lbs (2.7kg)



| Permeability Cells, Top Cap/Base Pedestal Sets and Individual Top Caps and Bases | | | | | | | | |
|--|---------------|----------------|--------------|--------------|--------------|---------------------|-----------------|----------------|
| Size | Cell Standard | Cell Stainless | Set Aluminum | Top Cap Only | Base Only | Set Stainless Steel | SS Top Cap Only | SS Base Only |
| 35mm | HM-4188B | HM-4188SS | HM-4188.35 | HM-4199.35T | HM-4188.35B | HM-4188.35SS | HM-4199.35SST | HM-4188.35SSB |
| 1.4" | | | HM-4188.14 | HM-4199.14T | HM-4188.14B | HM-4188.14SS | HM-4199.14SST | HM-4188.14SSB |
| 38mm | | | HM-4188.38 | HM-4199.38T | HM-4188.38B | HM-4188.38SS | HM-4199.38SST | HM-4188.38SSB |
| 1.5" | | | HM-4188.15 | HM-4199.15T | HM-4188.15B | HM-4188.15SS | HM-4199.15SST | HM-4188.15SSB |
| 50mm | | | HM-4188.50 | HM-4199.50T | HM-4188.50B | HM-4188.50SS | HM-4199.50SST | HM-4188.50SSB |
| 2.0" | | | HM-4188.20 | HM-4199.20T | HM-4188.20B | HM-4188.20SS | HM-4199.20SST | HM-4188.20SSB |
| 70mm | | | HM-4188.70 | HM-4199.70T | HM-4188.70B | HM-4188.70SS | HM-4199.70SST | HM-4188.70SSB |
| 2.8" | | | HM-4188.28 | HM-4199.28T | HM-4188.28B | HM-4188.28SS | HM-4199.28SST | HM-4188.28SSB |
| 100mm | | | HM-4188.100 | HM-4199.100T | HM-4188.100B | HM-4188.100SS | HM-4199.100SST | HM-4188.100SSB |
| 4.0" | | | HM-4188.40 | HM-4199.40T | HM-4188.40B | HM-4188.40SS | HM-4199.40SST | HM-4188.40SSB |

Permeability Cells

ASTM D5084; BS 1377 Part 6 1990

HM-4188B permeability cells are constructed of high-quality materials throughout for long-lasting performance. The cell top and base are precision machined from 6061 T6 aluminum and black anodized for a durable finish. To facilitate sample setup, the chamber and cell top can be quickly and easily removed by loosening the three knobs that hold the upper assembly to the base. The clear acrylic chamber provides a working pressure of 150 psi (1,000 kPa) and is tested to 250 psi (1,700 kPa).

The cell has five, no-volume-change, valves aligned along the front of the cell for maximum convenience. Two valves handle top drainage, two valves handle bottom drainage, and one valve handles filling/emptying and providing confining pressure to the cell.

The removable base pedestal accommodates various sample diameters from 35mm to 4 inch, see chart above for model numbers corresponding to the size needed. Cells are available with black-anodized aluminum or stainless steel top caps and base pedestals, **refer to chart above.**

Brass valves are standard with these cells, but stainless steel valves (stainless steel is typically used with hazardous materials) are an option, please inquire. Cell dimensions are: 13.75" H x 8.75" dia. (349.2 x 222.3mm). Overall dia. is: 11" (279.4mm).

Triaxial Cells— HM-4199

For those who plan to do triaxial tests in addition to permeability testing, consider using HM-4199B or HM-4199SS triaxial cells for the added convenience of using one cell for both tests. See page 131.

ELITE SERIES

Automated Pressure Controller



HM-5810.3F

Automated, 3-Channel Pressure Controller

ASTM D5084

The HM-5810 is an automated three-channel pressure controller designed to handle saturation, consolidation and permeation of a triaxial test sample. In this application it can be used solely for permeability testing as well, eliminating the need for distribution panels, etc. The HM-5810 is all you need to successfully do permeability testing for soil.

Cell, head and tail pressure can be set in increments of 0.1 PSI while volume change is measured to 0.0001cc. The flow rate for permeation can be set from 1 cc/sec (60 cc/min) down to less than 0.000002 cc/sec (0.00012 cc/min). There are three data input channels – one for each pressure transducer, or if you are only doing permeability, you will only need one of the channels/pressure transducers.

The HM-5810 provides an accurate and simplified permeability setup, which eliminates the need for separate distribution panels, and simplifying tubing and control cable setup. By using the integral staging platform, the HM-5810 provides an extremely compact and organized setup.

The HM-5810 is built around Humboldt's integral, data logger with touch-screen control, which allows the HM-5810 to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

Standalone Mode

In stand-alone mode, the HM-5810 Pressure Controller provides a 7" (178mm) touch-screen controller, giving you finger-tip control of your testing processes, as well as providing real-time, visual views of your data in both tabular and graphic formats. The waterproof, touch screen provides colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine while the test is running. Data can then be viewed simultaneously from a computer or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced HM-5007SW Permeability Software Module.

Computer Control

When operated from a networked computer the NEXT software provides robust machine and test control, and report generation. It also provides the ability to control and monitor multiple machines from a single computer.

NEXT software and the enhanced Permeability module, HM-5007SW provides robust machine control, calibration, data acquisition and report generation for those who want to use a computer to control permeability testing operations.

HM-5810.3F Specifications:

| | |
|---------------------------|--|
| Hydraulic pressure range: | 200-500 psi |
| Volumetric capacity | 270mL/channel |
| Load Capacity | 3000lbf (15kN) |
| Dimensions (L x D x H) | 38" x 15" x 20.5" (970 x 385 x 520mm) |
| Voltage | 110/220V 50/60Hz - 16.0 amps |

Controller Specifications:

| | |
|---|---|
| Display (Resistive Touch) | 7" (178mm) VGA (480 x 800) |
| Real-time test data | Graphic and tabulation |
| Processor | Dual 32-bit ARM |
| RAM | 64MB |
| Memory, non-volatile | 4GB |
| Analog to digital converter | 24 bit |
| Logging speed | up to 50 readings per second |
| Multi-test storage | 1000 |
| Points per test | 3000 |
| USB port (front) | export data, import/export calibration data, WiFi |
| USB port (back) | provides external power for wireless access point |
| Ethernet connection | for network connectivity |
| 24-bit differential analog to digital converter | 2 |
| Ambient temperature sensor | 1 |
| Firmware Update | Ethernet or flash drive |

Automated, 3-Channel Pressure Controller HM-5810.3F

Shipping wt. 168 lb (76kg)



NOTES

Permeability cells and related accessories are not included and should be ordered separately.



NEXT SOFTWARE

For more information on Humboldt's Next Permeability Module, please see pages 108-109.



HM-4150.3F



HM-4140.3F



HM-4160.3F



HM-4150A



HM-4160A

Humboldt FlexPanels

ASTM: D1559, D2850, D2166, D4767, and D5084; AASHTO: T193, T296, T297, T208; BS 1377: Part 4: 1990, BS 1377: Part 6, BS 1377: Part 7: 1990, BS 1377: Part 8: 1990

Permeability testing measures the rate of discharge of water under laminar flow conditions through a unit cross-sectional area of a porous medium under a unit hydraulic gradient and standard (20°C) temperature conditions. In permeability testing, soil is subjected to water under a known pressure, and the flow is measured. The coefficient of permeability (k), or simply permeability, expresses the ability of water to flow through the particular medium. The "constant head" test method is applicable to coarse granular soils such as sands and gravels. The "falling head" test method is applicable to fine grain soils. Either method may be used to test clay soils.

Humboldt FlexPanels

Humboldt FlexPanels provide a simple and highly efficient distribution system for providing air, water and de-aired water for use in permeability and tri-axial testing applications. The FlexPanel's simple, straight-forward configuration, with its integral burettes provides a condensed/compact design that takes up less counter space than competing systems with air/water bladders.

The long, narrow burette design of Humboldt's FlexPanels provide faster test processing times when compared to larger, shorter burette systems, while providing the same volume. This is due to the reduced amount of meniscus formation in the narrower burettes, which allows the water level to drop faster, resulting in faster readings. In addition, the use of longer/narrower burettes and a scale graduation of 0.02ml, also provides an easier-to-read and more accurate scale.

FlexPanels also feature a bias regulator and bridge. The bias regulator maintains the differential pressure when confining and back pressures are increased. The bridge delivers simultaneous control of base and top pressures through the use of just one regulator. This feature minimizes operator time and reduces the margin of error in opening and adjusting regulators during a test. The Humboldt FlexPanel system is comprised of 5 separate panel configurations, which can be grouped together to accommodate from 1 to 6 cell setups.

Fast and Easy Setup and Operation

Humboldt FlexPanels make setup fast and easy with clearly labeled ports and quick-connect hook-ups. Operation is just as easy with clearly labeled controls, large gauges and easy-to-read burette markings.

All Humboldt FlexPanels use no-volume change Swagelock valves and Fairchild constant-bleed type precision regulators for accurate control. All inlets and outlets utilize quick-connects to ensure fast, accurate setup to permeameter cells, as well as air, water and drain hook ups. Fittings, tubing and connectors are supplied with each unit. All FlexPanels are designed to handle air pressures up to 150 psi. For testing contaminated samples, Humboldt offers an optional Toxic Interface Unit, which prevents toxic fluids and vapors from entering the FlexPanel. See next page.

Humboldt FlexPanels Features:

Humboldt FlexPanels are constructed of lightweight aluminum for long, rust-free life. FlexPanels provide an accurate and easy-to-operate solution for controlling compressed air, water, de-aired water and vacuum without the need for air/water bladder interfaces to produce the pressures necessary for permeability and triaxial testing. FlexPanels utilize a set of three burettes to control cell, top cap and base pedestal pressures. This extremely versatile pressure system controls the pressure, water, de-airing tank and vacuum from a single panel. The three burettes allow for the control of the cell pressure and the back pressure for each cell. They can monitor volume change in the sample and can be used to measure the flow of water through the sample for permeability testing.

| | HM-4140.3F | HM-4140M.3F | HM-4150.3F | HM-4150M.3F | HM-4160.3F | HM-4160M.3F | HM-4150A | HM-4160A |
|--------------------------|--------------------------------------|------------------------|---|------------------------|--|------------------------|---------------------------------------|---------------------------------------|
| Pressure/ Resolution | 2-150 psi (0.1 psi) | 14-1000 kPa (1 kPa) | 2-150 psi (0.1 psi) | 14-1000 kPa (1 kPa) | 2-150 psi (0.1 psi) | 14-1000 kPa (1 kPa) | Not Applicable | |
| Vacuum | 0-14.7 psi or 30 Hg | (0-100kPa) or 30 Hg | 0-14.7 psi or 30 Hg | (0-100kPa) or 30 Hg | 0-14.7 psi or 30 Hg | (0-100kPa) or 30 Hg | | |
| Inner Burette | | | | | | | | |
| Cell | Not Applicable | | 50cc x 0.1cc (ml) | | | | | |
| Top | Not Applicable | | 10cc x 0.02cc (ml) | | | | | |
| Base | Not Applicable | | 10cc x 0.02cc (ml) | | | | | |
| Outer Burette | | | | | | | | |
| Cell | Not Applicable | | 400 cc (ml) | | | | | |
| Top | Not Applicable | | 460 cc (ml) | | | | | |
| Base | Not Applicable | | 460 cc (ml) | | | | | |
| Voltage | 110/220VAC 50/60Hz | | | | | | Not Applicable | |
| Power | 6 watts | | | | | | | |
| Operating Temperature | 14 to 158°F (-10 to 70°C) | | | | | | | |
| Dimensions | 8 x 8 x 37.5" (203 x 203 x 952mm) | | 8 x 25.5 x 37.5" (203 x 648 x 952mm) | | 8 x 43.5 x 37.5" (203 x 1105 x 952mm) | | 8 x 19.5 x 37.5" (203 x 495 x 952) | 8 x 37.5 x 37.5" (203 x 952 x 952) |
| Shipping Weight | 35lb (16kg) | | 95lb (43kg) | | 145lb (66kg) | | 107lb (49kg) | 157lb (71kg) |

FlexPanels can manually measure volume change or permeability in a triaxial test sample without the use of a volume change apparatus, a distinct benefit when compared to air/water bladder systems.

- Bias pressure regulator allows simultaneous control of confining and back pressures, while maintaining a constant differential.
- Longer burette and 0.02ml graduation give more accurate results, better productivity, and faster turnaround.
- Uses no-volume-change Swagelock valves
- Bridge feature delivers simultaneous control of base and top pressures by adjusting one pressure regulator simplifying testing.
- Quick-connect hookups for fast and reliable set up.
- Master control panel houses digital pressure readout for the controlling pressure, inlet vacuum regulator and gauge, inlet pressure regulators and gauge, de-aired water tank controls, tap and de-aired water supply outlets, and pressure and vacuum outlets.

Control Panels

The HM-4140 stand-alone control panel or the integral control panels on the HM-4150 and HM-4160 provide pressure controls and readouts for permeability and triaxial applications. All three controllers provide identical controls, which include: a digital, readout pressure meter, a pressure supply gauge, a master pressure regulator, a vacuum supply gauge, a master vacuum regulator, de-aired water tank controls, tap and de-aired water supply outlets and pressure and vacuum outlets.

Auxiliary Panels

The HM-4150A and HM-4160A auxiliary panels provide additional sets of burettes, which can be used to expand the capacity of a system. Each set of three (3) burettes provide the controls necessary for another cell to be used. The HM-4150A provides one (1) set of burettes and the HM-4160A provides two (2) sets. Humboldt recommends any combination of up to six (6) burettes sets can be used with each control panel.

Toxic Interface Unit

Safe and convenient means of performing permeability tests of corrosive or toxic permeants. Flexible fluoro-elastomer bladder accumulator interfaces between control panel and sample drains on permeameter. Serves as a fluid separator to prevent permeant from entering control panel. Also prevents contact of air with permeant, thus no toxic or corrosive vapors can escape into lab. Handles any fluid compatible with stainless steel, PTFE, and the fluoro-elastomer bladder. Unit measure 8" H x 5" dia. Two units are required for each cell.

Toxic Interface Unit

HM-4190



Shipping wt. 7 lbs (3.1kg)



HM-4190

Rear of panel showing quick-connect hookups and plumbing.





Expansion Index Consolidometer

ASTM D4829

Self-contained unit for conducting expansion tests on cured soil specimens. After compaction in stainless steel ring, specimen is placed in the consolidometer with air-dried porous stones, and loaded with a stainless steel weight. Specimen is allowed to consolidate for 10 minutes, after which it is immersed in distilled water for up to 24 hrs. During this time, height of specimen is recorded to determine maximum swell. Corrosion resistant, durable anodized aluminum and stainless steel construction. Includes anodized aluminum base and collar, stainless steel specimen ring and weight, 12.6 lb. (5.7kg) loading weight, and 3.99" dia. x 0.5" (101.4 x 12.5mm) porous stones. **Dial Indicator required, see below.** 6" dia x 11" H (152 x 279 mm).

Expansion Index Consolidometer **HM-5405**
Shipping wt. 20 lbs (9kg)

Dial Indicators for Consolidometer

The expansion index consolidometer requires one of these dial indicators.

Dial Indicator, 0.2" range x 0.0001" **H-4460**
Dial Indicator, 0.5" range x 0.0001" **H-4471**
Dial Indicator, 1.0" range x 0.001" **H-4158.1**
Dial Indicator, 12mm range x .002mm **H-4465.12**
Dial Indicator, 25mm range x .010mm **H-4465.25**
Dial Indicator, 50mm range x .020mm **H-4465.50**
Shipping wt. 1.3 lbs (0.6kg)

Porous Stone

Porous stone for use with HM-2405 consolidometer, 3.99" x 0.5".

Porous Stone, 3.99" x 0.5" **HM-4184.399T**
Shipping wt. 0.5 lbs (0.2kg)

Soil Volume Change Meter (PVC)

Used to evaluate potentially dangerous swelling/shrinking conditions found in clay soils in commercial/residential development sites. PVC (potential volume change) refers to maximum possible volume change a soil could undergo when submitted to changing moisture conditions. It features fast and simple operation, measuring both shrinkage and swelling of soils and is ideal for gauging swelling of clay soils. Includes: H-4454.010, 1,000 lb. (4.5 kN) capacity proving ring, mold assembly, loading cap, porous stones, loading pistons, 2-3/4" (70 mm) dia. specimen ring (HM-1220.70), and conversion charts. 7.25" (184 mm) dia. base x 15.5" (394 mm) height.

Soil Volume Change Meter (PVC) **HM-2415**
Shipping wt. 32 lbs (14.5kg)

Compaction Base and Collar

The compaction base and collar is used to produce a soil sample for use with the basic swell/expansion consolidometers. Use HM-3701 compaction hammer.

Compaction Base & Collar, 2.440" **HM-1975-D**
Compaction Base & Collar, 2.500" **HM-1975-E**
Shipping wt. 7 lbs (3kg)

Compaction Hammer

Rod with sliding weights on a 2" (51mm) dia foot. Stop allows adjusting height of drop up to 8" (203mm). Includes one .25 lb. (100g) and one 2.25 lb. (1kg) weight.

Compaction Hammer **HM-3701**
Shipping wt. 6 lbs (2.7kg)

Basic Swell/Expansion Consolidometer

A self-contained consolidometer used to conduct swell expansion tests on soil specimens. Set includes: stainless steel base/acrylic ring device with adjustable, dial indicator standard and bracket, a compaction specimen ring, top and bottom porous stones and a 60 psf stainless steel loading weight. Consolidometer can also be used with cutting ring, listed below, instead of supplied compaction ring for use in acquiring samples from undisturbed Shelby tube samples. A dial indicator is required, choose from either H-4471 with a range of .500" with .0001" divisions or H-4465.12 with a range of 12mm and .002mm divisions. Alternative loading weights are also available, please inquire.

Consolidometer, 2.440" **HM-1972-1D**
Consolidometer, 2.500" **HM-1972-1E**
Shipping wt. 8 lbs (4kg)

Components for HM-1972-1D

| | |
|---|--------------|
| Cutting Ring, SS | HM-1220.24.8 |
| Compaction Ring, SS | HM-1972-3D |
| Loading Weight, 60 PSF (SS) | HM-1972-6D |
| Top Porous Stone | HM-4184.240 |
| Base Porous Stone, 3.31" dia. x 0.25" thick | HM-4184.331 |

Components for HM-1972-1E

| | |
|---|--------------|
| Cutting Ring, SS | HM-1220.25.8 |
| Compaction Ring, SS | HM-1972-3E |
| Loading Weight, 60 PSF (SS) | HM-1972-6E |
| Top Porous Stone | HM-4184.2485 |
| Base Porous Stone, 3.31" dia. x 0.25" thick | HM-4184.331 |

| Test Parameters | | | | | | | | | | | | | | | Information | | | | | | | | | | | | | | |
|-----------------|-------------------------|------------|------------|---------------------|----------------------|-----------------------------|-------------------------------|------------------------------|-----------------------------------|-------------------|-----------------------|---------------------------------|------------------|------------------|-----------------------|------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Test Parameters | | | | | | | | | | | | | | | Information | | | | | | | | | | | | | | |
| Reading | Elapsed Time (hh:mm:ss) | Load (Lbf) | Disp. (in) | Pore Pressure (psi) | Corrected Load (Lbf) | Corrected Displacement (in) | Corrected Pore Pressure (psi) | Δ Pore Pressure (psi) | Corrected Area (in ²) | Actual Strain (%) | Deviator Stress (psi) | Corrected Deviator Stress (psi) | σ_1 (psi) | σ_3 (psi) | $\sigma_1 - \sigma_3$ | Ab | | | | | | | | | | | | | |
| 0 | 00:00:00 | 79.3 | 0.2480 | 80.0 | 0.0 | 0.0000 | 0.0 | 0.0 | 6.300 | 0.0 | 0.0 | 0.0 | 70.0 | 10.0 | 1.00 | 0.0 | | | | | | | | | | | | | |
| 1 | 00:02:00 | 85.0 | 0.2640 | 81.7 | 5.7 | 0.0160 | 1.7 | 1.7 | 6.326 | 0.3 | 6.9 | 6.9 | 92 | 8.3 | 1.11 | 1.8 | | | | | | | | | | | | | |
| 2 | 00:04:00 | 99.2 | 0.2820 | 82.8 | 19.9 | 0.0360 | 2.8 | 1.1 | 6.338 | 0.8 | 6.8 | 6.8 | 128 | 8.8 | 2.00 | 0.55 | | | | | | | | | | | | | |
| 3 | 00:06:00 | 122.3 | 0.3000 | 84.0 | 43.0 | 0.0710 | 4.8 | 0.8 | 6.377 | 1.2 | 8.7 | 8.7 | 139 | 5.2 | 3.89 | 0.40 | | | | | | | | | | | | | |
| 4 | 00:08:01 | 135.0 | 0.3170 | 84.8 | 55.7 | 0.0890 | 4.8 | 0.1 | 6.387 | 1.5 | 18.2 | 18.2 | 153 | 5.1 | 3.89 | 0.40 | | | | | | | | | | | | | |
| 5 | 00:10:01 | 144.5 | 0.3350 | 85.2 | 73.0 | 0.1070 | 5.2 | 0.3 | 6.416 | 2.1 | 18.2 | 18.2 | 170 | 4.7 | 3.70 | 0.44 | | | | | | | | | | | | | |
| 6 | 00:12:01 | 152.3 | 0.3530 | 85.2 | 76.5 | 0.1250 | 5.2 | 0.1 | 6.435 | 2.4 | 13.8 | 13.8 | 187 | 4.4 | 3.89 | 0.35 | | | | | | | | | | | | | |
| 7 | 00:14:01 | 157.8 | 0.3710 | 85.3 | 83.8 | 0.1420 | 5.3 | 0.0 | 6.475 | 2.7 | 13.9 | 13.9 | 187 | 4.4 | 3.89 | 0.35 | | | | | | | | | | | | | |
| 8 | 00:16:01 | 163.1 | 0.3880 | 85.3 | 88.1 | 0.1600 | 5.3 | -0.1 | 6.494 | 3.0 | 14.4 | 14.4 | 193 | 5.0 | 3.89 | 0.34 | | | | | | | | | | | | | |
| 9 | 00:18:01 | 167.4 | 0.4060 | 85.2 | 90.2 | 0.1850 | 5.1 | -0.1 | 6.515 | 3.3 | 14.9 | 14.9 | 199 | 5.1 | 3.89 | 0.32 | | | | | | | | | | | | | |
| 10 | 00:20:01 | 169.5 | 0.4230 | 85.1 | 93.7 | 0.2120 | 5.0 | -0.1 | 6.534 | 3.6 | 15.3 | 15.3 | 204 | 5.2 | 4.04 | 0.30 | | | | | | | | | | | | | |
| 11 | 00:22:01 | 173.0 | 0.4410 | 85.0 | 97.3 | 0.2310 | 4.9 | -0.1 | 6.556 | 3.8 | 15.8 | 15.8 | 210 | 5.7 | 4.11 | 0.28 | | | | | | | | | | | | | |
| 12 | 00:24:02 | 176.6 | 0.4580 | 84.9 | 100.2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 00:26:02 | 179.5 | 0.4770 | 84.8 | 103.9 | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 00:28:02 | 183.2 | 0.4940 | 84.8 | 106.8 | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | 00:30:02 | 186.1 | 0.5120 | 84.7 | 111.2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | 00:32:02 | 190.5 | 0.5300 | 84.5 | 113.9 | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | 00:34:02 | 193.2 | 0.5480 | 84.4 | 115.9 | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | 00:36:02 | 195.2 | 0.5660 | | | | | | | | | | | | | | | | | | | | | | | | | | |

DATA LOGS

5320

PREVIOUS TESTS

CURRENT TESTS (446ED0W6)

LOAD_1_361458

-0.008

0.01

VOLUM_1_15438





SOIL-MECHANICS

| | | | |
|---|---------|--|---------|
| Consolidation | 110-114 | Triaxial Cells | 131 |
| Consolidation Cell Components | 115-117 | Triaxial Distribution Panels | 132 |
| Data Acquisition | 149-152 | Triaxial Flex Panels | 133 |
| Direct Shear | 118-125 | Triaxial Load Frames | 126-130 |
| Elite Series Equipment | 106-108 | Triaxial Sample Prep | 146-148 |
| Erosion | 153 | Triaxial Setup Accessories | 145 |
| NEXT Software | 109 | Triaxial Setup Components | 142-144 |
| Pneumatic | 118-119 | Triaxial Setups | 134-141 |



ELITE SERIES

Soil Mechanics Equipment

Humboldt's Elite Series testing machines feature a 7", full-color touch-screen controller that provides you with full, graphical monitoring of all testing functions in stand-alone applications, while maintaining full PC control when desired. With Elite Series machines you can have full, finger-tip control and monitoring of all testing functions with the touch-screen controllers, found on our load frames, consolidation and direct-shear machines, as well as our other data acquisition loggers and controllers.

Elite Series machines provide at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a PC, building upon Humboldt's dedication to modular, stand-alone, data-acquisition.

Stand-Alone Control

In stand-alone applications, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's USB port or the data can be transferred to a networked computer. The USB port can also be used to power a wireless access point, which can provide a wireless hook-up with the PC, if no LAN is available.

Computer Control

Humboldt's Next, Basic software is included with the all Elite Series machines. This software provides robust machine control, calibration, data

acquisition and report generation for those using a computer to control various testing operations.

In addition, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, while also providing report generating capabilities using Humboldt NEXT software test-specific modules, see page 108-109.

So, whether you are controlling a single load frame, controlling multiple machines or even a complete geotechnical lab, Humboldt's NEXT Basic software, in conjunction with Humboldt's Elite Series machines provide a complete solution for the acquisition, recording and presentation of testing data in data tabulation and graphic chart formats.



| | |
|--|-----------|
| HM-3000.3F Upgrade to HM-5030.3F | HM-5030U |
| HM-2900.3F Upgrade to HM-5020.3F | HM-5020U |
| HM-2450.3F and HM-2315 Upgrade to HM-5240.3F | HM-5240U |
| HM-2325A.3F Upgrade to HM-5320.3F | HM-5320U |
| HM-2330D.3F Upgrade to HM-5330.3F | HM-5330U |
| HM-2470.3F Upgrade to HM-5470.3F | HM-5470U |
| HM-2560.3F Upgrade to HM-5560.3F | HM-5560U |
| HM-2750A.3F Upgrade to HM-5750A.3F | HM-5750AU |
| HM-2750D.3F Upgrade to HM-5750D.3F | HM-5750DU |
| HM-4469C Upgrade to HM-4470C | HM-4470U |

Upgrade your existing Humboldt Geotechnical Testing machines to Elite Series machines.

You can upgrade your existing Humboldt testing equipment to our Elite Series machines. These upgrades require your existing machine to be sent to Humboldt for a complete refurbishment and upgrade to the new equipment. Upgrades include the new 7", full-color touch-screen controller, and a new enclosure. Refer to the chart on the left for available upgrades.

(When upgrading machines, return transducers and load cells along with machine for recalibration.)



control and monitoring of all testing functions



Choose: Stand-Alone or Computer Control

NEXT SOFTWARE

CONTROL, DATA ACQUISITION AND REPORTING



Humboldt's, NEXT Basic Software Provides:

- Machine control, and data acquisition via networked computer
- Provides the ability to use NEXT software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display
- Effective recording rate of 320 readings per second
- Stores 1000 tests with up to 3000 points per test.
- Up to 255 individual tests can be run simultaneously from a single PC
- Advanced, test-specific modules are available, which provide all the calculations and graphs required per testing standards
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQUIS, gINT, etc.

Humboldt's NEXT Basic software is used to control the operation of Humboldt's testing machines, as well as provide data acquisition and reporting of test data. The software provides a computer-based platform with the ability to configure testing machines and the testing process; calibrate transducers, load cells and digital indicators; specify testing parameters and limits, operate the machine during the testing and provide detailed reports of the data collected in tabular or graphical formats.

From controlling a single operation to a complete geotechnical lab, Humboldt's NEXT Basic data acquisition software, in conjunction with compatible Humboldt testing equipment, provides a complete solution for the acquisition, recording and presentation of test data. NEXT Basic software is included with many of Humboldt's load frames, consolidation and direct shear machines; providing robust machine control, calibration, data acquisition and report generation for those using a computer to control load frame operations.

With Humboldt's NEXT Basic software, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, as well as the ability to control and monitor multiple tests at the same time.

So, whether you are controlling a single testing operation or controlling a complete geotechnical lab, Humboldt's NEXT Basic software, in conjunction with Humboldt's testing machines, provides a complete solution for the calibration, acquisition, recording and presentation of testing data in data tabulation and graphic chart formats.

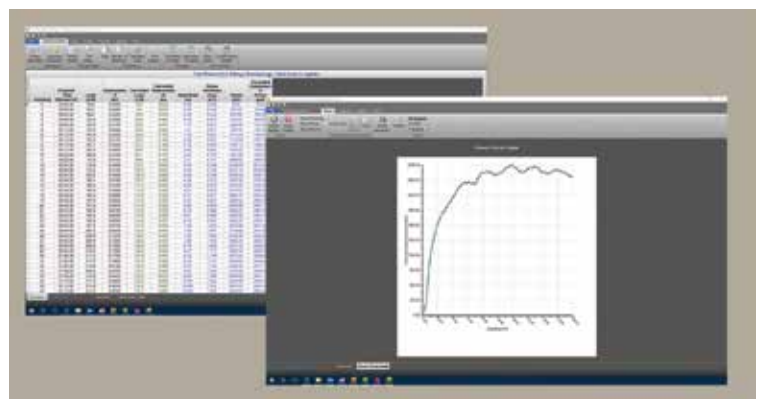
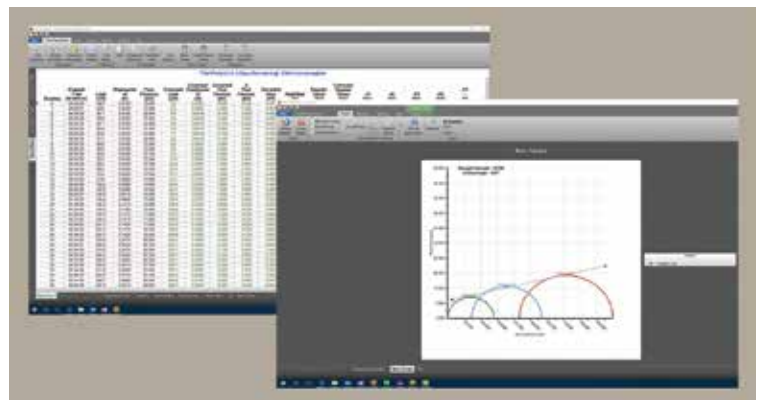
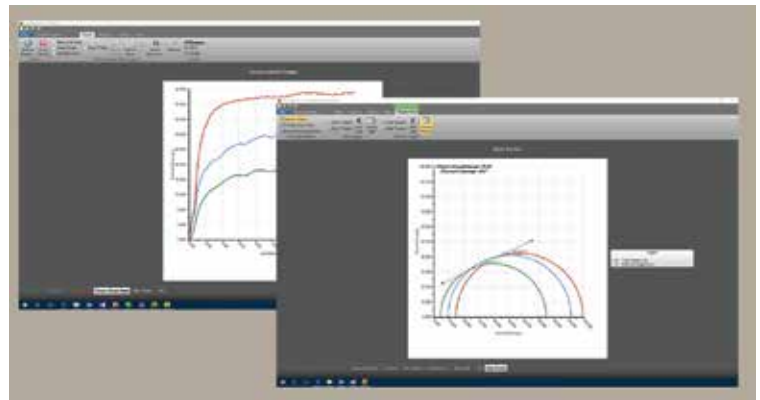
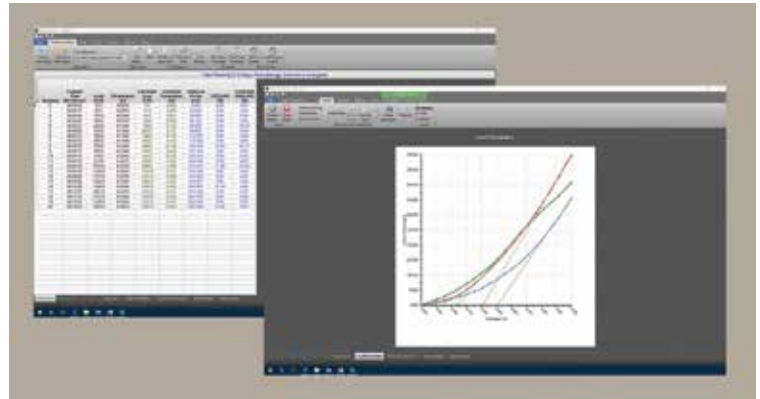
NEXT Test-Specific Software Modules

Humboldt NEXT Basic software can be enhanced with the purchase of test-specific modules. These modules provide you with the following capabilities beyond the standard software included with your ELITE Series load frames.

- Test-specific setup, which guides you through the process and includes selecting data collection parameters that best fit the specific test
- Input specific project information for each test, such as project name, client information, etc.
- All test-specific initial, intermediate, and final parameters required by ASTM and BS standards are dynamically calculated for you, based on your input of specimen information, such as size, weight, etc.
- Tabulated test data, graphs and all test-specific calculations are provided in real time, allowing you to monitor tests in process
- Generate test-specific reports that include all graphs and data presented in a project
- Simultaneously run multiple tests on one computer, involving any of the available NEXT modules and any compatible Humboldt equipment up to 255 device connections, which is up to 1020 inputs
- Create and store test-specific test setup templates for rapid setup of future tests
- Produce test-specific graphs, which allow you to draw construction lines to calculate angles and other test-specific parameters
- Automatically recover from a PC shutdown without loss of data
- All unit parameters can be adjusted individually
- Easily change between different test standards
- Access free, down loadable software upgrades for purchased modules
- Additional modules are available, please inquire

| | |
|--------------------------------------|-----------|
| Consolidation Module | HM-5100SW |
| Direct Shear Module | HM-5700SW |
| CBR/LBR Module | HM-5001SW |
| Unconsolidated Undrained (UU) Module | HM-5002SW |
| Consolidated Undrained (CU) Module | HM-5003SW |
| Unconfined Compression (UC) Module | HM-5004SW |
| Consolidated Drained (CD) Module | HM-5006SW |
| Marshall Module | HM-5005SW |
| Permeability Module | HM-5007SW |

**YOU CAN PURCHASE AND REGISTER
YOUR SOFTWARE MODULES ONLINE!**
<https://www.humboldtmg.com/next-software-modules.html>



ELITE SERIES

Automated Consolidation



ConMatic IPC, Automated Consolidation System

ASTM: D2435, D4546, AASHTO: T216, BS:1377:5

The HM-5470.3F ConMatic IPC is a fully-automated, incremental pressure controller for performing incremental consolidation and one-dimensional swell tests. The ConMatic IPC allows consolidation, constant load and volume swell tests to be run automatically, freeing up technicians for other tasks and reducing the duration of the testing procedures by more than half—effectively saving time and manpower and increasing lab profitability. One ConMatic IPC automated system can replace the production of several manual machines—running incremental consolidation tests according to ASTM D2435 Method B, where successive load increments are applied after 100% primary consolidation.

Once a sample has been placed onto the test platform and the test conditions set, the ConMatic IPC performs all consolidation tests, including moving to the next stress level, without operator



NOTES

Includes Humboldt NEXT Software HM-5100SW Consolidation-specific Module

assistance. The system automatically moves through the different test parameters specified by the user with incremental consolidation tests typically being completed in 24 to 48 hours. The Humboldt NEXT software with the HM-5100SW Consolidation module uses sample deformation readings taken from the displacement transducer and load readings from the load cell to maintain a constant applied stress or strain to the sample through the use of a digital pressure regulator. Test results are recorded and rendered in real-time on the computer screen while test data is stored and calculations are performed automatically. Humboldt's NEXT software with the HM-5100SW Consolidation module provides:

- Live test data tabulation and live graphing capabilities (real-time)
- Complete test reporting including all calculations and graphs required for testing
- Review and exporting of tests using Microsoft Excel
- Smart Test Function: automatically picks up where it left off if the test was not finished due to unexpected events within your computer

The unique design of the ConMatic IPC system enables the user to connect multiple ConMatic IPC units to a single computer and run them independently and simultaneously when connected via a LAN-network.

Controller Specifications:

| | |
|---|---|
| Display (Resistive Touch) | 7" (178mm) VGA (480 x 800) |
| Real-time test data | Graphic and tabulation |
| Processor | Dual 32-bit ARM |
| RAM | 64MB |
| Memory, non-volatile | 4GB |
| Analog to digital converter | 24 bit |
| Data acquisition | 2 Channels |
| Logging Rate | effective rate of 320 readings per second |
| Multi-test storage | 1000 |
| Points per test | 3000 |
| USB port (front) | export data, import/export calibration data, WiFi |
| USB port (back) | provides external power for wireless access point |
| Ethernet connection | for network connectivity |
| 24-bit differential analog to digital converter | 2 |
| Ambient temperature sensor | 1 |
| Firmware Update | Ethernet or flash drive |

HM-5470.3F

UPGRADE

Convert your existing Humboldt HM-2470.3F to the new HM-5470.3F, order HM-5470U.



HM-5470.3F

| Specifications: | |
|----------------------------------|---|
| Sample size | up to 4" (100mm) |
| Maximum load | 2200lbf (10kN) |
| Clearance, vertical | 8.25" (210mm) |
| Clearance, horizontal | 7.75" (197mm) |
| Maximum piston travel | 0.5" (12.7mm) |
| Dimensions (L x W x H) | 12" x 12" x 30" (305 x 305 x 762mm) |
| ConMatic IPC System Requirements | |
| AC Supply | 110/220 VAC 50/60 Hz 5 Amp |
| Air Supply | Clean and dry (air filter, water trap), minimum: 100psi (700kps) continuous air supply 10CFM (0.3m ³ /min) |

Computer Control

NEXT software and the enhanced Consolidation module, HM-5100SW, is included with the ConMatic IPC automated consolidation machine. This software provides robust machine control, calibration, data acquisition and report generation for those using a computer to control consolidation testing operations.

In addition, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, while also providing report generating capabilities using the consolidation test-specific software module.

So, whether you are controlling a single consolidation machine, controlling multiple machines, or even a complete geotechnical lab, Humboldt's NEXT software, in conjunction with Humboldt's ConMatic IPC, provides a complete solution for the acquisition, recording and presentation of consolidation testing data in data tabulation and graphic chart formats.

- Machine control, and data acquisition via networked computer
- Provides the ability to use Humboldt's Next Software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display
- Effective sampling rate of 320 readings per second
- Stores 1000 tests with up to 3000 points per test.
- Up to 255 individual tests can be run simultaneously from a single PC
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQulS, gINT, etc.

ConMatic IPC, 120/220V 50/60Hz **HM-5470.3F**
 Shipping wt. 52 lbs (23.85kg)

The HM-5470.3F ConMatic IPC Includes:

| | |
|--|-------------|
| (1) S-type load cell 2,000 lbs (10kN) with 0.75" adapter | HM-2300.020 |
| (1) Linear strain transducer, 1.0" (25mm) | HM-2310.10 |
| Controller Filter Kit | HM-200926 |
| (1) NEXT consolidation software module | HM-5100SW |

Typical HM-5470.3F Consolidation Setup:

| Part # | Description |
|---------------------------------------|-------------------------------|
| HM-5470.3F | ConMatic IPC |
| Required Components, Order Separately | |
| HM-1220.XX* | Fixed ring consolidation cell |

* XX Requires a sample size designation, see page 115 for choices

Additional Items Required

| | |
|-----------------------------------|-------------------------------|
| PC computer | not supplied |
| Refrigeration Dryer | HM-4221 |
| Desiccant Dryer, Silica Gel | HM-4222 |
| Filter/Regulator | HM-4223 |
| Consolidation Installation Kit | HM-4168 |
| 25' of 0.25" Tubing | HM-4196.25 (sold by the foot) |
| Controller Filter Kit replacement | HM-200926 |

Pneumatic Consolidation

ConMatic Pneumatic Consolidation Machine

ASTM: D2435, D4546, AASHTO: T216, BS:1377:5

Compact and easy-to-use, the HM-5432.3F pneumatic consolidation load frame is used to estimate the rate and amount of settlement anticipated for a proposed structure. The unit applies loads instantly without impact for stress-controlled consolidation testing; and, maintains the load regardless of sample compression. Its small footprint saves valuable lab counter space while maintaining its versatility by supporting fixed ring, floating ring, or permeability cells.

Features Include:

- Highly-sensitive accuracy in lower load ranges
- Integral digital readout simplifies checking applied load and setup of predetermined load
- Adjustable upper cross beam
- Instantaneous loading without impact
- Flexible load choice
- Not sensitive to shock
- Choice of English or Metric models

The HM-5432's digital readout displays applied loads with the help of precision pressure regulators and pressure transducers with a linearity of $\pm 0.1\%$. The 1" (25.4mm) thick aluminum platforms have centering pads and accept any consolidation ring up to 4.0" (100.0mm) in diameter. Stainless steel vertical rods support the cross-head and dial gauge. One HM-001076- Pressure Ball is included with the unit. Air supply tubing (25') to hook up the compressed air line is also included. The unit features a durable enamel, powder-coated steel cabinet which protects the internal components.



HM-5432.3F



UPGRADE

Convert your Humboldt HM-2432A.3F to the NEW HM-5432.3F, order HM-5432U.

Specifications:

| | |
|------------------------|-------------------------------------|
| Sample size | up to 4" (100mm) |
| Maximum load | 2200lbf (10kN) |
| Clearance, vertical | 8.25" (210mm) |
| Clearance, horizontal | 7.75" (197mm) |
| Maximum piston travel | 0.5" (12.7mm) |
| Dimensions (L x W x H) | 12" x 12" x 30" (305 x 305 x 762mm) |

ConMatic System Requirements

| | |
|------------|---|
| AC Supply | 110/220 VAC 50/60 Hz 5 Amp |
| Air Supply | Clean and dry (air filter, water trap), minimum: 100psi (700kps) continuous air supply 10CFM (0.3m ³ /min) |

The HM-5432 can be used with a standard mechanical dial gauge setup or, for data acquisition applications, it can be teamed with digital indicators or strain transducers (LSCT) and coupled to one of the Humboldt's data loggers. For additional data acquisition capabilities add Humboldt's NEXT HM-5100SW Consolidation-specific module and a computer for enhanced data acquisition and report capabilities. **The HM-5432.3F only includes the basic unit, order gauges and cells separately.**

ConMatic TSF, 120/220V 50/60Hz HM-5432.3F
ConMatic kgf/cm², 120/220V 50/60Hz HM-5432M.3F
Shipping wt. 48 lbs (21.7kg)

Typical HM-5432.3F Consolidation Setup:

| Part # | Description |
|---------------------------------------|--------------------------------|
| HM-5432.3F | ConMatic 32 TSF |
| HM-5432M.3F | ConMatic 32 Kg/cm ² |
| Required Components, Order Separately | |
| HM-1220.XX | Fixed ring consolidation cell |
| H-4471CC | Dial gauge, 0.5" X .0001" CC |
| H-4465.12CC | Dial gauge, 12 X 0.002mm CC |

* XX Requires a sample size designation, see page 115 for choices



Dead-Weight Consolidation



HM-1100A

Dead-Weight Consolidation Frame

ASTM: D2435, D4546, AASHTO: T216, BS:1377:5

Able to survive in even the harshest laboratory environments, the HM-1100A will provide you with reliable service day-in and day-out. The design features a rugged frame manufactured from aluminum with stainless steel vertical rods, horizontal cross arms and beam support rods. The load arm incorporates 9:1, 10:1, and 11:1 beam ratios for greater flexibility and loading weight requirements. Using the 10:1 ratio on 2.5" (63 mm) diameter samples, the system is capable of producing loads up to 48 tsf (4,597 kPa).

- Triple beam ratios minimize loading weight requirements
- 48 tsf (5,148 kPa) maximum load capacity
- Aluminum and stainless steel construction for corrosion resistance and long life
- Wide range of consolidation cells available in fixed ring, floating ring, permeability and back-pressure designs
- Loading weights available in both, tsf and kg versions
- **Basic unit does not include a dial indicator, order separately, see page 152.**
- The HM-1100A can also be paired with our Data Loggers with digital indicators or strain transducers (LSCT). See next page.

Dead-Weight Consolidation Frame HM-1100A



Shipping wt. 75 lb (34kg)

| Specifications | |
|-----------------------|---|
| Load Capacity | 48 tsf (4,597 kPa) |
| Beam Ratios | 9:1, 10:1 and 11:1 |
| Frame Construction | Heavy-duty aluminum frame with stainless steel vertical, horizontal and beam support rods |
| Cell Platform | Anodized aluminum with locating pins for centering cells. |
| Dimension (W x D x H) | 7.75" x 32" x 19.5" (197 x 812 x 495 mm) |
| Weight | 47 lbs. (21kg) |

Consolidation (Dead-Weight) Typical Setups:

| Part # | Description |
|-------------------------------|---|
| Dead weight consolidation | |
| HM-1100A | Dead weight consolidation frame-front load |
| HM-1120 † or HM-1123 † | Weight set, 16 TSF or Weight set, 64kg |
| HM-1220.XX* | Fixed ring consolidation cell |
| H-4471CC or H-4465.12CC | Dial gauge, 0.5" X .0001" CC or (12 x 0.002mm) CC |

† More weight choices can be found on page 117.

* XX Requires a sample size designation, see page 115 for choices



HM-1100.1

HM-1100.3

Consolidation Frame Stands

Butcher block table-top with heavy-duty, steel frame designed to provide stable mounting platform for HM-1100A consolidation frames. Consolidation frames can also be bolted to the table and the table can be bolted to floor for increased stability.

Single-Station Frame Stand

HM-1100.1

Triple-Station Frame Stand

HM-1100.3



Shipping wt. HM-1100.1: 50 lb (23kg),
HM-1100.3: 115 lb (52.1kg)

DATA ACQUISITION SETUPS FOR SEMI-AUTOMATIC AND DEAD-WEIGHT CONSOLIDATION

Data Acquisition and Control for both the HM-5432 semi-automatic consolidation machine and the HM-1100A dead-weight consolidation frame can be achieved with the use of one of Humboldt's 4-channel data loggers. The touch-screen monitor of the data logger provides test control and live test monitoring in either a stand-alone or computer-controlled configuration.

In the case of the HM-5432, pneumatic loads are controlled by manual valve controls located on the front panel of the consolidation machine. With the HM-1100A dead-weight loads are controlled by physically adding weights to the consolidation frame. With both machines, the data logger provides four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configurations or accessed through a LAN-networked computer using Humboldt's NEXT Basic software.

Stand-Alone Test Monitoring

The touch-screen controller provides you with full, graphical monitoring of testing functions in a stand-alone application. The seven-inch, water-proof screen on the Humboldt Data Loggers provides at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer, building upon Humboldt's dedication to modular, stand-alone data acquisition.

Now, in a stand-alone application, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's FRONT USB port or the data can be transferred to a computer via the LAN port.

- 4-channel data acquisition
- Hi-res, 7", waterproof, touch-screen provides total control and real-time graphical display of tests
- Machine/Test control and data acquisition via touch-screen

Computer Test Monitoring

Humboldt's NEXT Basic software can be downloaded from: <https://www.humboldtmg.com/support/software.php> for use with a Humboldt data logger and computer. This software provides basic data acquisition and report generation for those using a computer for this purpose.

In addition, you can purchase Humboldt's HM-5100SW Consolidation module for consolidation test-specific set up and monitoring of the testing function.

- Data acquisition via a networked computer
- Provides the ability to use Humboldt's NEXT Software's HM-5100SW consolidation module
- Real-time graphical chart and numerical display of tests via computer display

- Effective sampling rate of 50 readings/sec.
- Stores 1000 tests with up to 3000 points per test.

ConMatic Semi-Automatic Consolidation Machine



Humboldt Dead-weight Consolidation Frame



Analog Data Acquisition Setup

Data acquisition setup for Pneumatic consolidation using analog transducer and Logger

| | |
|---------------------------|---|
| HM-5432.3F or HM-5432M.3F | ConMatic 32 TSF or ConMatic 32 Kg/cm ² |
| HM-1220.XX* | Fixed ring consolidation cell |
| HM-2310.04 | Strain transducer 0.4" (10mm) |
| HM-2310BR | Strain transducer bracket |
| HM-5320.3F | Humboldt Logger 4 channel analog data acquisition |
| HM-5100SW | NEXT consolidation module |

Digital Data Acquisition Setup

Data acquisition setup for Pneumatic consolidation using digital indicator and Logger

| | |
|---------------------------|--|
| HM-5432.3F or HM-5432M.3F | ConMatic 32 TSF or 32 Kg/cm ² |
| HM-1220.XX* | Fixed ring consolidation cell |
| HM-4470.10 | Digital indicator 1" x .0001" (25 x 0.002 mm) |
| HM-4470C | Digital Indicator Cable, 6 ft. |
| HM-5330.3F | Humboldt Logger 4 channel digital data acquisition |
| HM-5100SW | NEXT consolidation module |

* XX Requires a sample size designation, see page 115 for choices.

Analog Data Acquisition Setup

Data acquisition setup for Dead-weight consolidation using analog transducer and Logger

| | |
|------------------------|---|
| HM-1100A | Dead weight consolidation frame |
| HM-1120 † or HM-1123 † | Weight set, 16 TSF Weight set, 64 kg |
| HM-1220.XX* | Fixed ring consolidation cell |
| HM-2310.04 | Strain transducer 0.4" (10mm) |
| HM-2310BR | Strain transducer bracket |
| HM-5320.3F | Humboldt Logger 4 channel analog data acquisition |
| HM-5100SW | NEXT consolidation module |

Digital Data Acquisition Setup

Data acquisition setup for Dead-weight consolidation using digital indicator and Logger

| | |
|--------------------|--|
| HM-1100A | Dead weight consolidation frame |
| HM-1120 or HM-1123 | Weight set, 16 TSF Weight set, 64 kg |
| HM-1220.XX* | Fixed ring consolidation cell |
| HM-4470.10 | Digital indicator 1" x .0001" (25 x 0.002 mm) |
| HM-4470C | Digital Indicator Cable, 6 ft. |
| HM-5330.3F | Humboldt Logger 4 channel digital data acquisition |
| HM-5100SW | NEXT consolidation module |

† More weight choices can be found on page 117.

Fixed Ring Consolidation Cell

ASTM: D2435, D4546, AASHTO: T216,
BS:1377:5

Complete cell assembly features stainless steel construction and self-trimming cutter ring. Cutter ring rests inside clamping ring on lower porous stone, which is larger than the sample. The top porous stone and loading pad rest on the sample. The assembly is fixed on the cell base and enclosed within an acrylic cylinder open to the atmosphere, which permits saturation of the sample. The cell comes complete with all the parts illustrated in the drawing below.

Fixed Ring Consolidation Cell

See Chart



Shipping wt. 9 lb (4kg)



| Fixed Ring Consolidation Cell | |
|-------------------------------|-------------|
| 2.0" | HM-1220.20 |
| 2.42" | HM-1220.242 |
| 2.5" | HM-1220.25 |
| 3.0" | HM-1220.30 |
| 4.0" | HM-1220.40 |
| 50mm | HM-1220.50 |
| 70mm | HM-1220.70 |
| 75mm | HM-1220.75 |
| 100mm | HM-1220.100 |

Floating Ring Consolidation Cell

ASTM: D2435, D4546, AASHTO: T216,
BS:1377:5

Complete cell assembly features stainless steel construction with self-trimming cutter ring. Similar in construction to a fixed ring cell with the exception that the lower porous stone fits inside the cutter ring and can move vertically within it. The sample ring is also free to move vertically. The cell comes complete with all the parts illustrated in the drawing below.

Floating Ring Consolidation Cell

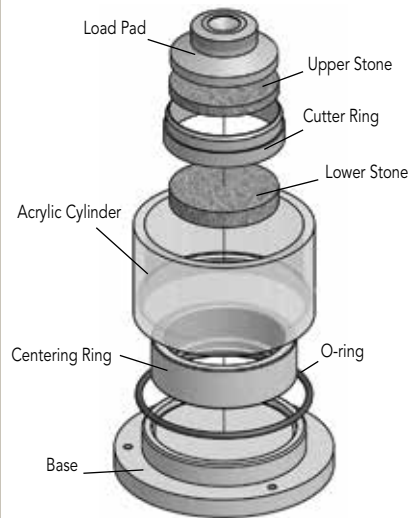
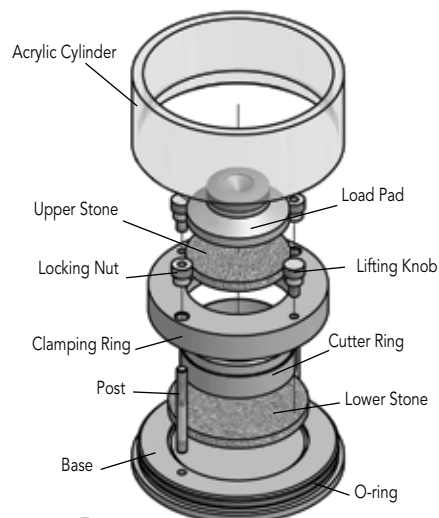
See Chart



Shipping wt. 6 lb (2.7kg)



| Floating Ring Consolidation Cell | |
|----------------------------------|-------------|
| 2.0" | HM-1210.20 |
| 2.42" | HM-1210.242 |
| 2.5" | HM-1210.25 |
| 3.0" | HM-1210.30 |
| 4.0" | HM-1210.40 |
| 50mm | HM-1210.50 |
| 70mm | HM-1210.70 |
| 75mm | HM-1210.75 |
| 100mm | HM-1210.100 |



Fixed Ring Permeability Cell

ASTM: D2435, D4546, AASHTO: T216,
BS:1377:5

Similar in construction to a fixed ring cell with the exception that the saturated sample and water are sealed from the atmosphere. Complete cell assembly features stainless steel construction and self-trimming cutter ring. Base features outlet port and 10cc pipette for monitoring water level. The cell comes complete with all the parts illustrated in the drawing below, as well as a pipette.

Fixed Ring Permeability Cell

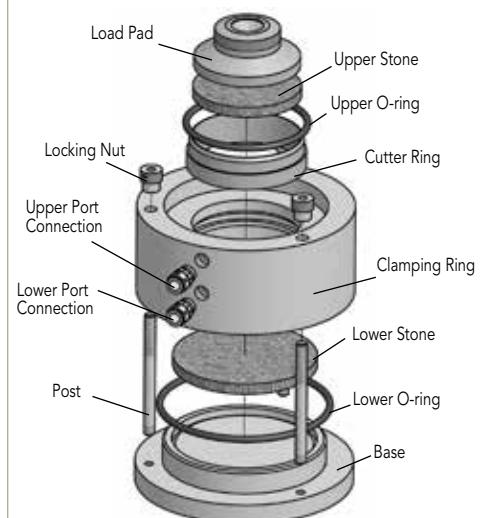
See Chart



Shipping wt. 12 lb (5.4kg)



| Fixed Ring Permeability Cell | |
|------------------------------|-------------|
| 2.0" | HM-1230.20 |
| 2.42" | HM-1230.242 |
| 2.5" | HM-1230.25 |
| 3.0" | HM-1230.30 |
| 4.0" | HM-1230.40 |
| 50mm | HM-1230.50 |
| 70mm | HM-1230.70 |
| 75mm | HM-1230.75 |
| 100mm | HM-1230.100 |



See next page for component details.



| Load Pad | |
|----------|----------------|
| 2" | HM-1220.20.10 |
| 2.42" | HM-1220.24.10 |
| 2.5" | HM-1220.25.10 |
| 3.0" | HM-1220.30.10 |
| 4.0" | HM-1220.40.10 |
| 50mm | HM-1220.50.10 |
| 70mm | HM-1220.70.10 |
| 75mm | HM-1220.75.10 |
| 100mm | HM-1220.100.10 |



| Upper Stone | |
|-------------|----------------------|
| 2" | HM-4184.1985 |
| 2.42" | HM-4184.240 |
| 2.5" | HM-1220.25.11 (stud) |
| 2.5" | HM-4184.2485 |
| 3.0" | HM-4184.2985 |
| 4.0" | HM-4184.3985 |
| 50mm | HM-4184.1955 |
| 70mm | HM-4184.274 |
| 75mm | HM-4184.2940 |
| 100mm | HM-4184.3925 |



| Lower Stone (floating) | |
|------------------------|---------------|
| 2" | HM-4184.1985T |
| 2.42" | HM-4184.240T |
| 2.5" | HM-4184.2485T |
| 3.0" | HM-4184.2985T |
| 4.0" | HM-4184.3985T |
| 50mm | HM-4184.1955T |
| 70mm | HM-4184.274T |
| 75mm | HM-4184.2940T |
| 100mm | HM-4184.3925T |



| Lower Stone (fixed, permeability) | |
|-----------------------------------|---------------|
| 2" | HM-4184.331 |
| 2.42" | HM-331 |
| 2.5" | HM-4184.331 |
| 3.0" | HM-4184.331 |
| 4.0" | HM-4184.4375T |
| 50mm | HM-4184.331 |
| 70mm | HM-4184.331 |
| 75mm | HM-4184.331 |
| 100mm | HM-4184.4375T |



| Acrylic Cylinder (fixed-floating) | |
|-----------------------------------|--------------|
| 2" | HM-1220.25.2 |
| 2.42" | HM-1220.25.2 |
| 2.5" | HM-1220.25.2 |
| 3.0" | HM-1220.25.2 |
| 4.0" | HM-1220.40.2 |
| 50mm | HM-1220.25.2 |
| 70mm | HM-1220.25.2 |
| 75mm | HM-1220.25.2 |
| 100mm | HM-1220.40.2 |



| Centering Ring (floating) | |
|---------------------------|----------------|
| 2" | HM-1210.20.12 |
| 2.42" | HM-1210.24.12 |
| 2.5" | HM-1210.25.12 |
| 3.0" | HM-1210.30.12 |
| 4.0" | HM-1210.40.12 |
| 50mm | HM-1210.50.12 |
| 70mm | HM-1210.70.12 |
| 75mm | HM-1210.75.12 |
| 100mm | HM-1210.100.12 |



| Clamping Ring (permeability) | |
|------------------------------|---------------|
| 2" | HM-1230.20.9 |
| 2.42" | HM-1230.24.9 |
| 2.5" | HM-1230.25.9 |
| 3.0" | HM-1230.30.9 |
| 4.0" | HM-1230.40.9 |
| 50mm | HM-1230.50.9 |
| 70mm | HM-1230.70.9 |
| 75mm | HM-1230.75.9 |
| 100mm | HM-1230.100.9 |



| Clamping Ring (fixed) | |
|-----------------------|---------------|
| 2" | HM-1220.20.9 |
| 2.42" | HM-1220.24.9 |
| 2.5" | HM-1220.25.9 |
| 3.0" | HM-1220.30.9 |
| 4.0" | HM-1220.40.9 |
| 50mm | HM-1220.50.9 |
| 70mm | HM-1220.70.9 |
| 75mm | HM-1220.75.9 |
| 100mm | HM-1220.100.9 |



| Base (floating/permeability) | |
|------------------------------|--------------|
| 2" | HM-1230.25.1 |
| 2.42" | HM-1230.25.1 |
| 2.5" | HM-1230.25.1 |
| 3.0" | HM-1230.25.1 |
| 4.0" | HM-1230.40.1 |
| 50mm | HM-1230.25.1 |
| 70mm | HM-1230.25.1 |
| 75mm | HM-1230.25.1 |
| 100mm | HM-1230.40.1 |



| Base (fixed) | |
|--------------|--------------|
| 2" | HM-1220.25.1 |
| 2.42" | HM-1220.25.1 |
| 2.5" | HM-1220.25.1 |
| 3.0" | HM-1220.25.1 |
| 4.0" | HM-1220.40.1 |
| 50mm | HM-1220.25.1 |
| 70mm | HM-1220.25.1 |
| 75mm | HM-1220.25.1 |
| 100mm | HM-1220.40.1 |



| Cutting Ring (all) | |
|--------------------|---------------|
| 2" | HM-1220.20.8 |
| 2.42" | HM-1220.24.8 |
| 2.5" | HM-1220.25.8 |
| 3.0" | HM-1220.30.8 |
| 4.0" | HM-1220.40.8 |
| 50mm | HM-1220.50.8 |
| 70mm | HM-1220.70.8 |
| 75mm | HM-1220.75.8 |
| 100mm | HM-1220.100.8 |



| Calibration Disk | |
|------------------|---------------|
| 2" | HM-1220.20.4 |
| 2.42" | HM-1220.24.4 |
| 2.5" | HM-1220.25.4 |
| 3.0" | HM-1220.30.4 |
| 4.0" | HM-1220.40.4 |
| 50mm | HM-1220.50.4 |
| 70mm | HM-1220.70.4 |
| 75mm | HM-1220.75.4 |
| 100mm | HM-1220.100.4 |



| Lower o-ring (floating/permeability) | |
|--------------------------------------|-----------|
| 2" | HM-003053 |
| 2.42" | HM-003053 |
| 2.5" | HM-003053 |
| 3.0" | HM-003053 |
| 4.0" | HM-003056 |
| 50mm | HM-003053 |
| 70mm | HM-003053 |
| 75mm | HM-003053 |
| 100mm | HM-003056 |



| Lower o-ring (fixed) | |
|----------------------|-----------|
| 2" | HM-003052 |
| 2.42" | HM-003052 |
| 2.5" | HM-003052 |
| 3.0" | HM-003052 |
| 4.0" | HM-003024 |
| 50mm | HM-003052 |
| 70mm | HM-003052 |
| 75mm | HM-003052 |
| 100mm | HM-003024 |



| Upper o-ring (permeability) | |
|-----------------------------|------------|
| 2" | HM-003057 |
| 2.42" | HM-003058 |
| 2.5" | HM-003054 |
| 3.0" | HM-003059 |
| 4.0" | HM-0030604 |
| 50mm | HM-003057 |
| 70mm | HM-003061 |
| 75mm | HM-003062 |
| 100mm | HM-003063 |



| Filter Paper | |
|--------------|------------|
| 2" | HM-4189.20 |
| 2.42" | HM-4189.25 |
| 2.5" | HM-4189.25 |
| 3.0" | HM-4189.30 |
| 4.0" | HM-4189.40 |
| 50mm | HM-4189.20 |
| 70mm | HM-4189.28 |
| 75mm | HM-4189.30 |
| 100mm | HM-4189.40 |



| Post | |
|------|--------------|
| ALL | HM-1220.25.3 |



| Locking Nut | |
|-------------|--------------|
| ALL | HM-1220.25.5 |



| Lifting Knob | |
|--------------|--------------|
| ALL | HM-1220.25.6 |



| 5/8" Pressure Ball (Stainless) | |
|--------------------------------|-----------|
| ALL | HM-001076 |



| Port Connection Upper (Permeability) | |
|--------------------------------------|-----------|
| ALL | HM-003027 |



| Port Connection Lower (Permeability) | |
|--------------------------------------|-----------|
| ALL | HM-003055 |



HM-1240.25

Trimming Turntable for 2.5" Specimens

Trims samples down to correct sizing.

Trimming Turntable, 2.5" Specimens HM-1240.25

Shipping wt. 5lb (2.27kg)

Shear & Consolidation Installation Kit

Kit designed to provide fittings, connectors, tubing and tools to complete an installation set up. Kit includes items in the table below. All items can be purchased individually as well, see chart to left.

Shear & Consolidation Installation Kit HM-4168

Shipping wt. 4.5 lbs (2.04kg)

| Shear & Consolidation Install Kit Components | |
|---|------------|
| .25" OD Tubing, 100ft. | HM-4196.25 |
| .375" to .25" Reducer Bushing (3) | HM-4150.77 |
| Cutter, Flexible Tubing (1) | HM-000058 |
| Thread Tape, PTFE (1) | HM-000059 |
| Wrench, Adjustable, 6" (1) | HM-000064 |
| Union T Fitting, .25" (5) | HM-4150.45 |
| Quick Valve Coupling, .25" (2) | HM-4150.72 |
| Regulator Elbow, .25" (3) | HM-4150.44 |
| Tube Fitting T, 6mm OD (5) | HM-003175 |
| Push-to-Connect Tube Fitting Coupler, .25" OD (4) | HM-003176 |



HM-4168

Weight Sets for Consolidation and Direct Shear Testing

| Weight Set | Set Includes | Model No. | Ship. Wt. |
|-------------------|---|-----------|------------------|
| 16 TSF Set | includes: (2) .125 TSF, (1) .25 TSF, (1) .50 TSF, (1) 1.0 TSF, (1) 2.0 TSF, (3) 4.0 TSF weights | HM-1120 | 140 lbs. (64kg) |
| 32 TSF Set | includes: (2) .125 TSF, (1) .25 TSF, (1) .50 TSF, (1) 1.0 TSF, (1) 2.0 TSF, (7) 4.0 TSF weights | HM-1121 | 275 lbs. (125kg) |
| 32 kg Set | includes: (4) 1 kg, (3) 4 kg, (2) 8 kg weights | HM-1122 | 73 lbs. (33.1kg) |
| 50 kg Set | includes: (3) 1 kg, (1) 2 kg, (1) 5 kg, (4) 10 kg weights | HM-1125 | 110 lbs. (50kg) |
| 64 kg Set | includes: (4) 1 kg, (5) 4 kg, (5) 8 kg weights | HM-1123 | 150 lbs. (68kg) |
| 88 kg Set | includes: (4) 1 kg, (5) 4 kg, (8) 8 kg weights | HM-1124 | 130 lbs. (59kg) |



HM-1120

Individual Weights for Consolidation and Direct Shear Testing

| Individual Weights: Kg | | Individual Weights: TSF | |
|------------------------|------------|-------------------------|-------------|
| Weight | Model No. | Weight | Model No. |
| 0.5kg | HM-1122.05 | 0.125 (1/8) | HM-1120.125 |
| 1.0kg | HM-1122.1 | 0.25 (1/4) | HM-1120.250 |
| 2.0kg | HM-1122.2 | 0.50 (1/2) | HM-1120.500 |
| 4.0kg | HM-1122.4 | 1.0 | HM-1120.1 |
| 5.0kg | HM-1122.5 | 2.0 | HM-1120.2 |
| 8.0kg | HM-1122.8 | 4.0 | HM-1120.4 |
| 10.0kg | HM-1122.10 | | |

ELITE SERIES

Automated Direct Shear

Pneumatic Direct/Residual Shear Apparatus

ASTM: D3080; AASHTO: T236, BS:1377:7

The Humboldt HM-5760 Direct/residual shear apparatus, utilizes pneumatic loading to apply vertical loads to a soil sample—eliminating the need for loading weights used in dead weight-type systems.

The HM-5760 is a microprocessor-based machine featuring a stepper-motor drive system and a 7" touch-screen display that allows the operator to control and monitor all test functions. Like all Humboldt Elite series machines, the HM-5760 is built with durable, high-quality components and features the use of a stepper motor, precision gears and gear box to ensure smooth and reliable operation, as well as precise results.

The HM-5760 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the HM-5760 to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

In stand-alone mode, the HM-5760 direct shear machine provides a 7" (178mm) touch-screen controller, giving you finger-tip control of your testing processes, as well as providing real-time, visual views of your data in both tabular and graphic formats. The waterproof, touch screen provides colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine

while the test is running. Data can then be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced HM-5700SW Direct Shear Reporting Software.

When operated from a networked computer the NEXT software provides robust machine and test control, and report generation. It also provides the ability to control and monitor multiple machines from a single computer.



NOTES

Counter-balance device for ASTM D3080 compliance. Not available anywhere else. Also available as a retrofit kit. HM-2560A.1.

The HM-5760 is supplied complete with a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, and a 0.4" (10.2mm) vertical strain transducer. Humboldt's HM-5700SW NEXT Direct Shear software module is also included.

Shear box assemblies and related accessories are not included and should be ordered separately.

Humboldt's exclusive, counter-balance device for ASTM D3080 compliance is included with the HM-5760.

Pneu. Direct/Residual Shear Apparatus HM-5760.3F

Shipping wt. 168 lb (76kg)

HM-5760.3F Specifications:

| | |
|---------------------------|---|
| Horiz. movement | 2" (50mm) Maximum |
| Horiz. shear force | 2000 lbf (10kN) |
| Vertical load | 2000 lbf (10kN) |
| Data Channels | 4 |
| Speed Range | 0.00001 to 0.49999 in./min. 0.00001 to 12.9999 mm/min. |
| Dimensions (L x D x H) | 30" x 15.5" x 22" (760 x 394 x 558mm) |
| Voltage | 110/220V 50/60Hz - 6.5amps |

Pneumatic Direct Shear System Requirements

| | |
|------------|---|
| AC Supply | 110/220 VAC 50/60 Hz 5 Amp |
| Air Supply | Clean and dry (air filter, water trap), minimum: 100psi (700kps) continuous air supply 10CFM (0.3m ³ /min) |



HM-5760.3F

| Controller Specifications: | |
|---|---|
| Display (Resistive Touch) | 7" (178mm) VGA (480 x 800) |
| Real-time test data | Graphic and tabulation |
| Processor | Dual 32-bit ARM |
| RAM | 64MB |
| Memory, non-volatile | 4GB |
| Analog to digital converter | 24 bit |
| Data acquisition | 4 Channels |
| Logging Rate | effective rate of 320 readings per second |
| Multi-test storage | 1000 |
| Points per test | 3000 |
| USB port (front) | export data, import/export calibration data, WiFi |
| USB port (back) | provides external power for wireless access point |
| Ethernet connection | for network connectivity |
| 24-bit differential analog to digital converter | 4 |
| Ambient temperature sensor | 1 |
| Firmware Update | Ethernet or flash drive |

Computer Control

NEXT software and the enhanced Direct Shear module, HM-5700SW, is included with the HM-5760 pneumatic direct-shear machine. This software provides robust machine control, data acquisition and report generation for those using a computer to control direct shear testing operations.

In addition, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, while also providing report generating capabilities using the direct shear test-specific software module.

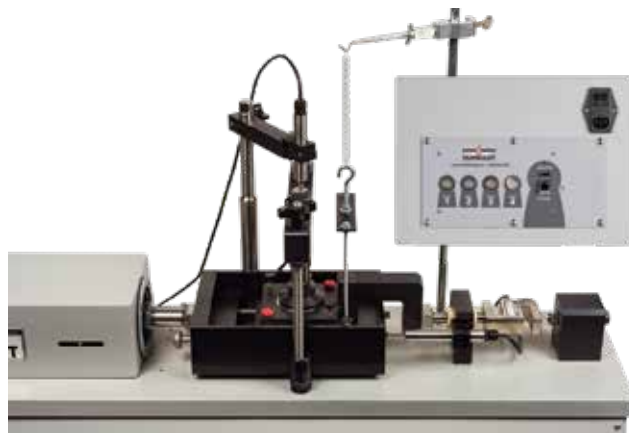
So, whether you are controlling a single direct-shear machine, controlling multiple machines, or even a complete geotechnical lab, Humboldt's NEXT software, in conjunction with Humboldt's HM-5760 Direct-shear machine, provides a complete solution for acquisition, recording and presentation of direct-shear testing data in tabular and graphic chart formats.

- Machine control, and data acquisition via a networked computer
- Provides the ability to use Humboldt's Next Software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display
- Effective sampling rate of 3250 readings per second
- Stores 1000 tests with up to 3000 points per test



Typical Test Setup for HM-5760

| Description | Part # |
|---|-----------------|
| Fully-Automatic Pneumatic Direct Shear (includes a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, and a 0.4" (10.2mm) vertical strain transducer) | HM-5760.3F |
| NEXT Direct Shear software module (included with HM-5760) | HM-5700SW |
| Shear box assembly (specify size) | HM-2751.XX(S/D) |
| Shear box cutter (specify size) | HM-2702.XX(S/D) |
| Dolly/tamper (specify size) | HM-2703.XX(S/D) |
| * XX Requires a sample size designation, see page 125 for choices | |
| Additional Items Required | |
| PC computer | not supplied |
| Refrigeration Dryer | HM-4221 |
| Desiccant Dryer, Silica Gel | HM-4222 |
| Filter/Regulator | HM-4223 |
| Direct Shear/Consolidation Installation Kit | HM-4168 |



- Up to 255 individual tests can be run simultaneously from a single PC
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQulS, gINT, etc.

Semi-Automated Direct Shear

Pneumatic Direct/Residual Shear Apparatus

ASTM: D3080; AASHTO: T236, BS:1377:7

The HM-5755 is a semi-automatic pneumatic loading machine, which with its touch-screen monitor provides test control and live test monitoring in either a stand-alone or computer-controlled configuration. With the HM-5755, pneumatic loads are controlled by manual valve controls located on the front panel for easy use. The HM-5755 also provides four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configurations or accessed through a LAN-networked computer using Humboldt's Next Software.

In stand-alone mode, the HM-5755 direct shear machine provides a 7" (178mm) touch-screen controller, giving you finger-tip control of your testing processes, as well as providing real-time, visual views of your data in both tabular and graphic formats. These new waterproof, touch screens provide colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine while the test is running. Data can then be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced HM-5700SW Direct Shear software module.

When operated from a networked computer the NEXT software provides robust machine and test

control, and report generation. It also allows the ability to control and monitor multiple machines from a single computer.

The HM-5755 is supplied complete with a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, a 0.4" (10.2mm) vertical strain transducer and Humboldt's NEXT software. Shear box assemblies, **Humboldt's NEXT Direct Shear module and related accessories are not included and should be ordered separately.**

Pneumatic Direct/Residual Shear HM-5755.3F
Shipping wt. 200 lb (90.7kg)



NOTES

Counter-balance device for ASTM D3080 compliance. Not available anywhere else. Also available as a retrofit kit. HM-2560A.1

HM-5755.3F Specifications:

| | |
|---------------------------|---|
| Horiz. movement | 1" (25.4mm) maximum |
| Horiz. shear force | 2000 lbf (10kN) |
| Vertical load | 2000 lbf (10kN) |
| Data Channels | 4 |
| Speed Range | 0.00001 to 0.49999 in./min. 0.00001 to 12.9999 mm/min. |
| Voltage | 110/220 VAC 50/60HZ |
| Current | 6.5 amps |
| Dimensions (L x D x H) | 30" x 15.5" x 22" (760 x 394 x 558mm) |

Pneumatic Direct Shear System Requirements

| | |
|------------|---|
| AC Supply | 110/220 VAC 50/60 Hz 5 Amp |
| Air Supply | Clean and dry (air filter, water trap), minimum: 100psi (700kps) continuous air supply 10CFM (0.3m ³ /min) |



NOTES

This machine does not include HM-5700SW Software, order separately.



HM-5755.3F

| Controller Specifications: | |
|---|---|
| Display (Resistive Touch) | 7" (178mm) VGA (480 x 800) |
| Real-time test data | Graphic and tabulation |
| Processor | Dual 32-bit ARM |
| RAM | 64MB |
| Memory, non-volatile | 4GB |
| Analog to digital converter | 24 bit |
| Data acquisition | 4 Channels |
| Logging Rate | effective rate of 320 readings per second |
| Multi-test storage | 1000 |
| Points per test | 3000 |
| USB port (front) | export data, import/export calibration data, WiFi |
| USB port (back) | provides external power for wireless access point |
| Ethernet connection | for network connectivity |
| 24-bit differential analog to digital converter | 4 |
| Ambient temperature sensor | 1 |
| Firmware Update | flash drive |

Computer Control

NEXT software and the enhanced Direct Shear module, HM-5700SW, can be used to enhance the operation of the HM-5755 Semi-automated direct-shear machine. This software provides robust machine control, data acquisition and report generation for those using a computer to control consolidation testing operations. However, pneumatic loads are still controlled by the manual valve controls located on the front panel.

In addition, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, while also providing report generating capabilities using the consolidation test-specific software module.

So, whether you are controlling a single direct-shear machine, controlling multiple machines, or even a complete geotechnical lab, Humboldt's NEXT software, in conjunction with Humboldt's HM-5760 Direct-shear machine, provides a complete solution for the calibration, acquisition, recording and presentation of direct-shear testing data in data tabulation and graphic chart formats.

- Machine control, and data acquisition via a networked computer
- Provides the ability to use Humboldt's Next Software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display



Typical Test Setup for HM-5760

| Description | Part # |
|--|------------------|
| Pneumatic Direct Shear with analog inputs (includes a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, and a 0.4" (10.2mm) vertical strain transducer) | HM-5755.3F |
| NEXT Direct Shear software module | HM-5700SW |
| Shear box assembly (specify size) | HM-2751.XX(S/D)* |
| Shear box cutter (specify size) | HM-2702.XX(S/D)* |
| Dolly/tamper (specify size) | HM-2703.XX(S/D)* |
| Additional Items Required | |
| PC computer | not supplied |
| Refrigeration Dryer | HM-4221 |
| Desiccant Dryer, Silica Gel | HM-4222 |
| Filter/Regulator | HM-4223 |
| Direct Shear/Consolidation Installation Kit | HM-4168 |

* XX Requires a sample size designation, see page 125 for choices and (S/D) refers to square or round sample.



- Effective sampling rate of 320 readings per second
- Stores 1000 tests with up to 3000 points per test.
- Up to 255 individual tests can be run simultaneously from a single PC
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQUIS, gINT, etc.

Dead-Weight Direct Shear



NOTES

Counter-balance device for ASTM D3080 compliance. Not available anywhere else. Also available as a retrofit kit. HM-2560A.1



The HM-5750 Series of Dead-weight Direct-shear machines, come in three configurations — analog, digital and manual gauge measuring devices. These machines feature Humboldt's touch-screen monitor for test control. In addition, Models HM-5750A and HM-5750D provide three (3) integral and indepen-

dent data acquisition channels, which can be utilized in stand-alone configurations or accessed through a LAN-networked computer using Humboldt's Next Software for control and data collection.


Direct/Residual Shear Apparatus, Analog

ASTM: D3080; AASHTO: T236, BS:1377:7

The HM-5750A Direct Shear machine is an economical choice for performing direct/residual shear tests utilizing the dead-weight method and analog measuring devices. The microprocessor-based system features a stepper-motor drive system and a 7" touch-screen display that allows the operator to control and monitor all test functions.

Like all Elite Series machines, the HM-5750A is built around Humboldt's integral, multi-channel data logger with touch-screen control, which allows the HM-5750A to be used as a stand-alone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network. The carriage accepts shear boxes up to 4.0" (100mm) internal dimension. Forward and reverse measurements permit residual shear testing as standard. A built-in safety feature prevents the overloading of the load measuring system.

The HM-5750A is supplied complete with a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, and a 0.4" (10.2mm) vertical strain transducer. Shear box assemblies and related accessories are not included and should be ordered separately. (See page 125)

Direct Shear Apparatus, Analog **HM-5750A.3F**
 Shipping wt. 330 lb (149kg)

Direct/Residual Shear Apparatus, Digital

ASTM: D3080; AASHTO: T236, BS:1377:7

The HM-5750D Direct Shear machine is an economical choice for performing direct/residual shear tests utilizing the dead-weight method and digital measuring devices. The microprocessor-based system features a stepper-motor drive system and a 7" touch-screen display that allows the operator to control and monitor all test functions.

Like all Elite Series machines, the HM-5750D is built around Humboldt's integral, multi-channel data logger with touch-screen control, which allows the HM-5750D to be used as a stand-alone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network. The carriage accepts shear boxes up to 4.0" (100mm) internal dimension. Forward and reverse measurements permit residual shear testing as standard. A built-in safety feature prevents the overloading of the load measuring system.

The HM-5750D is supplied complete with a 2,200 lbf (10kN) capacity load ring and two 1.0" x 0.0001" (25.40 x 0.002mm) digital indicators. Shear box assemblies and related accessories are not included and should be ordered separately. (See page 125)

Direct Shear Apparatus, Digital **HM-5750D.3F**
 Shipping wt. 330 lb (136kg)

Direct/Residual Shear Apparatus, Manual

ASTM: D3080; AASHTO: T236, BS:1377:7

The HM-5750 and HM-5750M Direct Shear machines are an economical choice for performing direct/residual shear tests utilizing the dead-weight method with load rings and dial gauges.

These models include the carriage, stand, vertical load hanger and a balanced lever loading arm with a 10:1 ratio that reduces the weight required to perform tests. The micro-processor-based system features a stepper motor drive system and 7" touch-screen display.

The carriage accepts shear boxes up to 4.0" (100mm) internal dimension. Forward and reverse measurements permit residual shear testing as standard. A built-in safety feature prevents the over travel of the load measuring system.

The HM-5750 and HM-5750M are supplied complete with a 2,000 lbf (10kN) capacity load ring, 1.0" x 0.001" (25.4 x 0.01mm) and 0.5" x 0.0001" (12 x 0.002mm) dial indicator. Shear box assemblies and related accessories are not included and should be ordered separately. (See page 125)

Direct Shear Apparatus, Manual **HM-5750.3F**
 Direct Shear Apparatus, Manual Metric **HM-5750M.3F**



Shipping wt. 300 lb (149kg)



NOTES

The machines on this page do not include HM-5700SW Software.

Dead-Weight Direct Shear

| Specifications: | HM-5750A | HM-5750D | HM-5750 | HM-5750M |
|------------------------|--|---|---------|----------|
| Horizontal movement | 2" (50mm) Maximum | | | |
| Horizontal shear force | 2000 lbf (10kN) | | | |
| Vertical load | 2000 lbf (10kN) | | | |
| Data Channels | 3 | 3 | 0 | 0 |
| Speed Range | 0.00001 to 0.49999 in./min. (0.00001 to 12.9999 mm/min.) | | | |
| Data storage | 1000 tests and up to 3000 readings per test | 1000 tests and up to 3000 readings per test | — | — |
| Dimensions (L x D x H) | 40" x 10" x 45" (1016 x 254 x 1143mm) | | | |
| Voltage | 110/220V 50/60Hz - 6.5amps | | | |

Typical Test Setup for HM-5750A

| Part # | Description |
|---------------------------|--|
| HM-5750A.3F | Dead-weight Direct Shear with analog inputs (includes a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, and a 0.4" (10.2mm) vertical strain transducer) |
| HM-5700SW | NEXT Direct Shear software module |
| HM-1120 † or HM-1125 † | 16 TSF or 50 kg weight set |
| HM-2751.XX(S/D)* | Shear box assembly |
| HM-2702.XX(S/D)* | Shear box cutter |
| HM-2703.XX(S/D)* | Dolly/tamper |



Typical Test Setup for -

| Part # | Description |
|---------------------------|--|
| HM-5750D.3F | Dead-weight Direct Shear with digital inputs (a 2,200 lbf (10kN) capacity load ring and two 1.0" x 0.0001" (25.40 x 0.002mm) digital indicators) |
| HM-5700SW | NEXT Direct Shear software module |
| HM-1120 † or HM-1125 † | 16 TSF or 50 kg weight set |
| HM-2751.XX(S/D)* | Shear box assembly |
| HM-2702.XX(S/D)* | Shear box cutter |
| HM-2703.XX(S/D)* | Dolly/tamper |



Typical Test Setup for HM-5750 & HM-5750M

| Part # | Description |
|---------------------------------|---|
| HM-5750.3F or HM-5750M.3F | Dead-weight Direct Shear with load ring (a 2,200 lbf (10kN) capacity load ring, 1.0" x 0.001" (25.4 x 0.01mm) and 0.5" x 0.0001" (12 x 0.002mm) dial indicator) |
| HM-1120 † or HM-1125 † | 16 TSF or 50 kg weight set |
| HM-2751.XX(S/D)* | Shear box assembly |
| HM-2702.XX(S/D)* | Shear box cutter |
| HM-2703.XX(S/D)* | Dolly/tamper |



† More weight choices can be found on page 117.

* XX Requires a sample size designation, see page 125 for choices and (S/D) refers to square or round sample.



proof screen on these Direct Shear machines provides at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer, building upon Humboldt's dedication to modular, stand-alone data acquisition.

Now, in a stand-alone application, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's FRONT USB port or the data can be transferred to a computer via the LAN port.

- 3-channel data acquisition
- Hi-res, 7", waterproof, touch-screen provides total control and real-time graphical display of tests
- Machine/Test control and data acquisition via touch-screen

Humboldt's HM-5750A and HM-5750D Dead-weight Direct Shear machines provide test control and live test monitoring in either a stand-alone or computer-controlled configuration. While weights must still be loaded manually, the rest of the operation can be directed from the touch-screen monitor or a networked computer.

Stand-Alone Test Monitoring

The touch-screen controller provides you with full, graphical monitoring of testing functions in a stand-alone application. The seven-inch, water



Individual Weights for Consolidation and Direct Shear Testing

| Individual Weights: Kg | |
|------------------------|------------|
| Weight | Model No. |
| 0.5kg | HM-1122.05 |
| 1.0kg | HM-1122.1 |
| 2.0kg | HM-1122.2 |
| 4.0kg | HM-1122.4 |
| 5.0kg | HM-1122.5 |
| 8.0kg | HM-1122.8 |
| 10.0kg | HM-1122.10 |

| Individual Weights: TSF | |
|-------------------------|-------------|
| Weight | Model No. |
| 0.125 (1/8) | HM-1120.125 |
| 0.25 (1/4) | HM-1120.250 |
| 0.50 (1/2) | HM-1120.500 |
| 1.0 | HM-1120.1 |
| 2.0 | HM-1120.2 |
| 4.0 | HM-1120.4 |

Weight Sets for Consolidation and Direct Shear Testing

| Weight Set | Set Includes | Model No. | Ship. Wt. |
|------------|---|-----------|------------------|
| 16 TSF Set | includes: (2) .125 TSF, (1) .25 TSF, (1) .50 TSF, (1) 1.0 TSF, (1) 2.0 TSF, (3) 4.0 TSF weights | HM-1120 | 140 lbs. (64kg) |
| 32 TSF Set | includes: (2) .125 TSF, (1) .25 TSF, (1) .50 TSF, (1) 1.0 TSF, (1) 2.0 TSF, (7) 4.0 TSF weights | HM-1121 | 275 lbs. (125kg) |
| 32 kg Set | includes: (4) 1 kg, (3) 4 kg, (2) 8 kg weights | HM-1122 | 73 lbs. (33.1kg) |
| 50 kg Set | includes: (3) 1 kg, (1) 2 kg, (1) 5 kg, (4) 10 kg weights | HM-1125 | 110 lbs. (50kg) |
| 64 kg Set | includes: (4) 1 kg, (5) 4 kg, (5) 8 kg weights | HM-1123 | 150 lbs. (68kg) |
| 88 kg Set | includes: (4) 1 kg, (5) 4 kg, (8) 8 kg weights | HM-1124 | 130 lbs. (59kg) |

Controller Specifications:

| | |
|---|---|
| Display (Resistive Touch) | 7" (178mm) VGA (480 x 800) |
| Real-time test data | Graphic and tabulation |
| Processor | Dual 32-bit ARM |
| RAM | 64MB |
| Memory, non-volatile | 4GB |
| Analog to digital converter | 24 bit |
| Data acquisition | 3 Channels |
| Logging Rate | effective rate of 320 readings per second |
| Multi-test storage | 1000 |
| Points per test | 3000 |
| USB port (front) | export data, import/export calibration data, WiFi |
| USB port (back) | provides external power for wireless access point |
| Ethernet connection | for network connectivity |
| 24-bit differential analog to digital converter | 4 |
| Ambient temperature sensor | 1 |
| Firmware Update | flash drive |

Computer Test Monitoring

Humboldt's NEXT Basic software can be downloaded from: <https://www.humboldtmg.com/support/software.php> for use with these Humboldt Direct Shear machines. This software provides basic data acquisition and report generation for those using a computer for this purpose.

In addition, you can purchase Humboldt's HM-5700SW Direct Shear module for direct shear test-specific set up and monitoring of the testing function, as well as advanced test reporting capabilities.

Shear Box Assemblies for HM-5760, HM-5755, HM-5750

| Size | Square | Round |
|-------|--------------|--------------|
| 2.0" | HM-2751.20S | HM-2751.20D |
| 2.42" | HM-2751.24S | HM-2751.24D |
| 2.5" | HM-2751.25S | HM-2751.25D |
| 4.0" | HM-2751.40S | HM-2751.40D |
| 50mm | HM-2751.50S | HM-2751.50D |
| 60mm | HM-2751.60S | HM-2751.60D |
| 100mm | HM-2751.100S | HM-2751.100D |



HM-2751.25D



HM-2751.60S

NOTES

Shearbox assemblies include: sample box, (2) porous plates, (1) loading pad, and (1) grid plate. All shearboxes feature mounting screws for use with the HM-2750 ASTM D3080-compliant counter-balance device.



HM-2703 .25S



HM-2703 .25D



HM-2702.S



HM-2702.25D



HM-1220.25S



HM-1220.25D



HM-2704.25S



HM-2704.25D

| Dolly Tamper | | |
|--------------|--------------|--------------|
| | Square | Round |
| 2" | HM-2703.20S | HM-2703.20D |
| 2.42" | HM-2703.24S | HM-2703.24D |
| 2.5" | HM-2703.25S | HM-2703.25D |
| 4.0" | HM-2703.40S | HM-2703.40D |
| 50mm | HM-2703.50S | HM-2703.50D |
| 60mm | HM-2703.60S | HM-2703.60D |
| 100mm | HM-2703.100S | HM-2703.100D |

| Cutter | | |
|--------|--------------|--------------|
| | Square | Round |
| 2" | HM-2702.20S | HM-2702.20D |
| 2.42" | HM-2702.20S | HM-2702.24D |
| 2.5" | HM-2702.20S | HM-2702.25D |
| 4.0" | HM-2702.40S | HM-2702.40D |
| 50mm | HM-2702.50S | HM-2702.50D |
| 60mm | HM-2702.60S | HM-2702.60D |
| 100mm | HM-2702.100S | HM-2702.100D |

| Calibration Disk | | |
|------------------|--------------|--------------|
| | Square | Round |
| 2" | HM-1220.20S | HM-1220.20D |
| 2.42" | HM-1220.24S | HM-1220.24D |
| 2.5" | HM-1220.25S | HM-1220.25D |
| 4.0" | HM-1220.40S | HM-1220.40D |
| 50mm | HM-1220.50S | HM-1220.50D |
| 60mm | HM-1220.60S | HM-1220.60D |
| 100mm | HM-1220.100S | HM-1220.100D |

| Porous Plate | | |
|--------------|--------------|--------------|
| | Square | Round |
| 2" | HM-2704.20S | HM-2704.20D |
| 2.42" | HM-2704.24S | HM-2704.24D |
| 2.5" | HM-2704.25S | HM-2704.25D |
| 4.0" | HM-2704.40S | HM-2704.40D |
| 50mm | HM-2704.50S | HM-2704.50D |
| 60mm | HM-2704.60S | HM-2704.60D |
| 100mm | HM-2704.100S | HM-2704.100D |



HM-001076



HM-003274



HM-003275A

Installation and Spare Parts Kit HM-4168:

Direct Shear Installation and Spare Parts Kit provides tubing, fasteners and tools to complete an installation of pneumatic direct shear equipment.

Installation and Spare Parts Kit

HM-4168

5 lb (2.3kg)



HM-4168

| Accessory | Model |
|---|------------|
| Replacement Pressure Ball 5/8" 440 Stainless Steel | HM-001076 |
| Screw, Black Head | HM-003274 |
| Screw, Red Head* | HM-003275A |

*Red Head Screws are used to hold the shear box together and are made with plastic heads, which will shear off before shear box can be damaged.

ELITE SERIES Load Frames



Elite Series Load Frames

ASTM D1883, D2850, D2166, D4767 and D1559; AASHTO T193, T296, T297, T208, T245 and T246; BS 1377: Part 4, BS 1377 Part 7, BS 1377 Part 8, BS 598 Part 107

Humboldt's Elite Series Load Frames provide the materials testing lab with a choice of three, highly-versatile and precision-built loading systems covering a range of testing applications. The HM-5030 is the workhorse of the group, capable of handling any testing need up to 50kN or 11,000 lbf. The HM-5020 is a machine designed specifically for triaxial

testing and other testing requirements up to 15kN or 3,000 lbf. and, the HM-5040, is a heavy-duty machine capable of handling testing requirements up to 100kN or 22,000 lbf.

These machines provide four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configurations or accessed through a LAN-networked computer using Humboldt's Next Software.

Elite Series load frames are built with durable, high-quality components and feature the use of a stepper motor, precision gears and gear box to ensure smooth and reliable operation, as well as precise results.

In stand-alone mode, these load frames provide a 7" (178mm) touch-screen controller. These new waterproof, touch screens provide colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine while the test is running. Data can then be downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced test-specific modules.



NOTES

Elite Series load frames are sold as load frames only though shown here with typical triaxial setups.



HM-5020 TRIAXIAL LOADER

| | |
|----------------------|---|
| Load capacity | 3000 lbf (15kN) |
| Speed Range Testing: | 0.00001 – 2.00000 in/min (0.00001 – 50.80000 mm/min) |
| Fast Approach: | 2.1 in/min (55.0 mm/min) |
| Data channels | 4 |
| Platen Size / Travel | 10" (254mm) / 4" (100mm) |
| Data storage | 1000 tests and up to 3000 readings per test |
| Clearance, vertical | 27" (686mm) |
| Clearance, horiz. | 11" (286mm) |
| Voltage | 110/220V 50/60Hz. 5.0 amps |

A small-footprint, triaxial-specific load frame that provides the versatility, precision and durability found throughout Humboldt's Elite Series load frames.

The HM-5020 Triaxial Loader has been specifically designed to handle triaxial testing applications, including: UU, CU and CD triaxial and UC. From educational institutions and consulting firms to high-volume commercial labs and construction projects, the Triaxial Loader can handle any application with ease. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5020 to perform any tests required up to its load capacity of 3000 lbf (15kN).

Like all Elite Series load frames, the HM-5020 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

Triaxial Loader, 110/220V 50/60 Hz **HM-5020.3F**



Shipping wt. 120 lb (54kg)



HM-5030 MASTER LOADER

| | |
|----------------------|---|
| Load capacity | 11000 lbf (50kN) |
| Speed Range Testing: | 0.00001 – 2.00000 in/min (0.00001 – 50.80000 mm/min) |
| Fast Approach: | 3.0 in/min (75.0 mm/min) |
| Data channels | 4 |
| Platen Size / Travel | 10" (254mm) / 4" (100mm) |
| Data storage | 1000 tests and up to 3000 readings per test |
| Clearance, vertical | 40" (1000mm) |
| Clearance, horiz. | 15" (380mm) |
| Voltage | 110/220V 50/60Hz. 5.0 amps |

Designed for applications requiring multi-purpose loading systems, such as road construction projects in either mobile or fixed labs, educational institutions and consulting firms, the HM-5030 Master Loader is ideal for just about any application from road construction to high-volume commercial and educational laboratories.

While the HM-5030 has been specifically designed for soil testing labs conducting multiple testing operations including: UU, CU and CD triaxial, UC, CBR and LBR. It is also perfect for running Marshall, Hveem, TSR and SCB asphalt tests as well. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5030 to perform any tests required up to its load capacity of 11000 lbf (50kN).

Like all Elite Series load frames, the HM-5030 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

Master Loader, 110/220V 50/60 Hz **HM-5030.3F**



Shipping wt. 300 lb (136kg)



HM-5040 GRAND LOADER

| | |
|----------------------|---|
| Load capacity | 22000 lbf (100kN) |
| Speed Range Testing: | 0.00001 – 0.49999 in/min (0.00001 – 12.50000 mm/min) |
| Fast Approach: | 0.5 in/min (12.5 mm/min) |
| Data channels | 4 |
| Platen Size / Travel | 10" (254mm) / 4" (100mm) |
| Data storage | 1000 tests and up to 3000 readings per test |
| Clearance, vertical | 44" (1100mm) |
| Clearance, horiz. | 21" (540mm) |
| Voltage | 110/220V 50/60Hz. 5.0 amps |

The HM-5040 Grand Loader is ideal for just about any application from road construction to high-volume commercial and educational laboratories, which require higher pressure loading capacities up to 22000 lbf (100kN), such as those involving larger sized samples and samples comprised of rock and rock/soil mixtures. Its wider stance and large vertical and horizontal clearances allows it to accommodate much larger sample-size cells.

Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5040 to perform any tests required up to its load capacity of 22000 lbf (100kN).

Like all Elite Series load frames, the HM-5040 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer. The HM-5040 includes a storage base with casters.

Grand Loader, 110/220V 50/60 Hz **HM-5040.3F**



Shipping wt. 725 lb (329kg)

ELITE SERIES Load Frames



Choose: Stand-Alone or Computer Control

Stand-Alone Control

Humboldt's touch-screen controller provides you with full, graphical monitoring of all testing functions in a stand-alone application, while maintaining full computer control when desired.

Now you can have full, finger-tip control and monitoring of all testing functions with Humboldt's touch-screen controller, found on Humboldt's Elite Series Load Frames. This seven-inch, waterproof screen provides at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer, building upon Humboldt's dedication to modular, stand-alone data acquisition.

Now, in a stand-alone application, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's FRONT USB port or the data can be transferred to a computer via the LAN port.

A second USB port located on the back of the machine can also be used to power a wireless access point, which can provide a wireless hook-up with a computer, if no LAN is available.

Touch-Screen Controller Provides:

- 4-channel data acquisition
- Hi-res, 7", waterproof, touch-screen provides total control and real-time graphical display of tests
- Machine/Test control and data acquisition via touch-screen
- Control all channels at the same time
- Calibration of channels to load cell and transducer
- Real-time graphical chart and numerical display of tests via touch-screen display
- Effective sampling rate of 50 readings per second
- Stores up to 1000 tests with 3000 points per test
- 2 USB ports. One in front for data transfer and the rear port is for powering a wireless access point.

Computer Control

Humboldt's Next software is included with the all Elite Series Load Frames. This software provides robust machine control, data acquisition and report generation for those using a computer to control testing operations.

In addition, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, while also providing report generating capabilities using NEXT software and the test-specific software modules.

So, whether you are controlling a single load frame, controlling multiple machines or even a complete geotechnical lab, Humboldt's NEXT software, in conjunction with Humboldt's Elite Series Load Frames provide a complete solution for acquisition, recording and presentation of testing data in data tabulation and graphic chart formats.

- Machine control, and data acquisition via networked computer
- Provides the ability to use Next Software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display
- Effective sampling rate of 50 readings per second
- Stores 1000 tests with up to 3000 points per test.
- Up to 255 individual tests can be run simultaneously from a single PC
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQuIS, gINT, etc.

Typical Test Setups with HM-5030

Controller Specifications

Specifications for the touch-screen controller, instrumentation and data acquisition used with Humboldt Elite series load frames.

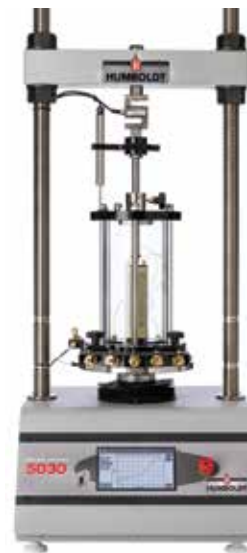
| Controller Specifications: | |
|---|---|
| Display (Resistive Touch) | 7" (178mm) VGA (480 x 800) |
| Real-time test data | Graphic and tabulation |
| Processor | Dual 32-bit ARM |
| RAM | 64MB |
| Memory, non-volatile | 4GB |
| Analog to digital converter | 24 bit |
| Data acquisition | 4 Channels |
| Logging Rate | effective rate of 320 readings per second |
| Multi-test storage | 1000 |
| Points per test | 3000 |
| USB port (front) | export data, import/export calibration data, WiFi |
| USB port (back) | provides external power for wireless access point |
| Ethernet connection | for network connectivity |
| Emergency stop | Large button |
| 24-bit differential analog to digital converter | 4 |
| Ambient temperature sensor | 1 |
| Limit switches | 2 |
| Firmware Update | flash drive |



CBR/LBR



Unconfined Compression



Consolidated Drained and Undrained



Unconsolidated Undrained



Marshall



Semi-Circular Bending



HM-2850.3F

HM-2850 load frame shown with optional components for conducting CU Triaxial tests.

| Specifications | |
|------------------------|---|
| Load capacity | 11000 lbf (50kN) |
| Speed range | .00001 - 2.00000 in/min. .00001 - 50.80000 mm/min. |
| Platen Size / Travel | 8" (203mm) / 4" (100mm) |
| Clearance, vertical | 40" (1000mm) |
| Clearance, horiz. | 11" (279mm) |
| Dimensions (l x w x h) | 17 x 22 x 51 inch (432 x 559 x 1295mm) |
| Voltage | 110/220V 50/60Hz. 5.0 amps |

Multi-Speed Load Frame

ASTM: D1883, D2850, D2166, D4767, and D1559; AASHTO: T193, T296, T297, T208, T245, and T246; BS 1377: Part 4: 1990, BS 1377: Part 7: 1990, BS 1377: Part 8: 1990, BS 598: Part 107

The HM-2850 Multi-speed Load Frame is designed for those who want a high-quality, but simple, multi-purpose load frame without built-in data acquisition capabilities. The HM-2850 is ideal for applications where the operator is either not concerned with data acquisition; or, already has or is planning to construct their own data acquisition system. With its large 7" color, touchscreen, the HM-2850 provides the operator with the ability to precisely select any speed with four decimal accuracy within the machine's speed range.

The HM-2850 features a quiet, direct drive stepper motor that provides a range of loading speeds from 0.00001 to 2.00000 in/min. This speed range is more than adequate for the majority of standard soil tests. The HM-2850 also incorporates a separate, dedicated control to accommodate 2.00 in/min. for use in Marshall and TSR Testing, as well as a rapid travel speed of 2.25 in/min for moving the platen into position quickly. Speeds are controlled through the use of edit keys and the digital display.

Multi-Speed Load Frame, 110/220V 50/60 Hz HM-2850.3F
Shipping wt. 300 lb (136kg)

Features Include:

- 8" platen provides roomy, stable base for test equipment
- User selectable unit change from touchscreen between U.S. Standard and Metric units.

Multi-Speed Load Frame— HM-2850.3F

Includes:
3/4-16 HHG531/2
WF04—Washer

CU/UU Triaxial Setup with HM-2850

| Components | Item |
|--|---------------------------|
| Load | |
| 50kN (11240 lbf) capacity | HM-2850.3F |
| Strain | |
| Load ring 2,200 lbf (10 kN) | H-4454.020 |
| Dial gauge 2.0" travel, 0.001" divisions) | H-4463 |
| Pore pressure transducer | HM-4170 |
| Ball seat adapter | HM-200387 |
| Single channel readout (choose) | HM-2350 HM-2350.4F |
| Pressure | |
| Pressure distribution panel for CU triaxial (choose) | HM-4150.3F HM-4150M.3F |
| Pressure distribution panel for UU triaxial (choose) | HM-4140.3F HM-4140M.3F |
| De-airing system | HM-4187A.3F |
| Vacuum pump (choose) | H-1763A H-1763A.4F |
| Triaxial Cell (choose 1 below) | |
| 3" / 75mm dia. capacity | HM-4199B |
| 4" / 100mm dia. capacity | HM-4199B-4 |
| Top Cap/ Base Pedestal Set (specify specimen size) | HM-4199.XX |

Unconfined Compression Setup with HM-2850

| Components | |
|---|--------------|
| Load | |
| 50kN (11240 lbf) capacity | HM-2850.3F |
| Upper unconfined platen | HM-2002 |
| Displacement Contact Assembly | HM-3000.10.5 |
| Load ring 500 lbf (2.5 kN) | H-4454.005 |
| Dial gauge 2.0" travel 0.001" divisions | H-4463 |

Typical Soil Cement Setup

| Components | |
|-----------------------------|------------|
| Load | |
| 50kN (11240 lbf) capacity | HM-2850.3F |
| Upper swivel platen | HM-2003E |
| Strain | |
| Load ring 5,000 lbf (25 kN) | H-4454.050 |



HM-4199B



HM-4699B-4



HM-4199B-6



HM-5199B-4

Standard Triaxial Cell

The Standard Triaxial Cell is available for use with sample sizes from 1.4" (35mm) to 2.8" (71mm). The clear acrylic chamber has a working pressure of 150 psi (1,000 kPa) and is tested to 250 psi (1,700 kPa). The design features a solid base, which provides an extremely stable test platform making it faster and easier to center the cell on the load frame platen—reducing setup times. HM-4199B cells provide easy access to the test chamber by utilizing a one-piece, chamber unit that is quickly removed through the removal of three easy-turn knobs. These cells also have an integral de-airing block for the pore pressure transducer built into the side. The cells have five no-volume-change valves aligned on one side for maximum convenience. Two valves handle top drainage, two valves handle bottom drainage, and one valve handles filling and drainage, as well as providing confining pressure to the cell. The removable base pedestal accommodates various sample diameters. Top caps and base pedestals are available in black-anodized aluminum or stainless steel in various sizes (see chart below). Other sizes are available. The cell top and base are precision machined from 6061 T6 aluminum, black anodized for a durable finish. A .625" hardened stainless steel piston runs inside a linear bearing to reduce friction. Choice of brass or stainless steel valve fittings is also available (stainless steel for use with hazardous materials).

Standard Triaxial Cell, up to 3.0" (75mm) HM-4199B
15 lb (7kg)

High-Pressure Triaxial Cell, up to 4" (100mm)

This High-Pressure Triaxial Cell is designed for use in testing samples of up to 4" (100mm) samples in high-pressure applications of up to 500psi or 3500 ICPA. Construction is similar to our Standard Triaxial cells, but includes 4 metal bands to maintain the integrity of the test chamber.

High-Pressure Triaxial Cell, 4" (100mm) HM-4699B-4
Stainless Version Cell, 4" (100mm) HM-4699BSS-4
35 lb (16kg)

Standard Triaxial Cell 6" (150mm)

This Standard Triaxial Cell is designed for use in testing 6" (150mm) samples. Construction is similar to our Standard Triaxial cells, but accommodates 6" (150mm) samples.

Standard Triaxial Cell, 6" (150mm) HM-4199B-6
130 lb (59kg)

Double-wall Triaxial Cell w/ Submersible Load Cell

This Double-wall Triaxial Cell can handle samples up to 4" (100mm) and includes a 2000lb (10kN) Submersible Load Cell (HM-2300.020S). Double-wall Triaxial Cells are typically used when testing unsaturated soil samples.

Double-Wall Triaxial Cell, 4" (100mm) HM-5199B-4
28 lb (13kg)



HM-4199.28

| Cell | Sample Diameter Compatibility | | | | | |
|------------|-------------------------------|----------------|----------------|----------------|---------------|---------------|
| | 1.4" (35mm) | 1.5" (39mm) | 2.0" (50mm) | 2.8" (71mm) | 4" (100mm) | 6" (150mm) |
| HM-4199B | X | X | X | X | | |
| HM-4699B-4 | X | X | X | X | X | |
| HM-4199B-6 | | | | | | X |
| HM-5199B-4 | X | X | X | X | X | |

NOTES

When ordering cells, specify Top Cap and Base Pedestal Set for desired sample size. Order porous stones separately, see page 148.

| Size | Top Cap/ Pedestal Sets | |
|-------|------------------------|-----------------|
| | Aluminum | Stainless Steel |
| 35mm | HM-4199.35 | HM-4199.35SS |
| 1.4" | HM-4199.14 | HM-4199.14SS |
| 38mm | HM-4199.38 | HM-4199.38SS |
| 1.5" | HM-4199.15 | HM-4199.15SS |
| 50mm | HM-4199.50 | HM-4199.50SS |
| 2.0" | HM-4199.20 | HM-4199.20SS |
| 70mm | HM-4199.70 | HM-4199.70SS |
| 2.8" | HM-4199.28 | HM-4199.28SS |
| 100mm | HM-4199.100 | HM-4199.100SS |
| 4.0" | HM-4199.40 | HM-4199.40SS |
| 150mm | HM-4199.150 | HM-4199.150SS |
| 6" | HM-4199.60 | HM-4199.60SS |

| Size | Top Caps | |
|-------|--------------|-----------------|
| | Aluminum | Stainless Steel |
| 35mm | HM-4199.35T | HM-4199.35SST |
| 1.4" | HM-4199.14T | HM-4199.14SST |
| 38mm | HM-4199.38T | HM-4199.38SST |
| 1.5" | HM-4199.15T | HM-4199.15SST |
| 50mm | HM-4199.50T | HM-4199.50SST |
| 2.0" | HM-4199.20T | HM-4199.20SST |
| 70mm | HM-4199.70T | HM-4199.70SST |
| 2.8" | HM-4199.28T | HM-4199.28SST |
| 100mm | HM-4199.100T | HM-4199.100SST |
| 4.0" | HM-4199.40T | HM-4199.40SST |
| 150mm | HM-4199.150T | HM-4199.150SST |
| 6" | HM-4199.60T | HM-4199.60SST |

| Size | Pedestals | |
|-------|--------------|-----------------|
| | Aluminum | Stainless Steel |
| 35mm | HM-4199.35B | HM-4199.35SSB |
| 1.4" | HM-4199.14B | HM-4199.14SSB |
| 38mm | HM-4199.38B | HM-4199.38SSB |
| 1.5" | HM-4199.15B | HM-4199.15SSB |
| 50mm | HM-4199.50B | HM-4199.50SSB |
| 2.0" | HM-4199.20B | HM-4199.20SSB |
| 70mm | HM-4199.70B | HM-4199.70SSB |
| 2.8" | HM-4199.28B | HM-4199.28SSB |
| 100mm | HM-4199.100B | HM-4199.100SSB |
| 4.0" | HM-4199.40B | HM-4199.40SSB |
| 150mm | HM-4199.150B | HM-4199.150SSB |
| 6" | HM-4199.60B | HM-4199.60SSB |

NOTE: HM-4199B Triaxial Cells include a HM-4199B.20 piston extension for smaller samples sizes.



HM-4155



HM-4154



HM-4165.3F



HM-4164.3F

Automated Control Panel

ASTM: D2850, D2166, D4767, and D1559;
AASHTO: T193, T296, T297, T208; BS 1377: Part 4: 1990, BS 1377: Part 7: 1990, BS 1377: Part 8: 1990

Used in conjunction with the HM-5240.3F pressure controller, Humboldt automated control panels provide an accurate and easy-to-operate solution for providing the controls necessary for distributing compressed air, water, de-aired water and vacuum within an air/water bladder-type triaxial testing system. The use of these control panels and the HM-5240.3F pressure controller allows changes in cell and back pressures required for sample saturation to be done automatically without the need for an operator. This feature reduces the need for continual monitoring of the sample saturation process during a triaxial test.

| Specifications | | | |
|--------------------------------|---------------------------------------|-----|-----|
| Pressure gauge | psi | BAR | Mpa |
| Max. input pressure | 200 | 14 | 1.4 |
| HM-4164 dimensions (L x W x H) | 8 x 8 x 37.5" (203 x 203 x 952mm) | | |
| HM-4165 dimensions (L x W x H) | 8 x 19.5 x 37.5" (203 x 495 x 952) | | |

Humboldt auto control panels feature an analog input pressure gauge and controller, an air/water filter for the input pressure and de-aired water tank input, as well as quick-disconnects for quickly connecting bladders, the pressure controller and triaxial cells.

The HM-4154 provides connections for one triaxial cell, while the HM-4155 provides connections for up to three triaxial cells. For each triaxial cell, one bladder is required for generating the cell pressure and a second bladder is required for back pressure.

Automated Panel, 1 Cell

HM-4154



Shipping wt. 100 lb (45.3kg)

Automated Panel, 3 Cell

HM-4155



Shipping wt. 80lb (36.2kg)

Manual Control Panel

ASTM: D2850, D2166, D4767, and D1559;
AASHTO: T193, T296, T297, T208; BS 1377: Part 4: 1990, BS 1377: Part 7: 1990, BS 1377: Part 8: 1990

For those operations that do not require automated control, Humboldt's HM-4164 and HM-4165 manual control panels provide an accurate and easy-to-operate solution for controlling compressed air, water, de-aired water and vacuum within an air/water bladder-type triaxial testing system.

The use of these control panels provides the necessary control for making changes in cell and back pressures required for sample saturation to be done from a central location on the panel. The operator has complete control of system pressure during the triaxial test with three independently-controlled pressure regulators. These control panels have a bias pressure regulator feature, which allows simultaneous control of confining and back pressures, while maintaining a constant differential pressure. Humboldt manual control

panels feature an analog input pressure gauge and controller, an air/water filter for the input pressure and de-aired water tank input, a digital pressure readout for each set of cell functions, as well as quick-disconnects for quickly connecting bladders, the pressure controller and triaxial cells.

| Specifications | | | |
|--------------------------------|---------------------------------------|------|-------|
| Pressure gauge | psi | BAR | Mpa |
| Max. input pressure | 200 | 14 | 1.4 |
| Max. output pressure | 150 | 10 | 1 |
| Pressure resolution | 0.1 | 0.01 | 0.001 |
| HM-4164 dimensions (L x W x H) | 8 x 8 x 37.5" (203 x 203 x 952mm) | | |
| HM-4165 dimensions (L x W x H) | 8 x 19.5 x 37.5" (203 x 495 x 952) | | |

The HM-4164 provides connections for one triaxial cell, while the HM-4165 provides connections for up to three triaxial cells. For each triaxial cell, one bladder is required for generating the cell pressure and a second bladder is required for back pressure.

Manual Panel, psi, 1 Cell,



120/220V 50/60Hz

HM-4164.3F

Shipping wt. 100 lb (45.3kg)

Manual Panel, kPa, 1 Cell,



120/220V 50/60Hz

HM-4164M.3F

Shipping wt. 100 lb (45.3kg)

Manual Panel, psi, 3 Cell,



120/220V 50/60Hz

HM-4165.3F

Shipping wt. 76 lb (34.7kg)

Manual Panel kPa, 3 Cell,



120/220V 50/60Hz

HM-4165M.3F

Shipping wt. 100 lb (45.3kg)

**Humboldt FlexPanels**

ASTM: D1559, D2850, D2166, D4767, and D5084; AASHTO: T193, T296, T297, T208; BS 1377: Part 4: 1990, BS 1377: Part 6, BS 1377: Part 7: 1990, BS 1377: Part 8: 1990

Humboldt FlexPanels provide an accurate and easy-to-operate solution for controlling compressed air, water, de-aired water and vacuum without the need for air/water bladder interfaces to produce the pressures necessary for triaxial testing. FlexPanels utilize a set of three burettes to control cell, top cap and base pedestal pressures.

This extremely versatile pressure system controls the pressure, water, de-airing tank and vacuum from a single panel. The three burettes allow for the control of the cell pressure and the back pressure

for each cell. They can monitor volume change in the sample and can be used to measure the flow of water through the sample for permeability testing. FlexPanels can manually measure volume change or permeability in a triaxial test sample without the use of a volume change apparatus, a distinct benefit when compared to air/water bladder systems. See page 97-98 for more information and specifications for Humboldt's FlexPanels.

Control Panel (psi), 120/220V 50/60Hz **HM-4140.3F**
Shipping wt. 35 lb (16kg)

Control Panel (kPa), 120/220V 50/60Hz **HM-4140M.3F**
Shipping wt. 50 lb (22.6kg)

Control Panel, 1-Cell (psi), 120/220V 50/60Hz **HM-4150.3F**
Shipping wt. 98 lb (44.5kg)

Control Panel, 1-Cell (kPa), 120/220V 50/60Hz **HM-4150M.3F**
Shipping wt. 98 lb (44.5kg)

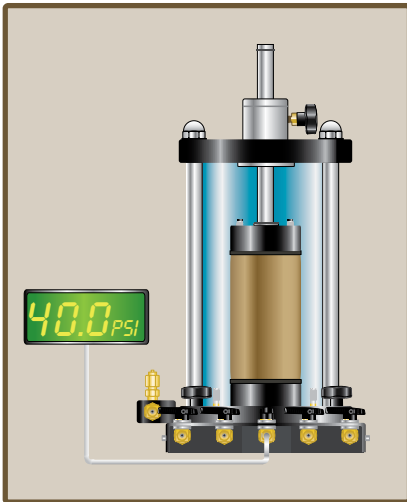
Control Panel, 2-Cell (kPa), 120/220V 50/60Hz **HM-4160.3F**
Shipping wt. 175 lb (79.3kg)

Control Panel, 2-Cell (kPa), 120/220V 50/60Hz **HM-4160M.3F**
Shipping wt. 125 lb (56kg)

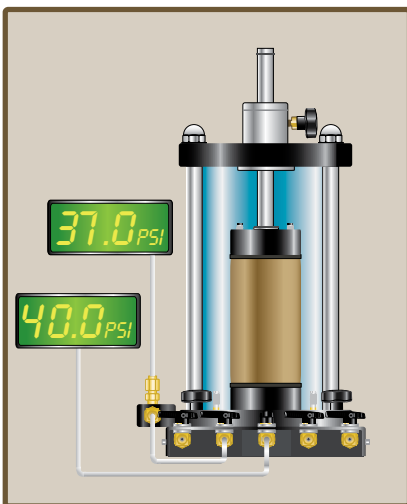
Auxiliary Panel, 1-Cell **HM-4150A**
Shipping wt. 77 lb (34.9kg)

Auxiliary Panel, 2-Cell **HM-4160A**
Shipping wt. 275 lb (124.7kg)

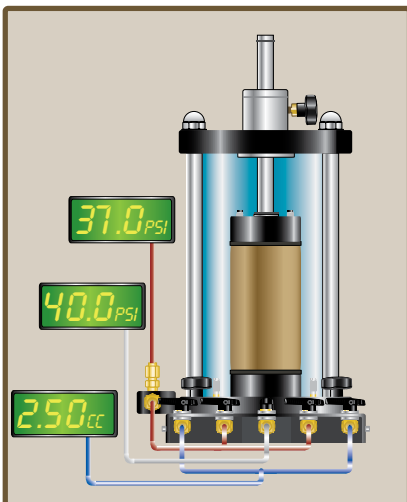
| | HM-4140.3F | HM-4140M.3F | HM-4150.3F | HM-4150M.3F | HM-4160.3F | HM-4160M.3F | HM-4150A | HM-4160A |
|--------------------------|--------------------------------------|------------------------|---|------------------------|--|------------------------|---------------------------------------|---------------------------------------|
| Pressure/ Resolution | 2-150 psi (0.1 psi) | 14-1000 kPa (1 kPa) | 2-150 psi (0.1 psi) | 14-1000 kPa (1 kPa) | 2-150 psi (0.1 psi) | 14-1000 kPa (1 kPa) | Not Applicable | |
| Vacuum | 0-14.7 psi or 30 Hg | (0-100kPa) or 30 Hg | 0-14.7 psi or 30 Hg | (0-100kPa) or 30 Hg | 0-14.7 psi or 30 Hg | (0-100kPa) or 30 Hg | | |
| Inner Burette | | | | | | | | |
| Cell | Not Applicable | | 50cc x 0.1cc (ml) | | | | | |
| Top | Not Applicable | | 10cc x 0.02cc (ml) | | | | | |
| Base | Not Applicable | | 10cc x 0.02cc (ml) | | | | | |
| Outer Burette | | | | | | | | |
| Cell | Not Applicable | | 400 cc (ml) | | | | | |
| Top | Not Applicable | | 460 cc (ml) | | | | | |
| Base | Not Applicable | | 460 cc (ml) | | | | | |
| Voltage | 110/220VAC 50/60Hz | | | | | | Not Applicable | |
| Power | 6 watts | | | | | | | |
| Operating Temperature | 14 to 158°F (-10 to 70°C) | | | | | | | |
| Dimensions | 8 x 8 x 37.5" (203 x 203 x 952mm) | | 8 x 25.5 x 37.5" (203 x 648 x 952mm) | | 8 x 43.5 x 37.5" (203 x 1105 x 952mm) | | 8 x 19.5 x 37.5" (203 x 495 x 952) | 8 x 37.5 x 37.5" (203 x 952 x 952) |
| Shipping Weight | 35lb (16kg) | | 98lb (44.4kg) | | 175lb (79.3kg) | | 77lb (34.9kg) | 275lb (124.7kg) |



UU-Triaxial Test
Typical Cell Setup



CU-Triaxial Test
Typical Cell Setup



CD-Triaxial Test
Typical Cell Setup

Humboldt Triaxial Testing Systems

Humboldt provides an extensive line of triaxial testing equipment solutions for today's soil labs.

Presented below and on the following pages are three triaxial systems based around our HM-5030 and HM-5020 load frames, our NEXT software with triaxial-specific software modules and three different pressure control solutions.

Automated Pressure Control Triaxial System

Designed for those who want the ultimate in control of their triaxial testing, Humboldt's automated pressure control triaxial system is a computer-controlled system specifically designed for soil testing laboratories conducting UU, CU and CD Triaxial tests, as well as unconfined compression. It is perfect for large, high-volume labs, as well as those who want to utilize technology to increase staff efficiencies and testing accuracy. This system provides complete control of the testing process including data acquisition.

Available in one or three-cell configurations, our automated control panels can handle your testing needs in stride. And, if you want to increase the number of simultaneous tests you can run, Humboldt's NEXT software can easily handle a multitude of tests. All you need to do is add cells and the other appropriate equipment to handle your needs.

Humboldt's automated pressure control triaxial system is built around the HM-5240.3F Stand-alone pressure controller. The HM-5240.3F is a fully-automated pneumatic pressure controller, which is highly accurate up to 150psi (1000kpa) in pressure and 100cc (100ml) in volume. It is designed specifically for geotechnical laboratory triaxial testing (UU, CU and CD) and provides control and monitoring of cell pressure, back pressure, pore water measurement and volume change when used with our Elite Series load frames.

The HM-5240 provides four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configuration or accessed through a LAN-networked computer using Humboldt's NEXT software. The unit is built with durable high-quality components and features the use of two electronic regulators to ensure smooth and reliable operation of pressures, as well as precise results.

In stand-alone mode, this pressure controller provides a 7" (178mm) touch-screen controller. This new waterproof, touch screen provides colorful, at-a-glance monitoring of testing functions without the use of a computer. Operator could see all the data in several formats at the controller while the test is running. Then can be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced test-specific modules. The system can also be configured for use with our triaxial-specific load frame, the HM-5020.3F. While Humboldt's automated pressure control triaxial system has been designed to work as a complete system, its make-up provides for the ultimate in versatility and expanded possibilities.

See pages 136-137 for a complete component list for the automated pressure control triaxial system



Automated Pressure Control Triaxial System Components

Manual Pressure Control Triaxial System

Humboldt's manual pressure control triaxial system provides a manually-controlled alternative to our automated system. The manual system eliminates the HM-5240.3F pressure controller from the system and replaces its function with a control panel that allows for manual control of the confining and back pressures. The HM-2315 Volume Change Apparatus, which measures the volume change of a soil sample by monitoring the flow of water through the chamber of the unit. The lower assembly contains changeover valves, which when used in conjunction with the upper assembly provides limitless capacity. It is accurate to better than ± 0.05 ml and is easily de-aired in seconds.

Like the automated system, our manually-controlled system can run UU, CU and CD triaxial tests, as well as unconfined compression. Manual control panels are available in one or three-cell configurations and can be used in multiple configurations. All you need to do is add cells and the other appropriate equipment to handle your needs.

Humboldt's manual pressure control triaxial system is built around our NEXT software and our enhanced test-specific modules, which monitors, controls and reports test data, and, the highly-regarded HM-5030 load frame with its built-in, 4-channel data acquisition controller for stress, strain, pore water pressure and volume change measurement. The system can also be configured for use with our triaxial-specific load frame, the HM-5020. While Humboldt's manual pressure control triaxial system has been designed to work as a complete system, its make-up provides for the ultimate in versatility and expanded possibilities.

See pages 138-139 for a complete component list for the Manual Pressure Control Triaxial System.

FlexPanel Pressure Control Triaxial System

Humboldt's FlexPanel pressure control option eliminates the use of the air/water bladder interface concept of pressure control in lieu of its highly-accurate burette system. Humboldt FlexPanels provide an accurate and easy-to-operate solution for controlling compressed air, water, de-aired water and vacuum without the need for air/water bladder interfaces to produce the pressures necessary for triaxial testing. FlexPanels utilize a set of three burettes to control cell, top cap and base pedestal pressures.

This extremely versatile pressure system controls the pressure, water, de-airing tank and vacuum from a single panel. The three burettes allow for the control of the cell pressure and the back pressure for each cell. They can monitor volume change in the sample and can be used to measure the flow of water through the sample for permeability testing. This is a benefit to using FlexPanels over the air/water bladder system.

Like our other control systems you can run UU, CU and CD triaxial tests, as well as unconfined compression with FlexPanels. They are available in one or three-cell configurations and can be used in multiple configurations. All you need to do is add cells and the other appropriate equipment to handle your needs.

Humboldt's FlexPanel pressure control system also uses our NEXT software and our enhanced test-specific modules, which monitors, controls and reports test data, and, the highly-regarded HM-5030 load frame with its built-in, 4-channel data acquisition controller for stress, strain, pore water pressure and volume change measurement. The system can also be configured for use with our triaxial-specific load frame, the HM-5020.

See pages 140-141 for a complete component list for the FlexPanel Pressure Control Triaxial System.



Manual Pressure Control Triaxial System Components



FlexPanel Pressure Control Triaxial System Components

Automatic Pressure Control

Component List for 1 and 3-Cell Triaxial System with Automatic Pressure Control

Automatic Pressure Control System, 1-Cell Setup

| Components | | |
|--|-----------------------|---|
| Load Frame (choose 1 below) | | |
| 50kN (11240 lbf) capacity | HM-5030.3F | 1 |
| 15kN (3372 lbf) capacity | HM-5020.3F | 1 |
| 100kN (220000 lbf) capacity | HM-5040.3F | 1 |
| Load/Strain | | |
| Load Cell | HM-2300.020 | 1 |
| Strain Transducer (LSCT) | HM-2310.20 | 1 |
| Ball Seat Adapter | HM-200387 | 1 |
| Strain Transducer Bracket | HM-4178BRT | 1 |
| UU Triaxial Software Module | HM-5002SW | 1 |
| CU Triaxial Software Module | HM-5003SW | 1 |
| CD Triaxial Software Module | HM-5006SW | 1 |
| Pressure/Volume Change | | |
| Pressure Distribution Panel | HM-4154 | 1 |
| Air/Water Bladder | HM-4151A | 2 |
| Pressure/Volume Controller | HM-5240.3F | 1 |
| De-airing System | HM-4187A.3F | 1 |
| Vacuum Pump | H-1763A or H-1763A.4F | 1 |
| Silent Air Compressor | HM-4220 or HM.4220.4F | 1 |
| Triaxial Cell (choose 1 below) | | |
| 3" / 75mm dia. capacity | HM-4199B | 1 |
| 4" / 100mm dia. capacity | HM-4699B-4 | 1 |
| Top Cap/ Base Pedestal Set (specify specimen size) | HM-4199.XX | 1 |
| Installation Kit | HM-4167 | 1 |

Automatic Pressure Control System, 3-Cell Setup

| Components | | |
|--|-----------------------|---|
| Load Frame (choose 1 below) | | |
| 50kN (11240 lbf) capacity | HM-5030.3F | 1 |
| 15kN (3372 lbf) capacity | HM-5020.3F | 1 |
| 100kN (220000 lbf) capacity | HM-5040.3F | 1 |
| Load/Strain | | |
| Load Cell | HM-2300.020 | 1 |
| Strain Transducer (LSCT) | HM-2310.20 | 1 |
| Ball Seat Adapter | HM-200387 | 1 |
| Strain Transducer Bracket | HM-4178BRT | 1 |
| UU Triaxial Software Module | HM-5002SW | 1 |
| CU Triaxial Software Module | HM-5003SW | 1 |
| CD Triaxial Software Module | HM-5006SW | 1 |
| Pressure/Volume Change | | |
| Pressure Distribution Panel | HM-4155 | 1 |
| Air/Water Bladder | HM-4151A | 6 |
| Pressure/Volume Controller | HM-5240.3F | 3 |
| De-airing System | HM-4187A.3F | 1 |
| Vacuum Pump | H-1763A or H-1763A.4F | 1 |
| Silent Air Compressor | HM-4220 or HM.4220.4F | 1 |
| Triaxial Cell (choose 1 below) | | |
| 3" / 75mm dia. capacity | HM-4199B | 3 |
| 4" / 100mm dia. capacity | HM-4699B-4 | 3 |
| Top Cap/ Base Pedestal Set (specify specimen size) | HM-4199.XX | 3 |
| Installation Kit | HM-4167 | 1 |

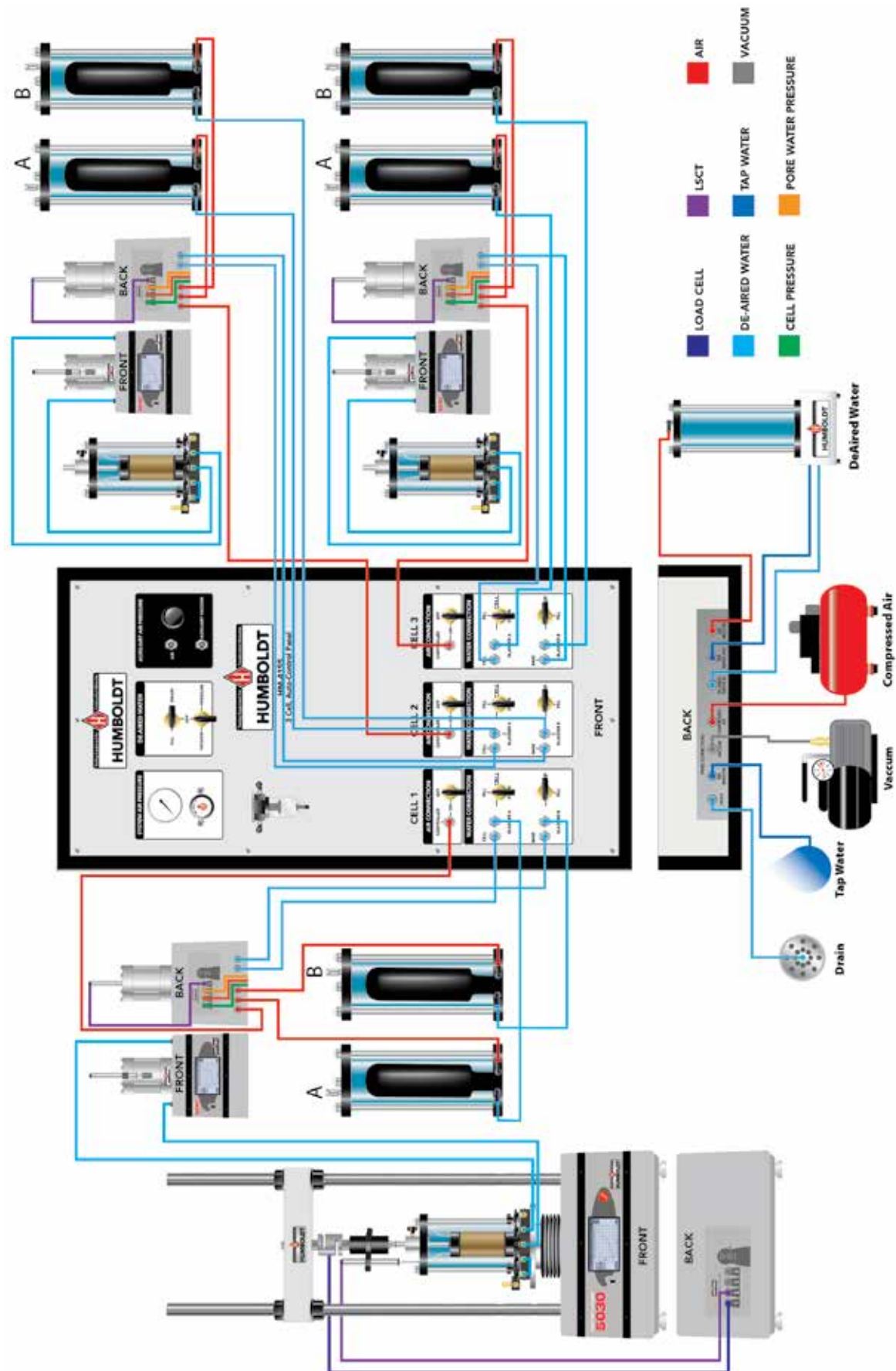
Standard Triaxial Sample Prep Accessories:

(See page 148 for a complete list and description. Items with .XX require a sample size)

| Accessory | Item # | Required | Accessory | Item # | Required |
|---------------------|------------|----------|--------------------------|------------|----------|
| Acrylic Base Disk | HM-4179.XX | 2 or 6 | 2-Part Compaction Mold | HM-3818.XX | 1 |
| Membranes | HM-4180.XX | 1 | 2-Part Vacuum Split Mold | HM-3827.XX | 1 |
| Membrane Stretcher | HM-4181.XX | 1 | Split Miter Box | HM-3847.XX | 1 |
| O-Rings (12-pack) | HM-4182.XX | 1 | Filter Paper (100-pack) | HM-4189.XX | 1 |
| O-Ring Placing Tool | HM-4183.XX | 1 | Filter Strips | HM-4189FS | 1 |
| Porous Stone | HM-4184.XX | 2 or 6 | High Vacuum Grease | HM-4198 | 1 |
| Membrane Tester | HM-4185.XX | 1 | Compaction Mold | HM-3820.XX | 1 |

Triaxial Installation Kit— HM-4167

Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. See page 145 for kit contents and other individual set up items.



Automatic Pressure Control System, 3-Cell Setup

Manual Pressure Control

Component List for 1 and 3-Cell Triaxial System with Manual air/water bladder Pressure Control

Manual Pressure Control System, 1-Cell Setup

| Components | | |
|---|-----------------------|---|
| Load Frame (choose 1 below) | | |
| 50kN (11240 lbf) capacity | HM-5030.3F | 1 |
| 15kN (3372 lbf) capacity | HM-5020.3F | 1 |
| 100kN (220000 lbf) capacity | HM-5040.3F | 1 |
| Load/Strain/Pore Pressure | | |
| Load Cell | HM-2300.020 | 1 |
| Strain Transducer (LSCT) | HM-2310.20 | 1 |
| Ball Seat Adapter | HM-200387 | 1 |
| Strain Transducer Bracket | HM-4178BRT | 1 |
| UU Triaxial Software Module | HM-5002SW | 1 |
| CU Triaxial Software Module | HM-5003SW | 1 |
| CD Triaxial Software Module | HM-5006SW | 1 |
| Pressure | | |
| Pressure Distribution Panel | HM-4164.3F | 1 |
| Air/Water Bladder | HM-4151A | 2 |
| De-airing System | HM-4187A.3F | 1 |
| Pore Pressure Transducer | HM-4170 | 1 |
| Silent Air Compressor | HM-4220 or HM-4220.4F | 1 |
| Vacuum Pump | H-1763A or H-1763A.4F | 1 |
| Volume Change | | |
| Volume Change Apparatus (Required for CU & CD Triaxial) | HM-2315 | 1 |
| Strain Transducer, 1" (25mm) | HM-2310.10 | 1 |
| LSCT/LVDT Mounting Bracket | HM-2310BR | 1 |
| Triaxial Cell (choose 1 below) | | |
| 3" / 75mm dia. capacity | HM-4199B | 1 |
| 4" / 100mm dia. capacity | HM-4699B-4 | 1 |
| Top Cap/ Base Pedestal Set (specify specimen size) | HM-4199.XX | 1 |
| Installation Kit | HM-4167 | 1 |

Manual Pressure Control System, 3-Cell Setup

| Components | | |
|---|-----------------------|---|
| Load Frame (choose 1 below) | | |
| 50kN (11240 lbf) capacity | HM-5030.3F | 1 |
| 15kN (3372 lbf) capacity | HM-5020.3F | 1 |
| 100kN (220000 lbf) capacity | HM-5040.3F | 1 |
| Load/Strain/Pore Pressure | | |
| Load Cell | HM-2300.020 | 1 |
| Strain Transducer (LSCT) | HM-2310.20 | 1 |
| Ball Seat Adapter | HM-200387 | 1 |
| Strain Transducer Bracket | HM-4178BRT | 1 |
| UU Triaxial Software Module | HM-5002SW | 1 |
| CU Triaxial Software Module | HM-5003SW | 1 |
| CD Triaxial Software Module | HM-5006SW | 1 |
| Humboldt Logger | HM-5320.3F | 1 |
| Pressure | | |
| Pressure Distribution Panel | HM-4165.3F | 1 |
| Air/Water Bladder | HM-4151A | 6 |
| De-airing System | HM-4187A.3F | 1 |
| Pore Pressure Transducer | HM-4170 | 3 |
| Silent Air Compressor | HM-4220 or HM-4220.4F | 1 |
| Vacuum Pump | H-1763A or H-1763A.4F | 1 |
| Volume Change | | |
| Volume Change Apparatus (Required for CU & CD Triaxial) | HM-2315 | 3 |
| Strain Transducer, 1" (25mm) | HM-2310.10 | 3 |
| LSCT/LVDT Mounting Bracket | HM-2310BR | 3 |
| Triaxial Cell (choose 1 below) | | |
| 3" / 75mm dia. capacity | HM-4199B | 3 |
| 4" / 100mm dia. capacity | HM-4699B-4 | 3 |
| Top Cap/ Base Pedestal Set (specify specimen size) | HM-4199.XX | 3 |
| Installation Kit | HM-4167 | 1 |

Standard Triaxial Sample Prep Accessories:

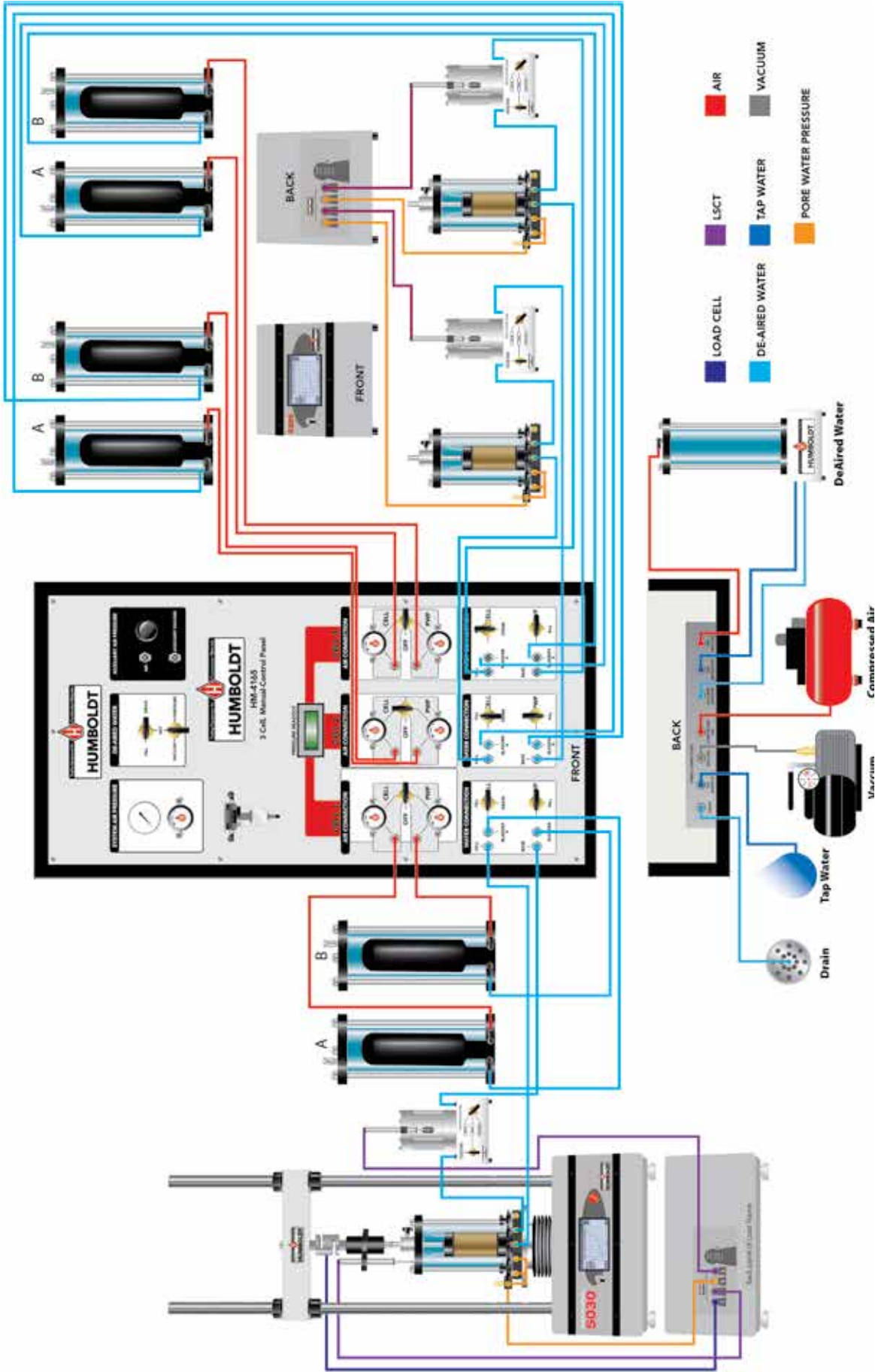
(See page 148 for a complete list and description. Items with .XX require a sample size)

| Accessory | Item # | Required | Accessory | Item # | Required |
|---------------------|------------|----------|--------------------------|------------|----------|
| Acrylic Base Disk | HM-4179.XX | 2 or 6 | 2-Part Compaction Mold | HM-3818.XX | 1 |
| Membranes | HM-4180.XX | 1 | 2-Part Vacuum Split Mold | HM-3827.XX | 1 |
| Membrane Stretcher | HM-4181.XX | 1 | Split Miter Box | HM-3847.XX | 1 |
| O-Rings (12-pack) | HM-4182.XX | 1 | Filter Paper (100-pack) | HM-4189.XX | 1 |
| O-Ring Placing Tool | HM-4183.XX | 1 | Filter Strips | HM-4189FS | 1 |
| Porous Stone | HM-4184.XX | 2 or 6 | High Vacuum Grease | HM-4198 | 1 |
| Membrane Tester | HM-4185.XX | 1 | Compaction Mold | HM-3820.XX | 1 |

Triaxial Installation Kit— HM-4167

Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. See page 145 for kit contents and other individual set up items.





Manual Pressure Control System, 3-Cell Setup

FlexPanels Pressure Control

Component List for 1 and 3-Cell Triaxial/Permeability System with FlexPanel Pressure Control

FlexPanel Pressure Control System, 1-Cell Setup

| Components | | |
|--|-----------------------|---|
| Load Frame (choose 1 below) | | |
| 50kN (11240 lbf) capacity | HM-5030.3F | 1 |
| 15kN (3372 lbf) capacity | HM-5020.3F | 1 |
| 100kN (220000 lbf) capacity | HM-5040.3F | 1 |
| Load/Strain/Pore Pressure | | |
| Load Cell | HM-2300.020 | 1 |
| Strain Transducer (LSCT) | HM-2310.20 | 1 |
| Pore Pressure Transducer | HM-4170 | 1 |
| Ball Seat Adapter | HM-200387 | 1 |
| Strain Transducer Bracket | HM-4178BRT | 1 |
| UU Triaxial Software Module | HM-5002SW | 1 |
| CU Triaxial Software Module | HM-5003SW | 1 |
| CD Triaxial Software Module | HM-5006SW | 1 |
| Pressure | | |
| Pressure Distribution Panel | HM-4150.3F | 1 |
| De-airing System | HM-4187A.3F | 1 |
| Silent Air Compressor | HM-4220 or HM-4220.4F | 1 |
| Vacuum Pump | H-1763A or H-1763A.4F | 1 |
| Volume Change | | |
| Volume Change Apparatus (Required for CD Triaxial) | HM-2315 | 1 |
| Strain Transducer, 1" (25mm) | HM-2310.10 | 1 |
| LSCT/LVDT Mounting Bracket | HM-2310BR | 1 |
| Triaxial Cell (choose 1 below) | | |
| 3" / 75mm dia. capacity | HM-4199B | 1 |
| 4" / 100mm dia. capacity | HM-4699B-4 | 1 |
| Top Cap/ Base Pedestal Set (specify specimen size) | HM-4199.XX | 1 |
| Installation Kit | HM-4167 | 1 |

FlexPanel Pressure Control System, 3-Cell Setup

| Components | | |
|--|-----------------------|---|
| Load Frame (choose 1 below) | | |
| 50kN (11240 lbf) capacity | HM-5030.3F | 1 |
| 15kN (3372 lbf) capacity | HM-5020.3F | 1 |
| 100kN (220000 lbf) capacity | HM-5040.3F | 1 |
| Load/Strain/Pore Pressure | | |
| Load Cell | HM-2300.020 | 1 |
| Strain Transducer (LSCT) | HM-2310.20 | 1 |
| Pore Pressure Transducer | HM-4170 | 3 |
| Ball Seat Adapter | HM-200387 | 1 |
| Strain Transducer Bracket | HM-4178BRT | 1 |
| UU Triaxial Software Module | HM-5002SW | 1 |
| CU Triaxial Software Module | HM-5003SW | 1 |
| CD Triaxial Software Module | HM-5006SW | 1 |
| Humboldt Logger | HM-5320.3F | 1 |
| Pressure | | |
| Pressure Distribution Panel | HM-4150.3F | 1 |
| Pressure Distribution Panel | HM-4160A | 1 |
| De-airing System | HM-4187A.3F | 1 |
| Silent Air Compressor | HM-4220 or HM-4220.4F | 1 |
| Vacuum Pump | H-1763A or H-1763A.4F | 1 |
| Volume Change | | |
| Volume Change Apparatus (Required for CD Triaxial) | HM-2315 | 3 |
| Strain Transducer, 1" (25mm) | HM-2310.10 | 3 |
| LSCT/LVDT Mounting Bracket | HM-2310BR | 3 |
| Triaxial Cell (choose 1 below) | | |
| 3" / 75mm dia. capacity | HM-4199B | 3 |
| 4" / 100mm dia. capacity | HM-4699B-4 | 3 |
| Top Cap/ Base Pedestal Set (specify specimen size) | HM-4199.XX | 3 |
| Installation Kit | HM-4167 | 1 |

Standard Triaxial Sample Prep Accessories:

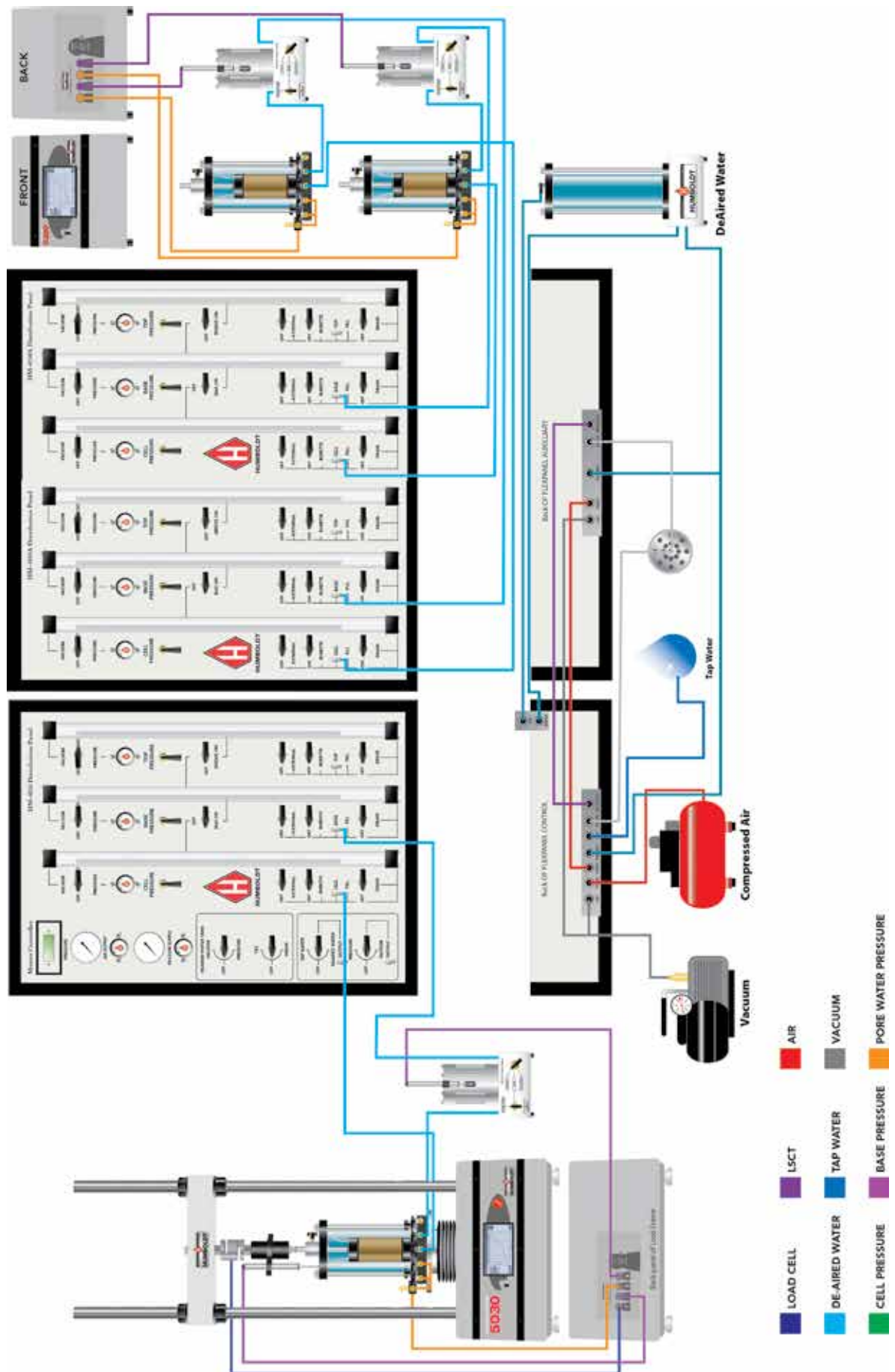
(See page 148 for a complete list and description. Items with .XX require a sample size)

| Accessory | Item # | Required | Accessory | Item # | Required |
|---------------------|------------|----------|--------------------------|------------|----------|
| Acrylic Base Disk | HM-4179.XX | 2 or 6 | 2-Part Compaction Mold | HM-3818.XX | 1 |
| Membranes | HM-4180.XX | 1 | 2-Part Vacuum Split Mold | HM-3827.XX | 1 |
| Membrane Stretcher | HM-4181.XX | 1 | Split Miter Box | HM-3847.XX | 1 |
| O-Rings (12-pack) | HM-4182.XX | 1 | Filter Paper (100-pack) | HM-4189.XX | 1 |
| O-Ring Placing Tool | HM-4183.XX | 1 | Filter Strips | HM-4189FS | 1 |
| Porous Stone | HM-4184.XX | 2 or 6 | High Vacuum Grease | HM-4198 | 1 |
| Membrane Tester | HM-4185.XX | 1 | Compaction Mold | HM-3820.XX | 1 |

Triaxial Installation Kit— HM-4167

Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. See page 145 for kit contents and other individual set up items.





FlexPanel Pressure Control System, 3-Cell Setup

ELITE SERIES

Automated Pressure Controllers



HM-5820



HM-5810

| Specifications: | HM-5810 | HM-5820 |
|----------------------------|---|--|
| Maximum hydraulic pressure | 0-500 psi | |
| Volumetric capacity | 270mL/channel | |
| Load capacity | N/A | 3000 lbf (15kN) |
| Voltage/Current | 110/220V 50/60Hz - 16.0 amps | |
| Dimensions (L x D x H) | 38" x 15" x 20.5" (970 x 385 x 520 mm) | 38" x 15" x 45.5" (970 x 385 x 1160 mm) |

Automated, Pressure Controller

ASTM D5084

The HM-5810 is an automated pressure controller designed to handle saturation, consolidation and permeation of a triaxial test sample. In this application it can be used solely for permeability testing as well, eliminating the need for distribution panels, etc. The HM-5810 is all you need to successfully do permeability testing for soil.

Cell, head and tail pressure can be set in increments of 0.1 PSI while volume change is measured to 0.0001cc. The flow rate for permeation can be set from 1 cc/sec (60 cc/min) down to less than 0.000002 cc/sec (0.00012 cc/min). There are three data input channels – one for each pressure transducer, or if you are only doing permeability, you will only need one of the channels/pressure transducers.

The HM-5810 provides an accurate and simplified permeability setup, which eliminates the need for separate distribution panels, and simplifying tubing and control cable setup. By using the integral staging platform, the HM-5810 provides an extremely compact and organized setup.

The HM-5810 is built around Humboldt's integral, data logger with touch-screen control, which allows the HM-5810 to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

Hydro-Control Pressure Controller HM-5810.3F



Shipping wt. 168 lb (76kg)

Automated, Pressure Controller with Load Frame

ASTM D5084, D2850, D2166, D4767; AASHTO T296, T297, T208

The HM-5820 is an automated pressure controller designed to handle saturation, consolidation and permeation of a triaxial test sample, as well as perform a shear function with the use of its integral HM-5020 Load Frame. This allows the technician to also perform triaxial shear tests without having to purchase separate load frame.

Cell, head and tail pressure can be set in increments of 0.1 PSI while volume change is measured to 0.0001cc. The flow rate for permeation can be set from 1 cc/sec (60 cc/min) down to less than 0.000002 cc/sec (0.00012 cc/min). There are three data input channels – one for each pressure transducer, or if you are only doing permeability, you will only need one of the channels/pressure transducers.

The HM-5820 provides an accurate and compact configuration for performing triaxial tests without the need for separate distribution panels, and simplifying tubing and control cable setup. By using the integral load frame, the HM-5820 provides an extremely compact and organized setup.

The HM-5820 is built around Humboldt's integral, data logger with touch-screen control, which allows the HM-5820 to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

Triax-Control Pressure Controller HM-5820.3F



Shipping wt. 168 lb (76kg)

Controller Specifications:

| | |
|---|---|
| Display (Resistive Touch) | 7" (178mm) VGA (480 x 800) |
| Real-time test data | Graphic and tabulation |
| Processor | Dual 32-bit ARM |
| RAM | 64MB |
| Memory, non-volatile | 4GB |
| Analog to digital converter | 24 bit |
| Logging speed | up to 50 readings per second |
| Multi-test storage | 1000 |
| Points per test | 3000 |
| USB port (front) | export data, import/export calibration data, WiFi |
| USB port (back) | provides external power for wireless access point |
| Ethernet connection | for network connectivity |
| 24-bit differential analog to digital converter | 4 |
| Ambient temperature sensor | 1 |
| Firmware Update | flash drive |



NOTES

Triaxial cells, sample prep materials and additional load cells, etc. are not included and need to be purchased separately. For more information on Humboldt's NEXT software Modules, see page 108-109.





HM-5240.3F



HM-5250.3F

HM-2315
Shown with HM-2310.10
Transducer and HM-
2310BR Bracket**Pneumatic Pressure Controller, 150psi (1000kpa)**

The HM-5240.3F is a fully-automated pneumatic pressure controller, which is highly accurate up to 150psi (1000kpa) in pressure and 100cc (100ml) volume in any one direction. It is designed specifically for geotechnical laboratory triaxial testing (UU, CU and CD) and provides control and monitoring of cell pressure, back pressure, pore water measurement and volume change when used with our Elite Series load frames.

The HM-5240 provides four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configuration or accessed through a LAN-networked computer using Humboldt's NEXT software. The unit is built with durable high-quality components and features the use of two electronic regulators to ensure smooth and reliable operation of pressures, as well as precise results.

In stand-alone mode, this pressure controller provides a 7" (178mm) touch-screen controller. This new waterproof, touch screen provides colorful, at-a-glance monitoring of testing functions without the use of a computer. Operator could see all the data in several formats at the controller while the test is running. Then can be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced test-specific modules.

| Specifications | |
|-----------------------|--|
| Maximum Pressure | 150psi (1000kpa) |
| Volume Capacity | 100cc (100ml) in any one direction |
| Voltage | 110-220V 50/60Hz - 5.0 amps |
| Dimension (L x W x H) | 13" x 11.5" x 22" (330 x 292 x 559mm) |

Pressure Controller, **HM-5240.3F**
Shipping wt. 40 lb (18.1kg)

Hydraulic Pressure Controller, 500psi (3500kpa)

The HM-5250.3F is a fully-automated hydraulic pressure controller, which is highly accurate up to 500psi (3500kpa) in pressure and 200cc (200ml) in volume. It is designed specifically for geotechnical laboratory triaxial testing (UU, CU and CD) and provides control and monitoring of cell pressure, back pressure, pore water measurement and volume change when used with our Elite Series load frames.

The HM-5250 provides four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configuration or accessed through a LAN-networked computer using Humboldt's NEXT software. The unit is built with durable, high-quality components and features the use of stepper motors and precision gears to ensure smooth and reliable operation of pressures, as well as precise results.

In stand-alone mode, this pressure controller provides a 7" (178mm) touch-screen controller. This new waterproof, touch screen provides colorful, at-a-glance monitoring of testing functions without

the use of a computer. Operator could see all the data in several formats at the controller while the test is running. Then can be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced test-specific modules.

| Specifications | |
|-----------------------|--|
| Maximum Pressure | 500psi (3500kpa) |
| Volume Capacity | 200cc (200ml) |
| Voltage | 110-220V 50/60Hz - 8.0 amps |
| Dimension (L x W x H) | 13" x 11.5" x 22" (330 x 292 x 559mm) |

Pressure Controller, **HM-5250.3F**
Shipping wt. 75 lb (34kg)

Volume Change Apparatus, Automatic

The apparatus is used for measuring the volume change of a soil sample by monitoring the flow of water through the chamber of the unit. The lower assembly contains changeover valves, which when used in conjunction with the upper assembly provides limitless capacity. The unit can be used with a linear strain transducer, a digital indicator, or as part of an automated system. It is accurate to better than ± 0.05 ml and is easily de-aired in seconds. Includes connectors, valves, and tubing. Order strain transducer or digital indicator separately.

Volume Change Apparatus **HM-2315**
Shipping wt. 22 lb (9.9kg)

**Air/Water Bladder Cylinder**

The Humboldt air/water bladder cylinder is used to deliver pressurized de-aired water to the triaxial cell. The bladder acts as an reservoir and interface between the compressed air, used as the pressure source, and the de-aired water, which is used as the pressurizing medium for the sample. The use of the bladder eliminates the reintroduction of air into the de-aired water, while providing a high-degree of accuracy. The cylinder will operate continuously to a maximum pressure of 150 psi (1000 kPa). It is constructed of anodized aluminum top and bottom plates, acrylic cylinder and a fluoroelastomer bladder.

Bladder Cylinder **HM-4151A**
Shipping wt. 11 lb (4.9kg)

Bladder

Replacement bladder for HM-4151A Air/Water Bladder Cylinder.

Bladder **HM-4151.1**
Shipping wt. 0.5 lbs (0.22kg)

De-Airing Water System

The HM-4187A.3F produces 8-liter batches of de-aired water without the use of heat. Combined mechanical agitation and vacuum evacuation removes gasses at much higher rate than conventional heat-boiling methods. Will de-air water to less than 0.5 pph dissolved oxygen in 4 minutes. Requires a vacuum pump, (see page 140) 1/55hp motor 110V, 60Hz. 7.5 x 7.5 x 20" (190 x 190 x 508mm).

De-Airing System, 120/220V 50/60Hz **HM-4187A.3F**
Shipping wt. 24.5 lb (11.3kg)

De-Airing Water Tank

For use with Triaxial/Permeability Distribution Panels. Requires a Vacuum Pump, (see page 140).

De-Airing Water Tank **HM-4187H**
Shipping wt. 17 lb (7.7kg)

Strain Transducer

Strain transducer, 1" (25mm) for use with HM-2315 automatic volume change apparatus.

Strain Transducer **HM-2310.10**
Shipping wt. 1 lb (0.45kg)

Transducer Bracket

Bracket to attach strain transducer to HM-2315 automatic volume change apparatus.

Transducer Bracket **HM-2310BR**
Shipping wt. 0.1 lb (0.04kg)

Pore Pressure Transducer

Highly accurate, 200 psi (1400 kPa) pore pressure transducer. Designed for geotechnical lab applications with outstanding overload protection and protected from corrosive water. Requires input of 10 V DC, with an output of 100 mV. Supplied with 2 meter cable and 5-pin DIN plug.

Pore Pressure Transducer **HM-4170**
Shipping wt. 0.8 lb (0.36kg)

Refrigeration Dryer

Compressed air quality is often overlooked in many labs. Compressed air contains condensate which, when cooled, will turn into water, causing extensive damage to both the compressed air network and testing equipment. Refrigeration dryers actively remove this condensate to achieve near perfectly dry compressed air. The benefits are notable: less system downtime, reduced costs and maintenance, and improved test equipment

life. This refrigeration dryer, thanks to its PlusPack heat exchanger and the most compact dimensions on the market, will prove a major asset in your lab. Dryer uses a 1/2" NPT-F pipe size and nominal flow is: 10 SCFM, 17 Nm³/hr and 0.3 Nm³/min. based on an ambient and inlet temperature of 100°F (38°C) and a working pressure of 100 psig (7 bar).

Refrigeration Dryer, 115V 60Hz 1ph **HM-4221**
Shipping wt. 20 lb (9.1kg)

Desiccant Dryer

Ideal for drying small volumes of air at the point of use. Convenient in-line mounting saves space. ISO Class 2 dryer. Max. operating pressure is 150 psig. and max operating temperature is 125°F. Total capacity is 4400 ft³, Female NPT inlet/outlet size is 0.25 NPTF, bowl size is 1.75 lbs, Height: 11", Width: 4.625". Includes one charge of desiccant.

Desiccant Dryer **HM-4222**
Shipping wt. 5 lb (2.3kg)

Filter/Regulator

One-piece, Filter/Regulator, 0-125 psi (0 - 8.6 bar) with standard filtration of 5 micron. Height is 9.77 and width is 2.36. Bowl material is polycarbonate and includes sight glass and pressure gauge.

Filter/Regulator **HM-4223**
Shipping wt. 1.48lb (0.67kg)

**Compressor**

When operating under full load this exceptionally quiet compressor offers a tremendously low noise level of 40 db/A. Each compressor is built with quality in mind, and comes equipped with powder-coated air tank, pressure switch, 1-micron air filter, regulator, and pressure gauges for completely automatic and trouble free operation.

| Specifications | |
|--------------------|--------------------|
| Output | 4.2 CFM120 L/Min |
| Horse Power | 1.0Hp |
| Tank Size | 13 Gal/50 Lt. |
| Noise Level | 42 db/A |
| Max Pressure | 120 PSI (8 Bar) |
| Operating Pressure | 90-120 PSI/6-8 Bar |

Compressor, 120V 50/60Hz **HM-4220**

Compressor, 220V 50/60Hz **HM-4220.4F**

Shipping wt. 147 lbs (66kg)

High-Vacuum Pump

Direct-drive two-stage rotary sliding vane high vacuum pump features gas ballast and trap to reduce risk of oil being sucked into the system. Produces free air displacement 85L per minute (3 cu. ft. per minute) and maximum vacuum 29-30". Operating temperature is 30 to 170°F (-1.11 to 76.6°C). Has 0.25" OD intake ports for 0.25" ID tubing. Dimensions: 11.25" x 15.5" x 6.5" (28.6 x 39.4 x 16.5cm).

High-Vacuum Pump, 120V 60Hz **H-1763A**

High-Vacuum Pump 230V 50/60Hz **H-1763A.4F**

Shipping wt. 31 lbs (14kg)

Triaxial Installation Kit

Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. Kit includes items in the table below. All items can be purchased individually as well.

| Triaxial Kit Components | |
|---|-------------|
| .125" Brass Ferrules (10) | HM-4197.12 |
| .25" Brass Ferrules (10) | HM-4197.25 |
| .125" OD Tubing, 10ft. | HM-4196.12 |
| .25" OD Tubing, 100ft. | HM-4196.25 |
| .375" to .25" Reducer Bushing (3) | HM-4150.77 |
| Cutter, Flexible Tubing (1) | HM-000058 |
| Thread Tape, PTFE (1) | HM-000059 |
| Hex wrench, 3/16" (1) | HM-000060 |
| Hex wrench, 7/64" (1) | HM-000061 |
| Hex wrench, 2.5mm (1) | HM-000062 |
| Wrench, 7/16 & 9/16" (1) | HM-000063 |
| Wrench, Adjustable, 6" (1) | HM-000064 |
| Union T Fitting, .25" (5) | HM-4150.45 |
| Quick Valve Coupling, .25" (2) | HM-4150.72 |
| Regulator Elbow, .25" (3) | HM-4150.44 |
| .25" to .125" Reducer Coupling (3) | HM-4150.78 |
| Tube Fitting T, 6mm OD (5) | HM-003175 |
| Push-to-Connect Tube Fitting Coupler, .25" OD (4) | HM-003176 |
| Plug, .25" Nylon (5) | HM-003193 |
| O-ring (Upper Cap), .125" (10) | HM-4150.006 |
| O-ring for Quick-Connect (10) | HM-4196.CXO |

Triaxial Installation Kit



HM-4167

Shipping wt. 4.5 lbs (2.04kg)

Shear & Consolidation Installation Kit

Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. Kit includes items in the table below. All items can be purchased individually as well.

| Shear & Consolidation Kit Components | |
|---|------------|
| .25" OD Tubing, 100ft. | HM-4196.25 |
| .375" to .25" Reducer Bushing (3) | HM-4150.77 |
| Cutter, Flexible Tubing (1) | HM-000058 |
| Thread Tape, PTFE (1) | HM-000059 |
| Wrench, Adjustable, 6" (1) | HM-000064 |
| Union T Fitting, .25" (5) | HM-4150.45 |
| Quick Valve Coupling, .25" (2) | HM-4150.72 |
| Regulator Elbow, .25" (3) | HM-4150.44 |
| Tube Fitting T, 6mm OD (5) | HM-003175 |
| Push-to-Connect Tube Fitting Coupler, .25" OD (4) | HM-003176 |

Shear & Consolidation Installation Kit **HM-4168**



Shipping wt. 4.5 lbs (2.04kg)

Replacement Pressure Regulators

| | |
|---|--------------|
| Pressure regulator 2-150 psi w/ fittings | HM-4150.22AS |
| Positive bias regulator w/ fittings | HM-4150.23AS |



HM-3820.28



HM-3818.28



HM-3701



HM-3330

Compaction Mold, Three-Part with Hammer

Three-part aluminum molds with easy-close band clamp closure. Molds include base plate and pedestal, which provides a stable platform for mold during production. Ratio of sample height to diameter is 2:1.

| Sample Size | Mold with Base Plate |
|-------------|----------------------|
| 1.4" | HM-3820.14 |
| 1.5" | HM-3820.15 |
| 1.875" | HM-3820.18 |
| 2.0" | HM-3820.20 |
| 2.36" | HM-3820.23 |
| 2.5" | HM-3820.25 |
| 2.8" | HM-3820.28 |
| 4.0" | HM-3820.40 |
| 6.0" | HM-3820.60 |
| 35mm | HM-3820.35 |
| 38mm | HM-3820.38 |
| 50mm | HM-3820.50 |
| 70mm | HM-3820.70 |
| 100mm | HM-3820.100 |
| 150mm | HM-3820.150 |

Compaction Mold, Three-Part

See Table



Shipping wt. 18 lbs (8.2kg)

Compaction Mold, Two-Part

Two-part aluminum molds with easy-close band clamp closure. Molds include base plate and pedestal, which provides a stable platform for mold during production. Ratio of sample height to diameter is 2:1.

| Sample Size | Mold with Base Plate |
|-------------|----------------------|
| 1.4" | HM-3818.14 |
| 1.5" | HM-3818.15 |
| 1.875" | HM-3818.18 |
| 2.0" | HM-3818.20 |
| 2.36" | HM-3818.23 |
| 2.5" | HM-3818.25 |
| 2.8" | HM-3818.28 |
| 4.0" | HM-3818.40 |
| 6.0" | HM-3818.60 |
| 35mm | HM-3818.35 |
| 38mm | HM-3818.38 |
| 50mm | HM-3818.50 |
| 70mm | HM-3818.70 |
| 100mm | HM-3818.100 |
| 150mm | HM-3818.150 |

Compaction Mold, Two-Part

See Table



Shipping wt. 15 lbs (6.8kg)

Compaction Hammer

Rod with sliding weights on a 2" (51mm) dia foot. Stop allows adjusting height of drop up to 8" (203mm). Includes one .25 lb. (100g) and one 2.25 lb. (1kg) weight.

Compaction Hammer

HM-3701



Shipping wt. 6 lbs (2.7kg)

Soil Sample Trimmer

Sample trimmer with alignment bar for cutting samples to precise diameters. The HM-3330 handles samples up to 4" samples by employing easily interchangeable top platens. Stainless steel pins in pedestal & top platen hold sample in position. Top platen bearing assembly is lowered & locked and sample trimmed with wire saw. Order top platens (below) and saw (next page) separately.

Soil Sample Trimmer, 1" to 4"

HM-3330



Shipping wt. 7 lb (3.1kg)

Top Platens for Soil Trimmer

Individual, sized, top platens for the soil sample trimmer. Platens are interchangeable.

| Size | Model | Size | Model |
|--------|------------|-------|-------------|
| 1.0" | HM-3330.10 | 4.0" | HM-3330.40 |
| 1.4" | HM-3330.14 | 35mm | HM-3330.35 |
| 1.875" | HM-3330.18 | 38mm | HM-3330.38 |
| 2.0" | HM-3330.20 | 50mm | HM-3330.50 |
| 2.5" | HM-3330.25 | 70mm | HM-3330.70 |
| 2.8" | HM-3330.28 | 100mm | HM-3330.100 |
| 3.0" | HM-3330.30 | | |

Top Platens for Soil Trimmer

See Chart



Shipping wt. 1 lb (0.45kg)



**Wire Saw**

Sample trimming saw with replaceable wire blade.

Wire Saw **HM-3175**
Shipping wt. 1 lbs (0.45kg)

Wire Saw Blade

Replacement wire for HM-3175 saw.

Wire Saw Blade **HM-3175.1**
Shipping wt. 0.1 lb (0.04kg)

Preparation Knife

Used for sample preparation and general lab work, knife has 6"-long thin, sharp blade and wood handle.)

Preparation Knife **H-4973**
Ship wt. 0.5lbs. (0.2kg)

Length Comparator

ASTM D2166, D2850, D4767, BS 1377:8

Length comparator designed to quickly and accurately measure the height of soil samples to within $\pm 0.1\%$ of the total height. Includes a digital indicator accurate to within 0.0001 inches (0.002mm) with 0 to 1" (0 to 25mm) total range. The comparator is comprised of an upright support 14" (356mm) tall attached to a 6" x 6" x 2" (150 x 150 x 50mm) granite base and includes a 6" (152mm) reference bar. Other reference bars such as 4.0", 3.0" and 2.0" for other sample sizes are available. Reference bar includes Calibration Report traceable to the National Institute of Standards and Technology.

Length Comparator **HM-4173**
Shipping wt. 20 lb (9.07kg)

Precision Diameter Tape

ASTM D2166, D2850, D4767, BS 1377:8

Diameter tapes provide a fast, reliable method for measuring the diameter of concrete, soil and asphalt cores and cylinders. One reading provides round and out-of-round diameters within an accuracy of .001" (.03mm) by means of special graduations and vernier scale. All tapes are made from a stainless alloy and are precision engraved to ensure accuracy. Inch-scale tape has a diameter range of 0.75 to 7" and the metric-scale tape has a diameter of 28 to 200mm. Includes certificate of calibration. Tapes are calibrated and include a NIST-traceable certification.

Precision Diameter Tape, 0.75 to 7" **HM-4174**
Precision Diameter Tape, 28 to 200mm **HM-4174M**
Shipping wt. 0.8 lb (0.36kg)

High-Vacuum Grease

Effective means of sealing latex membranes to sides of the top cap.

High-Vacuum Grease **HM-4198**
Shipping wt. 0.8 lb (0.36kg)

Filter Paper Strips

Wrapped around sample to accelerate saturation in triaxial testing, 5 x 150mm, Grade 55, 100/pkg.

Filter Paper Strips **HM-4189FS**
Shipping wt. 0.5 lb (0.22kg)

Latex Membranes

Made from non-porous latex rubber [max. temp. 220°F (104°C)]. Length varies according to sample diameter. All have sufficient length to enclose full length of sample, both top & base of pedestal, and disc—plus enough surplus to allow doubling over the O-rings. 12/pkg. Membranes are 0.012" or 0.025" in thickness.

| Latex Membranes, 0.012" | |
|-------------------------|------------|
| 35mm | HM-4180.14 |
| 38mm | HM-4180.15 |
| 50mm | HM-4180.20 |
| 70mm | HM-4180.28 |
| 100mm | HM-4180.40 |
| 150mm | HM-4180.60 |
| 1.4" | HM-4180.14 |
| 1.5" | HM-4180.15 |
| 2.0" | HM-4180.20 |
| 2.8" | HM-4180.28 |
| 4.0" | HM-4180.40 |
| 6.0" | HM-4180.60 |

| Latex Membranes, 0.025" | |
|-------------------------|-------------|
| 35mm | HM-4180.14T |
| 38mm | HM-4180.15T |
| 50mm | HM-4180.20T |
| 70mm | HM-4180.28T |
| 100mm | HM-4180.40T |
| 150mm | HM-4180.60T |
| 1.4" | HM-4180.14T |
| 1.5" | HM-4180.15T |
| 2.0" | HM-4180.20T |
| 2.8" | HM-4180.28T |
| 4.0" | HM-4180.40T |
| 6.0" | HM-4180.60T |

Latex Membranes

See Tables above

Shipping wt. 0.8 lb (0.36kg)



HM-4179.28



HM-4189.28



HM-4184.28



HM-4182.28



HM-4183.28

| Acrylic Disk | |
|--------------|---------------|
| 35mm | HM-4179.35 |
| 38mm | HM-4179.38 |
| 50mm | HM-4179.50 |
| 70mm | HM-4179.70 |
| 100mm | HM-4179.100 |
| 150mm | HM-4179.150 |
| 1.4" | HM-4179.14 |
| 1.5" | HM-4179.15 |
| 2.0" | HM-4179.20 |
| 2.8" | HM-4179.28 |
| 4.0" | HM-4179.40 |
| 6.0" | HM-4179 ww.60 |

Acrylic disk used in UU triaxial tests.

| Filter Paper | |
|--------------|------------|
| 35mm | HM-4189.15 |
| 38mm | HM-4189.15 |
| 50mm | HM-4189.20 |
| 70mm | HM-4189.28 |
| 100mm | HM-4189.40 |
| 150mm | HM-4189.60 |
| 1.4" | HM-4189.15 |
| 1.5" | HM-4189.15 |
| 2.0" | HM-4189.20 |
| 2.8" | HM-4189.28 |
| 4.0" | HM-4189.40 |
| 6.0" | HM-4189.60 |

Used to prevent soil from penetrating into porous stones or into a panel.
100/pkg.

| Porous Stones | |
|---------------|-------------|
| 35mm | HM-4184.35 |
| 38mm | HM-4184.38 |
| 50mm | HM-4184.50 |
| 70mm | HM-4184.70 |
| 100mm | HM-4184.100 |
| 150mm | HM-4184.150 |
| 1.4" | HM-4184.14 |
| 1.5" | HM-4184.15 |
| 2.0" | HM-4184.20 |
| 2.8" | HM-4184.28 |
| 4.0" | HM-4184.40 |
| 6.0" | HM-4184.60 |

Used for permeability and triaxial testing to allow even distribution of water through sample. Two stones required per cell, each 1/4" thick (6mm).

| O-Rings | |
|---------|------------|
| 35mm | HM-4182.14 |
| 38mm | HM-4182.15 |
| 50mm | HM-4182.20 |
| 70mm | HM-4182.28 |
| 100mm | HM-4182.40 |
| 150mm | HM-4182.60 |
| 1.4" | HM-4182.14 |
| 1.5" | HM-4182.15 |
| 2.0" | HM-4182.20 |
| 2.8" | HM-4182.28 |
| 4.0" | HM-4182.40 |
| 6.0" | HM-4182.60 |

For sealing membranes from confining fluid and sample.
Neoprene. 12/pkg.

| O-Ring Placing Tool | |
|---------------------|------------|
| 35mm | HM-4183.14 |
| 38mm | HM-4183.15 |
| 50mm | HM-4183.20 |
| 70mm | HM-4183.28 |
| 100mm | HM-4183.40 |
| 150mm | HM-4183.60 |
| 1.4" | HM-4183.14 |
| 1.5" | HM-4183.15 |
| 2.0" | HM-4183.20 |
| 2.8" | HM-4183.28 |
| 4.0" | HM-4183.40 |
| 6.0" | HM-4183.60 |

Positions rings to seal membrane with minimum disturbance to specimen.



HM-4181.28



HM-4185.28



HM-3847.28



HM-3827.28



HM-4186.28

| Membrane Stretcher | |
|--------------------|------------|
| 35mm | HM-4181.14 |
| 38mm | HM-4181.15 |
| 50mm | HM-4181.20 |
| 70mm | HM-4181.28 |
| 100mm | HM-4181.40 |
| 150mm | HM-4181.60 |
| 1.4" | HM-4181.14 |
| 1.5" | HM-4181.15 |
| 2.0" | HM-4181.20 |
| 2.8" | HM-4181.28 |
| 4.0" | HM-4181.40 |
| 6.0" | HM-4181.60 |

Simple & effective method of sheathing (encasing) sample with latex membrane without creasing or damaging the sleeve.

| Membrane Tester | |
|-----------------|------------|
| 35mm | HM-4185.14 |
| 38mm | HM-4185.15 |
| 50mm | HM-4185.20 |
| 70mm | HM-4185.28 |
| 100mm | HM-4185.40 |
| 150mm | HM-4185.60 |
| 1.4" | HM-4185.14 |
| 1.5" | HM-4185.15 |
| 2.0" | HM-4185.20 |
| 2.8" | HM-4185.28 |
| 4.0" | HM-4185.40 |
| 6.0" | HM-4185.60 |

Tester is easy to use for quick visual detection of possible flaws in membranes.

| 2-Part Split Miter Box | |
|------------------------|-------------|
| 35mm | HM-3847.35 |
| 38mm | HM-3847.38 |
| 50mm | HM-3847.50 |
| 70mm | HM-3847.70 |
| 100mm | HM-3847.100 |
| 150mm | HM-3847.150 |
| 1.4" | HM-3847.14 |
| 1.5" | HM-3847.15 |
| 2.0" | HM-3847.20 |
| 2.8" | HM-3847.28 |
| 4.0" | HM-3847.40 |
| 6.0" | HM-3847.60 |

For use with undisturbed samples and for sample trimming of cohesive soils. Made from non-ferrous metal.

| 2-Part Vacuum Split Former | |
|----------------------------|-------------|
| 35mm | HM-3827.35 |
| 38mm | HM-3827.38 |
| 50mm | HM-3827.50 |
| 70mm | HM-3827.70 |
| 100mm | HM-3827.100 |
| 150mm | - |
| 1.4" | HM-3827.14 |
| 1.5" | HM-3827.15 |
| 2.0" | HM-3827.20 |
| 2.8" | HM-3827.28 |
| 4.0" | HM-3827.40 |
| 6.0" | HM-3827.60 |

For use with non-cohesive soils and disturbed samples. Made from non-ferrous metal. Larger sizes require use of supporting jacks.

| Sample Trimmer with Knife | |
|---------------------------|------------|
| 35mm | HM-4186.14 |
| 38mm | HM-4186.15 |
| 50mm | HM-4186.20 |
| 70mm | HM-4186.28 |
| 100mm | HM-4186.40 |
| 150mm | HM-4186.60 |
| 1.4" | HM-4186.14 |
| 1.5" | HM-4186.15 |
| 2.0" | HM-4186.20 |
| 2.8" | HM-4186.28 |
| 4.0" | HM-4186.40 |
| 6.0" | HM-4186.60 |

Used to trim sample ends or cut sample to a specific length.



HM-5320.3F

HM-5330.3F

Humboldt Elite Series Data Loggers

Humboldt's Elite Series Data Loggers are specifically designed for use within construction materials testing labs. You can use Humboldt Data Loggers to cost-effectively update your older, non-computerized load frames, direct shear and consolidation machines with computerized data acquisition—increasing lab output, freeing-up technicians and providing more accurate test results.

Humboldt's modular-design, data acquisition concept is designed to give you the most flexible and cost-effective method of data logging for your lab. Rather than having to buy into a large data logging system and then growing into it, Humboldt Data Loggers give you the flexibility and low cost outlay of being able to buy loggers on an "as you grow" basis, increasing your data logging capability as your expansion demands.

Humboldt Data Loggers can be used with a wide variety of transducers, load cells and digital indicators; and both come with Humboldt's, highly-regarded, NEXT software. This software provides robust data acquisition and report generation for those wanting to use a computer to monitor tests and collect test data.

In stand-alone mode, these data loggers provide a 7" (178mm) touch-screen controller, which provides real-time, visual views of your data in both tabular and graphic formats. These new waterproof, touch screens provide colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine while the test is running. Data can then be viewed simultaneously or downloaded later to a computer in the lab, in the next

room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced test-specific modules.

When operated from a networked computer the NEXT software provides robust machine and test control, and report generation. It also allows the ability to control and monitor multiple machines from a single computer.

Humboldt Elite Series Data Logger, Analog

Provides four individual, 24-bit analog to digital converters with an instrumentation excitation supply of 10 VDC. The analog Logger is ideal for use with instruments, such as pressure transducers, load cells, and strain transducers. It provides data storage for 1000 readings per channel. Voltage: 120/220V 50/60Hz.

Humboldt Elite Series Data Logger, Analog

HM-5320.3F

Shipping wt. 5lb (2.2kg)

Humboldt Elite Series Data Logger, Digital

Provides four individual, Digital Indicator inputs with an instrumentation excitation supply of 5 VDC. The digital Logger is ideal for use with digital indicators. It provides data storage for 1000 readings per channel. Voltage: 120/220V 50/60Hz.

Humboldt Elite Series Data Logger, Digital

HM-5330.3F

Shipping wt. 6 lb (2.7kg)

Digital Indicator Cable, 6ft.

For use with HM-4469 & HM-4470 Series digital gauges when used with Elite Series Machines and Digital Data Logger.

Digital Indicator Cable, 6 ft.

HM-4470C

Shipping wt. 6 lb (2.7kg)

| Specifications | |
|---|---|
| Display | 7" (178mm) VGA (480 x 800) Resistive-touch screen |
| Real-time test data | Graphic and tabulation |
| Processor | Dual 32-bit ARM |
| RAM | 64MB |
| Memory, non-volatile | 4GB |
| Analog to digital converter | 24 bit |
| Data acquisition | 4 Channels |
| Logging Rate | effective rate of 320 readings per second |
| Multi-test storage | 1000 |
| Points per test | 3000 |
| USB port (front) | use to export data and import/export calibration data, also use to provide external power for optional WIFI adapter |
| USB port (back) | provides external power at the back of the machine |
| Ethernet connection | for network connectivity |
| Emergency stop | Large button |
| 24-bit differential analog to digital converter (21 bits @1000 samples/sec. | 4 |
| Ambient temperature sensor: | 1 |
| Limit switches | 4 |
| Firmware Update | Ethernet or flash drive |

**NOTES**

Load Cells are wired for use with Humboldt Equipment. Please contact support for wiring instructions when using with manufacturers' equipment.

**S-type Load Cells**

Load cells are bi-directional for compression loads. Constructed from stainless steel. Load cells can be used with various instrumentation to measure loads. Includes: 6 ft. cable with 5-pin DIN plug and calibration certificate.

| Performance Specifications | |
|----------------------------|----------------------------------|
| Excitation voltage: | 10 VDC, max. 15 VDC |
| Rated output: | 3.0 mv/V minimum |
| Non-linearity: | 0.03% full scale Output |
| Hysteresis: | 0.02% FSO |
| Non-repeatability: | 0.01% FSO |
| Creep (30 minutes): | 0.03% FSO |
| Zero balance: | ±1.0% FSO |
| Bridge resistance: | |
| Input: | 350 ohms, nominal |
| Output: | 350 ohms, ±3.5 ohms |
| Overload: | |
| Safe static: | 150% of capacity |
| Ultimate: | 175% of capacity |
| Temperature: | |
| Compensated range: | 0-150°F |
| Effect on output: | 0.0006% FSO/°F |
| Effect on zero: | 0.0008% FSO/°F |
| Finish: | Nickel-plated or stainless steel |
| Seal: | Waterproof |

| | |
|------------------------------|-------------|
| Load Cell, 500 lbf (2.5 kN) | HM-2300.005 |
| Load Cell, 1000 lbf (5 kN) | HM-2300.010 |
| Load Cell, 2000 lbf (10 kN) | HM-2300.020 |
| Load Cell, 5000 lbf (25 kN) | HM-2300.050 |
| Load Cell, 10000 lbf (50 kN) | HM-2300.100 |

Shipping wt. from 1 lb (0.45kg) to 3.5 lbs (1.6kg)

Pancake Load Cells

Pancake-design load cells are available for those who want to use a load cell design that theoretically provides the least amount of deflection in applications.

| Performance Specifications | |
|----------------------------|-----------------------------|
| Overload Capacity: | 200% |
| Excitation Voltage: | 10 VDC, Maximum |
| Non-linearity: | 0 ± 0.05% Full Scale Output |
| Hysteresis: | 0.05% Full Scale Output |
| Diameter: | 3" (75mm) |
| Cable Length: | 79" (2m) |
| Height: (excluding Ram) | 2" (50mm) |

| | |
|-------------------------------|--------------|
| Load Cell, 2000 lbf (10 kN) | HM-2300.020P |
| Load Cell, 5000 lbf (25 kN) | HM-2300.050P |
| Load Cell, 10000 lbf (50 kN) | HM-2300.100P |
| Load Cell, 15000 lbf (75 kN) | HM-2300.150P |
| Load Cell, 25000 lbf (125 kN) | HM-2300.250P |
| Load Cell, 50000 lbf (250 kN) | HM-2300.500P |

Shipping wt. 11 lb (5kg)

Platen, Swivel Top

4.25" (108mm) diameter top swivel platen. Platen used for soil cement and/or large unconfined compression tests.

| | |
|--------------------|----------|
| Platen, Swivel Top | HM-2003E |
|--------------------|----------|

Shipping wt. 5.2 lb (2.35kg)

Platen, Swivel Top

6.25" (158.75mm) diameter top swivel platen. Platen used for soil cement and/or large unconfined compression tests.

| | |
|--------------------|----------|
| Platen, Swivel Top | HM-2006E |
|--------------------|----------|

Shipping wt. 6.5 lb (2.95kg)

Submersible Load Cells

For those concerned with reducing the effects of hysteresis on testing results, we offer a submersible load cell, which is designed to work within the tri-axial cell. Positioning the load cell within the tri-axial cell eliminates the possible drag effect introduced by using a plunger between the sample and an externally-mounted load.

| Performance Specifications | |
|----------------------------|-----------------------------|
| Overload Capacity: | 150% |
| Excitation Voltage: | 20 VDC, Maximum |
| Non-linearity: | 0 ± 0.05% Full Scale Output |
| Hysteresis: | 0.05% Full Scale Output |
| Diameter: | 4.13" (104.8mm) |
| Cable Length: | 79" (2m) |
| Height: (excluding Ram) | 2.5" (63.5mm) |

| | |
|-----------------------------|--------------|
| Load Cell, 1000 lbf (5 kN) | HM-2300.010S |
| Load Cell, 2000 lbf (10 kN) | HM-2300.020S |
| Load Cell, 5000 lbf (25 kN) | HM-2300.050S |

Shipping wt. 1 lb (0.45kg)

Stud, Threaded

Threaded stud for attaching S-type load cells to load frame cross beams.

| | |
|----------------|----------|
| Stud, Threaded | H-4178.2 |
|----------------|----------|

Shipping wt. 0.2 lb (0.09kg)

Stud Adapter

Adapter for connecting 3/4-16F threads to 1/2-20.

| | |
|--------------|----------------|
| Stud Adapter | HM-2300.75AD50 |
|--------------|----------------|

Shipping wt. 0.2 lb (0.09kg)

**Linear Strain Conversion Transducers (LSCT)**

Extremely accurate and reliable strain gauge instruments. Compact size does not require a module. High resolution and performance superior to LVDT. Stainless steel casing for environmental protection. Operating temperature range 0 to 70°C. Requires input of 10V dc; output up to 6.5 mV per volt.

- Less than 250g spring force on spindle
- Non-linearity better than $\pm 0.1\%$ of full scale deflection
- Hysteresis-compensated with linearity better than $\pm 0.1\%$ of full scale in both directions
- Negligible temperature effect

| | |
|------------------------------|------------|
| LSCT, 0.4" (10mm) | HM-2310.04 |
| LSCT, 1.0" (25mm) | HM-2310.10 |
| LSCT, 2.0" (50mm) | HM-2310.20 |
| Shipping wt. 0.8 lb (0.36kg) | |

Linear Potentiometer Transducers (LPT)

Accurate and reliable strain gauge instruments for use with Humboldt's HM-5150, HM-5170 and HM-5120 Load Frames.

| | |
|---|------------|
| Linear Potentiometer Transducer 1.0" (25mm) | HM-2305.10 |
| Linear Potentiometer Transducer 2.0" (50mm) | HM-2305.20 |
| Shipping wt. 0.8 lb (0.36kg) | |

LSCT Displacement Transducer Bracket

Bracket is used with the HM-5020.3F, HM-5030.3F and HM-5040.3F load frames with the HM-2310.xx LSCTs for use with many tests. Can also be used with CBR piston (H-4178) in conjunction with HM-2310.xx LSCTs.

| | |
|--------------------------------------|------------|
| LSCT Displacement Transducer Bracket | HM-4178BRT |
| Shipping wt. 0.7 lb (0.32kg) | |

LSCT/LVDT Contact/Mounting Bracket

Bracket used in mounting LSCT to equipment in replacement of dial gauge.

| | |
|------------------------------|-----------|
| LSCT/LVDT Mounting Bracket | HM-2310BR |
| Shipping wt. 0.1 lb (0.04kg) | |

LSCT Triaxial Mounting Bracket

Bracket used in mounting LSCT or dial gauge to the upper part of a triaxial cell with a 0.625" (15.5mm) dia. ram for strain measurement. (HM-2310BR also required for use with LSCT.)

| | |
|--------------------------------|-----------|
| LSCT Triaxial Mounting Bracket | HM-4193BR |
| Shipping wt. 2 lbs (0.9kg) | |

Linear Potentiometer Bracket

Bracket used to mount HM-2305 LSCTs.

| | |
|------------------------------|------------|
| Linear Potentiometer Bracket | HM-2305BRT |
| Shipping wt. 0.7 lb (0.32kg) | |

Linear Potentiometer Bracket

Bracket used to mount HM-2305 potentiometers to HM-5120 and HM-5170 for Marshall applications.

| | |
|------------------------------|-------------|
| Linear Potentiometer Bracket | HM-2305BRSQ |
| Shipping wt. 0.7 lb (0.32kg) | |

LVDT Bracket

Bracket used to mount LVDTs in load frame setups.

| | |
|------------------------------|----------|
| LVDT Bracket | HM-1327B |
| Shipping wt. 0.7 lb (0.32kg) | |

Transducer Data Extension Cable

Data extension cable for use with load cells, LSCT or pressure devices. Cable is 25ft. (7.6m) length.

| | |
|---------------------------------|----------|
| Transducer Data Extension Cable | HM-2310C |
| Shipping wt. 1 lb (0.45kg) | |

Pore Pressure Transducer

Highly accurate, 200 psi (1400 kPa) pore pressure transducer. Designed for geotechnical lab applications with outstanding overload protection and protected from corrosive water. Requires input of 10 V DC, with an output of 100 mV. Supplied with 2 meter cable and 5-pin DIN plug.

| | |
|------------------------------|---------|
| Pore Pressure Transducer | HM-4170 |
| Shipping wt. 0.8 lb (0.36kg) | |

De-Airing Block

For use with pore pressure transducer.

| | |
|----------------------------|----------|
| De-Airing Block | HM-4170B |
| Shipping wt. 1 lb (0.45kg) | |

Digital Pore Pressure Set

For accurately measuring and monitoring pore water pressures and back pressure. For determining level of saturation ("B" parameter) during saturation stages of triaxial/permeability tests. Includes readout, pore pressure transducer, and de-airing block assembly.

| | |
|------------------------------------|------------|
| Digital Pressure Set, 120V 60Hz | HM-4175 |
| Digital Pressure Set, 220V 50/60Hz | HM-4175.4F |
| Shipping wt. 7 lb (3.1kg) | |

Digital Pressure Transducer

Solid state transducer/readout unit incorporates the latest semiconductor technology into a

high-quality, yet inexpensive strain gauge. Three-digit readout display has $\pm 0.25\%$ of full scale accuracy—comparable to others at twice the cost. Battery operated with very long battery life—typically up to 5 years. On/off button at top of readout has factory set "on" time built into the memory. Readout shuts off automatically after 20 minutes.

| | |
|-----------------------------|---------|
| Digital Pressure Transducer | HM-4172 |
| Shipping wt. 2 lbs (0.9kg) | |

AC Adapter, 120V 60Hz

AC adapter for digital indicator, allows indicator to run off AC power.

| | |
|------------------------------|-----------|
| AC Adapter, 120V 60Hz | HM-4469AC |
| Shipping wt. 0.6 lb (0.27kg) | |

Data Cable

For use with HM-4469 and HM-4470 Series Digital Gauges when used with Elite Series Machines and Digital Data Logger. Includes 6ft. cable.

| | |
|------------------------------|----------|
| Data Cable | HM-4470C |
| Shipping wt. 0.5 lb (0.23kg) | |

Data Cable

Upgrade for HM-4169C Data Cable for use with Elite Series Machines and Digital Data Logger. Includes 6ft cable.

| | |
|------------------------------|----------|
| Data Cable | HM-4470U |
| Shipping wt. 0.5 lb (0.23kg) | |

Data Cable

Data cable for digital indicator, used with HM-2330D.3F Humboldt Logger.

| | |
|------------------------------|----------|
| Data Cable | HM-4469C |
| Shipping wt. 0.5 lb (0.23kg) | |

Multi-Device Cable

Allows one computer to control multiple daisy-chained machines. For Non-elite machines.

| | |
|----------------------------|-----------|
| Multi-Device Cable | HM-000379 |
| Shipping wt. 1 lb (0.45kg) | |

Single-Channel Displays

The HM-2350 provides 4-digit accuracy and the HM-2360 provides 6-digit accuracy.

| | |
|--------------------------------------|------------|
| Single-Channel Display, 120V 60Hz | HM-2350 |
| Single-Channel Display, 220V 50/60Hz | HM-2350.4F |
| Single-Channel Display, 120V 60Hz | HM-2360 |
| Single-Channel Display, 220V 50/60Hz | HM-2360.4F |
| Shipping wt. 6 lb (2.7kg) | |



Load Rings

ASTM E74

Sometimes referred to as "proving rings," load rings are used with various asphalt, concrete, or soil instrumentation to measure loads, and are ideal for use with our Master Loader compression machines, direct shear machines and other testing equipment. Our high-quality, tensile steel rings have spherical seatings suitable for all shear boxes and load frames. Each load ring is shipped with a fitted gauge or indicator and calibration certificate, and supplied with tables listing all measurement units. 8.25" (210mm) high, 3/4-16 UNF thread female mounting. Available with digital indicators compatible with data acquisition systems. Eight models range in size from 110 to 22,000 lbf (0.5 to 100.0 kN).

| Load Ring with Digital Indicator | | | |
|----------------------------------|-------|-------|-------------|
| lbf | kN | kgf | Model |
| 110 | 0.5 | 50 | H-4454.001D |
| 220 | 1.0 | 100 | H-4454.002D |
| 550 | 2.5 | 250 | H-4454.005D |
| 1100 | 5.0 | 500 | H-4454.010D |
| 2200 | 10.0 | 1000 | H-4454.020D |
| 5500 | 25.0 | 2500 | H-4454.050D |
| 11000 | 50.0 | 5000 | H-4454.100D |
| 22000 | 100.0 | 10000 | H-4454.200D |

| Load Ring with Dial Indicator | | | |
|-------------------------------|-------|-------|------------|
| lbf | kN | kgf | Model |
| 110 | 0.5 | 50 | H-4454.001 |
| 220 | 1.0 | 100 | H-4454.002 |
| 550 | 2.5 | 250 | H-4454.005 |
| 1100 | 5.0 | 500 | H-4454.010 |
| 2200 | 10.0 | 1000 | H-4454.020 |
| 5500 | 25.0 | 2500 | H-4454.050 |
| 11000 | 50.0 | 5000 | H-4454.100 |
| 22000 | 100.0 | 10000 | H-4454.200 |

Load Rings

See Tables

Shipping wt. 8 lb (3.7kg)

Dial Gauges

Indicators are built to American gauge design specifications for accuracy and are used in field and laboratory testing applications. Dials are high-quality, low-friction type, designed for long life and accurate repeatable readings. All dial indicators have continuous graduations and revolution counters that show revolutions of the indicator hand. They are furnished with a lug back (with a 90° mounting hole to be used vertically or horizontally), a regular contact point .25" long, and a dust cap.

| Range | Division | Dia. | Brake | Model |
|--------|----------|-------|-------|-----------|
| .200" | .0001" | 2.25" | No | H-4460 |
| .200" | .0001" | 2.25" | Yes | H-4461A |
| .300" | .0001" | 2.25" | No | H-4462 |
| .500" | .0001" | 2.25" | No | H-4471 |
| 1.000" | .001" | 2.25" | No | H-4158.1 |
| 2.000" | .001" | 2.75" | No | H-4463 |
| 3.000" | .001" | 2.75" | No | H-4464 |
| 4.000" | .001" | 2.75" | No | H-4465 |
| 5.000" | .001" | 2.75" | No | H-4466 |
| 12mm | .002mm | 57mm | No | H-4465.12 |
| 25mm | .010mm | 57mm | No | H-4465.25 |
| 50mm | .020mm | 70mm | No | H-4465.50 |

All dial gauges above feature clockwise rotation. Counter-clockwise models are available for all except: H-4465 and H-4462. To order counter-clockwise models, add CC to the end of the model number.

Dial Gauges

See Table

Shipping wt. 1.3 lb (0.58kg)

Digital Indicators

Switchable inch/metric digital indicator is accurate to $\pm .0001$ " (.002mm). Instant zero feature. Locks in maximum reading on LCD display with characters 0.240" high and 0.115" wide. Runs either clockwise or counter clockwise. Operates with replaceable batteries or AC power with automatic shutoff.

Will replace any mechanical dial gauge.

| Range | Resolution | Model |
|----------------|------------------|------------|
| .250" / 6.35mm | .0001" .002mm | HM-4470.02 |
| .600" / 15.0mm | | HM-4470.05 |
| 1.0" / 25.4mm | | HM-4470.10 |
| 2.0" / 50.0mm | | HM-4470.20 |
| 4.0" / 101.6mm | | HM-4470.40 |

Digital Indicators

See Table

Shipping wt. 1 lb (0.45kg)

Gauge Contact Point Extensions

Used in applications where gauges require longer contact points to ensure correct gauge placement. Contact points feature hardened steel points with polished tip to prevent scratching. Points fit all standard indicators and gauges. **Not compatible with H-4471, H-4471CC, H-4465.12, or H-4465.12CC gauges.**

| Contact Point Extensions | Model |
|--------------------------|-----------|
| 0.25" (6.4mm) Extension | H-4466.2 |
| 0.5" (13mm) Extension | H-4466.5 |
| 1" (25mm) Extension | H-4466.10 |
| 1.5" (38mm) Extension | H-4466.15 |
| 2" (50mm) Extension | H-4466.20 |
| 3" (76mm) Extension | H-4466.30 |
| 6" (152mm) Extension | H-4466.6 |

Gauge Contact Point Extensions

See Table

Shipping wt. 0.1 lb (0.04kg)

Magnetic Indicator Mount

Convenient, portable mount for mounting indicators and gauges. Mount has magnetic base, which mounts on metallic surfaces. Features non-magnetic stainless steel holding rod, 6 x 0.25" (154 x 6.4mm), set in hardened ball socket. Can be mounted in almost any position.

Magnetic Indicator Mount

H-4470

Shipping wt. 1.3 lb (0.58kg)

Magnetic Gauge Mount

Convenient, portable mount for mounting indicators and gauges. Mount has magnetic base, which mounts on metallic surfaces.

Magnetic Gauge Mount

HS-4156.14

Shipping wt. 1.3 lb (0.58kg)



| Specifications | |
|----------------|--|
| Flow Rate | 0 to 8 meters per second |
| Specimen Size | Accepts 3.0" OD x 2.875" (76.2 x 73mm) ID Shelby Tubes |
| Dimensions | 96" x 40" x 96" (2,438 x 1016 x 2438mm) excludes wheels. |

Erosion Function Apparatus

The HM-5940 erosion function apparatus (EFA) was designed and built to prevent bridge failures by measuring the erodibility of soil. Used in conjunction with the SRICOS scour prediction method, the HM-5940 can provide more accurate erodibility measurements and scour predictions than previously obtainable. Applications for its use include: scour at bridges, piping of dams, beach erosion and surface erosion problems. In the case of scour at bridges, the EFA leads to improved accuracy on scour depth predictions, offering several advantages over previous test methods. These advantages include: minimum sample disturbance; measurement of erosion rate vs. shear stress; measurement of critical shear stress, and incorporation of the test results from the SRICOS scour prediction method. The HM-5940 erosion function apparatus uses standard 3.0" OD x 2.875" ID (76.2 x 73 mm) Shelby tubes. The SRICOS method improves the accuracy of pier scour predictions. The HM-4000 EFA is designed to be used in conjunction with the SRICOS method of scour prediction. The SRICOS scour prediction method and the HM-5940 erosion function apparatus were developed through research carried out by Jean-Louis Briaud, PHD, PE. and the scour research team at the Texas Transportation Institute of the Texas A&M University

System. In comparison with the HEC-18 equation (a standard for calculating scour predictions), SRICOS generally leads to smaller calculated scour depths and compares more favorably to actual measured scour depths.

- 7" touch screen interface
- Records and tabulates test data.
- Can store hundreds of tests at a time.
- Graphs flow rate vs. time as well as water temperature vs. time
- System can automatically fill the water tank using water level sensors.
- System can automatically cycle between water sump and water fill during tests to maintain lower water temps.
- If hooked up the internet then the machine will auto update with available firmware updates.
- Test data can be exported to USB stick for transfer to a PC with "data download software" from the Humboldt website.
- Motor can push the sample any specific distance customizable by the user.

The EFA uses either of two variants of the SRICOS method:

The Extended SRICOS Method:

- 1) Calculate the maximum depth of scour.
- 2) Collect soil samples at the site.
- 3) Test samples in the EFA to obtain the erosion rate vs. the hydraulic shear stress applied.
- 4) Prepare the velocity hydrograph for the bridge.
- 5) Use the SRICOS program with 3 & 4 above as input and generate the depth of scour vs. time over the period covered by the chosen hydrograph.

The Simple SRICOS Method:

- 1) Calculate the maximum depth of scour.
- 2) Collect soil samples at the site.
- 3) Test samples in the EFA to obtain the erosion rate vs. hydraulic shear stress applied.
- 4) Calculate the equivalent time for a given design life of the bridge and for the design velocity.
- 5) Using known equations, calculate the scour depth at the end of the design life.

Erosion Function Apparatus

HM-5940



Shipping wt. 1500 lbs (680kg)





CONCRETE

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H-2783



H-2786C

Humboldt Concrete Air Meter

ASTM C231, AASHTO T152

The H-2783 air meter, which exceeds ASTM requirements, features the Humboldt, all-brass super pump, the most reliable and highest quality pump available. The meter's easy-to-use, and extra durable stainless steel clamping system employs four, one-piece, self-locking clamps that quickly seal the lid to the base with proper tension aided by an o-ring to assure a watertight seal. The large, easy-to-read, 4-inch diameter, heavy-duty, direct percentage gauge with calibration adjustments is accurate to the nearest 0.1%. The bucket, or pressure chamber, features EZ-grip, cast handles, which improve usability. This is especially true when the bucket is also used as a 0.25 cu. ft. unit weight measure. The lid of the pressure meter features a smooth sloped top so water and concrete wipe right off. By eliminating the cavities in the lid that trap and hold concrete, maintenance and repair problems are greatly reduced. The meter also features a machined base, which ensures the meter sets level when conducting tests. The kit includes a durable plastic carrying case; a tamping rod; strike-off bar; rubber bulb syringe; plastic calibration vessel; inside calibration tube, outside calibration tube and operating instructions.

Features Include:

- Humboldt all-brass Super Pump
- Large, heavy-duty, easy-to-read gauge
- Cast handles for secure grip
- Bucket can be used as a 0.25 cu. ft. unit weight measure
- Complete with all needed accessories and case

Humboldt Concrete Air Meter

H-2783



Ship wt. 36lbs. (16.3kg)

Concrete Air Meter

ASTM C231, AASHTO T152

The H-2786C air meter features a simplified, low-maintenance design, which uses no moving parts inside the chamber. Pressure is released into the base by an external, brass, quick-release T-valve. The meter uses brass cover clamps, which can be adjusted for clamping pressure. A large, easy-to-read, 4" diameter, direct percentage gauge with calibration adjustments is accurate to the nearest 0.1%. The base is machined inside and out for easy cleaning and the chamber and cover are one solid component, eliminating bottom gasket leaks. The H-2786C air meter also features the Humboldt, all-brass super pump, the most reliable and highest quality pump available. The meter's base/bucket can be used as a 0.25 cu. ft. unit weight measure. The kit includes a durable plastic carrying case; tamping rod; strike-off bar; wash bottle; plastic calibration vessel; inside calibration tube, outside calibration tube and operating instructions.

Concrete Air Meter

H-2786C



Ship wt. 34.9lbs. (15.9kg)

Press-Ur-Meter Concrete Air Meter, Wood Case

ASTM C231, AASHTO T152

This is the original Press-Ur-Meter for field and laboratory tests. This air meter is designed to provide air content and the determination of specific gravity and free moisture of aggregate. Designed to save time, reduce water use, ensure accuracy and maintain sample integrity (sample may also be used for slump and compression tests). The meter uses brass cover clamps, which can be adjusted for clamping pressure. A large, easy-to-read, 4" diameter, direct percentage gauge with calibration adjustments is accurate to nearest 0.1%. The H-2786 meter also features the Humboldt, all-brass super pump, the most reliable and highest quality pump available. The meter's base/bucket can be used as a 0.25 cu. ft. unit weight measure. This kit includes a wood carrying case; tamping rod; strike-off bar; rubber bulb syringe; aluminum calibration vessel; inside calibration tube, outside calibration tube and operating instructions.

Press-Ur-Meter with vertical wood case

H-2786



Ship wt. 30lbs. (13.6kg)



H-2784

Looking for the Humboldt Super Air Meter?

See page 214



H-2786P

Press-Ur-Meter Concrete Air Meter, Plastic Case
ASTM C231, AASHTO T152

This is the original Press-Ur-Meter for field and laboratory tests. This air meter is designed to provide air content and the determination of specific gravity and free moisture of aggregate. Designed to save time, reduce water use, ensure accuracy and maintain sample integrity (sample may also be used for slump and compression tests). The meter uses brass cover clamps, which can be adjusted for clamping pressure. A large, easy-to-read, 4" diameter, direct percentage gauge with calibration adjustments accurate to the nearest 0.1%. The H-2786 meter also features the Humboldt, all-brass super pump, the most reliable and highest quality pump available. The meter's base/bucket can be used as a 0.25 cu. ft. unit weight measure. This kit includes a molded-plastic carrying case; tamping rod; strike-off bar; rubber bulb syringe; aluminum calibration vessel; inside calibration tube, outside calibration tube and operating instructions.

Press-Ur-Meter with horizontal plastic case H-2786P
Ship wt. 30lbs. (13.6kg)



H-2756

Chace Concrete Air Indicator Kit
AASHTO T199

(Isopropyl-Alcohol Method) Complete kit for measuring air content of fresh concrete includes H-2755 Chace air indicator, instructions, cleaning brush and plastic squeeze-type bottle for alcohol in plastic storage box. Glass tube provides marked lines on stem for estimating total air content. Kit does not replace conventional air meters.

Chace Concrete Air Indicator Kit H-2756
Ship wt. 1.4lbs. (1.8kg)



H-2782

Air Entrainment Meter, 8 Liter

ASTM C231, EN 12350-7, BS 1881, GOST 10181

The H-2782 8 Liter air meter features push-buttons for simple test performance. The meter's easy-to-use, and extra durable stainless steel clamping system employs four, one-piece, self-locking clamps that quickly seal the lid to the base with proper tension aided by an o-ring to assure a watertight seal. It also features durable, stainless steel handles. The large, easy-to-read, 4-inch (100mm) dia., heavy-duty, direct percentage gauge with calibration adjustments is accurate to the nearest 0.1%. This gauge is built into the meter's cover for excellent protection from damage. The meter also features a machined base, which ensures the meter sets level when conducting tests. The air meter includes a calibration kit and operating instructions. A case can be ordered below right.

Air Entrainment Meter, 8L H-2782
Ship wt. 21.1lbs. (9.6kg)



H-2781

Air Entrainment Meter, 5 Liter

ASTM C231, EN 12350-7, BS 1881, GOST 10181

The H-2781 5 Liter air meter features push-buttons for simple test performance. The meter's easy-to-use, and extra durable stainless steel clamping system employs four, one-piece, self-locking clamps that quickly seal the lid to the base with proper tension aided by an o-ring to assure a watertight seal. It also features durable, stainless steel handles. The large, easy-to-read, 4-inch (100mm) dia., heavy-duty, direct percentage gauge with calibration adjustments is accurate to the nearest 0.1%. This gauge is built into the meter's cover for excellent protection from damage. The meter also features a machined base, which ensures the meter sets level when conducting tests. The air meter includes a calibration kit and operating instructions. A case can be ordered below.

Air Entrainment Meter, 5L H-2781
Ship wt. 19.8lbs. (9.0kg)

Air Entrainment Meter Accessories

| Item | Part No. |
|--------------------------|----------|
| Transport Case, Aluminum | H-2782.1 |



H-2755

Chace Concrete Air Indicator
AASHTO T199

For quick field checks for air content of fresh concrete in about three minutes, pocket-sized unit air meter is furnished with instructions and correlation chart. Glass tube provides marked lines on stem for estimating total air content. Air Indicator includes brass cup and stopper. Unit does not replace conventional air meters. Overall Dimensions: 6.25 x 1.125" dia. (159 x 29mm).

Chace Concrete Air Indicator H-2755
Ship wt. 0.25lbs. (.45kg)



H-2755.2

Chace Air Indicator Glass Filter Tube Only
AASHTO T199

Chace Glass Filter Tube only H-2755.2
Glass tube provides marked lines on stem for estimating total air content. Does NOT include brass cup and stopper.

Ship wt. 0.2lbs. (.45kg)



H-2789



H-2793



H-2788



H-2783.30

Air Meter Calibrators (5%)

Calibrators check the accuracy of any pressure-type concrete air meter. Set the specially-designed canister upright at the bottom of the water-filled base, and the meter should read 5% air by volume. Two calibrators are used for a 10% air reading.

Air Meter Calibrator, Brass H-2789

Air Meter Calibrator, Aluminum H-2793

Air Meter Calibrator, Plastic H-2788

Ship wt. 3lbs. (1.3kg)



H-3399



H-2785.31



H-2785.35

H-2785.34

H-2783.31

H-2783.32



H-2785.36



H-2785.32

H-2785.33

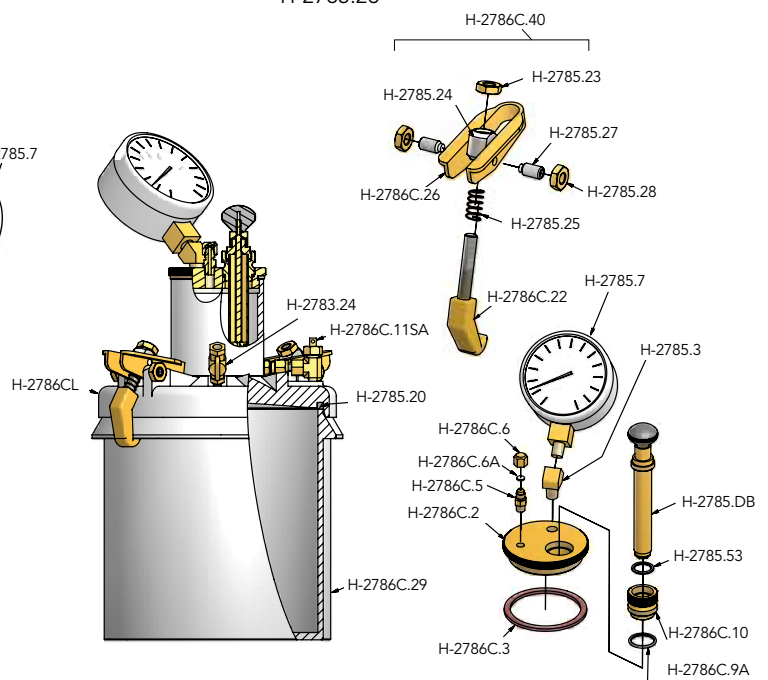
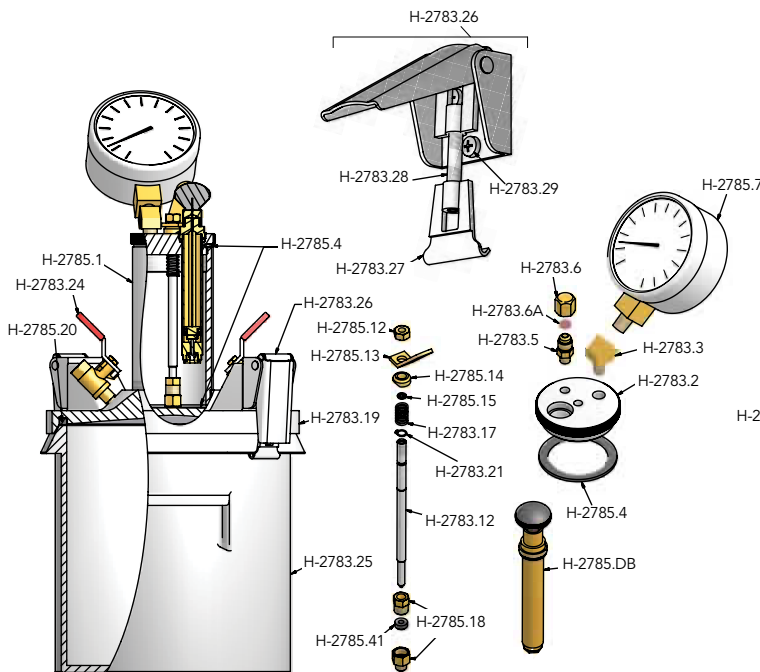
H-2786C.32



H-2786C.33



H-2783.26

**H-2783 Air Meter Replacement Items**

| Part No. | Description | Part No. | Description |
|-----------|-------------------------|-----------|------------------------------|
| H-2785.1 | Pressure chamber | H-2785.18 | Needle valve seat assembly |
| H-2783.2 | Pressure chamber cap | H-2783.19 | Cover |
| H-2783.3 | Pressure chamber elbow | H-2785.20 | Cover o-ring |
| H-2785.4 | Pressure chamber gasket | H-2783.21 | Needle valve spring retainer |
| H-2783.5 | Air-release stem | H-2783.24 | Cover petcock |
| H-2783.6 | Air-release cap | H-2783.25 | Base |
| H-2783.6A | Release cap gasket | H-2785.41 | Needle valve seat gasket |
| H-2785.7 | Air meter gauge | H-2783.26 | Latch assembly |
| H-2783.12 | Needle valve stem | H-2783.27 | Latch |
| H-2785.12 | Needle valve nut | H-2783.28 | Adjusting rod |
| H-2785.13 | Needle valve lever | H-2783.29 | Latch assembly screw |
| H-2785.14 | Needle valve spacer | H-2785.DB | Super Pump assembly |
| H-2785.15 | Needle valve o-ring | H-2783.39 | Gasket replacement kit |
| H-2783.17 | Needle valve spring | | |

H-2786C Air Meter Replacement Items

| Part No. | Description | Part No. | Description |
|--------------|--------------------------|------------|---------------------------|
| H-2785.7 | Gauge, complete | H-2785.27 | Clamp toggle lock nut |
| H-2785.3 | Pressure chamber elbow | H-2785.25 | Spring |
| H-2786C.3 | Gasket, pressure chamber | H-2786C.26 | Toggle |
| H-2786C.2 | Pressure chamber cap | H-2786C.22 | Clamp |
| H-2786C.5 | Air-release stem | H-2786C.10 | Super Pump adapter |
| H-2786C.29 | Pot (base only) | H-2786C.9A | O-ring, lower for adapter |
| H-2786C.6 | Release cap and gasket | H-2785.53 | O-ring for tube |
| H-2786C.6A | Release cap gasket only | H-2786C.29 | Pot, base only |
| H-2786C.11SA | Valve assembly, complete | H-2786CL | Lid only |
| H-2785.20 | Cover o-ring | H-2785.DB | Super Pump |
| H-2785.24 | Clamp trunnion | H-2786C.55 | Gasket replacement kit |
| H-2785.23 | Nut, clamp | H-2786C.40 | Latch assembly complete |



H-2783.62H



H-2785.38HP



H-2785.38



H-4976

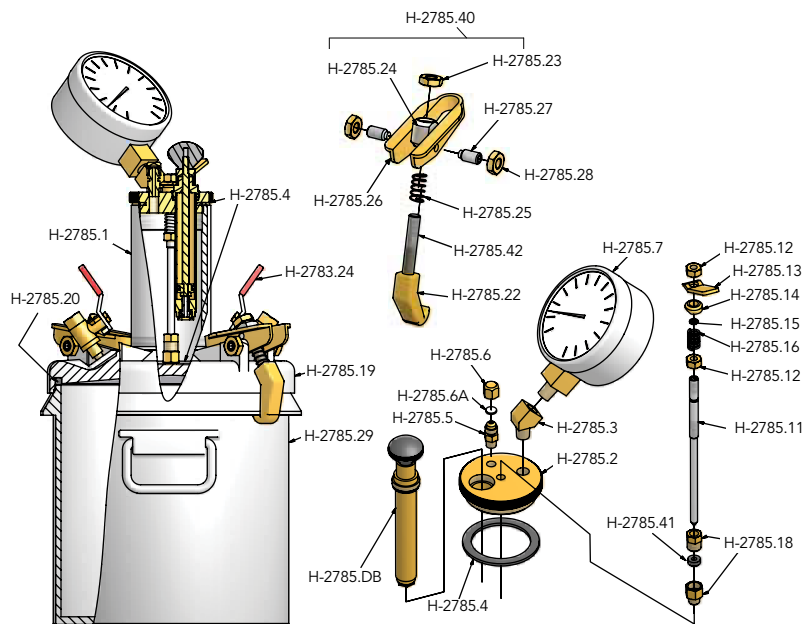
Air Meter Replacement Accessories

| Item | Part No. |
|--|-------------|
| Calibration Vessel, plastic | H-2783.30 |
| Calibration Vessel, metal | H-2785.31 |
| Calibration Tube (outside) | H-2783.31 |
| Calibration Tube (inside) | H-2783.32 |
| Calibration Tube (outside) | H-2785.32 |
| Calibration Tube (inside) | H-2785.33 |
| Calibration Tube (outside) | H-2786C.32 |
| Calibration Tube (inside) | H-2786C.33 |
| Wash Bottle | H-3399 |
| Strike-off Bar | H-2785.34 |
| Tamping Rod 5/8" x 16" | H-2785.35 |
| Syringe, Rubber Bulb | H-2785.36 |
| Latch Assembly | H-2783.26 |
| Plastic Case, Horizontal | H-2783.62H |
| Latch & Pin for H-2783.62H Case | H-2783.60L |
| Wooden Case, Press-Ur-Meter | H-2785.38 |
| Plastic Case, Press-Ur-Meter, Horizontal | H-2785.38HP |
| Rubber Mallet, 1.25 lb. (0.57kg) | H-4976 |

CLEAN, REPAIR CALIBRATE



Call: 1.800.544.7220



H-2785.DB

Super Pump for Air Meters

Step up to the quality and reliability of the Humboldt super pump. The super pump's all brass construction resists acids in cement. All parts, including valve, are replaceable. For use with all type B air meters.

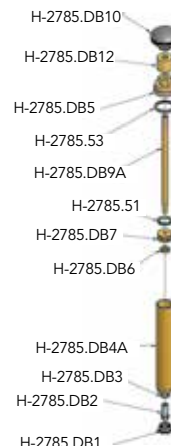
Super Pump for Air Meters

H-2785.DB

Ship wt. 0.5lbs. (.45kg)

H-2786 Air Meter Replacement Items

| Part No. | Description | Part No. | Description |
|-----------|------------------------------|-----------|--------------------------|
| H-2785.1 | Pressure chamber | H-2785.19 | Cover |
| H-2785.2 | Pressure chamber cap | H-2785.20 | Cover O-ring |
| H-2785.3 | Pressure chamber elbow | H-2783.24 | Cover Petcock |
| H-2785.4 | Pressure chamber gasket | H-2785.22 | Clamp with stud |
| H-2785.5 | Air-release stem | H-2785.23 | Clamp nut |
| H-2785.6 | Air-release cap | H-2785.24 | Clamp trunnion |
| H-2785.6A | Release cap gasket | H-2785.25 | Clamp spring |
| H-2785.7 | Air meter gauge | H-2785.26 | Clamp toggle |
| H-2785.11 | Needle valve stem | H-2785.27 | Clamp toggle set screw |
| H-2785.12 | Needle valve nut | H-2785.28 | Clamp toggle lock nut |
| H-2785.13 | Needle valve lever | H-2785.29 | Base |
| H-2785.14 | Needle valve spacer | H-2785.41 | Needle valve seat gasket |
| H-2785.15 | Needle valve o-ring | H-2785.42 | Stud |
| H-2785.16 | Needle valve spring | H-2785.DB | Super Pump assembly |
| H-2785.12 | Needle valve spring retainer | H-2785.55 | Gasket replacement kit |
| H-2785.18 | Needle valve seat assy. | H-2785.40 | Latch assembly complete |



H-2785DB Super Pump Replacement Parts

| Part No. | Description |
|-------------|--------------------|
| H-2785.DB1 | Valve nut |
| H-2785.DB2 | Valve |
| H-2785.DB3 | Valve O-ring |
| H-2785.DB4A | Pump tube |
| H-2785.DB5 | Pump cap |
| H-2785.DB6 | Stem nut |
| H-2785.DB7 | Pump piston |
| H-2785.DB9A | Pump stem |
| H-2785.DB10 | Pump handle |
| H-2785.DB12 | Stem cap |
| H-2785.51 | Pump piston O-ring |
| H-2785.53 | Pump tube O-ring |



ASTM Unit Weight Measures



Non-ASTM Unit Weight Measures



ACCESSORIES

Portable Scales for use with Unit Weight measurements, Go to Pages 335-336.

**Roll-A-Meter Air Indicator**

ASTM C173, AASHTO T196

This lightweight aluminum Roll-A-Meter is used to determine the air content of concrete mixes, and is recommended for concrete containing lightweight aggregate, air-cooled slag or highly porous aggregate. The meter's fast acting one-piece, self-locking stainless steel clamps assure a watertight seal between the top section and bowl. A see-through window in the neck has easy to read engraved scale graduated from 0 to 9% with .25% sub-graduations. A durable plastic carrying case with a tough die cut closed cell hard foam insert protects the meter and its accessories. Kit includes: Meter, carrying case, tamping rod, baffle funnel, strike-off bar, calibration measuring vessel, syringe, 16 oz. measuring cup, spanner wrench and manual.

Roll-A-Meter Air Indicator

H-2796A

Ship wt. 29.8lbs. (11.4kg)

Volumetair Air Meter

ASTM C173, AASHTO T196

The volumetair is used for the rolling method of measuring entrained air in any concrete. This ultra lightweight and easy-to-use instrument is supplied complete with the meter, funnel, syringe, tamper, calibration cup, mallet, strike-off bar and plastic carrying case. The plastic materials used in the construction of this unit not only make it lightweight; but also allow the user to use water for clean-up and small amounts of muriatic acid for periodic cleaning. The sight tube has a range of 0 to 9% and the base volume is 134 cu. in. (2200ml).

Volumetair Air Meter

H-2795P

Ship wt. 19lbs. (6.8kg)

ASTM Unit Weight Measures

ASTM C29, C138, C192, AASHTO T19, T121, T158

Machined aluminum, cylindrical unit weight measures with handles for determining unit weight of fine, coarse or mixed aggregates. Water-tight with true and even top and bottom. Measures retain form after repeated use.

ASTM Measures

see chart

Ship wt. see chart

Non-ASTM Unit Weight Measures

Heavy-gauge, seam-welded, water-tight, steel unit weight measures with bail handles. Can be used for concrete or aggregate. Do not meet ASTM specifications.

Non-ASTM Measures

see chart

Ship wt. see chart

Strike-Off Plates

ASTM C29, C138, C192, AASHTO T19, T121, T158

Clear .625" (15.8mm) thick, acrylic plates used to strike off surface of unit weight measure samples. Use a plate that is 2" (50.8mm) larger than the diameter of the unit weight measure.

| Size sq. in. (mm sq.) | Model | Ship Wt. lbs. (kg) |
|--------------------------|-----------|-----------------------|
| 8 (203) | H-3669.1P | 2.3 (0.9) |
| 10 (254) | H-3669.4P | 4 (1.0) |
| 12 (305) | H-3669.2P | 5.1 (2.3) |
| 16 (406) | H-3669.3P | 8 (3.6) |

Strike-Off Plates

see chart above

ASTM Unit Weight Measures

| Capacity cu. ft. (liter) | Inside Dia. in. (mm) | Inside Ht. in. (mm) | Ship Wt. lbs. (kg) | Model |
|-----------------------------|-------------------------|------------------------|-----------------------|----------|
| 1/10 (2.8) | 6 (152) | 6.1 (155) | 6.5 (2.7) | H-3660.1 |
| 1/4 (7.1) | 8 (203) | 8.8 (224) | 9.4 (4.9) | H-3664.1 |
| 1/3 (9.3) | 8 (203) | 11.5 (292) | 17 (7.7) | H-3663.1 |
| 1/2 (14.1) | 10 (254) | 11 (279) | 20 (7.2) | H-3661.1 |
| 1 (28.3) | 14 (356) | 11.2 (155) | 22 (13.6) | H-3662.1 |

Non-ASTM Unit Weight Measures

| Capacity cu. ft. (liter) | Inside Dia. in. (mm) | Inside Ht. in. (mm) | Ship Wt. lbs. (kg) | Model |
|-----------------------------|-------------------------|------------------------|-----------------------|--------|
| 1/10 (2.8) | 6 (152) | 6.1 (155) | 6.5 (3.2) | H-3660 |
| 1/4 (7.1) | 8 (203) | 8.8 (224) | 15 (6.8) | H-3664 |
| 1/3 (9.3) | 8 (203) | 11.5 (292) | 15.8 (8.7) | H-3663 |
| 1/2 (14.1) | 10 (254) | 11 (279) | 20 (10) | H-3661 |
| 1 (28.3) | 14 (356) | 11.2 (155) | 33 (15) | H-3662 |

Tamping (Puddling) Rod

Round, straight steel rod for use with concrete cylinder molds, slump cones and unit weight measures. Rod measures .625" (16mm) dia. x 24" (610mm) long. Both ends are rounded to hemispherical tip. Plated for rust resistance.

Tamping (Puddling) Rod

H-3650

Ship wt. 3lbs. (0.9kg)



H-3669.4P



H-3650



Acme Penetrometer

ASTM C403, AASHTO T197

Hydraulic reaction-type apparatus for determining the setting time of concrete with slump greater than zero by testing mortar sieved from the concrete mixture. It also determines the effects of variables, such as temperature, cement mixture proportions, additions and admixtures upon the time of setting and hardening of concrete. The penetrometer's design makes it easy to operate, being more efficient, with a longer gear rack. All needles are one length so settings may remain the same. Loads are applied hydraulically with pressures read on a 200 lbf (890N) capacity gauge graduated in 2 lbf divisions. Set of six needles allows multiplication to a maximum reading of 8000 lbf. The acme penetrometer features cast aluminum base and set of stainless steel penetration needles in a wooden block (bearing area: 1, 1/2, 1/4, 1/10, 1/20 and 1/40 sq. in., (645, 323, 161, 65, 32 and 16mm²). Includes 100 laboratory test data reporting forms.

Acme Penetrometer **H-4133**
 Ship wt. 40lbs. (18kg)

Data Sheets, Time of Set
 ASTM C403, AASHTO T197

Time of setting data sheets for use with the H-4133 and H-4137. Package of 100 sheets.

Data Sheets, Time of Set **H-4133F**
 Ship wt. 3.3lbs. (1.45kg)



Resistance Needle Set

ASTM C403, AASHTO T197

Set of six, stainless steel needles and holding block for use with the H-4133 acme penetrometer mortar penetration resistance apparatus. Set includes all needles in chart below. Needles are also available individually. See table below.

| Description | Part No. |
|-----------------------------------|-----------|
| 1 sq. in. (645mm ²) | H-4133.15 |
| 1/2 sq. in. (323mm ²) | H-4133.16 |
| 1/4 sq. in. (161mm ²) | H-4133.17 |
| 1/10 sq. in. (65mm ²) | H-4133.18 |
| 1/20 sq. in. (32mm ²) | H-4133.19 |
| 1/40 sq. in. (16mm ²) | H-4133.20 |

Resistance Needle Set **H-4133N**
 Ship wt. 1.2lbs. (0.5kg)

Cementometer Moisture Meter

The cementometer type-R handles normal water/cement ratios between 0.35 to 0.65. The unit is calibrated for standard type I, II, and III cements and can also be programmed with up to ten different mix designs by the user. For highest accuracy, the user should program the unit for the material being used. The simple-to-use calibration process rapidly creates user programs without the need for external computing devices. The unit can store over 150 readings complete with time and date for future reference. Data can be recalled via USB interface.

Cementometer Moisture Meter **HC-4972**
 Ship wt. 7lbs. (3.1kg)



H-4134



H-4132



H-4134F

Concrete Pocket Penetrometer

ASTM C403, C780

Lightweight, spring-reaction type concrete penetrometer for field and lab evaluation of the initial set of concrete mortar, based on ASTM C403. Penetration plunger has a 1/20 sq. in. tip area. Plunger is steadily pushed into the mortar to a 1 in. depth, as indicated on the shaft, at periodic time intervals. The penetrometer's calibrated range is 0-700 psi. Resistance in psi is indicated on the scale. The term "initial set" is the semi-hardened, partially hydrated condition of the concrete beyond which it can no longer be worked. The point of initial set is reached when the penetration value is 500psi.

Concrete Pocket Penetrometer **H-4134**
 Ship wt. 0.9lbs. (.45kg)

Concrete Pocket Penetrometer, w/Dial

ASTM C403, C780

Lightweight, spring-reaction type concrete penetrometer for field and lab evaluation of the initial set of concrete mortar, based on ASTM C403. Penetration plunger has a 1/20 sq. in. tip area. Plunger is steadily pushed into the mortar to a 1" depth, as indicated on the shaft, at periodic time intervals. Penetrometer's calibrated range is 0-700 psi. Resistance in psi is indicated on the scale. The term "initial set" is the semi-hardened, partially-hydrated condition of the concrete beyond which it can no longer be worked. The point of initial set is reached when the penetration value is 500 psi.

Concrete Pocket Penetrometer w/Dial **H-4132**
 Ship wt. 0.9lbs. (.45kg)

Penetrometer Foot

ASTM C403, C780

For use with masonry mortars to determine board life and initial consistency. Method can be used as a basis for acceptance of mortars. Stainless steel disk, 2.70" (68.58mm) dia. Can be used with H-4134 or H-4132 Penetrometers.

Penetrometer Foot **H-4134F**
 Ship wt. 2.2lbs. (.99kg)



H-3637 and H-3635
Slump Cone Sets
feature Easy-Carry
Configuration



H-3637



H-3645



H-3643



H-3655



H-3656



H-3635

Deluxe Slump Cone Set

ASTM C143, C143M, AASHTO T119, BS1881

The Humboldt, deluxe slump cone set provides you with the basic slump test components in an easy-carry configuration, plus a scoop and funnel to aid in filling the slump cone. The set also includes a specially-designed "crete-brush" with a 20" handle, which stands up to the harsh acids used to clean slump test equipment. The deluxe set includes: H-3636 base plate, H-3638 funnel, H-3639.20 brush, H-3640 slump cone (standard steel), H-3651 tamping rod w/ 6" scale on handle, and a H-3731 scoop and H-4901 tape measure.

Standard Slump Cone Set

H-3635

Ship wt. 25lbs. (11.4kg)

Standard Slump Cone Set

ASTM C143, C143M, AASHTO T119, BS1881

The Humboldt, standard slump cone set provides you with the basic slump test components in an easy-carry configuration. The unique base design allows you to combine the individual components together into a one-piece, portable unit (see photo). The standard set includes our H-3636 cast aluminum base plate, H-3640 slump cone (standard steel), H-3651 tamping rod w/ 6" scale on handle and H-4901 tape measure. The base includes bolt-on clamps, which hold the slump cone securely during filling and rodding. The integral handle, attached to the base, can be rotated above the specimen once the cone has been removed and used as a guide to measure the slump.

Standard Slump Cone Set

H-3637

Ship wt. 20lbs. (9.5kg)

Slump Test Set w/ Pan

ASTM C143, C143M, AASHTO T119, BS1881

This slump cone test set is designed for those who prefer a traditional pan setup. This set includes our H-3640 slump cone (standard steel), the H-3800 wire-bristle, wooden-handled brush, a H-3650 tamping (puddling) rod, the H-3725 galvanized-steel, 24" x 24" x 3" slump pan, and a H-3760 Trowel.

Slump Test Set w/ Pan

H-3645

Ship wt. 24lbs. (10.9kg)

K Slump Tester

ASTM C1362

The K-slump tester provides a fast approximate determination of slump and workability of wet concrete. Can be used to measure slump in buckets, wheelbarrows, ready-mix truck chutes, as well as in-place forms and test molds. The tester is capable of indicating a fairly accurate correlation to an actual slump test. The probe can also be used to determine the workability and the degree of compaction of fresh concrete. Includes correlation chart and instructions.

K Slump Tester

H-3643

Ship wt. 1.1lbs. (0.5kg)

Ball Penetration Apparatus (Kelly Ball)

ASTM C360, AASHTO T183, CTM533

Used to test the consistency of concrete using the penetration of a half sphere into plastic concrete. A 1" (2.5-centimeter) penetration by the kelly ball corresponds to about 2" (5 cm) of slump. The apparatus consists of 30 lb. (14kg) cylinder with hemispherically shaped bottom and handle. Stirrup or frame guides handle act as reference for measuring the depth of penetration. The stirrup handle is graduated in 0.25" (6.4mm) increments on one side and half-centimeter increments on the other side for measuring the depth of penetration. Concrete may be tested as it is placed into forms prior to any manipulation or in a suitable container.

Ball Penetration Apparatus, 30 lb

H-3655

Ball Penetration Apparatus, 20 lb.

H-3655-20

Ship wt. 33.7lbs. (15kg)

Ball Drop Apparatus (Kelly Ball)

ASTM D6024

Used to test the suitability of load applications on controlled low-strength material (CLSM). Used as a field test to determine the readiness of the CLSM to accept loads prior to adding a wearing surface. Ball and handle weigh 30-33 lbs (14-15kg).

Ball Penetration Apparatus, D6024

H-3655.D6024

Carrier for Ball Penetration Apparatus

Heavy-duty, cast-aluminum design with quick release latches. Provides convenience for the operator and protection to Kelly ball when transporting to and from the job site.

Carrier for Ball Penetration Apparatus

H-3656

Ship wt. 18lbs. (8kg)





SLUMP ACCESSORIES AND REPLACEMENT PARTS

Slump Cone, Steel

ASTM C143, C143M, AASHTO T119

Steel slump cone has plated finish to resist rust. Fitted with handles and foot lugs for use with H-3636 base plate. 8" (203mm) dia. at base, 4" (102mm) dia. at top and 12" (305mm) high.

Slump Cone, Steel **H-3640**
 Ship wt. 7lbs. (2.7kg)

Slump Cone, Metric Steel

ASTM C143, C143M, AASHTO T119

Steel slump cone has plated finish to resist rust. Fitted with handles and foot lugs for use with H-3636 base plate. Dimensions are: (200mm) dia. at base, (100mm) dia. at top and (300mm) high.

Slump Cone, Metric Steel **H-3640M**
 Ship wt. 7lbs. (2.7kg)

Slump Cone, Plastic

ASTM C143, C143M, AASHTO T119

Lightweight, plastic slump cone will not dent or rust and can be cleaned with an acid bath. Formed with handles and foot lugs for use with H-3636 base plate. 8" (203mm) dia. at base, 4" (102mm) dia. at top and 12" (305mm) high.

Slump Cone, Plastic **H-3640P**
 Ship wt. 2.3lbs. (1.4kg)

Graduated Tamping Rod

ASTM C143, C143M, AASHTO T119, BS 1881

Steel Tamping Rod with 6" scale in 0.25" increments engraved on handle for measuring amount of slump. When used with H-3636 base plate, raise handle over specimen and measure distance from handle to specimen.

Graduated Tamping Rod **H-3651**
 Ship wt. 4lbs. (1.8kg)

Tamping (Puddling) Rod— H-3650

ASTM C138, C138M, C143, C143M, ASTM C173, C173M, C31, C31M, AASHTO M 205, T 119, T152, BS 1881

Round, straight steel rod for use with concrete cylinder molds, slump cones and unit weight measures. Rod measures .625" (16mm) dia. x 24" (610mm) long. Both ends rounded to hemispherical tip. Plated for rust resistance. No scale.

Tamping (Puddling) Rod **H-3650**
 Ship wt. 3lbs. (0.9kg)

Base Plate, Aluminum

ASTM C143, C143M, AASHTO T119, BS 1881

Cast-aluminum base plate firmly holds all slump cone models, permitting one person to conveniently perform test. Base clamps turn down over cone foot lugs to secure entire assembly. Movable handle raises vertically over specimen (after removal of cone) and slump is easily measured with the 6" scale cut into handle end of H-3651 tamping rod.

Base Plate, Aluminum **H-3636**
 Ship wt. 8lbs. (3.6kg)

Slump Pan, Galvanized

ASTM C143, C143M, AASHTO T119, BS 1881

Durable, steel pan with tapered sides for easy cleaning and nesting. Dimensions: 24" x 24" x 3" (610 x 610 x 76mm).

Slump Pan, Galvanized **H-3725**
 Ship wt. 9.9lbs. (8.2kg)

Brush, Wooden Handle

Brass wire with wood handle brush. Dimensions: 2" x .875" x 5.25" (25 x 22 x 133mm), 10.25" (360mm) overall length.

Brush, Wooden Handle **H-3800**
 Ship wt. 0.5lbs. (0.9kg)

Crete Brush, 8" Handle

Acid-proof crete brush with 8" handle.

Crete Brush, 8" Handle **H-3639.8**
 Ship wt. 0.75lbs. (0.9kg)

Crete Brush, 20" Handle

Acid-proof crete brush with 20" handle.

Crete Brush, 20" Handle **H-3639.20**
 Ship wt. 1lbs. (0.9kg)

Scoop, One-piece Aluminum

Round nose #2 scoop. Bowl dimensions: 8.25" (210mm) length x 5.25" (133mm) width x 3" (76mm) depth.

Scoop, One-piece Aluminum **H-3731**
 Ship wt. 1.5lbs. (0.9kg)

Funnel, Aluminum

Aluminum funnel for use with all slump cones to assist in filling.

Funnel, Aluminum **H-3638**
 Ship wt. 0.8lbs. (0.9kg)

Trowel, Forged Steel

Forged steel trowel with flat, pointed blade, features rubber/plastic comfort handle, 2.75" X 5" (70 x 127mm).

Trowel, Forged Steel **H-3760**
 Ship wt. 0.4lbs. (0.9kg)

Tape Measure

16 ft (5m) tape measure with rubber grip cover and wrist strap.

Tape Measure **H-4901**
 Ship wt. 0.8lbs. (0.45kg)

**Penetration Apparatus**

ASTM C1712

The penetration apparatus provides a rapid assessment of static segregation resistance of self-consolidating concrete. While it does not actually measure static segregation, it does provide a quick assessment of whether static segregation is likely to occur. The included scale is marked in 1mm increments and is replaceable. Test apparatus is used in conjunction with an inverted standard slump cone, order H-3640 for this purpose. You may also need a strike-off bar, order H-2785.34.

Penetration Apparatus**HC-3668**

Ship wt. 3lbs. (1.9kg)

L-Box Flowability Test

EN 12350, ASTM pending

Method used to determine flow rates and passability of Self-consolidating concrete in confined spaces, as well as an evaluation of filling, passing ability and segregation resistance. Applicable to concrete with aggregates of 1" (25mm) maximum size. Test box is comprised of concrete reservoir, a slide gate, an obstacle grid comprised of 3 bars and a test basin. Includes metal strike-off bar and instructions.

L-Box Flowability Test**H-3658**

Ship wt. 27lbs. (12kg)

Static Segregation Column

ASTM C1610

Used to determine the potential for static segregation of self-consolidating concrete by measuring the coarse aggregate content in the top and bottom portions of a cylindrical specimen. This test can be used as a quality control determination for levels of coarse aggregate segregation, especially for deep section applications like walls or columns. This test is not applicable for self-consolidating concrete with lightweight aggregate. The column includes a stable base, three column sections and two sliding separator blades, which allow the column to be disassembled while capturing the concrete sample in the column sections.

Static Segregation Column**HC-3666**

Ship wt. 24lbs. (11kg)

V-Funnel Flowability Test

EN 12350

Designed to evaluate the segregation resistance of self-consolidating concrete through the flowing speed from a funnel. Applicable to concrete with aggregates of 1" (25mm) maximum size. Stainless steel construction with 10L capacity. Upper edge is smooth and reinforced and the outflow orifice is equipped with a sealable valve. Includes polyethylene box to collect discharge and a 36" (914mm) long straight edge to level concrete prior to testing.

V-Funnel Flowability Test**HC-3665**

Ship wt. 53lbs. (24kg)

J-Ring Test Set, Steel Base Plate

ASTM C1621, C1621M, C1611

The J-ring test can be used to determine the passing ability of self-consolidating concrete. It is applicable for laboratory use in testing different concrete mixtures for passing ability or can be used in the field as a quality control test. It is typical to also perform a slump flow test with the J-ring test. This test is similar to the J-ring except the J-ring is not used. The difference between the results of the two tests provides an indicator of the passing ability of the concrete.

Designed for durability, Humboldt's J-ring set includes a slump cone, J-ring with smooth or rebar rods and steel base plate with positioning rings.

J-Ring Test Set, Smooth Rods**H-3652****J-Ring Test Set, Rebar Rods****H-3652R**

Ship wt. 85lbs. (38.5kg)

J-Ring Test Set, HDPE Base Plate

ASTM C1621, C1621M, C1611

Identical to the sets above except that these feature a HDPE base plate. This plate is easier to transport and use on site. These sets include a slump cone, J-ring with smooth or rebar rods and the HDPE base plate with screened positioning rings.

J-Ring Test Set, HDPE Plate, Smooth Rods**H-3652P****J-Ring Test Set, HDPE Plate, Rebar Rods****H-3652PR**

Ship wt. 85lbs. (38.5kg)

Individual J-Ring Components

| Description | Part No. |
|-------------------------|----------|
| J-Ring with Smooth Rods | H-3654 |
| J-Ring with Rebar Rods | H-3654R |
| Base Plate, Stainless | H-3653 |
| Base Plate, Plastic | H-3653P |
| Slump Cone | H-3640 |

**Vebe Consistometer**

EN 12350-3; BS1881:104; UNI 9419

The Vebe Consistometer method is based on the same principle of the simple slump cone test, for the determination of the workability of concrete, but it has the advantage of a mechanized action. After removing the slump cone, the concrete undergoes a vibration to determine slump.

Vebe Consistometer, 120V 60 Hz H-3647**Vebe Consistometer, 220V 60 Hz H-3647.2F****Vebe Consistometer, 220V 50Hz H-3647.5F**

Ship wt. 198lbs. (90kg)

Consistency Vibrating Table Test

ASTM C1170 Method A, C1170 Method B

Used for determining the consistency of stiff to extremely dry concrete mixtures like those used in roller-compacted concrete mixtures. Density of the specimens is determined by determining the mass of the consolidated specimen and dividing by its volume. The unit is comprised of a vibrating table, which can be bolted to a floor or substantial base slab. A swing arm with a guide sleeve for the 50 lb (22.7kg) surcharge weight is attached to the base, which allows the weight to swing out of the way when filling the mold, but allows easy application of the weight to the top of the specimen in the mold prior to vibration. The test mold is 9.5" x 7.75" ID with handles for easy movement and is locked into place on the base with positioning tabs and wing nuts.

Consistency Vibrating Table, 120V 60 Hz H-3648**Consistency Vibrating Table, 220V 60 Hz H-3648.2F****Consistency Vibrating Table, 220V 50Hz H-3648.5F**

Ship wt. 360lbs. (150kg)

Cylinder Mold Vibrating Table Apparatus

ASTM C1176, C470 Method B

Used for making roller-compacted concrete in cylinder molds using a vibrating table. This practice is used when the standard procedures of rodding and internal vibration are not practicable. The unit is comprised of a vibrating table, which can be bolted to a floor or substantial base slab. A swing arm with guide sleeve for the 20 lb (9kg) surcharge weight is attached to the base, which allows the weight to swing out of the way when filling the mold, but allows easy application of the weight to the top of the specimen in the mold prior to vibration. The test mold is a 6" x 12" mold conforming to ASTM C470 and is locked into place on the base of the unit.

Vibrating Table, 120V 60 Hz H-3649**Vibrating Table, 220V 60 Hz H-3649.2F****Vibrating Table, 220V 50Hz H-3649.5F**

Ship wt. 305lbs. (138kg)

Cylinder Molds for Vibrating Table Apparatus

ASTM C1176, C470 Method B

Standard, disposable, plastic cylinder molds with flat bottoms. For use with H-3649 Vibrating table and H-2950.RCA Mold Sleeves. Easily stripped with stripper tools, sold separately. Oversize charges apply to cartons of 36.

Plastic Cylinder Molds, 36 per carton H-3041

Ship wt. 26lbs. (11.8kg)

Plastic Cylinder Molds, 20 per carton H-3041.20

Ship wt. 15lbs. (6.8kg)

Mortar Penetration Resistance Apparatus

ASTM C403, AASHTO T197

Spring-reaction-type apparatus, graduated from 10 to 130 lbf (45 to 580N) in increments of 2 lbf (9N) for testing rate of hardness of mortars sieved from concrete mixtures. Determines effects of variables such as temperature, cement, mixture proportions, additions and admixtures upon the time of setting and hardening of concrete. Penetration resistance is measured by the downward vertical force exerted to penetrate the mortar 1" (25mm). Pressure reading is measured by a scale with a sliding ring indicator on the handle's stem. Includes these interchangeable mortar penetration resistance needles: 1, 1/2, 1/4, 1/10, 1/20 and 1/40 sq. in (645, 323, 161, 65, 32, 16mm²).

Mortar Penetration Resistance Apparatus H-4137

Ship wt. 16lbs. (9kg)

Resistance Needle Set

ASTM C403, AASHTO T197

Set of six, screw-on type, replacement needles for use with the H-4137 mortar penetration resistance apparatus. Set includes all needles in chart below. Needles are also available individually.

Resistance Needle Set H-4143

Ship wt. 0.5lb (1.0kg)

| Description | Part No. |
|-----------------------------------|------------|
| 1 sq. in. (645mm ²) | H-4143.1 |
| 1/2 sq. in. (323mm ²) | H-4143.50 |
| 1/4 sq. in. (161mm ²) | H-4143.25 |
| 1/10 sq. in. (65mm ²) | H-4143.10 |
| 1/20 sq. in. (32mm ²) | H-4143.05 |
| 1/40 sq. in. (16mm ²) | H-4143.025 |



H-2683.3F

Humboldt Concrete Maturity Sensor System

ASTM C1074

Humboldt's New Maturity Sensor System provides an innovative way to monitor concrete strength using the maturity testing method. CMOTS provides a wireless, accurate, durable and reusable method for charting concrete temperatures, maturity and strengths, which allows constant monitoring from any device (computer, phone or tablet) with an Internet connection.

CMOTS is ideal for monitoring maturity in massive concrete pours, walls, suspended slabs and pavements, as well as for footings, cylinders and beams for monitoring compliance with curing requirements.

The Humboldt Maturity System provides a wireless solution to collecting data avoiding loss of data due to cable damage during construction activities. Temperature and compressive strengths can be accessed from anywhere without visiting the construction site. And, the system is very cost effective when compared to other semi-wireless systems.

The system is comprised of three key components— a transmitter, sensor and receiver. The sensor is connected to the transmitter with a waterproof connection via a 20ft. (6m cable). The sensor is then embedded at a desired location within a concrete pour. The attached transmitter is then placed alongside the pour and can be secured, if desired. The wireless receiver is then located within 1000 ft (300m) of the furthest installed transmitter/sensor.

When the sensors are installed, they are activated by registering them with your website account using a sensor-specific ID number. Once this step is completed, the transmitters for each sensor will begin to receive data from the sensor and transmit that data to the receiver. The receiver then relays this information to your account on the web-based cloud platform. This information/data is available to you in real time, 24/7, 365 days a year by simply logging into your account, using your user name and password.

Raw data received by your sensors is transformed by the web-based platform into compressive strength, using the specific maturity curve developed for that specific concrete mix design.

Because the maturity sensor system is wireless, there is no limit to the number of sensors that can be used or the number of pours done at one time. Since the transmitter component of this system is reusable, battery life is 3 years from the activation date, it can be reused by purchasing replacement sensors for subsequent uses, which can be connected to the existing transmitters via the waterproof connector. Sensors are available with 20ft (6m) cables, but extension cables are also available in similar lengths for extended sensor placement.

The Maturity Sensor System is available as a kit, which includes (1) Receiver, (5) Transmitters, (5) Sensors with 20ft (6m) cables and a website platform account. Voltage: 120/220V 50/60Hz.

Humboldt Maturity Sensor System H-2683.3F
 Ship wt. 8.9lbs. (4kg)



H-2683.4



H-2683.6

H-2683.7

Humboldt Maturity Sensor System Components

| Description | Part No. |
|---|----------|
| Temperature Transmitter w/20ft (6m) cable | H-2683.4 |
| Sensor w/ 20ft (6m) cable | H-2683.6 |
| Extension Cable, 20ft (6m) | H-2683.7 |





HG-4040



Installation Example of HG-4040



H-2682

SmartRock, Wireless Maturity Sensor

ASTM C1074

SmartRock is a rugged, mobile app-based wireless sensor for monitoring the temperature of concrete from fresh to hardened stage. It also estimates concrete strength, based on the maturity concept. The SmartRock can be placed in the concrete form work, no more than 3" deep (installed on the rebar) before pouring, to monitor the temperature of concrete in situ. The continuous measurements are recorded on the SmartRock memory and can be downloaded at any time during the concrete setting and hardening on-site using the mobile application on a smartphone or tablet device.

The continuous monitoring of concrete temperature can be used as a QC/QA method as well as maturity-based strength estimation of concrete. The field monitoring of concrete temperature can also help with optimizing the formwork removal time, application of load on the structure, and adjusting the curing temperature of concrete on-site.

SmartRock can be used to monitor the temperature of fresh and hardened concrete. This information can be used for:

- Optimization of curing conditions
- Quality control in the field
- Estimation of strength (ASTM C1074)
- Formwork removal timing
- Post-tensioning
- Opening road to traffic
- Monitoring temperature gradients in mass concrete

Features (Hardware):

- Wireless technology
- Rugged and waterproof design
- Easy installation and activation by tying the wires together
- Extended temperature sensor cable for mass concrete
- Long battery life (up to 4 months after installation)

Features (Software):

- Real-time data display (e.g. temperature, strength, max-min)
- Maturity calibration database
- Free Android and iOS apps for smartphone and tablet
- Easy data sharing between devices
- Project management tools
- PDF report generation
- Photos and blueprints attachment
- Goal limit setting for temperature and strength

| Specifications | |
|--------------------------|---|
| Reading Range | -22 to +176°F (-30 to 80°C) |
| Accuracy | ± 1.8 °F (1°C) |
| Measurement Frequency | Once every 15 mins for 2 months of data |
| Wireless Signal Range | Up to 26 feet (up to 8 meters) |
| Dimensions | 1.5" x 1.5" x 0.5" (38 x 38 x 12mm) |
| Temperature Cable Length | 16" (40cm) 10 ft (3m) |
| Battery Life | Up to 4 months after installation |

SmartRock Maturity Sensor, 16" (40cm) HG-4040

SmartRock Maturity Sensor, 10ft (3m) HG-4040.10



Ship wt. 1lbs. (0.4kg)

Multi-Channel, Maturity Meter

ASTM C1074

Humboldt Maturity Meters provide a predictable strength determination of cast-in-place concrete based on ASTM standard C1074-98 (Estimating concrete strength by the maturity meter method). These units utilize inexpensive, disposable, T-type thermocouple wire with quick-connect jacks, which can be embedded directly into a concrete structure to measure temperature at timed intervals. These readings can then be used to document the maturity process within the structure in order to:

- Predict the time for form and shoring removal
- Estimate loading and post-tensioning time
- Control winter heating/insulation
- Reduce construction time and costs

The H-2680 and H-2682 have four channels, and provide the maturity number calculation, instant readout and temperature history on a menu-driven alphanumeric display. A communications port allows information to be transferred from the meter to another meter, printer or computer. The H-2682 provides the use of a rechargeable nickel-cadmium battery, which can be used to enhance performance in cold weather applications.

Both units give maturity number calculation, instant readout and temperature history. All four channels may be used simultaneously. All information is available on menu-driven alphanumeric display. Datum temperature is programmable from -20° to +60°C. Communications port allows information transfer from meter to meter, printer or computer. H-2680 includes: four, type "T" thermocouple wire and GFE connectors, RS-232 communications cable, 9V battery and plastic carrying case. H-2682 includes: four, type "T" thermocouple wire and GFE connectors, RS-232 communications cable, rechargeable nickel-cadmium battery with 120V battery charger/ AC adapter and plastic carrying case.

Maturity Meter H-2680

Maturity Meter, Rechargeable H-2682



Ship wt. 8.9lbs. (4kg)

Maturity Meter Components

| Description | Part No. |
|-------------------------|--------------|
| Thermocouple Wire: | |
| 24 GA, (per foot) | H-2670.1 |
| 20 GA, Type T (per ft.) | H-2670.1T |
| 24 GA, Type T, 50 ft. | H-2670.1.50 |
| 24 GA, Type T, 100 ft. | H-2670.1.100 |
| Plug for thermocouple | H-2680P |
| Printer | H-2684 |
| AC Adapter/Charger | H-2682CH |
| Serial Cable | H-2686 |



H-3859



H-3859PL



H-3849PL



H-3849PC



H-3846A

Utility Mixer with Steel Drum

ASTM C192

This quality Utility Mixer is perfect for batch mixing of concrete, as well as numerous other industrial applications. It features a 5.5 ft.³ heavy-duty, steel drum. The 1/2hp motor is quiet and features a heavy-duty, reliable worm-drive gearbox. It's 5.5 ft.³ drum can produce batches as fast as one per minute. The mixer features a well-balanced tilt handle and the convenient drum lock secures the drum in one of five available positions. The mixer also features a tubular, steel frame and utilizes maintenance-free bearing design.

The Mixers Feature:

- Sturdy mixing blades
- Convenient on/off switch standard with motor
- Hand tow kit option available
- Drum opening of 15.25" (381mm), depth 24.75" (628.65mm)
- Discharge height of 20" or 22.75" with tow kit
- Three (3) ft.³ batch size, 5.5 cubic foot drum volume
- Overall dimension of 31.5" x 35.5" x 50" (drum facing down)
- Pre-drilled steel base can be anchored to the floor
- 25 RPM drum rotation

Utility Mixer with Steel Drum

1/2hp Electric, 120V 60Hz

H-3859

1/2hp Electric Motor & Hand Tow Kit, 220V 60Hz H-3859TK

Ship wt. 366lbs. (166kg)

Utility Mixer with Poly Drum

ASTM C192

This quality Utility Mixer is perfect for batch mixing of concrete, as well as numerous other industrial applications. It features a 5.5 ft.³ field-replaceable, poly drum for fast, non-stick cleanup and extended life for the mixer, which is FDA/NSF/USDA approved. The 1/2hp motor is quiet and features a heavy-duty, reliable worm-drive gearbox. It's 5.5 ft.³ drum can produce batches as fast as one per minute. The mixer features a well-balanced tilt handle and the convenient drum lock secures the drum in one of five available positions. The mixer also features a tubular, steel frame and utilizes maintenance-free bearing design.

The Mixers Feature:

- Sturdy in-mold mixing blades
- Convenient on/off switch standard with motor
- Hand tow kit option available
- Drum opening of 15.25" (381mm), depth 24.75" (628.65mm)
- Discharge height of 20" or 22.75" with tow kit
- Three (3) ft.³ batch size, 5.5 ft.³ drum volume
- Overall dimension of 31.5" x 35.5" x 50" (drum facing down)
- Pre-drilled steel base can be anchored to the floor
- 25 RPM drum rotation

Utility Mixer with Poly Drum

1/2hp Electric, 120V 60Hz

H-3859PL

1/2hp Electric & Hand Tow Kit, 220V 60Hz H-3859PLTK

Ship wt. 346lbs. (156kg)

Poly Drum Replacement

3 ft.³ replacement liner for H-3859 mixer.

Poly Drum Replacement

H-3849PL

Ship wt. 29lbs. (13.1kg)

Poly Drum Cover

Snug-fitting drum cover for H-3859 mixer.

Poly Drum Cover

H-3849PC

Ship wt. 29lbs. (13.1kg)

Lightweight Wheelbarrow Mixer

ASTM C192

Drum mixing capacity is 3 ft.³. (85 Liters). Lightweight, portable mixer only weighs 125 lbs. High-torque, 1/2hp electric motor with on/off switch. Spins at 28 rpm. CE and CSA approved electric motor. Strong polyurethane drum will not crack or rust and is easy to clean. Includes mixing stand. Ring gear is enclosed for safe operation. Transport handles adjust for easy storage. Can clear a 30" (762mm) door opening. Ships unassembled in a box. Shipping Dimensions: 24" x 23" x 30" (610 x 584 x 762mm).

Lightweight Wheelbarrow Mixer

1/2hp Electric, 110V 60Hz

H-3846A

Ship wt. 121lbs. (54kg)



H-3030A

Concrete Beam Tester for 6" x 6" Beams

Humboldt's Portable, Concrete Beam Testers are a great quality control tool for contractors, DOTs and consultants for quickly and accurately determining flexural strengths of concrete using 6" x 6" cross-section test beams. These Beam Breakers are hydraulically driven units using the center-point loading method and provide continuous readings to the beam breaking point while retaining the maximum reading for accuracy and to eliminate lost data. The gauge also resets to zero for testing multiple beams.

These beam breakers are constructed of lightweight aluminum, making them extremely portable for use at even the most remote of job-sites. Self-contained, portable concrete beam tester, which accurately and easily determines flexural strengths of 6" x 6" test beams of 16" and 18" lengths.

While not in full compliance with ASTM C293 since they use a hand pump, these beam testers can be used as an accurate quality control tool to determine whether curing concrete has met a specified flexural strength. In this type of application, a known flexural strength value is determined and is used as a go/no-go test parameter. Numerous government agencies including Illinois DOT have found its results acceptable for their purposes.

These beam testers provide dual registration of modulus at rupture between 15,000 lbf. and 0–6,800 kgf. The unit is calibrated by measuring the load applied on a calibrated load cell. The factory calibration is supplied at gauge readings of 10% FS, FS and 3 readings in between. Three load cell readings are averaged at each point to establish the correction for each point.

Concrete Beam Tester

| | |
|--------------------------|---------|
| 16", Single-Point | H-3030A |
| 18", Single-Point | H-3032A |
| 18", Third Point | H-3033A |
| Ship wt. 87lbs. (39.4kg) | |



H-3030CL

Continuous-Load Concrete Beam Tester

ASTM C293,C78; AASHTO T177

By adding a Micro-pump to our Concrete Beam Testers provides a continuous load pressure to the testing procedure, which renders these Beam Testers in compliance with the ASTM standards. According to the ASTM, a load can be rapidly applied to the beam up to 50% of the expected maximum load. Then, by using the micro-pump the rest of the load can be applied continuously until failure. The range of the micro-pump allows it to add up to 10,000 lbf pressure.

Humboldt's Portable, Concrete Beam Testers with Micro-pumps are a great quality control tool for contractors, DOTs and consultants for quickly and accurately determining flexural strengths of concrete using 6" x 6" cross-section test beams. These Beam Breakers are hydraulically driven units using the center-point loading method and provide continuous readings to the beam breaking point while retaining the maximum reading for accuracy and to eliminate lost data. The gauge also resets to zero for testing multiple beams.

These beam breakers are constructed of lightweight aluminum, making them extremely portable for use at even the most remote of job-sites. Self-contained, portable concrete beam tester, which accurately and easily determines flexural strengths of 6" x 6" test beams of 16" and 18" lengths.

Continuous-Load Concrete Beam Tester

| | |
|--------------------------|----------|
| 16", Single-Point | H-3030CL |
| 18", Single-Point | H-3032CL |
| 18", Third-Point | H-3033CL |
| Ship wt. 90lbs. (40.8kg) | |

NOTES

For Beam Molds, see page 171.



H-3031CL

Continuous-Load Beam Breaker for 4" x 14" Beams

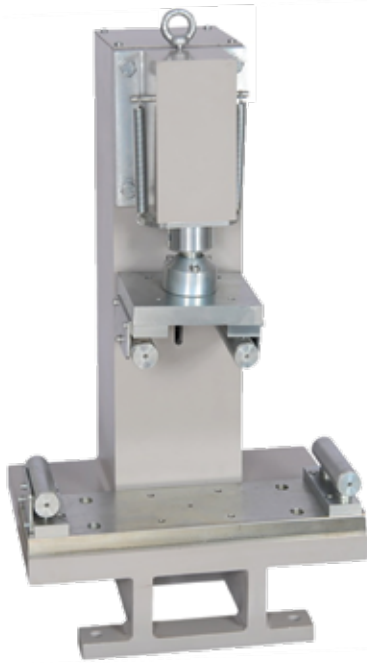
ASTM C293

The Humboldt H-3031CL Portable, Continuous-Load, Concrete Beam Breaker is a great quality control tool for contractors, DOTs and consultants for quickly and accurately determining flexural strengths of concrete using 4" x 4" x 14" test beams. The H-3031CL incorporates a continuous, screw jack to provide a continuous application of force against the test beam. By providing a continuous force, these beam breakers comply with the ASTM C293 standard and can be used as an accurate quality control tool to determine whether curing concrete has met a specified flexural strength. In this type of application, a known flexural strength value is determined and is used as a go/no-go test parameter.

The H-3031CL beam breaker is constructed of lightweight aluminum, making it extremely portable for use at even the most remote of job-sites. Self-contained, portable concrete beam tester, which accurately and easily determines flexural strengths of 4" x 4" x 14" test beams, which are placed on rollers that are 12" apart. The hydraulically driven unit uses a center-point loading method that provides continuous readings to the break point and retains the maximum reading to eliminate losing the break-point data. The gauge will then reset to zero for repeat tests. The lightweight aluminum unit features a 8,000 lbf. x 100 lbf. The unit is calibrated by measuring the load applied on a calibrated load cell. The factory calibration is supplied at gauge readings of 10% FS, FS and 3 readings in between. Three load cell readings are averaged at each point to establish the correction for each point.

Continuous-Load Beam Tester 4" x 14" Beams

| |
|--------------------------|
| H-3031CL |
| Ship wt. 90lbs. (40.8kg) |



HCM-1142



HCM-1143



HCM-5070

| Specification | HCM-1142 |
|-----------------------|-----------------|
| Capacity | (100kN) |
| Piston Stroke | 2.95" (75mm) |
| Test Chamber Height | 7.00" (180mm) |
| Bending Roller Length | 6.30" (160mm) |
| Bending Roller Dia. | 1.50" (38mm) |
| Lower Roller Distance | 29.50" (750mm) |
| Overall Width | 33.00" (840mm) |
| Overall Depth | 33.20" (845mm) |
| Overall Height | 47.80" (1215mm) |

| Specification | HCM-1143 | HCM-1144 |
|-----------------------|-----------------------|-----------------|
| Capacity | (200kN) | (300kN) |
| Piston Stroke | 1.96" (50mm) | 8.66" (220mm) |
| Bending Roller Length | optional | 20.10" (510mm) |
| Bending Roller Dia. | 1.50 -0.78" (38-20mm) | 1.6" (40mm) |
| Lower Roller Distance | 35.40" (900mm) | 40.1" (1020mm) |
| Overall Width | 39.30" (1000mm) | 26.40" (670mm) |
| Overall Depth | 50.80" (1290mm) | 53.90" (1370mm) |
| Overall Height | 50.80" (1290mm) | 87.00" (2210mm) |

Flexural Series Compression Machines

ASTM C78, C293; EN 12390-5, EN 1339, EN 1338

These Flexural Series machines can be paired with the Humboldt Concrete Compression Frame and HCM-5070 Automatic Console Controller to provide an automated solution for testing standard concrete beams. Frames support a hydraulic ram and upper platen sub-assembly incorporating a spherical seating. The upper and lower platens will accept various specimen loading bearer, which are sold separately.

| | |
|-------------------------|----------|
| Flexural Machine, 100kN | HCM-1142 |
| Flexural Machine, 200kN | HCM-1143 |
| Flexural Machine, 300kN | HCM-1144 |

These three Flexural machines are controlled with Humboldt's HCM-5070 Automatic controller, which is designed to make fast work of testing a variety of standard beams.

The HCM-5070 Console controller provides an easy-to-use automated testing work flow—just choose the test standard you wish to run from the menu and the controller will quickly guide you through the setup.

Choose the "Fast Testing" option and your compression frame will run tests as fast as you can load your beams while sequentially numbering each test automatically. Just click on the start button. The HCM-5070 controller features a robust, reliable and cool-running 1hp pump, which works together with the controller for full operational control.

The HCM-5070 controller's high-resolution, 7-inch, color, touch-screen provides accurate, precision frame operation, setup and calibration. Test setup is simple, just choose the ASTM standard you wish to use and the controller will quickly walk you through the setup procedure. Calibration is also easy with these controllers, allowing you to use from 1 to 10 points to calibrate the machine in any increment you choose. It also provides an accurate motor-control knob, which let's you dial in precise loads for calibration.

Humboldt's controllers provide two channel inputs for load, which allows for the control of two separate compression frames when using the HCM-HP4014 selector valve accessory. The controller also provides two additional channel inputs for displacement, which provides an easy solution for determining Poisson's ration and Young's modulus testing.

Features:

- Provide two channel inputs for load, which allows for the control of two separate compression frames
- Provides two additional channel inputs for displacement, which allows performing extensometer and compressometer testing
- 7", high-resolution color touch-screen display with live readout, graphical and tabular display
- Easy test setup, just choose the standard you wish to test for and the controller will walk you through the complete setup
- Pre-programmed to run the following tests: ASTM C39, ASTM C78, ASTM C293, ASTM C469, ASTM C496, ASTM C1019, ASTM C109/C109M, BS EN 12390-3, EN 12390-5, EN 1339, EN 1338
- Integral storage within the controller of up to 1000 tests and 3000 points per test
- Simple, Fast and accurate machine calibration with accurate, motor-control knob

Humboldt Auto Console Controller HCM-5070
Humboldt Auto Console Controller HCM-5070.4F
CE Ship wt. 200 lbs. (91kg)



Concrete Beam Molds, Heavy-Duty

ASTM C31, C78, C192, C293; AASHTO T23, T97

Concrete Beam Molds, heavyweight, machined .375" steel. The sides of the one-piece mold hinge to the base and the ends hinge to the sides. Fastened with wing nuts. Reusable. Fast and easy to assemble and use. Easy to strip, clean, knock-down and store. Molds give accurate specimens for center or third-point loading tests.

| Description | Ship wt. | Part No. |
|--------------------------------------|-----------------|----------|
| 6" x 6" x 21" (152 x 152 x 533mm) | 54lbs. (24.4kg) | H-3005 |
| 6" x 6" x 24" (152 x 152 x 610mm) | 67lbs. (31kg) | H-3010 |
| 6" x 6" x 30" (152 x 152 x 762mm) | 70lbs. (31.7kg) | H-3015 |
| 6" x 6" x 36" (152 x 152 x 914mm) | 80lbs (36kg) | H-3020 |

Concrete Beam Mold, Lightweight

ASTM C31, C78, C192, C293; AASHTO T23, T97

Lightweight, stamped-steel, hinge-free beam mold is collapsible. Can be disassembled in to individual, interchangeable parts. Fastened with wing nuts.

| Description | Ship wt. | Part No. |
|--------------------------------------|-------------------|----------|
| 6" x 6" x 22" (152 x 152 x 559mm) | 29.2lbs. (13kg) | H-3007 |
| 4" x 4" x 14" (152 x 152 x 559mm) | 25.2lbs. (11.4kg) | H-3004 |

Concrete Beam Mold, Plastic

ASTM C31, C78, C192, C293

Durable, lightweight copolymer plastic beam mold utilizes simple thumb screws for ease of stripping, cleaning and assembly. The lightweight design requires no tools and weighs less than one quarter of the weight of a conventional mold. Will not rust, reusable, inexpensive.

| Description | Ship wt. | Part No. |
|--------------------------------------|-------------|----------|
| 6" x 6" x 21" (152 x 152 x 533mm) | 9lbs. (4kg) | H-3009 |

Curing Covers for Beam Molds, Insulated

Constructed of heavy-duty, rip-stop nylon with removable pad, which can be saturated with water for moisture retention during curing.

| Description | Ship wt. | Part No. |
|----------------------------|-----------------|-----------|
| Curing Cover 21", 22", 24" | 1.5lbs. (0.6kg) | H-3021.24 |
| Curing Cover 30" | 1lbs. (0.4kg) | H-3021.30 |
| Curing Cover 36" | 1lbs. (0.4kg) | H-3021.36 |

Concrete Cube Mold, Steel

ASTM C403; AASHTO T97

Single-cavity steel cube mold with base plate. Used for mortar specimens in the time of initial and final setting of concrete.

| | |
|----------------------------------|------------------------|
| 6" x 6" x 6" (152 x 152 x 152mm) | H-2827 |
| 150 x 150 x 150mm | H-2827M |
| | Ship wt. 27lbs. (12kg) |

Concrete Cube Mold, Steel, Heavy-Duty

ASTM C403; AASHTO T97

Single-cavity, two-part, steel cube mold with base plate. Used for compression testing of concrete cubes.

| | |
|-------------------|------------------------|
| 150 x 150 x 150mm | H-2827MHD |
| | Ship wt. 27lbs. (12kg) |

Concrete Cube Mold, Plastic

ASTM C403; AASHTO T97

Single-cavity plastic cube mold. Used for compression testing of concrete cubes and for mortar specimens in the time of initial and final setting of concrete.

| | |
|-------------------|-------------------------|
| 150 x 150 x 150mm | H-2827MP |
| | Ship wt. 3.5lbs (1.6kg) |

Leather Compression Shim

Leather shims for use with concrete beams, 4-pack. Dimensions: 7" x 2" x 0.25" thick.

| | |
|--------------------------|------------------------|
| Leather Compression Shim | HCM-0119LS |
| | Ship wt. 1.3lb (0.6kg) |

Vibrating Table

ASTM C31, C192, C293; AASHTO T23, T97

Cushioned impact vibrating table with load capacity of 300 lbs. (136.1kg) is used to vibrate beam forms, cylinder molds, concrete products and soil specimens. Table deck is 20" x 20" (508 x 508mm). Table vibrates at 3600 vpm. Amplitude or power of vibration is regulated by means of a rheostat in the electrical control circuit. Not supplied with cord and plug due to high wattage consumption requirements—must be connected through electrical conduit and fittings.

| | |
|-----------------------------|-------------------------|
| Vibrating Table, 115V, 60Hz | H-3755 |
| Vibrating Table, 230V, 60Hz | H-3755.2F |
| Vibrating Table, 230V, 50Hz | H-3755.5F |
| | Ship wt. 115lbs. (52kg) |

Vibration Indicator, Tachometer Type

Precision tachometer is pen size to allow accurate readings even on hard-to-reach equipment. Scale gives readings from 2,000 to 21,000.

| | |
|--------------------------------------|------------------------|
| Vibration Indicator, Tachometer Type | H-3753 |
| | Ship wt. 1lbs. (1.9kg) |

Vibration Indicator, Visual Type

Visual indicator gives accurate reading of amplitude of vibration so vibrating table may be adjusted.

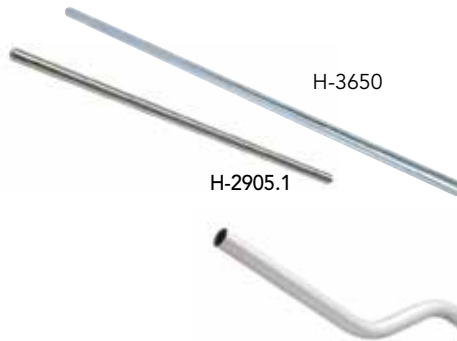
| | |
|----------------------------------|------------------------|
| Vibration Indicator, Visual Type | H-3754A |
| | Ship wt. 1lbs. (1.9kg) |

Concrete Vibrator

ASTM C31, C138, C192; AASHTO T23, T97

Lightweight square-head model is used for vibrating concrete test cylinders and molds in the laboratory or field. Unit is flexible-shaft type, powered with 3/4 HP electric motor. Shaft is 24" (610mm) long; vibrating head is 1" sq x 13" L (25 x 330mm) with a speed of 10,000 vpm. 115V model is 7 amps 1ph and 230V model is 3.6 amps 1ph.

| | |
|----------------------------------|-------------------------|
| Concrete Vibrator, 115V, 50/60Hz | H-2999A |
| Concrete Vibrator, 230V, 50/60Hz | H-2999A.4F |
| | Ship wt. 12lbs. (5.5kg) |



Concrete Cylinder Molds, Single-use, Plastic

C31, C39, C192, C470, C496; AASHTO T22, T23, T126, T198, M205

Disposable, plastic cylinder molds with flat bottoms. Easily stripped with stripper tools (order separately).

| Size | Description | Ship wt. | Model |
|------------------------|---|-------------------|-----------|
| 6" x 12" (152 x 305mm) | Reinforcing rib around top opening. Lids not included. Cartons of 36, oversize UPS charges apply. | 26 lbs. (11.8kg) | H-3041 |
| 6" x 12" (152 x 305mm) | Reinforcing rib around top opening. Lids not included. Cartons of 20 | 15 lbs. (6.8kg) | H-3041.20 |
| 6" Ø (152mm) | Plastic lid for use with H-3041 mold. Sold individually. | 0.08 lbs. (.04kg) | H-3041L |
| 4" x 8" (102 x 203mm) | Complete with integral, domed plastic lid. Cartons of 36, oversize UPS charges apply. | 14 lbs. (6.3kg) | H-3037PML |
| 3" x 6" (76 x 152mm) | Complete with integral, domed plastic lid. Cartons of 80, oversize UPS charges apply. | 16.4 lbs. (7.4kg) | H-3038PML |
| 2" x 4" (51 x 102mm) | Complete with integral domed plastic lid. Cartons of 84. | 5 lbs. (3.6kg) | H-3039P |

Tamping (Puddling) Rod

Round, straight steel rod measures .625" (16mm) dia. x 24" (610mm) long. Both ends rounded. Plated for rust resistance.

Tamping (Puddling) Rod **H-3650**
Ship wt. 4.3lbs. (1.9kg)

Tamping Rod

ASTM C157, C192

Round, straight steel rod measures .375" (10mm) dia. x 12" (305mm) long. Both ends are rounded to a hemispherical tip of the same diameter as the rod.

Tamping Rod **H-2905.1**
Ship wt. 4.3lbs. (1.9kg)

Mold Strippers

Mold strippers split single-use plastic cylinder molds for cylinder removal.

T-Handle Style **H-3041S**
Screwdriver Style **H-3041SMA**
Ship wt. 2lbs. (0.9kg)

Quick-Strip Mold Strippers

The Quick-Strip Mold Stripper from Humboldt provides fast, easy and safe stripping of cylinder molds with one easy pull of its lever. With each pull of the lever the Quick-Strip slices plastic cylinder molds with two opposing cuts, making removal of the concrete cylinder easy. And, since the Quick-Strip is designed to be bench mounted, it will also save your lower back from bending over to strip molds on the floor like you do with conventional stripping tools. The Quick-Strip also doesn't bottom out the knife blades when it cuts molds, so you'll save on the frequency of blade replacements. And, you'll save wear and tear on your floors, which are often ruined by repeated blade gouging.

- No more bending over molds on the floor
- No more missed hammer blows
- No more stripping tools slipping off the mold
- No more floor gouging

The Quick-Strip will provide you with cylinder mold stripping that's faster, safer and more efficient, especially when you have large numbers of cylinders to process.

Video: <https://youtube/WUTRdgNu-24>

Quick-Strip Mold Stripper, 4" x 8" **H-3045**
Ship wt. 75lbs. (34kg)

Quick-Strip Mold Stripper, 6" x 12" **H-3046**
Ship wt. 75lbs. (34kg)

Replacement Blade for Strippers **H-3046.1**
Ship wt. 1lbs. (1.9kg)





H-3043.6



H-3043.4



H-3040



H-3037



H-2942



H-2934



H-2950H



H-2920



H-2945G



H-2945



H-2900.4, H-2900.6

Concrete Cylinder Molds, Reusable, Plastic

C31, C39, C192, C470, C496; AASHTO T22, T23, T126, T198, M205

Lightweight, impact resistant construction. Will not crack, rust or deform. Can be reused up to 100 times.
 .25" (6.2mm) wall thickness. Sold individually.

| Size | Description | Ship wt. | Model |
|------------------------|--|------------------|----------|
| 6" x 12" (152 x 305mm) | .25" (6.2mm) wall thickness. Sold individually. | 4.1 lbs. (1.8kg) | H-3043.6 |
| 4" x 8" (102 x 203mm) | .25" (6.2mm) wall thickness. Sold individually. | 14.2lbs (.5kg) | H-3043.4 |

Concrete Cylinder Molds, Single-use, Cardboard

C31, C39, C192, C470, C496; AASHTO T22, T23, T126, T198,

| Size | Description | Ship wt. | Model |
|------------------------|--|----------------|--------|
| 6" x 12" (152 x 305mm) | Carton of 24, oversize UPS charges apply | 17 lbs (7.7kg) | H-3040 |
| 4" x 8" (102 x 203mm) | Carton of 50, oversize UPS charges apply | 15 lbs (6.8kg) | H-3037 |
| 3" x 6" (76 x 152mm) | Carton of 50, oversize UPS charges apply | 10 lbs (4.5kg) | H-3038 |
| 2" x 4" (51 x 102mm) | Carton of 50 | 5 lbs (2.2kg) | H-3039 |

Cylinder Molds, Reusable, Metal

ASTM C31, C39, C192, C470; AASHTO T22, T23, T97, T126, T198

Molds are constructed of plated steel for rust resistance and are dimensionally stable under severe use.
 Molds are split along one side with 2 quick-acting clamps welded to mold. When open, mold springs apart slightly to allow specimen removal. Includes detachable base plate.

| Size | Description | Ship wt. | Model |
|------------------------|--|-------------------|---------|
| 6" x 12" (152 x 305mm) | .125" (3mm) wall thickness | 18 lbs. (8.2kg) | H-2942 |
| | .25" (6mm) wall thickness | 30 lbs (13kg) | H-2950 |
| | .25" (6mm) wall thickness with handle | 24.2 lbs (10.9kg) | H-2950H |
| 4" x 8" (102 x 203mm) | .125" (3mm) wall thickness | 10 lbs (4.5kg) | H-2935 |
| | .25" (6mm) wall thickness | 14 lbs (6.3kg) | H-2934 |
| 3" x 6" (76 x 152mm) | .25" (6mm) wall thickness | 9 lbs (4kg) | H-2931 |
| 2" x 4" (51 x 102mm) | 3-Gang, split, cast bronze with heavy rib reinforcement. Quick-acting yoke clamps, bolts and thumbscrews for locking halves. | 8 lbs (3.6kg) | H-2920 |

Cylinder Carrier (Gripper Type)

The H-2945 employs a hand-grip pincer action to secure standard 6" (152mm) dia. cylinders. For 4" cylinders order the H-2945G-4".

Cylinder Carrier, 6" (Gripper Type) H-2945G
 Cylinder Carrier, 4" (Gripper Type) H-2945G-4"



Ship wt. 3lbs (1.4kg)

Cylinder Carrier (Cradle Type)

Steel cylinder carrier is plated to resist rust. Used to carry 6" (152mm) dia. concrete cylinders in field or laboratory.

Cylinder Carrier (Cradle Type) H-2945
 Ship wt. 2.5lbs (1.1kg)

Concrete Cylinder Wrap

Used to minimize fragment scattering and reduce cleanup time after the compression test. Made of canvas/nylon with Velcro fastening strips.

Concrete Cylinder Wrap, 4" H-2900.4
 Concrete Cylinder Wrap, 6" H-2900.6



Ship wt. 0.4lb (0.1kg)



H-2943



H-2977C

H-2977S.6
H-2977S.12

H-2970.1



H-2970A



H-2969.6

Sample Cart, Welded

Premium-grade all-welded cart has 800-lb. capacity. Features 5 x 1-1/4" casters mounted to cross-channel bolster plate for added support, convenient offset handle and 36" x 24" (914 x 609mm) tray size. Smooth finish; no rough edges. Shipped assembled.

Sample Cart, Bolt-Together

H-2943

Ship wt. 75lbs. (34kg)

Sample Cart, Bolt-Together

For use in handling concrete beams and cylinders, plus soil and aggregate samples in the lab or field. Ready to assemble. Cart has pan-type rolled-edge 3-1/2" (89mm) deep steel shelves. Top shelf reverses to flat working surface. Features 5" (127mm) dia. rubber casters; front casters swivel for easy steering. Dimensions: 24" x 36" x 32" (61 x 91 x 81cm). Assembly required.

Sample Cart, Bolt Together

H-2944

Ship wt. 55lbs (25kg)

Carrying Rack for Concrete Cylinders

Carrying rack for 4" x 8" test cylinders. Durable, molded plastic construction with molded handles for easy and safe transportation. Easily carry 8 cylinders at a time in this plastic carrier, which will not deteriorate or corrode in water. Allows you to keep companion cylinders together in the same case for curing.

Carrying Rack for Concrete Cylinders

H-2977C

Ship wt. 4.5lbs. (1.8kg)

Curing Rack for Concrete Cylinders

Durable, plastic cylinder curing racks provide a stable and open air flow design for storing cylinders during curing. The racks are manufactured from recycled plastic materials to resist moisture, abrasion, as well as chemical and temperature variations. Each rack has built-in handles for easy carrying. Each rack holds (4) 4" x 8" cylinders and the interlocking racks can be stacked 12 high (58").

Curing Rack for Cylinders (6 racks)

H-2977S.6

Ship wt. 7 lbs (3.2kg)

Curing Rack for Cylinders (12 racks)

H-2977S.12

Ship wt. 27.1lbs. (12.2kg)

Transport Rack for 6" Test Cylinders

Test cylinder transport rack securely holds (8) 6" x 12" cylinders in a lightweight and durable frame, which can be secured to a truck bed or used in conjunction with the H-2970A field curing chest listed below. Open center position is available for heater. Will not rot or rust. Rack is 23.5" square by 9" high.

Transport Rack for 6" Test Cylinders

H-2970.1

Ship wt. 11.2lbs. (5.1kg)

Transport Rack for 4" Test Cylinders

Test cylinder transport rack similar to above, but securely holds (16) 4" x 8" cylinders. Rack is 23" square by 7" high.

Transport Rack for 4" Test Cylinders

H-2970.2

Ship wt. 15lbs. (6.8kg)

Field Curing Chest

The field curing chest offers the user with an affordable approach to store, transport and cure concrete test cylinders. The chest consists of a 24" x 24" x 14" (610 x 610 x 356mm) zipper-sealed polymer and vinyl chest with 0.5" (12.7mm) insulating foam. The unit can accept up to nine 6" x 12" concrete cylinders.

Field Curing Chest

H-2970A

Ship wt. 13.6lbs. (6.18kg)

Poly Curing Tanks

Durable seamless design resists breakage. All round-end tanks have an extra heavy duty, molded rim and an extra-deep sidewall rib design for additional strength. Heavy duty, molded-in aluminum drain fitting and 1.25" poly drain plug ensure a long-life. Tested to -20° F, corrosion-free impact resistant and recyclable. Premium UV protection assures long life and resistance to color fade in outdoor use. Shipping weights: 8': 66lbs (29kg); 6': 49lbs (22kg); 4': 30lbs. (13.6kg).

Poly Curing Tank, 3' x 2' x 8'

H-2969.8

Poly Curing Tank, 2' x 2' x 6'

H-2969.6

Poly Curing Tank, 2' x 2' x 4'

H-2969.4

Ship wt. see above



Precision Tank Heater

Designed for efficient and economical indoor operation with H-2969 series curing tanks where temperature does not fall below 55°F (13°C). Temperature is thermostatically controlled and adjustable. The 1,000W, 8.3 amp, 120V solid-state controlled element will warm to a maximum of 200°F. Heater is Incoloy sheathed to prevent rust and is secured to aluminum base. Base provides protection for heater components from test cylinders in the tank. Overall length: 22.5" (57cm).

Precision Tank Heater, 110V 60Hz H-2986A
Precision Tank Heater, 220V 50/60Hz H-2986A.4F
Ship wt. 5lbs. (2.2kg)

Immersion Circulator and Heater

This Immersion Circulator/Heater converts any tank or vessel into a reliable, user-friendly circulating bath. Remarkably versatile and convenient, it delivers precise and reliable temperature control for virtually any laboratory application. The unit features a large, backlit digital display, which allows you to monitor a set point and actual temperature from across the lab. It has a protective housing that shields the pump and heater from damage yet offers easy access for cleaning. Flow management is easy with its convenient slide control, which easily adjusts to adapt to any need. Its adjustable mounting clamp fastens securely to both flat and rounded tank walls.

Working temperature: 135°F maximum

Temperature stability: ±0/07°C

Pump: 1-speed

Suitable for tank capacities to 28 liters and a minimum working depth of 7.25".

Circulator/Heater, 120V 60Hz H-2988A
Circulator/Heater, 220V 50/60Hz H-2988A.4F
Ship wt. 9lbs. (4.08kg)

Curing Tank Circulator

Silent submersion pump is 1/160hp (30W) with 120gph rating at 1ft. (30cm) height. Circulation from the 0.25" (6.4mm) MNPT discharge may be aimed; simply place the housing on any of five sides. Flow also may be directed using elbow connector (included) or by attaching extension tubing. Working parts are lubricated and sealed for life in glass-filled nylon housing with flush inlet. Features 6ft. (1.8m) grounded cord.

Curing Tank Circulator, 110V 60Hz H-2985
Curing Tank Circulator, 220V 50/60Hz H-2985.4F
Ship wt. 3lbs. (1.3kg)

Chart Recorder, Circular

This chart recorder provides reliable and rugged trend reporting with the ability to measure 3 different temperature ranges and 4 recording speeds (6 or 24 hr. and 7 or 31 days). Large LED display shows sensor temperature and all controls are located on the front panel. Unit can be free standing or wall mounted. Battery backup provides operation during power interruptions. Comes with 2 cartridge pens and 60 assorted charts. **Sensor is not designed to be fully immersible.**

Chart Recorder (°F), 120V 60Hz H-2735F
Chart Recorder (°C), 120V 60Hz H-2735C
Chart Recorder (°F), 220V 50/60Hz H-2735F.4F
Chart Recorder (°C), 220V 50/60Hz H-2735C.4F
Ship wt. 5lbs. (2.3kg)

Charts for Chart Recorder

| Description | Part No. |
|--|-----------|
| Probe w/ lead (15ft.), stainless steel | H-2735A.3 |
| Pen for H-2735 chart recorders (black) | H-3185.3A |
| 6" 7-Day Chart, 50 to 120°F | H-2735F.1 |
| 6" 24-Hr. Chart, 50 to 120°F | H-2735F.5 |
| 6" 7-Day Chart, 10 to 50°C | H-2735C.1 |
| 6" 24-Hr. Chart, 10 to 50°C | H-2735C.5 |

Concrete Curing Box, Deluxe

ASTM C192, C511, C31; AASHTO M201, T126, T23
Deluxe curing box provides heating and cooling while still being lightweight, and portable—74 lbs. (33.6kg). Plastic construction is rugged, durable and rustproof. Up to 22 standard 6" x 12" (152 x 305mm) test specimens can be stored at 72 ±2°F (22.2 ±1.1°C) over an ambient range of -10 to 100°F (-23 to 37.8°C). Sturdy, 14-gauge steel bottom rack provides optimum water circulation for even curing. Bottom valve for fast drainage. Lockable lid resists tampering. Requires minimum 15 amp circuit. Deluxe model includes recirculating water temperature control unit with temperature set buttons, indicating lights and digital readout for water temperature. **Not available in 220V 50/60Hz.** Shipping Dimensions: 76" x 28" x 29" (193 x 71 x 73.6cm) L x W x H

Curing Box, Heating/Cooling, 110V, 50/60Hz H-2968
Ship wt. 200lbs. (90.9kg)

Concrete Curing Box, Heating Only

ASTM C192, C511, C31; AASHTO M201, T126, T23
Curing box for concrete cylinders is lightweight, and portable—74 lbs. (33.6kg). Plastic construction is rugged, durable and rustproof. Up to 22 standard 6" x 12" (152 x 305mm) test specimens can be stored at 72 ±2°F (22.2 ±1.1°C) over an ambient range of -10 to 100°F (-23 to 37.8°C). Sturdy, 14-gauge steel bottom rack provides optimum water circulation for even curing. Bottom valve for fast drainage. Lockable lid resists tampering. Requires minimum 15 amp circuit. Heating-only model, though cooling can be achieved by cool water recirculation, if available. Includes adjustable heating control and dial thermometer. **Not available in 220V 50/60Hz.** Shipping Dimensions: 64" x 28" x 29" (162.5 x 71 x 73.6cm) L x W x H

Curing Box, Heat only, 110V, 50/60Hz H-2967
Ship wt. 120lbs. (54.5kg)



VaporPlus Curing Room System

ASTM C511

The VaporPlus Curing Room System provides the ideal solution for maintaining concrete curing rooms within ASTM C511 specifications. The VaporPlus system utilizes air atomization technology to produce a fine vapor fog to create the optimal environment for storing and curing concrete testing samples, such as cylinders. It provides the ideal solution for maintaining the high humidity levels (up to 100%) required for curing rooms.

The system is comprised of a simple timer, stainless steel, air atomizing nozzles, which produce a fine vapor fog, won't rust and are resistant against clogging. A water filtration unit, which includes sediment removal and 100% KDF, anti-bacterial filter and a compressor unit, which includes an adjustable water regulator for added humidity control.

The VaporPlus system is designed to provide consistent humidity results in rooms up to 26 x 26 x 8 ft. or 0-5,600 cubic feet. VaporPlus systems can accommodate rooms of all sizes, just add additional nozzles for larger room applications.

VaporPlus Curing Room System, 115V, 60Hz H-2741
VaporPlus System, 220V, 50/60Hz H-2741.4F

Ship wt. 47lbs. (21.3kg)

Replacement Parts for H-2741 VaporPlus

| Description | Part No. |
|-----------------------------|----------|
| Spray Nozzle | H-2741.1 |
| Air Filter Cartridge | H-2741.2 |
| Air Muffler Filter (Qty. 4) | H-2741.3 |
| 10" Sediment Cartridge | H-2741.4 |
| 10" KDF Media Cartridge | H-2741.5 |



H-2741.1



H-2741.2



H-2741.3



H-2741.4



H-2741.5

Monitor the VaporPlus System with Humboldt's NEW Concrete Humidity Sensor System!

Humboldt Concrete Humidity Sensor System

Based on Humboldt's Concrete Maturity System, the Humidity Sensor System can be used to wirelessly monitor curing room humidity.

The Humboldt Humidity Sensor System provides a wireless solution to collecting humidity data. Humidity can be accessed from anywhere without even visiting the curing room. When the system is installed, it is activated by registering it with your website account using a sensor-specific ID number. Once this step is completed, the transmitter for each sensor will begin to receive data from the sensor and transmit that data to



the receiver. The receiver then relays this information to your account on the web-based cloud platform. This information/data is available to you in real time, 24/7, 365 days a year by simply logging into your account, using your user name and password. See page 166 for additional information.

The Humidity Sensor System is available as a kit, which includes (1) Receiver, (1) Transmitter/Sensor, and a website platform account.

Humboldt Humidity Sensor System H-2689.3F

Ship wt. 8.9lbs. (4kg)





H-2742



H-2737



H-2738

Tri-Breeze Curing Room System Sanitizer

The Tri-Breeze Curing Room System Sanitizer is a sanitizing system designed for use with the Vapor-Plus Curing Room System. It provides proven sanitizing capabilities to disinfect against a build up of bacteria and viruses. It kills pathogens on contact and converts to regular oxygen, leaving no toxic residuals. It has been proven to be effective against *Listeria*, *Salmonella*, *E. Coli*, *Norovirus*, *Campylobacter* and other pathogens. The system generates oxygen (O_2) in a relatively simple process using ordinary air. Oxygen and Nitrogen are the raw materials. As the air is drawn through the reaction chamber, energy is supplied, which splits some oxygen molecules into oxygen atoms. Some of these atoms then quickly react with oxygen molecules to form an activated oxygen. This process cleans and sanitizes the system more effectively and less expensive than a chlorine-based system.

Tri-Breeze, Sanitizing System, 120V 60Hz H-2742

Tri-Breeze, Sanitizing System, 220V 50/60Hz H-2742.4F
Ship wt. 30lbs. (13.6kg)

Fine Mist Fogging Fan

The H-2737 bench-type fogging fan is a quiet and dependable fogging fan, perfectly suited for the small curing rooms. The H-2737 conveniently sits on flat surfaces or shelves and is extremely easy to set up and operate. The nozzle-free fan can atomize ordinary water supplies into a very fine mist-like-fog, as well as pond water without the risk of clogging. Utilizing high-speed centrifugal force and air flow, these units can propel a misty-fog stream up to 20 feet away. The H-2737 is engineered to withstand humid conditions as high as 100% relative humidity. Units are constructed of impenetrable components like Nema 4 boxes and connections, all 304 stainless steel hardware, UV-stabilized polyethylene housing and precision, high-strength injection molded polypropylene components. Units also reuse their condensation waste water, eliminating the need of a near by drain. Bench top units fill automatically by means of an internal float valve and come equipped with a simple garden hose connection. A quarter-turn valve controls the fogging output.

Specifications

| Description | Part No. |
|--------------------|--------------------------|
| Fogging Capacity | 0-3 gallons per hour |
| CFM Rating | 1,125 cubic ft. per min. |
| Energy Consumption | 1.5 amps @ 115V |
| Noise @ 10 ft. | 62dB(A) |
| Dimensions | 16" dia. x 16" length |
| Coverage | about 500 sq. ft. |

Similar to the H-2737, the H-2738 is a direct-feed, hanging unit, which receives liquid directly through a visual flowmeter control panel. This provides for fine "repeatable" control of the fogging output, as well as enhancing dependability by eliminating sump components. Direct feed units are well suited for harsher environments or applications where standing water in a sump could become an issue. Each unit is equipped with a 5gph (20-300cc/min) flowmeter panel and 12 foot condensation drainage line. Not available in 220V 50/60 Hz.

Fogging Fan, Bench Type

H-2737

Fogging Fan, Hanging Type

H-2738

Ship wt. 24.6lbs. (11.2kg)

Accessories for H-2737 & H-2738

| Description | Part No. |
|----------------------|----------|
| Floor Stand (Econo) | H-2734.1 |
| Ceiling Support | H-2734.2 |
| Wall Mount | H-2734.3 |
| Humidistat | H-2737.1 |
| Thermostat | H-2737.2 |
| Cycle Timer | H-2737.3 |
| Mini 360° Oscillator | H-2737.4 |



H-2736



H-2732



H-2736.4



H-2736.3



H-2736.SW



H-2736.1



H-2736.2



H-2962

H-2962.4F

Temperature/RH Loggers

These temperature and relative humidity data loggers are housed in a robust, waterproof (IP68-rated) case, which is designed for use in harsh applications like cylinder curing rooms. They are available with an integral, coated RH sensor (H-2736) or with a temperature and relative humidity probe with a 1.5m cable length (H-2732). The relative humidity probe features a coated RH sensor that shows good resistance to moisture and condensation, ensuring measurement reliability. These data loggers have a high reading resolution and accuracy and provide fast off-load speed and a low battery monitor. Data is downloaded to a computer for viewing, reports and archiving. Data stored on the logger will be retained after a battery is replaced. See tables below for specific logger specifications. **Require H-2736.SW software and a download cable for operation.** Dimensions: 1.75" x 2.25" x 3.15" (34 x 57 x 80mm).

Relative Humidity Specifications

| | |
|--------------------|----------------------|
| Sensor Type | Capacitive |
| Reading Range | 0 to 100% RH |
| Accuracy | ±3.0% at 77°F (25°C) |
| Reading Resolution | Better than 0.3% RH |
| Sensor Location | Externally mounted |
| Response Time | 10 seconds to 90% |

Temperature/RH Logger H-2736

Temperature/RH Logger with Probe H-2732



Ship wt. 0.3lbs. (.13kg)

Temperature/RH Logger Software

Explorer Software for operating H-2736 and H-2732 data loggers. This Windows-based program is simple and intuitive to use, allowing users to easily manage both Tinytag loggers and recorded data. A simple to use launch page that allows easy editing of a data logger's settings, while at the same time summarizing them clearly. When offloaded, recorded data is initially presented as a graph but can also be displayed as a table of readings if required. These views are supplemented with an information view, that summarizes details of the data being shown, and a daily minimum/maximum view. Data can easily be exported from all four views into MS Excel and Word, either as a file or by simply copying and pasting. The software supports multiple languages, and there is also a comprehensive, illustrated help file to take the user through the basics of the software, and its more advanced features. Site licenses are available for multiple installs.

Temperature/RH Logger Software H-2736.SW



Ship wt. 1lbs. (.45kg)

Logger Download Cables

Download cables to connect a PC to the H-2732 and H-2736 Loggers.

Download Cable, Serial H-2736.1

Download Cable, USB H-2736.2



Ship wt. 0.5lbs. (.22kg)

Logger Specifications

| | |
|------------------|--|
| Reading Capacity | 32,000 |
| Memory Type | Non-volatile 64K |
| Reading Types | Actual, Min, Max |
| Delayed Start | Relative / Absolute (up to 45 days) |
| Trigger Start | Magnetic Switch (H-2736.3) |
| Alarms | 2, fully programmable |
| Stop Options | When full, After "n" Readings, Never overwrite oldest data |
| Operating Range | -40°F to +185°F -40°C to +85°C |
| Battery | User-replaceable Lithium |

Temperature Specifications

| | |
|---------------|----------------------------------|
| Sensor | 10K NTC Thermistor |
| Range | -13 to 185°F (-25 to 85°C) |
| Response Time | 25 mins to 90% FSD in moving air |
| Accuracy | 0.01°C or better |

Trigger Start Magnet

A magnet for starting loggers that have been set up for a trigger start.

Trigger Start Magnet H-2736.3



Ship wt. 0.1lbs. (.04kg)

Stevenson-type Screen Enclosure

The Stevenson-type screen, or instrument shelter, shields data loggers against precipitation and direct heat radiation from outside sources, while still allowing air to circulate freely around it.

Stevenson-type Screen Enclosure H-2736.4



Ship wt. 1.5lbs. (.68kg)

Specimen Grinding Machine

ASTM standards D4543, C31, C39, C192, and C617

This automatic cylinder end grinder quickly grinds specimen ends plane and parallel prior to compression tests. This unit can grind three (3) 4" x 8" (100mm x 200mm), (3) 3" x 6" (76mm x 150mm) or two (2) 6" x 12" (150mm x 300mm) test cylinders simultaneously. The adapter for 4" x 8" (100mm x 200mm) and 3" x 6" (76mm x 150mm) test cylinders is easy to install on the table and requires no assembly. The machine is mounted on wheels for easy moving. Safe access to components allows for easy maintenance. The grinder's aluminum frame and stainless steel exterior ensure both resistance to corrosion and light weight.

H-2962 Specifications

| | |
|----------------|--|
| Specimen Size | 6" x 12" (152 x 305mm) cylinder 4" x 8" (102 x 203mm) cylinder 3" x 6" (75 x 150mm) cylinder |
| Cut Precision | Plane and Parallel to within 0.002" (.05 mm) |
| Cutting Feed | 8.5" (215mm) |
| Cutting Head: | 13" (330mm) |
| Cutting Speed: | 1400 rpm |
| Power Supply | 120V, 50/60Hz 1ph 10 amps 220V, 50/60Hz 1ph 10 amps |
| Dimensions | 24" x 37" x 52.5" (W x D x H) (610 x 940 x 1334mm) |



HC-2979.2F.3
HC-2979.5F.3

- Grinds planeness and parallelism of cylinder ends
- Planeness accuracy: 0.002" (0.05mm)
- Grinding time 90 to 120 seconds per end
- Ready to use for 6" x 12" (150mm x 300mm), 4" x 8" (100mm x 200mm), 3" x 6" (76mm x 150mm) and 2" x 4" (50mm x 100mm) test cylinders
- Selectable advance speed
- Automatic, bi-directional radial displacement of table
- Aluminum frame, stainless steel outer shell
- Splash guard reduces user exposure to water and dust
- Easy access to water inlet and outlet
- Diamond-grinding wheel included

Specimen Grinder, 120V, 50/60Hz H-2962
Specimen Grinder, 240V, 50/60Hz, 1Ph H-2962.4F
Ship wt. 904lbs. (410kg)

Grinding Wheel, Replacement for H-2962

Replacement grinding wheel for the H-2962 Specimen Grinding Machine.

Grinding Wheel, Replacement H-2962.1
Ship wt. 25 lb (11.3kg)

Automatic Grinding Machine

ASTM D4543, C31, C39, C192, and C617

This automatic grinding machine is designed to grind and polish concrete cubes, cylinders, blocks, natural stones, rocks and ceramic materials. Specimens are easily fixed to the table with the use of the proper locking stirrups. See chart for specimen types and sizes.

This unit features a grinding head is equipped with an end-of-stroke system, which allows full automatic displacement in both directions without activating the electric pushbutton. This unit is designed for the simultaneous grinding of varied types of specimens, including concrete cube, cylinders, blocks and rock. It offers the motorized radial displacement of the abrasive head in both directions.

The revolving abrasive head is radially and alternately moved in both directions through an electric motor actuated by push button. The column is completely protected against abrasive dust. The grinding head can be lowered vertically in 0.05mm graduations by using the top handwheel. The machine is made from rugged plate and is supplied

HC-2979 Specifications

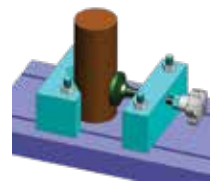
| | |
|---------------|---------------------------------|
| Specimen Size | 6" x 12" (152 x 305mm) cylinder |
| | 4" x 8" (102 x 203mm) cylinder |
| Table Dims. | 3" x 6" (75 x 150mm) cylinder |
| | 6" Cubes |
| Head Stroke | 100mm, 150mm, 200mm Cube |
| | 390 x 250mm Block |
| Wheel Dia. | 30.5" x 11.0" (775 x 280mm) |
| Wheel Speed | 8.5" (215mm) |
| Power Supply | 13" (330mm) |
| Dimensions | 1400rpm |
| | 400V, 3ph 4500W |
| | 48" x 42.5" x 68" (W x D x H) |
| | (1220 x 1080 x 1730mm) |

complete with: control panel; coolant/decantation tank for water and emulsifying oil; motor pump; set of standard abrasive sectors; safety chip guard that automatically stops the machine if it is removed. Both models are 3-Phase electric.

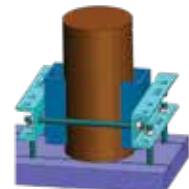
Specimen Grinder, 240V, 60Hz-3PH HC-2979.2F.3
Specimen Grinder, 240V, 50Hz-3PH HC-2979.5F.3
Ship wt. 904lbs. (410kg)

NOTES

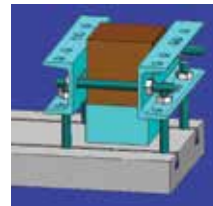
HC-2979 Grinding Machine includes Standard Abrasive Grinding Sections, but require the separate purchase of specimen locking devices, not included. Choose between the Fast Locking Device or the appropriate Locking Stirrups for your operation.



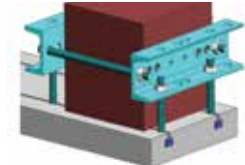
HC-2980.1



HC-2980.2, HC-2980.3



HC-2980.3



HC-2980.4

Standard Abrasive Grinding Sections

Standard abrasive grinding sections provide excellent grinding capabilities and long life. Sold as a set of 8.

Standard Abrasive Grinding Sections HC-2980.5
Ship wt. 20 lb (9.1kg)

Diamond Grinding Sections

Diamond grinding sections provide enhanced grinding capabilities and long life. Sold individually, 8 required.

Diamond Grinding Sections HC-2980.6
Ship wt. 20 lb (9.1kg)

Fast Locking Device

Fast locking device for use with Cubes 150 and 200mm; Cylinders 100 to 160mm. Each device accepts only one specimen. It is possible to grind (1) 200mm cube, (2) 150mm cubes or (2) cylinders.

Fast Locking Device HC-2980.1
Ship wt. 25 lb (11.3kg)

Locking Stirrups, Cylinders

For use with cylinder specimens, 4" x 8" and 6" x 12", 100mm, 150mm. Complete with 60mm high spacer. **Note: must be used in conjunction with HC-2980.3 for proper operation, order separately.**

Locking Stirrups, Cylinders HC-2980.2
Ship wt. 25 lb (11.3kg)

Locking Stirrups, Cubes

For use with cube specimens, 100mm, 150mm and 200mm. Complete with 60mm high spacer.

Locking Stirrups, Cubes HC-2980.3
Ship wt. 25 lb (11.3kg)

Locking Stirrups, Block

For use with block specimens 390mm x 250mm.

Locking Stirrups, Block HC-2980.4
Ship wt. 25 lb (11.3kg)



HC-2931.2F



HC-2930.36F

Shown with optional adjustable stand (sold separately).

Masonry Saw, 8" Cut

Saw for use in cutting cylinders and blocks. Blade capacity is 20" (508mm), which allows a cutting depth of 8" (203mm). Unit features a 5hp, 230 60hz 1ph Baldor motor. The saw has only two pivot points for reduced saw maintenance and longer diamond blade life. The cutting head pivots on bearings, which are sealed and lubricated for life requiring no greasing. Its ergonomically designed steel handle with molded grip bolts securely into place and the Sta-level® blade guard keeps the blade guard parallel to the cutting table for accurate cuts. Height can be controlled with a convenient crank control on foot pedal.

Blade not included, order separately.

- High torque, continuous duty dual capacitor motors make efficient use of horsepower and reduce cutting time.
- Capable of cutting 8" x 8" x 16" block with a 20" blade in one pass or 10" block with a 24" blade in one pass. (For 24" blade, please inquire)
- Height can be controlled with a convenient crank control or foot pedal.
- The Sta-level® blade guard keeps the blade guard parallel to the cutting table for accurate cuts.

HC-2931 Specifications

| | |
|--------------|---|
| Blade Dia. | 20" (508mm) |
| Cut Depth | 8" (203mm) |
| Motor | 5hp (3.7) |
| Power Supply | 230V, 1ph |
| Dimensions | 47.75" x 22" x 57.5" (1213 x 559 x 1461mm) |
| Weight | 361 lbs (162kg) |

Masonry Saw, 230V, 60Hz

HC-2931.2F

Ship wt. 361lbs. (162kg)

Masonry Saw, 5" Cut

Saw for use in cutting concrete and mortar cylinders and blocks. Blade capacity is 14" (350mm), which allows a cutting depth of 5" (127mm). Perfect for cutting 4"x 8" cylinders. Unit features a 1.5hp, 115/208-230 60hz 1ph Baldor motor. The saw has only two pivot points for reduced saw maintenance and longer diamond blade life. The cutting head pivots on bearings, which are sealed and lubricated for life requiring no greasing. Its ergonomically designed steel handle with molded grip bolts securely into place and the Sta-level® blade guard keeps the blade guard parallel to the cutting table for accurate cuts. Height can be controlled with a convenient crank control on foot pedal. There is a switch that needs to be set to change from 120V to 230V operation. **Includes 14" Vari-Cut Turbo blade.**

- Equipped with a patented water management system that keeps the work piece dry and the workplace clean.
- The double splash guard decreases water spray behind the saw and makes cleaning easier.
- Head rotates to easily cut 22.5 degree and 45 degree bevel cuts.
- It is easy for two people to move the saw thanks to integrated telescopic handles.
- Sta-level® blade guard keeps the blade guard parallel to the cutting table for accurate cuts.

HC-2930 Specifications

| | |
|--------------|---|
| Blade Dia. | 14" (356mm) |
| Cut Depth | 5" (127mm) |
| Motor | 1.5hp (1.1) |
| Power Supply | 120/230V, 1ph |
| Dimensions | 39.8" x 26.4" x 25.6" (1010 x 670 x 650mm) |
| Weight | 131 lbs (59kg) |

Masonry Saw, 120/230V, 60Hz

HC-2930.36F

Ship wt. 171lbs. (77kg)

CONCRETE



HC-2933, HC-2935



HC-2932, HC-2934

MASONRY SAW ACCESSORIES

Masonry Saw Elite Cut (Silent Core) Blade

High-quality, fast cutting, silent core blade designed for abrasive, lightweight block. Designed for dry or wet cutting. The segment height is .500" (400" diamond depth and 1.00" segment base).

Masonry Blade, 20" (508mm) x .140" x 1" HC-2933

Masonry Blade, 14" (350mm) x .125" x 1" HC-2935



Ship wt. 15lbs. (6.8kg)

Masonry Saw Blade, Elite Cut

High-quality, fast cutting, blade designed for abrasive, lightweight block. Designed for dry or wet cutting. The segment height is .500" (400" diamond depth and 1.00" segment base).

Masonry Blade, 20" (508mm) x .140" x 1" HC-2932

Masonry Blade, 14" (350mm) x .125" x 1" HC-2934



Ship wt. 15lbs. (6.8kg)

Portable Masonry Saw Stand

Portable, adjustable stand for HC-2871 Masonry Saw. Stand is easy to set up and take down and is adjustable to several heights for user comfort. It easily folds down to serve as a dolly to transport or store saw. Folded dimensions are: 22" x 42" x 12" (559 x 1067 x 305mm)

Portable Masonry Saw Stand

HC-2930.1



Ship wt. 40lbs. (18.1kg)



**Digital Caliper, 12"**

ASTM C174

This 0-12" (0-305mm) digital caliper has 3.5" long jaw blades for use in measuring cylinders. It features a large, easy-to-read digital display, ergonomic thumb rest; rolling thumb wheel; hold feature, Inch/metric conversion, preset mode now includes offset for inside jaws. It provides digital readout to .0005"/0.01mm for error-free reading and accuracy.

Digital Caliper **HC-2819.12**
 Digital Caliper, Certified **HC-2819.12C**
 Ship wt. 3lbs. 1.3kg)

Digital Caliper, 20"

ASTM C174

This 0-20" (0-508mm) digital caliper has 5.9" long jaw blades for use in measuring cylinders. It features a large, easy-to-read LCD digit, rolling thumb wheel; plus control buttons for zero, on/off and inch/mm functions. It provides digital readout to .0005"/0.01mm for error-free reading and an accuracy of $\pm .0025"$.

Digital Caliper **HC-2817**
 Ship wt. 8lbs. (3.6kg)

Core Length Measuring Device

ASTM C174

For determining concrete core lengths. Device accommodates either 4" or 6" diameter specimens up to 24" long. Allows measurements to be taken at the center of the specimen's upper end, as well as eight equidistant points along the circumference. Measuring rod has graduations on one end of 0.10" (2.5mm) apart and the other end is every 2mm.

Core Length Measuring Device **H-2939**
 Ship wt. 10.4lbs. (0.1kg)

Verification Cylinder

Used with H-2939 Core Length Measuring Device to verify cylinder lengths.

Verification Cylinder, 4" x 8" **H-2939.40**
 Verification Cylinder, 6" x 12" **H-2939.60**
 Ship wt. 2.5lbs (1.1kg)

Precision Diameter Tape

ASTM D2166, D2850, D4767, BS1377:8

Diameter tapes provide a fast, reliable method for measuring the diameter of concrete, soil and asphalt cores and cylinders. One reading provides round and out-of-round diameters within an accuracy of .001" (.03mm) by means of special graduations and vernier scale. All tapes are made from a stainless alloy and are precision engraved to ensure accuracy. Tape has diameter range of 2" to 12" (50 to 300mm). Includes certificate of calibration. Tapes are calibrated and include a NIST-traceable certification.

Core Length Measuring Device **H-2937**
 Core Length Measuring Device, Metric **H-2937M**
 Ship wt. 0.6lbs. (.2kg)

Concrete Micrometer

Designed for accurately measuring diameters of concrete cylinders, micrometer has spindles of hardened steel. Thimble and sleeve sections are chrome finish and have black graduations and numbers. The H-2938 has a range of 5.5" to 6.5" and the H-2938M has a range of 150-175mm. Readings can be made to hundredths or thousandths in decimals.

Concrete Micrometer **H-2938**
 Concrete Micrometer **H-2938M**
 Ship wt. 3.8lbs. (1.7kg)

Perpendicular Verification Devices

ASTM C39

PVDs (Perpendicular Verification Devices) are used to quickly and accurately verify cylinder perpendicularity per ASTM C39 when using Econ-o-Pad Capping Pad Sets with test cylinders.

Both the 4" x 8" and the 6" x 12" devices are configured to rest against the test cylinder while avoiding contact with your ASTM-compliant top and bottom retaining rings. By resting the base of the device against the lower platen of the compression machine while having the vertical edge against the test cylinder, you can use the included Gap Measuring Tool to verify that there are no gaps between the cylinder and the device indicating the compression test complies with ASTM C39 and can proceed.

Also available is a device designed for use with a 4" high x 7.5" round or square spacer for use when your operation uses this type of spacer in the compression machine.

Perp. Verification Device, 4" x 8" **H-2933.4NS**
 Perp. Verification Device, for 4" spacer **H-2933.4**
 Perp. Verification Device, 6" x 12" **H-2933.6**
 Ship wt. 0.6lbs. (.2kg)



H-2946C



H-2925A



H-2952

Econ-o-Cap Capping Pad Sets

ASTM C1231; AASHTO T22

Econ-o-caps provide a highly-efficient and reusable method for capping concrete cylinders for use in compression testing. Econ-o-caps eliminate the time and labor expenses associated with capping compounds. Sets are comprised of precision-machined, high-alloy steel retaining caps, which hold tough, elastomeric material pads. These pads can be assembled quickly and provide a fast end efficient method for distributing the test load uniformly across the cylinder, smoothing out any irregularities and ensuring consistent breaks. The steel retaining rings can be used for years with care and the pads are reusable up to 100 times or more with the aid of qualification testing of the pad's durometer. Bearing surfaces of the retaining rings is plane within 0.002in (0.05mm). Sets include (2) rings and (2) pads.

| Econ-o-Cap Sets | Ship wt. | Part # |
|-------------------|------------------|---------|
| 2" Econ-o-Cap Set | 4.3lbs. (2kg) | H-2946A |
| 3" Econ-o-Cap Set | 10lbs. (4.5kg) | H-2946B |
| 4" Econ-o-Cap Set | 10.5lbs. (4.8kg) | H-2946C |
| 6" Econ-o-Cap Set | 20lbs. (9.1kg) | H-2946D |

Econ-o-Cap Capping Pad Sets see chart above

see chart above

Econ-o-Cap Capping Rings

ASTM C1231; AASHTO T22

Single Cylinder Rings, sold individually.

| Econ-o-Cap Ring | Ship wt. | Part # |
|--------------------|-----------------|----------|
| 2" Econ-o-Cap Ring | 0.2lbs. (.09kg) | H-2946AR |
| 3" Econ-o-Cap Ring | 4lbs. (1.8kg) | H-2946BR |
| 4" Econ-o-Cap Ring | 5lbs. (2.7kg) | H-2946CR |
| 6" Econ-o-Cap Ring | 10lbs. (4.5kg) | H-2946DR |

Econ-o-Cap Capping Rings see chart above

see chart above

Econ-o-Cap Capping Pads

ASTM C1231; AASHTO T22

Single cylinder pads of specific size and durometer, sold individually. Durometer ranges:

50 durometer: 1500 to 2200 psi (10.3 to 15.1MPa)
 60 durometer: 2500 to 7000 psi (17.2 to 48.2MPa)
 70 durometer: 4000 to 12000 psi (27.5 to 82.7MPa)

| Single Econ-o-Cap Pad | Part # |
|--------------------------|-------------|
| 2" Pad, 60 Durometer | H-2946ACP60 |
| 2" Pad, 70 Durometer | H-2946ACP70 |
| 3" Pad, 50 Durometer | H-2946BCP50 |
| 3" Pad, 60 Durometer | H-2946BCP60 |
| 3" Pad, 70 Durometer | H-2946BCP70 |
| 4" Pad, 50 Durometer | H-2946CCP50 |
| 4" Pad, 60 Durometer | H-2946CCP60 |
| 4" Pad, 70 Durometer | H-2946CCP70 |
| 6.125" Pad, 50 Durometer | H-2946DCP50 |
| 6.125" Pad, 60 Durometer | H-2946DCP60 |
| 6.125" Pad, 70 Durometer | H-2946DCP70 |

Econ-o-Cap Capping Pads see chart above

see chart above

Vertical Cylinder Capper

ASTM C31, C39, C192, C617; AASHTO T22, T23, T126, T231

These heavy-duty vertical cylinder cappers are used in applying capping compound to concrete test cylinders in preparation for compression tests. The base and capping plate are machined from cold-rolled steel and the capping plate is finish-ground within .002" (.05mm) planeness. The cylinder guide is a rigid, one-piece standard, which is machined from high-strength, cast-aluminum alloy.

2" x 4" (51 x 102mm) Cylinders H-2925A
 3" x 6" (76 x 152mm) Cylinders H-2925B
 4" x 8" (102 x 203mm) Cylinders H-2925C

Ship wt. 18lbs. (8.1kg)

Capping Plates

Replacement capping and base plate assemblies for H-2925 series vertical cylinder cappers.

2" x 4" (51 x 102mm) Cylinders H-2925A.1
 3" x 6" (76 x 152mm) Cylinders H-2925B.1
 4" x 8" (102 x 203mm) Cylinders H-2925C.1

Ship wt. 10.7lbs. (4.8kg)

Vertical Cylinder Capper

ASTM C31, C39, C192, C617; AASHTO T22, T23, T126, T231

This heavy-duty vertical cylinder capper is used in applying capping compound to 6" x 12" (152 x 305mm) concrete test cylinders in preparation for compression tests. The vertical capper simplifies the capping process by ensuring the plane, end surfaces are at right angles to the axis of the cylinder. The upright is used as a guide for positioning the cylinder. Molten capping compound is poured into the mold (plate); then the cylinder is placed on the capping material. After the compound is set, the capped cylinder is removed for testing. All types of capping compounds can be used with this apparatus. Capping plate is machined and finish-ground from cold-rolled steel to within .002" (.05mm) planeness. Thickness of the capping plate is 0.75" (19mm), to allow regrinding and refinishing after considerable usage should the plate become gouged. Capping plates are round, allowing circular rotation during use that results in uniform wearing down of contacting surfaces for maximum length of service. The frame is machined from high-strength aluminum alloy.

Vertical Cylinder Capper, 6" x 12" H-2952

Ship wt. 25.7lbs. (11.3kg)

Capping Plate

Replacement ring and bottom plate for H-2952 vertical cylinder capper.

Capping Plate, 6" x 12" H-2952.3

Ship wt. 16lbs. (7.3kg)



H-2951



H-2959

Cylinder Capping Kit

ASTM C31, C39, C192, C617; AASHTO T22, T23, T126, T231

Kit provides the basic components for cylinder capping and includes: (1) H-2945 cylinder carrier, (1) H-2952 vertical cylinder capper, (1) H-2953 compound melting pot, (1) H-2959 capping compound and (1) H-2958 ladle. See individual components for descriptions.

Cylinder Capping Kit, 120V 60Hz H-2951
 Cylinder Capping Kit, 220V 50/60Hz H-2951.4F
 Ship wt. 130lbs. (58.7kg)

Capping Compound, Flake-style

ASTM C307, C321, C386, C579, C617, D71

50 lb bag of Sauereisen No. 600 sulfur-based, flake-form capping compound melts and sets within minutes. Silica-filled compound has 150 psi bond strength, 9000 psi compressive strength and 605 psi tensile strength. Compound pours between 265 and 290°F (129 to 143°C). Overheated material's viscosity is reinstated by decreasing temperature to 290°F.

Capping Compound, Flake-style H-2959
 Ship wt. 52lbs. (24kg)

Capping ladle

Stainless steel ladle with 4" (102mm) dia. bowl is used in transferring capping compound from melting pot to capping fixture.

Capping Ladle H-2958
 Ship wt. 1.3lb (0.6kg)

Compound Melting Pots

ASTM C617; AASHTO T231

Designed for melting capping compound, paraffin and similar materials; compound melting pots feature an adjustable thermostat to deliver close temperature control automatically from 100° to 320°F (37.8 to 160°C). Includes cover, pilot light, 6' (1.8m) 3-conductor grounded cord set. Inner pot is cast aluminum encased in a metal jacket with fiberglass and air insulation, keeping heat loss to a minimum. Replaceable heating elements are securely clamped to the bottom and sides of the crucible for even heat distribution.

| Capacity | Electric | Amps | Ship wt. | Model |
|----------|--------------|------|----------|-----------|
| 4 qt. | 120V 60Hz | 6 | 16.8 lbs | H-2953 |
| 3.8L | 220V 50/60Hz | 3 | 18 kg | H-2953.4F |
| 8 qt. | 120V 60Hz | 10 | 20 lbs | H-2954 |
| 7.6L | 220V 50/60Hz | 5 | 29 lbs | H-2954.4F |
| 12 qt. | 120V 60Hz | 11 | 31 lbs | H-2955 |
| 11.4L | 220V 50/60Hz | 5.5 | 31.1 lbs | H-2955.4F |
| 20 qt. | 120V 60Hz | 12 | 48 lbs | H-2948 |
| 19L | 220V 50/60Hz | 6 | 43.6 lbs | H-2948.4F |
| 28 qt. | 120V 60Hz | 15 | 48 lbs | H-2949 |
| 26.5L | 220V 50/60Hz | 7.5 | 48 lbs | H-2949.4F |

Compound Melting Pots

see chart above



Ship wt. see chart above



H-2953



HCM-0030iH

Shown with Optional
Flexural Attachment
for Beams.



HCM-1000iH



HCM-2500iHA

HCM-0030 Series Compression Machines

ASTM C39, E4, AASHTO T22

- Suitable for beams of standard strength concrete mixes
- 300 to 30,000 lbf (1.3 to 113.5kN) testing range with accuracy of $\pm 0.5\%$ of indicated load
- Standard configuration includes no platens. Order HCM-0119B for beam testing
- Choice of two digital controllers and two digital indicators (see page 186-187)
- Optional test platens and accessories available on pages 191-192
- Available as an auxiliary frame design with no controller or pump; includes mounting stand, load frame selector valve and overload protection. Order: HCM-0030.
- **Mounting stand: OPTIONAL**, order: HCM-0032

| Specification | Value |
|--------------------|-------------------|
| Vertical Opening | 18.5" (470mm) |
| Horizontal Opening | 9.250" (235mm) |
| Piston Stroke | 2.125" (54mm) |
| Lower Platen, Dia. | NA |
| Upper Platen, Dia. | NA |
| Oil Reservoir Cap. | 2 gal (7.6 liter) |
| Overall Width | 28.625" (727mm) |
| Overall Depth | 16" (406mm) |
| Overall Height | 51.50" (1308mm) |

See Page 188-189 for models and ordering information.

HCM-0030 Series Compression Machines

CE Ship wt. 460 lbs. (208kg)

HCM-1000 Series Compression Machines

ASTM C39, E4, AASHTO T22

- The HCM-1000 has been custom-configured to be used for mortar applications like 2" and 4" cubes, beams and other low-strength materials, below 100,000 lbs. (445kN). These machines are based on HCM-2500 frames, which have been reconfigured for accurate readings of lower-strength materials. The machines are sold without platens, so be sure to order the appropriate set for your applications.
- Custom-configured for mortar applications like 2" and 4" cubes
 - 1,000 to 100,000 (11 to 445kN) testing range with accuracy of $\pm 0.5\%$ of indicated load
 - Choice of two digital controllers and two digital indicators (see page 186-187)
 - Machine comes with no platens, order the appropriate set for your applications
 - **Mounting stand: OPTIONAL**, order: HCM-0200

| Specification | Value |
|--------------------|-------------------|
| Vertical Opening | 19.375" (492mm) |
| Horizontal Opening | 9.25" (235mm) |
| Piston Stroke | 2.5" (63.5mm) |
| Lower Platen | NA |
| Upper Platen, Dia. | NA |
| Oil Reservoir Cap. | 2 gal (7.6 liter) |
| Overall Width | 30" (762mm) |
| Overall Depth | 23.750" (603mm) |
| Overall Height | 60.625" (1540mm) |

See Page 188-189 for models and ordering information.

HCM-1000 Series Compression Machines

CE Ship wt. 655lbs. (297kg)

HCM-2500 Series Compression Machines

ASTM C39, E4, AASHTO T22

- Suitable for cylinders, cubes, beams and cores of standard strength concrete mixes
- 2500 to 250,000 lbf (11 to 1112kN) testing range with accuracy of $\pm 0.5\%$ of indicated load
- Suitable for concrete strength up to 7,000 psi for 6" diameter cylinders
- Standard configuration includes platens to test 6" x 12" (150mm x 300mm) cylinders.
- Choice of two digital controllers and two digital indicators (see page 186-187)
- Optional test platens and accessories available on pages 191-192
- Steel protective doors, not plastic.
- **Mounting stand: OPTIONAL**, order: HCM-0200

| Specification | Value |
|--------------------|-------------------|
| Vertical Opening | 19.375" (492mm) |
| Horizontal Opening | 9.25" (235mm) |
| Piston Stroke | 2.5" (63.5mm) |
| Lower Platen, Dia. | 6.5" (165mm)Ø |
| Upper Platen, Dia. | 6.5" (165mm) |
| Oil Reservoir Cap. | 2 gal (7.6 liter) |
| Overall Width | 27" (686mm) |
| Overall Depth | 17" (432mm) |
| Overall Height | 56.312" (1430mm) |

See Page 188-189 for models and ordering information.

HCM-2500 Series Compression Machines

CE Ship wt. 885 lbs. (401kg)



NOTES

Frame opening dimensions are measured without test platens installed in machine. Overall machine dimensions are measured with the stand, including machines where it is optional.



HCM-3000iH

HCM-3000 Series Compression Machines

ASTM C39, E4, AASHTO T22

- Suitable for cylinders, cubes, beams and cores of standard strength concrete mixes
- 3000 to 300,000 lbf (13.3 to 1334kN) testing range with accuracy of $\pm 0.5\%$ of indicated load
- Suitable for concrete strength up to 9,000 psi for 6" diameter cylinders
- Standard configuration includes platens to test 6" x 12" (150mm x 300mm) cylinders.
- Choice of two digital controllers and two digital indicators (see page 186-187)
- Optional test platens and accessories available on pages 191-192
- **Mounting stand: OPTIONAL**, order: HCM-0300

| Specification | Value |
|--------------------|------------------------|
| Vertical Opening | 18.5" (470mm) |
| Horizontal Opening | 9.5" (241mm) |
| Piston Stroke | 3" (76mm) |
| Lower Platen | 9" x 12" (229 x 305mm) |
| Upper Platen, Dia. | 6.5" (165mm) |
| Oil Reservoir Cap. | 2 gal (7.6 liter) |
| Overall Width | 31.5" (800mm) |
| Overall Depth | 17" (432mm) |
| Overall Height | 58.5" (1486mm) |

See Page 188-189 for models and ordering information.
HCM-3000 Series Compression Machines
 CE Ship wt. 1078 lbs. (488kg)



HCM-4000iHA

HCM-4000 Series Compression Machines

ASTM C39, E4, AASHTO T22

- Suitable for cylinders, cubes, beams and cores of high-strength concrete mixes
- 4000 to 400,000 lbf (17.8 to 1780kN) testing range with accuracy of $\pm 0.5\%$ of indicated load
- Suitable for concrete strength up to 11,000 psi for 6" diameter cylinders
- Standard configuration includes platens to test 6" x 12" (150mm x 300mm) cylinders.
- Choice of two digital controllers and two digital indicators (see page 186-187)
- Optional test platens and accessories available on pages 191-192
- Large frame opening to allow easier loading of test specimens
- Mounting stand is **INCLUDED**

| Specification | Value |
|--------------------|---------------------------|
| Vertical Opening | 18.375" (467mm) |
| Horizontal Opening | 13.312" (338mm) |
| Piston Stroke | 2.5" (63.5mm) |
| Lower Platen | 12.5" x 18" (318 x 475mm) |
| Upper Platen, Dia. | 6.5" (165mm) |
| Oil Reservoir Cap. | 2 gal (7.6 liter) |
| Overall Width | 39.875" (1013mm) |
| Overall Depth | 20" (508mm) |
| Overall Height | 61.250" (1556mm) |

See Page 188-189 for models and ordering information.
HCM-4000 Series Compression Machines
 CE Ship wt. 1700 lbs. (771kg)



HCM-5000iH

HCM-5000 Series Compression Machines

ASTM C39, E4, AASHTO T22

- Suitable for cylinders, cubes, beams and cores of high-strength concrete mixes
- 5000 to 500,000 lbf (22.2 to 2224kN) testing range with accuracy of $\pm 0.5\%$ of indicated load
- Suitable for concrete strength up to 14,000 psi for 6" diameter cylinders
- Standard configuration includes platens to test 6" x 12" (150mm X 300mm) cylinders.
- Choice of two digital controllers and two digital indicators (see page 186-187)
- Optional test platens and accessories available on pages 191-192
- Large frame opening to allow easier loading of test specimens
- Mounting stand is **INCLUDED**

| Specification | Value |
|--------------------|---------------------------|
| Vertical Opening | 18.375" (467mm) |
| Horizontal Opening | 14" (356mm) |
| Piston Stroke | 2.5" (63.5mm) |
| Lower Platen | 12.5" x 18" (318 x 475mm) |
| Upper Platen, Dia. | 6.5" (165mm) |
| Oil Reservoir Cap. | 2 gal (7.6 liter) |
| Overall Width | 30" (762mm) |
| Overall Depth | 23.750" (603mm) |
| Overall Height | 60.625" (1540mm) |

See Page 188-189 for models and ordering information.
HCM-5000 Series Compression Machines
 CE Ship wt. 2500 lbs. (1134kg)

NOTES

Frame opening dimensions are measured without test platens installed in machine. Overall machine dimensions are measured with the stand, including machines where it is optional.



HCM-5080



HCM-5070

HCM-5080 and HCM-5070 Automatic Controllers

ASTM C39, ASTM C78, ASTM C293, ASTM C469, ASTM C496, ASTM C1019, ASTM C109/C109M, BS EN 12390-32

Humboldt's HCM-5080 and HCM-5070 automatic controllers are designed to make fast work of testing cylinders, cubes and beams with all of Humboldt's compression frames.

These controllers provide an easy-to-use automated testing work flow—just choose the test standard you wish to run from the menu and the controller will quickly guide you through the setup. Choose the "Fast Testing" option and your compression frame will run tests as fast as you can load your cylinders, cubes or blocks while sequentially numbering each test automatically. Just click on the start button.

The HCM-5080 and HCM-5070 controllers feature a robust, reliable and cool-running 1hp, multi-piston pump, which works together with the controller for full operational control.

These controller's high-resolution, 7-inch, color, touch-screen provides accurate, precision frame operation, setup and calibration. Test setup is simple, just choose the ASTM standard you wish to use and the controller will quickly walk you through the setup procedure. Calibration is also easy with these controllers, allowing you to use from 1 to 10 points to calibrate the machine in any increment you choose. It also provides an accurate motor-control knob, which let's you dial in precise loads for calibration.

Humboldt's controllers provide two channel inputs for load, which allows for the control of two separate compression frames when using the HCM-HP4014 selector valve accessory. Both controllers also provide two additional channel inputs for displacement, which provides

an easy solution for determining Poisson's ration and Young's modulus testing.

Humboldt's automatic controllers provide data acquisition capabilities of up to 1000 tests with 3000 points per test. This information can be exported via the front USB port and a flash drive.

Features:

- Provide two channel inputs for load, which allows for the control of two separate compression frames
- Provides two additional channel inputs for displacement, which allows performing extensometer and compressometer testing
- 7", high-resolution color touch-screen display with live readout, graphical and tabular display
- Easy test setup, just choose the standard you wish to test for and the controller will walk you through the complete setup
- Rapid approach, initial load and testing load are automated during test cycles
- Automatic control of test parameters
- Provides data acquisition of one reading per second
- Integral storage within the controller of up to 1000 tests and 3000 points per test
- Simple, Fast and accurate machine calibration with accurate, motor-control knob
- Displays in Imperial or metric numbers
- Pre-programmed to run the following tests: ASTM C39, ASTM C78, ASTM C293, ASTM C469, ASTM C496, ASTM C1019, ASTM C109/C109M, BS EN 12390-3

Humboldt Controller Specifications

| | |
|-----------------------------|---|
| HCM-5080 | 120V 60Hz |
| HCM-5080.4F | 220V 50/60HZ |
| HCM-5070 | 120V 60Hz |
| HCM-5070.4F | 220V 50/60HZ |
| HCM-5090.3F | 120/220V 50/60HZ |
| Display | 7" (178mm) VGA (480 x 800) Resistive-touch screen |
| Processor | Dual 32-bit ARM |
| RAM | 4GB |
| Analog to digital converter | 24 bit |
| Data acquisition | 4 Channels |
| Data Speed | 1000Hz (1kHz) |
| Logging speed | 1 reading per second |
| Test storage | 1000 |
| Points per test | 3000 |

Humboldt's HCM-5070 automatic controller is a console version of the HCM-5080 automatic controller and both share the same features. Both Humboldt Controllers are: 120/220V 50/60z. However, the pump is either 120V 60Hz or 220V 50/60Hz.

Humboldt Automatic Controller HCM-5080
Humboldt Automatic Controller HCM-5080.4F
 Ship wt. 180lbs. (82kg)

Humboldt Auto Console Controller HCM-5070
Humboldt Auto Console Controller HCM-5070.4F
 Ship wt. 200lbs. (91kg)

Accessories for HCM-5080 & HCM-5070

| | |
|------------|---|
| HCM-4177 | Pressure Transducer, 10,000 psi with Cable and Plug |
| HCM-4177.1 | Pressure Transducer, 10,000 psi |
| HCM-4177.4 | Cable for Pressure Transducer 10,000 psi with Plug |
| HCM-005050 | ISO VG 46 Hydraulic Oil, 1gal. (2gal. required) |
| HCM-HP4014 | Frame Selector Valve |



HCM-5090



HCM-720

Upgrade your existing compression frame

Looking to upgrade your existing compression machine? Now you can easily upgrade it with one of Humboldt's automatic compression machine controllers — the HCM-5080 or the HCM-5070. Both controllers come with our robust, reliable and cool-running 1hp pump, which works together with the controller for full operational control of your compression machine. Both are pre-programmed to run the following tests: ASTM C39, ASTM C78, ASTM C293, ASTM C469, ASTM C496, ASTM C1019, ASTM C109/C109M, BS EN 12390-3

The HCM-5080 upgrade kit comes with the necessary brackets and mounting hardware and both controllers are available with new compatible transducers, making these upgrade kits a quick and easy upgrade.

Don't want an automated controller? You can also upgrade your machine with the HCM-5090 digital indicator and use your existing pump or add one of our manual pumps as well. The HCM-5090 is also pre-programmed to run all the tests listed above.

Upgrade/Retrofit Accessories for HCM-5090

| | |
|------------|---|
| HCM-4177 | Pressure Transducer, 10,000 psi with Cable and Plug |
| HCM-4177.1 | Pressure Transducer, 10,000 psi |
| HCM-4177.4 | Cable for Pressure Transducer with Plug |

HCM-5090 Digital Indicator

ASTM C39, ASTM C78, ASTM C293, ASTM C469, ASTM C496, ASTM C1019, ASTM C109/C109M, BS EN 12390-32

Humboldt's HCM-5090 digital indicator provides the same platform and many of the same features as the HCM-5080 and HCM-5070 except that it does not act as a controller, but works with a manually-operated pump. The HCM-5090 digital indicator features:

- Provide two channel inputs for load, which allows for the control of two separate compression frames
- Provides two additional channel inputs for displacement, which allows performing extensometer and compressometer testing
- 7", high-resolution color touch-screen display with live readout, graphical and tabular display
- Easy test setup, just choose the standard you wish to test for and the controller will walk you through the complete setup
- Provides data acquisition of one reading per second
- Integral storage within the controller of up to 1000 tests and 3000 points per test
- Simple, Fast and accurate machine calibration
- Displays in Imperial or metric numbers
- Pre-programmed to run the following tests: ASTM C39, ASTM C78, ASTM C293, ASTM C469, ASTM C496, ASTM C1019, ASTM C109/C109M, BS EN 12390-3

The HCM-5090 is also available as a retrofit package.

Humboldt Digital Indicator

HCM-5090.3F



Ship wt. 13 lbs. (5.9kg)

HCM-720 Digital Indicator

ASTM C39, E4, AASHTO T22

The i7 is an easy-to-use digital load indicator that simultaneously displays both live load and rate of load values during a test. It eliminates the need to toggle keys between functions, and, automatically displays peak load and average rate of load at the end of each test.

All test information is clearly displayed on the indicator's 5.3" (135 mm) wide 240 x 64 pixel backlit V.G.A., liquid-crystal display with adjustable contrast settings. Test data is displayed in user selectable engineering units of lbs, kN, kg and N with rate of load displayed in force units per second.

The indicator will store up to 600 tests in memory, and transfer them directly into a word document via the optional USB Able Cable, or print them on an optional serial printer. Stored test data includes; test date and time, sample ID number, peak load and average rate of load. The average rate of load calculation is based on the average load rate applied to the sample during the second half of the test.

The i7 is also available as a retrofit package.

HCM-720 Digital Indicator

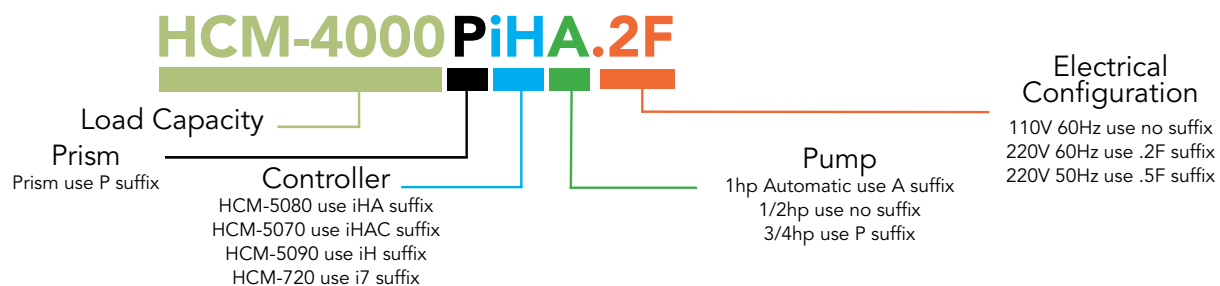
HCM-720



Ship wt. 13 lbs. (5.9kg)



Concrete Compression Machine Ordering Matrix



Concrete Compression Frame (ONLY)

| Compression Machine | Order Number |
|---|--------------|
| Compression Machine, 30,000 (133.5kN) | HCM-0030 |
| Compression Machine, 100,000 (445kN) | HCM-1000 |
| Compression Machine, 250,000 (1,112kN) | HCM-2500 |
| Compression Machine, 300,000 (1,334kN) | HCM-3000 |
| Compression Machine, 400,000 (1,780kN) | HCM-4000 |
| Compression Machine, 500,000 (2,224kN) | HCM-5000 |
| Compression Machine Prism Series, 500,000 (2,224kN) | HCM-5000P |

Compression Machine Capacities in PSI

| Load Capacity | Model | Cylinder | | | Cube | | | Brick | Beam | | Block | |
|---------------|----------|----------|---------|----------|--------|-------|------|--------------|---------------|---------------|--------|-------|
| | | 3" x 6" | 4" x 8" | 6" x 12" | 2" | 6" | 8" | 2" x 4" x 8" | 6" x 6" x 20" | 4" x 4" x 14" | Single | Prism |
| 30000 | HCM-0030 | 3395 | 1910 | 849 | 50000 | 5556 | 3125 | 750 | 2222 | 3333 | NA | NA |
| 100000 | HCM-1000 | 11318 | 6366 | 2829 | 20000 | 2222 | 1250 | NA | 7407 | 11111 | NA | NA |
| 250000 | HCM-2500 | 28294 | 15915 | 7074 | 60000 | 6667 | 3750 | 6250 | 18519 | 27778 | NA | NA |
| 300000 | HCM-3000 | 33953 | 19099 | 8488 | 80000 | 8889 | 5000 | 7500 | 22222 | 33333 | NA | NA |
| 400000 | HCM-4000 | 45271 | 25465 | 11318 | 100000 | 11111 | 6250 | 10000 | 29630 | 44444 | NA | NA |
| 500000 | HCM-5000 | 56588 | 31831 | 14147 | 6000 | 667 | 375 | 12500 | 37037 | 55556 | 3125 | 3125 |

Concrete Compression Machine Ordering Matrix

HCM-0030 Series: 30,000 lbs. (133.5 kN)

| Controller | Pump Size | Electrical | Order Number |
|-------------|--------------|------------|---------------|
| HCM-5090.3F | 1/2hp Manual | 120V 60Hz | HCM-0030iH |
| HCM-5090.3F | 1/2hp Manual | 230V 60Hz | HCM-0030iH.2F |
| HCM-5090.3F | 1/2hp Manual | 230V 50Hz | HCM-0030iH.5F |
| HCM-720 | 1/2hp Manual | 120V 60Hz | HCM-0030i7 |
| HCM-720 | 1/2hp Manual | 230V 60Hz | HCM-0030i7.2F |
| HCM-720 | 1/2hp Manual | 230V 50Hz | HCM-0030i7.5F |

HCM-1000 Series: 100,000 lbs. (445 kN)

| Controller | Pump Size | Electrical | Order Number |
|-------------|---------------|--------------|-----------------|
| HCM-5080 | 1hp Automatic | 120V 60Hz | HCM-1000iHA |
| HCM-5080.4F | | 230V 50-60Hz | HCM-1000iHA.4F |
| HCM-5070 | | 120V 60Hz | HCM-1000iHAC |
| HCM-5070.4F | | 230V 50-60Hz | HCM-1000iHAC.4F |
| HCM-5090.3F | 1/2hp Manual | 120V 60Hz | HCM-1000iH |
| HCM-5090.3F | 1/2hp Manual | 230V 60Hz | HCM-1000iH.2F |
| HCM-5090.3F | 1/2hp Manual | 230V 50Hz | HCM-1000iH.5F |
| HCM-720 | 1/2hp Manual | 120V 60Hz | HCM-1000i7 |
| HCM-720 | 1/2hp Manual | 230V 60Hz | HCM-1000i7.2F |
| HCM-720 | 1/2hp Manual | 230V 50Hz | HCM-1000i7.5F |

HCM-3000 Series: 300,000 lbs. (1,334 kN)

| Controller | Pump Size | Electrical | Order Number |
|-------------|---------------|--------------|-----------------|
| HCM-5080 | 1hp Automatic | 120V 60Hz | HCM-3000iHA |
| HCM-5080.4F | | 230V 50-60Hz | HCM-3000iHA.4F |
| HCM-5070 | | 120V 60Hz | HCM-3000iHAC |
| HCM-5070.4F | | 230V 50-60Hz | HCM-3000iHAC.4F |
| HCM-5090.3F | 1/2hp Manual | 120V 60Hz | HCM-3000iH |
| HCM-5090.3F | 3/4hp Manual | | HCM-3000iHP |
| HCM-5090.3F | 1/2hp Manual | 230V 60Hz | HCM-3000iH.2F |
| HCM-5090.3F | 3/4hp Manual | | HCM-3000iHP.2F |
| HCM-5090.3F | 1/2hp Manual | 230V 50Hz | HCM-3000iH.5F |
| HCM-5090.3F | 3/4hp Manual | | HCM-3000iHP.5F |
| HCM-720 | 1/2hp Manual | 120V 60Hz | HCM-3000i7 |
| HCM-720 | 3/4hp Manual | | HCM-3000i7P |
| HCM-720 | 1/2hp Manual | 230V 60Hz | HCM-3000i7.2F |
| HCM-720 | 3/4hp Manual | | HCM-3000i7P.2F |
| HCM-720 | 1/2hp Manual | 230V 50Hz | HCM-3000i7.5F |
| HCM-720 | 3/4hp Manual | | HCM-3000i7P.5F |

HCM-5000 Series: 500,000 lbs. (2,224 kN)

| Controller | Pump Size | Electrical | Order Number |
|-------------|---------------|--------------|-----------------|
| HCM-5080 | 1hp Automatic | 120V 60Hz | HCM-5000iHA |
| HCM-5080.4F | | 230V 50-60Hz | HCM-5000iHA.4F |
| HCM-5070 | | 120V 60Hz | HCM-5000iHAC |
| HCM-5070.4F | | 230V 50-60Hz | HCM-5000iHAC.4F |
| HCM-5090.3F | 3/4hp Manual | 120V 60Hz | HCM-5000iHP |
| HCM-5090.3F | 3/4hp Manual | 230V 60Hz | HCM-5000iHP.2F |
| HCM-5090.3F | 3/4hp Manual | 230V 50Hz | HCM-5000iHP.5F |
| HCM-720 | 3/4hp Manual | 120V 60Hz | HCM-5000i7P |
| HCM-720 | 3/4hp Manual | 230V 60Hz | HCM-5000i7P.2F |
| HCM-720 | 3/4hp Manual | 230V 50Hz | HCM-5000i7P.5F |

HCM-2500 Series: 250,000 lbs. (1,112 kN)

| Controller | Pump Size | Electrical | Order Number |
|-------------|---------------|--------------|-----------------|
| HCM-5080 | 1hp Automatic | 120V 60Hz | HCM-2500iHA |
| HCM-5080.4F | | 230V 50-60Hz | HCM-2500iHA.4F |
| HCM-5070 | | 120V 60Hz | HCM-2500iHAC |
| HCM-5070.4F | | 230V 50-60Hz | HCM-2500iHAC.4F |
| HCM-5090.3F | 1/2hp Manual | 120V 60Hz | HCM-2500iH |
| HCM-5090.3F | 3/4hp Manual | | HCM-2500iHP |
| HCM-5090.3F | 1/2hp Manual | 230V 60Hz | HCM-2500iH.2F |
| HCM-5090.3F | 3/4hp Manual | | HCM-2500iHP.2F |
| HCM-5090.3F | 1/2hp Manual | 230V 50Hz | HCM-2500iH.5F |
| HCM-5090.3F | 3/4hp Manual | | HCM-2500iHP.5F |
| HCM-720 | 1/2hp Manual | 120V 60Hz | HCM-2500i7 |
| HCM-720 | 3/4hp Manual | | HCM-2500i7P |
| HCM-720 | 1/2hp Manual | 230V 60Hz | HCM-2500i7.2F |
| HCM-720 | 3/4hp Manual | | HCM-2500i7P.2F |
| HCM-720 | 1/2hp Manual | 230V 50Hz | HCM-2500i7.5F |
| HCM-720 | 3/4hp Manual | | HCM-2500i7P.5F |

HCM-4000 Series: 400,000 lbs. (1,780 kN)

| Controller | Pump Size | Electrical | Order Number |
|-------------|---------------|--------------|-----------------|
| HCM-5080 | 1hp Automatic | 120V 60Hz | HCM-4000iHA |
| HCM-5080.4F | | 230V 50-60Hz | HCM-4000iHA.4F |
| HCM-5070 | | 120V 60Hz | HCM-4000iHAC |
| HCM-5070.4F | | 230V 50-60Hz | HCM-4000iHAC.4F |
| HCM-5090.3F | 3/4hp Manual | 120V 60Hz | HCM-4000iHP |
| HCM-5090.3F | 3/4hp Manual | 230V 60Hz | HCM-4000iHP.2F |
| HCM-5090.3F | 3/4hp Manual | 230V 50Hz | HCM-4000iHP.5F |
| HCM-720 | 3/4hp Manual | 120V 60Hz | HCM-4000i7P |
| HCM-720 | 3/4hp Manual | 230V 60Hz | HCM-4000i7P.2F |
| HCM-720 | 3/4hp Manual | 230V 50Hz | HCM-4000i7P.5F |

HCM-5000P Masonry Prism Series: 500,000 lbs. (2,224 kN)

| Controller | Pump Size | Electrical | Order Number |
|-------------|---------------|--------------|------------------|
| HCM-5080 | 1hp Automatic | 120V 60Hz | HCM-5000PiHA |
| HCM-5080.4F | | 230V 50-60Hz | HCM-5000PiHA.4F |
| HCM-5070 | | 120V 60Hz | HCM-5000PiHAC |
| HCM-5070.4F | | 230V 50-60Hz | HCM-5000PiHAC.4F |
| HCM-5090.3F | 3/4hp Manual | 120V 60Hz | HCM-5000PiHP |
| HCM-5090.3F | 3/4hp Manual | 230V 60Hz | HCM-5000PiHP.2F |
| HCM-5090.3F | 3/4hp Manual | 230V 50Hz | HCM-5000PiHP.5F |
| HCM-720 | 3/4hp Manual | 120V 60Hz | HCM-5000Pi7P |
| HCM-720 | 3/4hp Manual | 230V 60Hz | HCM-5000Pi7P.2F |
| HCM-720 | 3/4hp Manual | 230V 50Hz | HCM-5000Pi7P.5F |

Compression Machine Travel Limit Switch

An electrical switch that prevents the hydraulic piston from going beyond its maximum travel point.

| | |
|-------------------------------|------------|
| Limit Switch, HCM-2500 Series | HCM-TM0101 |
| Limit Switch, HCM-3000 Series | HCM-TM0106 |
| Limit Switch, HCM-4000 Series | HCM-TM0100 |
| Limit Switch, HCM-5000 Series | HCM-TM0102 |
| Ship wt. 3 lbs. (1.4kg) | |



Masonry Series Compression Machines

ASTM C39, C140, C1314, E4, AASHTO T22

Masonry series machines are available in a single capacity of 500,000 (2,224kN) with a testing range from 1 to 100% of machine capacity, with an accuracy of $\pm 0.5\%$ of indicated load. These compression testing machines feature two-block masonry prism configuration of full-sized blocks up to 12" (304 mm) wide.

- Tests blocks, masonry prisms, pavers and retaining wall units
- 500,000 (2,224kN) testing range with accuracy of $\pm 0.5\%$ of indicated load
- Machines up to 800,000 (3,559kN) are also available, please inquire.
- Standard configuration includes platens for testing 6" x 12" (150 x 300mm) cylinders
- Draw rod is included for safer, easier and faster changing of test platens and spacers

The heavy-duty load frames use the same proven design and manufacturing process found in all of our machines, with a wide horizontal opening and

large compression platen table for easier loading of heavy specimens. The machine's included mounting stand also places the lower platen at a convenient working height.

These machines' unique lower, dual-platen system features a wear platen through-hardened to 60 HRC or greater and is designed for fast and easy maintenance without the need for expensive rental equipment to remove the platen, unlike the cumbersome single-plate systems used in competitive units. Changing test platens and spacers is quick, easy, and safe with our draw rod, used to adjust the load frame's inside vertical working height, and optional carrier bracket system, which features a heavy-duty arm mounted on the rear left corner of the load frame that pivots on two hinged joints. When the block platen is not being used, it can be conveniently stored on the bracket's arm. **Includes mounting stand.**

Optional test platens and accessories add to the versatility of the prism machines, see pages 191-192. See Page 189 for models and ordering information.

HCM-5000P Series Prism Machines



Ship wt. 1,700 lbs. (771kg)

Draw Rod Assembly

Draw rods are included with all masonry model machines. The draw rod system is used to adjust the inside vertical working height of the load frame, to allow for testing samples of different heights through the use of spacers and test platens. The system is made up of a steel hand wheel with internal ball bearings and a threaded rod that is easily raised or lowered inside the load frame for height adjustment. Spacers slide onto the rod, the rod is threaded into the test platen and the assembly is then tightened against the cross-head.

Draw Rod Assembly

HCM-0802

Ship wt. 38 lbs. (17.3kg)

Platen Carrier Brackets

The Carrier Bracket is used for safer removal and mounting of the block platen assembly inside the load frame, and should be considered a must have option when testing masonry units.

The brackets heavy-duty arm is mounted on the rear left hand corner of the load frame and pivots on two hinged joints, allowing the complete assembly to rotate smoothly into and out of the load frame. When not in use, platen and arm are conveniently stored on rear of machine.

HCM-4000 Carrier Bracket

HCM-0190SP

Ship wt. 120 lbs. (54.4kg)

HCM-5000 Carrier Bracket

HCM-0190P

Ship wt. 155 lbs. (70.3kg)





HCM-0101



HCM-0113



HCM-0112A



HCM-0107P



HCM-0119B

Cylinder Platens

ASTM C39, AASHTO T-22

Used when testing 6" (152 mm) or 4" (101 mm) diameter concrete cylinders in compression. Platen is manufactured from steel with all components plated for corrosion resistance.

Its bearing platen is 6.5" (165 mm) in diameter, through-hardened to HRC 55 or greater, plane to .0005" (.02 mm), has scribed concentric circles, and is hard nickel plated for wear resistance.

Note: An optional spacer is required for testing 4" (101 mm) diameter cylinders.

| Machines | HCM-2500 | HCM-3000 |
|----------|----------|----------|
| Platen | HCM-0101 | HCM-0104 |
| Machines | HCM-4000 | HCM-5000 |
| Platen | HCM-0101 | HCM-0101 |

Cylinder Platens

see chart above

Ship wt. 1078 lbs. (488.7kg)

6" (152mm) Cube Platen Test Sets

ASTM C109, C1604, C39, AASHTO T-22, T-106

Used for testing 6" (152 mm) concrete cubes and cylinders in compression.

Cube test set consists of a 6.5" (165mm) square, spherically-seated upper platen assembly.

The platen bearing blocks are through-hardened to HRC 55 or greater, plane to .0005" (.012 mm) in any 6" (152 mm) area, has concentric circles for easier centering of cylinders and is hard nickel-plated for wear and corrosion resistance.

Kit includes; spherical seated platen assembly and spacer. Note: A 6.5" (152 mm) square lower platen is supplied with MA-0113 cube set for use in HCM-2500 series machines

| Machines | HCM-2500 | HCM-3000 |
|---------------|-----------|-----------|
| Set | HCM-0113 | HCM-0111 |
| Platen, Upper | HCM-0113X | HCM-0111X |
| Machines | HCM-4000 | HCM-5000 |
| Set | HCM-0116 | HCM-0116 |
| Platen, Upper | HCM-0116X | HCM-0116X |

6" (152mm) Cube Platen Set

see chart above

2500 Platen

Ship wt. 38 lbs. (17.2kg)

3000 Platen

Ship wt. 116 lbs. (52.6kg)

4000 & 5000 Platen

Ship wt. 100 lbs. (45.3kg)

2" (50mm) Cube Platen Test Sets

ASTM C109, C1604, C39, AASHTO T-22, T-106

Used for testing 2" (50 mm) cubes and 3" (76 mm) diameter cylinders and cores in compression. Cube test set consists of a 3.125" (80mm) diameter, spherically-seated upper platen assembly and a lower pedestal with a 2.83" (72mm) diameter bearing block surface used for positioning the cube sample at the correct height for testing.

The bearing blocks of the upper platen are hardened to 60 HRC and plane to .0005" (.01 mm) and hard plated for corrosion resistance.

The upper bearing block is closely held in its spherical seat, but is free to tilt in any direction and seat securely under load. The bearing blocks are removable and replaceable.

The platen is easily installed in the upper cross-head of the load frame and is securely held in place by either the holding stem, hex bolt or draw rod system.

Spacers are required for testing 3" diameter cylinders or cores. Cube pedestal is not used when testing cylinders or cores.

| Machines | HCM-0030 | HCM-2500 |
|---------------|------------|-----------|
| Set | HCM-0112SA | HCM-0112A |
| Platen, Upper | HCM-0023L | HCM-0023L |
| Platen, Lower | HCM-0022SA | HCM-0022A |
| Machines | HCM-3000 | HCM-4000 |
| Set | HCM-0114A | HCM-0115A |
| Platen, Upper | HCM-0023N | HCM-0023 |
| Platen, Lower | HCM-0022A | HCM-0022A |
| Machines | HCM-5000 | |
| Set | HCM-0115A | |
| Platen, Upper | HCM-0023 | |
| Platen, Lower | HCM-0022A | |

2" (50mm) Cube Platen Set

see chart above

UPS

Ship wt. 14lbs. (6.3kg)

Masonry Platens

ASTM C140, C1314 for HCM-0107P Only!

Masonry platens feature large diameter spherical disk and seat assemblies, and platen bearing surface plane to .001" (.025 mm) in any 6" (152 mm) direction, through hardened to HRC 60 and plated for wear and corrosion resistance. The bearing block is held securely in its seat assembly by a series of heavy duty springs and safety links which allow it to rotate freely and seat under load.

The HCM-0106 and HCM-0106.3 are used to test masonry units up to 8" (203 mm) wide. Both items are supplied with an 8" wide x 16" long bottom bearing plate through-hardened to HRC 60 and plated for corrosion resistance.

The HCM-0107P can be used to test masonry units up to 12" (305 mm) wide.

| Machines | HCM-2500 | HCM-3000 |
|----------|-----------|------------|
| Platen | HCM-0106 | HCM-0106.3 |
| Machines | HCM-4000 | HCM-5000 |
| Platen | HCM-0107P | HCM-0107P |

Masonry Platen

see chart above

UPS

Ship wt. 135 lbs. (61.2kg)

Flexural Beam Attachment

ASTM C78, C293, AASHTO T-97, T-177

Used to determine the modulus of rupture of center or third-point beams with a depth of 6" (150 mm). The upper heads load bearing blocks are easily changed for either a center or third-point testing configuration. Bottom support blocks are set in the lower support channel with a fixed 18" (457 mm) span length.

Bearing blocks are spring-loaded to hold them in contact with the pivot balls and rod, as required by ASTM specifications. These beam attachments can be used with 4" x 4" x 16" and 6" x 6" x 18" beams.

| Machines | HCM-2500 | HCM-3000 |
|------------|-----------|-----------|
| Attachment | HCM-0119B | HCM-0117B |
| Machines | HCM-4000 | HCM-5000 |
| Attachment | HCM-0119B | HCM-0119B |
| Machines | HCM-0030 | |
| Attachment | HCM-0119B | |

Flexural Beam Attachment

see chart above

UPS

Ship wt. 134 lbs. (60.7kg)



HCM-0120



HCM-00127



HCM-0135



HCM-HP4014

Cylinder Splitting Set

ASTM C496, AASHTO T-198

The cylinder splitting head has a bearing contact area of 12" (304 mm) long by 2" (50 mm) wide, its surface is machined plane to .001" (.025 mm) and has a scribed center line of the face of the bar for easier centering of test samples.

Note: A lower bearing plate 12.5" (317 mm) long by 7" (178 mm) wide is supplied with HCM-0120 Splitting Test Set for use in HCM-2500 series machines.

| Machines | HCM-2500 | HCM-3000 |
|---------------|----------|----------|
| Splitting Set | HCM-0120 | HCM-0124 |
| Machines | HCM-4000 | HCM-5000 |
| Splitting Set | HCM-0123 | HCM-0123 |

Cylinder Splitting Set

see chart above

| | |
|--------------------|-----------------------------|
| HCM-0120 | Ship wt. 173 lbs. (69kg) |
| HCM-0123, HCM-0124 | Ship wt. 240 lbs. (108.8kg) |

Spacers for Platen Adjustment

Spacers are used with test platens to adjust the vertical working clearance height inside a machines load frame, for testing samples of various types and sizes to prevent over-extension of the load frames piston.

They are manufactured from steel and machined plane on both ends to maintain a parallel alignment between spacers and test platens. Spacers are painted for corrosion resistance. Spacers are available in four model types; three model types for mounting against the machines upper cross-head by the holding stem, socket head bolt or draw rod methods, and one model type that sits on the machines lower crosshead used with a bearing platen.

Spacers

see chart below



Brick Platen Assembly

ASTM C39, C67, AASHTO T-67

The brick platen assembly is designed for testing brick in compression. The set consists of an upper spherically-seated platen and a lower platen. The upper platen is 6.5" (165mm) wide x 8" (203mm) long x 1.875" (48mm) thick, through-hardened to HRC 60 or better, plane to .0005" (.02mm) and hard-plated for wear and corrosion resistance. The platen is closely held in its spherical seat, but in such a manner as to allow the contact platen to tilt freely and seat securely under load.

The bottom bearing block is used beneath the test specimen to minimize wear on the lower machine platen. It is 8" (203mm) long x 6.5" (165mm) wide x 1.875" (48mm) thick, through-hardened to HRC 60 or greater, plane to .0005" (.02mm) and is hard-plated for wear and corrosion resistance.

Optional spacers are required to close the vertical opening of the machine when testing bricks.

Brick Platen Assembly

HCM-00127



Ship wt. 100 lbs. (45kg)

Upper Brick Platen Only

HCM-0015



Ship wt. 100 lbs. (45kg)

Cylinder Loading Shelf

Auxiliary Cylinder Loading Shelf is available for use with HCM-2500 Series machines.

Cylinder Loading Shelf

HCM-0135



Ship wt. 40lbs. (18.4kg)

Feeler Gauge

Feeler gauges are used for precise alignment of the base and platen.

Feeler Gauge, .001 x 12"

HCM-CA0481

Feeler Gauge Set

HCM-CA0485



Ship wt. 6lbs. (2.7kg)

Selector Valve

The HCM-HP4014 selector valve accessory provides switching capabilities between two separate compression frames when using a single pump for both frames. This valve can be used with either the HCM-5080 or HCM-5070 Humboldt automatic controllers or our HCM-5090.3F digital indicator.

Selector Valve

HCM-HP4014



Ship wt. 7lbs. (3.2kg)

AbleCable (i7 Digital Indicator)

Serial/USB cable, which allows you to transfer load vs. time graph with test date, I.D. number and test data directly into a spread sheet program. This allows the user to transfer data from an individual test to a spread sheet to create a X-Y load vs. time graph with the graph wizard. Requires user to set initial column headings. **For use with the i7 digital indicator only.**

AbleCable

HCM-0718



Ship wt. 0.4lbs. (0.181g)

AbleCable Extension, 25' (7.6m)

HCM-0707.25



Ship wt. 5lbs. (2.2kg)

Compression Machine Travel Limit Switch

An electrical switch that prevents the hydraulic piston from going beyond its maximum travel point.

| | |
|-------------------------------|------------|
| Limit Switch, HCM-2500 Series | HCM-TM0101 |
| Limit Switch, HCM-3000 Series | HCM-TM0106 |
| Limit Switch, HCM-4000 Series | HCM-TM0100 |
| Limit Switch, HCM-5000 Series | HCM-TM0102 |



Ship wt. 3 lbs. (1.4kg)

Platens and Spacers for Concrete Compression Frames

| Cylinders | Item | HCM-2500 | HCM-3000 | HCM-4000 | HCM-5000 | Ship Wgt. |
|-----------|--------|-----------|-----------|----------|----------|-----------------|
| 4 x 8 in. | Platen | Supplied | Supplied | Supplied | Supplied | 39 lb/17.7kg |
| | Spacer | HCM-0639 | HCM-0662 | HCM-0653 | HCM-0653 | 34.4 lb /15.6kg |
| 3 x 6 in. | Platen | HCM-0023L | HCM-0023N | HCM-0023 | HCM-0023 | 45 lb/20.1kg |
| | Spacer | HCM-0639 | HCM-0661 | HCM-0654 | HCM-0654 | 35 lb/15.8kg |
| 2 x 4 in. | Platen | HCM-0023L | HCM-0023N | NR | NR | 13 lb/5.8kg |
| | Spacer | HCM-0615 | HCM-0666 | NR | NR | 17 lb/3.1kg |



H-2912L



H-2911



H-2918D

| Compressometer / Extensometers | Dial Gauge | LSCT |
|-----------------------------------|---------------|---------|
| 6" x 12" (152 x 305mm) cylinders | H-2912 | H-2912L |
| 4" x 8" (102 x 203mm) cylinders | H-2917 | H-2917L |
| 3" x 6" (76 x 152mm) cylinders | H-2919 | H-2919L |

| Compressometers | Dial Gauge | Digital Indicator | LSCT |
|----------------------------------|---------------|----------------------|---------|
| 6" x 12" (152 x 305mm) cylinders | H-2911 | H-2911D | H-2911L |
| 4" x 8" (102 x 203mm) cylinders | H-2916 | H-2916D | H-2916L |
| 3" x 6" (76 x 152mm) cylinders | H-2918 | H-2918D | H-2918L |

Data Acquisition Upgrade for Existing Compression Machines and Compressometer-Extensometer Testing

Looking to upgrade your existing manually-operated compression machine or add compressometer/extensometer testing capabilities to it? Now you can easily upgrade your frame with Humboldt's HCM-5090 Digital Indicator. The HCM-5090's four, independent data acquisition channels provide you with enough options to control all your data needs with one digital indicator.

A typical setup would provide the logging of Load, Stress and Rate from one compression machine in Channel One. Channels Two and Three would provide inputs for measuring displacement—allowing you to perform extensometer and compressometer testing. Channel Four would provide another input for logging Load, Stress and Rate, perfect for an additional load frame set up for something like flexural testing or cubes. All this information can be simultaneously tracked by the HCM-5090.3F. For more information on the HCM-5090.3F, see page 187. **If you are interested in an automatic solution upgrade, you should look at the HCM-5080 and HCM-5070 automatic controllers on page 186.**

Digital Indicator, 120/220V 50/60Hz HCM-5090.3F
Ship wt. 6lbs. (2.7kg)

Strain Transducer

ASTM C469

Strain transducer: 0.4" (10mm)

Strain Transducer HM-2310.04
Ship wt. 1lbs. (453g)

Pressure Transducer

Pressure transducer: 10,000 psi with cable and plug for HCM-5090.3F

Pressure Transducer HCM-4177
Ship wt. 1lbs. (453g)



HCM-5090.3F



HM-2310.04



HCM-4177

Compressometer-Extensometers

ASTM C469

Compressometer-extensometers are used to determine Poisson's ratio and Young's modulus during a compression test. This device contains a third, center yoke with a hinge dividing it into two equal segments. The middle yoke is hinged to permit rotation of the two segments of the yoke in the horizontal plane. Indicator gives deformation readings. Second indicator is furnished for compressometer section. Unit measures changes in length and diameter. All H-2900 series compressometers may be ordered with dial gauges, digital indicators or strain transducers, see charts above. Digital indicators and LSCT models can be used with data acquisition systems through the use of our mini-loggers, see right.

Compressometer-Extensometers see chart above
Ship wt. 9.6 lbs. (4.3kg)

Compressometers

ASTM C469

The compressometer is used for evaluating the chord modulus of elasticity (Young's modulus) of concrete cylinders while undergoing compression testing. The compressometer includes two, cast-aluminum alloy yokes, mounting and central points, stainless steel control rods. Models are available with a dial gauge—with a range of 0.2" (5.08mm) and minimum graduations of .0001 (.0025mm), as well as with a digital indicator or a LSCT transducer. Digital indicators and LSCT models can be used with data acquisition systems through the use of our mini-loggers, see right.

Compressometers see chart above
Ship wt. 10 lbs. (4.5kg)



Concrete Rebound Hammers

Concrete rebound hammers are used to determine in-place strength of concrete. All these models accurately measure compressive strength, which directly determines the load-bearing capacity and durability of concrete structures. All models also include a grinding stone, carrying case and instruction booklet with conversion charts.

Humboldt Rebound Hammer

ASTM C805, D5873; BS 1881: Part 202;
ISO/DIS8045; ENV 206; IGG/T 23-2001

Humboldt's concrete rebound hammer provides a reliable, yet economical, alternative to the original Schmidt hammer. It is designed for testing concrete 4" (100mm) or more in thickness with a maximum particle size less than or equal to 1.25" (32mm), providing a quick and simple test for obtaining an immediate indication of concrete strength in various parts of a structure. The Humboldt rebound hammer covers a compressive strength range of 1,450 to 9,000 psi (10 to 62 MPa). To operate, the rebound hammer is pressed against the concrete structure and the rebound values are displayed on a mechanical sliding scale. These values can then be correlated to compressive strength by using the conversion table chart affixed to the hammer. It includes a grinding stone, a cloth carrying case, instruction booklet and conversion charts.

Humboldt Test Hammer, Type N

H-2987H



Ship wt. 4lbs. (1.8kg)

Schmidt Hammer, Type N

ASTM C805, D5873; BS 1881: Part 202;
ISO/DIS8045; ENV 206; IGG/T 23-2001

The original Schmidt® hammer, type N, is designed for non-destructive testing of concrete items 4" (100mm) or more in thickness, or concrete with a maximum particle size less than or equal to 1.25" (32mm). It is designed for testing concrete within a compressive strength range of 1,450 to 10,152 psi (10 to 70 N/mm²) and impact energy of the test is 1.6 ft-lbs (2.207 Nm). The (type N) Schmidt hammer is pressed against the concrete structure and the rebound values are displayed on a mechanical

sliding scale. These values can then be correlated to compressive strength by using the conversion table chart affixed to the hammer. The original Schmidt hammer is known for its durability and accuracy.

Schmidt Hammer, Type N

H-2975

Schmidt Hammer, Type N (N/mm²)

H-2975M



Ship wt. 4.7lbs. (2.1kg)

Schmidt Hammer, Type L

The H-2975L hammer is designed for testing thin-walled structural components with a thickness of less than 4" (100mm) or rock cores. This hammer features an impact of 0.74 Nm, which is 1/3 less energy than type N hammers and uses a N/mm² scale.

Schmidt Hammer, Type L (N/mm²)

H-2975LM



Ship wt. 4.8lbs. (2.2kg)

Original Schmidt OS8000

ASTM C805, D5873; BS 1881: Part 202;
ISO/DIS8045; ENV 206; IGG/T 23-2001

The Original Schmidt OS8000 is the Original concrete test hammer, now digitally redefined - and it is also the most advanced R-value hammer ever made, with unmatched performance, ease of use, and versatility, as well as reporting on the go thanks to its mobile app. This hammer provides both analog and digital functions. This allows you to take readings using the integral scale or use the digital functions, which offer several enhanced capabilities. It is designed for testing concrete within a compressive strength range of 1,450 to 10,152 psi (10 to 70 N/mm²) and impact energy of the test is 1.6 ft-lbs (2.207 Nm). The Schmidt OS8000 is pressed against the concrete structure and the rebound values are displayed on a mechanical sliding scale, as well as the digital readout on the top of the hammer.

The hammer's digital capabilities increase productivity by providing faster operation and great improvements of the time needed for taking readings. A free, mobile App is available, which functions via bluetooth technology on any compatible Apple® iOS device (please see App Store for

details) or any supported Android™ device (see Google Play Store for details). The App provides geolocation capabilities and access to a cloud-based webtool. This web-based reporting capability provides you and others at different locations to access report data. It provides extensive reporting abilities, including custom curves and ones to ASTM/EN standards. Reports and data are available in both .pdf or .csv file formats for use by computers. A bluetooth printer is also available for on-site printing of mobile App reports and the new Schmidt Live also provides audio output of results, if desired. The Schmidt Live runs on AAA batteries.

Schmidt OS8000, Type N with App

H-2994

Schmidt OS8000, Type N with Printer

H-2994P

Schmidt OS8000, Type L with App

H-2992

Schmidt OS8000, Type L with Printer

H-2992P

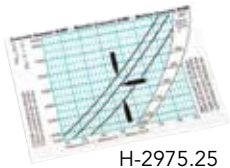


Ship wt. 4.7lbs. (2.1kg)

Silver Schmidt OS8200

ASTM C805, D5873; BS 1881: Part 202;
ISO/DIS8045; ENV 206; IGG/T 23-2001

Silver Schmidt OS8200 is as accurate, reliable, and versatile as ever—and now, connected, thanks to its optical measurement technology delivering Q-value measurements, paired with digital productivity features and user-friendly mobile apps. The Proceq SilverSchmidt OS8200 test hammer has been redesigned to provide unmatched accuracy, repeatability and easy, intuitive operation. The Schmidt OS8200 features quicker and more accurate testing while addressing the previous insufficiencies of the traditional hammers. With the Schmidt OS8200 impact direction no longer has an impact on values; values are not affected by internal friction of the hammer operation, and, loss of accuracy because of seal problems is not an issue. In use, the Silver Schmidt OS8200 eliminates cocking the hammer for each blow and recording the results, the OS8200 allows you to do all your test blows in rapid succession, while it records the results. These results can then be reviewed. Intuitive User Interface is language independent through the use of easy-to-understand icons.



H-2975.25
H-2975.25N



H-2975.27



H-2987H.7



H-2972



REPAIR

Humboldt provides repair and calibration services for concrete rebound hammers, Call: 1.800.544.7220.

The interface menu structure is similar to a mobile phone's. Practically every command can be activated either directly or via no more than 2 consecutive steps. All data is automatically saved and may be reviewed via the data list. The memory capacity is dependent of the length of tests in a series, but roughly 400 series with 10 readings each can be accomplished with the Silver Schmidt. A free, mobile App is available, which functions via blue-tooth technology on any compatible Apple® iOS device (please see App Store for details) or any supported Android™ device (see Google Play Store for details). The Silver Schmidt hammer includes these standard accessories: battery charger with USB cable, data carrier with software, carrying strap, grinding stone, chalk, documentation and carrying bag. Software provided for performing firmware upgrades and selecting presets only.

| | |
|-------------------------------------|----------|
| Schmidt OS8200, Type N with App | HC-2720 |
| Schmidt OS8200, Type N with Printer | HC-2720P |
| Schmidt OS8200, Type L with App | HC-2721 |
| Schmidt OS8200, Type L with Printer | HC-2721P |
| Ship wt. 4.7lbs. (2.1kg) | |

Grinding Stone for Rebound Hammers

Replacement grinding stone for rebound hammers.

| | |
|--------------------------|-----------|
| Grinding Stone | H-2975.27 |
| Ship wt. 0.9lbs. (0.4kg) | |

Calibration Anvil for Rebound Hammers

ASTM C805, D5873; BS 1881: Part 202; ISO/DIS8045; ENV 206; IGJT 23-2001

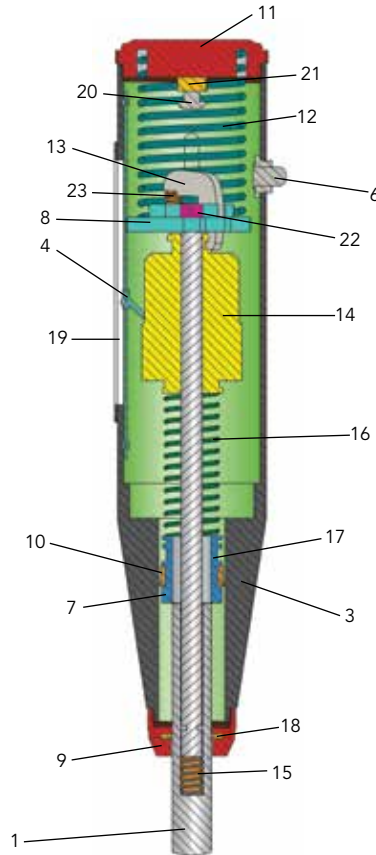
Calibration anvil ensures continued test accuracy. For use with all test hammers. Hammers should be periodically checked to determine correct performance.

| | |
|--------------------------|--------|
| Calibration Anvil | H-2972 |
| Ship wt. 58lbs. (26.3kg) | |

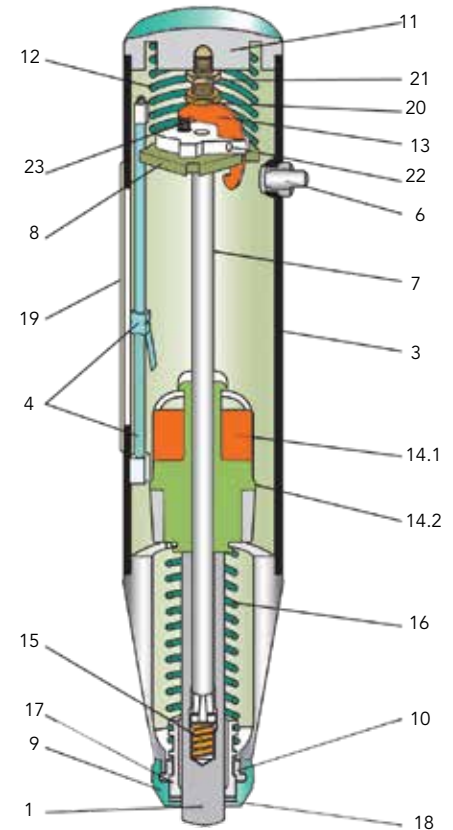
Conversion Chart Labels

Replacement conversion chart for rebound hammers.

| | |
|----------------------------------|------------|
| Conversion Chart Label (psi/MPa) | H-2987H.7 |
| Conversion Chart Label (psi) | H-2975.25 |
| Conversion Chart Label (N/mm2) | H-2975.25N |
| Ship wt. 0.5lbs. (0.22kg) | |



| H-2987H Replacement Parts | | |
|---------------------------|-----------------------|-----------|
| Key | Description | Part# |
| 1 | Impact Plunger | H-2987.1 |
| 3 | Housing, complete | H-2987.3 |
| 4 | Rider with Guide Rod | H-2987.4 |
| 6 | Push-button, complete | H-2987.6 |
| 7 | Hammer Guide Bar | H-2987.7 |
| 8 | Guide Disk | H-2987.8 |
| 9 | Cap | H-2987.9 |
| 10 | Two-part Ring | H-2987.10 |
| 11 | Rear Cover | H-2987.11 |
| 12 | Compression Spring | H-2987.12 |
| 13 | Pawl | H-2987.13 |
| 14 | Hammer Mass | H-2987.14 |
| 15 | Retaining Spring | H-2987.15 |
| 16 | Impact Spring | H-2987.16 |
| 17 | Guide Sleeve | H-2987.17 |
| 18 | Felt Washer | H-2987.18 |
| 19 | Acrylic Window | H-2987.19 |
| 20 | Trip Screw | H-2987.20 |
| 21 | Lock Nut | H-2987.21 |
| 22 | Pin | H-2987.22 |
| 23 | Pawl Spring | H-2987.23 |



| H-2975 Replacement Parts | | |
|--------------------------|-----------------------|-----------|
| Key | Description | Part# |
| 1 | Impact Plunger | H-2975.1 |
| 3 | Housing, complete | H-2975.3 |
| 4 | Rider with Guide Rod | H-2975.4 |
| 6 | Push-button, complete | H-2975.6 |
| 7 | Hammer Guide Bar | H-2975.7 |
| 8 | Guide Disk | H-2975.8 |
| 9 | Cap | H-2975.9 |
| 10 | Two-part Ring | H-2975.10 |
| 11 | Rear Cover | H-2975.11 |
| 12 | Compression Spring | H-2975.12 |
| 13 | Pawl | H-2975.13 |
| 14 | Hammer Mass | H-2975.14 |
| 15 | Retaining Spring | H-2975.15 |
| 16 | Impact Spring | H-2975.16 |
| 17 | Guide Sleeve | H-2975.17 |
| 18 | Felt Washer | H-2975.18 |
| 19 | Acrylic Window | H-2975.19 |
| 20 | Trip Screw | H-2975.20 |
| 21 | Lock Nut | H-2975.21 |
| 22 | Pin | H-2975.22 |
| 23 | Pawl Spring | H-2975.23 |



H-2978

Windsor HP Probe System

ASTM C803; BS 1881

The Windsor HP probe system is used to evaluate the compressive strength of in-place concrete. This non-destructive test can be used on fresh or mature concrete with equal effectiveness. The system features an electronic measuring device for accuracy and efficiency. Three individual tests can be automatically averaged and displayed on the LCD in compliance with ASTM procedures. The data, together with time and date of the test can be stored in the memory for uploading to a PC. Two probe and power load types are available: silver probes are used for high performance concrete with strengths up to 17,000 psi (110 MPa) and gold probes for test applications on concrete with less than 3,000 psi (19.4 MPa) strength. The system consists of the drive unit, electronic measuring device, templates, measuring caps, gauge plates and carrying case. **Probes are not included with this product and must be ordered separately.**

Windsor HP Probe System

H-2978

Ship wt. 30.6lbs. (13.8kg)



H-2978.01



H-2978.03

Windsor HP Probe Kits

Each certified probe kit includes 3 probes and 3 matched, nickel-plated power loads. Silver probe kit is for natural stone or coarse aggregate (density greater than 125 lbs/cu ft). Gold probe kit is for lightweight aggregate (less than 125 lbs./cu. ft. density) **Can not be shipped via air or ocean.**

Windsor Silver Probe Kit (3 probes) H-2978.01**Windsor Gold Probe Kit (3 probes)** H-2978.03

Ship wt. 0.4lbs. (0.1kg)

Windsor Silver Probe Kit (75 probes) H-2978.01C**Windsor Gold Probe Kit (75 probes)** H-2978.03C

Ship wt. 10lbs. (4.5kg)



HC-2978

Windsor HP Pin System

Measures the compressive strength of concrete, mortar and brick in-situ, quickly, accurately. A non-explosive instrument, the Windsor Pin™ system uses a spring-loaded device to drive a steel pin into the concrete or mortar. The depth of penetration of the needle correlates to the compressive strength of the material under test. A removable chuck and a small pin size facilitate the testing of mortar joints; this is the only system for testing the in-place strength of brick mortar joints. **Pins are not included, see below.**

Windsor HP Pin System

HC-2978



Ship wt. 20lbs. (9kg)

Steel Pins for Windsor Pin System

Box of 40 pins.

Steel Pins for Windsor Pin System

HC-2978.1



Ship wt. 2lbs. (0.9kg)

Replacement Micrometer for Windsor Pin**Replacement Micrometer**

HC-2978.2



Ship wt. 2lbs. (0.9kg)



HC-6100A.3F

Humboldt Concrete Scanner

The Humboldt Concrete GPR Scanner has been designed to find even the deepest targets while still providing high-resolution. The unit boasts the most diverse sensor suite on the market today. It can be used to locate rebar, power lines, cables, conduits, pipes, and voids.

Dual-frequency GPR antennas insure high-resolution scans can be made without sacrificing penetration depth. The two GHz antennas clearly identify objects buried in concrete to depths of about two feet, while the 750 MHz antennas can detect objects as deep as 6 feet. This scanner also provides a dual mode power line detector that detects both current and voltage. This is useful for detecting power lines where no current is flowing.

The system is controlled with a rugged IP67 Windows tablet computer that connects to the sensor via WiFi. There are several mounting configurations for the tablet to support one- or two-person teams.

The unit has several survey configurations for maximum flexibility. A long handle can be attached for floor surveys. Finally, the long handle converts into a tripod for the tablet computer, in order to provide maximum freedom of the sensor head.

The wireless design has eliminated all cables to improve ease of use, and eliminate common problems associated with connectors and cables. An

innovative positioning system includes an odometer, GPS, as well as optional inertial measurements. Advance software is available to provide cross section views (B-Scans), depth slice views, and 3D views.

Features:

- 2 GHz bi-static radar antenna
- 750 MHz bi-static radar antenna
- Electric field sensor for detecting power lines or tracer signals
- Magnetic field sensor for detecting power lines or tracer signals
- Includes rugged IP67 tablet computer
- Dimensions: 12" x 8.9" x 8.5" including wheels and skid plate
- WiFi connection between sensor and tablet
- Removable tablet computer allows data analysis from vehicle or office
- Durable construction with IP65 ingress protection
- Positioning systems include odometer, GPS, and optional inertial measurements.
- Optically-coupled odometer eliminates cables and interference to magnetic sensors
- Short handle for surveys within arm's reach
- Long handle for floor surveys rotates and locks into different positions

- Rechargeable LiFePO4 battery provides 5-6 hours of use. Includes second battery for all day use. Carrying case includes built-in charging system for batteries.

Includes: Concrete Scanner, Long Handle, Tablet and Carrying Case

Humboldt Concrete Scanner- **HC-6100A.3F**
 Ship wt. 7.7lbs. (3.5kg)



HC-2967A
(shown with iPad,
not included)

Proceq Portable GPR Live GP8000

ASTM D4748, D6087, D6432; AASHTO R37-04;
ACI 228.2R.98; EN 302066- ETSI

The Proceq GP8000 portable ground penetrating radar instrument is the beginning of a new era in NDT. The outstanding, patented ultra-wideband technology combined with a compact wireless probe delivers unmatched industry performance. Just connect to your iPad and detect objects and back walls reliably, with amazing clarity and ease of use.

Proceq GP8000 is the world's first large-scale inspection solution that utilizes augmented reality in industrial applications, and is now available on Apple iPad with iOS 12. You can now augment the world around you with 2D and 3D visualizations of GPR data and insights merged seamlessly with your local environment.

Proceq GP8000 ground penetrating radar features the unique stepped-frequency continuous-wave radar technology, which delivers the widest bandwidth in the market and in a handheld device. All applications that have typically been addressed with multiple separate antennas in the range of 0.9 to 3.5 GHz can now be covered with a single device — this means that you do not need to buy and switch to a different antenna for every inspection challenge. Unlike traditional devices with pulsed GPR technology, Proceq GP8000 enables you to detect features of various types and sizes with an unmatched depth penetration.

The powerful, user-friendly Proceq GPR Live app for Apple® iPad, together with the wireless Proceq GP8000 probe, make it possible to perform real-time, on-site data analysis, sharing, and collaboration, like no other product in its category.

The Proceq GPR Live app for Apple® iPad is designed to simplify the entire assessment process of concrete structures. As an example, the integrated wizard assists you with audio feedback during area scans. The intuitive object identification marker is another great feature that makes the life of every operator easier. The Proceq GP8000

probe wirelessly connects to its app for Apple® iPad. Thus, Proceq GPR Live allows instant imaging on a high-resolution touchscreen of up to 12.9" diagonal (iPad Pro) — this makes it the ground penetrating radar inspection solution with the largest and most crisp display in the industry.

The wireless, compact Proceq GP8000 probe is built into a lightweight but highly-durable housing, and ensures reliable, high-quality measurement results even when operated in the most challenging environments. Additionally, the probe operates with standard rechargeable AA batteries to guarantee smooth air travels and easy battery replacements worldwide. Proceq GP8000 Pro delivers a rich set of intuitive features that help you get the job done with peace of mind. It includes a built-in Live Wire kit, cloud-enabled sync and collaboration, export of raw data to SEG-Y, on-site touch-happy visualizations in 2D and 3D, Augmented Reality, and more. The superbly intuitive mobile app is supported by software updates that deliver enhancements and new features. Robust accessories, such as the telescopic rod, are also optionally available.

As a result, Proceq GP8000 is the one true all-in-one handheld GPR, and the most modern and future-proof ground penetrating radar instruments in the world.

Proceq GP8000, Basic

HC-2967A

Proceq GP8000, Pro

HC-2968A

Ship wt. 3lbs. (1.4kg)

Proceq GP8000 Basic Software*

HC-2967.10

Proceq GP8000 Pro Software*

HC-2968.10

Ship wt. 0.4lbs. (0.1kg)

*Basic software for the HC-2967A is sold as a one-time purchase. This allows you to own the software and use it with your unit for as long as you like. Pro software requires a 2-year subscription with the first year being purchased with your HC-2968A unit and the second and subsequent years being purchased directly from Proceq. These are one-year, use licenses.

| Features | Basic | Pro |
|--------------------------|-------|-----|
| Ultra-wideband GPR | X | X |
| Basic time-slice view | X | X |
| Pro time-slice view | | X |
| 3D View | | X |
| Data sharing & reporting | | X |
| Secure cloud features | | X |

Specifications

| | |
|-----------------------|--|
| Measuring principle | Stepped-frequency continuous-wave GPR |
| Frequency range | 0.2 to 4.0 GHz |
| Central frequency | 2.4 GHz |
| Bandwidth | 2.85 GHz |
| Maximum peak power | -7 dB EIRP |
| Max. depth range | 28" (70cm) on dry concrete |
| Dimensions | 8.7" x 7.1" x 5.6" (220 x 180 x 143 mm) |
| Weight | 4.4 lb (2 kg) |
| Battery | (8) AA (alkaline or rechargeable) |
| Battery lifetime | 3.5 hours of continuous use |
| Display | Any iPad |
| Operating temperature | 14 to 122°F -10 to 50°C |
| Humidity | <95% RH, non-condensing |
| IP classification | IP54 |
| Export (Pro only) | Measurement (Proceq GPR Live app file), snapshot (JPG), chart (CSV) |
| Languages | English, German, Japanese, Chinese, Korean |
| Regional settings | Imperial/metric units |

HC-2967A & HC-2968A Accessories

| Item | Part No. |
|---|-----------|
| Tablet Holder | HC-2968.1 |
| Telescopic rod/tablet holder (iPad Air/Mini) | HC-2968.2 |
| Battery pack 8x AA NiMH | HC-2968.3 |
| Grid Paper 60 x 60/5cm (set of 5) | HC-2968.4 |
| Grid Paper 60 x 60/10cm (set of 5) | HC-2968.5 |
| Grid Paper 24 x 24/2" (set of 5) | HC-2968.6 |
| Grid Paper 24 x 24/4" (set of 5) | HC-2968.7 |
| Chalk (set of 10) | HC-2968.8 |



HC-2968U
(shown with iPad,
not included)



Proceq Ultraportable GP8800

ASTM D4748, D6087, D6432; AASHTO R37-04; ACI 228.2R.98; EN 302066- ETSI

Proceq's Ultraportable Ground Penetrating Radar, GP8800 is yet another revolution by Proceq in concrete inspection and imaging. The rugged, light-weight Swiss Made probe packs our unique radar technology in a tiny footprint with gigantic clarity and depth. This makes it possible to locate rebar and tendon ducts by inspecting overhead, in tight spots, close to walls, from the edge of the slab—and in congested spaces, such as underneath pipes.

Connect the powerful probe to your iPad and enjoy the rich features of the famously user-friendly Proceq GPR Live app. Inspect with ease in four different configurations by reorienting the wireless wheel on the fly, even during the measurement, without screws or tools. Enjoy powerful post-processing, visualization, sharing, collaboration and reporting anywhere, anytime—in 3D and Augmented Reality.

Proceq GP8800 is the only ground penetrating radar in the market that offers complete, wireless autonomy and flexibility in an mini, ultraportable, lightweight probe that connects to iPad over encrypted Wi-Fi.

There is no need to connect Proceq GP8800 to any master GPR device with long, thick, and fragile cables that adversely impact data quality. Say goodbye to tripping hazards, and welcome convenient scanning, even overhead.

As for flexibility: the wireless wheel snaps effortlessly on any side of the probe in both trailing and side-car configurations, and can be rotated at will for cross-polarization, even while you scan—without fumbling with screws or tools.

Proceq GP8800 is powered by a battery pack with

rechargeable AA batteries, enabling smooth air travel and easy battery replenishments worldwide.

Need unlimited autonomy, better access to tight spaces, or both? Simply tether the battery pack or an off-the-shelf power bank by USB-C and scan under pipes with as little as 63 mm (2.5 in) distance to concrete—for hours and hours.

Proceq GP8800 features the unique implementation of Stepped-Frequency Continuous-Wave (SFCW) radar technology by Proceq, delivering the most ultra-wide bandwidth ever in a handheld GPR device.

As proven by the explosive global adoption of Proceq GPR Live by expert GPR users since 2017, SFCW GPR technology by Proceq delivers far superior signal-to-noise ratio compared to traditional high-frequency pulsed GPR devices for concrete scanning.

Now available in the ultraportable form factor of Proceq GP8800, SFCW GPR will continue to impress you with superior inspection insights thanks to crystal-clear radar data, without the traditional dilemma between multiple pulsed-GPR antennas, center frequencies, and their hard compromises between resolution and penetration depth

Proceq GP8800, Pro



HC-2968U

Ship wt. 0.4lbs. (0.1kg)

Proceq GP8800 Pro Software*



HC-2968U.10

Ship wt. 0.4lbs. (0.1kg)

*Pro software requires a 2-year subscription with the first year being purchased with your HC-2968A unit and the second and subsequent years being purchased directly from Proceq. These are one-year, use licenses.

| Specifications | |
|--------------------------|--|
| Radar technology | Stepped-frequency continuous-wave GPR |
| Frequency range | 400 – 6000 MHz |
| Depth penetration* | 65 cm / 25.6 in |
| Dimensions** | 90 x 90 x 60 mm / 3.5 x 3.5 x 2.4 in |
| Weight** | 460 g / 16.2 oz |
| Max. line scan length | 1000 m / 3281 ft |
| Max. area scan size | 120 x 120 cm / 47.2 x 47.2 in |
| Antenna distance to edge | 45 mm / 1.77 in |
| Path measurement | Wireless wheel, ±2% accuracy |
| Cross-polarization | Yes, adjustable at any time |
| Ground clearance | 0 mm / 0 in |
| Built-in battery | Removable pack, 4x AA (NiMH), flight-safe |
| Off-the-shelf power bank | 5V DC, at least 2A |
| Autonomy | 2.5 h (up to 8 hours with off-the-shelf 10'000 mAh power bank) |
| Connectivity | Wi-Fi® and USB-C to iPad |
| Operating temperature | -10 to 50 °C / 14 to 122 °F |
| Operating humidity | <95% RH, non-condensing |
| IP rating | IP54 |
| Exporting formats | JPG, PNG, CSV, SEG-Y, HTML |

| Accessories | |
|------------------------------------|------------|
| Item | Part No. |
| Telescopic rod | HC-2968U.2 |
| Battery complete | HC-2968U.3 |
| Grid Paper 60 x 60/5cm (set of 5) | HC-2968.4 |
| Grid Paper 60 x 60/10cm (set of 5) | HC-2968.5 |
| Grid Paper 24 x 24/2" (set of 5) | HC-2968.6 |
| Grid Paper 24 x 24/4" (set of 5) | HC-2968.7 |
| Chalk (set of 10) | HC-2968.8 |



HC-2969

Zircon MT7 Rebar Locator

ACI 318; BS 1881 Part 204

MetalliScanner® MT7 metal detector quickly and easily locates rebar, pipes, and other metal before you saw or drill. The bright, backlit display indicates metal target depth (inches and centimeters) up to 6" deep, type of metal located (ferrous or non-ferrous), and whether you are moving towards or away from a target. Use to find and avoid rebar in concrete before drilling, to find pipes and junction boxes behind tile, and even detect the nails/tacks in studs behind lath and plaster walls. This powerful tool saves time and money by eliminating guesswork, rework, needless holes, and costly broken drill bits or saw blades. Recommended uses include locating and reinforcing rebar in masonry and measuring subsurface nail spacing in roofing material for compliance with building codes.

- Features two scanning modes; Standard mode DeepScan mode
- Locates and determines the depth of 0.5" rebar and 0.5" copper pipe up to 6"(15cm) deep
- Finds and differentiates ferrous and non-ferrous metal
- Position accuracy to within $\pm 0.5"$ (13mm) for #4 rebar or 0.5" copper pipe
- Backlit display and audio tone clearly indicate location of target
- Rubberized handle and built-in lanyard loop
- Pivoting handle attachment for extended and overhead reach can be used with standard threaded broom handle, etc.
- Includes 9V battery and protective carrying case.

Zircon MT7 Rebar Locator**HC-2969**

Ship wt. 3lbs (1.4kgs)



HC-2976

Zircon MT6 Rebar Locator

ACI 318; BS 1881 Part 204

Locate embedded metal before your drill bit or saw blade does. This powerful dedicated metal scanning tool can locate metal up to 6 inches deep in solid concrete.

The MT6 locates both ferrous and non-ferrous metal up to 6" (152mm) deep in concrete and other non-metallic surfaces. It also differentiates between ferrous and non-ferrous metal targets and indicates the target depth in inches and centimeters.

The MT6 indicates when you are approaching a metal object with a large plus (+) sign on the display. When the plus becomes a minus (-), you have crossed over the target and are now moving away. Use to avoid rebar, cables, pipe, nails in reclaimed wood, nails/tacks in studs behind lath & plaster walls, electrical boxes and conduit, and more.

The MT6 is the tool recommended by the My Safe Florida Home Program to assist in hurricane loss mitigation.

Automatically differentiates between magnetic metal (such as rebar) and non-magnetic metal (such as copper pipe). Shows the depth of metal from the surface in both inches and centimeters

Easy-to-read LCD screen pinpoints the location of metal objects to the nearest 0.5" (13mm) and depth to the nearest inch (25mm)

Helps map out the grid of metal through any non-metallic construction material, including concrete, tile, and marble.

Zircon MT6 Rebar Locator**HC-2976**

Ship wt. 3lbs (1.4kgs)



HC-2983A

Profoscope+

ACI 318; BS 1881 Part 204

The Profoscope is a versatile, fully-integrated rebar detector and cover meter with a unique real-time rebar visualization, allowing the user to actually "SEE" the location of the rebar beneath the concrete surface to a maximum depth of 180mm and can determine rebar diameter to a depth of 64mm. This is coupled with rebar-proximity indicators and optical and acoustical locating aids. Rebar diameter can also be estimated within the specified testing range. The Profoscope combines these unique features in a compact, light device that allows the user to operate this rebar detector with one hand making the task of locating rebars a simple and efficient process. In addition, the instrument can record measurement data, manually or automatically. This increases testing efficiency on the construction site significantly. The included software tool allows post-processing or exporting of the collected data.

Profoscope+**HC-2983A**

Ship wt. 6lbs (2.7kgs)



HC-2981A



HC-2982A

Profometer 600

ACI 318; BS 1881 Part 204

The Profometer 600 (HC-2981A) is the ideal instrument for contractors who need to avoid damages to the reinforcement steel when drilling, coring or cutting. It additionally covers the needs of inspection engineers to locate rebars and to assess concrete cover values and rebar sizes for spot checks.

With the Locate Mode you can precisely detect the rebar location and direction, as well as measure the cover and the rebar diameter.

The Profometer 600 provides visual assistance for speed and signal strength control, as well as having settings directly accessible on the measurement screen.

The Spot Probe is provided for areas with congested rebar arrangements and the unit automatically detects inclined rebars.

The statistics and snapshot views allow comprehensive review of the measured data directly on the screen. The statistics view presents a graphical overview of the distribution of cover measurements. The snapshot view shows cover for each rebar with the diameter displayed as a number.

It also provides graphical display of measured values and minimum cover set and easy inspection of the measured values directly on the screen. Settings can be changed before and after storage and stored files can be reopened to continue measurements. Data can be exported to a PC via the Profometer-Link software.

Profometer PM600**HC-2981A**

Ship wt. 15lbs. (6.8kg)

Profometer 630AI & 650AI

ACI 318; BS 1881 Part 204

The sophisticated Profometer 630AI (HC-2982A) further enhances the application range of the Profometer 600 with Single-Line, Multi-Line and Area Scan Modes, as well as an extensive choice of statistical views, increasing productivity for civil engineers and inspection companies in charge of assessing the conformity of concrete cover of a new structure (quality check and resistance assessment) or dealing with corrosion analysis on large elements.

Single-Line Scan provides a linear scan of the cover across the first layer of rebar over a long distance, with or without diameter measurement. The signal curve allows the user to manually verify and confirm the rebar position, delivering improved resolution.

The user can zoom in to scale according needs while displaying the cover curve or signal strength curve.

Multi-Line Scan provides multiple linear scans across the first layer of rebar over a rectangular area. Cover, diameter and signal strength spectrum are shown in one view. Each line can be viewed individually in the Single-Line View. Color classification can be used to show cover and rebar diameter settings and the signal strength spectrum can be used for further evaluation.

Area Scan

The grid display of the Area Scan Mode allows a simplified view of the measured cover data. It is best suited for a combination with potential field measurements and individual grid sizes can be selected.

The Profometer 650AI (HC-2984A) extends the features of the Profometer 630AI further still with the unique Cross-Line Scan measuring mode and analysis functions. Full reporting features are available, as required on large investigation campaigns where a comprehensive report is to be delivered to the client.

The 2D Cross-Line Scan extends the Multi-Line Scan with the special functionality of combining scans in the X and Y directions and measuring the rebars of the first and second layer typically arranged in a rectangular mesh. The signal strength spectrum can be seen in addition to the cover and diameter. By changing the Offset- and Gain-slider positions the signal strength range and resolution can be set and accordingly shown in a color spectrum, for example to display the first layer of rebar.

Profometer PM630AI**HC-2982A****Profometer PM650AI****HC-2984A**

Ship wt. 15lbs. (6.8kg)



Profometer Corrosion

ASTM C876

The Profometer Corrosion is the most versatile corrosion analysis solution, based on the half-cell method, in the market today. Coupled with the Profometer's unique wheel electrodes, this unit provides the fastest and most efficient on-site testing available. And, as the direct successor to the Canin, the Profometer Corrosion is compatible with existing Canin and most third party electrodes.

In addition, the Profometer Corrosion can also be easily upgraded to include all the additional capabilities of the Profometer 6 Cover Meter. This results in having a future-proof, all-in-one solution for rebar assessment and corrosion analysis.

The Profometer's dual-core processor allows fast data acquisition and real-time control over the measurement procedure directly on site. Its rugged housing has been specially developed for testing in harsh environments.

The high resolution and illustrative Profometer touchscreen enables high productivity with 2D grid views, an assisted workflow and on-site post processing of the measured data. Together with the included PC software it allows best possible analysis of the statistical data with efficient custom reporting.

Features Include:

- Intuitive user-friendly interface for data acquisition
- Optimized workflow for both rod and wheel measurements
- Customizable text can be entered for any specific locations
- Flexible features enable the mapping of any irregular geometry
- Improved digital filtering to remove the effect of external noise (civil and industrial power sources)
- Profometer Link PC software for data analysis, combined data evaluation and reporting on any third party software

| Profometer Corrosion Specifications | |
|-------------------------------------|--|
| Voltage Measuring Range | -1000 to +1000 mV |
| Voltage Resolution | 1 mV |
| Impedance | 100 MΩ |
| Sampling Rate | 900 Hz |
| Display | 7" color display 800 x 480 pixels |
| Memory | Internal 8 GB flash memory |
| Regional Settings | Metric and imperial units and multi-language and timezone supported |
| Power input | 12 V +/-25% /1.5 A |
| Dimensions | 250 x 162 x 62 mm |
| Weight (of display device) | About 1525g (incl. battery) |
| Battery | 3.6 V, 14 Ah |
| Battery lifetime | > 8h (in standard operating mode) |
| Humidity | < 95% RH, non condensing |
| Operating temperature | -10°C to +50°C |
| IP Classification | Touchscreen IP54, universal probe IP 67 |

- Create custom reports with exported graphs and charts
- Housing is specially designed to be used on-site in harsh environments, including carrying strap, integrated stand and sunshield cover
- High resolution color display
- Battery lifetime of > 8h
- 8 GB flash memory
- Dual-core processor supporting diverse communication and peripheral interfaces
- Future-proof investment through direct upgrade possibilities for upcoming Profometer products

Profometer Corrosion includes: Profometer touch-screen; interface box; battery charger; 82 ft. (25m) cable coil with clamp; USB cable; DVD with software; documentation, carrying strap and case. **Order Probe separately.**

Profometer Corrosion

HC-2873

Ship wt. 15lbs (6.8kg)

| Profometer Corrosion Accessories | |
|--|-----------|
| Rod Electrode | HC-2873.2 |
| One-Wheel Electrode | HC-2873.3 |
| Four-Wheel Electrode | HC-2873.4 |
| Telescopic Extension 5.6ft. (1.7m) & 10ft. (3m) cable | HC-2873.5 |
| Spare Battery | HC-2873.6 |
| Quick Charger | HC-2873.7 |
| Anti-glare Protection Film | HC-2873.8 |
| Upgrade kit to Profometer 600 Cover Meter | HC-2783.1 |
| Software Upgrade from Profometer 600 to Profometer 630 | HC-2874 |
| Software Upgrade from Profometer 630 to Profometer 650 | HC-2875 |



HG-9047

iCOR™

Giatec iCOR™ is a unique non-destructive testing tool for detailed detection and evaluation of corrosion in reinforced concrete structures without the need to have an electrical connection to the rebar. iCOR is equipped with high-precision sensors to measure:

- Corrosion potential mapping of rebar
- Corrosion rate mapping of rebar
- Real In-situ electrical resistivity of concrete
- Ambient temp. and relative humidity of rebar
- On-site assessment of concrete durability

iCOR utilizes wireless technology to transmit data to a tablet, where data can be stored, analyzed and visualized. Moreover, the tablet app offers a powerful post-processing tool and an easy way to share the results with other team members. iCOR can significantly save time, human resources and cost in the condition assessment of concrete structures.

iCOR employs a complex electrical circuit model for predicting different properties of concrete materials, and steel reinforcement. An advanced mathematical algorithm is implemented in the core software of the device. This software processor is responsible for the analysis of certain characteristics of reinforced concrete structure such as the polarization resistance of embedded reinforcement and the "real" electrical resistivity of concrete. Includes: iCOR measuring device; measurement cable; charging cable; table charging cable; (3) contact sponges (half cell); (12) contact sponges (corrosion) electrode storage solution; conductive gel; spray bottle; case; data recording app; tablet and carrying support, tablet charger and verification kits.

| iCOR™ Specifications | |
|------------------------|------------------------------------|
| Testing Time | 3 to 15 seconds |
| Corrosion Rate | 0 ~ 300 μm / year |
| Corrosion Potential | +200 to -800 mV / CSE |
| Electrical Resistivity | 0 ~ 10,000 $\Omega \cdot \text{m}$ |
| Operating Temp. | 32 to 113°F (0 ~ 45°C) |
| Operating Humidity | 20~ 90% RH |
| Dimensions | 250 x 70mm |
| Weight | 900g |

Giatec iCOR™ Essential Pkg. **HG-9047**
 Ship wt. 15lbs (6.8kg)



H-2872

CorMap Rebar Corrosion Mapping System

ASTM C876; BS 1881 Part 201

The CorMap is a simple and economical instrument for use in identifying areas of probable rebar corrosion. The system consists of the voltmeter, two electrode extensions, reference electrode with copper sulfate reservoir, copper sulfate, wetting agent reservoir, dispensing sponge, 250 ft. (80m) cable reel, and a heavy-duty carrying case. In operation, the high impedance voltmeter is connected between the reinforcing steel and the reference electrode on the concrete surface where a measurement can be made for the half-cell potential. This measurement is then used to determine the probability of corrosion activity. By testing at a fixed distance apart, a grid of half-cell potentials can be developed and areas delineated.

CorMap Rebar Corrosion Mapping System **H-2872**
 Ship wt. 24lbs. (10.8kg)

Copper Sulfate, 8.5 oz. (400ml) Container

For use with the CorMap mapping system.

Copper Sulfate, 8.5 oz. (400ml) **H-2872.1**
 Ship wt. 1.6lbs. (.7kg)

Giatec Perma2™ Rapid Chloride Permeability

ASTM C1202, C1740; AASHTO T277

Perma2™ is a laboratory test device for measuring the electrical resistance of concrete against the penetration of chloride (RCPT) according to the standard methods such as ASTM C1202, AASHTO T277 and ASTM C1760. The measurement data derived from this test method can be used to estimate the chloride diffusion coefficient of concrete in service life predictions and structure design, as well as durability-based quality control of concrete. Perma2™ is electrically certified for rapid chloride penetrability testing in concrete laboratories and is the only RCPT device that meets the specifications of ASTM and AASHTO specifications.

Perma2™ provides an easy-to-use, stand-alone testing device, which is accurate to $\pm 0.1\text{mA}$. It can test up to 4 samples at a time with a flexible logging time of 1-10 minutes depending on test and sample parameters. It also features automatic temperature control and customizable setups.



HG-9036

Applications:

- Concrete's ability to resist chloride ion penetration (ASTM C1202, AASHTO T277)
- Bulk electrical conductivity of concrete (ASTM C1760)
- Performance-based quality control of concrete
- Estimation of chloride diffusion coefficient of concrete
- Estimation of chloride migration coefficient of concrete
- Estimation of the remaining life of concrete structures
- Service life design of concrete structures

Perma2™ unit includes complete set of test cells, Temperature sensors, test cables, power cord, USB cable, user manual, communication software, gauge vacuum pump assembly, desiccator assembly, PC software and USB connection.

Perma2™ Complete,
 120V 60Hz **HG-9036**
 220V 50/60Hz **HG-9036.4F**
 Ship wt. 125 lbs. (56.6 kg.)

Perma2™ less Pump and Desiccator,
 120/220V 50/60Hz **HG-9020.3F**
 Ship wt. 40 lbs. (18.1 kg.)

| Perma2™ Accessories / Replacement Parts | |
|--|------------|
| Perma2™ Device, 110/220 50/60Hz | HG-9044.3F |
| Perma2™ Test Cell | HG-9021 |
| Stainless Steel Mesh - Pair | HG-9027 |
| Sample Prep Package, 115V 60Hz | HG-9042 |
| Sample Prep Package, 230V 50/60Hz | HG-9042.4F |
| Rubber Gasket Cast - Pair, 4" (100mm) Dia. . | HG-9028 |
| Rubber Gasket Core - Pair 3.75" (95mm) Dia | HG-9039 |
| Test Cable Set | HG-9022 |
| Temperature Sensor | HG-9023 |



H-2877



H-2877.1



H-2874



H-2878



HC-6390

The Chlorimeter Chloride Test System

A field kit for the determination of chloride ion content in concrete, fresh cement, masonry, most other construction materials, and water. The determination of the chloride ion concentration in concrete is essential in assessing the need for maintenance on, for example, bridge decks and parking structures. The test can also be used to ensure that materials used in new construction are free from potentially harmful chloride ion levels. The Chlorimeter produces results on-site, within minutes that are accurate and comparable to expensive laboratory tests. With this method, the concentration of acid soluble chlorides is measured. In most cases, this is equivalent to total chloride concentration. It measures the electrochemical reaction of a weighted sample placed in an extraction liquid. It automatically shows a temperature compensated reading of percent of chlorides on its digital display. A wide range— from 0.002 to 2% chloride by weight— is covered.

Kit does not include required hand drill or extraction and calibration liquids, which can be ordered below.

Chlorimeter Chloride Test System H-2877
 Ship wt 14lbs. (6.3kg)

Extraction and Calibration Liquid, small kit

Pack of 12 jars, extraction liquid and calibration liquid

Extraction and Calibration Liquid, Small H-2877.1
 Ship wt 0.5lb. (0.2kg)

Extraction and Calibration Liquid, large kit

Pack of 100 jars, extraction liquid and 20 jars of calibration liquid.

Extraction and Calibration Liquid, Large H-2877.2
 Ship wt 5lb. (2.2kg)

ASR Detect

ASR Detect™ is both a practical and a scientific tool. Its principal application is analyzing existing concrete structures. By identifying alkali silica deterioration in its earliest stages, the ASR Detect facilitates the problem being identified when remediation techniques can be applied; for example, treating the concrete with a lithium-bearing solution to inhibit further deterioration. Where deterioration is advanced, ASR detect provides a clear picture of the extent and depth of the damage.

As a scientific tool, ASR detect can be applied to improving the understanding of where, how and why ASR occurs. That understanding is basic to developing ASR preventatives that allow high-alkali cements or poor-quality aggregates to be used in concrete mixes without risking the development of ASR.

To identify alkali silica reaction (ASR) in concrete, two reagents are applied to the broken surface of a concrete core and the excess rinsed off. On contaminated concrete, the resultant stains reveal the presence of ASR. The stains also reveal the extent of the ASR in the concrete and indicate the stage of ASR progression. Yellow indicates that degradation has begun; pink warns that degradation is advancing.

ASR Detect H-2878
 Ship wt 10lbs. (4.5kg)

Carbo Detect

Carbo Detect™ is a simple colored dye field test for detecting carbonation. The single reagent is sprayed on the surface to be checked. The reagent will change to pink in uncarbonated concrete and remain colorless when sprayed on carbonated concrete.

Carbo Detect H-2874
 Ship wt 1.3lbs. (.6kg)

Ultrasonic Pulse Velocity Tester

ASTM C597; BS1881:203; EN 12504

Used to determine the presence of faults, voids, cracks, etc. in in-situ or precast concrete and for long-term monitoring of structures subject to environmental conditions. Gives data concerning the homogeneity of the concrete, by generating pulses of sound into the concrete and measuring the time the sound takes to travel from the transmitter probe to the receiver probe through the material. Measuring range: 0 - 3000 μ s - accuracy \pm 0.1 μ s

- Selection of the ultrasonic pulse amplitude adjustable from 250 to 1000 V
- Measurement of the required time by the ultrasonic pulse to go through the tested material.
- Single or continuous acquisition mode with automatic or manual saving.
- Calibration of a defined time value.
- Capacity of data acquisition, processing and filing of the test data up to 30.000 samples.
- Interface mini USB for PC connection.
- Two outlets for connection to the oscilloscope.

Includes (2) 55kHz probes with cables; calibration rod and paste; rechargeable battery pack and case.

Ultrasonic Pulse Velocity Tester HC-6390
 Ship wt 3lbs. (1.6kg)

| Accessories for HC-6390 | |
|---|-----------|
| 55 kHz Transmitting/receiving replacement probes | HC-6390.1 |
| Exponential 150 kHz Transmitting/receiving probes | HC-6390.2 |
| Exponential 55 kHz Transmitting/receiving probes | HC-6390.3 |
| Exponential 24 kHz Transmitting/receiving probes | HC-6390.4 |
| Probe Cables (2) 12' (3.5m) | HC-6390.5 |
| Probe Cables (2) 33' (10m) | HC-6390.6 |



H-2984

HC-6320
HC-6330**Pundit Lab, Ultrasonic Test Device**

ASTM C597-02, EN12504-4, BS 1881 Part 203, ISO1920-7:2004, IS1311


The Pundit Lab ultrasonic tester can be used to detect the presence of cracks, voids and other imperfections in concrete, as well as determine and monitor the strength and deterioration of concrete, which may have occurred due to age, fire, frost or chemical attack. The Pundit Lab devices provide optimized pulse shaping, automated transmission settings and a range of powerful transducers. They allow analysis of the received signal and manual triggering directly on the instrument. Full remote control of all transmission parameters, data logging function and functionality that can turn your PC into an oscilloscope. USB interface and data analysis software provide data analysis and export to third party programs through Open interface such as LabVIEW. Pundit Lab consists of: display unit, 2 transducers (54kHz), 2 BNC cables 1.5 m, couplant, calibration rod, battery charger with USB-cable, 4x AA (LR6) batteries, data carrier with software, documentation and carrying case

Pundit Lab Ultrasonic Test Device **H-2984**
 Ship wt. 13.4lbs. (6kg)

Pundit Lab+, Ultrasonic Test Device

ASTM C597-02, EN12504-4, BS 1881 Part 203, ISO1920-7:2004, IS1311

The Pundit Lab+ builds upon the Pundit Lab and comes with an extended feature set, making it particularly suitable for on-site measurements. Functions include, an integrated gain stage making an external amplifier unnecessary when using long cables or exponential transducers, a real time stamp for recording the time of measurement, a data review list that allows previous measurements to be viewed on site, and a correlation to compressive strength either directly from pulse velocity or in combination with a rebound value (SONREB method). Pundit Lab+ consists of: display unit, 2 transducers (54kHz), 2 BNC cables 1.5 m, couplant, calibration rod, battery charger with USB-cable, 4x AA(LR6) batteries, data carrier with software, documentation and carrying case

Pundit Lab+ Ultrasonic Test Device **H-2983**
 Ship wt. 13.4lbs. (6kg)

* included with unit.

Transducers for Pundit Lab

| | |
|--|----------|
| 24 kHz Transducer (2 required) | H-2984.1 |
| 54 kHz Transducer (2 required)* | H-2984.2 |
| 150 kHz Transducer (2 required) | H-2984.3 |
| 250 kHz Transducer (2 required) | H-2984.4 |
| 500 kHz Transducer (2 required) | H-2984.5 |
| (2) 54 kHz Exponential Transducers (include calibration rod) | H-2984.6 |
| (2) 250 kHz Shear Wave Transducers (include couplant) | H-2984.7 |

Pundit 200 Pulse Velocity and 200 Pulse Echo

ASTM C597-02, EN12504-4, BS 1881 Part 203, ISO1920-7:2004, IS1311, CECS21


The Pundit PL-200 and PL-200PE are the first instruments using a new generation and design-protected Touchscreen Unit. They are specifically designed to be used on-site, in harsh environments for a range of applications while providing enhanced measurement modes. The Pundit PL-200 and PL-200PE feature a new generation and design-protected Touchscreen. This screen features the highest resolution and sharpest image of any comparable product available in the market. This coupled with a powerful dual-core processor allows the best possible analysis of the measured waveforms. Typically, up to 100,000 A-Scans can be stored on the device. Furthermore, advanced ultrasonic products currently being developed will be directly compatible, extending the application range and making the Pundit Touchscreen a sound future proof investment.

The Pundit PL-200 provides an extended range of measurement modes and superior features for on-site testing: Assessing the concrete uniformity using standard A-Scans and the new Line Scan functionality, estimating the compressive strength of concrete or measuring the surface velocity and the depth of perpendicular cracks. The intelligent software supports directly accessible settings in real time from the measuring screen and allows multiple trigger modes and zoom functionality to permit precise determination of the transmission time. An extensive range of transducers for the Pundit PL-200 are available.

The Pundit PL-200PE employs state-of-the-art pulse echo technology to extend the ultrasonic application to objects where access is restricted to a single side. The measurement process is greatly assisted by Proceq innovations such as advanced echo tracking and automatic estimation of pulse velocity. The A-scan mode allows direct analysis of the raw signal and the real-time B-scan mode provides a cross-sectional view perpendicular to the scanning surface. This allows the user to determine the slab thickness and to localize subsurface deformities such as voids, pipes, delaminations and honeycombing. Control buttons and optical feedback directly on the probe increase measurement efficiency and make the instrument even more user-friendly.

Specifications

| | |
|-----------------|--|
| Range | 0.1 – 7930 μ s |
| Resolution | 0.1 μ s (< 793 μ s), 1 μ s (> 793 μ s) |
| Display | 7" color display 800x480 pixels |
| Pulse Volt. UPV | 100 – 450 Vpp |
| Pulse Volt. UPE | 100 – 400 Vpp |
| Bandwidth | 20 – 500 kHz |
| Receiver Gain | 1x – 10,000x (0 – 80dB) |
| Memory | Internal 8 GB Flash memory |
| Battery | Lithium Polymer, 3.6 V, 14.0 Ah |
| Battery Life | > 8h (std. mode) |
| Operating Temp. | -10°C – 50°C (Non-charging) |
| Humidity | < 95 % RH, non condensing |

Pundit PL-200 Pulse Velocity **HC-6320**
Pundit PL-200PE Pulse Echo **HC-6330**
 Ship wt. 40lbs. (18.1kg)



HC-6450

HC-6460A
(shown with iPad,
not included)HC-6460A
(shown dual-handle
kit and iPad,
not included)

Pundit 250 Pulse Echo Array

The Pundit 250 Array is a rapid ultrasonic pulse echoing imaging scanner that can be used for deep scanning of concrete and fiber-reinforced concrete. It can be used for thickness measurements of thick concrete and tunnel linings; determining localized defects such as voids, honeycombing and depth and extent of delaminations and the detection of objects in the concrete such as pipes and tendon ducts beyond the rebar layer. The Pundit 250 Array is based on the ultrasonic multi-channel pulse echo technology using 8 channels. One channel transmits and the echoes are received by the other seven channels. Each channel transmits in turn.

A complete measurement consists of 56 A-scans. These are used to compute and display a B-scan in real-time using the Synthetic Aperture Focusing Technique (SAFT). Coupling two transducers results in a 16 channel aperture processing a total of 240 A-scans per measurement cycle.

The 250 Array provides high-resolution scanning with high-quality images of defects, rebar and tendon ducts with superior near-field performance. No couplant is required due to the dry point contact technology.

The Pundit Array includes a clear rear display for status information and immediate feedback of readings, an integrated laser for guided measurements and a removable battery pack with rechargeable AA batteries.

The unit is extremely flexible, allowing single-handed positioning, as well as double-handed positioning for increased control. Upgradeable to 16 channels, which doubles the scan width.

The Pundit 250 Array consists of: Pundit Touchscreen, Pundit Array transducer, Pundit 250 Array software, Pundit Array Cable 12-pin 1.5m, Pundit Array contact tester, 6x Rechargeable AA NiMH batteries, power supply, USB cable, calibrated tape, DVD with software, documentation, carrying strap and carrying case.

| Specifications | |
|--------------------|--------------|
| Gain | 0 to 80dB |
| Analog Bandwidth | 15 to 100kHz |
| Range | 0 to 1000µs |
| Resolution | 1µs |
| Pulse Voltage | ± 150V |
| Pulse Shape | Rectangle |
| PRF | 8 to 200ms |
| Operating Time | 7 Hr (min.) |
| Number of Channels | 8 |

Pundit 250 Pulse Echo Array **HC-6450**
Ship wt. 13.2lbs. (6kg)

Rapid Ultrasonic Pulse Echoing Upgrade Kit

Upgrade Kit for upgrading Pundit 200 Pulse Echo to a Pundit 250 Array consisting of: Pundit Array transducer, Pundit 250 Array software, Pundit Array Cable 12-pin 1.5m, Pundit Array contact tester, 6x Rechargeable AA NiMH batteries, calibrated tape, DVD with software, documentation, carrying case.

Pulse Echo Upgrade Kit for Pundit 200 **HC-6451**
Ship wt. 5.5lbs. (2.4kg)

Pundit PD8000 Pro Live Array

ACI 228.2R-13

Pundit PD8000, the wireless inspection solution with multi-channel ultrasonic pulse echo technology, brings on-site structural concrete assessment and imaging to the next level when it comes to pragmatism and productivity.

Pundit PD8000 is powered by intelligent software for real-time visualization providing unmatched precision, sharpness, focus and image stability for the longest scans and at unheard-of before penetration depths. The A.I.-powered data analysis makes it easy to identify features and flaws, interpret them, and communicate the value of your inspection work to your customer.

The rugged and robust housing makes Pundit PD8000 perfect for the demands of a harsh construction environment. The ergonomic design of the probe and its controls enhance your productivity: they are placed directly on the handles, making seamless and convenient operation possible under any conditions.

A.I.-assisted positioning and automated image stitching drastically improve the quality of your insights, while accelerating your overall inspection process. PD8000 probe wirelessly connects to the Pundit Live Array app for iPad providing unmatched concrete imaging thanks to crisp, high-resolution touchscreen. The gesture driven and user-friendly app is rich with intelligent features and sophisticated algorithms and together with superb mobile processing power enable on-site analysis and immediate visualization on-site including the true 3D view together with Augmented Reality, with the highest precision, focus and clarity. A.I. assisted data analysis and material identification algorithms allow to identify and interpret inspection results precisely and reliably.



HC-6440

HC-6485

Finally achieve clarity of your data thanks to voice, image and text annotations that enrich the built-in Logbook of each measurement. Thanks to the cloud services make sharing data and collaborating with your colleagues instantaneously possible from anywhere, anytime.

| Specifications | |
|------------------------------|---|
| Measurement Modes | Line scan Stripe scan |
| Frequency range | 40 kHz (30 - 80 kHz) |
| Nominal Transducer Frequency | 50 kHz |
| Measuring Range | Up to 3 m / 118 in (depending on concrete quality) |
| Channels | 8 (16 with upgrade) |
| Bandwidth | 20 - 70 kHz |

| | |
|------------------------------|--------------------------|
| Proceq PD8000, Basic | HC-6460A |
| Proceq PD8000, Pro | HC-6461A |
| | Ship wt. 5lbs. (2.3kg) |
| Proceq PD8000 Basic Software | HC-6460.10 |
| Proceq PD8000 Pro Software | HC-6461.10 |
| | Ship wt. 0.4lbs. (0.1kg) |

| Pundit Live Array Accessories | |
|-------------------------------|-----------|
| Pundit Array transducer | HC-6450.1 |
| Transducer extension kit | HC-6450.2 |
| Dual-handle kit | HC-6450.3 |
| Battery Pack, complete | HC-6450.4 |
| Battery, Rechargeable (6) | HC-6450.5 |
| Calibrated Tape, set of (5) | HC-6450.6 |

Sonic Echo Foundation Tester

ASTM D5882

The FTG is a small laptop or tablet powered, non-destructive system for measuring the depth and integrity of drilled shafts, driven piles, concrete mats, and timber foundations using the Sonic Echo principle (also called the PIT or Low Strain Integrity, as well as other names).

Requires only minimal training for use — connect the FTG to your laptop or tablet and start testing with the FTG software. The system includes everything you need for testing except for a user-provided Windows 7, 8, or 10 laptop or tablet - including an accelerometer receiver and a hammer.

Features:

- Small, lightweight and easily transported
- Fast and accurate field measurements
- Real-time waveform display while testing
- Digital filtering of data
- Switch between English and metric units
- Save results for later review
- Includes accelerometer receiver and cables
- Includes 3 lb (1.4 kg) non-instrumented hammer with removable tips

For use with a Windows 7-10 devices supplied by the user

| | |
|------------------------------|-------------------------|
| Sonic Echo Foundation Tester | HC-6485 |
| | Ship wt. 10lbs. (4.5kg) |

Cross Hole Ultrasonic Monitor (CHUM)

ASTM D6760; AFNOR NF P 94-160-1

The CHUM (Cross Hole Ultrasonic Monitor) uses the Crosshole Sonic Logging (CSL) method (ASTM D6760-16) to perform high-resolution quality control on deep foundations.

The system uses an ultrasonic wave sent from an

emitter to a receiver while both are pulled through water-filled access tubes embedded in the concrete. The measured arrival time and energy are directly related to concrete quality.

Additional methods supported by the CHUM are Single Hole Ultrasonic Testing (SHUT) and Tomography (two- and three-dimensional).

Main Features:

- Easy to use; The user-friendly software makes it possible to master the CHUM in less than a day. No additional expensive training required
 - Powerful tomography features
 - Unlike other system based on an embedded computer (which may soon become obsolete), CHUM connects to the USB port of your regular notebook computer or Tablet PC.
- The basic CHUM package includes everything required to perform CSL and 2D tomography:
- The CHUM instrument, two ultrasonic transducers, two 50m cable reels, two depth meter pulleys, cables and AC power adapter
 - Optional: 100m/150m cable reels, 3D tomography
 - Testing, analysis and reporting software
 - Interpretation assistance package
 - 10 years of free software upgrades
 - 3 year warranty on hardware

| | |
|-------------------------------|-------------------------|
| Cross Hole Ultrasonic Monitor | HC-6440 |
| | Ship wt. 20lbs. (9.1kg) |

| CHUM Accessories | |
|------------------------|-----------|
| Transceiver, 100m reel | HC-6440.1 |
| Transceiver, 150m reel | HC-6440.2 |
| CHUM 3DT Software | HC-6440.3 |



H-2880



H-2879.200



H-2879

Concrete Thickness Gauge

ASTM C1383

The Concrete thickness gauge measures concrete slab thickness without drilling. With this device you no longer need to drill, core, or excavate sites to determine concrete slab thickness. The CTG-2 is a nondestructive system for measuring the thickness and integrity of concrete slabs. The Concrete thickness gauge detects: voids, honeycomb areas, cracks and delamination.

It can be used on pavements, tunnel linings, walls and other plate-like structures using the Impact Echo principle. Easy-to-use, this unit requires no special knowledge or training—just follow the easy instructions and connect the unit to a user-provided Windows-based computer or tablet and start testing using the included WinCTG2 software.

Software Features:

- Olson's WinCTG-2 Software is used for data acquisition and analysis.
- Report Capability: Use X and Y coordinates to set up a test grid. Generate a thickness summary table which can be exported to most spreadsheets in comma separated format. For greater accuracy, calibrate the unit at a location of known thickness to obtain the concrete velocity for the job.

| Thickness Gauge Specifications | |
|--------------------------------|---------------------------|
| Thickness range | 3.2" to 6' (81mm to 1.8m) |
| Power | CR123A 3V Lithium battery |
| Frequency resolution | 10Hz |
| Samples per test | 4545 |
| Sampling Rate | 45454/sec. |
| Cable length (test head) | 3' (910mm) |

Concrete Thickness Gauge

H-2880



Ship wt. 6 lbs. (2.7kg.)

Resipod Resistivity Meter

AASHTO T358-15

Resipod is a fully integrated 4-point Wenner probe, designed to measure the electrical resistivity of concrete in a completely non-destructive test.

Operating on the principle of the Wenner probe, the Resipod is designed to measure the electrical resistivity of concrete or rock. A current is applied to the two outer probes, and the potential difference is measured between the two inner probes. The current is carried by ions in the pore liquid. The calculated resistivity depends on the spacing of the probes.

It is extremely fast and stable and packaged in a robust, waterproof housing designed to operate in a demanding site environment. The Resipod is the successor of the classic CNS Farnell resistivity meter.

Surface resistivity measurement provides extremely useful information about the state of a concrete structure. Not only has it been proven to be directly linked to the likelihood of corrosion and the corrosion rate, recent studies have shown that there is a direct correlation between resistivity and chloride diffusion rate and even to determination

| Resipod Specifications | |
|------------------------|-------------------------|
| Range | 0.1 – ca. 1000 kΩcm |
| Resolution, 200μA | ±0.2 kΩcm or ±1% |
| Resolution, 50μA | ±0.3 kΩcm or ±2% |
| Resolution, <50μA | ±2 kΩcm or ±5% |
| Frequency | 40 Hz |
| Memory | 500 measured values |
| Power | >50 hours autonomy |
| Charger | USB type B, (5V, 100mA) |

of early compressive strength. This makes it one of the most versatile NDT methods for concrete.

- Waterproof and designed to float

CONCRETE

- Supplied with a USB connection and dedicated Resipod Link PC software, rugged carrying case, test block and documentation
- DOT tested and field proven through highway department studies

Resipod Resistivity Meter, 1.5" (38mm) H-2879

Resipod Resistivity Meter, 2" (50mm) H-2879.50



Ship wt. 5.5lbs. (2.4kg)

Resipod Geometric Accessory

Resipod geometric is designed to comply with the latest research intended to extend the current limits of the AASHTO T358-15 standard, which is limited to particular sample geometries and a maximum aggregate size of 1.5" (38mm).

Resipod Geometric Accessory

H-2879.200



Ship wt. 5lbs. (2.2kg)

Resipod Bulk Resistivity Accessory

The bulk resistivity test is an alternative method where the sample resistivity is measured between electrical plates placed at either end of the sample. The geometry factor is very simple and the test is rapid to perform, with similar advantages as the surface resistivity test. The resipod bulk resistivity kit provides everything necessary for carrying out this test on standard 4" (100mm) diameter cylinders.

Resipod Bulk Resistivity Accessory

H-2879.300



Ship wt. 2lbs. (.9kg)





HG-9037.3F



HG-9035.3F

Surf™ Surface Resistivity

AASHTO T358-15

Surf™ is a laboratory non-destructive test device for rapid, easy and accurate measurement of the surface electrical resistivity of concrete based on the four-probe (Wenner-Array) technique according to AASHTO TP 95-11, and pending ASTM specifications. Surf™ has a unique and customized setup, which enables the measurement of electrical resistivity with high accuracy by reducing the duration of the test and minimizing ambient effects.

The Surf™ provides a test cradle for 4" x 8" and 6" x 12" cylinders, which provides four (4) 4-sensor arrays positioned at 90° intervals around the cradle. Surf™'s patented technology automatically takes measurements at each of the sensor points around the cylinder and then repeats the process for all 8 measurements in less than 15 seconds. The included PC software takes this information and generates the reports required by the standards

Applications:

- Performance-based, quality control testing
- Estimation of chloride diffusion coefficient
- Service-life design of concrete structures
- Remaining life estimation of structures
- Crack detection in under load concrete
- Monitoring the setting time of fresh concrete

Features:

- Patented technology
- Fully compliant with both AASHTO T358-15 and the upcoming ASTM standard
- Fast measurement (8 measurements < 15s)
- Four-channel surface resistivity meter
- Variable frequency (13 - 100 Hz)
- Limits moisture loss
- Automatic report generation with PC software
- Fresh concrete testing/crack detection

The Giatec Surf™ kit includes" the Surf™ unit, 100 x 200mm (4" x 8") sample holder, power adapter, USB cable, communication software, user manual, and conductive gel.

Giatec Surf™ Complete Kit HG-9037.3F
Giatec Surf™ Device Only HG-9030.3F

Ship wt. 15 lbs. (6.8 kg.)

SURF™ Specifications

| | |
|----------------------|--------------------|
| Measurement Channels | 4 |
| Measurement Display | Yes |
| LCD Display Area | 65 x 33 mm |
| Dimensions of Device | 200 x 160 x 70 mm |
| Software. | Surf™ Data Monitor |

Surf™ Accessories / Replacement Parts

| | |
|---|---------|
| Surf™ Sample Holder, 4" x 8" (100 x 200mm) Dia. | HG-9031 |
| Surf™ Verification Kit, High and Low range | HG-9032 |
| Conductive Gel - Low Viscosity, 250ml | HG-9038 |
| Surf™ Test Cable, Four-point with clip. | HG-9033 |
| Surf™ Contact Sponge Set, 16 pcs. | HG-9034 |

RCON2™ Concrete Resistivity

ASTM C1202

RCON2™ is a non-destructive testing device that measures the electrical resistivity of concrete samples. Resistivity has been shown to be an excellent method for evaluating the micro-structural properties of concrete, including: diffusion of chloride in concrete; rebar corrosion in concrete; setting time of fresh concrete; curing of concrete; moisture transfer in concrete; cathodic protection design, and crack detection in concrete.

Since RCON2 is a non-destructive testing method and requires no special sample prep, it can utilize the same samples that are currently being used for compressive strength testing without affecting that test.

RCON2 is fast (measurement time is less than 5 seconds), accurate ($\pm 2\%$, utilizing variable frequency method) and flexible (the measurement can be taken with different settings and test configurations). It also allows for continuous measurement of electrical resistivity over time, which can

be used to monitor several other parameters such as the changes of water content and time of setting in concrete specimens.

In concrete materials, electrical resistivity has been well correlated with important durability parameters such as permeability and diffusivity. In addition, this non-destructive test can easily be conducted on fresh or hardened concrete specimens at different ages or various stages of hydration in order to study workability, setting times and durability performance of the concrete. The electrical resistivity method has also been applied to investigate corrosion of rebar in concrete, creep, aggregate segregation and freeze/thaw of concrete since they affect the pore network properties. The concrete electrical resistivity techniques is also a suitable replacement for the rapid chloride permeability test of concrete (as per ASTM C1202) since there is a strong correlation between the electrical resistivity and durability performance of concrete.

The Giatec RCON2™ device, complete package includes: RCON2™ unit, Power adapter, Test cable set, Alligator test clip, Sample holder, Verification kit, Fresh concrete probe, User manual, Communication PC software, USB cable, 2 bottles of conductive gels, 2 pairs of contact sponges.

Giatec RCON2™ Complete HG-9035.3F
Shipping wt. 16 lbs. (7.2 kg.)

Giatec RCON2™ Device only HG-9011.3F
Shipping wt. 20 lbs. (9 kg.)

RCON2™ Accessories / Replacement Parts

| | |
|--|---------|
| Verification Kit | HG-9012 |
| Sample Holder, 2 pair Contact Sponges | HG-9013 |
| Contact Sponge, 1 pair 150mm | HG-9014 |
| Conductive Gel - Low Viscosity, 250ml | HG-9015 |
| Conductive Gel - Medium Viscosity, 250 ml. | HG-9016 |
| Fresh Concrete Probe | HG-9017 |
| Test Cable Set | HG-9018 |

**Pull-off Tester, DY-2**

ASTM C1583, D4541, D7234, D7522; BS 1881 Part 207; EN 1542, 1015, 1348; ISO 4624

The quality of concrete repairs is determined by the adhesive strength between the repair material and the substrate. Pull-off testing is the most widely used test method to assess bond strength. The DY-2 family of automated pull-off testers covers the complete range of pull-off applications with unmatched ease of operation and the ability to store a complete record of the test. The DY-2 with its integrated feedback controlled motor provides a regulated load rate as specified by all standards, thereby providing a fully automated test for the most repeatable results. It is lightweight for easy operation even on walls and overhead.

The DY-2 pull-off testers are also unique, in that they record every single test parameter required by specifications:

With the DY-2 pull-off testers, the operator is able to provide a complete record of the pull-off test, proving that the test was carried out in accordance with applicable standards.

Three versions are available, the HC-2985: 135 - 1349 lbf (0.6 - 6kN) covers most common applications, while HC-2986: 360 - 3597 lbf (1.6 - 16kN) provides increased accuracy for low-strength applications, and, the HC-2987: 360 - 562 - 5620 lbf (2.5 - 25kN) can be used for very high strength applications such as testing of fibre-reinforced polymers bonded to concrete structures or testing the bond strength of repair and overlay materials. **Disc set is not included with this product and must be ordered separately.**

| | |
|---|---------|
| 135 - 1349 lbf (0.6 - 6kN) Tensile Force | HC-2985 |
| 360 - 3597 lbf (1.6 - 16kN) Tensile Force | HC-2986 |
| 562 - 5620 lbf (2.5 - 25kN) Tensile Force | HC-2987 |
| Ship wt. 16lbs. (7.2kg) | |

| Pull-off Tester DY-2 Accessories | Part No. |
|---|------------|
| 50mm/M10 Disc Set, steel | HC-2985.1 |
| 50mm/M10 Disc Set, Alum. | HC-2985.2 |
| 20mm/M10 Disc Set, Alum. | HC-2985.3 |
| 50 x 50mm/M10 Disc Set, Alum. | HC-2985.4 |
| 40 x 40mm/M10 Disc Set, Alum. | HC-2985.5 |
| 100mm/M10 - 3-Disc Set, Alum. | HC-2985.6 |
| 100 x 100mm/M10-3-Disc Set Alum. | HC-2985.7 |
| 75mm/M10 Disc Set, Alum. | HC-2985.8 |
| Draw Bolt, M10 Short | HC-2985.9 |
| Draw Bolt, M8 Short | HC-2985.10 |
| Draw Bolt, M12 Short | HC-2985.11 |
| Adapter Plate for Large Discs | HC-2985.12 |
| Fixing Kit for vertical and overhead surfaces | HC-2985.13 |

Bond Test Kit with 25kN Gauge

ASTM D4541, D7234

The bonding strengths of a wide and varied range of materials including concrete, screeds, repair mortars, epoxy resin coatings, laminates, plastics, paints and enamels may be accurately determined using this Bond Tester. Adequate direct tensile strength or bonding strength between two layers is important if repairs to concrete structures or additional overlays and screeding on existing concrete is to be structurally sound. The pull-off test as a means of projecting the compressive strength of concrete and other materials involves bonding a circular steel disk to the surface by means of an epoxy resin adhesive. A controlled tensile force is then applied to the disk, and as the strength of the bond becomes greater than that of the material under stress it will eventually fail in tension. From the area of the disk and the force applied at failure it is possible to calculate a nominal tensile strength for the material. The standard kit includes: 50mm of stroke, a 25kN gauge; 10 x 50 mm steel bond discs; 10 x 75 mm steel bond discs and a calibration certificate

| | |
|-------------------------------|----------|
| Bond Test Kit with 25kN Gauge | HC-2988A |
| Ship wt. 50lbs. (22.6kg) | |

Standard-Duty Anchor Test Kit with 25kN Gauge

ASTM D4541, D7234

This Anchor Test Kit is designed for testing fixings, fasteners and anchors. It consists of a mechanical screw arrangement acting through a hydraulic load cell, which measures the load applied to the fixing directly. The resulting load value is then indicated on the dial type analog gauge. This Kit features the 25kN Gauge, to suit most applications. (Other gauges are available); threaded rods, studs and slotted button adapters in 1/4", 3/8" and 7/8" sizes and a calibration certificate.

Anchor Test - 25kN Gauge, UNC Thread HC-2957U

Anchor Test - 25kN Gauge, Metric Thread HC-2957M
Ship wt. 40lbs. (18kg)

Kits with Digital Gauge

All Bond and Anchor Test sets are available with a standard digital gauge. The use of digital gauges provides many advantages including improved accuracy of $\pm 0.5\%$ full-scale deflection (the analog gauge has an accuracy of $\pm 2\%$). Other features include:

- Backlight facility for improved viewing in low-light applications
- Ability to change the screen orientation, allowing easy reading from any angle
- Tougher outer gauge protective cover included
- Improved interface, allowing easier setup and operation of facilities, such as "peak hold"
- Improved transducer, 1000 bar is standard
- Range of display units kN, lbg, Kips, psi or bar

Anchor Test - 25kN Digital, UNC Thread HD-2957DU

Anchor Test - 25kN Digital, Metric Thread HD-2957DM
Ship wt. 40lbs. (18kg)



HC-2960



HC-2959



HC-2988.10

HC-2988.11

HC-2958

Medium-Duty Anchor Test Kit with 50kN Gauge ASTM D4541,D7234

The medium-duty tester kit bridges the middle ground of testing applications from 30kN to 50kN loads. This tester kit features upgraded engineering to accommodate the increased load requirements. While it appears similar to the 25kN models, internal components have been upgraded. To sustain the 50kN load, the HC-2960 features a reinforced, load-spreading bridge featuring three extended-length legs, which can be adjusted to fit up to six positions using an integral pin arrangement. An upgraded turning handle is used to match the increased loads and an integrated M24 operating nut is included to use with a ratchet wrench for operation in confined spaces. Kit Contents: Includes tester body and operating nut; Analog gauge (0-50kN); Spreading bridge with telescopic legs and hardened pins; Turning handle with integral 24mm Nut; M12 locking adapter; Bolt tester adapter; Threaded stud adapters: M16, M20 and M24; Button Adapters: M10, M12 threaded and 6.5, 8.5, 10.5 and 12.5 slotted, robust carrying case with grab handle.

Anchor Test – 50kN Gauge, UNC Thread HC-2960
Ship wt. 40lbs. (18kg)

Heavy-Duty Tester Kit –145kN Digital Gauge ASTM D4541,D7234

The HC-2959 portable, self-contained, 145kN Heavy-Duty Tester has been designed to meet the demand for proof load testing of larger construction fixings. A lightweight, triangular-shaped, aluminum load spreading bridge has been designed specifically for the this tester and directs reaction loads away from the fixing. This, combined with the tester, weighs only 31lbs. (14kg).

Applications:

- Proof and failure load testing of most fixing types
- High load expanding and resin anchors
- Cast-in sockets and channel
- Hold-down bolts for stanchion base plates
- Base plate fixings for column lighting
- Anchorage for crash barrier and safety fences
- Bridge parapet anchors

The HC-2959 comes with three (3)k fully-adaptable, telescopic aluminum legs are held in place with steel ball pins, offering easy assembly and adjustment. The swivel feet offer 30mm of fine adjustment. Load application is achieved via a ratchet handle, which drives a hydraulic multiplier and the applied load is recorded on a integral digital gauge.

Kit Contents: Includes tester body and operating nut; Digital gauge (0-145kN); Offset load spreading bridge with 10mm eye hook; (3) telescopic legs with fully-adjustable swivel feet; 400mm M20 connecting rod; M20 adjustable nut; 22mm Ratchet spanner; (5) M20 threaded adapters – M12, M16, M20, M24, M30; Dual spirit level; Hex wrenches and spare screws, carrying case and calibration certificate.

Heavy-Duty Tester Kit, Digital Gauge- HC-2959
Ship wt. 40lbs. (18kg)

Digital Gauge with Wireless App

Revolutionary digital technology captures test results using a mobile phone or tablet device, allowing for instant visual graphs on-site for bond testing, including anchors & eyebolts. Test results are produced in real time visual graphs for each test. Can be used with most current bond testers from most manufacturers. (Requires Wi-Fi or Mobile Network Signal) Compatible with Android or Apple-based devices such as smartphone/Tablet. Android system 4.4 onwards or Apple iOS 7 and above is required. Data enabled SIM with email function required for dispatching reports.

Note: Does not include bond tester or mobile device

Wireless App & Digital Gauge for Testers HC-2958
Ship wt. 5lbs. (2.26kg)

| Standard Gauges | Part No. |
|---------------------|------------|
| 5kN Gauge, Analog | HC-2988.4 |
| 10kN Gauge, Analog | HC-2988.5 |
| 15kN Gauge, Analog | HC-2988.7 |
| 20kN Gauge, Analog | HC-2988.6 |
| 25kN Gauge, Analog | HC-2988.8 |
| 30kN Gauge, Analog | HC-2988.9 |
| 25kN Gauge, Digital | HC-2988.10 |
| 30kN Gauge, Digital | HC-2988.11 |

| Adapters | Part No. |
|-----------------------------|---------------|
| Threaded Stud adapter, M10 | HC-2957TSA.10 |
| Threaded Stud adapter, M12 | HC-2957TSA.12 |
| Threaded Stud adapter, M30 | HC-2957TSA.30 |
| Threaded Button adap., M4 | HC-2957TBA.04 |
| Threaded Button adap., M5 | HC-2957TBA.05 |
| Threaded Button adap., M6 | HC-2957TBA.06 |
| Threaded Button adap., M8 | HC-2957TBA.08 |
| Slotted Button adap., M4.5 | HC-2957SBA.04 |
| Slotted Button adap., M5.5 | HC-2957SBA.05 |
| Bolt Test Adapter, M16 | HC-2957BTA.16 |
| 1" Threaded rod adapter | HC-2959.M100 |
| 1.25" Threaded rod adapter | HC-2959.M125 |
| 0.875" Threaded rod adapter | HC-2959.M875 |
| Ring Bolt Adapter | HC-2957RBAM12 |

| Bond Tester Extension Legs | Part No. |
|----------------------------|-----------|
| 50mm Hex extension legs | HC-2988.1 |
| 75mm Hex extension legs | HC-2988.2 |
| 100mm Hex extension legs | HC-2988.3 |

| Bond Discs | Part No. |
|----------------------------|------------|
| 50mm Bond Disc (set of 10) | HC-2988.50 |
| 75mm Bond Disc (set of 10) | HC-2988.75 |



HC-3186S.4F

Rapid, Freeze-Thaw Cabinet

ASTM C666, procedure A; AASHTO T161

Humboldt's Elite Series, Freeze-Thaw Cabinet is used to measure the resistance of concrete to deterioration caused by repeated cycles of freezing and thawing. The HC-3186S.4F Freeze-Thaw is designed to test up to eighteen 3" x 4" x 16" (76 x 102 x 406cm) concrete specimens simultaneously, with one being a control. Key features of the Freeze-Thaw Includes:

- Fully automatic operation frees operator to perform other lab duties.
- Allows users to establish field control using correlations between concrete strength and durability
- Permits the evaluation of variables in concrete properties and conditioning.
- Useful in the evaluation of the durability of aggregates, as well as the properties of admixtures.

Humboldt's touch-screen controller provides you with full, graphical monitoring of all testing functions in a stand-alone application. Now you can have full, finger-tip control and monitoring of all testing functions with Humboldt's touch-screen controller, found on our Freeze-Thaw Cabinet. The seven-inch, waterproof screen provides at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer.

Now, in a stand-alone application, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and temperature readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's USB port.

The HC-3186S Freeze-Thaw provides the following capabilities:

- User-created test control is possible, for changing freeze time, minimum temperature, maximum temperature and the number of cycles desired.
- Real-time, on-screen control and monitoring with graphing, allowing different data views to be chosen.
- Test data can be reviewed after a test is completed, which includes tabulation and graph views.
- Touch-screen interface for easy navigation.
- Test data can be downloaded or exported via the front USB port and a flash drive. Reports can be generated by using Humboldt's HM-Data Download software and the exported data.

It is possible to have up to eight freeze-thaw cycles within a 24-hour period, however, the exact number of cycles is dependent upon the time required for the temperature at the center of the control prism to fall from 40 to 0°F (4.4 to -17.8°C) and then back to 40°F (4.4°C). The temperature at the center of the control specimen is controlled with the use of a 0.75HP (0.6KW) refrigeration unit and electric resistance heaters with fully automatic controls.

Current temperature of the control specimen can be checked by a glance at the large, 7" color display on the controller. It is also possible to track the temperatures of freeze-thaw cycles in real-time with a glance at the display. For corrosion resistance and long service life, the HC-3186S Freeze-Thaw features a stainless steel, 84"L x 32"W x 35.75"H (213 x 81 x 91cm) cabinet construction with 3" (76mm) insulation on all sides. The internal test compartment measures 74" x 26" x 6" (188 x 66 x 15cm). A 30-amp circuit is required for operation.

Specifications

| | |
|---------------------------------------|---|
| Condenser Operating Temperature Range | -30°F to 45°F (-34°C to 7°C) evap (R-404A) Designed for up to 110°F (43°C) ambient |
| Data channels | 1 |
| Data storage | 1000 tests and up to 3000 readings per test |
| Cabinet Dims | 84"L x 32"W x 35.75"H (213 x 81 x 91cm) |
| Controller Dims | 22.25"H x 16.25"W x 6"D (56 x 41 x 15cm) |
| Voltage | 208/230V 50/60Hz Single Phase - 30amps |

Order H-3195 freeze-thaw molds separately, on next page.

Freeze-Thaw Cabinet Includes:

(17) H-3185TA Stainless Steel Sample Trays, 3" x 4" x 16.375" (76 x 102 x 406mm)

(1) H-3185TSA Stainless Steel Sample Tray with spout, 3" x 4" x 16.375" (76 x 102 x 406mm)

Freeze-Thaw Cabinet, 220V 50/60Hz HC-3186S.4F

Ship wt. 1200lbs. (544kg)

Controller Specifications

| | |
|----------------------|--|
| Display | 7" (178mm) VGA (480 x 800) Resistive-touch screen |
| Real-time test data | Graphic and tabulation |
| Processor | Dual 32-bit ARM |
| RAM | 64MB |
| Memory, non-volatile | 4GB |
| Data acquisition | 1 Channel |
| Logging speed | 1 reading every 5 minutes |
| Multi-test storage | 1000 |
| Points per test | 3000 |
| USB port | used to export data via thumb drive |
| Ethernet connection | for network connectivity |
| Firmware Update | Ethernet or flash drive |



Replacement Parts

| Item | Part No. |
|--|------------|
| Thermocouple for HC-3186S.4F | H-3186S.3 |
| Thermocouple for H-3185B | H-3185B.3 |
| Thermocouple for H-3185SD | H-3185SD.3 |
| Heating Element specify 115V or 230V | H-3185SH |
| 7-Day Chart Paper (100/Bx) -20 to +80°F | H-3185.1 |
| 7-Day Chart Paper (100/Bx) -30 to +10°C | H-3185.1AC |
| 7-Day Chart Paper (100/Bx) -20 to +50°F | H-3185.1AF |
| Pan Replacement Kit (1 per kit) | H-3185.3A |

Freeze-Thaw Specimen Mold

ASTM C233, C666; AASHTO T157, T161

For 3" x 4" x 16" (76 x 102 x 406mm) specimens exposed to rapidly repeated freeze-thaw cycles in water or air. Mold is cold-rolled steel with detachable base plate.

Freeze-Thaw Specimen Mold **H-3195**
Ship wt. 37.1 lb. (16.82kg)

Freeze-Thaw Specimen Mold

Mold for 4" x 4" x 16" specimens.

Freeze-Thaw Specimen Mold **H-3198**
Ship wt. 40 lb. (18.1kg)

Freeze-Thaw Specimen Mold

Mold for 100 x 100 x 400mm specimens.

Freeze-Thaw Specimen Mold **H-3198M**
Ship wt. 40 lb. (18.1kg)

Stainless Steel Sample Tray

3" x 4" x 16.375" (76 x 102 x 406mm) specimens.

Stainless Steel Sample Tray **H-3185TA**
Ship wt. 4 lb. (1.8kg)

Stainless Steel Sample Tray

100 x 100 x 400mm specimens.

Stainless Steel Sample Tray **H-3185TM**
Ship wt. 2 lb. (0.9kg)

Stainless Steel Sample Tray with Spout

3" x 4" x 16.375" (76 x 102 x 406mm) with spout.

SS Sample Tray with Spout **H-3185TSA**
Ship wt. 3 lb. (1.3kg)

E-Meter for Flexural Resonance of Concrete

ASTM C215, C666

The E-meter can determine flexural resonance of concrete under accelerated freezing and thawing cycles and aggressive environments, conforming to ASTM C215 and C666. It determines the resonant frequencies of the three modes of vibration and is the only method of calculating the following material parameters non destructively: Young's modulus of elasticity, modulus of rigidity, Poisson ratio and damping constant. Frequencies are automatically scanned in one of four ranges. It can handle specimen sizes up to 6 inches (150mm) in cross section and from 1.75 inches (45mm) to 28 inches (711mm) in length. A semi-automatic feature facilitates the fast identification of resonance. Oscillator frequency range: 10 Hz to 100 kHz in 4 switched range Frequency indicator display: 6 digit LED Gate times: 1 sec. or 10 sec. switch selected, LED indicated accuracy: 20 ppm + 1 count over full operating temperature range.

E-Meter for Flexural Resonance **H-3176**
Ship wt. 113 lb. (51.2kg)

Resonance Test Gauge

ASTM C215, C666

Designed for lab use, the Resonance Test Gauge (RTG) connects to the customer's Windows device for longitudinal, Flexural and torsional resonance testing of concrete, rock, asphalt and masonry (cylinders, beams and cores). Results can be exported to the Calculations Spreadsheet which automatically determines dynamic properties such as Young's modulus (E), shear modulus (G) and Poisson's ratio (ν) (meets ASTM C215 standard for resonance testing of concrete for dynamic properties and ASTM C666 standard for freeze-thaw durability testing).

Unit includes the following: 2 oz. Spherical Head Hammer; Spatula for Adhesive Grease; RTG Device, Jump Drive with RTG Software; Adhesive Grease; Accelerometer, Microdot BNC Cable, Mounting Block; Sponge Rubber Mat for Specimen Support. The RTG system must be used with a Windows 7-10 device running the RTG software. The computer or tablet is supplied by the user.

- Real-time waveform display while testing
- Automatic frequency calculation
- Full user selection of gain and units

| Specifications | |
|---|-----------------------|
| Sampling Rate | 45,455 samples/second |
| Accelerometer Flat Frequency Response Measurement Range | 20,000 Hz |
| Number of Samples Acquired Per Test | 1024 samples |
| Nyquist Frequency | 22,727 Hz |
| Frequency Resolution | 44.39 Hz |

Resonance Test Gauge

HC-3177
Ship wt 10lbs. (4.5kg)



H-2784



H-2784.500



HC-3706

Humboldt Super Air Meter

ASTM C231, AASHTO T152

The H-2784 Super Air Meter (SAM) is a testing device that measures both the air void spacing and air volume of plastic (fresh) concrete in about 10 minutes. Air void spacing has been shown to be a better indicator of concrete freeze-thaw durability than total air content; however, until now, it has been challenging to measure in fresh concrete. By being able to measure the actual air-void spacing in fresh concrete, the meter helps users better understand the freeze-thaw durability of their concrete before it is placed.


The meter can function in two ways. First, it provides all the same information as a Type B meter, under the same analytical conditions as a conventional pressure meter. After completing the conventional testing the meter is then able to move into a second mode of operation that places the concrete under a series of higher pressures. By understanding how the concrete responds to the series of high pressures, the meter can assess properties of the air-void system beyond the air content.

The H-2784 Super Air Meter is a modified version of a typical pressure meter (ASTM 231). The primary modification is that two sequential pressurizations are applied to the concrete. The deformation of the concrete is first investigated at 14.5, 30, and 45 psi, the pressure is then released, and the same pressure steps are used again to measure the deformation. The differences between the first and second pressure steps are used to calculate the SAM number, which is correlated with the average spacing between air voids in the concrete mixture. If the spacing between the voids is too high, then this could mean the concrete is susceptible to freeze-thaw deterioration. A SAM number of 0.20 has been shown to correctly determine over 90% of the time whether the spacing between the

bubbles meets the recommendations of the ACI 201 Concrete Durability Committee.

This new air meter has been investigated using more than 300 lab and field mixtures at Oklahoma State University and the FHWA Turner Fairbanks Laboratories. As part of an ongoing Pooled Fund Study, the SAM is being used by multiple DOTs on field concrete. The results of this testing are also being compared to performance in an ASTM C666 rapid freeze-thaw test*. An AASHTO Provisional Standard for this test has been approved. The meter is currently being used in more than 22 different U.S. States and one Canadian Province. The SAM has been specified in Oklahoma and Michigan on transportation projects.


The H-2784 includes one Super Air Meter testing device, and all accessories required to calibrate the meter and perform the type B or SAM tests. This includes a calibrator; a mallet; safety glasses; strike-off board; a tamping rod; filling bulb and a durable, protective case. It is recommended that the CAPE System (below) be used with the Super Air Meter.

Humboldt Super Air Meter **H-2784**
 Ship wt. 46lbs. (21kg)

CAPE System for Super Air Meter

ASTM C231, AASHTO T152

The CAPE Tank Accessory simplifies pressurization of the H-2784 Super Air Meter during testing, eliminating the need to manually pump to the required pressures. The tank is fitted with three inflation chucks including regulators that are easily attached to the pressurization valve of the Super Air Meter.


Super Air Meter CAPE System **H-2784.500**
 Ship wt. 21lbs. (9.5kg)

Water Impermeability Test Device

EN 12390-8, ISO 7031, UNI 9533

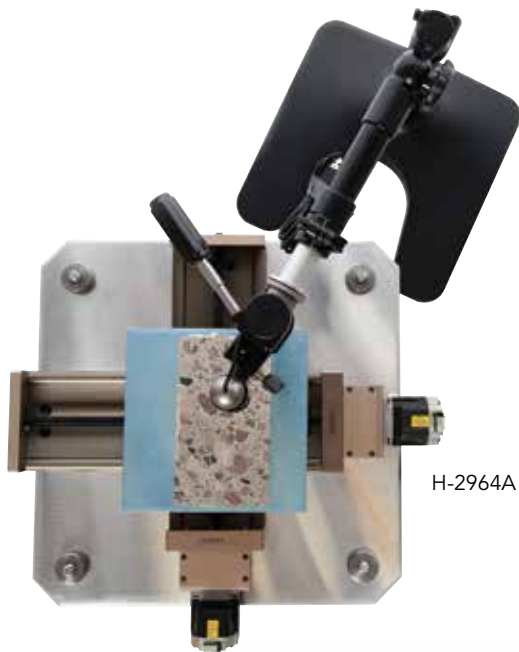
Used to determine the surface impermeability of concrete by water using concrete test specimens. The device determines the depth of water penetration into hardened concrete under a known time and pressure. Specimens are put into the test chamber, clamped with suitable flanges and gaskets, and then a known water pressure is applied to the specimen's surface for a time as called for by the Standard. An air compressor is used to provide an adequate and constant pressure. The water penetration is measured by quantitative water penetration measurement using the graduated burettes.

Available with either 3 or 6 test stations, these Impermeability test devices can be used with the following test specimen sizes: 150 x 150 x 120mm, 150 x 150 x 150mm, 200 x 200 x 120mm or 150 x 300mm (requires accessory).

Impermeability Device, 3 Station **HC-3703**
Impermeability Device, 6 Station **HC-3706**
 Ship wt. 348 lbs. (158kg)

Accessories

| Item | Part No. |
|-------------------------------|------------|
| Air Compression, 120V 50/60Hz | HM-4220 |
| Air Compression, 220V 50/60H | HM-4220.4F |
| Roughing plate, 100mm | HC-3703.6 |
| Roughing plate, 75mm | HC-3703.7 |
| Steel Inserts, 200x200x80mm | HC-3703.8 |
| Steel Inserts, 150x150x30mm | HC-3703.9 |
| Plastic Inserts, 200x200x80mm | HC-3703.10 |
| Plastic Inserts, 150x150x30mm | HC-3703.11 |



H-2964A



H-2964A (shown with computer, not included)



H-3230



H-3230.2

H-3230.3



H-3230.4

H-3230.7



H-3230.5



H-3230.6

Linear Traverse Machine

ASTM C457 Part B

The linear traverse machine is used to facilitate the counting of microscopic voids in concrete. The H-2964A complies or exceeds ASTM C457 specifications. Computer software controls the motorized specimen table with solid-state positioning motors. The software controls the traverse patterns and distances between measurements based on test sample parameters. The software also provides counting determinations to be made to material-type categories. Test results can be exported to Microsoft Excel for analysis and printing. Printable reports can be configured to Canadian Ministry of Transport or ASTM requirements.

Unit Includes:

- Digital microscopic video camera with integral light source
- Computer-controlled motorized specimen table with solid-state positioning motors
- Software CD with controller
- Multi-adjustable camera stand

Computer is not included.

Linear Traverse, 120V 60Hz H-2964A
Linear Traverse, 220V 50/60Hz H-2964A.4F

Ship wt. 100lbs. (45.3 kg)

Multi-Length Strain Gauge Set

ASTM C426

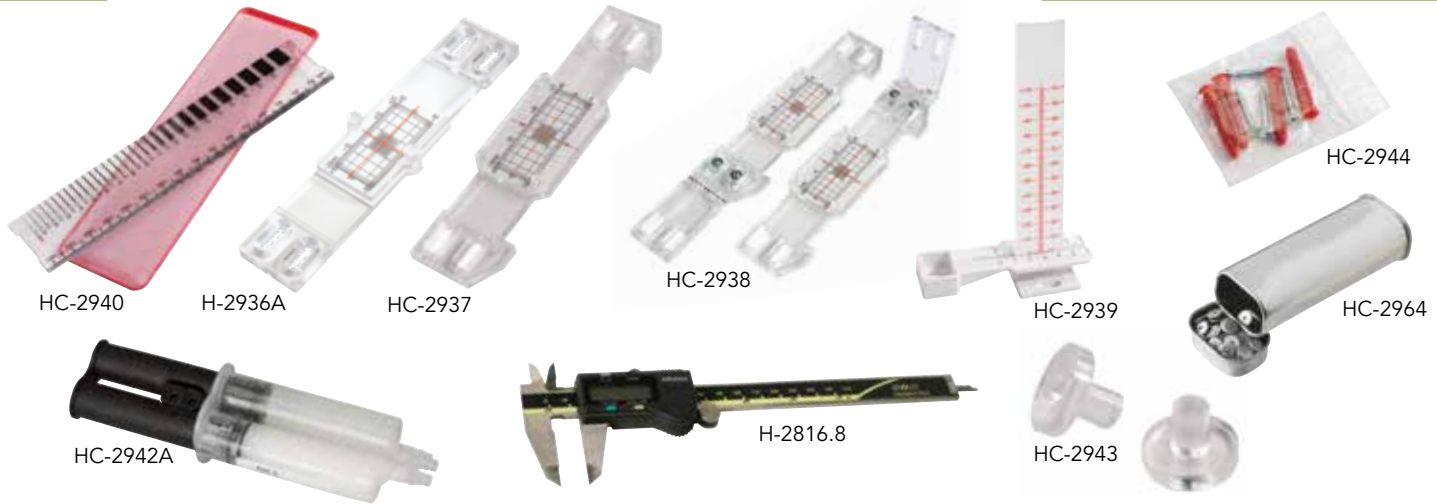
Mechanical gauge is recommended as a substitute for the Whittemore strain gauge for many applications. Designed to measure strain in masonry-type materials, structural components under load, opening or closing of structural cracks, measuring relative structural displacements, rock mechanics testing and drying shrinkage of concrete block testing. Instrument frame is cast aluminum alloy with 5 master settings of 2, 4, 6, 8 and 10 inches, easily set for gauging. Dial indicator has .0001" minimum graduation; effective strain range is 0.3". Maximum linear measurement is 0.4". Set includes: strain gauge, dial indicator, 8 brass inserts, 2 contact seats, 2 mounted contact points, invar master bar, punch bar and one compartmented wood storage case. Metric model has 5, 10, 15, 20 and 25cm settings and dial indicator with 0.02mm graduations.

Strain Gauge Set H-3230
Strain Gauge Set, Metric H-3231
Strain Gauge Set, Digital H-3230D
Strain Gauge Set, Digital, Metric H-3231D

Ship wt. 1 lbs. (.45 kg.)

Strain Gauge Replacement Parts

| | |
|-----------------------------|-----------|
| Contact Point | H-3230.2 |
| Contact Seat | H-3230.4 |
| Brass Inserts (pkg. of 100) | H-3230.3 |
| Invar Master Bar | H-3230.5 |
| Invar Master Bar, Metric | H-3230.5M |
| Punch Bar Point | H-3230.7 |
| Punch Bar | H-3230.6 |
| Punch Bar, Metric | H-3230.6M |

**Crack Width Gauge**

ACI 2242-01

The crack width gauge is designed specifically to measure widths and locations of cracks prior to beginning a monitoring program. The crack width gauge is suitable for internal and external use. It is made of polycarbonate, which has a coefficient of linear thermal expansion of 7.0×10^{-5} cm/cm/°C for ambient temperatures between -30°C and 30°C. The scale is calibrated from the end of the gauge to facilitate measuring cracks in corners. Supplied in protective case.

Crack Width Gauge**HC-2940**

Ship wt. 0.3lb. (.13kg)

Standard Crack Gauge

Crack gauges can be used to monitor horizontal or vertical movement across a crack on a flat surface. The H-2936A standard crack gauge is a precision device that consists of two plates, which overlap for a part of their length. The bottom plate is transparent and marked with a hairline cursor in the form of a cross. Can be fixed to the surface with screws or adhesive (not included). Supplied with instructions and record sheet.

Crack Width Gauge**H-2936A**

Ship wt. 0.15lb. (.06kg)

Crack Gauge Plus

The crack gauge plus can be used to monitor horizontal or vertical movement across a crack on a flat surface. The Plus offers two upgrades to the standard design. Rather than presetting the two measuring plates together at zero with tape, the plus uses four small pegs, which ensure alignment during installation and then removed during monitoring. The plus also provides measuring flats, which allow accurate readings to be taken with calipers during monitoring. Can be fixed to the surface with screws or adhesive (not included). Supplied with instructions and record sheet.

Crack Gauge Plus**HC-2937**

Ship wt. 0.2lb. (.09kg)

Corner Crack Gauge

The corner crack gauge uses a hinged mounting bracket to allow monitoring of cracks in corners with angles between 70° and 180°. Monitors both internal and external corners. Corner gauges use the design of the plus gauge using four small pegs, which ensure alignment during installation and are then removed during monitoring. The corner gauge also provides measuring flats, which allow accurate readings to be taken with calipers during monitoring. Can be fixed to the surface with screws or adhesive (not included). Supplied with instructions and record sheet. Sold in pairs.

Corner Crack Gauge, (2-pack)**HC-2938**

Ship wt. 0.4lb. (.18kg)

Displacement Crack Gauge

The displacement crack gauge monitors horizontal and displacement movement where there is a step across a crack due to displacement of "out-of-plane" movement. The gauge consists of a base plate (not calibrated), a top plate (calibrated) and a graduated ruler. The ruler is removed from the gauge when not taking a measurement, but used to measure the relative movement in the plates. Can be fixed to the surface with screws or adhesive (not included). Supplied with instructions and record sheet.

Corner Crack Gauge**HC-2939**

Ship wt. 0.4lb. (.18kg)

Crack Monitor Adhesive

Crack monitor adhesive is a fast-hardening 2-component epoxy adhesive for use in affixing crack monitors to concrete surfaces. Comes in a one ounce dual-tube syringe for easy application.

Crack Monitor Adhesive**HC-2942A**

Ship wt. 0.3lb. (.13kg)

Caliper Marks

Caliper marks can be affixed with adhesive to either side of a crack to be monitored and then used to measure crack movements with a caliper.

Caliper Marks (Pkg of 100)**HC-2943**

Ship wt. 0.3lb. (.13kg)

Caliper Mark Discs, Stainless Steel

Caliper marks can be affixed with adhesive to either side of a crack to be monitored and then used to measure crack movements with a caliper. Pkg. of 100.

Caliper Mark Discs, Stainless Steel**HC-2964**

Ship wt. 0.3lb. (.13kg)

Screws and Plugs for Crack Gauge

Package of (4) four zinc-plated screws and four plastic plugs, suitable for affixing a crack gauge to a flat surface.

Screws and Plugs for Crack Gauge**HC-2944**

Ship wt. 0.2lb. (.09kg)

Digital Caliper, 8" (200mm)

Provides accurate outside, inside, depth and step measurements and features large, easy-to-read LCD digits, rolling thumb wheel; plus control buttons for zero, on/off and inch/mm functions. Range: 0-8" (0-200mm); Accuracy: ± 0.001 .

Digital Caliper, 8" (200mm)**H-2816.8**

Ship wt. 2.2lb. (.9kg)

Crack Monitoring Kit

A kit designed to provide all the products needed to set up a crack monitoring program. Supplied with a courier bag with shoulder strap, the kit includes: (1) crack width gauge; (5) crack gauge plus (1) pair of corner crack gauges; (7) packs of fixing screws; (1) crack monitor adhesive; instruction booklet and record sheets.

Crack Monitoring Kit**HC-2941**

Ship wt. 3.5lb. (1.5kg)

Essential, Digital Crack Monitoring Kit

This set contains all the essential components needed to set up a crack monitoring system using precision digital calipers. This kit includes a crack width gauge to measure the width of cracks prior to monitoring, a digital caliper, a pack of stainless steel discs and crack record sheets. Also included is an illustrated manual with full instructions, which describes best practice methods for using the calipers. All the components can be re-ordered separately in order to replenish the kit.

Essential, Digital Crack Monitoring Kit**HC-2947**

Ship wt. 3.5lb. (1.5kg)

HC-2941



HC-2947



HC-2948



HC-2956



HC-2955



HC-2955.1



HC-2950



Professional, Digital Crack Monitoring Kit

This set contains all that is needed to set up a crack monitoring system using precision calipers. This kit includes a crack width gauge to measure the width of cracks prior to monitoring, a digital caliper with data port, a pack of stainless steel discs, a pack of caliper marks, a pair of corner discs and crack record sheets. Also included is an illustrated manual with full instructions, which describes best practice methods for using the calipers. All the components can be re-ordered separately in order to replenish the kit.

Pro, Digital Crack Monitoring Kit

HC-2948



Ship wt. 4lb. (1.8kg)

Concrete Crack Data Logger

The HC-2955 crack data logger provides a method to monitor cracks and linear displacements in concrete structures, featuring an integrated data logger, which measures both displacement and ambient temperature. This crack detector measures cracks, with a resolution of 0.01mm, by using a rotary, precision potentiometer, which is driven by the winding/unwinding of a stainless steel wire with an 80mm stroke. It is also possible to add an extension to the steel cable to monitor cracks over wide expanses or areas that are not readily accessible, such as bridge decks, multi-faceted structures and other hard-to-reach places. The crack detector is configured using a graphic, user interface operating on a Windows® computer.

Temperature measurement range is -4°F to 176°F (-20°C - +80°C) with 1° resolution. The unit is powered by a user-replaceable battery, which should last between six months and five years, depending on how the unit is configured and frequency of downloads.

The measurements are stored in internal memory and are downloaded to a Windows PC using a USB cable (supplied). Data logger capacity is: 51062 readings

or 18236 readings with redundant CRC, Acquisition frequency is adjustable from 10 seconds to 91 hours. Includes a download link for the latest version of the user guide and software.

Concrete Crack Data Logger

HC-2955



Ship wt. 1lb. (.45kg)

Concrete Crack Data Logger, Wi-Fi

The HC-2956 wireless crack data logger provides a method to monitor cracks and linear displacements in concrete structures, featuring an integrated data logger, which measures both displacement and ambient temperature. This crack detector measures cracks, with a resolution of 0.01mm, by using a rotary, precision potentiometer, which is driven by the winding/unwinding of a stainless steel wire with an 80mm stroke. It is also possible to add an extension to the steel cable to monitor cracks over wide expanses or areas that are not readily accessible, such as bridge decks, multi-faceted structures and other hard-to-reach places. The crack detector is configured using a graphic, user interface operating on a Windows® computer.

Temperature measurement range is -4°F to 176°F (-20°C - +80°C) with 1° resolution. The unit is powered by a user-replaceable battery, which should last between six months and five years, depending on how the unit is configured and frequency of downloads.

Measurements are stored in internal memory, which can be downloaded to a Windows PC via a wireless connection from a range of up to 150m using a graphic user interface on a PC computer. Data logger capacity is: 51062 readings or 18236 readings with redundant CRC, Acquisition frequency is adjustable from 10 seconds to 91 hours. Includes a download link for the latest version of the user guide and software.

Concrete Crack Data Logger

HC-2956



Ship wt. 1lb. (.45kg)

Extension Cables for Concrete Crack Data Loggers

Extension kit for the HC-2955 and HC-2956 Concrete Crack Data Loggers for those applications requiring a longer span across larger cracks and joints or where mounting points require a longer expanse. These cables are available in 4 sizes: 12" (30cm); 20" (50cm); 39" (100cm) and 79" (200cm).

| | |
|------------------------------|-----------|
| Cable Extension, 12" (30cm) | HC-2955.1 |
| Cable Extension, 20" (50cm) | HC-2955.2 |
| Cable Extension, 39" (100cm) | HC-2955.3 |
| Cable Extension, 79" (200cm) | HC-2955.4 |



Ship wt. 1lb. (.45kg)

Concrete Crack Measuring Microscope

The crack measuring microscope is a precision, hand-made product, which is designed specifically for measuring cracks in concrete. This high-definition microscope is further enhanced by having its own adjustable light source for darkened conditions. Overall height of the microscope is 5.125" (130mm).

The image is focused by turning a knurled knob on the side of the instrument and the eyepiece scale can be rotated through 360° to align with the direction of the crack. The 4mm width of measurement has a lower scale, divided into 0.2mm divisions, which are subdivided into 0.02mm divisions. Comes complete in its own sturdy wooden pocket-size case.

Concrete Crack Measuring Microscope HC-2950



Ship wt. 2lb. (0.9kg)



HC-3000



HC-3001


 HC-3000.1
 HC-3000.6
 HC-3000.7


HC-3000.2

HC-3000.2C



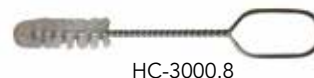
HC-3000.11

HC-3000.3


 HC-3000.4
 HC-3000.5


HC-3000.10

HC-3000.9



HC-3000.8

RH/Moisture Meter Kit with BluePeg Sensor ASTM F2170

The HC-3000 concrete moisture meter for contractors, floor covering installers and restoration specialists to use as a Thermo-Hygrometer or for in-depth moisture testing of concrete following ASTM F2170-11 RH in-situ probe test. Moisture meter indicates relative humidity, temperature, GPP and DPT.

If you are looking for an accurate Hygrometer, the HC-3000 concrete moisture meter with RH BluePeg probe should be your choice. The RH BluePeg probe uses a hi-accuracy sensor with a short acclimation time. The RH BluePeg probe can be connected with a small Adapter directly to the meter. For extended reach, a cable up to 50ft long can be added. All cables have easy-to-connect and fail-proof 35mm stereo connectors.

The RH BluePeg Probe, sleeves, cable and RH concrete moisture meter have been designed for a simple and fail-proof measuring procedure.

The RH BluePeg probe drops easily into the sleeve. The cap fits perfectly and is as flat as can be. The 3.5mm stereo connector can be easily connected. No pin alignment of the cable needs to be fitted. Plug in and read, that's what our customers like.

RH Moisture Meter w/BluePeg Sensors HC-3000
 Ship wt 2.9lbs. (1.3kg)

BW/Moisture Non-Invasive Meter Kit with BluePeg Sensor ASTM F2170, F2659

The HC-3001 is a non-invasive moisture meter with dual-depth measuring capabilities. The RH BluePeg Probe can be added to use as a Thermo-Hygrometer or for RH in-situ probe testing of concrete following the latest ASTM F2170 standard. The HC-3001's unique dual-depth pinless moisture meters allows the user to have more versatility. Two moisture meters in one. Great for thinner and thicker boards, engineered floor planks, and water-borne finishes.

Wood in Scan Mode: the HC-3001 gives wood moisture readings in percent. Corrections are built-in for a measuring depth of 1/4" and for 3/4" for each wood species setting (specific gravity 0.3 to 1.0). Included are 7 different settings for bamboo.

Building Materials in Scan Mode: the HC-3001 gives moisture content in percent for drywall. For concrete and light-weight building materials comparative readings can be taken to evaluate moisture conditions and find wet spots. 1/4" and 3/4" measuring depth are available. Conforms to ASTM 2659.

Air in RH Mode: Add RH BluePeg Probe for ambient relative humidity and temperature, GPP and DPT. Use meter as Thermo-Hygrometer.

Concrete in RH Mode: Add RH BluePeg Probes and RH accessories for in-situ moisture testing of concrete. Conforms to ASTM F2170.

**BW Moisture Non-Invasive Meter
w/BluePeg Sensors HC-3001**
 Ship wt 5lbs. (2.26kg)

HC-3000 & HC-3001 Moisture Meter Accessories

| | |
|-------------------------------|------------|
| Blue-Peg Sensors, 5-pk. | HC-3000.1 |
| Blue-Peg Sensors, 10-pk. | HC-3000.7 |
| Blue-Peg Sensors, 1-pk. | HC-3000.6 |
| RH Cable | HC-3000.2 |
| RH Cable for In-Situ Concrete | HC-3000.2C |
| RH Adapter for Sleeves | HC-3000.3 |
| RH Adapter for Meter | HC-3000.11 |
| Sleeves, 20-pk., 1.8" | HC-3000.4 |
| Sleeves, 100-pk., 1.8" | HC-3000.5 |
| Sleeves, 10-pk., 3.0" | HC-3000.10 |
| Calibration Salt | HC-3000.9 |
| Brush | HC-3000.8 |



Concrete Moisture Meter

ASTM F2659, F2170, F2420, BS 5325 and BS 8293
Tramex CMEX II is a digital display version of the concrete encounter. It operates on the principle of non-destructive impedance measurement. Parallel co-planar electrodes are mounted on the base, which during operation transmit a low-frequency signal into a concrete slab. Quickly and easily measures moisture content. Can be used with the Hygro-i relative humidity probe, which when connected, changes the moisture meter into hygrometer mode. This combination provides an ideal solution for measurements of ambient relative humidity, temperature and dew-point conditions within a building structure, especially concrete flooring. Humidity readings are displayed in both % relative humidity and mixing ratio (grains/lb or grams/kg). Provides accurate and fast results allowing concrete slab testing per ASTM F2170 in-situ method, and ASTM F2420 RH hood method.

Concrete Moisture Meter **HC-2994**
Ship wt 3lbs. (1.6kg)

Concrete Inspection Kit

ASTM F2659, F2170

A complete kit for testing concrete moisture per ASTM F2659 & ASTM F2170, featuring the HC-2994 moisture meter and Hygro-i® relative humidity probes. The Concrete Inspection Kit includes:

- CMEX II Digital, concrete moisture meter.
- 4 Hygro-i® RH probes for testing to ASTM F2170.
- Hygro-i® Electronic Interface Cable
- 12 Hole liners for testing to ASTM F2170.
- Calibration check salts for RH probes.
- IRTX Infrared surface thermometer and heavy-duty carry case.

Features:

- Instant, non-destructive concrete moisture content test from 0 - 6.9% to ASTM F2659.
- Fastest, most reliable Hygro-i® RH probe for testing to ASTM F2170.
- Perform multiple tests simultaneously.
- Re-usable Hygro-i® Relative Humidity probes prove to be the lowest cost per ASTM F2170.
- Test ambient site conditions of Temperature, RH, Dew Point & Mixing Ratio.
- Backlit display for ease of reading in low level lighting.
- Check calibration of RH probes as often as required by standards.
- Instant surface temperature readings to avoid condensation.

Concrete Moisture Meter **HC-2995A**
Ship wt 9lbs. (4.1kg)

Relative Humidity, Hygro-i Probe

ASTM F2170, F2420, BS 5325 and BS 8203

Relative humidity probe for use with HC-2994 concrete moisture meter.

Relative Humidity Hygro-i Probe **HC-2994.5**
Ship wt 2lbs. (.9kg)

HC-2994 Moisture Meter Accessories

| | |
|--------------------------|------------|
| Hygro-i® Probe, 1 probe | HC-2994.1 |
| Hygro-i® Probe, 3-pk. | HC-2994.2 |
| Hygro-i® Probe, 6-pk. | HC-2994.3 |
| Hygro-i® Probe, 12-pk. | HC-2994.6 |
| Hygro-i® Interface Cable | HC-2994.4 |
| Insulated RH Hood | HC-2994.7 |
| Calibration Check | HC-2994.8 |
| Calibration Check Plate | HC-2994.9 |
| Hole Liners, 50-pk. | HC-2994.10 |
| Hole Liners, 100-pk. | HC-2994.11 |

Concrete Encounter (Moisture)

The concrete encounter is a hand-held electronic moisture meter, which uses non-destructive impedance measurement to determine moisture levels in concrete floors. The concrete encounter will give you an instant reading of moisture content to over 6% for concrete and 0-10 comparative for gypsum floor screeds, enabling you to make an informed decision on when to install floor coverings. Designed to be used on clean, dust-free slabs, just switch on and press the instrument firmly against the floor surface. Readings are then read directly from the analog meter. Coplanar electrodes with spring-loaded contacts enhance signal depth and sensitivity to a depth of .5" (12.5mm).

Concrete Encounter (Moisture) **HC-2990**
Ship wt 1.4lbs. (0.6kg)

Vapor Emission Test Kit

ASTM E1907, F1869

The vapor emission test is used for determining the moisture acceptability for the placement of floor coverings and coatings over concrete slab surfaces. Using this method, users can easily quantify the volume of water vapor emitting from a 1,000 square foot concrete slab over a 24-hour period. Commonly known as the anhydrous calcium chloride vapor emission method, the test is directly specified by the vast majority of the floor covering industry as the primary measure of moisture acceptability for floor covering or coating installations. The kit consists of a calcium chloride container, a specifically designed dome cover with seal and step-by-step instructions. A balance or scale readable to 0.1 grams is required, but must be purchased separately.

Vapor Emission Test Kit
12-pak (10,000 sq. ft. coverage) **HC-2993B**
3-pak (1,000 sq. ft. coverage) **HC-2993A**
Ship wt 4.4lbs. (1.9kg)

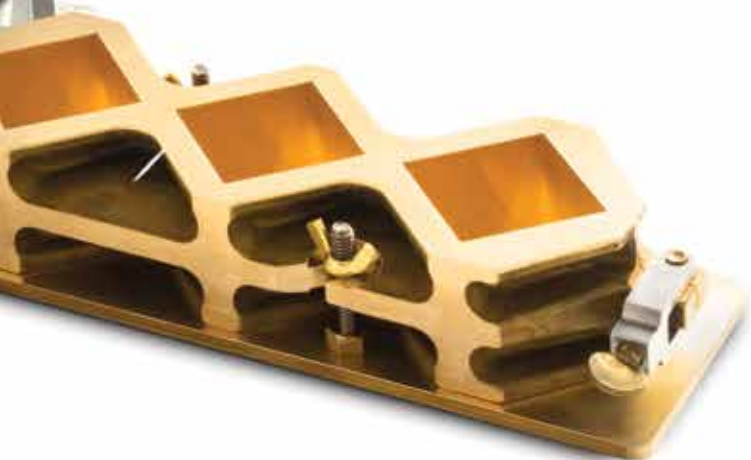




CEMENT

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H-3852.3F



H-3853.3F



H-3854.3F


Mortar Mixer, 4.73L (5qt)

ASTM C305; AASHTO T162; EN 196
DIN 1164; BS 3892; ISO 679; NF P15-411

Two-speed mixer designed to mix cement mortars and pastes. Mixer provides manually-controlled cement, water and sand supplies. Mixer features a 5 Liter (5.3qt) stainless steel bowl and ASTM stirrer, and a two-speed motor, which runs at either 140 \pm 5 rpm or 285 \pm 10 rpm.

Features touch screen-operated control panel, which provides fast, easy control in eight languages. Numerous safety features are incorporated in the mixer and includes a service program with malfunction messages for operator, including paddle/planetary speed and time monitoring. Heavy-duty construction of aluminum and cast iron provides durability and a long service life. The mixer provides a powerful motor for quiet and maintenance-free operation aided by the use of planetary gears and a toothed, belt drive. The mixing bowl is connected to the mixer by a quick-release clamping system. The distance between the mixing bowl and the stirrer is 3 \pm 1 mm and can be easily and accurately set.

Mixer design conforms to CE standards, featuring a mixing bowl cover, electronic position monitoring of the mixing bowl, emergency stop switch and restart protection.

Mortar Mixer, 4.73L (5qt) 120/230V 50/60Hz H-3852.3F
 Ship wt. 165lbs. (75kg)

Mortar Mixer w/ Program Control and Auto Sand Feed


ASTM C305; AASHTO T162; EN 196, EN 413, EN 480, DIN 1164; BS 3892; ISO 679; NF P15-411

Mixer with 4.73L (5qt) capacity provides automatic program control and auto sand feed with manually-controlled cement and water supply. Provides software with 4 standard programs installed covering the following standards: ASTM C305, EN 196 -1,3,9; EN 480 and EN 413. Two-speed mixer designed to mix cement mortars and pastes. Mixer features a 5 Liter (5.28qt) stainless steel bowl and ASTM stirrer, and a two-speed motor, which runs at either 140 \pm 5 rpm or 285 \pm 10 rpm.

Features touch screen-operated control panel, which provides fast, easy control in eight languages. Numerous safety features are incorporated in the mixer and includes a service program with malfunction messages for operator, including paddle/planetary speed and time monitoring.

Heavy-duty construction of aluminum and cast iron provides durability and a long service life. The mixer provides a powerful motor for quiet and maintenance-free operation aided by the use of planetary gears and a toothed, belt drive. The mixing bowl is connected to the mixer by a quick-release clamping system. The distance between the mixing bowl and the stirrer is 3 \pm 1 mm and can easily and accurately set.

Mixer design conforms to CE standards, featuring a mixing bowl cover, electronic position monitoring of the mixing bowl, emergency stop switch and restart protection.

Mortar Mixer w/Program, 120/230V 50/60Hz H-3853.3F
 Ship wt. 165lbs. (75kg)

Mortar Mixer w/ Program Control and Auto Sand and Water Feed


ASTM C305; AASHTO T162; EN 196, EN 413, EN 480, DIN 1164; BS 3892; ISO 679; NF P15-411

Mixer with 4.73L (5qt) capacity provides automatic program control and auto sand feed with manually-controlled cement and water supply. Provides software with 4 standard programs installed covering the following standards: ASTM C305, EN 196 -1,3,9; EN 480 and EN 413. Two-speed mixer designed to mix cement mortars and pastes. Mixer features a 5 Liter (5.28qt) stainless steel bowl and ASTM stirrer, and a two-speed motor, which runs at either 140 \pm 5 rpm or 285 \pm 10 rpm.

Features touch screen-operated control panel, which provides fast, easy control in eight languages. Numerous safety features are incorporated in the mixer and includes a service program with malfunction messages for operator, including paddle/planetary speed and time monitoring.

Heavy-duty construction of aluminum and cast iron provides durability and a long service life. The mixer provides a powerful motor for quiet and maintenance-free operation aided by the use of planetary gears and a toothed, belt drive. The mixing bowl is connected to the mixer by a quick-release clamping system. The distance between the mixing bowl and the stirrer is 3 \pm 1 mm and can easily and accurately set.

Mixer design conforms to CE standards, featuring a mixing bowl cover, electronic position monitoring of the mixing bowl, emergency stop switch and restart protection.

Mortar Mixer w/Program, 110/230V 50/60Hz H-3854.3F
 Ship wt. 170lbs. (77kg)



H-3858.3F



HC-3851



H-3841

Humboldt Laboratory Mixer, 5-Qt.

ASTM C305; AASHTO T162; EN 196
DIN 1164; BS 3892; ISO 679; NF P15-411

Humboldt's NEW 5-Qt. Laboratory Mixer has been designed to provide material testing labs with a step up in quality from the typical lab mixer. This mixer has been designed specifically for the demands of cement and soil mixing and not as a kitchen-prep machine. This new mixer, with its clear safety cover provides a sealed mixing design, which allows for material, water and other additives to be easily added to the mix via a port at the top of the mixer. The clear safety cover is attached to the mixer, independent of the bowl and can be removed for cleaning. The mixer features lightweight aluminum construction and comes with a stainless steel stirrer and mixing bowl.

The H-3858 promotes extremely safe operation and complies with CE standards. It provides enclosed operation, an emergency stop button and stops automatically when the bowl is lowered during the mixing process. Its design is optimized for easy handling including its easy-lowering bowl mechanism. The mixer provides two mixing speeds: 140 \pm 5 rpm and 285 \pm 10 rpm. Dimensions are: 9.25" x 15.5" x 22.4" (235 x 396 x 568mm).

Mixer, 5-Qt. (4.73L), 120/230V 50/60Hz H-3858.3F
Shipping wt. 66lbs (30kg)

Mortar Mixer, 5L (5.3qt)

ASTM C305; AASHTO T162; EN 196
DIN 1164; BS 3892; ISO 679; NF P15-411

This excellent, alternative to the Hobart mixer features two-speed, manual-control with a very robust design, expressly made for the efficient mixing of cement pastes and mortar. The mixer offers two speeds: 140 rpm for revolving with 62 rpm planetary action and 285 rpm revolving with 15 planetary action. This mixer features a heavy-duty design, which provides excellent stability when placed on a counter top. Provides open mixing bowl for easy visual consistency control. Simple distance control between stirrer paddle and mixing bowl maintains standard distance between bowl and stirrer.

Hoisting mechanism can also be used to lower the mixing bowl. Quick-clamping system allows mixing bowl to be attached to the mixer easily. Provided with standard stainless steel bowl and standard beater.

Mortar Mixer, 5L (5.3qt), 120V 60Hz HC-3851

Mortar Mixer, 5L (5.3qt), 230V 60Hz HC-3851.2F

Mortar Mixer, 5L (5.3qt), 230V 50Hz HC-3851.5F
Ship wt. 125lbs. (56kg)

Mixer, 5-Qt. (4.73L)

ASTM C305; AASHTO T162

ASTM-compliant mixer for mixing hydraulic cement pastes and mortars of plastic consistency. Mixer includes H-3844 bowl positioning adapter, a 5-qt. (4.73L) stainless steel bowl and 1 flat, stainless steel beater for mixing heavy materials. Hobart model No. N-50 operates on principle of planetary action—beater reaches every part of the batch, rotating on its axis in opposite directions as it moves around the bowl. Thoroughly blends, mixes and aerates all ingredients for consistent, predictable finished batches. Selective agitator transmission has 3 speed settings: 139, 285 and 591 RPM. Base dimensions: 10.375 x 15" (264 x 381mm). Height: 17" (432mm). Features UL-listed cord and plug. See below for accessories and replacement parts.

Mixer, 120V 60Hz H-3841

Mixer, 230V 60Hz H-3841.2F

Mixer, 230V 50Hz H-3841.5F

Ship wt. 55lbs. (25kg)

| Mixer Components | Part # |
|---|-----------|
| Bowl positioning adapter | H-3844* |
| Bowl lid, acrylic | H-3846L |
| Beater— stainless steel, flat-type | H-3841.1* |
| Bowl— stainless steel, 5 qt. (4.73L) | H-3841.2* |
| Wire loop whip— stainless steel | H-3841WW |
| Cage (guard) for bowl, metal | H-3841.7 |
| Wire loop whip— SS, Heavy-duty, 0.25" dia. wire | H-3841HW |

* Included with H-3841 mixer.



H-3841.1



H-3844



H-3841.2



H-3841HW



H-3841WW



ACCESSORIES

For Mixer Component Chart,
please see previous page 223.

Humboldt Extreme-Duty Whisk

Custom, hand-made extreme-duty whisk designed for use with the H-3841 mixer. Whisk is formed from 0.25" dia. stainless steel rod for extended service. Designed to withstand the abuse of mixing heavy-aggregate concrete and asphalt mixes. Whisks are available for other mixers, see page 280 for information.

Humboldt Extreme-Duty Whisk **H-3841HW**
 Ship wt. 3lbs. (1.3kg)

Test Sand, ASTM 20-30

ASTM C91, C141, C185, C359, C778; AASHTO T132, T137, T185

Sand is specially graded natural silica sand to pass a No. 20 (850 μ) sieve. Specific gravity is 2.65. Packed in 50 lb. (22.7kg) bags or boxes.

Test Sand, ASTM 20-30, bag **H-3820**
Test Sand, ASTM 20-30, box **H-3820BX**
 Ship wt. 55lbs. (24kg)

Ottawa Test Sand for Cube Molds

ASTM C87, C109, C348, C359, C593, C778; AASHTO T71, T106, T185

Sand is specially graded natural silica sand graded to retain 98% on a No. 100 (150 μ) sieve, 75% on a No. 50 (300 μ) 30% on a No. 40 (425 μ) and 2% on a No. 30 (600 μ). Specific gravity is 2.65. Packed in 50 lbs. (22.7kg) bags or boxes.

Ottawa Test Sand, bag **H-3825**
Ottawa Test Sand, box **H-3825BX**
 Ship wt. 53lbs. (24kg)



H-3341



H-3342



H-3340



H-3820



H-3825

H-2845
H-2846**Tube Sampler with Partitions, Bulk Cement**

ASTM C183; AASHTO T127

For sampling hydraulic cement in bulk shipments or bulk storage. Has two polished brass telescopic tubes with registering slots (with partitions) that open or close by rotation of the inner tube. Outer tube has sharp point to facilitate penetration. Sampler is 1.375" (35mm) dia. x approximately 63" (160cm) long.

Tube Sampler with Partitions **H-3341**
 Ship wt. 9.8lbs. (4.4kg)

Tube Sampler w/o Partitions, Bulk Cement

ASTM C183; AASHTO T127

For sampling hydraulic cement in bulk shipments or bulk storage. Has two polished brass telescopic tubes with registering slots (without partitions) that open or close by rotation of the inner tube. Outer tube has sharp point to facilitate penetration. Sampler is 1.375" (35mm) dia. x approximately 63" (160cm) long.

Tube Sampler without Partitions **H-3342**
 Ship wt. 10.9lbs. (4.49kg)

Tube Sampler, Packaged Cement

ASTM C183; AASHTO T127

For sampling hydraulic packaged cement, brass unit has hardwood handle. Unit is 1.25" (32mm) dia. x 28.75 (730mm) long.

Tube Sampler, Packaged Cement **H-3340**
 Ship wt. 1.7lbs. (.77kg.)

Air Entrainment Meters for Mortar

EN 1015-7, EN 459-2

Air entrainment meters for testing freshly-mixed mortar with direct readings in percent. Uses hand-operated pump. The H-2845 and H-2846 Air Meters are used for the determination of the total air content in cement paste, mortar and masonry cement. These meters have a pressure chamber, in which a defined pressure is generated. By opening the overflow valve, the pressure in the chamber is equalized within the sample container, which is filled with mortar. The pressure drop is a measurement of the air content present in the mortar. The accuracy of the pressure gauge is 1.0. Both air meters use pushbutton controls for simple test operation. Both meters use a mechanical valve to provide a reliable seal between the pressure chamber and test container. The pressure gauge is integrated in the top of the meter. Quick-release fasteners between the container and cover provide easy sealing and opening of the meter. Both meters utilize a robust hand pump for operation independent of air supply system.

Air Entrainment Meter for Mortar, 1L **H-2845**

Air Entrainment Meter for Mortar, 0.75L **H-2846**
 Ship wt. 2.4lbs. (1.08kg)

Air Meter Accessories

| Description | Model |
|----------------------------|----------|
| Filling Hopper (1L & 0.75) | H-2845.1 |
| Transport Box (1L & 0.75) | H-2845.2 |



**Cube Mold, Diagonal Bronze**

ASTM C87, C91, C109, C141, C267, C307, C311, C472, C617, C618, C1073; AASHTO T71, T106.

Three-gang, cube mold with diagonal arrangement in forged bronze. Reinforcing rib prevents spreading and detachable baseplate. Available in 2" and 50mm.

2" Cube Mold, Parallel H-2820
50mm Cube Mold, Parallel H-2820M
Ship wt. 13.7lbs. (6.2kg)

Cube Mold, Diagonal Stainless Steel

ASTM C87, C91, C109, C141, C267, C307, C311, C472, C617, C618, C1073; AASHTO T71, T106.

Three-gang, 2" cube mold with diagonal arrangement in forged stainless steel. Reinforcing rib prevents spreading with detachable baseplate.

2" Cube Mold, Diagonal Stainless Steel H-2808
Ship wt. 12lbs. (5.4kg)

Cube Mold, Parallel Stainless Steel

ASTM C87, C91, C109, C141, C267, C307, C311, C472, C617, C618, C1073; AASHTO T71, T106.

Three-gang, cube mold with parallel arrangement in 316 stainless steel. Fitted with angles for attaching to studs threaded into detachable baseplate. Available in 2" and 50mm.

2" Cube Mold, Parallel H-2810
50mm Cube Mold, Parallel H-2810M
Ship wt. 14lbs. (6.3kg)

Cube Mold, Expansive Grout, Bronze

2" cube mold for expansive grout with diagonal arrangement, forged bronze. Reinforcing rib prevents spreading. Detachable base plate and top plate. Also available in 50mm.

Cube Mold, Expansive Grout, 2" H-2823
Cube Mold, Expansive Grout, 50mm H-2823M
Ship wt. 17.2lbs. (7.8kg)

Cover Plate for Cube Mold

Cover plate for slowing the cooling rate as compound is poured. Designed to be used with H-2820 cube molds.

Cover Plate for Cube Mold H-2822
Ship wt. 6.2lbs. (2.8kg)

Cube Mold, Expansive Grout, Stainless Steel

2" cube mold for expansive grout with diagonal arrangement, forged stainless steel. Reinforcing rib prevents spreading. Detachable base plate and top plate.

Cube Mold, Expansive Grout H-2802
Ship wt. 14lbs. (6.3kg)

Cube Mold, Econ-o-Cube

ASTM C109

The Econ-O-Cube cube mold forms three 2" test cubes in a diagonal arrangement. Mold and detachable base are held together by self-aligning thumbscrews, which ensure an even, tight fit. Molded to ASTM C109 dimensional tolerances.

Cube Mold, Econ-o-Cube H-2821
Ship wt. 4lbs. (2kg)



H-2809



H-2816.8



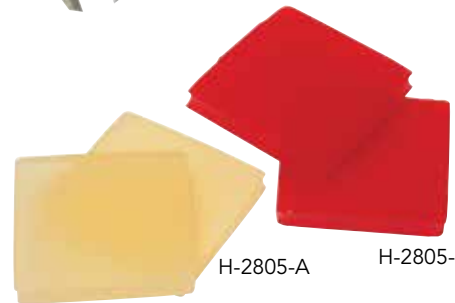
H-2817



H-2800



H-3855



H-2805-A

H-2805-R



H-2812



H-2860W

H-2860



H-2804

Cube Mold, Stamped Construction

2" cube mold with diagonal arrangement. Used with cement, gypsum, lime, mortars, etc. These molds do not meet ASTM or AASHTO specifications and must be individually measured.

Cube Mold, Stamped Construction H-2809
 Ship wt. 1.7lbs. (0.7kg)

Briquette Mold

ASTM C307

Cast-bronze briquette mold for hydraulic cement mortar tensile strength tests. Bronze clamps with pins hold the two mold halves securely. Designed to prevent spreading during molding.

Briquette Mold H-2800
 Ship wt. 3.5lbs. (1.5kg)

Tamper, Wood

ASTM C87, C109, C157, C185, C596; AASHTO T106, T137, T160

Wood tamper is 6" (152mm) long with 0.5 x 1" (13 x 25mm) cross section.

Tamper, Wood H-2860W
 Ship wt. 0.3lbs. (0.14kg)

Tamper, Rubber Compound

Rubber compound tamper is 6" (152mm) long with 0.5 x 1" (13 x 25mm) cross section. Does not comply with ASTM standards.

Tamper, Rubber Compound H-2860
 Ship wt. 0.3lbs. (0.14kg)

Tamping Stick

ASTM C185; AASHTO T137

Maple wood with .625" (16mm) dia. and 6" (152mm) length.

Tamping Stick H-3855
 Ship wt. 0.1lbs. (0.04kg)

Rubbing Block

Ground steel block 3" dia. x 1" (76 x 25mm) for removing loose sand grains and encrustations from concrete specimen surfaces before compressive testing.

Rubbing Block H-2812
 Ship wt. 0.2lbs. (0.09kg)

Digital Caliper, 0-200mm

Provides accurate outside, inside, depth and step measurements and features large, easy-to-read LCD digits, rolling thumb wheel; plus control buttons for zero, on/off and inch/mm functions.

Digital Caliper, 0-200mm H-2816.8
 Ship wt. 2.2lbs. (1kg)

Dial Caliper, Stainless Steel 6" (150mm)

Easy-to-read black face dial caliper with combination inch and metric scales features 0.001"/0.1mm graduations, hardened and ground stainless steel main beam with hardened, ground and lapped measuring faces.

Dial Caliper, Stainless Steel 6" (150mm) H-2817M
 Ship wt. 1.5lbs. (0.68kg)

Dial Caliper, Stainless Steel 6"

Similar to above, features a 6" measuring range with .001" graduations and .100" per revolution.

Dial Caliper, Stainless Steel 6" (150mm) H-2817
 Ship wt. 1.3lbs. (0.58kg)

Certified Calipers are also available, please inquire.

2" Cube Compression Pad, Amber

Compression pad, 90 durometer, used in compression tests of 2" cubes. Used with H-2804 Retainer Caps. Sold individually.

2" Cube Compression Pads, Amber H-2805-A
 Ship wt. .25lbs. (.11kg)

2" Cube Compression Pad, Red

Compression pad, 80 durometer, used in compression tests of 2" cubes. Used with H-2804 Retainer Caps. Sold individually.

2" Cube Compression Pads, Red H-2805-R
 Ship wt. 0.25lbs. (0.11kg)

2" Cube Pad Retainer Caps

Stainless steel retainer caps for use with 2" cube specimens. Use with 2" compression pads to eliminate the need for capping compound. Sold in sets of 2.

2" Cube Pad Retainer Caps H-2804
 Ship wt. 0.25lbs. (0.23kg)

2" Cube Compression Pads Set

Compression pads used with H-2804 Retainer Caps. Sold in set, consisting of (2) H-2805-R and (2) H-2805-A.

2" Cube Compression Pads Set H-2805
 Ship wt. .5lbs. (.22kg)



| Prism Molds | | |
|--|----------------------|---------|
| Description | Ship wt. | Model |
| Application: Autoclave expansion of Portland cement; length change of mortar and concrete; potential alkali reactivity of cement/aggregate combinations; linear change of magnesium and oxychloride cements; volume change of cement paste | | |
| 1" x 1" x 10" (25 x 25 x 254mm), 1-mold, cold-rolled steel | 7.3 lbs (3.3kg) | H-3252 |
| 1" x 1" x 10" (25 x 25 x 254mm), 2-mold, cold-rolled steel | 9.6 lbs (4.3kg) | H-3253 |
| 1" x 1" x 5" (25 x 25 x 127mm), 2-mold, stainless steel | 6 lbs (2.72kg) | H-3255S |
| Description | Ship wt. | Model |
| Application: Volume change tests of mortars | | |
| 2" x 2" x 10" (51 x 51 x 254mm), 2-mold, cold-rolled steel | 20.6 lb (9.3kg) | H-3251 |
| 1" x 1" x 5" (25 x 25 x 127mm), 2-mold, cold-rolled steel | 6 lb (2.7kg) | H-3255 |
| Application: Volume change of cement past; length change of mortar and concrete | | |
| 3" x 3" x 10" (76 x 76 x 254mm), 1-mold, cold-rolled steel | 24.8 lbs (11kg) | H-3254 |
| Application: Volume change tests | | |
| 4" x 4" x 10" (102 x 102 x 254mm), 1-mold, cold-rolled steel | 35.5 lbs (16.1kg) | H-3256 |
| 1.6" x 1.6" x 6.3" (40 x 40 x 160mm) 3-gang mold, cold-rolled steel This mold, not used with gauge studs | 14.3 lbs (6.4kg) | H-3270 |

Prism Molds

ASTM C490

Designed to produce required 10" effective gauge length, prism test bars. Molds feature removable partitions, base and end plates. Effective gauge length is measured from inside end of the studs. Molds produce cement prism specimens 11.25" long. Including studs, outside to outside length of specimen is 11.625".

Prism Molds



see chart
Ship wt. see chart

Gauge Studs

ASTM C151, C157, C227, C490; AASHTO M210, T107.

Gauge studs have stainless steel contact points and are knurled and threaded for use with cement prism molds. Packaged 10 per bag.

Gauge Studs



H-3260
Ship wt. 0.15lbs. (0.06kg)

Tamping Rod

ASTM C157, C192; AASHTO T60.

Round, straight steel .375" dia. x 12" (10 x 305mm). Both ends rounded to a hemispherical tip the same diameter as the rod.

Tamping Rod



H-2905.1
Ship wt. 0.5lbs. (0.23kg)

Restraining Cage, 2" x 2" x 10"

ASTM C806

For 2" x 2" x 10" (51 x 51 x 254mm) prism molds. Features 1/4-20 continuous threaded rod and acorn nuts.

Retaining Cage, 2" x 2" x 10"



H-3251RC
Ship wt. 1.4lbs. (0.63kg)

Restraining Cage, 3" x 3" x 10"

ASTM C878

For 3" x 3" x 10" (51 x 51 x 254mm) prism molds. Features 1/4-20 continuous threaded rod and acorn nuts.

Restraining Cage, 3" x 3" x 10"



H-3257
Ship wt. 2.8lbs. (1.27kg)

Demold Device for Prism Molds

Handy device for removing prism samples from molds.

Demolding Device for Prism Molds



H-3258DD
Ship wt. 4lbs. (1.8kg)

Go-No Go Gauge

For gauge stud and molds.

Dimensions: 1" x 1" x 10" molds.

Go-No Go Gauge



H-3258
Ship wt. 2lbs. (0.9kg)

**Flow Table, Motorized with Counter**

ASTM C87, C109, C110, C185, C230, C243, C348, C593; AASHTO T71, T106, T137 and T152
Used to determine the flow of hydraulic cement, mortars and cement pastes. A test specimen is molded on the table to a specified volume and shape. Then, with the mold removed, leaving the test specimen on the table. The table is dropped and raised (via a hand crank or optional motor) a specified number of cycles, after which the flow (or increase in average diameter of the specimen) is measured. Motorized flow table with 10" (254mm) dia. cast-bronze table/platen and automatic digital counter. Motor stops automatically once pre-set number of drops is achieved. Includes heavy-duty table/platen assembly, standard H-3622 cast bronze, 2.75" top dia. x 2" high x 4" bottom dia. cone mold, motor and H-3614B counter. Designed to be mounted to concrete mounting block. Order H-3624F, pedestal form and easily create your own mounting block. Applications include: compression strength and air content tests of cement mortar; flow tests of hydraulic cement mortars; consistency tests of magnesium oxychloride cements; flexural strength test for bond strength or mortar to masonry units.

| | |
|----------------------------------|-----------|
| Flow Table, w/Counter, 120V 60Hz | H-3624 |
| Flow Table, w/Counter, 220V 60Hz | H-3624.2F |
| Flow Table, w/Counter, 220V 50Hz | H-3624.5F |
| Ship wt. 81lbs. (37kg) | |

Flow Table, Motorized

ASTM C230

Used to determine the flow of hydraulic cement, mortars and cement pastes. A test specimen is molded on the table to a specified volume and shape. Then, with the mold removed, leaving the test specimen on the table. The table is dropped and raised (via a hand crank or optional motor) a specified number of cycles, after which the flow (or increase in average diameter of the specimen) is measured. Motorized flow table with 10" (254mm)

dia. cast-bronze table/platen. Includes heavy-duty table/platen assembly, standard H-3622 cast bronze, 2.75" top dia. x 2" high x 4" bottom dia. cone mold, and motor. Designed to be mounted to concrete mounting block. Order H-3624F, pedestal form and easily create your own mounting block. Used in determining consistency of cement mortars.

| | |
|----------------------------------|-----------|
| Flow Table, Motorized, 120V 60Hz | H-3625 |
| Flow Table, Motorized, 220V 60Hz | H-3625.2F |
| Flow Table, Motorized, 220V 50Hz | H-3625.5F |
| Ship wt. 80lbs. (36kg) | |

**NOTE**

220V 60Hz machines require a transformer, which is included.

Flow Table, Hand-Driven

ASTM C230

Hand-driven flow table with 10" (254mm) dia. cast-bronze table/platen. Includes standard H-3622 cast bronze, 2.75" top dia. x 2" high x 4" bottom dia. cone mold. Used in determining consistency of cement mortars.

| | |
|--------------------------|--------|
| Flow Table, Hand-Driven | H-3620 |
| Ship wt. 27lbs. (12.2kg) | |

Flow Molds

Cast-bronze 2.75" top dia. x 4" bottom dia. x 2" high cone mold or cast-bronze 70mm top dia. x 100mm bottom x 50mm high. cone mold.

| | |
|-----------------------------------|---------|
| Flow Mold, 2.75" / 4" x 2" high | H-3622 |
| Flow Mold, 70mm/100mm x 50mm high | H-3622M |
| Ship wt. 2.4lbs. (1.08kg) | |

Pedestal Form

Wooden form used to create a concrete base for flow tables.

| | |
|--------------------------|---------|
| Pedestal Form | H-3624F |
| Ship wt. 28lbs. (12.7kg) | |

Counter, Automatic

Can be used to upgrade H-3625 motorized flow table so a predetermined number of drops can be set to run automatically. Use H-3614B.4F with H-3625.5F.

| | |
|-------------------------------|------------|
| Counter, Automatic, 120V 60Hz | H-3614B |
| Counter, Automatic, 220v 50Hz | H-3614B.4F |
| Ship wt. 4lbs. (1.8kg) | |

Caliper, Mortar Diameter Check

ASTM C87, C185, C230; AASHTO M152, T71, T137
Rugged caliper used to measure mortar flow diameter and indicate the + percentage of flow.

| | |
|--------------------------------|--------|
| Caliper, Mortar Diameter Check | H-3621 |
| Ship wt. 2lb. (0.9kg) | |

Mortar Flow Shield

ASTM C230; AASHTO M152

Circular shield for use with H-3622 flow mold to prevent mortar from spilling on table top.

| | |
|------------------------|--------|
| Mortar Flow Shield | H-3623 |
| Ship wt. 2lbs. (0.9kg) | |

Straight Edge

ASTM C185, D558, D559, D560, D698; AASHTO T137.

Straight edge of ground steel with beveled edge. .125" x 1.25" x 8" (3 x 32 x 200mm)

| | |
|--------------------------|----------|
| Straight Edge | H-4144.8 |
| Ship wt. 0.9lbs. (0.9kg) | |

Grout Boxes

ASTM C1019


Cardboard box designed to be used to mold grout test samples. Each box forms 4 molds and can be used as a transport/shipping container as well. Boxes yield consistent, identical prism samples, while the engineered, slotted corrugation retains moisture while closely simulating CMU absorption rates. 25 boxes to a package. Overall dimensions: 7.5" x 7.5" x 7" (190 x 190 x 178mm). Section: 3.25" x 3.25" x 6.75" (83 x 83 x 171mm)

| | |
|-----------------------------|--------|
| Grout Boxes (package of 25) | H-2838 |
| Ship wt. 17.3lbs. (7.84kg) | |

**Grout Flow Cone Set**

ASTM C939


These test sets are used to determine the time of efflux of a specified amount of fluid hydraulic cement grout, by allowing it to flow through a standardized flow cone. It can be used for with preplaced-aggregate (PA), but can also be used for other fluid grouts. The test method described in ASTM C939 determines the flowability by measuring the time of discharge of a 1.725L sample of grout as it is passed through a 0.5" (12.7mm) orifice at the bottom of the cone. Humboldt's HC-2834S test set, which complies with ASTM C939, is comprised of a cast aluminum cone with a top ID of 7" (178mm) and a replaceable orifice at the bottom of 0.5" (12.7mm). The cone also includes an adjustable point gauge assembly, which is used to indicate the initial level of the grout sample. The set also includes a sturdy, tripod stand, which allows the cone to firmly fit into for testing (H-2833) and a 6L stainless steel beaker (H-2434SSB). The test set is also available with a 0.75" (19mm) orifice (HC-2835S), which does NOT comply with ASTM C939, but accommodates grout with larger aggregate. All items of the set are available as individual items, please see replacement parts for these items.

| | |
|---|----------|
| ASTM Grout Flow Cone Set, 0.5" (13mm) | HC-2834S |
| Grout Flow Cone Set, 0.75" (19mm) | HC-2835S |
|  Ship wt. 30lbs. (13.6kg) | |

Grout Flow Cone


ASTM C939

Cast-aluminum flow cone with either 0.5" (13mm) or 0.75" (19mm) replaceable orifice. Includes adjustable point gauge assembly. Overall dimensions: 8" dia. x 12"H (203 x 305mm). H-2835 does NOT comply with ASTM C939.

| | |
|--|--------|
| ASTM Grout Flow Cone, 0.5" (13mm) | H-2834 |
| Grout Flow Cone, 0.75" (19mm) | H-2835 |
|  Ship wt. 10lbs. (4.5kg) | |

Grout Flow Cone, Plastic


Plastic flow cone with either 0.5" (13mm) or 0.75" (19mm) replaceable orifice. Includes adjustable point gauge assembly. H-2834 sold separately.

| | |
|--|---------|
| ASTM Grout Flow Cone, 0.5" (13mm) | H-2834P |
| Grout Flow Cone, 0.75" (19mm) | H-2835P |
|  Ship wt. 2lbs. (0.9kg) | |

Grout Flow Orifice, Replacement


ASTM C939

Grout flow orifice with either 0.5" (13mm) or 0.75" (19mm) opening.

| | |
|--|------------|
| Grout Flow Orifice, 0.5" (13mm) | H-2834.500 |
| Grout Flow Orifice, 0.75" (19mm) | H-2834.750 |
|  Ship wt. 1lb. (0.45kg) | |


Grout Flow Cone Stand

Sturdy well-constructed steel stand to support flow cones so the top is level and the cone free from vibration. Overall dimensions: 21"W x 9.5"D x 23"H.

| | |
|--|--------|
| Grout Flow Cone Stand | H-2833 |
|  Ship wt. 9.5lbs. (4.3kg) | |


Beaker, 6-liter Stainless Steel

6-liter stainless steel beaker with rolled-top edge, perfect for grout flow testing. Cleans up with ease.

| | |
|---|-----------|
| Beaker, 6-liter Stainless Steel | H-2834SSB |
|  Ship wt. 2.8lbs. (1.27kg) | |

Micrometer Bridge Set


Designed to hold one cylinder to permit repeated volume change measurements without moving or disturbing the specimen. Includes the following items: H-2901 micrometer bridge, H-2902 micrometer depth gauge, H-2904 tapered cylinder mold, H-2905.2 tamping rod, H-2905.2 glass plate and H-2905.3 weight.

| | |
|--|--------|
| Micrometer Bridge Set | H-2903 |
|  Ship wt. 23.4lbs. (10.6kg) | |

Tapered Cylinder Mold


ASTM C1090

Used to determine volume change of grout, mold is constructed of steel tubing 0.25" wall x 3" dia. x 6"H (6 x 76 x 152mm). Mold is split longitudinally with two quick-acting clamps welded to the mold. Top edge of mold is machine tapered to a narrow rim. Includes detachable base plate.

| | |
|--|--------|
| Tapered Cylinder Mold | H-2904 |
|  Ship wt. 7.8lbs. (3.5kg) | |

Micrometer Depth Gauge

Graduations in the thousandths of an inch (.001"), range 0 to 3", .125" rod dia. Sleeve is designed with staggered lines, hardened and precision ground screw; lock nut holds the setting at the precise measurement. Includes protective case. Base length is 2.5".

| | |
|---|--------|
| Micrometer Depth Gauge | H-2902 |
|  Ship wt. 2lbs. (.9kg) | |

Micrometer Bridge


Bridge is used to hold the H-2904 mold in place while repeated volume change measurements are made. Stainless Steel.

| | |
|--|--------|
| Micrometer Bridge | H-2901 |
|  Ship wt. 7lbs. (3.1kg) | |

Tamping Rod

ASTM C157, C192

Round, straight steel rod is .375" (10mm) dia. x 12" (305mm) long. Both ends are rounded to a hemispherical tip of the same diameter as the rod.

| | |
|---|----------|
| Tamping Rod | H-2905.1 |
|  Ship wt. 4.5lbs. (2.04kg) | |

Glass Plate

Glass plate used with micrometer bridge setup.

| | |
|---|----------|
| Glass Plate | H-2905.2 |
|  Ship wt. 0.4lbs. (0.18kg) | |

Weight, 3 lb

3 lb weight for use with micrometer bridge setup.

| | |
|--|----------|
| Weight, 3 lb | H-2905.3 |
|  Ship wt. 3lbs. (1.4kg) | |



H-3493A



H-3491



H-3492A



H-3490A



H-3320



H-3161



H-3162.5F

Organic Impurities Test Set

ASTM C40; AASHTO T21

Determines presence of injurious organic compounds in sands used in cement mortar or concrete. Test serves as warning that further tests of sands are necessary before they can be approved for use. Air shipments must meet Dangerous Goods requirements because of Sodium Hydroxide Beads. **Order H-3493X without Sodium Hydroxide Beads to avoid Dangerous Goods requirements.**

Organic Impurities Test Set
Test Set, w/o Sodium Hydroxide

H-3493A
H-3493AX

Ship wt. 6.8lbs. (3kg)

Organic Color Wheel

ASTM C40; AASHTO T21

Color comparison wheel for use with organic impurities test. Color wheel has five different color filters to compare to test solution.

Organic Color Wheel

H-3492A

Ship wt. 0.6lbs. (.27kg)

Sodium Hydroxide Beads

1lb (454g) Container of Sodium Hydroxide Beads. Air shipments must meet Dangerous Goods requirements.

Sodium Hydroxide Beads

H-3491

Ship wt. 1.5lbs. (.68kg)

Graduated Bottle

12 oz. (.35L) graduated bottle for organics impurities test.

Graduated Bottle

H-3490A



Ship wt. 0.8lbs. (0.36kg)

Reaction Container

ASTM C289

For determining potential alkali reactivity of aggregates (chemical method) when used with high alkali cements. Stainless steel unit is 2" dia. x 2.25" high (51mm dia. x 57mm) fitted with air-tight cover. 50-75ML capacity.

Reaction Container

H-3320



Ship wt. 1.3 lbs. (0.56kg)

Cement Calorimeter, Digital

ASTM C186

Features precision digital thermometer for determining heat of hydration of cements by measuring difference between heat of solution of dry cement and heat of solution of a separate sample partially hydrated for 7 to 28 days. Constant-speed stirrer maintains uniform temperature throughout liquid and supplies sufficient agitation to keep solid reactant suspended in the acid mixture. Includes insulated wood case, insulated 1G (3.8L) can; 1 pt. (0.47L) vacuum jar with stopper; 2-channel, Precision Digital Thermometer with a resolution of 0.001°C; plastic funnel; stirring paddle and chuck; geared synchronous motor.

Cement Calorimeter, Digital, 120V 60Hz H-3161

Cement Calorimeter, Digital, 230V 50/60Hz H-3161.4F



Ship wt. 35lbs. (15.8kg)

CEMENT

Calorimeter

EN 196-9

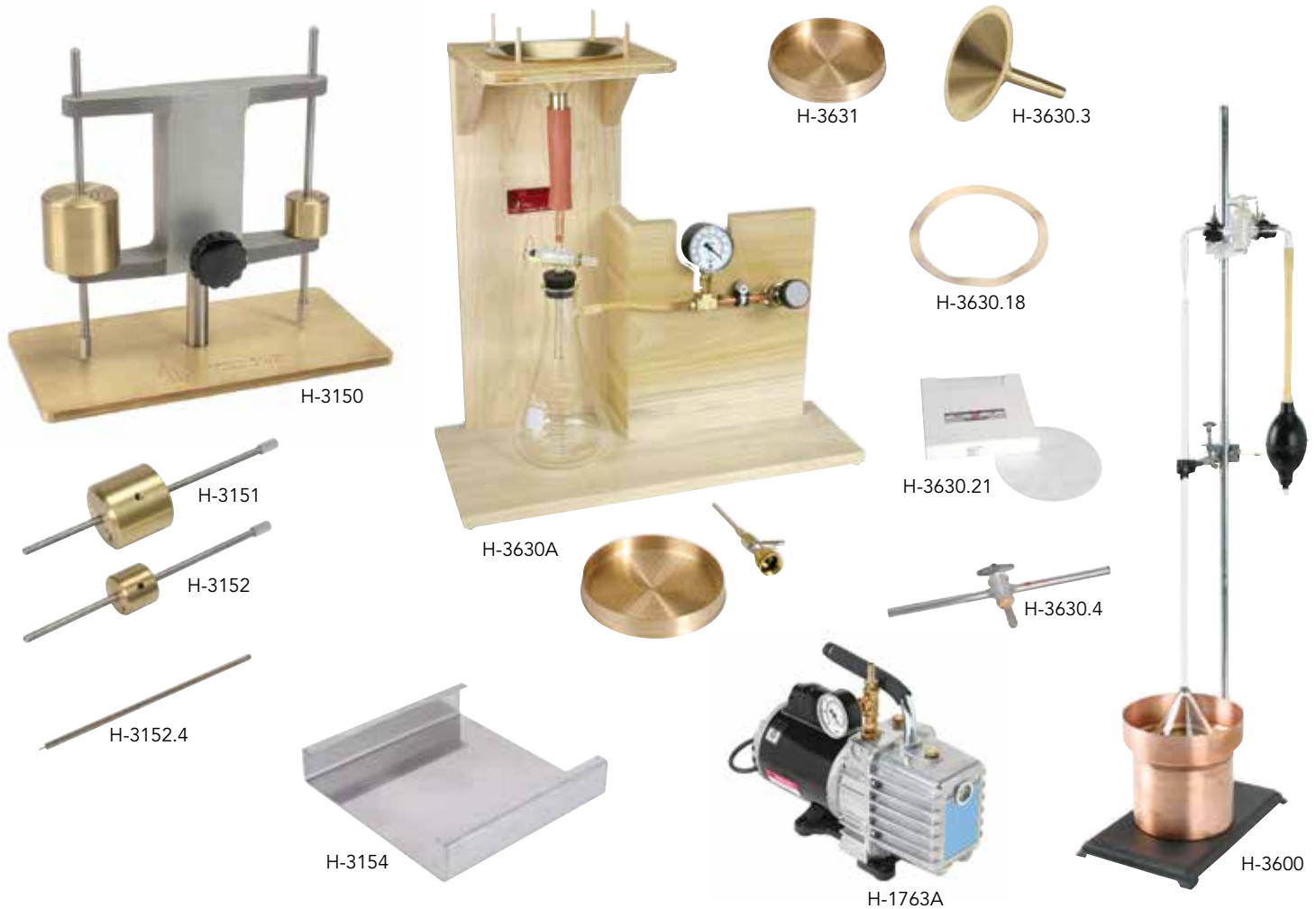
Used to measure the heat of hydration of cement by the semi-automatic Langavant method. Test calorimeter includes factory calibration certificate. Temperature recorder provides (4) input channels for recording and transmission of temperature values. Analysis software provides reporting and editing function for calculating the heat of hydration. Unit includes: test calorimeter; reference calorimeter; mortar-sample container, temperature recording device and analysis software. Power for unit is supplied by USB from a PC or laptop. Does not include required PC.

Calorimeter, 220V, 50Hz

H-3162.5F

Ship wt. 77lbs. (35kg)



**Gillmore Apparatus**

ASTM C91, C141, C150, C266, C414;
AASHTO T154

Used to determine initial and final set times of Portland cement, masonry cement, hydraulic hydrated lime and certain mortars. Comprised of two stainless steel needles with 0.0375" (4.8mm) cylindrical flat-end needles. One is 1/12" (2.12mm) dia. 1/4 lb. (113.4g) weight for initial set. The second is 1/24" (1.06mm) dia., 1lb. (453.6g) weight for final set.

Gillmore Apparatus**H-3150**

Ship wt. 5.7lbs. (2.5kg)

Gillmore Accessories and Replacement Parts

| Description | Model |
|---|----------|
| Strike-off plate, 0.5" thickness | H-3154 |
| Needle, 1/24" (1.06mm) dia. with 1lb (453.6g) weight | H-3151 |
| Needle, 1/12" (2.12mm) dia. with 1/4lb. (113.4g) weight | H-3152 |
| Gillmore needle, 0.050" dia. | H-3152.4 |

Water Retention Apparatus

ASTM C1506, C110, C207 and E149

The apparatus is used in specification tests of masonry cement and physical testing of quicklime and hydrated lime. These tests include: ASTM D1506, ASTM C110 and ASTM C207. This test method provides a means for determining the ability of mortars and plasters to retain water under suction. Test results may be used to determine compliance with specifications. The results obtained using this test method can be used to compare the relative ability of mortars and plasters to retain water under suction. Unlike older models, this unit incorporates a vacuum regulator and gauge system in place of the old mercury manometer and relief column. The complete unit consists of an aspirator pump, vacuum regulator, vacuum gauge, three-way stopcock, flask, rubber gasket, brass funnel, perforated brass dish, filter paper and hardwood stand.

Water Retention Apparatus**H-3630A**

Ship wt. 25lbs. (11.3kg)

Water Retention Apparatus Replacement Parts

| Description | Model |
|------------------------------------|-----------|
| Funnel | H-3630.3 |
| Stopcock | H-3630.4 |
| Rubber gasket | H-3630.18 |
| Filter paper, 15cm, package of 100 | H-3630.21 |
| Perforated brass dish | H-3631 |
| Flask, 1000ml | H-4913.1M |
| Vacuum Pump | H-1763A |
| Drierite Air Drying Unit | H-1759 |

Cement Bleeding Apparatus

ASTM C243

Used to determine bleeding rate and bleeding capacity of cement paste and mortar by direct and continuous procedure. Includes noncorrosive metal container for paste or mortar, collecting ring, support stand and necessary glassware. Rubber-covered double V-jaw burette clamp holds stopcock in position; single rubber-covered jaw clamp supports the burette and funnel assembly.

Cement Bleeding Apparatus**H-3600**

Ship wt. 16lbs. (7.2kg)



NOTE

.3F part numbers are 120/220V 50/60Hz

Blaine Air Permeability Apparatus

ASTM C204; AASHTO T153

The Blaine Air Permeability Apparatus determines the fineness of Portland cement in terms of specific surface area expressed as the total surface area in square centimeters per gram of mortar or cement. The Blaine works by drawing a definite quantity of air through of bed of cement exhibiting a definitive porosity value. The number and size of the pores in a prepared bed of definite porosity is a function of the size of the particles and determines the rate of airflow through the bed. This procedure is outlined in ASTM C204, Method A and AASHTO T153. The Humboldt Blaine Air Permeability Apparatus consists of: calibrated U-tube manometer, ground glass joint, stainless steel test cell and plunger, rubber aspirator bulb and perforated disc. Includes an 8 oz. (226.8g) bottle of red manometer fluid, filter paper, wood block for holding test cell during filling and a funnel. Mounted on finished wood panel with rubber-footed base. To perform this test, NIST Portland Cement #114q is required by the ASTM standard for calibration. See Accessories H-3817 and H-3817.20. Blaine Air Permeability Apparatus

H-3810

Ship wt. 7lbs. (3.1kg)

H-3810 Accessories & Replacement Parts

| Description | Model |
|--|-----------|
| Rubber bulb | H-3811 |
| Cell and plunger | H-3812 |
| Cell and plunger, Calibrated | H-3812CAL |
| Perforated brass disc | H-3813B |
| Perforated stainless steel disc | H-3813S |
| Manometer fluid, 8oz (240ml) | H-3814 |
| Monometer u-tube, calibrated | H-3815 |
| Filter paper discs, medium retentive, 1.27cm, pkg 1000 | H-3816.1M |

SRM 114q - Portland Cement Fineness Standard

This Standard Reference Material (SRM) is used in calibrating fineness testing equipment according to

ASTM Standard Methods. The SRM unit consists of a glass vial with plastic caps containing powdered cement (each vial is contained in a sealed foil bag). Each vial contains approximately 5g of cement.

SRM 114q, 1 vial

H-3817

SRM 114q, package of 20

H-3817.20



Ship wt. 0.5lbs. (0.2kg)

Blaine Apparatus, Semi-Automatic

ASTM C204; AASHTO T153, EN 196; DIN 1164; BS 4550

Determines fineness of cement in terms of specific surface expressed as total surface area square centimeters per gram. To obtain the most accurate results, the test should be performed in a temperature-controlled environment. The Semi-automatic Blaine Apparatus provides more accuracy and precision than provided by the manual Blaine Apparatus. The device uses an automatic pump and timer to evaluate the time precisely. Calibration of this unit is done using a cement sample reference, such as NIST 114q. To obtain the most accurate results, the test should be performed in a temperature controlled environment. Unit includes: the unit with an electric pump and timer; measuring cell, filter papers (12.8mm, 1000pk.; fill oil (50ml); plug; thermometer; brush and funnel.

Blaine Apparatus, Semi-Automatic

H-3056.3F



Ship wt. 15lbs. (6.8kg)

H-3056.3F Accessories & Replacement Parts

| Description | Model |
|------------------------------|-----------|
| Calibration Sand, Coarse | H-3056.2 |
| Calibration Sand, Fine | H-3056.4 |
| Fill Oil | H-3056.5 |
| Light Grease | H-3056.10 |
| U-shaped Tube | H-3056.6 |
| Filter Papers, 12.8mm (1000) | H-3056.1 |
| Measuring Cell | H-3056.11 |
| Perforated Disc | H-3056.8 |
| Tamper | H-3056.13 |

Blaine Air Permeability (H-3810) Replacement Parts



Blaine Semi-Automatic Apparatus (H-3056.3F) Replacement Parts



Electronic Blaine Apparatus, Dyckerhoff (see next page)

The Electronic Blaine Apparatus, Dyckerhoff system is a semi-automatic device with pump and time registration for the rapid determination of specimen characteristics. This device is a semi-automatic cement air permeability tester used for the determination of the specific surface or Blaine value. Once the test material is set inside the chambers, the test procedure is able to measure the values for the user. Measuring cell dia. is 41 mm (1.6"). Volume of measuring cell is 73 cm³. Unit includes apparatus, measuring cell, filter papers ø41mm 500pk, fill oil 150ml, tamper and dust filter ø13mm.

Electronic Blaine Apparatus, Dyckerhoff

H-3058.3F



Ship wt. 47lbs. (21.3kg)

PC-Controlled Blaine Apparatus, Dyckerhoff (see next page)

The PC-controlled, electronic Blaine Apparatus, Dyckerhoff system provides a fully automatic test procedure and evaluation, complete with software, for one cell. Once the test material is set inside the chambers, the test procedure is able to measure the values for the user. This device provides quick test preparation, which does not require the operator to determine the weighed quantity, as precise as he would for the standard procedure. After test preparation, the device can perform the test in full automation, recording all information without need of supervision. Software automatically records all information without need of supervision. Apparatus and software are able to measure the final result for the user. Measuring cell dia. is 41 mm (1.6"). Volume of measuring cell is approximately ca. 75 cm³. Comes complete with apparatus, measuring cell, filter papers ø41mm 500pk, fill oil 150ml, tamper and dust filter ø13mm.

Does not include required PC. See next page for replacement parts and accessories.

PC-Controlled Apparatus, Dyckerhoff

H-3059.3F



Ship wt. 47lbs. (21.3kg)



H-3058.3F



H-3059.3F



HA-3056



H-3052



H-3058.1

H-3058, H-3059 Accessories & Replacement Parts

| Description | Model |
|-------------------------------|-----------|
| Reference Sand, Coarse, 600g | H-3058.7 |
| Reference Sand, Fine, 600g | H-3058.8 |
| Fill Oil | H-3056.5 |
| Light Grease | H-3056.10 |
| U-shaped Tube | H-3056.6 |
| Filter Papers, 41mm (500) | H-3058.1 |
| Foam Plugs, dust filters (10) | H-3058.5 |
| Precision Digital Gauge | H-3059.6 |
| O-ring | H-3058.2 |
| Perforated Disk, 30 x 7mm | H-3058.4 |

Vicat Apparatus, Automatic

ASTM C187, C191, AASHTO T131, EN 196-3, DIN 1164, DIN 1168 gypsum, NF P15/431 and BS4550

This automatic Vicat Apparatus provides a completely automatic method for determining the initial and final setting time of cements or mortar pastes.

The HA-3056 is supplied complete with a 1.13mm x 57mm needle; a vicat mold 70/80 dia. x 40mm height; sample container (water bath); 500 sheets of plotting paper; final set needle; cleaning strip; tweezer, T-wrench and delay timer.

Vicat Apparatus, Auto, 120/220V 50/60Hz HA-3056.3F
Ship wt. 37lbs. (17.6kg)

HA-3056 Accessories, Spare Parts

| Description | Model |
|---|-----------|
| Initial set needle, 1.13mm dia. x 57mm length | HA-3056.2 |
| Final set needle with special foot, 1.13mm dia. | HA-3056.5 |
| Vicat mold, 70/80 dia. x 40mm (EN 196, ASTM C187-191) | HA-3056.6 |
| Plotting Paper (500 sheets) | HA-3056.1 |
| Recording Pen (1) | HA-3056.3 |
| Sample Container (140 x 60mm) | HA-3056.8 |
| Glass Base Plate | HA-3056.7 |
| Cleaning Strip for Needle | HA-3056.4 |

Vicat Machine, Automatic

ASTM C187, C191; AASHTO T131; EN 196-3; DIN 1164, DIN 1168 gypsum; NF P15/431 and BS4550

The Vicatronic apparatus provides a completely automatic method for determining the initial and final setting time of cements or mortar pastes. The automated test operation provides for precise and repeatable results, which are automatically printed out from the integral printer built into the apparatus. The Vicatronic can also be connected to a PC via a RS232 cable allowing data to be downloaded via programs like Microsoft hyper terminal. The Vicat-Win software (H-3052.4) allows the receiving, managing, processing and completing test data; the software can automatically create graphs, personalize them and print test reports.

The Vicatronic has a large high-contrast, high-resolution LCD display, which shows the test data together with the general functions of the unit. The easy-to-see menu provides a simplified guide to running a test. During the test, the display also provides a real-time graph of the results, which can be monitored.

The Vicatronic is supplied with firmware that allows the automatic performance of tests in accordance with the following standards: ASTM C191, AASHTO T131, EN 196/3, DIN 1164, DIN 1168 gypsum, NF P15/431 and BS4550. Additional programs can be developed by the operator. This is particularly useful when testing new mortars, additives or research tests requiring sophisticated and flexible applications.

The Vicatronic is supplied complete with the integral printer, two hardened needles (one with 1mm diameter and one with 1.13mm. diameter), two conical molds EN and ASTM, and a glass plate to hold the conical mold. Dimensions: 15.75" x 7.87" x 18.5" (400 x 200 x 470mm).

Vicat Machine, Automatic, 120V 50/60Hz H-3052
Vicat Machine, Automatic, 230V 50/60Hz H-3052.4F
Ship wt. 37.6lbs. (17kg)

H-3052 Accessories, Spare Parts

| Description | Model |
|------------------------------|-----------|
| Needle 1.13mm dia., EN 196-3 | H-3052.2 |
| Needle 1mm dia., ASTM C191 | H-3052.9 |
| Weight, 700g | H-3052.45 |
| Mold tank, in-water testing | H-3052.3 |
| Printer paper (5 rolls) | H-3052.6 |

Vicat-Win Software

Allows the receiving, managing, processing and completion of test data on a PC. This software can automatically create graphs, personalize them and print test reports.

Vicat-Win Software H-3052.4
Ship wt. 0.1lbs. (0.04kg)



HC-3056.3F



HC-3057.3F



HC-3058.3F




HC-3059.3F

Vicat Apparatus, Computer-Controlled

ASTM C187, C191, AASHTO T131, EN 196-3, DIN 1164, DIN 1168 gypsum, NF P15/431 and BS4550

This automatic, computer-controlled Vicat Apparatus provides a completely automatic method for determining the initial and final setting time of cements or mortar pastes.

With the use of a PC or Laptop this bench-top model provides programmed test sequences for vicat testing. Tests can be performed in air or in a water bath with constant temperature (heat exchanger and cooler for constant water temperature) The unit automatically records initial set time and final set time, as well as the ability of setting plots. The supplied plunger and needle weigh $300g \pm 1g$ and after each penetration the vicat needle is automatically cleaned. The standard, supplied software provides programmable test sequences for data recording. Includes: (1) Vicat mold (conical hard plastic ring) 70/80 dia. x 40 mm; (1) glass base plates, 120 mm dia.; (1) centering for Vicat mold (conical hard plastic ring) 70/80 dia. x 40 mm; (1) pair of cleaning brushes; (1) tee wrench, 1.25 mm; (1) tee wrench, 2 mm; (1) spare glass plates, 120 mm dia.; (2) spare initial-set needles, 1.13 mm dia.; Serial cable, USB/RS232-Adapter and Mains cable. **PC or laptop required for operation— not included.**

Vicat Apparatus, Comp, 120/220V 50/60Hz HC-3056.3F
 Ship wt. 154lbs. (70kg)

Vicat Apparatus, Computer Controlled


ASTM C191 Method B; AASHTO T131; EN 196-3, EN 480-2; DIN 1164; BS4550

These computer-controlled, Vicat Apparatus can be used to determine the initial and final setting time of cement, mortar pastes and gypsum. This six-station apparatus automatically monitors the setting process and provides output curves of the process. The test sequence is programmable and tests can be performed in air or in the supplied, temperature-controlled water bath. With programmed test sequences, the unit provides automatic registration of initial set and final set times, as well as providing setting plots of the entire sequence. The supplied plunger and needle weigh $300g \pm 1g$ and after each penetration the vicat needle is automatically cleaned.

The computer-controlled vicat apparatus includes: Base unit as a table model apparatus with a control unit and standard software for performing programmable test sequences and for data recording.

6-Station Vicat Apparatus


Includes: (6) vicat molds (60/70 dia. x 40 mm conical hard-plastic rings); (6) glass base plates (120 mm dia.); (6) centerings for the vicat molds; 1 pair of cleaning brushes; (1) t-wrench (1.25 mm); (1) t-wrench (2 mm); (2) spare glass plates (120 mm dia.); (2) spare initial-set needles, (1.0 mm dia.); Filter sponge (coarse); Filter sponge (fine); serial cable, and cover. **PC or laptop required for operation— not included.**

Vicat Apparatus, 6-Station, 120/220V 50/60Hz HC-3057.3F
 Ship wt. 215lbs. (97.5kg)

8-Station Vicat Apparatus


Includes: (8) vicat molds (60/70 dia. x 40 mm conical hard-plastic rings); (8) glass base plates (120 mm dia.); (8) centerings for the vicat molds; 1 pair

of cleaning brushes; (1) t-wrench (1.25 mm); (1) t-wrench (2 mm); (2) spare glass plates (120 mm dia.); (2) spare initial-set needles, (1.0 mm dia.); Filter sponge (coarse); Filter sponge (fine); serial cable, and cover. **PC or laptop required for operation— not included.**

Vicat Apparatus, 8-Station, 120/220V 50/60Hz HC-3058.3F
 Ship wt. 237lbs. (108kg)

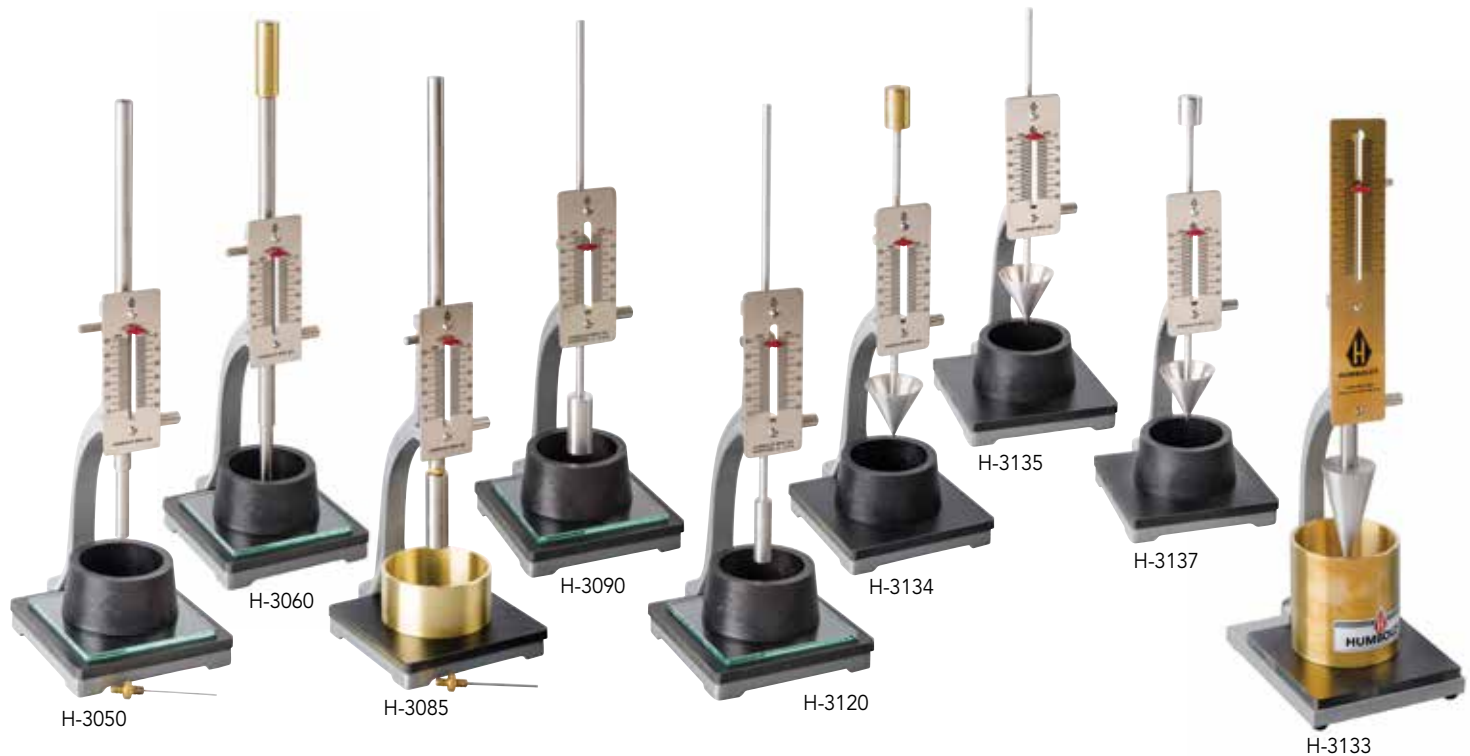
12-Station Vicat Apparatus

Includes: (12) vicat molds (60/70 dia. x 40 mm conical hard-plastic rings); (12) glass base plates (120 mm dia.); (12) centerings for the vicat molds; 1 pair of cleaning brushes; (1) t-wrench (1.25 mm); (1) t-wrench (2 mm); (2) spare glass plates (120 mm dia.); (2) spare initial-set needles, (1.0 mm dia.); Filter sponge (coarse); Filter sponge (fine); serial cable, USB/RS232 adapter and power supply. **Standard PC or laptop required for operation— not included.**

Vicat Apparatus, 12-Station, 120/220V 50/60Hz HC-3059.3F
 Ship wt. 430lbs. (195kg)

HC-3057, HC-3058 & HC-3059 Spare Parts

| Description | Model |
|--|------------|
| Needle 1.13mm dia., EN 196-3 | HC-3057.13 |
| Needle 1.0mm dia., ASTM C191 | HC-3057.14 |
| EN ring $\varnothing 70/80 \times 40$ mm | HC-3057.02 |
| ASTM ring $\varnothing 60/70 \times 40$ mm | HC-3057.03 |
| Glass plate, 120mm | HC-3057.07 |
| Cleaning brushes, 1 pair | HC-3057.08 |
| 700g weight for EN 480-2 | HC-3057.10 |

**Vicat Consistency Apparatus**

ASTM C91, C141, C187, C191, C308, C451, C472; AASHTO T129, T131, T186

Reversible stainless steel plunger with 10mm dia. on one end and threaded, H-3070 1mm dia. stainless steel needle on the other. Weight of plunger assembly with adjustable indicator is 300g total. This includes the 1mm stainless needle. Graduated 0-50mm scale. Includes frame with bakelite platform, graduated 0-50mm scale, reversible plunger assembly with H-3070 1mm diameter stainless steel needle, H-3080 conical mold and H-3049 glass plate.

Vicat Consistency Apparatus H-3050
 Ship wt. 5lbs. (2.2kg)

Vicat Apparatus, Modified, 400g

ASTM C191, AASHTO T131, EN196/3

Modified vicat apparatus with 10mm dia. plunger and H-3061 100 gram weight. Weight of plunger assembly with adjustable indicator is 400g total. Includes graduated 0-50mm scale, frame with bakelite platform, plunger assembly, H-3080 conical mold and H-3049 glass plate.

Vicat Apparatus, Modified, 400g H-3060
 Ship wt. 4.6lbs. (2kg)

Vicat Apparatus, Set Time & Consistency

ASTM C807

Designed to switch between 17.5mm dia. plunger for consistency determinations and a 2mm dia. needle for time of set determinations. Plunger assembly with adjustable indicator weighs 400g with 17.5mm needle attached and 300g with 2mm needle. Includes graduated 0-50mm scale, frame

with bakelite platform, plunger assembly with adjustable indicator and H-3086 brass ring mold (76mm ID x 40mm).

Vicat Apparatus, Set Time & Consistency H-3085
 Ship wt. 4.7lbs. (2.1kg)

Vicat Consistency Apparatus, Modified, 50g

ASTM C110

Modified consistency vicat apparatus with 19mm dia. aluminum plunger on .25" rod. Weight of plunger assembly with adjustable indicator is 50g total. Includes graduated 0-50mm scale, frame with bakelite platform, plunger assembly, H-3080 conical mold and H-3049 glass plate.

Vicat Consistency Apparatus, Modified, 50g H-3090
 Ship wt. 5lbs. (2.7kg)

Vicat Consistency Apparatus, Modified, 30g

ASTM C110

Modified consistency vicat apparatus with 12.5mm dia. aluminum plunger on .25" rod. Weight of plunger assembly with adjustable indicator is 30g total. Includes graduated 0-50mm scale, frame with bakelite platform, plunger assembly, H-3080 conical mold and H-3049 glass plate.

Vicat Consistency Apparatus, Modified, 30g H-3120
 Ship wt. 10lbs. (4.5kg)

Modified Vicat Cone Penetrometer, 100g

American Dental Association

Features a 35g magnesium cone with a 65g brass weight for a total plunger weight of 100g. Includes frame with bakelite platform, graduated 0-50mm scale, magnesium cone plunger assembly with adjustable indicator, 65g weight and H-3080 conical mold.

Modified Vicat Cone Penetrometer, 100g H-3134
 Ship wt. 6.8lbs. (3kg)

Modified Vicat Cone Penetrometer, 35g

ASTM C472

Used to evaluate unsanded plaster. Features a magnesium cone and plunger assembly with a total weight of 35g. Includes frame with bakelite platform, graduated 0-50mm scale, magnesium cone plunger assembly with adjustable indicator and H-3080 conical mold.

Modified Vicat Cone Penetrometer, 35g H-3135
 Ship wt. 6.8lbs. (3kg)

Modified Vicat Cone Penetrometer, 50g

ASTM C472

Used to evaluate unsanded plaster. Features a magnesium cone and plunger assembly, which includes a 15g weight for a total plunger weight of 50g. Includes frame with bakelite platform, graduated 0-50mm scale, magnesium cone plunger assembly with weight and adjustable indicator and H-3080 conical mold.

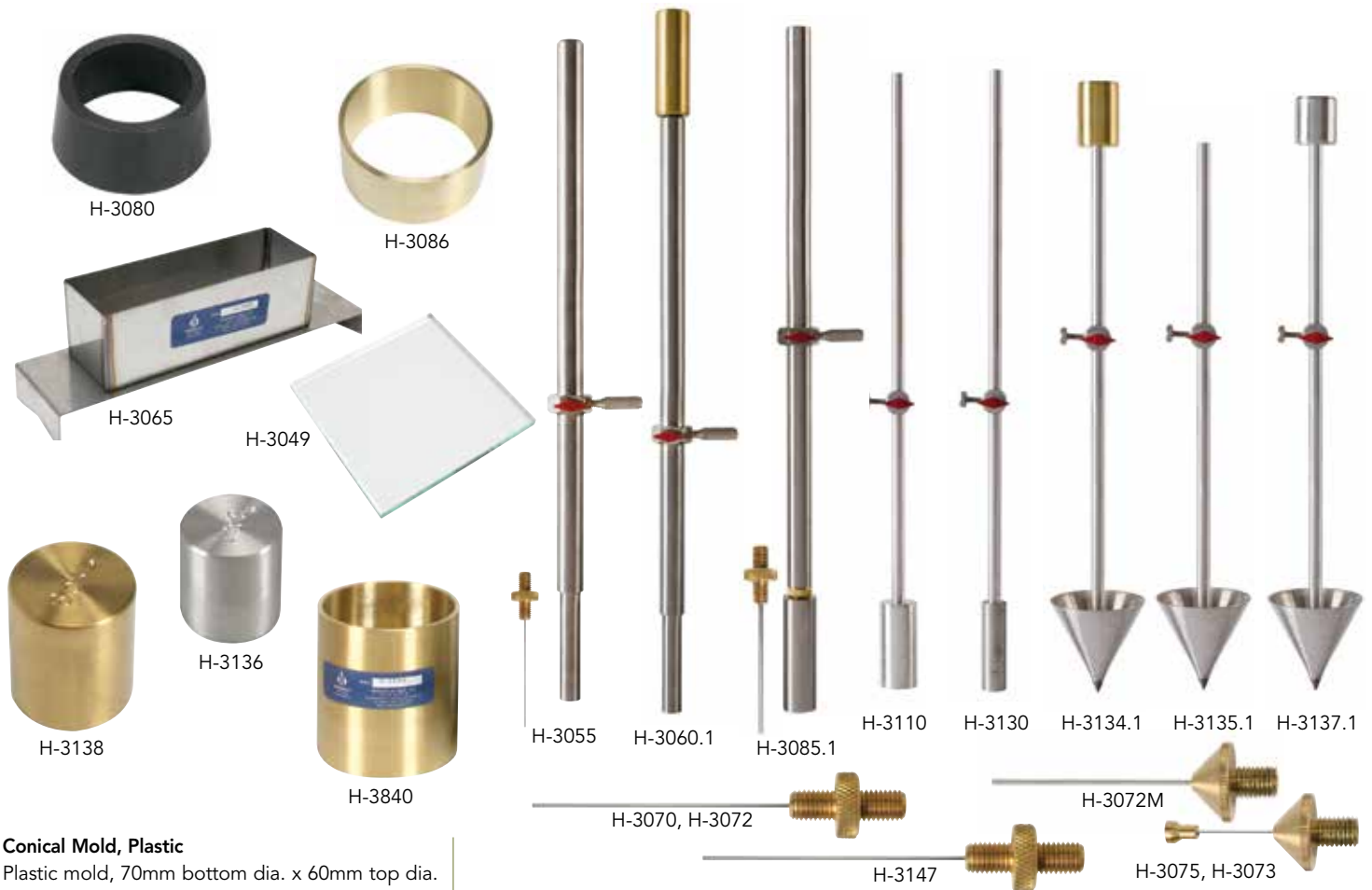
Modified Vicat Cone Penetrometer, 50g H-3137
 Ship wt. 4lbs. (1.8kg)

Modified Vicat Cone Penetrometer, 200g

ASTM C780, C185

Used to evaluate unsanded plaster. Features an aluminum cone, 1.625" x 3.625" (41.3 x 92.08mm) and blunted to a hemisphere a distance of .125" (3.2mm) for an overall length of 3.5" (88.9mm) and plunger assembly with adjustable indicator. Total plunger weight is 200g. Includes frame with bakelite platform, aluminum cone plunger assembly with adjustable indicator and H-3840 400ml brass measure cup as specified for ASTM C185.

Modified Vicat Cone Penetrometer, 200g H-3133
 Ship wt. 7lbs. (3.1kg)

**Conical Mold, Plastic**

Plastic mold, 70mm bottom dia. x 60mm top dia. x 40mm high. For use with all Vicat apparatuses.

Conical Mold, Plastic**H-3080**

Ship wt. 0.6lbs. (0.2kg)

Mold, Brass

Brass mold, 76mm dia. x 40mm high. For use with H-3085 vicat apparatus.

Mold, Brass**H-3086**

Ship wt. 0.5lbs. (0.2kg)

Mold Container

ASTM C359

Mold for use in false set test. 2" x 2" x 6" (51mm x 51mm x 152mm) Overall length including base is 9.25" (235mm).

Mold Container**H-3065**

Ship wt. 1lbs. (0.4kg)

Glass Plate

Glass plate, 4" x 4" x .1375" (101.6mm x 101.6mm x 4.8mm). For use with H-3050, H-3060 and H-3090 vicat apparatus.

Glass Plate**H-3049**

Ship wt. 0.4lbs. (0.1kg)

Measure, 400ml

ASTM C185, C780; AASHTO M152

Calibrated to 400ml, this measure is used to determine air content of hydraulic cement mortar. Cylindrical with 3" (76mm) ID, approximately 3-15/32" (88mm) depth.

Measure, 400ml**H-3840**

Ship wt. 2.3lbs. (1.04kg)

| Replacement Plunger Assemblies | Vicat | Plunger |
|--|--------|----------|
| Plunger assembly: plunger, needle and indicator, 300g | H-3050 | H-3055 |
| Plunger assembly: plunger, weight and indicator, 400g | H-3060 | H-3060.1 |
| Plunger assembly: plunger and indicator, 300g | H-3085 | H-3085.1 |
| Plunger assembly: plunger, needle, weight and indicator | H-3090 | H-3110 |
| Plunger assembly: plunger, needle, weight and indicator | H-3120 | H-3130 |
| Plunger assembly: plunger, cone, weight, indicator, and (2) bushings | H-3134 | H-3134.1 |
| Plunger assembly: plunger, cone, indicator and (2) bushings | H-3135 | H-3135.1 |
| Plunger assembly: plunger, cone, weight, indicator and (2) bushings | H-3137 | H-3137.1 |
| Plunger assembly: plunger, cone and indicator | H-3133 | H-3133.1 |

| Needles | Vicat | Needle |
|--|------------------|------------|
| 1mm dia. stainless steel with knurled threaded holder | H-3050 H-3085 | H-3070 |
| 1.13mm dia. stainless steel with knurled threaded holder | | H-3072 |
| Initial set needle, 1.13mm dia. x 45mm, BS EN 196-3. | | H-3072M |
| Final set needle, 1.13mm dia., BS EN 196-3. | | H-3073 |
| Initial and final set needle, ASTM C191 | | H-3075 |
| 2mm dia., stainless steel vicat needle | | H-3147 |
| 17.5mm dia., stainless steel vicat needle | | H-3085.1.1 |

| Weights | Vicat | Weight |
|---------------------------------------|--------|--------|
| 100g weight replacement for H-3060 | H-3060 | H-3061 |
| 100g weight, increases H-3090 to 150g | H-3090 | H-3100 |
| 100g weight replacement for H-3137 | H-3137 | H-3136 |
| 65g weight replacement for H-3134 | H-3134 | H-3138 |



H-3250



H-3250D



H-3250.8

**ACCESSORIES**

For Molds, please see page 227.

Length Comparator, Dial Indicator

ASTM C151, C157, C227, C311, C341, C342, C452, C490, C596; AASHTO M210, T107, T160.

Length comparators measure length changes of hardened cement paste, mortar and concrete prismatic specimens. Indicators are mounted on a sturdy upright support attached to a solid triangular base. All units include stationary and movable anvils designed to fit H-3260 gauge studs, which are cast into test specimens and an invar reference bar. Comparators for 10" (254mm) or 16" (406mm) effective length samples with 3.625" (92mm) dia. dial gauge with a range of .400" and gradations of .0001". The Dial is marked 0-10. Includes stationary and movable anvils designed to fit the H-3260 gauge studs that are cast on test specimens and an invar reference bar. Unit accommodates test specimens up to 4" x 4" (102 x 102mm) cross section.

Length Comparator, 10" Effective Length H-3250
 Length Comparator, 16" Effective Length H-3248
 Ship wt. 32.7lbs. (14.8kg)

Length Comparator, Digital Indicator

ASTM C151, C157, C227, C311, C341, C342, C452, C490, C596; AASHTO M210, T107, T160.

Length comparators measure length changes of hardened cement paste, mortar and concrete prismatic specimens. Indicators are mounted on a sturdy upright support attached to a solid triangular base. All units include stationary and movable anvils designed to fit H-3260 gauge studs, which are cast into test specimens and an invar reference bar. Comparators for 10" (254mm) or 16" (406mm) effective length samples with digital indicator with a range of .600" and resolution of .0001". Measures inches and millimeters includes batteries and AC adapter. Unit can be zeroed at any point on the range and can be switched from inches to mm by pressing a button. Includes stationary and movable anvils designed to fit the H-3260 gauge studs that are cast on test specimens and an invar reference bar. Unit accommodates test specimens up to 4" x 4" (102 x 102mm) cross section.

Length Comparator, 10" Effective Length
 120V 60Hz H-3250D
 220V 50/60Hz H-3250D.4F
 Length Comparator, 16" Effective Length
 120V 60Hz H-3248D
 220V 50/60Hz H-3248D.4F
 Ship wt. 36.5lbs. (16.8kg)

Comparator Replacement Components

| Description | Model |
|---|--------------|
| Invar reference bar for use with H-3250 and 10" (254mm) specimens | H-3249A |
| Invar reference bar for use with H-3248 and 16" (406mm) specimens | H-3249A.16 |
| Invar Sleeve | H-3249.2 |
| Dial indicator | H-3250.3 |
| Digital indicator, 120V 60Hz | H-3250.3D |
| Digital indicator, 220V 50/60Hz | H-3250.3D.4F |
| Anvil, Top with collar (one each) | H-3250.4 |
| Anvil, Top only | H-3250.4.4 |
| Collar w/ set screw | H-3250.4.3 |
| Elevating screw, nut collar & anvil assembly, Bottom | H-3250.7 |
| Adapter for 5" specimens | H-3250.8 |

Custom size Invar Reference Bars are available, please inquire: 1.800.544.7220.

NOTES

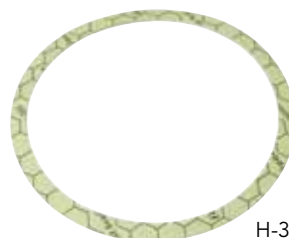
Length Comparators can be custom made for any length prism molds.



H-3240



H-3243B



H-3242



H-3240.4



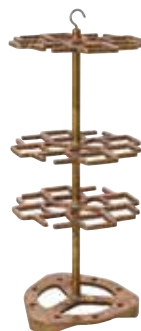
H-3267.ST



H-3240.22

H-3240.21M
H-3240.21N

H-3240.3



H-3243A



H-3245



H-3244

ACCESSORIES

For Molds, please see page 227.

Cement Autoclave

ASTM C151; AASHTO T107

Uses accelerated means of estimating delayed expansion of Portland cement caused by hydration of CaO and MgO. Test bars are exposed to controlled steam pressure and corresponding constant temperature. Unit produces 60-350 psi (0.4-2.4MPa) range of pressures and consists of steam vessel, pressure regulator, pressure gauge (0-600 psi x 5 psi), air vent valve, power switches and safety pop valve set at 350psi. Includes 20° 500°F spirit thermometer, wrench and 5 gaskets. Additional gaskets, heating units and safety pop valves are available as replacement parts. Chamber dimensions: 6.125" ID x 16". Overall dimensions: 17" x 48" x 28" (431 x 1219 x 711mm) 1700W maximum power demand. 220V version comes with transformer.

Cement Autoclave, 120V 60Hz H-3240

Cement Autoclave, 220V 50/60Hz H-3240.4F

Ship wt. 180lbs. (81.6kg)

Test Bar Holder, 10"

ASTM C141, C151; AASHTO T107

Test bar holder for 10"-long (254mm) gauge bars; 8-bar capacity. Holds specimens vertically, above water level, so each test bar is exposed to steam.

Test Bar Holder H-3243B

Ship wt. 2.9lbs. (1.4kg)

Test Bar Holder, 5"

ASTM C141, C151; AASHTO T107

Test bar holder for 5"-long (127mm) samples.

Test Bar Holder H-3243A

Ship wt. 4lbs. (1.8kg)

Test Bar Holder Only

ASTM C227

Test bar holder (stamp steel) for use with H-3267 mortar bar container. Holder has feet that elevate it from the base of the container providing space for water.

Test Bar Holder Only H-3267.ST

Ship wt. 4lbs. (1.8kg)

Rupture Disk

Rupture disks are used as safety devices in systems that involve pressure vessels, eliminating the need for a safety valve. The rupture disk is designed to be the weakest part of a pressure system so if there is a situation when excessive pressures occur, then the rupture disk fractures or opens thus releasing the built-up energy rendering the system safe. Rupture disks are a simple, yet reliable method for providing a safe system, which does not require calibration. Both disks are rated to 420°F. The Monel disk is rated to 375psi and the Nickel disk is rated to 341psi.

Rupture Disk, Monel H-3240.21M

Rupture Disk, Nickel H-3240.21N

Ship wt. 0.4lbs. (0.18kg)

Rupture Disk Holder

Rupture disk holder, complete with piping to attach to the H-3240 cement autoclave. Order rupture disks separately.

Rupture Disk Holder H-3240.22

Ship wt. 2.9lbs. (1.3kg)

Autoclave Replacement Parts

| Description | Model |
|---|-----------|
| Air vent valve | H-3240.2 |
| Safety pop-off valve | H-3240.3 |
| Pressure gauge | H-3240.4 |
| Pressure-control switch | H-3240.5 |
| Set of cap screws, 16 per set | H-3240.6 |
| Relay 60Hz | H-3240.7 |
| Gaskets, 100 per package | H-3242 |
| Lower heating unit for discontinued models. 115V. 50/60Hz | H-3244 |
| Heating element; two-piece wrap-around type for both top and bottom. 115V 50/60Hz | H-3245 |
| Thermometer, 20 to 580°F | H-2600.2F |
| Thermometer, -5 to 300°C | H-2610.2C |

**High-Pressure Autoclave**

ASTM C141, C151

Uses accelerated means of estimating delayed expansion of Portland cement caused by hydration of CaO and MgO. This is done by determining the volume constancy of mortar prism samples. Test bars are exposed to high-pressure steam compartment, which accepts a sample holder for 8 prisms per ASTM, 1" x 1" x 11.25" (25 x 25 x 285mm) and 6 prisms as per the DIN standard, 40 x 40 x 160mm. Unit has a capacity of 7.8 liters, a max pressure of 360 psi (25 bar) and a max temperature of 482°F (250°C).

Includes two gauges, one for temperature and one for pressure and a safety pop valve for safety. Also includes security test certificate for pressure chamber in accordance with EN pressure device directive.

The 120V 60Hz version of this autoclave comes with an auxiliary voltage converter, which is included. Overall dimensions: 20.5 dia" x 44" (550 dia x 1120).

High-Pressure Autoclave, 120V 60Hz H-3241
High-Pressure Autoclave, 220V 50Hz H-3241.5F

Ship wt. 220lbs. (100kg)

Prism Bar Frame

ASTM C141, C151

Prism bar frame for use with H-3241 autoclave. ASTM model holds 8 prisms 1" x 1" x 11.25" (25 x 25 x 285mm). DIN model holds 6 prisms 40 x 40 x 160mm.

Prism Bar Frame, ASTM

H-3241.1

Prism Bar Frame, DIN

H-3241.2

Ship wt. 4lbs. (1.8kg)

Wagner Turbidimeter

ASTM C115; AASHTO T98

Determines fineness of Portland cement, using photoelectric cell to measure light passing through suspended pulverized material. Microamp meter measures current generated in the cell; indicated reading is measure of turbidity of the suspension. Includes photoelectric cell (and light source in metal cabinet, timing burette and stand, wet sieving assembly including gauge and spray nozzle, microamp meter, 3 flasks, 4 test tubes, stirring apparatus and instruction book. Battery not included.

Wagner Turbidimeter

H-3805

Wagner Turbidimeter, 230V 60Hz

H-3805.2F

Wagner Turbidimeter, 230V 50Hz

H-3805.5F

Ship wt. 65lbs. (29.4kg)

Mortar Bar Container, 9" x 11" x 15.5"

ASTM C227, C1260

Stainless steel covered container for storing test specimens has tight-fitting cover that prevents moisture loss. Supports up to 36 mortar bars vertically. Dimensions: 9" x 11" x 15.5" (229 x 279 x 394mm).

Container, Mortar Bar-Rectangular

H-3265

Ship wt. 16lbs. (7.2kg)

Mortar Bar Container, Round with Bar Holder

ASTM C227

Plastic container includes H-3267.ST Test bar holder (cast bronze) that supports 8 bars vertically. Holder has feet that elevate it from the base of the container, which provides space for water and keeps test bars out of the water. Dimensions: 6" dia. x 17" (152 x 432mm).

Mortar Bar Container with Bar Holder

H-3267

Ship wt. 6.1lbs. (2.7kg)

Test Bar Holder Only

ASTM C227

Test bar holder (cast bronze) for use with H-3267 mortar bar container. Holder has feet that elevate it from the base of the container providing space for water.

Test Bar Holder Only

H-3267.1

Ship wt. 4lbs. (1.8kg)

Test Bar Holder Only

ASTM C227

Test bar holder (stamp steel) for use with H-3267 mortar bar container. Holder has feet that elevate it from the base of the container providing space for water.

Test Bar Holder Only

H-3267.ST

Ship wt. 4lbs. (1.8kg)



Multiple Bond Strength Tester

ASTM C1583, D4541, D7234, D7522; BS 1881 Part 207, EN 12004-2, 12002, 1324, 1542, 1015, 1348, 13892-8; DIN 1048-2, 13279-2, ISO 4624, Computer-aided multiple bond strength tester with force- or displacement-controlled test execution and deformation measurement

The Multiple bond strength tester is a computer-controlled hydraulically operated device with which several samples can be tested in a short sequence (approx. 20-25 pieces depending on the arrangement). The manual positioning of the pulling device is carried out on low-friction linear slides. Thus the tests can be carried out very comfortably and quickly. The bond strength is determined using a highly sensitive force transducer of class 0.2. A displacement measuring system is installed in the cylinder with which the deformation of the coating of the test specimen under load can be determined. The tests can be carried out both force- and displacement-controlled. All tests are recorded with software and can be subsequently analyzed and transferred to a freely configurable protocol. The graphical display of the measured value curve allows samples to be compared with each other at a glance. This makes the instrument suitable both for large laboratories with high testing volumes and for research facilities. The entire instrument is mounted on a stainless steel substructure in which the hydraulic and electrical components are installed. The hydraulic system is driven by a powerful radial piston pump. The electrical system is switched via a main switch with under-voltage release and the test can be interrupted immediately via an emergency stop button. Both round and square samples of different sizes

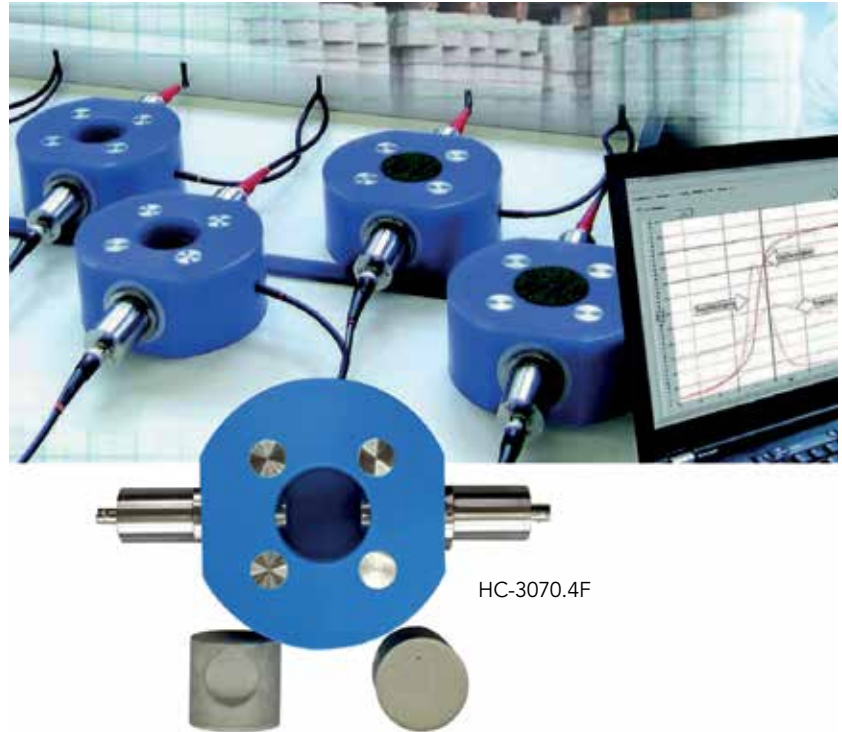
can be tested (e.g. diameter 50 mm or 50 x 50 mm). The samples are attached to a support plate (e.g. concrete) with the dimensions 400 x 400 mm and then inserted into the device via a heavy-duty pull-out and clamped there. The replacement of the slabs takes less than one minute. Plates with thicknesses from 10 to 80 mm can be used for fixing the specimens. The device covers all international standards and can also be configured for completely free test runs. This means that the device can also be used in the long term in case of any changes to standards. Standard configuration is 20kN, other load configurations are available, please enquire.

Bond Strength Tester, 220V 50/60Hz H-3060.4F
Ship wt. 882lbs. (400kg)

Ultrasonic Measuring System

This 8-channel, ultrasonic measuring system is specifically designed to measure the setting times of materials, such as cement, mortar, gypsum and concrete. The system is comprised of eight (8) measuring units with ultrasonic probes and temperature sensors, which are connected to an 8-channel hub. This hub is connected, via a USB cable, to a PC computer running the control software, which allows control and evaluation of each measuring unit.

The system provides a high-precision (0.05 μ s resolution) monitoring of the complete setting process from mixing to 28-day consistency in one test. The software provides an intuitive user-interface with direct-reading results from different modelings. The system provides a very-high reproducibility of the measurement results. It is able to detect deviations in the results early in the testing stage, which can speed up the testing process and provide an



optimal process for maintaining quality control of production and a substantial reduction in development times and costs.

Features:

- **Measuring Period:** 15 minutes - 31 days
- **Measuring Interval:** 10 seconds - 60 minutes
- Ultrasonic velocity in m/s or runtime in μ s
- Derivation (acceleration) and curvature
- Temperature inside the specimen
- Various zoom and scaling features also during the tests
- Reference measurements: online comparison of running measurements
- Envelope curves: definition of acceptable deviations from reference measurements
- Detection of initial set and final set
- Evaluation, Excel-export and printing during the running measurements
- Automatic logging of all measurements
- Log file browser with sort function (e.g. date product, filename, user)
- Calculation of dynamic modulus of elasticity

Includes UltraTestLab® Control Software.

Requires PC computer, not included.

Ultrasonic Measuring System H-3070.3F
Ship wt. 16lbs. (7.2kg)



Fast-Action Clamp



General Clamp

HC-3253.4F
HC-3254.4F

HCM-1000iH



HC-2820A.4F

Vibrating Table, 3-gang Molds

EN 196-1, BS 4550

Required for compaction of 40 x 40 x 160mm samples for EN 196-1 and BS 4550 standards. It can be ordered with either a fast-action clamp fitting or a general-purpose clamp fitting for (1) 3-gang mold for 40 x 40 x 160mm samples. The vibrating plate is 400 x 300 mm in size and is built into a powder-coated steel cabinet. The power switch box is mounted on a post attached to the top of the cabinet. Oscillation frequency is 50Hz with a sinusoidal waveform digital timer. Peak-to-peak value is $0.75 \pm 0.05\text{mm}$. **Note: A total vibrating mass of 35.0 +/- 1.5 kg acc. to EN 196-1:2005 can only be guaranteed by utilizing the precision three-gang mold with feeding hopper listed below.**

Vibrating Table, Fast-action Clamp, 230V 50/60Hz HC-3253.4F
CE

Ship wt. 552lbs. (250kg)

Vibrating Table, General Clamp, 230V 50/60Hz HC-3254.4F
CE

Ship wt. 552lbs. (250kg)

Precision, 3-gang Mold

EN 196

For use with vibrating table above. 40.1 x 40 x 160mm. Polished bright surface with numbered webs and nutplates. Electroless nickel finish.

Precision, 3-gang Mold HC-3253.1



Ship wt. 1.4lbs. (0.63kg)

Feeding Hopper for 3-gang Mold

EN 196

Feeding hopper for 3-gang mold and vibrating table.

Feeding Hopper, 3-gang Mold HC-3253.2



Ship wt. 1.4lbs. (0.63kg)

HCM-1000 Series Compression Machines

ASTM C39, ASTM C78, ASTM C293, ASTM C469, ASTM C496, ASTM C1019, ASTM C109/C109M, BS EN 12390-3

The HCM-1000 has been custom-configured to be used for mortar applications like 2" and 4" cubes, beams and other low-strength materials, below 100,000 lbs. (445kN). These machines are based on HCM-2500 frames, which have been reconfigured for accurate readings of lower-strength materials. The machines are sold without platens, so be sure to order the appropriate set for your applications.

- Custom-configured for mortar applications like 2" and 4" cubes
- 1,000 to 100,000 (11 to 445kN) testing range with accuracy of $\pm 5\%$ of indicated load
- Machine comes with no platens, order the appropriate set for your applications
- **Mounting Stand: OPTIONAL**, order: HCM-0200

| Specification | Value |
|--------------------|-------------------|
| Vertical Opening | 19.375" (492mm) |
| Horizontal Opening | 9.25" (235mm) |
| Piston Stroke | 2.5" (63.5mm) |
| Lower Platen | NA |
| Upper Platen, Dia. | NA |
| Oil Reservoir Cap. | 2 gal (7.6 liter) |
| Overall Width | 30" (762mm) |
| Overall Depth | 23.750" (603mm) |
| Overall Height | 60.625" (1540mm) |

See Page 166 for models and ordering information.

HCM-1000 Series Compression Machines



Ship wt. 610lbs. (277kg)

Cement Compression/Flexural Machine

ASTM C109; EN 196-1, 459-2, 1744-1, 1015-11, 13459-2; BS 3892-1, 4554-1

This fully-automatic, Combined Universal Compression / Bending / Tensile Testing Machine has been designed according to the EN196-1 and ASTM C109 standards for testing cement, mortar prisms and other binders, as well as plaster samples. The machine features a torsional rigid frame with 5 columns that are clamped in a way to restrict movement. It also features an impact-resistant polycarbonate test chamber for full enclosure protection.

The standard configuration for this machine is 300kN pressure and 30kN tensile/flexural pressure. Other combinations up to 600/30kN are available, please enquire. The test procedure is fully automatic and consists of a digital display with the ability to store the highest value of the test. Test accuracy meets EN ISO 7500-1, class 1 specifications.

Load Frame Specifications:

- Load Cells: according to DMS measuring principle
- Force indication range: 0 - 300 kN
- Force range: 6 - 300 kN, class 1 (Individual measuring range of class 1 is available optionally)
- Piston stroke: 50 mm
- Test chamber height: 200mm with round pressure plates
- Distance between columns: 210mm
- Insertion of standard-specific testing devices and accessories can be changed and fixed easily



HC-2821A.4F

Optional machine configuration with single-acting cylinders and pressure plates on both sides



HC-2820A.4



HC-2820A.5



HC-2820A.6



HC-3080.4F

- Electric piston stroke limitation and anti-rotation ball joint

Bending and Tensile Frame Specifications:

Load Cells: according to DMS measuring principle

Force indication range: 0 - 30 kN

Force range: 0.3 - 30 kN, class 1

Double-acting cylinder in servo quality

(low-friction sealing system) with distance measuring system and piston stroke of 200 mm

With anti-rotation lock on piston for force, displacement and deformation controlled testing.

Test chamber heights can be adjusted according to the type of accessories used (can be customised according to specifications).

Insertion of standard-specific testing devices and accessories can be changed and fixed easily.

- Operating desk, which consists of an emergency stop switch, prepared for installation of DOLI EDC Controller
- Hydraulic system with radial piston pump (or Internal gear pump) including all necessary safety, control and directional valves according to DIN 4413

- Accurate force and displacement control with servo valve

- Incl. switch box for electrical connection

The technology enables interchangeability of sensors since the sensor parameters are stored in the sensor plug.

- Remote maintenance by PC and internet connection

- Visualization of the force curve by software

- Force and deformation controlled tests with automatic fracture detection and the ability to store measured data

Dimensions: 47.3" x 22.4" x 93.3"

(1200 x 570 x 2370mm) (L X B X H)

Electrical: 3ph 230/400V, 50/60 Hz, 1.1 kW

Universal Compression Machine, 400V 50/60Hz HC-2820A.4F



Ship wt. 1433lbs. (650kg)

Universal Machine with Single-Acting Cylinders

ASTM C109; EN 196-1, 459-2, 1744-1, 1015-11, 13459-2; BS 3892-1, 4554-1

Optional machine configuration with single-acting cylinders and pressure plates on both sides

Universal Machine, 400V 50/60Hz HC-2821A.4F



Ship wt. 1433lbs. (650kg)

2" Cube Compression Testing Device

ASTM C109

For testing 2" x 2" cubes (50mm x 50mm). Installation height is 185mm

2" Cube Compression Testing Device HC-2820A.4



Ship wt. 30lbs. (13.6kg)

Flexure Testing Device

ASTM C348

For testing 2" x 2" cubes (50mm x 50mm). Installation height is 185mm

Flexure Testing Device HC-2820A.5



Ship wt. 30lbs. (13.6kg)

Prism Compression Testing Device

ASTM C349; EN196-1

For testing 40.1 x 40 x 160mm prisms with 40 x 40mm platens

Prism Compression Testing Device HC-2820A.6



Ship wt. 30lbs. (13.6kg)

Rolling Wheel Abrasion Machine (RWA)

EN 13892-5, EN 13892-7

The Rolling Wheel Abrasion Machine is used for the determination of the resistance to rolling strain on screeds for wear layers according to EN 13892-5 and screeds with floorcoverings according to EN 13892-7

The RWA Provides Test Programs For:

- EN 13892-5 with impellers Ø125 mm and 2000N (test surface: 390 x 260 mm)
- EN 13892-7 with impeller Ø47 mm and 150, 250, 350, 450, 550N (test surface: 210 x 150 mm),
- Freely programmable test sequences within the max. possible parameter of the other two standards

Features:

- Easy exchange of the impellers
- Large wheel with scrapers (against adhesion of sample material)
- The speeds of the X and Y axes can be adjusted for each standard
- Infinitely adjustable test load, display in Newton (calibratable)
- Fully enclosed test room with large secure access doors.
- Sample table 700 x 800 mm and 765 mm above the ground
- Manually infinitely adjustable sample lock, depending on the sample dimension
- Sample table of the machine moves up to the access doors of the machine for easy sample change
- Suction ring for suction of sample abrasion (vacuum cleaner not included)
- Fracture detection of samples (The limit switches for each impeller are adjustable)
- Operation via touchscreen
- Compressed air connection min. 6 bar up to max. 10 bar required

Rolling Wheel Abrasion Machine, 230V 50/60Hz HC-3080.4F



Ship wt. 1764lbs. (800kg)



HC-3043.4F

Humidity Curing and Storage Chambers


ASTM C109; EN 196-1


These upright humidity cabinets have been designed specifically for the curing and storage of mortar prisms and cubes in 3-gang molds. They feature durable stainless steel construction with durable specimen shelves that stand up to the loading and unloading of molds.


These chambers maintain a curing temperature 68°F (20°C) at an accuracy of $\pm 1^\circ$. A humidity reading of 95% can be maintained at an accuracy of $\pm 3\%$. These parameters are maintained through the use of an electronic, adjustable controller for both temperature and humidity.

Chambers are available with 6, 8 or 12 shelves. Each shelf will hold (4) 3-gang molds. So the 6-shelf model will hold (24) 3-gang molds; the 8-shelf model will hold (32) 3-gang molds and the 12-shelf model will hold (48) 3-gang molds.

Electrical specifications for these cabinets are
230V / 50/60 Hz / 1200 W

Humidity Curing Chamber, 6-shelf **HC-3040.4F**
 Ship wt. 772lbs. (350kg)

Humidity Curing Chamber, 8-shelf **HC-3041.4F**
 Ship wt. 794lbs. (360kg)

Humidity Curing Chamber, 12-shelf **HC-3042.4F**
 Ship wt. 860lbs. (390kg)

Workbench-style Humidity Curing Chambers


ASTM C109; EN 196-1


These humidity cabinets have been designed as a workbench to provide a work surface, as well as a cabinet for curing and storage of mortar prisms and cubes in 3-gang molds. They feature durable stainless steel construction with durable specimen shelves that stand up to the loading and unloading of molds.


These chambers maintain a curing temperature 68°F (20°C) at an accuracy of $\pm 1^\circ$. A humidity reading of 95% can be maintained at an accuracy of $\pm 3\%$. These parameters are maintained through the use of an electronic, adjustable controller for both temperature and humidity.

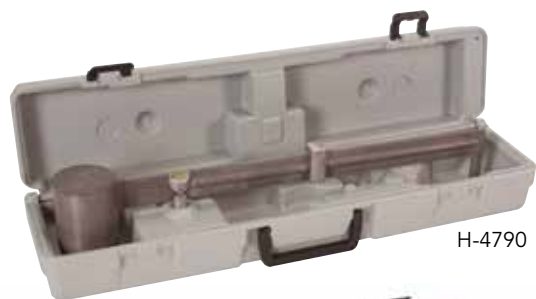
Chambers are available with 3, 6 or 9 shelves. Each shelf will hold (4) 3-gang molds. So the 6-shelf model will hold (12) 3-gang molds; the 8-shelf model will hold (24) 3-gang molds and the 12-shelf model will hold (36) 3-gang molds.

Electrical specifications for these cabinets are
230V / 50/60 Hz / 1200 W

Workbench Curing Chamber, 3-shelf **HC-3043.4F**
 Ship wt. 529lbs. (240kg)

Workbench Curing Chamber, 6-shelf **HC-3044.4F**
 Ship wt. 661lbs. (300kg)

Workbench Curing Chamber, 9-shelf **HC-3045.4F**
 Ship wt. 882lbs. (400kg)



H-4790



H-4791



HC-2842



HC-2845



HC-2843A



HC-2843



H-2818



H-2818HD



H-2818MS

Mud Balance

ASTM D4380

The mud balance provides a simple, practical method for the accurate determination of fluid density. The item's durable aluminum construction makes it ideal for field use. Its high-impact plastic case protects the balance during transport while providing a secure base for the balance during use. Scale reads in pounds per gallon (6-24 lb/gal); specific gravity (0.72-2.88 gms/cm³); pounds per cubic foot (45-180 lb/cu ft), and pounds per square inch per 1,000 feet of depth (310-1250 lb/sq in/100ft of depth). The H-4790 mud balance meets all the requirements of the API standard procedures for testing water base drilling fluids, oil base drilling fluids and oil well cements.

Mud Balance

H-4790



Ship wt. 5lbs. (2.2kg)

Tru-Wate Density Balance

ASTM D4380

The TRU-WATE Mud Balance is an instrument for measuring the absolute density of a fluid sample. With the TRU-WATE Balance, the density of a fluid sample, such as cement slurry, can be measured in a fixed volume sample under pressure. By pressurizing the sample cup the entrained air or gas can be decreased to a negligible volume, thus providing a slurry density measurement more closely in agreement with the true density which will be realized under down-hole conditions. This density balance is constructed of premium metals for durability, accuracy and ease of use. A high impact plastic case protects the balance during transport and provides a secure base in its working position.

TRU-WATE Density Balance

H-4791



Ship wt. 5lbs. (2.2kg)

Marsh Funnel Viscometer

ASTM D6910

The marsh funnel viscometer is a rugged, easy to operate instrument that is used for making rapid, on the spot measurements of drilling mud viscosity. Marsh funnel readings are only general measurements, but the frequent reporting of the marsh funnel viscosity will alert the mud engineer to sudden changes in the mud viscosity that could require corrective action. The marsh funnel Viscosity is the ratio of the speed of the mud as it passes through the outlet tube (the shear rate) to the amount of force—the weight of the mud itself, which is causing the mud to flow (the shear stress). marsh funnel viscosity is reported as the number of seconds required for one quart of mud to flow out of a full marsh funnel.

Marsh Funnel Viscometer

HC-2842



Ship wt. 3lbs. (1.3kg)

1 Liter Measuring Cup for Marsh Funnel

1 liter, plastic measuring cup used for collecting sample from marsh funnel.

1 Liter Measuring Cup

HC-2843A



Ship wt. 1lbs. (0.45kg)

1 Liter Measuring Cup for Marsh Funnel

1 liter, plastic measuring cup used for collecting sample from marsh funnel.

1 Liter Measuring Cup

HC-2843



Ship wt. 1lbs. (0.45kg)

Sand Content Test Set

ASTM D4380

The sand content kit is a simple, accurate and inexpensive sieve analysis apparatus for determining the sand content of drilling muds. The sand content kit consists of a special 200-mesh sieve 2.5" in diameter, fastened inside a collar upon which a small funnel is fitted on either end. This is used with a 10 ml glass measuring tube, graduated to read from 0 to 20% the percentage sand by volume. The collar and funnel are made of polyethylene and the screen is made of brass. A 500ml wash bottle and carrying case are included.

Sand Content Test Set

HC-2845



Ship wt. 3lbs. (1.3kg)

Mat Depth Gauge, Fireproofing

Gauge for measuring the depth of fireproofing. Plastic body with steel probe. Range: 0-6" (0-150mm).

Mat Depth Gauge, Fireproofing

H-2818



Ship wt. 0.3lbs. (0.13kg)

Mat Depth Gauge, Fireproofing

Gauge for measuring the depth of fireproofing. Plastic body with steel probe. Range: 0-3" (0-76mm).

Mat Depth Gauge, Fireproofing

H-2818HD



Ship wt. 0.3lbs. (0.13kg)

Mat Depth Gauge, Fireproofing

Gauge for measuring the depth of fireproofing. Plastic body with steel probe. Range: 0-3" (0-76mm).

Mat Depth Gauge, Fireproofing

H-2818MS



Ship wt. 0.3lbs. (0.13kg)





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H-1641T

Vacuum Degassing Oven (VDO Touch)

ASTM D6251; AASHTO R28; EN 14769

The vacuum degassing oven (VDO touch) is used to precisely and accurately degas pressure-aged binder samples and is designed for rapid removal of entrapped air bubbles in asphalt specimens to the required 15 ± 1.0 kPa (25.5Hg). The network-ready 7 in (178mm) touch-screen controller features easy menu-driven operation in multiple language options for fast programming of vacuum, temperature values and soak times. The controller display indicates time, temperature, and current process stage, with alerts at the end of each test. When connected to a network with an Ethernet cable, the VDO Touch can be operated remotely via smart phones, tablets, or PC's. USB Ports allow easy software upgrades.

The compact, table-top unit is constructed of stainless steel with a hinged lid to conserve space while allowing easy access to the stainless steel vacuum chamber. The oven holds up to (8) 4 oz. (114ml) or (4) 8 oz. (236ml) sample containers and features a self-contained, automatic vacuum system.

Temperatures in the VDO Touch vacuum chamber are measured by a platinum RTD probe with a range from ambient to 200°C with accuracy to $\pm 5^\circ\text{C}$. Soak and degassing times are both programmable up to 4,320 minutes. The rugged stainless steel cabinet, chamber and cover are easy to maintain, and the removable cover features a heat-resistant glass viewing window for monitoring purposes. The VDO includes (4) 236ml (8oz) sample tins, and a specimen removal tool for easy loading and unloading of samples. Dimensions: 24" x 16" x 12" (610 x 406 x 304mm).

H-1641T VDO Features:

- Automated tabletop degassing oven for rapid removal of entrapped air bubbles in asphalt specimens

- Network-ready, 7" touchscreen controller provides simple control to input vacuum, temperature and soak time values
- Ethernet cable connection enables remote operation via smart device
- Capacity for eight 4oz (118ml) or four 8oz (236ml) sample containers

H-1641T Specifications

| | |
|----------------------|--|
| Specimen Capacity | (4) eight oz. or (8) four oz. specimen containers |
| Vacuum Range | 6.6 KPA |
| Temperature range | Ambient to 410°F (210°C) |
| Temperature Accuracy | 0.2°F ($\pm 0.1^\circ\text{C}$) |
| RTD Temp. Accuracy | Class A RTD at max. temperature $\pm 1^\circ\text{F}$ ($\pm 0.55^\circ\text{C}$) |

Vacuum Degassing Oven, 120V 60Hz H-1641T

Vacuum Degassing Oven, 230V 50/60Hz H-1641T.4F

Shipping wt. 185 lbs (84kg)

H-1641T VDO Accessories & Components

| Description | Model |
|---|------------|
| UPS battery backup system | H-1640.1 |
| VDO verification kit | H-1641.7 |
| Sample container, 8 oz. (236ml) 4 (pk) | H-1641T.1A |
| VDO verification thermometer | H-1641T.2 |
| VDO vacuum verification gauge | H-1641T.3 |
| VDO calibration block | H-1641T.4 |
| VDO vessel cap | H-1641T.5 |

Pressure Aging Vessel (PAV3)

ASTM D6251-05; AASHTO R28-06; EN 14769

The PAV3 pressure aging vessel is used to simulate in-service oxidative aging of asphalt binder according to procedures developed by the Strategic Highway Research Program (SHRP). The PAV3 consists of a vertical, stainless steel pressure vessel in a stainless steel cabinet with encased band heaters, a precision sample holder for simultaneous testing of ten specimens, a set of ten TFOT specimen trays, a pressure controller, temperature controller, pressure and temperature measurement devices, temperature and pressure recorder, and a specimen loading and unloading tool.

The H-1640B.4F PAV3 features a compact, bench-top design with integral ASME code section VIII, division 1; 1992 A 93 pressure vessel controlled using a 7", full-color, touch-screen display, which is tilted for greater visibility. Operating pressure is 2.10 ± 0.05 MPa (304psi). Temperature is 80 to 115°C (176 to 239°F) and programmable from 50 to 150°C (122 to 302°F). Between 80 to 115°C (176 to 239°F) the tolerance is well within $\pm 0.1^\circ\text{C}$. Temperature uniformity is $\pm 0.5^\circ\text{C}$. Pressurization is programmable from 1 hour to 99 hours. This enables AASHTO R28, ASTM D6251, and EN 14769 specifications to be met without any special programming and also enables greater freedom for research and development projects. Real-time graphs are visible from the touch-screen controller while the unit's network-ready modem enables the PAV3 to be controlled from PCs and mobile devices when connected to a network.

Data acquisition of temperature, pressure, and time is collected throughout the aging process. Once the aging process is complete, a .csv file can be created and saved via the USB port on the front of the PAV3. Once the .csv file has been created, it can easily be viewed and manipulated in Microsoft



H-1640B.4F



HA-1635.3F



Excel® or other spreadsheet programs.

The PAV3 sample holder is a one-piece, solid device requiring no assembly and is easy to achieve an accurate level position with the leveling ring in the vessel. There is also room for a small bubble level between slots for verification purposes.

The PAV3 includes a network-ready modem, which provides connection to the internet, permitting the user to access the PAV3 with a mobile device or PC using a VNC viewer app program. VNC connection enables the user to connect, monitor, and control the PAV3 from a remote location. The PAV3 can be programmed with a custom IP address, so the number of PAV3s on a single network is essentially endless.

Pressure Aging Vessel, 230V 50/60Hz H-1640B.4F
Shipping wt. 433 lbs (193kg)

H-1640B.4F PAV3 Accessories & Components

| Description | Model |
|---------------------------|----------|
| UPS battery backup system | H-1640.1 |
| PAV verification kit | H-1640.2 |
| PAV o-ring | H-1640.3 |
| CGA adapter | H-1640.4 |
| High-pressure hose | H-1640.5 |
| Specimen pans set | H-1640.6 |
| Regulator, single-stage | H-1640.7 |
| Pan handling tool | H-1640.8 |
| Specimen rack | H-1640.9 |

Pressure Aging Vessel

ASTM D6251; AASHTO R28; EN 14769

Cooper Research Technology's New Generation Pressure Aging Vessel uses heated, pressurized air to simulate long term oxidative aging of asphalt binders.

This Pressure Aging Vessel uses a touch-screen controller with front panel user interface for complete control and monitoring of all test processes. The system has an operating pressure range of 2.1 ±0.1MPa and temperature range of 80°—115°C, with resolution of 0.1°C.

This easy-to-use system completes a test in three simple steps: Set the temperature and pressure, Insert specimens, Press the start button. A USB port located on the front of the unit allows the user to easily store test data and upgrade software when necessary.

Features:

- Fastest model on the market to reach target test temperature and maintaining it throughout the test.
- A platinum RTD device ensures the accurate temperature resolution and uniformity.
- A pressure relief valve and high- temperature thermal shut-down are included as standard safety features.
- Thermo Regulation: Proportional control with integral and derivative function
- External CE certification of the pressure vessel.
- Spiral wound gasket rather than an O-ring
- High temperature & pressure
- Robust

- High thermal cycling
- No perishing
- Longer lasting
- Includes touch-screen controller with front panel user interface with easy -to-use step-through operation
- Bench top unit with integral vessel/oven design and top opening door

The Pressure Aging Vessel includes a set of ten specimen pans, a precision, anodized aluminum sample holder with lifting handle, and a specimen handling tool. Additional pans can be ordered as necessary. Compressed air with a pressure of at least 350psi (2.4MPa) and a regulator is required and must be user provided.

PAV1, 120/220V 50/60Hz HA-1635.3F
Shipping wt. 433 lbs (193kg)

H-1635.3F Accessories & Replacement Parts

| Description | Model |
|------------------------------|----------|
| Stainless steel specimen pan | H-1635.2 |
| Specimen pan rack gripper | H-1635.6 |
| Specimen rack and handle | H-1635.7 |
| Spiral-wound gasket | H-1635.8 |
| Verification kit* | H-1635.6 |

*The Verification kit includes: handheld Pt100 Thermometer, PT100 Probe, 100mm long; Digital Pressure Gauge, 0-25bar; Wing Screw, Steel, M4x20mm; Wing Screw, Steel, M4x30mm; PAV1 Calibration Cube; PAV1 calibration test hose 1 metre 1/4" fittings 1 angled. With 1/4" adaptor; hard carrying case.



H-1642T

Bending Beam Rheometer with Touch Screen

ASTM D6648; AASHTO T313, TP87 BS EN 14771

The Bending Beam Rheometer 3 (BBR3) has been designed to perform flexural tests on asphalt binder and similar specimens as part of the PG grading system according to Superpave. The BBR3 is a state of the art internal computer system incorporating touchscreen technology. The BBR3's new external cooling unit is now more compact and omits less noise during operation. Programmable test parameters allow users to input and save their own unique settings, allowing the BBR3 to satisfy a diverse range of testing applications.

The BBR3 is made up of a fluid bath base with a built-in touchscreen computer, load frame, external refrigeration unit, and a calibration kit with carrying case. During operation, a known force is applied to the center of a horizontally supported specimen beam submerged in a cold liquid bath while internal software calculates the flexural creep stiffness of the beam. Used in part to determine a sample's critical cracking temperature and low temperature PG grade, the BBR3's -40°C to 25°C temperature range is efficiently calculated by a platinum RTD measuring device. The 500g load cell and changeable specimen supports easily transition the BBR3 for crack sealant testing, and the free standing external cooling unit ensures that the cooling fluid maintains a constant temperature. Programmable test parameters allow the user to define a test and save those parameters for later testing. Predefined test parameters include the standard ASTM BBR test, as well as the crack sealant test and the sliver test.

The BBR3's programmable test parameters include: Deflection Plot, Load Plot, Bath Temperature, Stirrer Speed, Specimen size, Testing Times, Load, and Testing Company.

| H-1642T Specifications | |
|--------------------------------|---|
| Power Requirements | 120, 1ph, 50/60 Hz |
| Operating Temperature | Ambient to -40°C |
| Test Load | Variable test range from 0 to 4,000 mN standard. System. Maintains required test load within +/- 5mN throughout test cycle. |
| Test Cycle Times | Cycle times for pre-load, recovery, and test load are completely operator adjustable. |
| Load Cell | 500g (temperature compensated) |
| LVDT Displacement Transducer | 6.35mm (0.25") calibrated range to provide 2µm resolution throughout testing and verification range. |
| Recommended Cooling Bath Fluid | Non-flammable ethylene glycol mixture. |
| Temperature Measurement | Platinum RTD |
| Compressed Air Requirements | 60 PSI inlet pressure (414 kpa) @ Class 3 Quality max particle of 5µm. |
| Weight | Approximately 148 lbs. |
| Dimensions | 24" W x 23.5" H x 26.5" D |

The BBR3 features a Displacement Transducer accuracy of 0.097 micron, a measurement resolution of 0.006g, and a Deformation Accuracy of 0.097. While other BBR models may favor Peltier cooling, the BBR3 operates more efficiently without it.

Reporting features on the new BBR3 include the ability to name your sample and enter any important notes. With the new BBR3, your data is collected twice per second in addition to these

new features, BBR3 users now also have the ability to upload their company logo directly into their test report.

Once the BBR3 has been connected to a network, users have the ability to access their equipment using a mobile phone, tablet, or PC. This also allows users to connect to a wireless printer, making it easy to print data and test results. A USB port on the back of the unit is also available for users who prefer to connect a printer directly.

In addition to the USB port on the back of the BBR3, a USB port on the front of the unit allows for user friendly software updates. Operators can also use this USB port to download data onto a flash drive, or connect a wireless keyboard for more efficient data input.

BBR3 Touch, 120V 60Hz H-1642T
 BBR3 Touch, 230V 50/60Hz H-1642T.4F
 Shipping wt. 250 lbs (115kg)

BBR Accessories & Components*

| Description | Model |
|-------------------------------|----------|
| Specimen Mold Set (5 per set) | H-1642.1 |
| Mylar Strips, 5 sets of 3 ea. | H-1642.2 |
| BBR Calibration Kit | H-1642.3 |

* For use with all BBRs H-1642T, H-1642T.4F, H-1642 and H-1642.4F



Bending Beam Rheometer

ASTM D6648; AASHTO T313-02

The bending beam rheometer (BBR) performs flexural tests on asphalt binder and similar specimens per tests, initially developed by the Strategic Highway Research Program (SHRP), which consist of a constant force being applied to a specimen in a chilled fluid bath in order to derive specific rates of deformation at various temperatures. The complete BBR system consists of a fluid bath base unit, a three-point bend test apparatus, which is easily removed from the base unit for specimen loading and unloading, an external cooling unit with temperature controller and a calibration hardware kit with carrying case. The unit features an integral, stainless steel load frame and in-line, blunt-point loading shaft. The large, easy-to-read digital display shows load, displacement, and bath temperature for ease of setup and operation. Real-time displacement, loading, and temperature graphs are displayed during the test cycle and can be re-plotted and re-scaled as needed for easy viewing.

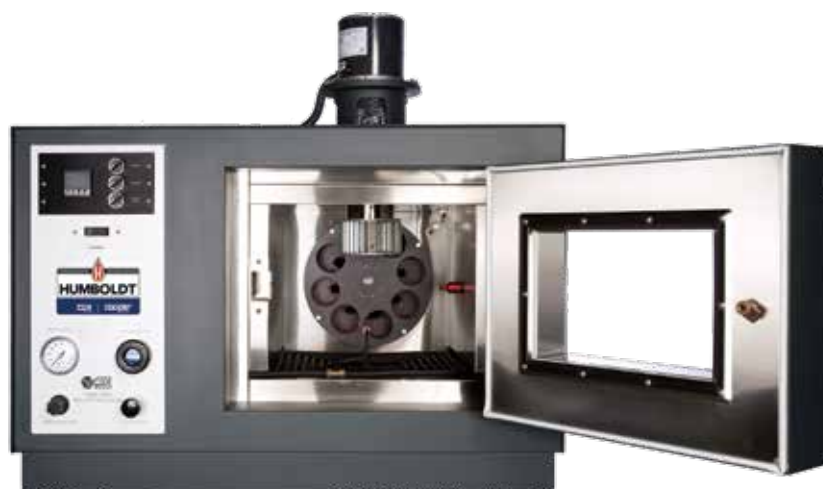
The BBR uses a linear, variable-displacement transducer (LVDT) with a range of 6.35mm and accuracy to ± 2 mm measures deflection. The temperature-compensating 500g load cell with mechanical overload protection ensures accurate load results. Safe, rapid cooling of the ethylene glycol mixture test fluid to -40° to 25°C is provided by a mechanical refrigeration system. Process temperature is controlled and monitored by two, independent, platinum RTD temperature transducers maintaining temperature stability.

H-1642 Specifications

| | |
|--------------------------------|--|
| Power Requirements | 115V 60Hz or 230V, 1ph, 50/60 Hz |
| Temperature Range | -40 to 25°C |
| Operating Temperature | Ambient to -40°C |
| Test Load | Variable range from 0-200g standard within $\pm .5\text{g}$ |
| Test Cycle Times | Cycle times for pre-load, recovery, and test load are completely operator adjustable |
| Load Cell | 500g (temperature compensated) |
| LVDT Displacement Transducer | 0.25 in. (6.35 mm.) calibrated range to provide 2 μm resolution throughout testing and verification range |
| Recommended Cooling Bath Fluid | Non-flammable ethylene glycol mixture |
| Coolant Capacity | 2 gallons (7.57 liters) |
| Temperature Measurement | Platinum RTD |
| Compressed Air Requirements | 50 psi (0.34 MPa) clean, dry air supply required |
| Dimensions | 24.125" W x 24.125" D x 23.25" H (w/ load frame) |
| Weight | Approximately 270 lbs. |

The BBR comes with a pre-loaded software package, which allows for device configuration, daily verifications, test setup, test initiation, and reporting. It also includes five aluminum specimen molds with mylar strips, a Calibration Kit with required weights, and confidence beam. Calibrated test weights and a certified LVDT (NIST-traceable). The easy-to-use software allows daily verification and periodic calibration of load cell, LVDT, and RTD transducers Dimensions: 49" x 49" x 41" (1,245 x 1,245 x 1,040mm). An adequate compressed air source must be supplied by user.

Bending Beam Rheometer, 120V 60Hz H-1642
Bending Beam Rheometer, 230V 50/60Hz H-1642.4F
 Shipping wt. 520 lbs (235.8kg)



H-30069.2F



H-30068.2F

Rolling Thin Film Oven

ASTM D2872; AASHTO T240; EN 12591; CTM 346

The Rolling Thin Film Oven (RTFO) is used to measure the effect of heat and air on a moving film of semi-solid asphaltic material and is an indicator of the approximate change in properties during conventional hot-mixing. The results of this treatment are determined from measurements of the asphalt properties before and after the test. Through the use of a programmable, temperature controller and a 4-digit, digital display system, along with a solid-state heater and 200-watt heating element, the oven accurately maintains the specified test temperature of $\pm 1^\circ\text{F}$ at 325°F ($\pm 0.5^\circ\text{C}$ at 163°C). The specially designed and unique heating solution means that the heat is evenly spread during the test, ensuring results are correct and repeatable. Cox & Sons RTFO is the reference in the world.

The oven also features: double-wall construction; door with double-pane viewing window; symmetrical top and bottom vents; air plenum, and squirrel-cage-type 1725 rpm fan

The RTFO is available in a standard model with a glass flow meter or with a digital flow meter. Both models are identical other than the meter.

The RTFO Oven Includes:

- 200 to 14,000 ml/min flow meter
- Moisture meter
- 0 to 100 psi air pressure gauge with regulator
- Rotating (15rpm) test rack.
- 8 Glass sample containers

Units come with (8) Glass Containers, (1) Jar Tong, (1) Bottle Cooling Rack, (1) 10ft Power Cable, and (1) Bottle Scraper. Overall dimensions 40"W x 36"H x 26"D (1016 x 914 x 660mm). A clean, dry compressed air source is required for oven operation.

RTFO, 208-230V 60Hz H-30068.2F
RTFO, 208-230V 50Hz H-30068.5F

Digital RTFO, 208-230V 60Hz H-30069.2F
Digital RTFO, 208-230V 50Hz H-30069.5F

Shipping wt. 480 lbs (217.7kg)

| Specifications | |
|---------------------|---|
| Construction | Double-walled, 16-gauge welded steel exterior. 18-gauge corrosion-resistant, stainless steel interior |
| Insulation | Insulation 3.5" (89mm) of high density fiberglass |
| Controller | Programmable microprocessor, UL listed |
| Temperature Display | Measured Temperature: 4 digit red LEDs Temperature Set Point: 4 digit green LEDs |
| Thermal Protection | Prevents overheating in the event of control failure |
| Temperature Range | Ambient to 390°F (200°C) |
| Vents | Double exhaust vents for dissipation of expended volatile from specimen |
| Air Flow Adjustment | Needle valve (long taper) |
| Air Pressure Gauge | Range 0 - 100 psi |
| Heat Exchanger | 5/16" dia. copper tube |

Rolling Thin Film Oven Accessories

| | |
|-----------------------------|------------|
| Silica gel, 1.5 lb can | H-30068.7 |
| Dry air system | H-30068.8 |
| Jar cooling rack | H-30068.3 |
| Bottle scraper | H-30068.2 |
| Digital mass flow-meter | H-30068.9 |
| ASTM 13C Thermometer | H-2610.13C |
| Additional specimen bottles | H-30068.12 |
| Oven Tongs | H-30068.1 |



ACCESSORIES

Accessories are not included and should be ordered separately.

Pyrolytic Oven

This new Pyrolytic Oven from ATS is a must have for any testing lab. Designed to burn off test residue from lab equipment, this oven performs safe, solvent-free cleaning of asphalt and other organic residues from laboratory equipment and glassware. The Pyrolytic Oven provides fully-automatic cleaning cycles and cost-effective operation while reducing hazardous waste handling and disposal.

This model improves on previous versions and incorporates state-of-the-art touchscreen technology, automatic operation, and a clean, matte-black design. Lab technicians no longer need to rely on scraping, wire brushing, or hand heating to clean equipment. Operators can simply place everything in their pyrolytic oven, press start, and allow the machine to do the work. This not only reduces mess, but saves time and creates a safer, more efficient lab environment.

The Pyrolytic Oven's touchscreen controller provides user-friendly operation with menu-driven programming, which allows completely automatic operation. System monitoring diagnostics provides alerts to operators when maintenance is required. Pre-programmed language options include English, German, French, Italian, Chinese, Spanish,



H-1647.2F



H-1631



H-30145ESS



ACCESSORIES

For more bench oven choices, as well as accessories, see pages: 346-349. For gloves for use with these ovens, see page 362.

and Arabic. The clean, matte-black design fits the physical footprint and exhaust connection point of older Pyro-Clean models.

Maximum oven temperature is 900°F (482°C) and cleaning temperatures range from 800° to 900°F to burn off organic contaminants, leaving behind only carbonized residue, which can be easily removed.

Features:

- Low operating costs allows users to save both time and money.
- User-friendly touchscreen technology and enhanced ATS software.
- Eliminates the need to hand clean equipment
- Destroys even trace residues of organic contaminants, leaving lab equipment ultra clean for critical testing.
- Reduces or eliminates the costs of hazardous waste material disposal, the dangers of glass breakage, and the overall mess associated with manual equipment cleaning.
- Pre-programmed language options include English, German, French, Italian, Chinese, Spanish, and Arabic.
- Developed utilizing more than 50 years of process heating and materials testing industry experience.
- Built-in system monitoring diagnostics to alert operators when maintenance is required.
- Fits physical footprint and exhaust connection point of previous, obsolete pyrolytic oven models.

Pyrolytic Oven, 220V 60Hz **H-1647.2F**
Shipping wt. 380 lbs (172kg)

Loss-on-Heat Thin Film Oven

ASTM D6, D1754; AASHTO T47, T179; BS2000

This dual-purpose 16ft³ oven can be used for loss-of-heat test and thin film test for bitumen and asphaltic materials. The loss-on-heat oven determines the effect on asphaltic materials of heating in an oven under prescribed conditions. The results are reported in terms of change in sample mass and/or changes in selected properties such as viscosity, penetration and ductility as evidenced by test data taken before and after the oven cycle.

The oven features a stainless steel interior, a powder-coated steel exterior and a double-glazed door window for viewing the test chamber. Side-mounted controls are comprised of a microprocessor digital control and an independent overheat thermostat. Two rotating platforms are supplied to perform both types of tests.

The oven's temperature range is: ambient to 365°F (180°C), pre-set to 163°C ± 1°C. **Dimensions:** Internal Chamber: 15" (H) x 20.5" (W) x 18" (D) (38 x 52 x 46cm); external dimension 22.5" (H) x 34" (W) x 25" (D) (57 x 87 x 63cm). External Dimension does not include motor or handle.

Loss-On-Heat Oven, 120V 60Hz **H-1631**
Loss-On-Heat Oven, 220V 60Hz **H-1631.2F**
Loss-On-Heat Oven, 220V 50Hz **H-1631.5F**
Shipping wt. 300 lbs (136kg)

Loss-On-Heat Oven Accessories

| Description | Model |
|--|----------|
| Sample container, ASTM D6 | H-1631.1 |
| Thin film oven pan, stainless steel for ASTM D1754 | H-1540 |

Heavy-Duty Lab Bench Oven, Stainless Steel

ASTM D6925

This Oven with Stainless-steel interior is a great choice for use in laboratory testing of asphalt mix designs. It is an economical, forced-draft oven capable of maintaining 450°F (232°C) temperatures, more than adequate for both short-term aging of asphalt samples and heating aggregates, asphalt binders and equipment for use in ASTM D6925, as well as other tests.

The .7ft³ (198L) capacity provides ample room for all applications. The oven features a dual-digital display, PID controller with optimized performance for temperature uniformity of ±2°C.

Two large, heavy-duty shelves are included and can handle up to 80lb each, perfect for gyratory molds and hot-mix asphalt samples. Stainless steel interior and included drip pan promote long life and easy maintenance.

Dimensions: Internal Chamber: 26" (H) x 20" (W) x 26" (D) (660 x 508 x 660mm); external dimension 33" (H) x 24" (W) x 32" (D) (838 x 610 x 813mm).

Lab Bench SS Oven, 120V 60Hz **H-30145ESS**
Lab Bench SS Oven, 230V 50/60Hz **H-30145ESS.4F**
Shipping wt. 206 lbs (93.4kg)

Heavy-Duty Lab Oven Accessories

| Description | Part # |
|----------------------------------|----------|
| Floor Stand, 1 fixed shelf | H-30150 |
| Floor cabinet, 2 sliding shelves | H-30155 |
| Exhaust adapter for 3" pipe | H-30181 |
| Shelf w/ mounting rails | H-30145S |



H-1068CB

HA-1068.3F



Interior of HA-1068 showing test molds, screw drive and disengage lever.

Elite Series Automated Ductilometer

ASTM D113, D5892, D6084; AASHTO T51

The HA-1068 Ductilometer features Humboldt's Elite Series Controller. This touch-screen controller provides you with full, graphical monitoring of all testing functions in a stand-alone application, while also providing the ability to control the machine from a networked computer or just port data from the controller to a networked computer.

The HA-1068 Controller provides precise speed control of the DC, stepper motor maintaining constant speed, entirely vibration-free, from 5 to 100mm/min. The unit provides for three test briquettes per testing sequence with a maximum carriage travel (elongation) of 150cm and an automatic stop feature. The machine also provides a manual disengage lever for quickly disengaging the screw drive to return the testing carriage back to the start position after a test completion. This feature allows multiple tests to be run without having to wait for the machine to reset itself.

The HA-1068 has a stainless steel interior with an overflow connection, and a baked enamel stainless steel-wrapped exterior. Gears are bronze or brass; all other parts are solid brass to prevent rusting. Finned stainless steel tubes beneath a false bottom provide efficient thermal transfer. A single stainless steel lead screw mounted above water level prevents agitation of water and premature rupture of specimens. A traveling pointer adjusts to zero starting position and indicates exact position of carriage on a linear centimeter scale attached to trough's front edge.

In stand-alone mode the controller provides you with full, graphical monitoring of all testing functions, while maintaining full computer control when desired. The seven-inch, waterproof screen provides at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer, building upon Humboldt's dedication to modular, stand-alone data acquisition.

You will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's FRONT USB port or the data can be transferred to a computer via the LAN port.

A second USB port located on the back of the machine can also be used to power a wireless access point, which can provide a wireless hook-up with a computer, if no LAN is available.

The HA-1068 Ductilometer is sold without a circulating temperature controller. If desired, choose a circulating temperature controller with the correct AC requirements. The temperature-controller provides a solid-state, thermostatically controlled bath and circulator to maintain water temperature within a $\pm 0.9^{\circ}\text{F}$ ($\pm 0.5^{\circ}\text{C}$). The temperature range is: -10°C to 80°C and the heating capacity is 1000W with a 0.1°C stability. Includes a 6' (183cm) cord, feed-through switch and 3-prong plug and 3 standard H-1080 briquette molds with H-1090 plates. Trough overall dimensions: 11.75" x 74" x 6.375" H (30 x 188 x 16cm). Acrylic Cover is included with this machine.

Elite Series Ductilometer, 120/220V 50/60Hz HA-1068.3F
Shipping wt. 425 lbs (193kg)

Circulating Temperature Controller

The H-1068CB Circulating Temperature Controller is designed for use with the H-1068X ductility machine. It provides a solid-state, thermostatically controlled bath and circulator to maintain water temperature within a $\pm 0.9^{\circ}\text{F}$ ($\pm 0.5^{\circ}\text{C}$). Temperature range is: -10°C to 80°C . 1000W heating capacity with 0.1°C stability. Dimensions: 25" x 9" x 19" (635 x 229 x 483mm).

| | |
|--------------------------------------|-------------|
| Circulating Temp. Control, 120V 60Hz | H-1068CB |
| Circulating Temp. Control, 220V 60Hz | H-1068CB.2F |
| Circulating Temp. Control, 220V 50Hz | H-1068CB.5F |

Shipping wt. 80 lbs (36.2kg)

Force Determination Kit for Ductilometers

This force determination kit is used to add force determination capabilities to the H-1068.3F Ductilometer. The HA-1068.3F is pre-setup to accept this add on. Just install and you are ready to proceed. The kit provides (3) Force Determination Transducers, cables and (1) Force Transducer Calibration Device.

Force Determination Kit

HA-1066

Shipping wt. 30 lbs (13.6kg)



Interior of HA-1060 showing test molds, screw drive and disengage lever.



Interior of HA-1060 showing HA-1066 force determination transducer set up.



HA-1060.4F

Elite Series Ductilometer, Refrigerated ASTM D113, D5892, D6084; AASHTO T51

Humboldt's Elite Series refrigerated Ductilometer features Humboldt's Elite Series Controller. This touch-screen controller provides you with full, graphical monitoring of all testing functions in a stand-alone application.

The HA-1060 Refrigerated Ductilometer is mounted into a polypropylene bath designed for use with sodium chloride solutions. The cabinet is constructed of a heavy-gauge, enamel-finish steel lower cabinet and stainless steel upper cabinet. It is fully-insulated and the sealed space between the inner and outer walls protects the low-thermal conductivity properties of the foam and fiberglass combination (tested and proven to have the best K factor). A high-capacity pump assures positive circulation in the bath to provide close temperature control. Three-direction flow regulation is handled with flow cut-off valves that engage when equilibrium is reached. A sensitive, magnetic-setting, electronic relay control panel for heat and refrigeration maintains temperature range of 32°F (0°C) to 86°F (30°C) by 0.1°F (0.1°C).

The HA-1060 Controller provides precise speed control of the DC, direct-drive motor maintaining constant speed, entirely vibration-free, from 5 to 100mm/min. The unit provides for three test bri-

quettes per testing sequence with a maximum carriage travel (elongation) of 150cm and an automatic stop feature. The machine also provides a manual disengage lever for quickly disengaging the screw drive to return the testing carriage back to the start position after a test completion. This feature allows multiple tests to be run without having to wait for the machine to reset itself.

The HA-1060 has a stainless steel interior with an overflow connection, and a baked enamel stainless steel-wrapped exterior. Gears are bronze or brass; all other parts are solid brass to prevent rusting. Finned stainless steel tubes beneath a false bottom provide efficient thermal transfer. A single stainless steel lead screw mounted above water level prevents agitation of water and premature rupture of specimens. A traveling pointer adjusts to zero starting position and indicates exact position of carriage on a linear centimeter scale attached to trough's front edge.

Stand-Alone Control

In stand-alone mode the controller provides you with full, graphical monitoring of all testing functions, while maintaining full computer control when desired. The seven-inch, waterproof screen provides at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer, building upon Humboldt's ded-

ication to modular, stand-alone data acquisition.

You will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's FRONT USB port or the data can be transferred to a computer via the LAN port. A second USB port located on the back of the machine can also be used to power a wireless access point, which can provide a wireless hook-up with a computer, if no LAN is available.

Includes 3 standard H-1080 briquette molds with H-1090 plates and an integral, clear acrylic cover to aid in temperature control. Cabinet is 90" x 41" x 23" (229 x 104 x 58cm).

Elite Ductilometer, Refrig., 220V 50/60Hz HA-1060.4F
Shipping wt. 1066 lbs (484kg)

Force Determination Kit for Ductilometers

This force determination kit is used to add force determination capabilities to the H-1068.3F Ductilometer. The HA-1068.3F is pre-setup to accept this add on. Just install and you are ready to proceed. The kit provides (3) Force Determination Transducers, cables and (1) Force Transducer Calibration Device.

Force Determination Kit HA-1066
Shipping wt. 30 lbs (13.6kg)



Humboldt Ductilometer

ASTM D113, D5892, D6084, AASHTO T51

Humboldt Ductilometers determine ductility of formed asphalt/cement or semi-solid bitumen by measuring the distance of elongation before reaching the breaking point of a briquette sample, which is pulled apart at a specific speed and temperature. The H-1068X is a three-speed machine designed for standard and force ductility tests. The unit tests three briquettes simultaneously and its DC, direct-drive motor maintains constant speed, entirely vibration-free. Speeds of 1/4, 1 or 5cm per minute are selected via lever shift on mechanical gear box.

A single stainless steel lead screw mounted above water level prevents agitation of water and premature rupture of specimens. A traveling pointer adjusts to zero starting position and indicates exact position of carriage on a linear centimeter scale attached to trough's front edge. Maximum carriage travel (elongation) is 150cm with an automatic stop.

The Unit has a stainless steel interior with an overflow connection, and a baked enamel stainless steel-wrapped exterior. Gears are bronze or brass; all other parts are solid brass to prevent rusting. Finned stainless steel tubes beneath a false bottom provide efficient thermal transfer. Includes a 6' (183cm) cord, feed-through switch and 3-prong plug. Includes 3 standard H-1080 briquette molds with H-1090 plates. Trough overall dimensions: 11.75" x 74" x 6.375"H (30 x 188 x 16cm). H-1068PC Acrylic Cover is recommended to maintain constant tank temperatures.

Humboldt Ductilometer

| | |
|----------------------------------|------------|
| Humboldt Ductilometer, 120V 60Hz | H-1068X |
| Humboldt Ductilometer, 220V 60Hz | H-1068X.2F |
| Humboldt Ductilometer, 220V 50Hz | H-1068X.5F |

Shipping wt. 240 lbs (108.8kg)

Ductilometer, Temperature-Controlled

ASTM D113, D5892, D6084, AASHTO T51

The H-1068 Ductilometer builds on the H-1068X machine and adds a circulating temperature-control unit. Solid-state thermostatically controlled bath and circulator maintain water temperature within a $\pm 0.18^\circ\text{F}$ ($\pm 0.1^\circ\text{C}$). The H-1068B is a three-speed machine designed for Standard and Force Ductility tests. The unit tests three briquettes simultaneously and its DC, direct-drive motor maintains constant speed, entirely vibration-free. Speeds of 1/4, 1 or 5cm per minute are selected via lever shift on mechanical gear box.

A single stainless steel lead screw mounted above water level prevents agitation of water and premature rupture of specimens. A traveling pointer adjusts to zero starting position and indicates exact position of carriage on a linear centimeter scale attached to trough's front edge. Maximum carriage travel (elongation) is 150cm with an automatic stop.

The Unit has a stainless steel interior with an overflow connection, and a baked-enamel, stainless steel-wrapped exterior. Gears are bronze or brass; all other parts are solid brass to prevent rusting. Finned stainless steel tubes beneath a false bottom provide efficient thermal transfer. Includes a 6' (183cm) cord, feed-through switch and 3-prong plug. Includes 3 standard H-1080 briquette molds with H-1090 plates. Trough overall dimensions: 11.75" x 74" x 6.375"H (30 x 188 x 16cm). H-1068PC Acrylic Cover is recommended to maintain constant tank temperatures.

Ductilometer, Temperature Controlled

| | |
|-------------------------|------------|
| Ductilometer, 120V 60Hz | H-1068B |
| Ductilometer, 220V 60Hz | H-1068B.2F |
| Ductilometer, 220V 50Hz | H-1068B.5F |

Shipping wt. 410 lbs (185.9kg)

Ductility Machine, Basic

ASTM D113, D5892, D6084, AASHTO T51

The H-1050 is a three-speed machine designed for standard and force ductility tests. It includes a quality mechanical gear box. Speeds of 1/4, 1 or 5cm per minute are selected via lever shift on mechanical gear box. The unit is a bare-bones, economical ductility machine, which does NOT include a wrapped exterior or thermal-finned, stainless steel tubes for enhanced thermal transfer.

| | |
|-------------------------------------|-----------|
| Ductility Machine, Basic, 120V 60Hz | H-1050 |
| Ductility Machine, Basic, 220V 60Hz | H-1050.2F |
| Ductility Machine, Basic, 220V 50Hz | H-1050.5F |

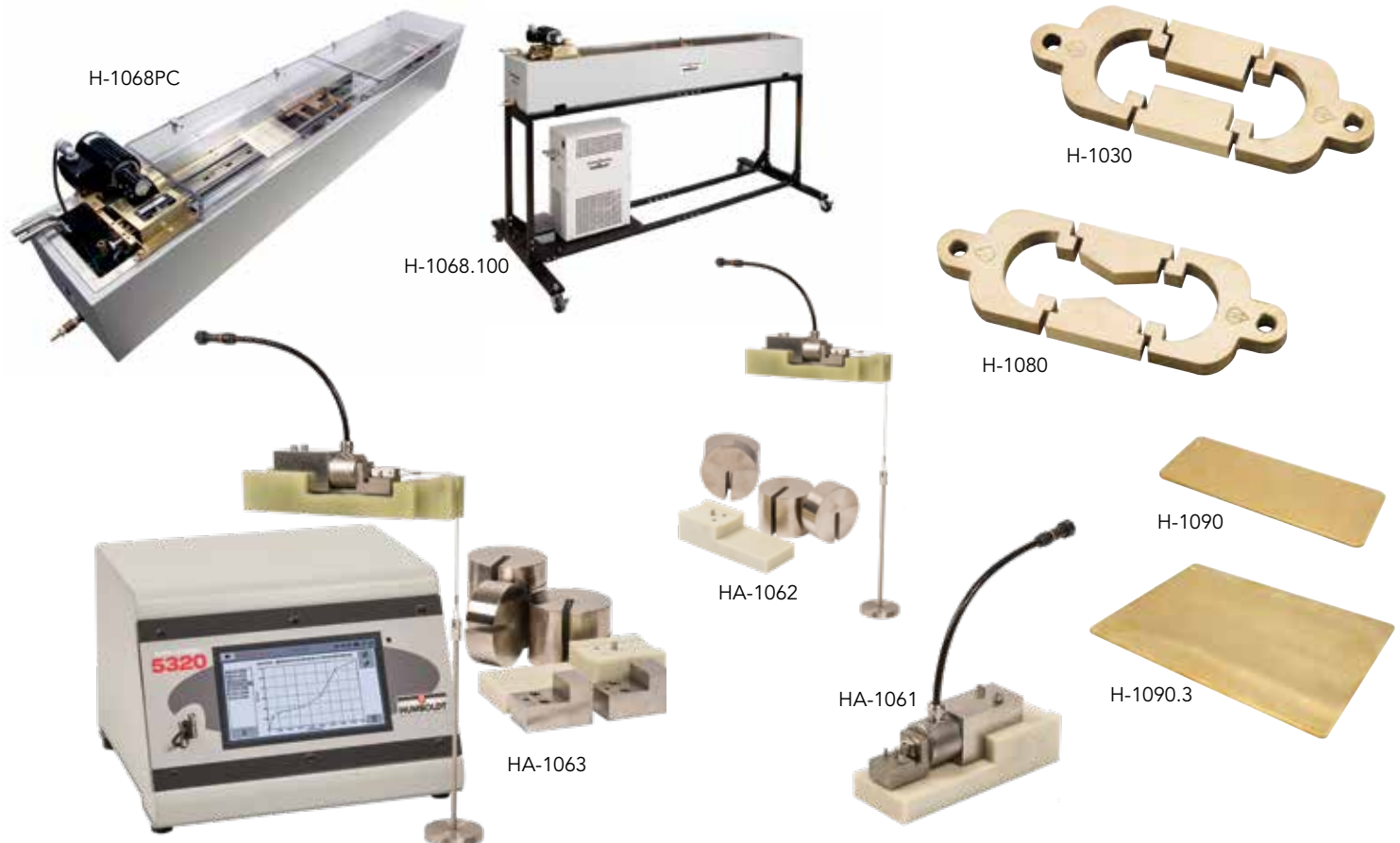
Shipping wt. 200 lbs (90.7kg)

Circulating Temperature Controller

The H-1068CB Circulating Temperature Controller is designed for use with the H-1068X ductility machine. It provides a solid-state, thermostatically controlled bath and circulator to maintain water temperature within a $\pm 0.9^\circ\text{F}$ ($\pm 0.5^\circ\text{C}$). Temperature range is: -10°C to 80°C . 1000W heating capacity with 0.1°C stability. Dimensions: 25" x 9" x 19" (635 x 229 x 483mm).

| | |
|-------------------------------------|-------------|
| Circulating Temp.Control, 120V 60Hz | H-1068CB |
| Circulating Temp.Control, 220V 60Hz | H-1068CB.2F |
| Circulating Temp.Control, 220V 50Hz | H-1068CB.5F |

Shipping wt. 80 lbs (36.2kg)



Cover for Ductilometers (Clear, Acrylic)

Temperature control cover made from clear acrylic sheet. Can be used with all ductility machines, except HA-1060, which comes with one.

Ductility Machine Cover **H-1068PC**
Shipping wt. 40 lbs (18kg)

Ductilometer Stand

Designed for use with Humboldt Ductilometers, places machine at working height and includes a shelf for circulating temperature controller. Features square steel legs. Needs assembly.

Ductilometer Stand **H-1068.100**
Shipping wt. 200 lbs (90.7kg)

Force Determination Kit for Manual Ductilometers

This force determination kit is designed for use with manual control ductilometers like the H-1068X and H-1068B. It provides (3) Force Determination Transducers, a HM-5320 Data Logger and (1) Force Transducer Calibration Device. This kit will allow you to do force determinations and the Data Logger will allow you to monitor the test and its results. Humboldt's Elite Series Data Logger provides four individual, 24-bit analog to digital converters with an instrumentation excitation supply of 10 VDC. The analog Logger is ideal for use with instruments, such as pressure transducers, load cells, and strain transducers. It provides data storage for 1000 readings per channel. See page 149 for more information.

Force Determination Kit **HA-1063**
Shipping wt. 30 lbs (13.6kg)

Force Determination Transducers

Force determination transducers for use with Humboldt Elite Series Ductilometers. Provides precise tensile strength measurement of any material, preparation, procedure or type of test to an accuracy of 0.01 lbs. Attaches over existing pin in Ductilometer without tools or machine modification. Can accommodate three adapters simultaneously. Electric components are located out of the water bath. Sold individually, Elite Series Ductilometer can accommodate up to 3 at a time.

Force Determination Transducer **HA-1061**
Shipping wt. 4 lbs (2.3kg)

Calibration Device, Force Transducers

Calibration device for Humboldt Elite Series Ductilometer force determination transducers. Provides simple and precise calibration of transducers. Includes calibration pedestal, storage pedestal, dead weight hanger and weight set.

Calibration Device, Force Transducers **HA-1062**
Shipping wt. 15 lbs (6.8kg)

Ductility Briquette Mold

ASTM D113

Mold for making test briquettes for use with any ductility testing machine. H-1080 briquette mold has angled sides for use in standard test. Four accurately machined interlocking brass segments are interchangeable with same parts from different molds; no parts identification marks are needed for matching. End piece that hold specimens being elongated are provided with mounting holes.

Ductility Briquette Mold **H-1080**
Shipping wt. 0.8 lb (0.36kg)

Elastic Recovery Mold

ASTM D5892, D6084, AASHTO T301

Mold for making test briquettes for use with any ductility testing machine. H-1030 briquette mold has straight sides for use in forced tests. Requires H-1090 or H-1090.3 base plates. Four accurately machined interlocking brass segments are interchangeable with same parts from different molds; no parts identification marks are needed for matching. End pieces, designed to hold specimens being elongated, are provided with mounting holes.

Elastic Recovery Mold **H-1030**
Shipping wt. 1.1 lb (0.49kg)

Base Plate

Brass, base plate for single mold. Flat surface provides uniform contact with mold and surfaces. 5.5" x 2" x .125" (140 x 51 x 3mm)

Base Plate, Single Mold **H-1090**
Shipping wt. 0.6 lbs (0.27kg)

Base Plate, Triple Mold

Brass base plate for triple mold. Flat surface provides uniform contact with bottom surfaces mold. 5.5" x 8" x .125" (140 x 203 x 3mm)

Base Plate, Triple Mold **H-1090.3**
Shipping wt. 1.8 lbs (0.8kg)

**Penetrometer, Universal**

ASTM D5, D217, D1168, D1321, D1403, D1831, D5329; AASHTO T49, T187 and others

Direct-reading instrument for precision penetration measurements of bituminous materials, cement, petrolatum and waxes, as well as food, cosmetics and pharmaceutical products. Unit has 5" diameter indicator dial, graduated in 400 divisions of 0.1mm, corresponding to 40mm penetration. Zero preset to eliminate errors. Includes 47.5g plunger with 3.2mm hole, and two loading weights (50g and 100g). Overall dim. 10.5" x 13" x 22" (266.7 x 330.2 x 558.8mm).

Penetrometer, Universal **H-1200**
Shipping wt. 25 lbs (11kg)

Penetrometer, Electric

ASTM D5, D217, D1168, D1191, D1321, D1403, D1831, D1855; AASHTO T49, T187 and others

Takes our H-1200 universal penetrometer and adds an automatic digital timer to it. The timer's release mechanism is switchable between seconds, minutes, or hours. Timer may be set in 1/10th second intervals. Plunger releases with push of a button, and automatically stops after the preset time duration. H-1240.4F adds a voltage adapter and internal switch on the timing mechanism to change cycle to 50Hz.

Penetrometer, Electric, 120V 60Hz **H-1240**
Penetrometer, Electric, 220V 50/60Hz **H-1240.4F**
Shipping wt. 32 lbs (15kg)

Penetrometer, Digital

ASTM D5, D217, D1168, D1191, D1321, D1403, D1831, D1855; AASHTO T49, T187 and others

The H-1240D penetrometer adds a digital gauge to the H-1240 electric penetrometer to provide precise at-a-glance readings, as well as the ability to automatically start a test with a button push and have the test end after a preset duration.

Penetrometer, Digital, 120V 60Hz **H-1240D**
Penetrometer, Digital, 220V 50/60Hz **H-1240D.4F**
Shipping wt. 26.2 lbs (11.8kg)

Penetrometer for Battery Paste

Battery Paste Penetrometer combines the H-1200 and a H-1255 grease cone, which has a hardened steel tip with a special plunger. Total needle weight is 60g ±.050g.

Penetrometer for Battery Paste **H-1202**
Shipping wt. 25 lbs (11kg)

Penetrometer, Portable

ASTM D5, D217, D1168, D1191, D1321, D1403, D1831, D1855; AASHTO T49, T187 and others

Lighter and smaller than H-1200 for field work, unit's micrometer adjusts for accurate settings, as well as coarse adjustment for approximate settings. Only one additional 50g loading weight is included with a H-1280 needle. Overall dim. 7" x 7" x 16" (178 x 178 x 406mm).

Penetrometer, Portable **H-1250**
Shipping wt. 14 lbs (6.3kg)

Penetrometer for Battery Paste, Portable

Battery Paste Penetrometer combines the H-1250 and a H-1255 grease cone, which has a hardened steel tip with a special plunger. Total needle weight is 60g ±.050g.

Penetrometer for Battery Paste, Portable **H-1252**
Shipping wt. 9 lbs (4.08kg)

Deluxe Water Bath

ASTM D6927, D5581 and D4867

Microprocessor-based control for precise temperatures throughout the range to 180°F. Includes magnetic circulator, ensuring constant water temperature, and, a stainless steel shelf, which stands 2" (51mm) above the bottom of the unit for free circulation of water above and below test samples aided by magnetic stir bar, included. Volume is 7.76 gallons (29.40L) and dimensions are: ID: 19.5" W x 11.5" D x 8" H (495.3 x 292.1 x 203.2mm)

Deluxe Water Bath, 120V 60Hz **H-1390**
Deluxe Water Bath, 220V 50/60Hz **H-1390.4F**
Ship wt. 44lbs. (19.9kg)



H-1250

H-1252

Water Bath

ASTM D6927, D5581 and D4867

Microprocessor-based control for precise temperatures throughout the range. Includes a stainless steel shelf, which stands 2" (51mm) above the bottom of the unit for free circulation of water above and below test samples. Volume is 7.76 gallons (29.40L) and dimensions are: ID: 19.5" W x 11.5" D x 8" H (495.3 x 292.1 x 203.2mm).

Deluxe Water Bath, 120V 60Hz **H-1392**
Deluxe Water Bath, 220V 50/60Hz **H-1392.4F**
Ship wt. 43lbs. (19.5kg)

Economy Water Bath

Low-cost alternative water bath for heating specimens holds eight standard 4" stability molds. Supporting shelf above the bottom allows water circulation around specimens. Automatic thermostatic control with a range of 150° to 500°F (65° to 160°C). ID 11.5" x 19.5" x 5.5" (293 x 497 x 140mm) deep. H-1380.4F uses a step-down transformer, which is included, for electric conversion.

Deluxe Water Bath, 120V 60Hz **H-1380**
Deluxe Water Bath, 220V 50/60Hz **H-1380.4F**
Ship wt. 18lbs. (18.16kg)

Transfer Dish

ASTM D5

Plastic transfer dish has flat bottom, straight sides and metal centering lugs with magnet in the bottom. Size is: 3.75" dia. x 3.25" deep (95 x 83mm).

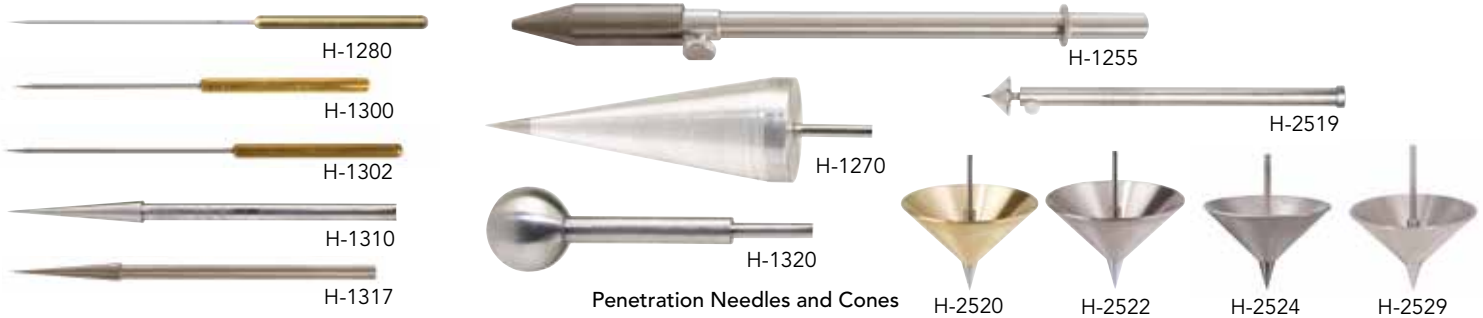
Transfer Dish **H-1352**
Shipping wt. 0.9 lb (0.4kg)



H-1394

H-1390

H-1352



| Penetration Needles and Cones | | | | | |
|--|---|--------|---|---|--------|
| Bituminous materials ASTM D5; AAS- HTO T49, IP49; ASA Std. A37.1; Fed Spec. SS.R. 406C, Meth. 214.01 | Standard hardened stainless steel needle, 40-45mm exposed needle length. Wt. 2.5g. | H-1280 | Measuring firmness of solid and plasticized fats: shortenings, butters AOCS Cc 16-60 | 20° aluminum cone, 3.2mm ferrule, 0.8mm stainless steel blunt tip. Overall length 106mm. Wt. 45g. | H-1270 |
| | Standard hardened stainless steel needle, 40-45mm exposed needle length. Certified to ASTM accuracy by independent laboratory. Wt. 2.5g. | H-1300 | Recovery of used grease, small samples ASTM D1403 | 1/4 scale. (Not considered a substitute for full-size cone specified in ASTM D217.) Wt. 9.38g | H-2519 |
| | Long hardened stainless steel needle, 50-55mm exposed needle length. Wt. 2.5g. | H-1290 | Grease testing penetrometers ASTM D217, D937 ASA Std. Z11.3 | Hollow 90° brass cone, highly polished stainless steel tip. Removable nut and stem. Wt. 102.5g. | H-2520 |
| | Long hardened stainless steel needle, 50-55mm exposed needle length. Certified to ASTM accuracy by independent laboratory. Wt. 2.5g. | H-1302 | | Hollow 90° stainless steel cone, highly polished stainless steel tip. Removable nut and stem. Wt. 102.5g. | H-2522 |
| Waxes with 250 or less penetration ASTM D1321 | Hardened stainless steel wax penetration needles with tapered point, blunt tip of truncated cone. Ferrule is approx. 3.2mm dia. Wt. 2.5g. | H-1310 | ASTM D2884 | Hollow 90° Magnesium cone and plunger. Total cone wt. 30.0g | H-2524 |
| | Same as H-1310. Certified to ASTM accuracy. | H-1317 | Food, Paste, Paints U.S. Dept of Agriculture | Hollow 90° Aluminum cone and tip. Total wt. 35g | H-2529 |
| Battery paste | Hardened stainless steel tip with special plunger. Total wt. 60g ± .050g. | H-1255 | Applications requiring 90° cones, ASTM D217, D937 ASA std. Z11.3 | Stainless steel replacement tip, nut and stem. | H-2525 |
| Joint sealant for asphalt & concrete pavements ASTM D5329 | Resilience ball penetration tool. Total wt. 27.5g. | H-1320 | | | |

Aluminum Moisture Boxes

Flat-bottom, straight-side seamless aluminum box has tight fitting cover, which fits bottom of box as well. Protects sample from exposure during storage and weighing operations.

Aluminum Moisture Boxes

See chart below

Sample Cups, Tin

Flat-bottom, seamless tin sample cups have telescoping covers. Hold samples for determining penetrations.

Sample Cups, Tin

See chart to right

Sample Cups, Tin

| Capacity | Dimensions | Quantity | Model |
|-----------------|--|----------|-----------|
| 2.5 oz (71g) | 1.87" (47.5mm) ID, 1.42" (36mm) deep | 48 | H-1350.3A |
| 3 oz (85g) | 2.25" (57.1mm) ID, 1.42" (36mm) deep | 36 | H-1350.3 |
| 4.7 oz (133g) | 2.42" (61.5mm) ID, 1.67" (42.6mm) deep | 36 | H-1350.4A |
| 5.6 oz (159g) | 2.59" (66mm) ID, 1.72" (43.4mm) deep | 36 | H-1350.6A |
| 8.2 oz (232g) | 3.05" (77.5mm) ID, 1.97" (50mm) deep | 18 | H-1350.8A |
| 16 oz (454g) | 4" (102mm) ID, 2.375" (60.3mm) deep | 1 | H-1350.16 |
| 42.3 oz (1200g) | 6.12" (155mm) ID, 3" (76.2mm) deep | 1 | H-1350.42 |
| 70.5 oz (2000g) | 6.12" (155mm) ID, 5" (127mm) deep | 1 | H-1350.70 |

Moisture Boxes, Aluminum

| OD | ID | Height | Inside Ht. | Volume cu. in./fl. oz. | Model |
|-------------|--------------|--------------|---------------|---------------------------------|--------|
| 2" (51mm) | 1.975 (50mm) | .875" (22mm) | 0.865" (22mm) | 2.650 (44cc) 1.47 (44ml) | H-4926 |
| 2.5" (64mm) | 2.470 (63mm) | 1.75" (44mm) | 1.746" (44mm) | 8.366 (137cc) 4.64 (137ml) | H-4927 |
| 3" (76mm) | 3.000 (76mm) | 1" (25mm) | 0.985" (25mm) | 6.963 (114cc) 3.86 (114ml) | H-4928 |
| 3.5" (89mm) | 3.490 (89mm) | 2" (51mm) | 1.990" (51mm) | 19.037 (312cc) 10.55 (312ml) | H-4929 |





SmartPave 92 Dynamic Shear Rheometers (DSR)

ASTM D7175, D7405; AASHTO T315, T350

Dynamic Shear Rheometers (DSR) classify asphalt binders based on their resistance to damage from age, temperature, and mechanical forces over a wide temperature range. DSR's are particularly important in the characterization of polymer-modified, performance graded (PG) binders used in modern Superpave mix designs. A disc-shaped binder sample is confined between two parallel plates and subjected to horizontal oscillation to determine dynamic shear properties.

Anton Paar SmartPave 92 Dynamic Shear Rheometers are configured to meet the demands of everyday quality control testing of 8mm and 25mm samples in asphalt production facilities. These models are ideal for classification of SHRP/SuperPave PG binders.

The synchronous, brushless DC motor drives a rotor mounted on a frictionless air bearing to allow the most precise movement and sensitive measurements. Maximum torque is 125 mNm (milliNewtons-meter) and minimum oscillation torque is 1 μ Nm. Speed range is from 10-3 to 1,500rpm. A clean, dry, and oil-free supply of compressed air is required for operation. Operating air pressures are from 58 to 101psi (4 to 7bar) with optimum pressure of 87psi (6bar).

User-friendly RheoCompass™ software is included and designed specifically for the needs of the asphalt industry. It contains numerous templates that are tailored specifically to the needs of the asphalt industry. The predefined test procedures

contain step-by-step instructions for all test types as defined by AASHTO, ASTM, DIN EN, and FGSV. RheoCompass™ software offers fully automatic temperature calibration and verification routines. Temperature accuracy and stability are crucial in asphalt testing. The unique automatic temperature calibration routine ensures temperature gradients <0.1 °C.

Toolmaster™ automatic tool recognition and configuration instantly recognizes testing components and temperature control units, eliminating the need to enter data manually when changing components. Quick-Connect coupling allows one-handed connection of key components and ensures fast, convenient changes. TruRay LED lighting feature provides a clear view of the sample and measurement surface for easy set up and precise filling of the measuring gap. A sliding rail design allows easy access to the sample during trimming and set up operations.

The HA-1700.3F is designed for everyday QC testing, and is supplied without the Peltier temperature-controlled hood. Upper and lower measuring plates and fittings for 8mm and 25mm samples are included. This cost-effective model does not fully meet ASTM and AASHTO requirements for total temperature control. The Peltier system in the base provides temperature control for the lower plate.

The HA-1701.3F is also configured for routine QC testing, but fully complies with current ASTM and AASHTO requirements for temperature control of the testing environment. The patented active Peltier temperature hood controls temperatures

both above and below the sample, eliminating temperature gradients and making heating and cooling rates much faster. Test times are reduced, while reproducibility is improved. With no water flow around the sample, set-up and testing takes place in a completely dry environment. Temperature range is -5° to 200°C, with temperature gradients less than 0.1°C.

Both Units Include:

- SmartPave 92 Dynamic Shear Rheometer
- Screw-on Lower Measuring Plate (25mm)
- Measuring Plate (25mm)
- Screw-on Lower Measuring Plate (8mm)
- Measuring Plate (8mm)
- RheoCompass™ Rheometer Software
- Air-cooled Petier Temperature Device
- Temperature Measuring Set SmartPave US vers.

The HA-1701.3F AASHTO Also Includes:

- Air-Cooled Peltier Hood
- Air Distributor MCR X2

Installation and training costs will be quoted separately by the manufacturer.

SmartPave 92, 115/230V 50/60Hz HA-1700.3F

SmartPave 92 AASHTO, 115/230V 50/60Hz HA-1701.3F



Shipping wt. 24.0lbs (10.9kg)



Digital Rotational Viscometer

ASTM D4402; AASHTO T316

The H-1638, Fungilab Evo Expert R range rotational viscometer paired with the Asphalt Industry Thermosphere offers the latest in SHRP asphalt binder testing equipment specifically designed to meet the requirements of ASTM D4402 / AASHTO T316 high-temperature test methods for asphalt binders. The precision and accuracy for controlling sample temperatures up to +300°C is ideal for the asphalt industry.

The H-1638 viscometer provides a measuring range of 25-40,000,000 cP with 54 speeds in a range from 0.01 to 200 rpm. A Color TFT screen, for easy reading and fast data recognition is paired with an intuitive, full-touch key pad provides the ultimate in data control. The Evo Expert also provides USB connection to your PC and WiFi integration for easy control and access to your measurements. It also includes DataBoss software.

Features:

- Data Displayed:
 - Selected speed: rpm
 - Selected spindle: SP
 - Viscosity reading: P mPas or cSt
 - Percentage of full scale: %
 - Sample temperature: °C or °F
 - Shear Rate: SR (s⁻¹) with coaxial spindles
 - Shear Stress: SS N/m² (with coaxial spindles)
 - Density: g/cm³
- Viscosity Reading: dynamic viscosity, cP or mPa·s, or kinematics viscosity, cSt.
- Unit Converter: SI to CGS.

Program Features:

- Time to torque & Time to stop
- 9 working memories
- Customizable speed options
- Multi-step
- Ramp
- AUTO-TEST: Automatic internal viscosimeter checking
- AUTO-RANGE: full scale range for combination spindle speed
- Temperature reading by PT100
- User-enabled viscosity and temperature calibration
- 10 language options

The Viscometer includes: Viscometer head with serial number, stand with 3-point levelling adjustment, Boss head, (1) TR8 spindle, spindle protector, spindle rack, PT100 probe, Datalogger software, USB cable, power cable, carrying case and calibration certificate.

Rotational Viscometer, 100/240V 50/60Hz H-1638.3F

Shipping wt. 18.0lbs (8.16kg)

Thermosphere

ASTM D4402; AASHTO T316

The Thermosphere allows for measurement of accurate viscosities at elevated temperatures. It offers the precision and accuracy for controlling sample temperature up to +300°C, ideal for the asphalt industry. It synchronizes with the Evo Expert Rheometer, above, to provide viscosity data. It provides an accuracy of 0.5°C for ambient to 80°C, <1.0°C for 80 to 150°C and <1.5°C for 150 to 300°C. Samples are placed in disposable Thermosphere chambers for each test. These chambers are available in 50 and 100 packs.

The Thermosphere includes: Thermosphere chamber; 3 height adjustable knobs for the base; Chamber; Chamber lid; Chamber support; Tweezer; Power cable; Holding rod enlarger for viscometer and an adapter to connect viscometer and thermosphere.

Thermosphere, 100V 60Hz

Thermosphere, 220V 50/60Hz



H-1639

H-1639.4F

22.0lbs (10.0kg)

Viscometer/Rheometer Accessories and Parts

| Description | Model |
|---------------------------------------|----------|
| Thermosphere chambers, 100pk. | H-1639.1 |
| Thermosphere chambers, 50pk. | H-1639.2 |
| Spindle (TR8) 50-170,000CP | H-1638.1 |
| Spindle (TR9) 250-830,000CP | H-1638.2 |
| Spindle (TR10) 500-170,000CP | H-1638.3 |
| Spindle (TR11) 1000-3,300,000CP | H-1638.4 |
| Silicone Std. Oil, RT 30,000 (600ml) | H-1637.6 |
| Silicone Std. Oil, RT 60,000 (600ml) | H-1637.7 |
| Silicone Std. Oil, RT 100,000 (600ml) | H-1637.8 |



H-2165



H-2166A



H-2167

H-2166A shown with (4) Automatic Timers, which need to be ordered in addition to the H-2166A bath, see below.

Saybolt Viscosity Bath

ASTM D88, D244, E102; AASHTO T72

Designed for Saybolt universal and furoil viscosity testing, this constant temperature bath meets all ASTM and AASHTO requirements for precise temperature control. The micro-processor PID circuitry assures accurate temperature control within ASTM tolerances throughout the range of ambient to 464°F (240°C). Temperature stability is $\pm 0.05^\circ\text{F}$ ($\pm 0.03^\circ\text{C}$).

Simple push-button controls and dual digital displays are used for easy setting and monitoring of the baths temperature. With a capacity of four viscometers and 60ml receiving flasks, the bath features sliding draft shields, chemical-resistant alignment plates for handling of flasks and a glare-free fluorescent backlight for easy viewing of test sample. The insulated bath interior is constructed entirely of heavy-gage stainless steel and the built-in overflow pipe and drain valve simplifies filling the bath oil to the required level. A chemical resistant top plate provides insulation and is easily removed to allow for cleaning of the bath interior. The bath is supplied complete with four thermometer supports, four port covers, four chained corks, two port closures, tube nut wrench, orifice wrench, withdrawal tube and oil strainer. Viscometer tubes, orifices, receiving flasks, oil and thermometers are not included and must be ordered separately.

Saybolt Bath, 120V 60Hz H-2165
Saybolt Bath, 220-240V 50/60Hz H-2165.4F
Shipping wt. 100 lbs (45.3kg)

Saybolt Viscosity Bath, For Automatic Timers

ASTM D88, D244, E102; AASHTO T72

Constant temperature viscosity bath designed for use with one to four Automatic Saybolt Viscosity Timing Sensors. **Bath is sold with no timers, order auto timers separately.** Features simple push-button controls and dual digital displays are used for easy setting and monitoring of the baths temperature.

With a capacity of four viscometers and 60ml receiving flasks, the bath features sliding draft shields, chemical-resistant alignment plates for handling of flasks and a glare-free fluorescent backlight for easy viewing of test sample. The insulated bath interior is constructed entirely of heavy-gage stainless steel and the built-in overflow pipe and drain valve simplifies filling the bath oil to the required level. A chemical resistant top plate provides insulation and is easily removed to allow for cleaning of the bath interior. A cooling coil for tap water or refrigerated coolant is provided for operation at near-ambient temperatures. Steel cabinet has leveling feet and a chemical-resistant polyurethane-epoxy finish.

Temperature range is ambient to 464°F (240°C) and temperature stability is $\pm 0.05^\circ\text{F}$ ($\pm 0.03^\circ\text{C}$). Bath capacity is 5 gallons (19L) and recommended bath medium is water or suitable heat transfer fluid. Included accessories: Cleaning plunger; chained corks; oil strainer; withdrawal tube; tube nut wrench; orifice wrench; port closures; port covers and thermometer supports.

Saybolt Viscosity Bath, 120V 60Hz H-2166A
Saybolt Viscosity Bath, 220-240V 50/60Hz H-2166A.4F
Shipping wt. 82 lbs (37kg)

Automatic Timers for Saybolt Viscosity Bath

ASTM D88, D244, E102; AASHTO T72

At the push of a button, the automatic timer starts the sample flow, senses the 60ml end point and digitally records and displays the efflux time in 0.1 seconds resolution with an accuracy of 0.05%. Automatic timing improves testing accuracy and convenience, eliminating the chain and cork assembly and the need to manually time each sample. One to four automatic timers can be fitted to the H-2166A Saybolt viscosity bath.

Saybolt Viscosity Timing Sensor, 120V 60Hz H-2167
Saybolt Viscosity Timing Sensor, 220-240V 50/60Hz H-2167.4F
Shipping wt. 5 lbs (2.2kg)



Test Apparatus Setup for bituminous materials

| Description | Qty. | Model # |
|---|------|--|
| Saybolt viscometer bath | 1 | H-2165 H-2165.4F H-2166A H-2166A.4F |
| Viscometer tube | 4 | H-2180 |
| Furol orifice | 4 | H-2174 |
| Displacement ring | 4 | H-2194 |
| Receiving flask for H-2165 or Borosilicate flask for H-2166 | 4 | H-2176 H-2179 |
| Technical oil, white | 5 | H-2189 |
| ASTM Thermometer* | 1 | H-2600.17F |
| or ASTM Thermometer* | 1 | H-2600.17C |

Test Apparatus Setup for lubricants, insulating oils and heater fuels

| Description | Qty. | Model # |
|---|------|--|
| Saybolt viscometer bath | 1 | H-2165 H-2165.4F H-2166A H-2166A.4F |
| Viscometer tube | 4 | H-2180 |
| Universal orifice | 4 | H-2173 |
| Receiving flask for H-2165 or Borosilicate flask for H-2166 | 4 | H-2176 H-2179 |
| Technical oil, white | 5 | H-2189 |
| ASTM thermometer* | 1 | H-2600.17F |
| or ASTM thermometer* | 1 | H-2600.17C |

Saybolt Viscosity Bath Accessories

ASTM D88, D244, E102; AASHTO T72

| Description | Model |
|--|------------|
| Cleaning plunger | H-2175 |
| Borosilicate glass receiving flask, 60ml (for H-2165) | H-2176 |
| Borosilicate glass receiving flask, 60ml (for H-2166) | H-2179 |
| Withdrawal tube | H-2177 |
| Oil strainer | H-2178 |
| Technical oil, white, (1 gal.) suitable for use up to 230°F (110°C) | H-2189 |
| High-temp. Dow-Corning 200 fluid (100 centistokes), 5 gallon, wt.40lb (18kg) | H-2199 |
| Displacement ring | H-2194 |
| Thermometer support | H-2195 |
| Orifice wrench | H-2196 |
| Socket wrench | H-2197 |
| Thermometer* (66 to 80°F) | H-2600.17F |
| Thermometer* (19 to 27°C) | H-2610.17C |
| Thermometer* (94 to 108°F) | H-2600.18F |
| Thermometer* (34 to 42°C) | H-2610.18C |
| Thermometer* (120 to 134°F) | H-2600.19F |
| Thermometer* (49 to 57°C) | H-2610.19C |
| Thermometer* (134 to 148°F) | H-2600.20F |
| Thermometer* (57 to 65°C) | H-2610.20C |
| Thermometer* (174 to 188°F) | H-2600.21F |
| Thermometer* (79 to 87°C) | H-2610.21C |
| Thermometer* (204 to 218°F) | H-2600.22F |
| Thermometer* (95 to 103°C) | H-2610.22C |



CAUTION These thermometers contain mercury. There are restrictions on their sale and shipment. Please check laws in your area or contact us before ordering. Due to Illinois law, Humboldt must drop-ship these items from New Jersey. Mercury Thermometers require ground shipment in the U.S. Not sold outside United States.

Components

| Description | Model |
|--|---------|
| Tubes with Orifices | |
| Brass saybolt viscometer tube w/ stainless steel universal orifice | H-2180 |
| Brass saybolt viscometer tube w/stainless steel furol orifice | H-2182 |
| Stainless saybolt viscometer Tube w/stainless steel furol orifice | H-2183 |
| Brass saybolt viscometer tube w/stainless steel universal and furol orifice, includes wrench | H-2184 |
| Stainless saybolt viscometer tube w/ universal and furol orifice, includes wrench | H-2185 |
| Orifices | |
| Stainless steel universal | H-2173 |
| Stainless steel furol | H-2174 |
| Stainless steel furol, calibrated | H-2174C |
| Tubes | |
| Stainless steel saybolt viscometer tube | H-2171 |
| Brass saybolt viscometer tube | H-2172 |



H-1720



H-1730



H-1741H

H-1741V

Constant Temperature Bath, 100°C

ASTM D445

Specifically designed for precise viscosity determination with glass capillary viscometers, the H-1720 baths offer superior temperature control to 100°C. The H-1720 offers a 12"Dia x 12"H (305mm x 305mm). bath jar that can accommodate most viscometers.

These baths maintain accurate temperature control of $\pm 0.01^\circ\text{C}$ within the range of 20°C to 100°C ($\pm 0.01^\circ\text{C}$), providing the temperature sensitivity required by ASTM D445 for kinematic viscosity measurements with glass capillary viscometers. Two electric heating elements inside the bath rapidly heat the medium to any desired temperature within the range.

The H-1720 bath chamber is a cylindrical clear glass vessel 12" dia x 12"H (305mm x 305mm). A stainless steel baffle located in the center of the bath provides a plain reflective background to aid in viewing instruments. The top cover contains seven round holes 2" (51mm) in diameter for insertion of viscometer holders, allowing up to seven viscosity measurements to be made simultaneously. Covers are supplied for capping unused holes. Two additional holes 10mm in diameter, are provided for thermometers. All wetted parts of the Constant Temperature Bath are made of stainless steel or glass. The frame is fabricated from heavy aluminum and coated with a corrosion-resistant epoxy finish. **Viscometers, holders, bath oil, and thermometers must be purchased separately.** Dimensions: 16"w x 14.25"d x 24"h (407 x 362 x 610mm).

Constant Temp. Bath, 120V 60Hz H-1720

Constant Temp. Bath, 220V 50/60Hz H-1720.4F
Shipping wt. 80 lbs (36.2kg)

Constant Temperature Bath, 150°C

ASTM D445

The H-1730 constant temperature bath maintains the accurate control required by ASTM D445 for kinematic viscosity measurements with glass capillary viscometers. The H-1730 baths offer superior temperature control to 150°C . Within the range of 20 to 100°C , temperature is controlled to 0.01°C ; above 100°C temperature it is controlled to 0.03°C .

The H-1730 bath chamber is a cylindrical clear glass vessel 12" dia x 12"H (305mm x 305mm). A stainless steel baffle is located in the center of the bath to provide a good background for viewing viscometers. Two fluorescent lamps illuminate the interior of the bath brightly and uniformly, without glare. Two heating elements inside the bath rapidly heat the bath medium to any temperature within the bath range. The top cover contains seven round holes 2" (51mm) in diameter. Up to seven glass capillary viscometers (in holders) can be placed in the bath. Other hole configurations can be supplied on special order.

A solid-state control circuit, equipped with a stainless steel-encased thermistor provides proportional control of temperature. A motor-driven stirrer ensures a uniform temperature throughout the bath.

All wetted parts of the bath are made of stainless steel or glass. The bath housing is fabricated from heavy aluminum and coated with a corrosion-resistant epoxy finish. **Viscometers, holders, bath oil, and thermometers must be purchased separately.** Dimensions: 17.25"w x 18.25"d x 23"h (438 x 464 x 584mm).

Constant Temp. Bath, 120V 60Hz H-1730

Constant Temp. Bath, 220V 50/60Hz H-1730.4F
Shipping wt. 123 lbs (56kg)

Digital Vacuum Pressure Regulators

ASTM D2171

These digital vacuum regulators (DVR) are designed for precise measurement and control of vacuum at 300 mm Hg below atmospheric pressure. Unlike other vacuum regulators, the solid-state H-1741H and H-1741V Regulators use no mercury. Both units are identical except that one is a horizontal configuration and the other is vertical. DVR meters display the amount of vacuum in mm/Hg or one of nine other units of measurement selected using a keypad on the meter.

In asphalt laboratories the digital vacuum regulator (DVR) may be used in conjunction with Cannon-Manning, Asphalt Institute, and Modified Koppers vacuum viscometers for measurement of highly viscous materials such as asphalt cement at 60°C (140°F) according to ASTM D 2171. The DVR is also useful in other laboratory systems where accurate measurement and control of vacuum is required.

Both the H-1741H and H-1741V are equipped with an internal vacuum pump and do not require an external vacuum source.

The internal set points for the instrument gauge are preset to regulate vacuum at 300 ± 0.5 mm Hg below atmospheric pressure (the vacuum required by ASTM D 2171). These set points may be altered to fit the user's specific needs within the DVR's operating range of 28 to 410 mm Hg below atmospheric pressure.

Reading accuracy: ± 0.5 mm HG. Operating temperature: 0 to 40°C (32 to 104°F). Upper/lower safety limit: 746mm HG below atmospheric pressure. Choice of horizontal: 18.5"w x 18"d x 6.75"h (470 x 457 x 171mm) or vertical: 6.75"w x 18"d x 18.5"h (171 x 457 x 470mm).

Digital, Vacuum Pressure Regulator

Regulator, Horizontal, 120V 60Hz H-1741H

Regulator, Horizontal, 220V 50/60Hz H-1741H.4F

Regulator, Vertical, 120V 60Hz H-1741V

Regulator, Vertical, 220V 50/60Hz H-1741V.4F

Shipping wt. 30 lbs (13.6kg)



H-1733



H-1745
H-1735



H-1722



H-1746.7



H-1747.1

IBF Bath Oil

Oil for constant temperature baths operating at less than 135°C (275°F). 6-gallon container (2.3L)

UBF Bath Oil **H-1732**

Shipping wt. 50 lbs (22.6kg)

Bath Fluid, High-Temperature Silicone

This clear, colorless, oily liquid has a nominal viscosity of 50 centistokes at 25°C, with a viscosity/temperature coefficient of 0.59. The boiling point is over 360°C with a flash point above 535°F. Fluid has a maximum volatility, with 0.5% weight loss over 24 hours at 150°C.

Bath Fluid, Silicone, .5 Gallon **H-1733**

Shipping wt. 20 lbs (9.07kg)

Vacuum Manifold

Vacuum manifold with manual valves for applying vacuum or pressure to capillary-type viscometers. Designed for use with the H-1720 and H-1730 constant temperature baths. Integral brackets permit mounting on bath covers. Two models are available: one for the H-1730, which has four valves and one for the H-1720, which has three valves. Both include a 10-foot length of rubber vacuum tubing, .25" bore x .625 OD, for connection to vacuum/pressure regulators. Housing is epoxy-coated aluminum, overall 13"W x 2.75"D x 9"H (330 x 70 x 229mm)

Vacuum Manifold for H-1720 **H-1745**

Vacuum Manifold for H-1730 **H-1735**

Shipping wt. 6 lbs (2.7kg)

Temperature Bath Storage Pedestal

This Heavy-duty, two-drawer unit provides a pedestal for constant temperature baths, as well as storage of accessories and consumables. It provides elevated viewing of the bath and ample room for storage of viscometers and other accessories. **Dimensions:** 18" W x 18" D x 6.5" H (457 x 457 x 165mm)

Temperature Bath Storage Pedestal **H-1722**

Shipping wt. 40 lbs (18.1kg)

Zeitfuchs® Cross-Arm Viscometer and Holder

ASTM D445, D446, D2170; AASHTO T201; ISO 3105

These models are used to determine kinematic viscosity of liquid asphalts, road oils and distillation residues of liquid asphalts at 140°F (60°C) and of asphalt cements at 275°F (135°C), requiring a charge of only 1 to 3ml. They are easily filled and cleaned while immersed in a temperature bath and need not be removed. The viscometers require a liquid depth of 9" (229mm). Includes round metal holder for 2" (51mm) dia. hole and certificate of calibration.

Zeitfuchs® Cross-Arm Viscometer see chart below

Shipping wt. 2 lbs (.9kg)

Zeitfuchs® Cross-Arm Viscometer and Holder

| Size | Approx. Constant Cs/Sec. | Range of Centistokes | Model |
|------|--------------------------|----------------------|-----------|
| 1 | 0.003 | 0.6 to 3 | H-1746.1 |
| 2 | 0.01 | 2 to 10 | H-1746.2 |
| 3 | 0.03 | 6 to 30 | H-1746.3 |
| 4 | 0.1 | 20 to 100 | H-1746.4 |
| 5 | 0.3 | 60 to 300 | H-1746.5 |
| 6 | 1.0 | 200 to 1,000 | H-1746.6 |
| 7 | 3.0 | 600 to 3,000 | H-1746.7 |
| 8 | 10 | 2,000 to 10,000 | H-1746.8 |
| 9 | 30 | 6,000 to 30,000 | H-1746.9 |
| 10 | 100 | 20,000 to 100,000 | H-1746.10 |

Asphalt Institute Vacuum Viscometer

ASTM D2170, D2171

Designed for measurement of highly-viscous materials, such as asphalt cement at 60°C (140°F), viscometer contains a graduated capillary instead of timing bulbs. Applicable to materials with a viscosity range of 0.036 to 80,000 poise. They require a minimum sample volume of only 3ml and require a liquid bath depth of 180 mm (7.1 inches). Includes permanently-attached, round metal holder for 2" (51mm) dia. hole and certificate of calibration.

Asphalt Inst. Vacuum Viscometer see chart below

Shipping wt. 2 lbs (.9kg)

Asphalt Institute Vacuum Viscometers

| Size/ No. | Viscosity Range (Poise) | Approx. Constant poise/second at 300mm Hg Vacuum | | | Model |
|--------------|-------------------------------|--|------|-----|----------|
| | | B | C | D | |
| 25 | 42 to 800 | 2 | 1 | 0.7 | H-1747.1 |
| 50 | 180 to 3,200 | 8 | 4 | 3 | H-1747.2 |
| 100 | 600 to 12,800 | 32 | 16 | 10 | H-1747.3 |
| 200 | 2,400 to 52,000 | 128 | 64 | 40 | H-1747.4 |
| 400R | 9,600 to 140,000 | 500 | 250 | 160 | H-1747.5 |
| 800R | 38,000 to 5,800,000 | 2000 | 1000 | 640 | H-1747.6 |

**Ford Viscosity Cups**

ASTM D333, D365, D1200

Used in determining viscosity of paint, lacquers and related coatings. Cup body is machined from aluminum; orifice is brass. Orifice not included with H-1530 cup, order from chart below. Cup/Orifice combinations should be selected to provide an efflux time within the 20 to 100-second range. Measurements with the Ford viscosity cup should be made at a temperature of $25^{\circ}\text{C} \pm 0.1^{\circ}$ ($77^{\circ}\text{F} \pm 0.2^{\circ}$) with a H-2610.17C (or H-2600.17F) thermometer. **Order thermometers and stand separately.**

| | |
|---------------------------|----------|
| Ford Cup w/ No. 1 Orifice | H-1530.1 |
| Ford Cup w/ No. 2 Orifice | H-1530.2 |
| Ford Cup w/ No. 3 Orifice | H-1530.3 |
| Ford Cup w/ No. 4 Orifice | H-1530.4 |
| Ford Cup w/ No. 5 Orifice | H-1530.5 |



Shipping wt. 1.2 lb (0.5kg)

Viscosity Cup Stand

Features leveling base and adjustable support bracket for H-1530 Ford viscosity cup.

Viscosity Cup Stand **H-1535**

Shipping wt. 5 lbs (2.3kg)

Asphalt Viscosimeter Float Test Set

ASTM D139, AASHTO T50

Used to test flow behavior or consistency of certain bituminous materials and tar products via a float test. Includes calibrated aluminum float and three brass collars. Individual components can be ordered. **Order thermometer separately.**

Asphalt Viscosimeter Float Test Set **H-1400**

Shipping wt. 0.6 lb (0.27kg)

Float Test Set Components

| Description | Model |
|-----------------------------|--------|
| Float only | H-1410 |
| Collars only (set of three) | H-1420 |

Cloud and Pour Point Apparatus Set

ASTM D97, D117, D2500

Used to test flow characteristics of petroleum oils using cloud and pour points. Includes glass bath jar, polished brass cylinder mounted on metal tripod base, glass test cylinder, cork bottom disc and top rings. **Order thermometer separately.**

Cloud and Pour Point Apparatus Set **H-2560**

Shipping wt. 5.3 lb (2.4kg)

Cloud and Pour Components

| Description | Model |
|---------------------------|-----------|
| Metal tripod base | H-2560.1 |
| Glass test jar | H-2560.3 |
| Glass battery bath jar | H-2560.5 |
| Brass cylinder | H-2560.2 |
| Cork disks | H-2595 |
| Cork rings | H-2598 |
| Thermometer* -36 to 120°F | H-2600.5F |
| Thermometer* -38 to 50°C | H-2610.5C |
| Thermometer* -112 to 70°F | H-2600.6F |
| Thermometer* -80 to 20°C | H-2610.6C |

Spot Test of Asphaltic Materials Set

AASHTO T102

Spot test set only for asphaltic products derived from petroleum not to be used for natural asphalts containing non-bituminous matter insoluble in xylene. Includes 250ml erlenmeyer flask, filter paper, 10ml pipette and rubber stopper.

Spot Test of Asphaltic Materials Set **H-1510**

Shipping wt. 3 lb (1.3kg)

**CAUTION****CAUTION**

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Digital, Auto Ring and Ball Apparatus

ASTM D36; AASHTO T53; EN 1427; BIS 2000; DIN 52011; UNE 7111

Designed for speed and accuracy, this ring and ball apparatus automatically determines the softening point of asphalts and pitches. Two laser sensors detect the fall of the ball, detecting and recording the softening point of the test material.

Touch-screen graphical interface allows for easy setup of the parameters and the immediate execution of the test. The high-resolution color display offers all functions of a PC for the management and analysis of data, test results and graphs. Bath temperature is measured by an electronic system maintaining the gradient ($5^{\circ}\text{C}/\text{min}$) as specified by the standard. Provides real-time visualization of the temperature/time graph for the entire test. A magnetic stirrer with electronic speed adjustment from 0 to 160rpm also ensures a uniform temperature in the vessel during the complete test.

Unit provides the ability to test with boiled distilled water for softening points from 30 to 80°C and 80° up to 150°C using glycerol.

Export data to a PC via USB flash drive or SD card with the ability to edit the data easily with Excel. Multiple languages are built in.

Digital, Auto Ring and Ball Apparatus **H-1567**Digital, Auto Ring and Ball Apparatus **H-1567.4F**

Shipping wt. 66 lb (30kg)

| Description | Model |
|--------------------------------|------------|
| Steel ball, 9.5mm dia. | H-1567.1 |
| Brass, tapered ring, chromed | H-1567.2 |
| Centering guide, chromed-brass | H-1567.3 |
| Beaker, 600ml pyrex | H-4911.600 |
| Calibration rods (2) | H-1567.4 |



H-1569



H-1570

Softening Point Apparatus, Double

ASTM E28; AASHTO T53

Ring and ball method Apparatus for softening point determinations for use with asphalts, pitches, tars and most resins. Includes 800ml beaker with brass, double set-up fixture with cover and thermometer port with stopper, 2 shouldered rings, 2 ball centering guides and 2 standard balls. Order required thermometer separately.

Softening Point Apparatus, Double H-1569

Shipping wt. 2lbs (.9kg)

Softening Point Apparatus, Quad

Ring and ball method Apparatus for softening point determinations for use with asphalts, pitches, tars and most resins. Includes 800ml beaker with brass, quad set-up fixture with cover and thermometer port with stopper, 4 shouldered rings, 4 ball centering guides and 4 standard balls. Order required thermometer separately.

Softening Point Apparatus, Quad H-1570

Shipping wt. 2lbs (.9kg)

Softening Point Apparatus Set w/ Burner

Single, ring and ball method softening point apparatus set, including burner. This set can be used for single determinations such as: asphalts, pitches, tars and most resins. Includes burner, beaker, support stand, 1 ring, wire gauze with ceramic center, thermometer clamp, 1 shouldered ring and stem with hardened steel ball. Order required thermometer separately.

Softening Point Apparatus Set w/Burner H-1595

Shipping wt. 10lbs (4.5kg)



H-1595

Shown with
Thermometers,
not included,
order separately



H-1596

Softening Point Apparatus Set w/ Hotplate

Single ring and ball method softening point apparatus set, including hotplate. This set can be used for single determinations such as: asphalts, pitches, tars and most resins. Includes 6" x 6" electric hotplate as a heat source rather than a gas burner. The hotplate provides an easy-to-set analog temperature control knob with graduated scale and LED display. Temperature range is: ambient to 540°C (Ambient to 1004°F). Includes beaker, support stand, 1 ring, wire gauze with ceramic center, thermometer clamp, 1 shouldered ring and stem with hardened steel ball. Order required thermometer separately.

Softening Point Apparatus Set w/Hotplate H-1596
120V 60Hz
220V 50/60Hz H-1596.4F

Shipping wt. 18.4lbs (8.3kg)and

Thermometers* for Softening Point Apparatus

| Description | Model |
|-------------------------|-------------|
| 30 to 180°F (ASTM 15F) | H-2600.15F |
| -2 to 80°C (ASTM 15C) | H-2610.15C |
| 85 to 392°F (ASTM 16F) | H-2600.16F |
| 30 to 200°C (ASTM 16C) | H-2610.16C |
| 30 to 350°F (ASTM 113F) | H-2600.113F |
| -1 to 175°C (ASTM 113C) | H-2610.113C |



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H-1575



H-1588



H-8900



H-8980

| Description | Model |
|--|------------|
| Brass, shouldered ring, Top: 23mm OD, 19.8mm ID; Bottom: 19mm OD, 15.9mm ID; Top to Shoulder: 4.4mm High; Shoulder to Bottom: 2mm High, 10 per package | H-1575 |
| Hardened steel ball, .375" (9.5mm) dia.; weight between 3.45 and 3.55g, 10 per package | H-1580 |
| Ball centering guide for shouldered rings, ball is centered on specimen by 3 locator pins | H-1588 |
| Ring and stem assembly with 16" (406mm) long brass wire stem with shouldered brass ring | H-1602 |
| Steel, clamp hook supports suspended thermometers. Locks into any position with check nut, Maximum distance from center of muff to hook: 4.25" (108mm), minimum distance is: 3.875" (99mm) | H-8900 |
| Thermometer clamp with adjustable 360° muff, phosphor-bronze jaws, 3.5" (89mm) long | H-8950 |
| Thermometer clamp, similar to H-8950, but holds H-1602 ring and stem and thermometer together | H-8980 |
| Base (Cast iron) w/ Support Rod | H-21220 |
| Burner | H-6220 |
| Beaker, 800ml, Graduated | H-4911.800 |
| Hot plate, 6" x 6" with LED Display | H-4942 |
| Wire Gauze, 5" x 5" w/ceramic material center | H-25865 |

**Bacon Bomb Samplers, 8oz. (237ml)**

ASTM D4057, D6074, D1265

Bacon Bomb Samplers can be used to obtain samples from storage tanks, tank cars and drums. when the sampler is lowered into the tank and hits the bottom, a plunger assembly opens to admit the material. The plunger closes again when the bomb is withdrawn, forming a tight seal. Equipped with plunger locking cam for tight closure during transport. Available in plated brass or stainless steel. 2" dia. x 10" L. (51 x 254mm).

Bacon Bomb Sampler, 8oz, Brass H-2405B
Bacon Bomb Sampler, 8oz, Stainless H-2405S

Shipping wt. 4lbs (1.8kg)

Bacon Bomb Samplers, 16oz. (473ml)

ASTM D4057, D6074, D1265

Bacon Bomb Samplers can be used to obtain samples from storage tanks, tank cars and drums. when the sampler is lowered into the tank and hits the bottom, a plunger assembly opens to admit the material. The plunger closes again when the bomb is withdrawn, forming a tight seal. Equipped with plunger locking cam for tight closure during transport. Available in plated brass or stainless steel. 2.75" dia. x 12" L (70 x 305mm).

Bacon Bomb Sampler, 16oz, Brass H-2406B
Bacon Bomb Sampler, 16oz, Stainless H-2406S

Shipping wt. 6lbs (2.7kg)

Bacon Bomb Samplers, 32oz. (946ml)

ASTM D4057, D6074, D1265

Bacon Bomb Samplers can be used to obtain samples from storage tanks, tank cars and drums. when the sampler is lowered into the tank and hits the bottom, a plunger assembly opens to admit the material. The plunger closes again when the bomb is withdrawn, forming a tight seal.

Equipped with plunger locking cam for tight closure during transport. Available in plated brass or stainless steel. 2.75" dia. x 15.25" L. (70 x 387mm).

Bacon Bomb Sampler, 32oz, Brass H-2407B
Bacon Bomb Sampler, 32oz, Stainless H-2407S

Shipping wt. 8lbs (3.6kg)

Weighted Beaker

For beaker sampling from tank cars, tank trucks, shore tanks, ship and barge tanks. Copper construction with weighted bottom. Includes handle and chained cork. Takes all level samples, as well as running and outlet samples. Select .75" (19mm) opening for light crude oils, light lubricating oils, kerosenes, gasolines, transparent gas oils, diesel fuels and distillates. Select 1.5" (38mm) for heavy crude and fuel oils, heavy lubricating oils and nontransparent gas oils. Body is 3.375" dia. x 14" L. (86 x 356mm).

Weighted Beaker, .75" (19mm) H-2400
Weighted Beaker, 1.5" (38mm) H-2401

Shipping wt. 5lbs (2.2kg)

Tag, Open-Cup Flash Tester

ASTM D1310, D3143; AASHTO T79

For determination flash and fire points of liquids at temperatures of up to 325°F (163 °C) and flash points of cutback asphalts at temperatures of less than 200°F (93 °C) as per test methods ASTM D1310, D3143 and related test specifications.

Determines Tag Open-Cup flash point of liquid products and cutback asphalts. Includes sample test cup, plated brass liquid bath with constant level overflow, pivoting ignition taper with pilot light and reference bead, pivoting thermometer holder, heater and base.

Electrically heated model is equipped with stepless variable heat control for accurate control of temperature rate of rise per specification. Gas heated model also available.

Includes Tag Open Cup Flash Point Tester, borosilicate glass sample cup, liquid bath with constant level overflow and manual. Order leveling device and draft shield separately. Order necessary ASTM 9C mercury thermometer locally. Illinois law prohibits us from selling mercury thermometers.

Tag, Open-Cup Tester, 120V 60Hz H-1990A
Tag, Open-Cup Tester, 230V 50/60Hz H-1990A.4F

Shipping wt. 37.1lbs (16.8kg)

Parts for Tag, Open-Cup Flash Tester

| Description | Model |
|----------------------------------|-----------|
| Replacement Pyrex cup | H-1990.1 |
| Leveling device | H-1990.2 |
| Thermometer*, range: 20 to 230°F | H-2600.9F |
| Thermometer*, range: -5 to 110°C | H-2610.9C |

Conradson Carbon Residue Apparatus

ASTM D189, D2416

Tests petroleum products to determine the amount of carbon residue left after evaporation and pyrolysis of an oil and to indicate relative coke-forming propensities. Includes burner, tripod, refractory block, nickel chrome triangle, nickel crucible and cover, Skidmore crucible, porcelain crucible and monel hood and bridge. Component parts available separately.

Conradson Carbon Residue Apparatus H-2495
Shipping wt. 7.1lbs (3.2kg)

Parts for Conradson Apparatus

| Description | Model |
|---------------------------------|--------|
| Porcelain crucible | H-2494 |
| Skidmore crucible and cover | H-2497 |
| Carbon residue apparatus hood | H-2496 |
| Nickel crucible with cover | H-2498 |
| Refractory block insulator ring | H-2505 |



H-2085



H-2095



CAUTION

CAUTION These thermometers contain mercury. There are restrictions on their sale and shipment. Please check laws in your area or contact us before ordering. Due to Illinois law, Humboldt must drop-ship these items from New Jersey. Mercury Thermometers require ground shipment in the U.S. Not sold outside United States.



H-2100

Cleveland Flash and Fire Point Tester

ASTM D92, D117; AASHTO T48

Used to determine flash and fire points by the Cleveland open-cup method. Consists of electric Heater with rheostat, flash point platform with Thermometer holder, test burner and flash cup. Utilizes a 1250W-10 amp, nickel-chromium heater with stepless variable control for accurate, repeatable, rate-of-rise temperature settings per specifications. Heater is enclosed in a stainless steel housing with cooling vents.

Thermometer position is adjustable and provides the ability to raise the thermometer out of the way to facilitate the placement and removal of the test cup. Test flame requires a gas supply and the test flame can be adjusted through the use of the built-in needle valve. Order thermometer separately.

Cleveland Flash Tester, 115V 60Hz H-2085
Cleveland Flash Tester, 220V 50/60Hz H-2085.4F

Shipping wt. 14lbs (6.3kg)

Replacement Parts/Accessories

| Description | Model |
|---------------------------------------|------------|
| Electric heater with rheostat (1250W) | H-2085.1 |
| Flash-point platform | H-2085P |
| Test burner w/ holder | H-2112 |
| Flash cup | H-2060 |
| Supra-board plate | H-2095.4.2 |
| Thermometer* | H-2600.11F |

Cleveland Flash and Fire Point Tester

ASTM D92, D117; AASHTO T48

Used to determine flash and fire points by the Cleveland open-cup method. Consists of a Humboldt, high-temperature burner, which is directly attached to the test support stand, for sample heating with a built-in, gas line extension for the test flame. Test flame burner and the heating burner include separate, integral, adjustment controls for regulating the flame. Includes flash point platform with thermometer holder, test burner and flash cup.

Thermometer position is adjustable and provides the ability to raise the thermometer out of the way to facilitate the placement and removal of the test cup. Flame size is adjustable through the use of the built-in needle valve. Order thermometer separately.

Cleveland Flash Tester, Gas H-2095
Shipping wt. 15lbs (6.8kg)

Replacement Parts/Accessories

| Description | Model |
|--|------------|
| Cast-Iron support base | H-21335 |
| High-temp burner w/ adjustable valve orifice | H-5605X |
| Test burner w/ holder | H-2112 |
| Flash-point platform | H-2095P |
| Supra-board plate | H-2095.4.2 |
| Platform coupling assembly | H-2095.5 |
| Flash cup | H-2060 |
| Thumb screw | H-3050.7 |
| Thermometer* | H-2600.11F |

Cleveland Flash and Fire Point Tester

ASTM D92, D117; AASHTO T48

Used to determine flash and fire points by the Cleveland open-cup method. Consists of a free-standing, Humboldt, high-temperature burner and a separate test flame burner, which is directly attached to the test support stand. Test flame burner and the heating burner include separate, integral, adjustment controls for regulating the flame. Includes flash point platform with Thermometer holder, test burner and flash cup.

Thermometer position is adjustable and provides the ability to raise the thermometer out of the way to facilitate the placement and removal of the test cup. Flame size is adjustable through the use of the built-in needle valve. Order thermometer separately.

Cleveland Flash Tester, Natural Gas H-2100
Shipping wt. 19lbs (8.6kg)

Replacement Parts/Accessories

| Description | Model |
|------------------------|------------|
| Cast-iron support base | H-21335 |
| Support rod | H-21370 |
| High-temp. burner | H-5550 |
| Test burner | H-2112 |
| Flash cup platform | H-2111 |
| Flash cup | H-2060 |
| Thermometer clamp | H-8900 |
| Thermometer* | H-2600.11F |

**Particle Charge Meter Set**

ASTM D7402; AASHTO T59

The particle charge meter identifies cationic emulsified asphalts by the migration of the particles to a negatively charged electrode (cathode) by means of a direct current. Allows selection of emulsified asphalts that are compatible with the available aggregate or sand. Set includes particle charge meter with positive- and negative-identified electrodes; a set of two H-2452 steel plates.

Particle Charge Meter Set, 110V 60Hz H-2450

Particle Charge Meter Set, 220V 50/60Hz H-2450.4F

Shipping wt. 12.9lbs (1.3g)

Particle Charge Meter Stainless Steel Plates

ASTM D7402; AASHTO T59

Set of two 1" x 4" (25.4 x 101.6mm) stainless steel plates for use with H-2450.

Particle Charge Meter Plates H-2452

Shipping wt. 0.3lbs (.1kg)

Solubility of Bituminous Materials Test Set

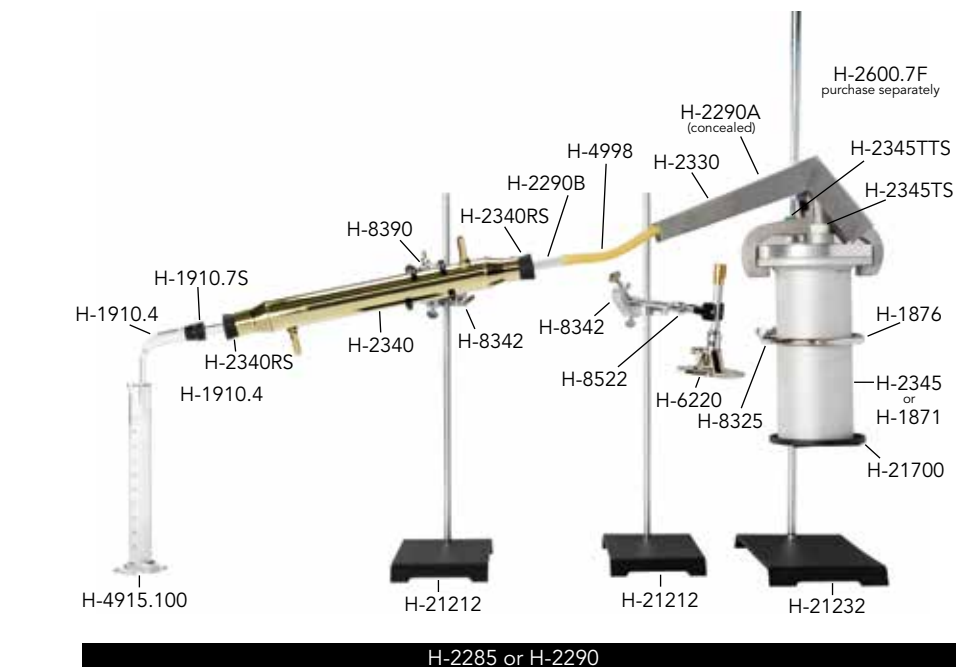
ASTM D4, D2042; AASHTO T44

Test set is used to determine the degree of solubility in trichloroethylene of asphalt materials having little or no mineral matter. The portion that is soluble represents the active cementing constituents.

Solubility of Bitumen Material Test Set H-1550

Shipping wt. 6lbs (2.7kg)

| H-1550 Parts | Model |
|--------------------------------|------------|
| Gooch crucible, 28ml | H-1550.1 |
| Crucible holder | H-1550.2 |
| Buchner funnel | H-1550.3 |
| Stopper with #7 hole | H-1550.5 |
| Filters, glass fiber, 10pk | H-1550.8 |
| Flask, 125ml | H-1883 |
| Rubber tubing | H-1448RT |
| Filter pump, Chapman | H-12020 |
| Erlenmeyer flask, vented 500ml | H-4913.500 |

**Distillation Set for Residue and Oil Distillate in Emulsified Asphalts**

ASTM D6997; AASHTO T59

The distillation set is designed to meet the requirements of the Standards listed above. Use of this set will allow the user to accurately determine the representative portion of residue in emulsified asphalts. Two models are available. The H-2285 uses the large H-2345 still and the H-2290 uses the small H-1871 still. For a detailed explanation of the test procedure refer to the ASTM or AASHTO standards listed above. The complete set is comprised of the items listed in the chart below. Order H-2600.7F thermometer separately.

Distillation Set for Emulsified Asphalt H-2285

Shipping wt. 28lbs (12.7kg)

Distillation Set for Emulsified Asphalt H-2290

Shipping wt. 30lbs (13.6kg)

Distillation Set Components

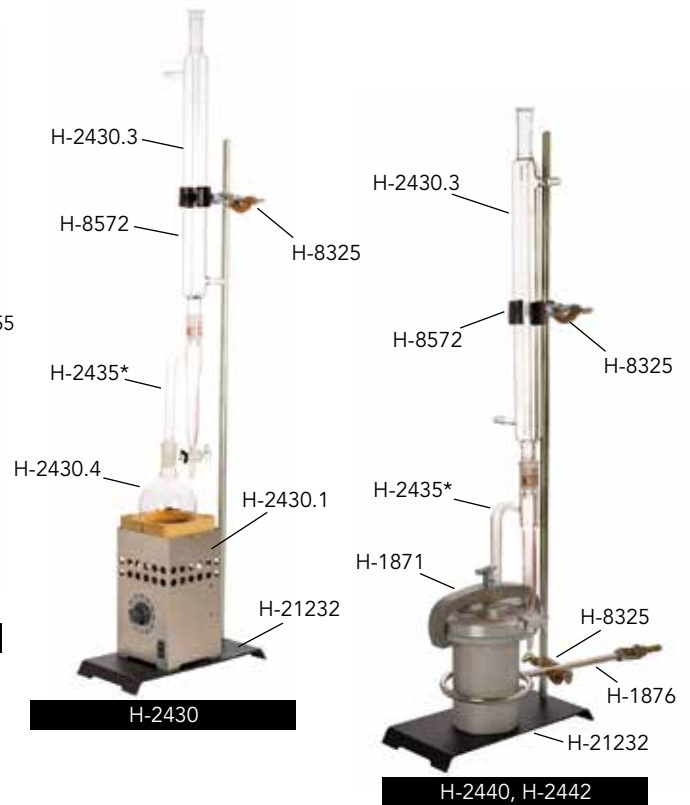
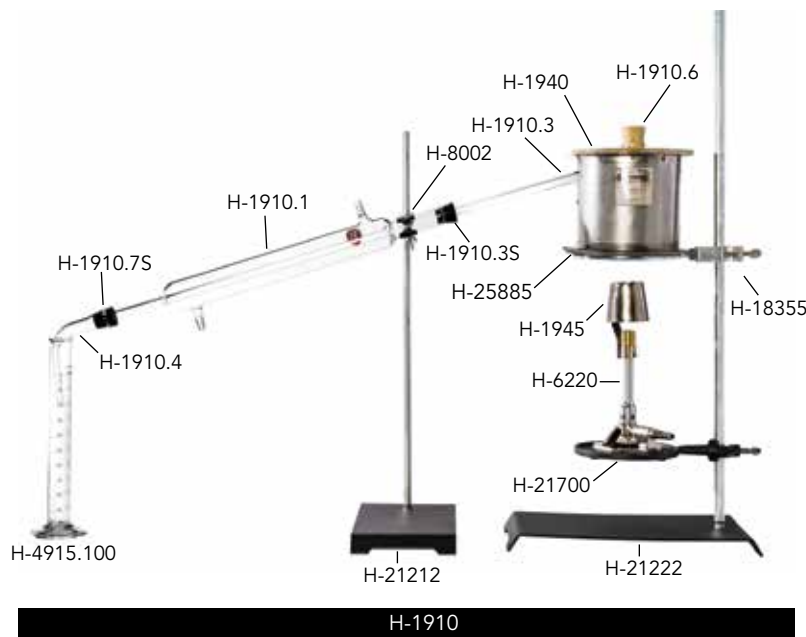
| Description | Model |
|---------------------------|------------|
| Still, aluminum, small | H-1871 |
| Ring burner | H-1876 |
| Support stands (2 in set) | H-21212 |
| Support stand | H-21232 |
| Support shelf | H-21700 |
| Burner | H-6220 |
| Condenser | H-2340 |
| Graduated cylinder | H-4915.100 |
| Tube shield | H-2330 |
| Straight glass tube | H-2290B |
| Bent glass tube | H-2290A |
| Adapter | H-1910.4 |
| Clamp, brass | H-8325 |
| Clamp | H-8390 |
| Clamp holders (2 in set) | H-8342 |
| Clamp | H-8522 |
| Rubber tubing | H-4998 |
| Still stopper (1) | H-2345TTS |
| Stopper, ptf | H-2345TS |
| Stoppers, rubber (2) | H-2340RS |
| Stopper, rubber | H-1910.7S |



CAUTION These thermometers contain mercury. There are restrictions on their sale and shipment. Please check laws in your area or contact us before ordering. Due to Illinois law, Humboldt must drop-ship these items from New Jersey. Mercury Thermometers require ground shipment in the U.S. Not sold outside United States.

**ACCESSORIES**

Digital and mercury-free mercury thermometers, see pages 316-319, 324.



Distillation Set for Cut-Back Asphaltic (Bituminous) Products

ASTM D402; AASHTO T78

The H-1910 distillation set is designed to meet the requirements of the Standards listed above. Use of this set will allow the user to measure the amount of the more volatile constituents in cutback asphaltic products. For a detailed explanation of the test procedure refer to the ASTM or AASHTO standards listed above. The complete set is comprised of the items listed in the chart below. Order H-2600.8F thermometer separately.

Distillation Set for Cut-Back Products H-1910

Shipping wt. 16.8lbs (7.6kg)

| Description | Model |
|---------------------|------------|
| Flask | H-1910.3 |
| Condenser | H-1910.1 |
| Adapter | H-1910.4 |
| Distillation shield | H-1940 |
| Flame shield | H-1945 |
| Graduated cylinder | H-4915.100 |
| Burner | H-6220 |
| Clamp | H-8002 |
| Support ring | H-18355 |
| Support stand | H-21212 |
| Support stand | H-21222 |
| Support shelf | H-21700 |
| Wire gauze | H-25885 |
| Stopper, rubber | H-1910.7S |
| Stopper, rubber | H-1910.1S |
| Stopper, cork | H-1910.6 |

Dean Stark Moisture Test Apparatus, Electric

ASTM D95, D244, D1461,E123; AASHTO T59, T110

The dean stark moisture test apparatus is used to determine the water content in petroleum products, tars, emulsified asphalts and other bituminous materials by the distillation method. The distillation process allows the water in the test sample to be isolated and collected in the receiver of the Trap. This model uses a glass flask, which is heated by an electric heater. The complete set is comprised of the items listed in the table below.

| Description | Model |
|----------------------------------|------------------------|
| Electric, heater 0-750W | H-2430.1 |
| Flask, 500ml | H-2430.3 |
| Distillation trap, 25ml, or 10ml | H-2435.25 H-2435.10 |
| Condenser, liebig | H-2430.3 |
| Support stand | H-21232 |
| Clamp, brass | H-8325 |
| Clamp, round jaw, coated | H-8572 |

Dean-Stark, Electric-Heated, 10ml H-2430

Dean-Stark, Electric-Heated, 25ml H-2430.4F

Shipping wt. 30lbs (13.6kg)

Dean Stark Moisture Test Apparatus, Gas Type

ASTM D95, D244, D1461,E123; AASHTO T59, T110

The Dean Stark moisture test apparatus is used to determine the water content in petroleum products, tars, emulsified asphalts and other bituminous materials by the distillation method. The distillation process allows the water in the test sample to be isolated and collected in the receiver of the Trap. This model uses an aluminum still, which is heated by a gas, ring burner. The complete set is comprised of the items listed in the table below.

| Description | Model |
|--|------------------------|
| Ring burner | H-1876 |
| Aluminum still, 0.95L | H-1871 |
| Distillation trap, 20ml, 25ml, or 10ml | H-2435.25 H-2435.10 |
| Condenser, liebig | H-2430.3 |
| Support stand | H-21232 |
| Clamp, brass | H-8325 |
| Clamp, round jaw, coated | H-8572 |

Dean-Stark, Gas-Heated, 20ml H-2440

Dean-Stark, Gas-Heated, 10ml H-2442.10

Dean-Stark, Gas-Heated, 25ml H-2442.25

Shipping wt. 30lbs (13.6kg)

**Still, Aluminum**

ASTM D95, D244, D1461, D6997, E123;
AASHTO T59, T110

Used primarily in standards for determining water in crude petroleum, tars and derivatives of those materials. Large model, 3.75" x 9.5" (95mm x 241mm) ID, has three tubulures, two drilled 10/18 and one drilled 24/40. The small model, 3.5" x 6" (89mm x 152mm) ID, has a 1 qt, (0.95L) capacity and one tubular. Both are cast aluminum.

Still, Large Aluminum **H-2345**
Still, Small Aluminum **H-1871**

Shipping wt. 6.5lbs (2.9kg)

Stoppers for Stills

Teflon stoppers for use with H-2345 and H-1871 Stills.

Stopper for Glass Tubing **H-2345TS**
Stopper for Thermometer **H-2345TTS**

Shipping wt. 0.2lbs (0.09kg)

Ring Burner

ASTM D244; AASHTO T59

Can be used with all gases. 4.75" (121mm) ID x 5.5" (140mm) OD. Overall shank length is 11" (279mm) with .375" (10mm) serrated hose connection. Guide pins keep burner equidistant around still. Fletcher attachment regulates gas and air.

Ring Burner **H-1876**
Shipping wt. 1.4lbs (.63kg)

Glass Stirring Rod

ASTM D244

Dimensions: 7" x 1/4"

Glass Stirring Rod **H-2444**
Shipping wt. 0.5lbs (.22kg)

Distillation Shield

ASTM D402; AASHTO T78

Use with H-1910. Flanged, open-end, stainless steel cylinder with .125" ceramic lining and two-part cover. For use with 500ml flask. Flame distillation only

Distillation Shield **H-1940**
Shipping wt. 1.5lbs (.68kg)

Flame Shield

ASTM D402; AASHTO T78

Use with H-1910. Stainless steel, spot-welded cone 2" (51mm) dia. at bottom with spring clip to fit 7/16" to .625" (11 to 16mm) burner tubes.

Distillation Shield **H-1945**
Shipping wt. 0.3lbs (.1kg)

Burner Chimney

Fits standard 4" (102mm) rings.

Burner Chimney **H-1946**
Shipping wt. 3lbs (1.3kg)

Condenser Jacket

ASTM D244; AASHTO T59

For use with H-2285 and H-2290. Brass, 15" long inlet/outlet tubulures on opposite sides of jacket.

Condenser Jacket **H-2340**
Shipping wt. 3lbs (1.3kg)

Connecting Tube Shield

ASTM D244; AASHTO T59

For use with H-2285 and H-2290. Stainless steel.

Connecting Tube Shield **H-2330**
Shipping wt. 1lbs (.45kg)

Still Cleaner

Use with H-1871 and H-2345. Tool to remove residue from interior of still, 13" x 4" (328 x 101mm) diameter.

Still Cleaner **H-2348**
Shipping wt. 1.3lbs (.58kg)

H-2435.25



H-2435.5

Glass Distillation Trap, 25ml

ASTM D95, D1461; AASHTO T78

25ml distillation trap graduated 0.1ml from 0 to 25ml.

Glass Distillation Trap, 25ml **H-2435.25**
Shipping wt. 1.1lbs (.49kg)

Glass Distillation Trap, 10ml

ASTM D95, D1461; AASHTO T78

10ml distillation trap graduated 0.1ml from 0 to 1ml and 0.2ml from 1ml to 10ml.

Glass Distillation Trap, 10ml **H-2435.10**
Shipping wt. 1lbs (.49kg)

Glass Distillation Trap, 5ml

ASTM D95, D1461; AASHTO T78

5ml distillation trap graduated 0.1ml.

Glass Distillation Trap, 5ml **H-2435.5**
Shipping wt. 1lbs (.45kg)

Glass Distillation Trap, 20ml

20ml distillation trap graduated 0.1ml.

Glass Distillation Trap, 20ml **H-2435.20**
Shipping wt. 1.5lbs (.68kg)



Vacuum Pycnometer Set (4.34L) for Rice Test

ASTM D2041; AASHTO T209, T283

Used in rice testing to determine the maximum specific gravity of bituminous paving mixtures with maximum aggregate size up to 19.1mm (.75"). The H-1750 provides a 4.34L volume with a 2.9L max. sample volume and typically a 2500g required sample size and a 7.5" ID x 6" depth. Set includes aluminum volumetric canister; volumetric lid; flat, vinyl vacuum lid with O-ring and a metal water vacuum aspirator with 3/8" IPT and 6' hose with release valve and fittings. Unit achieves vacuum using an aspirator or optional vacuum pump.

This set is also available in stainless steel, order H-1750SS. For those who want to use smaller test samples, the H-1751 is available. The H-1751 provides a 2.9L volume with a 1.9L maximum sample volume for a typical sample size of 1500g. It measures 7.5" ID x 4" depth, but the H-1751 does not comply with ASTM specs.

A larger volume model pycnometer is also available. It provides a 5.8L volume with a 3.9L maximum sample volume and a 4000g typical sample size. It measures 7.5" ID x 8" depth.

All models can be used with H-1756A vibrating apparatus or H-1782 de-airing device, and H-1754D manometer, sold separately. See page 265 for vacuum pumps. Replacement parts are available, please inquire.

| | |
|---------------------------------------|----------|
| Vacuum Pycnometer Set, 6" (4.34L) | H-1750 |
| Vacuum Pycnometer Set, SS, 6" (4.34L) | H-1750SS |
| Vacuum Pycnometer Set, 4" (2.9L) | H-1751 |
| Vacuum Pycnometer Set, 8" (5.8L) | H-1755A |

Ship wt. 13lbs. (5.8kg)

Pycnometer Replacement Lid

Replacement lid for models H-1750, H-1751 and H-1755A.

| | |
|----------------------------|----------|
| Pycnometer Replacement Lid | H-1750.2 |
| Ship wt. 0.05lbs. (0.02kg) | |

Pycnometer Lid, O-Ring

Replacement o-ring for models H-1750, H-1751 and H-1755A.

| | |
|----------------------------|----------|
| Pycnometer Lid, O-Ring | H-1750.3 |
| Ship wt. 0.05lbs. (0.02kg) | |

Vacuum Pycnometer Set, Large-Capacity

AASHTO T209, T283

Large-capacity unit, 10L (2.64 gal.), 6000g (13.2 lbs.) sample weight, with maximum aggregate size of 50mm (2"). The set features a domed, transparent cover for easy observation of sample testing, perforated plastic shelf, which some States require; water inlet valve and .25" ID hose, quick-disconnect, vacuum gauge, vacuum hose and aspirator with 3/8" NPT fitting. Flange OD is 10.75" (273mm); maximum clearance above plate is 7.75" (197mm). Use with H-1826A.3F vibrating table, and H-1754D manometer, sold separately. See page 165 for vacuum pumps. Replacement parts are available, please inquire. Dimensions: 9.5" ID x 12.125" (240 ID x 311mm)

| | |
|------------------------------|--------|
| Vacuum Pycnometer Set, Large | H-1820 |
| Ship wt. 10lbs. (4.5kg) | |

Slow-Release Valve for Vacuum Pycnometers

ASTM D2041; AASHTO T283

For use with H-1750, H-1755SS, H-1751, H-1755A and H-1820 for greater accuracy and shorter dry back time. Brass valve maintains 30mm vacuum pressure on sample.

| | |
|-------------------------|--------|
| Valve, Slow-Release | H-1749 |
| Ship wt. 0.6lbs. (.2kg) | |

Aspirator Filter Pump

Provides excellent performance for providing a vacuum for pycnometer applications. Water inlet is .375" and length is 5.375" (137mm). Nickel-plated with serrated tail and side arm.

| | |
|---------------------------|---------|
| Aspirator Filter Pump | H-12090 |
| Ship wt. 0.25lbs. (.11kg) | |

Manometer, Digital

A precise measurement device designed to replace mercury-filled manometers used in Rice test applications. This portable, hand-held device can be easily moved around the laboratory. Holes are provided for bench or wall mounting and a .375" barb fitting is used for quick connections. The instrument features a digital display range of 0 to 1000mm Hg (absolute) at a resolution of 0.1mm Hg. The device has a rated accuracy of +/-0.5% full scale and is powered by one 9V battery or AC adapter, both are included.

| | |
|----------------------------------|---------------|
| Manometer, Digital, 120V 60Hz | H-1754D |
| Manometer, Digital, Certified | H-1754D-CA |
| Manometer, Digital, 220V 50/60Hz | H-1754D.4F |
| Manometer, Digital, Certified | H-1754D.4F-CA |
| Ship wt. 2lbs. (.9kg) | |



H-1756.3F



H-1826.3F



H-1782



H-1753 shown in use with H-1782



HA-1665

De-airing Agitator

ASTM D2041; AASHTO T209, T283

Heavy-duty, vibrating, de-airing agitator for use with H-1750, H-1750SS, H-1751 and H-1755A pycnometers keeps sample material loose for more reliable test results. Strong, rugged-duty vibrators and sturdy bases having integral, heavy-duty on/off switches. Exclusive quick-release cam/lock fasteners allow quick placement and removal of canister.

De-airing Agitator, 120/220V 50/60Hz H-1756.3F



Shipping wt. 16 lbs (7.2kg)

De-airing Agitator, Large

AASHTO T209, T283

For use with the H-1820 large pycnometer. Heavy-duty vibrating Apparatus keeps sample material loose for more reliable test results. Strong, rugged-duty vibrators and sturdy bases having integral, heavy-duty on/off switches. Exclusive quick-release cam/lock fasteners allow quick placement and removal of canister.

De-airing Agitator, 120/220V 50/60Hz H-1826.3F



Shipping wt. 18 lbs (8.16kg)

De-Airing Flask Attachment

For use with H-1756.3F and H-1782, flask not included.

De-Airing Flask Attachment H-1753



Shipping wt. 1.3 lbs (.58kg)

Orbital De-Airing Device

The Humboldt orbital de-airing device is designed for use in maximum specific gravity and density determinations of bituminous paving mixtures. Through the use of an orbital shaking action, material densification that entraps air is virtually eliminated, resulting in more accurate and uniform test results. The front panel incorporates a variable

speed controller with a range of 10 to 250 rpm and an LED programmable timer with an accuracy of better than $\pm 0.1\%$. The orbital diameter of the 11" x 12" (279 x 305mm) platform is set at 1.5" (38.1mm). Taking up little counter space, the base is 10" x 10" (154 x 154mm) and has an overall height of 16" (406mm). Quick release clamps are used to permit quick mounting and removal of the pycnometer. The optional H-1753 flask attachment allows the user to conduct tests using a laboratory flask.

Orbital De-Airing Device, 120V 60Hz H-1782

Orbital De-Airing Device, 220V 50/60Hz H-1782.4F



Shipping wt. 38 lbs (17kg)

AutoRice Controller

ASTM D2041; AASHTO T209, T283

The AutoRice is an automatic control unit allowing laboratory technicians to quickly conduct and monitor specific gravity tests with the press of a button. Designed to accurately control and monitor the vacuum pressure, vacuum time and shaker vibration frequency for the Rice test, ASTM D2041 and AASHTO T209. The AutoRice ensures more consistent inter-laboratory repeatability and accuracy. The AutoRice will start the vacuum pump, regulate the vacuum pressure, precisely control the vacuum time and monitor the shaker frequency. Currently, the AutoRice acceleration monitor and shaker frequency is a parameter that is not monitored during the test. Data from the Rice test can be downloaded via the USB port, where results can be reviewed to assure accuracy and adherence to test specifications. The unique, compact design allows AutoRice to fit on a benchtop or mount to a wall and works with glass flasks and metal container setups.

Features:

- Reduces operator errors by automating test parameters; improving accuracy and repeatability
- Measures shaking frequency and acceleration to prevent stripping damage to the sample
- Automates saturation process for AASHTO T283 (moisture damage)
- Provides capability to enter weights and calculate max specific gravity results
- Replaces digital vacuum gauge used in Rice setup
- Replaces digital vacuum gauge used in Rice setup
- Stores test records (vacuum pressure, vacuum time, frequency and acceleration)
- Easy setup with menu driven software
- The AutoRice can output test data to a portable USB drive.

AutoRice Controller



HA-1665

Ship wt. 25lbs. (11.4kg)

PumpSaver

The PumpSaver is a unique new method for the removal of moisture in air prior to entering a vacuum pump. The device extends the life of vacuum pumps by reducing the amount of water entering the pump. It also increases pump efficiency by offering a lower resistance to air flow as opposed to a desiccant style air drier that actually inhibits the free flow of air. Using the PumpSaver also eliminates the requirement for a desiccant type air drier and eliminates the need to continually replace or recycle desiccant materials. The PumpSaver is



used to improve the accuracy, efficiency, reliability and repeatability of your tests requiring a vacuum pump, such as the Rice test, ASTM D2041 and AASHTO T209. PumpSaver connects to your vacuum pump and acts as a moisture trap eliminating the need for desiccants or in-line moisture filters to protect the pump from moisture damage.

- Reduces the number of oil changes per year
- Improves efficiencies
- Eliminates flow restricting desiccant cartridges
- Increases pump life and efficiencies

PumpSaver **HA-1666**
Ship wt. 5lbs. (2.3kg)

AutoRice USB Shaker Sensor **HA-1667**
Ship wt. 2lbs. (0.9kg)

Indicating Drierite Air Drying Unit

Easily installs in-line between vacuum pump and rice test equipment. This refillable unit measures 2.625" by 11.375" (667 x 289mm) with hose barbs at both ends, which can accept 0.25" to 0.375" flexible tubing. Supplied complete with 650g of 8 mesh, indicating desiccant.

Indicating Drierite Air Drying Unit **H-1759**
Shipping wt. 3.1 lbs (1.4kg)

Indicating Drierite Desiccant

ASTM D2041

Indicating drierite is impregnated with cobalt chloride. This desiccant is blue when dry and changes to pink upon absorption of moisture. The color change is pronounced and clearly visible. This makes indicating drierite valuable when it is necessary to know with certainty that dryness is being maintained and to signal when the drying agent should be replaced. It has the same efficiency as regular drierite and can be regenerated for reuse.

Indicating Drierite Desiccant, 1lb/8 mesh **H-1758**
Shipping wt. 2 lbs (.9kg)

Indicating Drierite Desiccant, 5lb/8 mesh **H-1761**
Shipping wt. 10 lbs (4.5kg)

Drierite Desiccant, 8 mesh

ASTM D2041

Replacement desiccant for air drying unit. Protects vacuum pump by removing final traces of moisture.

Drierite Desiccant, 1 lb **H-1757**
Shipping wt. 2.5 lbs (1.1kg)

Drierite Desiccant, 5 lb **H-1767**
Shipping wt. 9 lbs (4kg)

High Vacuum Pump

Direct-drive two-stage rotary sliding vane high vacuum pump features gas ballast and trap to reduce risk of oil being sucked into the system. Produces free air displacement 85L per minute (3 cu. ft. per minute) and maximum vacuum 29-30". Operating temperature is 30 to 170°F (-1.11 to 76.6°C). Has 0.25" OD intake ports for 0.25" ID tubing. Dimensions: 11.25" x 15.5" x 6.5" (28.6 x 39.4 x 16.5cm).

High Vacuum Pump 120V 60Hz **H-1763A**
High Vacuum Pump 220V 50/60Hz **H-1763A.4F**
Shipping wt. 31 lbs (14kg)

Two-Stage Oil-less Vacuum Pump,

Split-capacitor four-pole, two-stage oil-less diaphragm vacuum pump pulls 29" Hg maximum-obtainable vacuum.

Two-Stage Pump, 120V 60Hz **H-1762**
Two-Stage Pump, 230 50/60Hz **H-1762.4F**
Shipping wt. 25.7 lbs (11.6kg)

Two-Stage Vacuum Pump

Designed for continuous use, this two-stage, belt-driven pump operates on the oil-sealed rotary vane principle and is ideal for distillation, filtration, degassing and as a roughing pump for high-vacuum systems. Pumps are mounted on rectangular steel base plate and include V-belt and belt guard that totally encloses belt and pulleys. Pump pulls 29-30" maximum vacuum. Includes initial supply of oil plus an extra quart of HyVac® oil.

Two-Stage Pump, 120V 60Hz **H-1764**
Two-Stage Pump, 230 60Hz **H-1764.2F**
Two-Stage Pump, 230 50Hz **H-1764.5F**
Shipping wt. 55 lbs (24.9kg)

Vacuum Pump

High-vacuum, small capacity, general-purpose vacuum pump with belt guard has two-stage construction for efficiency with low maintenance. Features metal vanes and vented exhaust for introduction of air to remove condensable vapors. Pump is filled with oil; an extra quart is included. Exhaust filter is available separately. Guaranteed ultimate vacuum is 25-29" (635-736mm) mercury, and free-air displacement is 25L/min. (0.9cfm).

Vacuum Pump, 120V 60Hz **H-1770**
Shipping wt. 80 lbs (36kg)



Vacuum Pump Oil

High purity oil with low vapor pressure that does not materially increase at temperatures up to 50°C (122°F) and viscosity sufficiently low for use at 125°C (59°F). Oil remains fairly constant up to 50°C (122°F).

Vacuum Pump Oil, 1 Quart H-1766.2
Shipping wt. 3 lbs (1.3kg)

Vacuum Pump Oil, 1 Gallon H-1766.3
Shipping wt. 9 lbs (4kg)

Vacuum Pump Oil, 5 Gallon H-1766.4
Shipping wt. 41.2 lbs (18.6kg)

Vacuum Pump Oil, 1-Qt. (Case of 12) H-1766.5
Shipping wt. 25 lbs (11.3kg)

Vacuum Pump Oil, 1 Gallon (Case of 6) H-1766.6
Shipping wt. 54.6 lbs (24.7kg)

Flushing Oil for Vacuum Pumps, 1 gallon

Purges contaminants and condensables, such as water and solvents from all mechanical vacuum pumps. Use between oil changes minimizes contamination of new oil by residue from old oil; extends pump life.

Flushing Oil for Vacuum Pumps, 1 gal. H-1768.3
Shipping wt. 8.3 lbs (3.7kg)

Digital Timer, Humboldt

Humboldt's portable digital timers automatically shut off electrical equipment at a set time. Two models are available, one for up to 60 minutes, the other up to 99 seconds. Feature easy-to-use digital interface and two-plug, AC receptacle. The accuracy for both versions is 0.5%.

Digital Timer, Minute, 120V 50/60Hz H-4296A

Digital Timer, Minute, 220V 50/60Hz H-4296A .4F

Digital Timer, Second, 120V 50/60Hz H-4299

Digital Timer, Second, 220V 50/60Hz H-4299.4F
Ship wt. 3lbs. (1.3kg)

Universal Analog Timer

Portable timer automatically shuts off electrical apparatus at set time up to 60 minutes. Features two-plug AC receptacle.

Universal Analog Timer, 120V 60Hz H-4296

Universal Analog Timer, 220V 50/60Hz H-4296.4F

Shipping wt. 2.6 lbs (1.1kg)

Rhoma-Sol™ Specialty Emulsifier

Spray-on solution used in the removal of asphalt and tack oil from testing, paving, oiling, patching, reclaiming and other work zone equipment. Contains no hazardous petroleum solvents and is 100% biodegradable. Flammable, must ship by truck domestically and as Dangerous Goods Internationally.

Rhoma-Sol™ Specialty Emulsifier H-1304
Shipping wt. 2 lbs (0.9kg)

Asphalt Content/Binder Ignition Furnace

ASTM D6307

The asphalt content/binder furnace with internal automatic balance is an environmentally-friendly and cost-effective method for the accurate determination of asphalt content. Developed by NCAT, the National Center for Asphalt Technology. The furnace's large capacity handles samples up to 4,000 grams. Ignition method reduces testing time compared to solvent testing methods and automatic operation frees technicians for other tasks. Temperature range is: 392 to 1202°F (200 to 650°C). 4,800 watt operation Accurate internal balance monitors weights automatically throughout ignition to within ±0.1 gram. Easy operation—simply enter sample weight, calibration factor, load the sample, and push start, when unit beeps at test end, push stop, and sign receipt. Door safety features, such as a software-activated door lock, an automatic interlock that cuts power when door is open, full 180 degree door opening and door hinge lock eliminate harmful solvents and make

operation easy. Ignition Furnace comes complete with accessory package AY1087X1. CE-approved. Chamber dimensions: 14"W x 10.5"H x 14"D (355 x 266 x 355mm). Shipping dimensions: 32"W x 32"D x 60"H (813 x 813 x 1524mm).)

Content/Binder Ignition Furnace w/ Accessory Package, 240V 50/60Hz, 20 amp F85930-33
Shipping wt. 383 lbs (173.7kg)

Content/Binder Ignition Furnace w/ Accessory Package, 208V 60Hz, 23 amp F85938
Shipping wt. 280 lbs (127kg)

Content/Binder Ignition Furnace (furnace only) 240V 50/60Hz, 20 amp F85930-33X
Shipping wt. 357 lbs (161.9kg)

Content/Binder Ignition Furnace (furnace only) 208V 60Hz, 23 amp F85938X
Shipping wt. 230 lbs (104.3kg)

Accessory Package for Ignition Furnaces

Accessory package includes: 4 baskets, 2 trays, 2 covers, handle, cooling cage, insulated plate, gloves, face shield, 4 rolls of printer tape, balance calibration plate and androl oil.

| Description | Part # |
|--|----------|
| Exhaust tubing, 3"ID (sold by foot) | H-1515 |
| Exhaust tubing, stainless, 3"ID (sold by foot) | H-1515SS |
| Printer paper | PRX2 |
| Baskets (set of 2) | AY1087X6 |

Ignition Furnace Accessory Package AY1087X1
Shipping wt. 75 lbs (34kg)



ACCESSORIES

For gloves, see pages 362.



H-1456



H-1461



H-1451



H-1451.1

Centrifuge Extractor (Explosion Proof)

ASTM D2172; AASHTO T164

Available in 1500g and 3000g capacities, these extractors conform to the explosion-proof standards for the safety of operating personnel.

All models feature a removable aluminum bowl assembly, which quickly lifts out of the sealed housing for efficient specimen handling. A simple, control knob adjusts bowl speed. The heavy, cast-aluminum bowl cover latches securely in place and features an integral solvent dispensing cup for easy pouring of the solvent into the bowl.

Extractors are supplied complete with 25 filter discs. Replacement filter discs (100-packs) are available, see chart at bottom right of page.

Dimensions: both sizes: 18" x 18" x 18" (457 x 457 x 457mm).

| | |
|--------------------------------|-----------|
| Extractor, 1500g, 115V 60Hz | H-1466 |
| Extractor, 1500g, 220V 50/60Hz | H-1466.4F |
| Extractor, 3000g, 115V 60Hz | H-1473 |
| Extractor, 3000g, 220V 50/60Hz | H-1473.4F |

Shipping wt. 75lbs (34kg)

Auto Centrifuge Extractor, (Explosion Proof)

ASTM D2172; AASHTO T164

These extractors feature automated, auto control of the unit. Timer allows unit to run unattended for a specific period of time (1 to 10 minutes). Unit brakes and stops automatically when time expires and holds last test cycle settings in memory for repeatable tests. Time and speed can be set quickly with the rotating dials below the digital display that shows the settings. The controller can also be wall- or remotely-mounted for visual ease as well as vibration isolation.

Power is supplied by a reliable 1/8hp DC motor. Extractors are supplied complete with 25 filter discs. Replacement filter discs (100-packs) are available, see chart at bottom right of page.

| | |
|--------------------------------|-----------|
| Extractor, 1500g, 115V 60Hz | H-1461 |
| Extractor, 1500g, 220V 50/60Hz | H-1461.4F |
| Extractor, 3000g, 115V 60Hz | H-1465 |
| Extractor, 3000g, 220V 50/60Hz | H-1465.4F |

Shipping wt. 114lbs (51.7kg)

Asphalt Centrifuge Extractor (Open Motor)

ASTM D2172; AASHTO T164

This extractor is an open-motor version of the explosion-proof models described above. While it is safe to operate, it does not provide the added safety of the explosion-proof design. Available only in 1500g model, this extractor is a great economical choice or for those who need an extractor, but may not use it extensively.

| | |
|--------------------------------|-----------|
| Extractor, 1500g, 115V 60Hz | H-1452 |
| Extractor, 1500g, 220V 50/60Hz | H-1472.4F |

Shipping wt. 70lbs (31.7kg)

Auto Centrifuge Extractor (Open Motor)

ASTM D2172; AASHTO T164

This extractor is an open-motor version of the explosion-proof models described above. While it is safe to operate, it does not provide the added safety of the explosion-proof design. This extractor is a great economical choice or for those who need an extractor, but may not use it extensively. Not available in 220V model.

| | |
|--|--------|
| Centrifuge Extractor, 1500g, 115V 60Hz | H-1460 |
| Centrifuge Extractor, 3000g, 115V 60Hz | H-1464 |

Shipping wt. 76lbs (34.4kg)

| Centrifuge Extractor Replacement Parts | |
|--|-----------|
| Description | Model |
| Bowl for H-1456, H-1466 | H-1456B |
| Bowl for H-1471, H-1473 | H-1471B |
| Bowl cover, H-1456, H-1466 | H-1456BC |
| Bowl cover, H-1456, H-1466 | H-1471BC |
| Cover nut | H-1471N |
| Clamp, all models | H-1471C |
| O-Ring, all models | H-1471RV |
| Brake band, all models | H-1456BB |
| Brake band assembly, all | H-1471BBA |

| Extractor / Size | Model |
|---|------------|
| H-1451, H-1452 (9.75"OD x 1.75"ID) | H-1481.627 |
| H-1456, H-1466, H-1460, H-1461 (10"OD x 5"ID) | H-1487.627 |
| H-1471, H-1473, H-1464, H-1465 (12.25"OD x 5"ID) | H-1489.627 |

Asphalt Centrifuge Extractor (Explosion Proof)

ASTM D2172; AASHTO T164

The asphalt centrifuge extractor is designed for determining the percentage of bitumen in asphaltic mixtures. Available in 1500g and 3000g capacities, these extractors conform to the explosion-proof standards for the safety of operating personnel. All models feature a removable, aluminum bowl assembly, which quickly lifts out of the sealed housing for efficient specimen handling. A simple, control knob adjusts bowl speed up to 3600 rpm, and, an electric brake stops the centrifuge in seconds when extraction is complete. The heavy, cast-aluminum bowl cover latches securely in place and features an integral solvent dispensing cup for easy pouring of the solvent into the bowl. Power is supplied by a reliable 1/8hp DC motor. Extractors are supplied complete with 25 filter discs. Replacement filter discs (100-packs) are available, see chart at bottom right of page.

Dimensions: 1500g units: 12" x 20" x 22" (305 x 508 x 559mm); 3000g units: 14" x 20" x 22" (356 x 508 x 559mm).

| | |
|--------------------------------|-----------|
| Extractor, 1500g, 115V 60Hz | H-1451 |
| Extractor, 1500g, 220V 50/60Hz | H-1451.4F |
| Extractor, 3000g, 115V 60Hz | H-1474 |
| Extractor, 3000g, 220V 50/60Hz | H-1474.4F |

Shipping wt. 85lbs (38.5kg)

Filter Papers for H-1451 & H-1474 Centrifuge Extractors

| Extractor / Size | Model |
|--|----------|
| H-1451 9.75"(241mm) OD x 2.5"(64mm) Hole | H-1451.1 |
| H-1474 11.75"(298mm) OD x 2.5"(64mm) Hole | H-1474.1 |



H-1431

Asphalt Solvent Recycler

This unit has been designed to recycle the solvents used in asphalt extraction tests. It successfully extracts pure solvent from the oil and wastes generated from the extraction process and generates clean solvent ready for reuse in a new test. The unit reduces the need for new solvent and eliminates problems with solvent disposal.

- UL 2208 Certified
- 6-gallon, heavy-duty stainless steel boiling tank
- Air-cooled, no water hookup necessary
- Bag-lined tank allows easy removal of solid contaminants
- Vacuum-assist option for higher boiling solvents
- Quiet operation and low maintenance
- Multiple safety controls with automatic shutoffs
- Mobile – mounted on locking wheels for easy relocation & stabilizer bars for added support
- Easy installation to standard connection: 220-240V or 120V
- Electric, fill pump available as an option
- Small footprint – 22.25" w x 39" l x 44" h

| Description | Model |
|--------------------------|----------------------------------|
| Operating capacity: | 6 gallons / 23 Liters |
| Voltage: | 120V 60Hz or 240V 60HZ |
| Wattage: | 2800 VA (240V) 2300 VA (120V) |
| Maximum Rated Load: | 11.1 A (240V) or 185 A (120V) |
| Voltage: | 120V 60Hz or 240V 60Hz |
| Net weight: | 290 lbs (132kg) |
| Clamp, round jaw, coated | H-8572 |

Asphalt Solvent Recycler 120V 60Hz H-1431
 Asphalt Solvent Recycler 220-240V 50/60Hz H-1431.4F
 Shipping wt. 290 lbs (132kg)



H-1449A

Vacuum Extractor

ASTM D2172 (Method E); AASHTO T164

Basic vacuum extractor for use in quantitative determinations of bitumen in hot-mixed paving mixtures and pavement samples. The H-1449 provides a 12" (305mm dia) filtering surface. Unit includes a connecting hose, (100) H-1497.613 filter papers and test procedure instructions. Use with a 4,000cc erlenmeyer flask and a vacuum pump, see below. For replacement filter paper, use H-1497 series paper from chart at bottom of page.

Vacuum Extractor

H-1449A



Shipping wt. 58.6lbs (26.5kg)

| Vacuum Extractor Components & Accessories | |
|---|-----------------------|
| Description | Model |
| Fluorosilicone o-ring | H-1448.1 |
| Stainless steel plate, as provided | H-1448P |
| Stainless steel plate, heavy-duty | H-1448HP |
| Rubber Tubing | H-1448RT |
| Clear, Heavy-wall, Vacuum Tubing | H-1446 |
| 4,000cc erlenmeyer flask, meets ASTM D2172 and AASHTO T164 (Method E) | H-4913.4M |
| 8" Sieve adapter | H-1447 |
| High-vacuum pump (see page 165 for info) | H-1763A H-1763A.4F |

Filter Papers for Vacuum Extractors

| Size | Filter Speed | Flow Rate (ml/min.) | Thickness | Retention (µm) | Per Pkg. | Model |
|-----------|--------------|---------------------|-----------|----------------|----------|------------|
| 33cm dia. | Very fast | 360 | 0.51 | 48 | 50 | H-1497.617 |
| 33cm dia. | Very fast | 435 | 1.02 | 31 | 100 | H-1497.633 |
| 33cm dia. | Fast | 235 | 0.25 | 24 | 100 | H-1497.615 |
| 33cm dia. | Medium | 60 | 0.17 | 6 | 100 | H-1497.613 |
| 33cm dia. | Medium | 85 | 0.71 | 4 | 100 | H-1497.627 |



H-1857A

Centrifuge Extractor, Filterless

ASTM D1856; AASHTO T164

The continuous-flow filterless centrifuge extractor is ideally suited for use in the extraction of mineral fines from bitumen-laden solvents obtained from standard asphalt extraction tests. In operation, the solvent suspension is fed through the top funnel into a special aluminum beaker, (2) H-1857.5 supplied). Using the high, 11,000 rpm centrifugal force, the liquid moves up the beaker wall and out the overflow tube while the solids remain for easy removal at test completion. The system allows the continuous feeding of the suspension until the solids-retaining capacity of the beaker is reached. The unit is supplied complete with a No. 18 (1.0mm) and No. 200 (75µm) sieve for placement at the top of the inlet funnel. Using this arrangement, an asphalt mix extraction test can be carried out by pre-dissolving the mix with solvent and then pouring the sample into the sieve. Dimensions: 20" x 15" x 33" (508 x 380 x 840mm).

Centrifuge Extractor, Filterless

120V 60Hz

H-1857A

230V 60Hz

H-1857A.2F

230V 50Hz

H-1857A.5F



Shipping wt. 154lbs (69.8kg)

Aluminum Beaker

Replacement aluminum beaker for use with the filterless centrifuge extractor.

Aluminum Beaker

H-1857.5



Shipping wt. 2lbs (.9kg)



Reflux Extractor Sets

ASTM D2171, D2172; AASHTO T164 Method B
Used to determine the percentage of bitumen in a paving mixture using hot solvent extraction. Available in 1000g and 3000g versions.

The 1000g set includes: (2) 500g wire screen cones, copper condenser with 0.5" inlet/outlet water tubes, glass jar 6" OD x 18" H (152mm x 457mm) with ground open edges for a tight fit, a H-4942, 6" square hot plate and a 100-pack of 33cm filter paper.

The 2000g set includes: (2) 1000g wire screen cones, copper condenser with 0.5" inlet/outlet water tubes, glass jar 8.75" OD x 18" H (222mm x 457mm) with ground open edges for a tight fit, a H-4943, 9" square hot plate and a 100-pack of 40cm filter paper.

Reflux Extractor, 1000g, 120V 60Hz H-1495
Reflux Extractor, 1000g, 220V 50/60Hz H-1495.4F
Shipping wt. 29.3lbs (13.2kg)

Reflux Extractor, 2000g, 120V 60Hz H-1499
Reflux Extractor, 2000g, 220V 50/60Hz H-1499.4F
Shipping wt. 55lbs (24.9kg)

Reflux Extractor, 1000g Components

| Description | Model |
|--|------------|
| Wire screen cone, 500g sample holder (set of 2) | H-1495.1 |
| 0.5" Tube copper condenser w/ inlet/outlet water tubes | H-1495.2A |
| Glass jar with ground open edges | H-1495.3 |
| Electric hot plate | H-4942 |
| Filter paper, 33cm, 100-pack | H-1497.613 |
| FibreChem circle, 8.5" | H-1496 |

Reflux Extractor, 2000g Components

| Description | Model |
|--|------------|
| Wire screen cone, 1000g sample holder (set of 2) | H-1499.1 |
| 0.5" Tube copper condenser w/ inlet/outlet water tubes | H-1499.2A |
| Glass Jar with ground open edges | H-1499.3 |
| Electric hot plate | H-4943 |
| Filter paper, 40cm, 100-pack | H-1498.613 |
| FibreChem circle, 8.5" | H-1496 |

Pressure Limit Device

For use with reflux extractor kits to protect copper condenser from excessive pressure. For use with 0.5" tubes.

Pressure Limit Device H-1494A
Shipping wt. 0.5lbs (0.22kg)

Filter Papers for Reflux Extraction

| Size | Filter Speed | Flow Rate (ml/min.) | Thickness | Retention (µm) | Per Pkg. | Model |
|-----------|--------------|---------------------|-----------|----------------|----------|------------|
| 33cm dia. | Very fast | 360 | 0.51 | 48 | 50 | H-1497.617 |
| 33cm dia. | Very fast | 435 | 1.02 | 31 | 100 | H-1497.633 |
| 33cm dia. | Fast | 235 | 0.25 | 24 | 100 | H-1497.615 |
| 33cm dia. | Medium | 60 | 0.17 | 6 | 100 | H-1497.613 |
| 33cm dia. | Medium | 85 | 0.71 | 4 | 100 | H-1497.627 |
| 40cm dia. | Medium | 85 | 0.71 | 4 | 100 | H-1498.627 |
| 40cm dia. | Medium fast | 60 | 0.17 | 6 | 100 | H-1498.613 |
| 40cm dia. | Medium fast | 235 | 0.25 | 24 | 100 | H-1498.615 |
| 40cm dia. | Very fast | 300 | 0.51 | 48 | 50 | H-1498.617 |

Asphalt Dispensers

Round, melting pot has stainless steel crucible (18 gauge) and shell (20 gauge) to facilitate easy clean up. Choice of 6 quart, or 12 quart models. Includes heavy-duty, adjustable bench mounting stand, which fits either size. Dual-point temperature control allows independent temperature for pot (0-350°) and for valve (1-10°). Digital display may be read in either C° or F°. Other features include: multiple-circuit blanket heater for very uniform heat; no-drip 1" ball valve dispenser, 7.25" (184mm) above work surface; 50-watt valve heater; 3" (76mm) fiberglass insulation; separate aluminum cover; 6' power cord.

6-qt cap.— 800 watts; 12-qt cap.— 1,200 watts;
Asphalt Dispenser, 6Qt, 120V 60Hz H-1440
Asphalt Dispenser, 6Qt, 220V 50/60Hz H-1440.4F
Shipping wt. 30lbs (14kg)
Asphalt Dispenser, 12Qt, 120V 60Hz H-1442
Asphalt Dispenser, 12Qt, 220V 50/60Hz H-1442.4F
Shipping wt. 20lbs (19.1kg)

Bench Stand for Dispenser

Bench-mounted stand for Dispensers
Bench Stand for Dispenser H-1494STND
Shipping wt. 0.5lbs (0.22kg)



H-3839



H-3842A



H-3843A



H-3841.1



H-3841.2



H-3843AHW



H-3842HW

Mixer, 5-Qt.

This mixer can be used for mixing asphalt mixes in the lab. The H-3839 operates on the principle of planetary action where the beater reaches every part of a batch, rotating on its axis in opposite directions as it moves around the bowl. This mixer thoroughly blends, mixes and aerates all ingredients for a consistent, predictable finished batch. Selective agitator transmission has 3 speed settings: 139, 285 and 591 RPM. Direct gear drive and a heavy-duty motor ensure constant mixing speeds under load. A locking hand-lever provides precise raising and lowering of the mixing bowl. Base dimensions: 10.375 x 15" (264 x 381mm). Height: 17" (432mm). The mixer includes a stainless steel bowl, wire whip, dough hook and an aluminum flat beater. It is suggested that a stainless steel beater or a Humboldt extreme-duty whisk be purchased for asphalt mixing applications as the standard mixer parts do not wear well in asphalt applications.

Mixer, 5-Qt. (4.73L), 120V 60Hz **H-3839**

Mixer, 5-Qt. (4.73L), 230V 60Hz **H-3839.2F**

Mixer, 5-Qt. (4.73L), 230V 50Hz **H-3839.5F**

Shipping wt. 55 lbs (25kg)

H-3839 Accessories and Replacement Parts

| Description | Model |
|-------------------------------------|----------|
| Bowl lid, acrylic | H-3846L |
| Beater—stainless steel, flat-type | H-3841.1 |
| Bowl—stainless steel, 5 qt. (4.73L) | H-3841.2 |
| Wire loop whip—stainless steel | H-3841WW |
| Dough hook, aluminum | H-3841DH |

Laboratory Bench Mixer, 12-Qt. (11.35L)

The Hobart model HL-120 bowl has a 12-qt. (11.35L) mixing capacity and a 15-minute motor-driven timer. Planetary action of the beater assures thorough blending and mixing. Selective agitator transmission has 3 speed settings: 106, 196 and 358 RPM. Includes stainless-steel bowl, flat-type aluminum grid beater and aluminum dough hook. Base dimension: 14.75" x 20" x 29.5265" (375 x 508 x 750cm).

Laboratory Bench Mixer, 12-Qt. (4.73L)

120V 60Hz **H-3842A**

230V 50/60Hz **H-3842A.4F**

Shipping wt. 185 lbs (83.9kg)

H-3842A Accessories and Replacement Parts

| Description | Model |
|--------------------------------|-----------|
| Aluminum beater | H-3842A.1 |
| 12-qt. stainless steel bowl | H-3842A.2 |
| Aluminum dough hook | H-3842ADH |
| Stainless steel wire loop whip | H-3842AWW |

Laboratory Bench Mixer 20-Qt. (18.92L)

The Hobart HL-200 mixer has a positive gear drive and planetary mixing action to deliver positive results. Selective agitator transmission has 3 speed settings: 107, 198 and 361 RPM. Exclusive stirring switch provides low (53RPM) speed to facilitate adding liquids to semi-solids. Includes stainless-steel bowl and flat-type aluminum grid beater. Base dimension: 21" x 21.5" x 41.25" (533 x 546 x 1048cm).

Laboratory Bench Mixer, 20-Qt. (18.92L)

120V 60Hz **H-3843A**

230V 50/60Hz **H-3843A.4F**

Shipping wt. 230 lbs (104.3kg)

H-3843A Accessories and Replacement Parts

| Description | Model |
|--------------------------------|------------|
| Aluminum beater | H-3843A.1 |
| 20-qt. stainless steel bowl | H-3843A.2 |
| Aluminum dough hook | H-3843ADH |
| Stainless steel wire loop whip | H-3843A.WW |

Humboldt Extreme-Duty Whisks

Custom, hand-made extreme duty whisks are formed from 0.25" dia. stainless steel rod. Designed to stand up to the abuse of mixing heavy aggregate asphalt mixes in the mixers listed above.

| Description | Model |
|---|-----------|
| For H-3843A (Hobart HL-200 1/2HP) current | H-3843AHW |
| For H-3842A (Hobart HL-120 1/2HP) current | H-3842AHW |
| For H-3839 (Hobart N-50A-10) current | H-3841HW |
| Hobart 20-quart mixer old model (prior to 2007) | H-3843HW |
| Hobart 12-quart mixer old model (prior to 2007) | H-3842HW |

**NOTES**

Replacement parts for previous models, H-3842 (Hobart A-120) and H-3843 (Hobart A-200) are available, please call.

Also, please call for Extreme-duty whisks for these models.



Asphalt/Concrete Mixer, 5 gal., Stationary
Chain-driven mixer, ideal for sample batch mixing in either laboratory or field. Separate utility bucket cradles securely inside enameled-steel mixer frame. Maximum capacity 70 lbs (50lb recommended). Built for continuous duty performance. Choice of 4 Mixing angles. Mix bucket speed is 60 rpm with 0.5 HP motor. Configuration includes bucket, H-1690.2 paddle and accessory chain guard.

Asphalt/Concrete Mixer, 5 gal., Stationary
120V 60Hz H-1690
220V 50Hz H-1690.5F
Shipping wt. 55.4 lbs (25.1kg)

H-1690 Mixer Accessories

| Description | Model |
|--|----------|
| Mixing paddle for 5 gal. H-1690 mixer | H-1690.2 |
| Deluxe mixing paddle for 5 gal. H-1690 mixer | H-1690.3 |
| Bucket & cover for 5 gal. H-1690 Mixer | H-1690.1 |

Asphalt/Concrete Mixer, 5 gal., Mobile,
Direct-drive, 5 gallon, portable mixer with 8" semi-pneumatic wheels for mobility. Mix bucket speed is 60 rpm with 0.5 HP motor. Includes mix bucket only. Order desired paddles separately.

Asphalt/Concrete Mixer, 5 gal., Mobile
120V 60Hz H-1691
220V 50Hz H-1691.5F
Shipping wt. 84 lbs (38.1kg)

Asphalt/Concrete Mixer, 10 gal., Mobile,
10 gallon, portable mixer with 8" semi-pneumatic wheels for mobility. Mix bucket speed is 60 rpm with 0.5 HP motor. Includes mix bucket only. Order desired paddles separately, see below.

Asphalt/Concrete Mixer, 10 gal., Mobile
120V 60Hz H-1692
220V 50/60Hz H-1692.4F
Shipping wt. 97 lbs (44kg)

H-1691, H-1692 Mixer Accessories

| Description | Model |
|--|-----------|
| Asphalt paddle for 5 gal. portable mixer | H-1691.6A |
| Concrete paddle for 5 gal. portable mixer | H-1691.8A |
| Concrete paddle for 10 gal. portable mixer | H-1692.9 |
| Mix bucket for 5 gal. mixer | H-1691.4 |
| Mix bucket for 10 gal. mixer | H-1692.5 |

QuarterMaster™ Asphalt Mix Sample Splitter

The QuarterMaster™ is ideal for dividing the larger asphalt mix samples required in Superpave specifications. The hopper accepts samples up to 120 lb (54kg) of any mix with aggregate between 9.5 to 37.5mm and quarters it into four equal parts. In operation, a simple throw of a lever divides the sample. Using the device ensures greater control, consistency and uniformity in the preparation of test samples. The unit is supplied complete with four sample buckets. Dimensions are 14"W x 17"D x 48"H (356 x 432 x 1219mm). To assist operation, order a H-1702 materials handling scoop.

QuarterMaster™ Sample Splitter H-4122
Shipping wt. 100 lbs (45.3kg)

QuarterMaster™ Quick Funnel Insert

Use Funnel to significantly reduce the hopper size when reduction of smaller samples is desired.

QuarterMaster™ Quick Funnel Insert H-4122QF
Shipping wt. 11.2 lbs (5.08kg)

QuarterMaster™ Replacement Bucket

Replacement galvanized metal bucket for use with QuarterMaster™.

QuarterMaster™ Replacement Bucket H-3372
Shipping wt. 4lbs (1.8kg)



HA-5000A.4F

**Superpave GYR Gyratory**

ASTM D6925; AASHTO T312; CS9010-1115; CS9010-1230; SHRP M-002, T 0736-2011; TEX-241-F; EN 12697-10

Compaction is achieved by the application of a vertical stress (normally 600KPa (87psi)) via end platens to a known mass of asphaltic mixture within a 150 and 100mm internal Ø mold. The longitudinal axis of the mold is rotated (gyrated) at a fixed angle to the vertical while the platens are kept parallel and horizontal. During compaction the height of the sample is automatically measured and both the mixture density and void content calculated.

Features:

- Automatic mold insertion and retraction on side table which allows cooling time before extraction without loss of compaction time
- 150 mm and 100 mm internal Ø molds can be tested without changing parts.
- Cold mix (emulsion) materials can be compacted and the expelled liquid collected
- Ethernet for data acquisition and control system
- 20 mm solid steel side plates for robustness and flex prevention
- Gyration speed 15 to 30RPM
- Machine calibrated with traceable equipment
- User friendly, intuitive and reliable Windows® software developed using LabVIEW™, displays results in real time
- Software allows 3 methods of compaction—number of gyrations, height and target density. The operator is guided through every step of the compaction
- Real-time display of current height, density and void content (%) Data is recorded to disk at regular intervals for further analysis
- Utilities are included for transducer check, diagnostic routines and calibration.

Superpave Gyratory, 220V 50/60Hz HA-5000A.4F

Ship wt. 1120 lbs. (508kg)

**INSTALLATION**

Installation Verification and on-site Training are available for the Gyratory, please inquire.

Specifications

| | |
|--------------------------------|---|
| Speed | Normally 30 rpm |
| Stress | Normally 600 kPa (87psi) Maximum 1000 kPa (145psi) |
| Actuator Stroke | 9.85" (250mm) |
| Internal Angle of Gyration | 0.2 to > 2° |
| Electrical Supply | 220V 60 Hz |
| Specimen Ø mm (inch) | 6" (150mm) and 4" (100mm) |
| Compressed Air | 7-10 bar (100-145psi) @ 12.5cfm (350 lpm) |
| Mixtures | Wet, dry and rubber |
| Dimensions | 31" x 40" x 76" (780 x 1000 x 1920mm) |
| Working Space Required (WxDxH) | 79" x 79" x 87" (2000 x 2000 x 2200mm) |
| Desktop PC | Included |

**ACCESSORIES**

Accessories are not included and should be ordered separately.

| Accessories | Model |
|---|------------|
| Specimen Extruder, Pneumatic | HA-5000.17 |
| External Angle Verification | HA-5000.20 |
| 150mm Internal Ø mold & platens with specimen temperature measurement | HA-5000.2 |
| 150mm Internal Ø mold & platens, slotted for emulsion mix | HA-5000.6 |
| 100mm Internal Ø mold & platens, slotted for emulsion mix | HA-5000.4 |
| 100mm Internal Ø mold & platens | HA-5000.5 |
| Lift handle for light weight gyro mould | HA-5000.21 |
| 150mm Spacer to compact 63mm height on Gyratory | HA-5000.10 |
| Spacer, 100mm to compact 63mm height on HA-5000 | HA-5000.11 |
| Shear force display | HA-5000.13 |
| Specimen Temperature Measurement | HA-5000.14 |
| Calibration kit for external angle | HA-5000.12 |
| 100mm Circle Filter Paper (100 pk) | HA-5000.16 |
| (150mm circle filter papers (100pk) | HA-5000.15 |



| Specifications | |
|---------------------------|--|
| Vertical Load (150mm) | 10 to 1000 kPa (1000 kPa–10 bar) (800 kPa–8 bar) (700 kPa–7 bar) |
| Vertical Load (100mm) | 23 to 1500 kPa with 7 bar compressor |
| Vertical Load Control | Auto electronic system |
| Gyratory Rate | Adjustable from 5 to 60 work cycles/min. |
| Gyratory Angle Adjustable | 0 to 2.4° |
| Number of Cycles | Adjustable from 1 to 5000 |
| Electrical Supply | 230V 50/60 Hz |
| Compressed Air | 100-145psi (7-10 bar) @ 350 L/min (12.5cfm) |
| Mixtures | Wet, dry and rubber |
| Dimensions | 25.2" x 19.7" x 41.3" (640 x 500 x 1050mm) |

| Accessories | Model |
|--|-------------|
| Specimen Cylinder, (100mm) | HA-5950.1 |
| Specimen Cylinder, (150mm) | HA-5950.2 |
| Cylinder w/Holes, (100mm) | HA-5950.3 |
| Cylinder w/Holes, (150mm) | HA-5950.4 |
| Penetration Piston, (100mm) | HA-5950.5 |
| Penetration Piston, (150mm) | HA-5950.6 |
| Metallic Disk, (100mm) | HA-5950.7 |
| Metallic Disk, (150mm) | HA-5950.8 |
| Filter Paper, (100mm) | HA-5950.9 |
| Filter Paper, (150mm) | HA-5950.10 |
| Auto Specimen Extruder | HA-5950.11* |
| Bench | HA-5950.12 |
| Wheels | HA-5950.13 |
| Internal Angle Measurer | HA-5950.14 |
| Calibration Check for Internal Angle Measure | HA-5950.15 |

* Requires HA-5950.12 Bench for mounting.



HA-5950.14



ACCESSORIES

Accessories are not included and should be ordered separately.



HA-5950.1, HA-5950.2



HA-5950.3, HA-5950.4

Shown with
HA-5950.12 Bench
Order Separately



HA-5950.4F

Superpave Gyratory

ASTM D6925; AASHTO T312; CS9010-1115; CS9010-1230; SHRP M-002, T 0736-2011; TEX-241-F; EN 12697-10

This Gyratory Compactor is used to simulate and reproduce the real compaction conditions of actual road paving operations in determining the compaction properties of asphalt.

Its fully-automatic compaction operation provides that both rotary and vertical forces are applied to the specimen by the mechanical head. The gyratory's rigid, steel frame ensures that excellent angle control is maintained through the testing operation.

Load is applied by an electro-pneumatic cylinder, which is servo-controlled by a precision pressure regulator while the height is measured by a linear transducer. Gyratory motion is generated by an eccentric high-precision system allowing an easy set up with precision and constant angle of gyration. The rotation speed is controlled by an inverter through on-board computer control.

In addition to testing standard mixes the Gyratory can also test cold emulsified asphalt mixes using one of the available perforated molds. Machines are factory calibrated to the selected internal angle. The touch-screen, icon-based interface allows for easy test parameter set up and test

execution, as well as data acquisition and data processing.

- Rigid steel frame ensuring excellent angle control
- Electro-pneumatic action with servo-controlled regulator
- Full-color, touch-screen control unit
- PC Software for control, acquisition and data processing
- Optional shear stress measurement
- Optional integrated balance
- Optional integrated extruder

The machine provides direct connection to a LAN network and the internet, which allows for remote machine control, as well as remote communication with technicians for immediate diagnostics and problem solving and for software updates.

Unlimited memory storage with: 2 USB ports, 1 SD card. Machine is factory calibrated and supplied with the internal angle set to 1.16° as specified by ASTM, AASHTO Specifications.

Superpave Gyratory, 230V 50/60Hz HA-5950.4F

Ship wt. 529lbs. (240kg)

Compact, Hydraulic Steel Roller Compactor

ASTM D8079, EN 12697-33

The Roller Compactor is considered to be the method of laboratory specimen compaction that results in slabs of asphaltic paving materials with properties that most closely simulate those of materials in the highway. Slabs can be compacted to target mixture densities using loads that are equivalent to those of full-scale compaction equipment. This compactor is hydraulically powered and controlled by a programmable logic controller (PLC) connected to an HMI (Human Machine Interface), which the operator can use to select the number of passes. A manual pressure control is adjusted to set the required load. The main function of the Compact Steel Roller is to produce slabs for beam fatigue and wheel tracking tests.

Features:

- Versatile with various steel wheeled roller segments available
- Optional heated head for reducing mixture sticking to roller during compaction
- Optional vibrating roller option to simulate on-site vibratory rollers
- Compaction head option: of 15 7/12 x 6 x 10 2" (400/320 x 260mm) and 15 7/12 x 12" (400/305 x 305mm) slabs
- Slab depth from 1.6 to 3.9 inch (40 to 100 mm)
- Slabs can be used as wheel-tracking specimens, and cored to make indirect tensile test specimens or cut into beams for 4-Point Bending Test
- Roller Compactor molds will fit Cox/Cooper Wheel Trackers so that compacted slabs can be wheel-tracked without de-molding
- Maximum compaction load of 30kN (6750lbf) which is equivalent to largest on-site static rollers
- Speed can be controlled by user
- HMI for operator selection of number of passes
- Solid machine frame on height adjustable feet with enclosed transparent guarding with fully compliant safety interlock

Steel Roller Compactor, 220V 60Hz

HA-5700.2F

Steel Roller Compactor, 220V 50Hz

HA-5700.5F

Ship wt. 79 lbs. (36kg)



Used in conjunction with the HA-5300A.4F Hamburg Wheel Tracker and Flex Tracker, see page 300

**ACCESSORIES**

Accessories, roller heads and molds are not included and should be ordered separately.

| Accessories | Model |
|---|------------|
| Heated-head option | HA-5700.2 |
| Head: 15.7" x 12.6" x 10.2" (400 x 320 x 260mm) | HA-5700.11 |
| Head: 15.7" x 12" x 12" (400 x 305 x 305mm) | HA-5700.10 |
| Vibration option to simulate conditions in-situ | HA-5700.7 |
| Stainless steel mold 12.6" x 10.2" x 2.3" (320 x 260 x 60mm) deep | HA-5700.5 |
| Stainless steel mold 15.7" x 10.2" x 4" (400 x 260 x 100mm) deep | HA-5700.6 |
| Steel and aluminum quick release mold for roller compactor or wheel tracker, 15.7" x 10.2" x 2" (400 x 260 x 50mm) deep | HA-5700.3 |

* Other mold sizes available, please inquire.

| Specifications | |
|--------------------------------|---|
| Maximum Roller Load | 6750 lbf (30kN) over 12" (305mm) roll width |
| Trolley Travel | ±6" (150mm) or ±8" (200mm) |
| Slab Thickness | 1.6" to 3.9" (40 to 100mm) |
| Electrical Supply | 220V 60Hz, 1 Ph |
| Dimensions | 23.6" x 57" x 74.8" (600 x 1450 x 1900mm) |
| Working Space Required (WxDxH) | 63" x 67" x 79" (1600 x 1700 x 2000mm) |
| Desktop PC | Not required |

**INSTALLATION**

Installation Verification and on-site Training are available for the Steel Roller Compactor, please inquire.






Hand Compactor Set for 4" Molds

ASTM D6926


Compactor set that facilitates hand compaction of 4" Marshall specimens. Set features ASTM-compliant oak pedestal with hammer support rod, which holds hammer in perpendicular alignment to base during compaction. Also features a mold holder, which keeps the mold securely positioned during compaction. Set includes: H-1340G compaction hammer; H-1347 pedestal with ASTM-compliant steel plate; H-1341A compaction mold; H-1343 compaction mold holder; H-1345.6 hammer support rod, and H-1345.5 adjustable guide. Additional mold and hammer assemblies are recommended for efficient testing operations, allowing you to preheat multiple molds and hammers to speed testing.

4" Hand Compactor Set **H-1345**
 Ship wt. 165lbs. (74.8kg)

4" Hand Compaction Hammer

AASHTO T245, R68


Hammer used to compact asphalt mixture in the compaction mold. Flat circular face is 3.875" (98mm) dia.; hammer is 10 lb. (4.54kg.), sliding weight and has a free fall of 18" (457mm). Additional mold and hammer assemblies are recommended for efficient testing operations, allowing you to preheat multiple molds and hammers to speed testing.

4" Hand Compaction Hammer **H-1340**
 Ship wt. 18.5lbs. (8.3kg)

4" Hand Compaction Hammer w/ Finger Guard

ASTM D6926

Compacts asphalt mixture in the compaction mold. Hammer has finger guard at base of sliding weight. Flat circular face is 3.95" (100.3mm) dia.; hammer is 10 lb. (4.54kg.) sliding weight and has a free fall of 18" (457mm). Additional mold and hammer assemblies are recommended for efficient testing operations, allowing you to heat multiple molds and hammers to speed testing.

4" Hammer w/Finger Guard **H-1340G**
 Ship wt. 20lbs. (9.0kg)

Mold Holder for Hand Compaction

ASTM D6926

Holder mounts on compaction pedestal and centers the compaction mold under the hammer for fast, repeatable operation. Mold holder keeps mold, collar and base plate securely positioned during compaction.

Mold Holder for Hand Compaction **H-1343**
 Ship wt. 4.8lbs. (2.1kg)

Pedestal for 4" Hand Compactor


ASTM D6926

This oak pedestal is necessary for stabilizing molds during compaction. The ASTM-compliant oak compaction pedestal is 8" x 8" x 18" (203 x 203 x 457mm), capped with 12" x 12" x 1" (305 x 305 x 25mm) steel plate. The pedestal mounts to a concrete slab with four angle brackets located at the bottom of pedestal.

Pedestal for 4" Hand Compactor **H-1347**
 Ship wt. 82lbs. (37.1kg)

Hammer Guide, Adjustable

Hammer guide for hand compactor testing.

Hammer Guide, Adjustable **H-1345.5**
 Ship wt. 2.6lbs. (1.1kg)

Hammer Support Rod

Hammer support rod for hand compactor testing. Mounts to pedestal.

Hammer Support Rod **H-1345.6**
 Ship wt. 9.3lbs. (4.2kg)

Marshall Mix Design and Testing Booklet

This booklet covers the Marshall mix design criteria; equipment necessary to perform the tests; sample preparation and testing procedures; data analysis, as well as moisture susceptibility testing methods.

Marshall Mix Design Booklet **H-1328A**
 Ship wt. 9lbs. (4.1kg)



ACCESSORIES

Ovens and hotplates can be used to facilitate the heating of molds and hammers for better testing control. See pages 344-349 for ovens and page 351 for hotplates.



Heavy-Duty, Auto Marshall Compactor

ASTM D6926, D5581, AASHTO T245, PTM705, R68

Humboldt automatic, Marshall compaction machines are designed to provide a stable and rigid mechanism for producing 4" or 6" diameter asphalt pills used in Marshall tests. These Marshall compaction machines are available in two types of configurations: one with a rotating mold with a tapered-foot hammer assembly, and the other, a stationary mold with a flat-foot hammer. Both models feature a heavy-duty design, which stands up well to the constant jarring caused by the compaction process.

These machines feature an automatic counter, which allows the operator to preset the number of blows desired and, turns off the machine when a cycle is completed. After the number of blows has been set, the operator can start the machine with a push button and keep track of the number of blows on an LED readout. A cam-action lever operates the integral mold holder to facilitate insertion and removal of the compaction mold.

Machines can be ordered with either 4" or 6" molds, but can easily be altered later to accommodate the other size by purchasing a hammer and test molds of the desired size.

Each machine includes: the mechanical compactor, ASTM-compliant pedestal, an automatic counter and hammer assembly, (1) compaction mold, and (1) package of paper discs. rotating-mold configuration machines come with a tapered-foot hammer assembly and stationary-mold configuration machines come with a flat-foot hammer assembly.

Rotating Mold Configuration

| | |
|------------------------------|------------|
| 4" Dia. Specimens, 115V 60Hz | H-1364R |
| 6" Dia. Specimens, 115V 60Hz | H-1366R |
| 4" Dia. Specimens, 230V 60Hz | H-1364R.2F |
| 6" Dia. Specimens, 230V 60Hz | H-1366R.2F |
| 4" Dia. Specimens, 230V 50Hz | H-1364R.5F |
| 6" Dia. Specimens, 230V 50Hz | H-1366R.5F |

 Ship wt. 330lbs. (149.6kg)
Stationary Mold Configuration

| | |
|------------------------------|-----------|
| 4" Dia. Specimens, 115V 60Hz | H-1364 |
| 6" Dia. Specimens, 115V 60Hz | H-1366 |
| 4" Dia. Specimens, 230V 60Hz | H-1364.2F |
| 6" Dia. Specimens, 230V 60Hz | H-1366.2F |
| 4" Dia. Specimens, 230V 50Hz | H-1364.5F |
| 6" Dia. Specimens, 230V 50Hz | H-1366.5F |

 Ship wt. 320lbs. (145.15kg)


H-1364R

H-1360A
H-1360AFH-1360B
H-1360BF

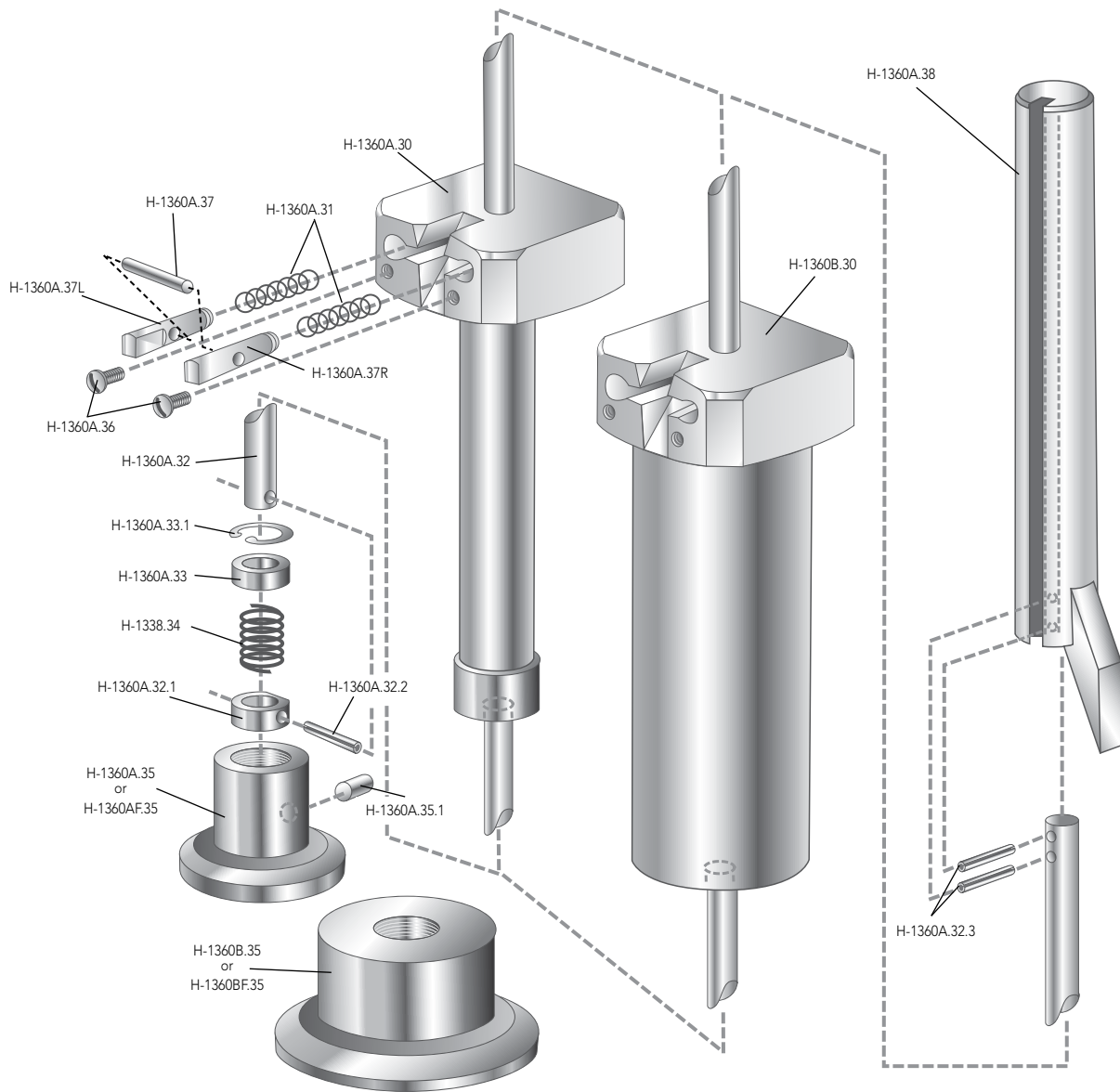
H-1360M

H-1334BA
H-1334BA.4F**ACCESSORIES**

Ovens and hotplates can be used to facilitate the heating of molds and hammers for better testing control. See pages 344-349 for ovens and page 351 for hotplates.

**Replacement Parts for Heavy-Duty Automatic, Single Compactors**

| Item | Part No. |
|--|-------------|
| 4" Hammer with tapered foot (rotating mold) | H-1360A |
| 6" Hammer with tapered foot (rotating mold) | H-1360B |
| 4" Hammer with flat foot (stationary mold) | H-1360AF |
| 6" Hammer with flat foot (stationary mold) | H-1360BF |
| Lift chain for H-1364, H-1366 series compactors | H-1360.21 |
| Replacement ASTM-compliant pedestal for compactors | H-1360M |
| Replacement counter & proximity switch, 120V | H-1334BA |
| Replacement counter & proximity switch, 230V | H-1334BA.4F |



Hammer Assemblies and Replacement Parts

| Item | Part No. | Item | Part No. |
|---------------------------------------|--------------|--------------------------------------|--------------|
| Sliding weight, 10 lb (for 4" mold) | H-1360A.30 | Anvil release arm weldment | H-1360A.38 |
| Sliding weight, 22.5 lb (for 6" mold) | H-1360B.30 | Hammer release arm | H-1360A.38.1 |
| Hammer slide shaft | H-1360A.32 | Anvil, top | H-1360A.38.2 |
| Spring retainer, anvil | H-1360A.32.1 | Spring (Foot) | H-1338.34 |
| Spring washer, anvil | H-1360A.33 | Spring (Release) | H-1360A.31 |
| Hammer foot, 4" tapered | H-1360A.35 | 0.25" dia. x 1" large roll pin | H-1360A.32.2 |
| Hammer foot, 4" flat | H-1360AF.35 | 0.1875" dia. x 1.5" roll pin | H-1360A.32.3 |
| Hammer foot, 6" tapered | H-1360B.35 | Internal retaining ring | H-1360A.33.1 |
| Hammer foot, 6" flat | H-1360BF.35 | 0.3125" dia x 0.5" large dowel pin | H-1360A.35.1 |
| Hammer release pin, left hand | H-1360A.37L | 1/4-20 x 1/2" large truss head screw | H-1360A.36 |
| Hammer release pin, right hand | H-1360A.37R | 0.25" dia. x 1.375" Large dowel pin | H-1360A.37 |



H-1336AD



H-1346D



H-1356D

4" Automatic, Single Compactor (64 Blows per min.) with Stationary Base

ASTM D6926, AASHTO T245, PTM705, R68

This compactor automatically compacts samples at a preset number of 64 hammer blows a minute and shuts off at completion. The compactor features a stationary base with flat-foot hammer. Unit includes mechanical compactor, automatic counter, ASTM-compliant oak compaction pedestal, (1) hammer and (1) H-1341A mold assembly. Additional mold and hammer assemblies are recommended for efficient testing operations, allowing you to preheat multiple molds and hammers to speed testing.

4" Single Compactor, 115V 60Hz H-1336AD
 4" Single Compactor, 230V 60Hz H-1336AD.2F
 4" Single Compactor, 230V 50Hz H-1336AD.5F

Ship wt. 226lbs. (102.5kg)

4" Automatic, Single Compactor (55 Blows per min.) with Stationary Base

ASTM D6926, AASHTO T245, PTM705, R68

This compactor automatically compacts samples at a preset number of 55 hammer blows a minute and shuts off at completion. The compactor features a stationary base with flat-foot hammer. Unit includes mechanical compactor, automatic counter, ASTM-compliant oak compaction pedestal, (1) hammer and (1) H-1341A mold assembly. Additional mold and hammer assemblies are recommended for efficient testing operations, allowing you to preheat multiple molds and hammers to speed testing.

4" Single Compactor, 115V 60Hz H-1336BD
 4" Single Compactor, 230V 60Hz H-1336BD.2F
 4" Single Compactor, 230V 50Hz H-1336BD.5F

Ship wt. 226lbs. (102.5kg)

4" Automatic, Double Compactor with Rotating Base

ASTM D6926, AASHTO T245, PTM705

This compactor automatically compacts two samples simultaneously at a preset number of hammer blows and shuts off at completion. The compactor features rotating bases with tapered-foot hammers. Unit includes mechanical compactor, automatic counter, ASTM-compliant oak compaction pedestal, (2) hammers and (2) H-1337 mold assemblies. Additional mold and hammer assemblies are recommended for efficient testing operations, allowing you to preheat multiple molds and hammers to speed testing.

4" Double Compactor, 115V 60Hz H-1346D
 4" Double Compactor, 230V 60Hz H-1346D.2F
 4" Double Compactor, 230V 50Hz H-1346D.5F

Ship wt. 265lbs. (120.2kg)

4" Automatic, Triple Compactor with Rotating Base

ASTM D6926, AASHTO T245, PTM705

This compactor automatically compacts three samples simultaneously at a preset number of hammer blows and shuts off at completion. The compactor features rotating bases with tapered-foot hammers. Unit includes mechanical compactor, automatic counter, ASTM-compliant oak compaction pedestal, (3) hammers and (3) H-1337 mold assemblies. Additional mold and hammer assemblies are recommended for efficient testing operations, allowing you to heat multiple molds and hammers to speed testing.

4" Triple Compactor, 115V 60Hz H-1356D
 4" Triple Compactor, 230V 60Hz H-1356D.2F
 4" Triple Compactor, 230V 50Hz H-1356D.5F

Ship wt. 351lbs. (181.4kg)

Replacement Parts for Standard-Duty, Automatic Compactors

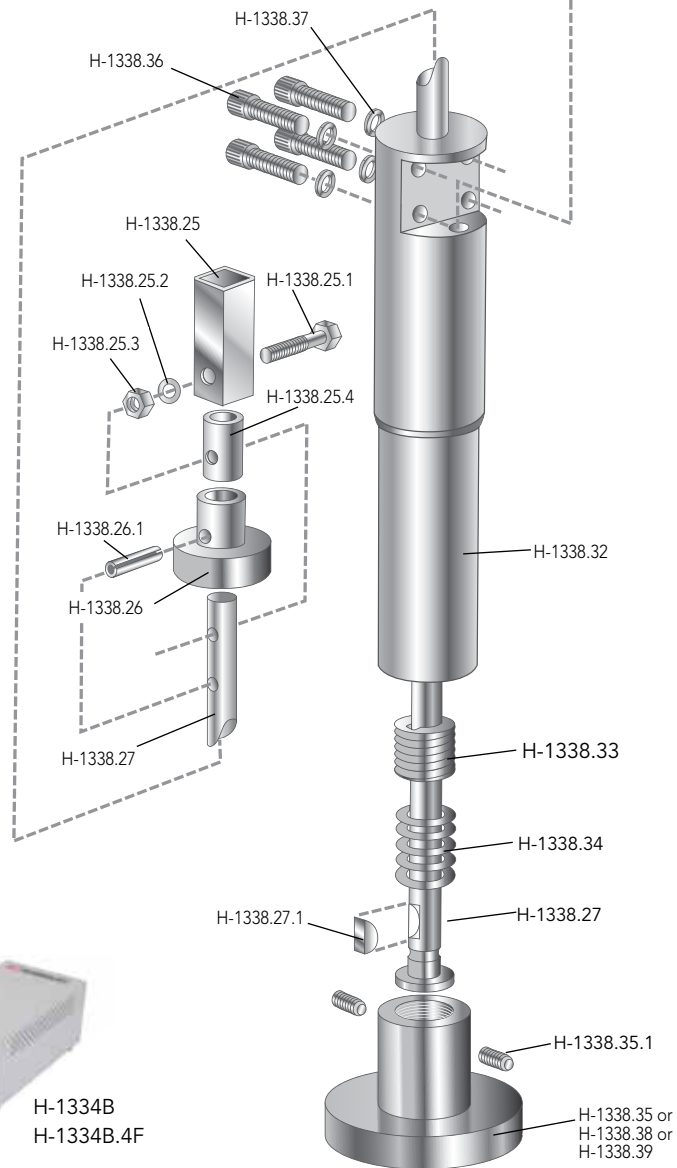
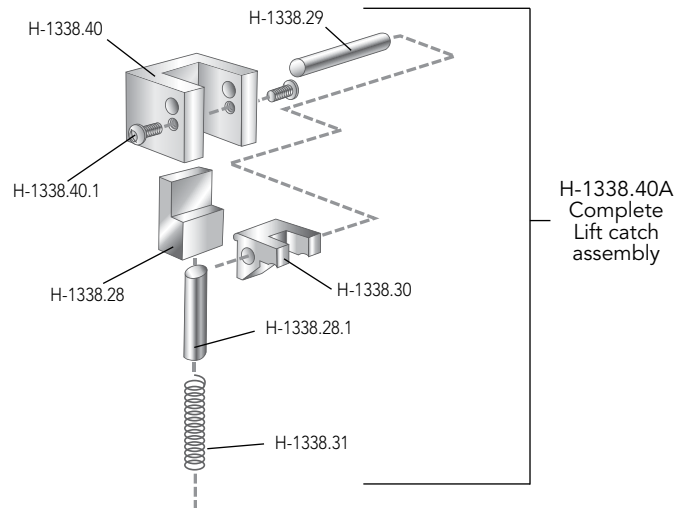
| Item | Model # |
|---|------------|
| 4" hammer with flat foot (stationary base) for H-1336D | H-1338A |
| 4" hammer with tapered foot (rotating base) for H-1346D, H-1356D | H-1338B |
| 4" hammer with "Canadian" tapered foot (rotating base) for H-1346D, H-1356D | H-1338C |
| Marshall Compaction Mold 4" for Stationary Base Compactors | H-1341A |
| Marshall Compaction Mold 4" for Rotating Base Compactors | H-1337 |
| Lift Chain for H-1336D, H-1346D and H-1356D | H-1336.21 |
| Replacement Counter and proximity switch for Compactors, 115V | H-1334B |
| Replacement Counter and proximity switch for Compactors, 230V | H-1334B.4F |
| Replacement Pedestal for H-1336D Marshall Compactor | H-1347M |
| Replacement Pedestal for H-1346D Marshall Compactor | H-1347.2M |
| Replacement Pedestal for H-1356D Marshall Compactor | H-1347.3M |

Lift Catch Assembly and Replacement Parts

| Item | Model # |
|------------------------------|-------------|
| Complete lift catch assembly | H-1338.40A |
| Release block | H-1338.28 |
| Pin | H-1338.28.1 |
| Clevis pin | H-1338.29 |
| Lift catch | H-1338.30 |
| Spring | H-1338.31 |
| Screw | H-1338.36 |
| Washer | H-1338.37 |
| Release housing | H-1338.40 |
| Screw for release housing | H-1338.40.1 |

Hammer Assemblies and Replacement Parts

| Item | Model # |
|--------------------------------------|-------------|
| Clevis pin with screw | H-1338.29 |
| Locator guide | H-1338.25 |
| Hex head bolt | H-1338.25.1 |
| Washer | H-1338.25.2 |
| Nut | H-1338.25.3 |
| Spacer | H-1338.25.4 |
| Hammer handle | H-1338.26 |
| Spring pin | H-1338.26.1 |
| Hammer rod | H-1338.27 |
| Key | H-1338.27.1 |
| Hammer weight (complete) | H-1338.32 |
| Plug | H-1338.33 |
| Spring | H-1338.34 |
| Hammer foot, flat | H-1338.35 |
| Hammer foot, tapered | H-1338.38 |
| Hammer foot, Canadian spec | H-1338.39 |
| Screw for foot (2 required) | H-1338.35.1 |
| Socket Head Screw, 5/16 x 18 x 1.25" | H-1338.36 |
| Washer | H-1338.37 |



ACCESSORIES

To facilitate the heating of molds and hammers,
See pages 344-349 for ovens and page 351 for hotplates.



H-1367, H-1367MM

H-1361

H-1341A

H-1337, H-1337MM

H-1341P
H-1361PH-1348
H-1363

H-1331



H-1353A

H-1355

Marshall Compaction Mold, 6" or 150mm

ASTM D5581

6" or 150mm compaction mold assembly for preparing test specimens with the H-1366 and H-1366R compactors. Can be used with rotating or stationary base models. Mold is machined from seamless tubing and plated. Mold is comprised of a base plate, mold cylinder and extension collar.

Compaction Mold, 6" H-1367
Compaction Mold, 150mm H-1367MM
Ship wt. 15lbs. (6.8kg)

Marshall Compaction Mold, 4" (Rotating Base)

ASTM D6926

4" compaction mold assembly for preparing test specimens with the H-1364R rotating base compactors. Mold is machined from seamless tubing and plated. Mold is comprised of a base plate, mold cylinder and extension collar.

Compaction Mold, 4" H-1361
Ship wt. 9lbs. (4kg)

Marshall Compaction Mold, 4" (Stationary Base)

ASTM D6926

4" compaction mold assembly for preparing test specimens with H-1336D mechanical compactor and H-1340 and H-1345 hand compactors. Mold is machined from seamless tubing and plated. Mold is comprised of a base plate, mold cylinder and extension collar. Base plate and collar are interchangeable with either end of the forming mold. Forming mold is 4" (102mm) ID by 3" (76mm) high.

Compaction Mold, 4" (Stationary Base) H-1341A
Ship wt. 8lbs. (3.6kg)

Marshall Compaction Mold, 4" or 100mm (Rotating Base)

4" or 100mm compaction mold assembly for preparing test specimens with the H-1346D and H-1356D rotating-base compactors. The mold is machined from seamless tubing and plated. Mold is comprised of a base plate, mold cylinder and extension collar. Base plate of mold is designed to link with rotating base feature of compactors causing the mold to rotate during compaction. Forming mold is 4" (102mm) ID by 3" (76mm) high and interchangeable with either end of the forming mold. Forming mold is 4" (102mm) ID by 3" (76mm) high.

Compaction Mold, 4" (Rotating Base) H-1337
Compaction Mold, 100mm (Rotating Base) H-1337MM
Ship wt. 8lbs. (4kg)

Paper Disks

ASTM D5581, D6926

Circular, smooth-edged 4" or 6" diameter disks, which can be placed in the bottom of compaction molds prior to filling with asphalt mixture to facilitate removal of the sample from the mold. Use with all molds.

Paper Disks, 4" package of 1000 H-1341P
Paper Disks, 6" package of 500 H-1361P
Ship wt. 0.8lbs. (0.3kg)

Mold Extractors

ASTM D5581, D6926, AASHTO T245, R68

Used with compression tester for removing 4" or 6" specimens from compaction molds.

Mold Extractor, 4" H-1348
Mold Extractor, 6" H-1363
Ship wt. 3.6lbs. (1.6kg)

Storage Can for Marshall Samples

4" dia. x 5.5" tall metal can with lid for storing Marshall mix samples.

Storage Can, 4" H-1331
Ship wt. 2.8lb. (1.27kg)

Sample Ejector, Hand-Operated

ASTM D5581, D6926, AASHTO T245, R68

Designed for lab and field use to extract asphalt samples from either 4" or 6" compaction molds. The ejection force is generated by means of a 3-ton (27.7kN) capacity hand-operated hydraulic jack. The cast-aluminum ejector head assembly can be positioned at different heights through the use of quick release pins. This enables the operator to easily match the ejection travel to the height of the mold being used. Maximum stroke distance for this ejector is 7.5". Overall dimensions: 13"W x 6"D x 27"H (330 x 152 x 686mm).

Sample Ejector, Hand-Operated H-1353A
Ship wt. 46.2bs. (20.9kg)

Sample Ejector, Motorized

ASTM D5581, D6926, AASHTO T245, R68

Similar in design and construction to the H-1353A series sample ejector, this model features the use of a 5-ton capacity motorized hydraulic pump and ram assembly. The unit incorporates extended upright rods in order to accommodate both standard 4" or 6" asphalt compaction molds, as well as the taller gyratory compaction molds. Maximum stroke distance for this ejector is 9.25". Overall dimensions excluding pump: 13"W x 6"D x 29"H (330 x 152 x 737mm).

Sample Ejector, 120V 60Hz H-1355
Sample Ejector, 220V 50/60Hz H-1355.4F
Ship wt. 81lbs. (36.7kg)



- Auto-tuning is fast & effortless
- Rapid cycling provides fast system response
- Dual, digital display simultaneously shows set point and process temperature
- Ramp-to-set point handles critical temperature processes smoothly
- Set point range limiting protects process and equipment
- Percent power limit protects components from stress
- Operator lockout guards against unwanted changes
- All exposed parts are stainless steel. Front panel is water and corrosion resistant.

Humboldt water baths feature a microprocessor-based digital controller for precise temperature control throughout their temperature range of ambient to 180°F (82°C) at an accuracy of $\pm 0.1\%$ of input span. The dual digital display simultaneously shows the set point and the process temperature at a glance.

Humboldt water baths are fully insulated to help maintain constant temperatures easily. Models H-1390 and H-1392 can accommodate (12) 4" diameter or (3) 6" diameter Marshall specimens at a time. And the model H-1394 can accommodate (16) 4" and (9) 6" diameter Marshall specimens at a time. All models include a stainless steel shelf, which supports specimens while allowing 2" of free circulating water above and below specimens. Models H-1390 and H-1394 also utilize a magnetic stirring bar to induce water flow within the bath and ensure a uniform temperature is maintained. Model H-1392 does not have a magnetic stirring bar. All exposed areas are stainless steel and the front control panel is both water and corrosion resistant.

Deluxe Water Bath

ASTM D6927, D5581 and D4867

Microprocessor-based control for precise temperatures throughout the range. Includes magnetic circulator, ensuring constant water temperature, and, a stainless steel shelf, which stands 2" (51mm) above the bottom of the unit for free circulation of water above and below test samples. Volume is 7.76 gallons (29.40L) and dimensions are: ID: 19.5" W x 11.5" D x 8" H (495.3 x 292.1 x 203.2mm).

Water Bath, Deluxe 120V 60Hz H-1390
Water Bath, Deluxe 220V 50/60Hz H-1390.4F



Ship wt. 44lbs. (19.9kg)

Water Bath

ASTM D6927, D5581 and D4867

Microprocessor-based control for precise temperatures throughout the range. Includes a stainless steel shelf, which stands 2" (51mm) above the bottom of the unit for free circulation of water above and below test samples. Volume is 7.76 gallons (29.40L) and dimensions are: ID: 19.5" W x 11.5" D x 8" H (495.3 x 292.1 x 203.2mm).

Water Bath, 120V 60Hz H-1392
Water Bath, 220V 50/60Hz H-1392.4F



Ship wt. 43lbs. (19.5kg)

Large Deluxe Water Bath

ASTM D6927, D5581 and D4867

Microprocessor-based control for precise temperatures throughout the range. Includes magnetic circulator, ensuring constant water temperature, and, a stainless steel shelf, which stands 2" (51mm) above the bottom of the unit for free circulation of water above and below test samples. Volume is: 14 gallons (53L) and dimensions are 20" x 20" x 10" deep (508 x 508 x 254mm).

Water Bath, Large 120V 60Hz H-1394
Water Bath, Large 220V 50/60Hz H-1394.4F



Ship wt. 75lbs. (34kg)

Economy Water Bath

Low-cost alternative water bath for heating specimens holds eight standard 4" stability molds. Supporting shelf above the bottom allows water circulation around specimens. Automatic thermostatic control with a range of 150° to 500°F (65° to 160°C). ID 11.5 x 19.5 x 5.5" (293 x 497 x 140mm) deep. H-1380.4F uses a step-down transformer, which is included, for electric conversion.

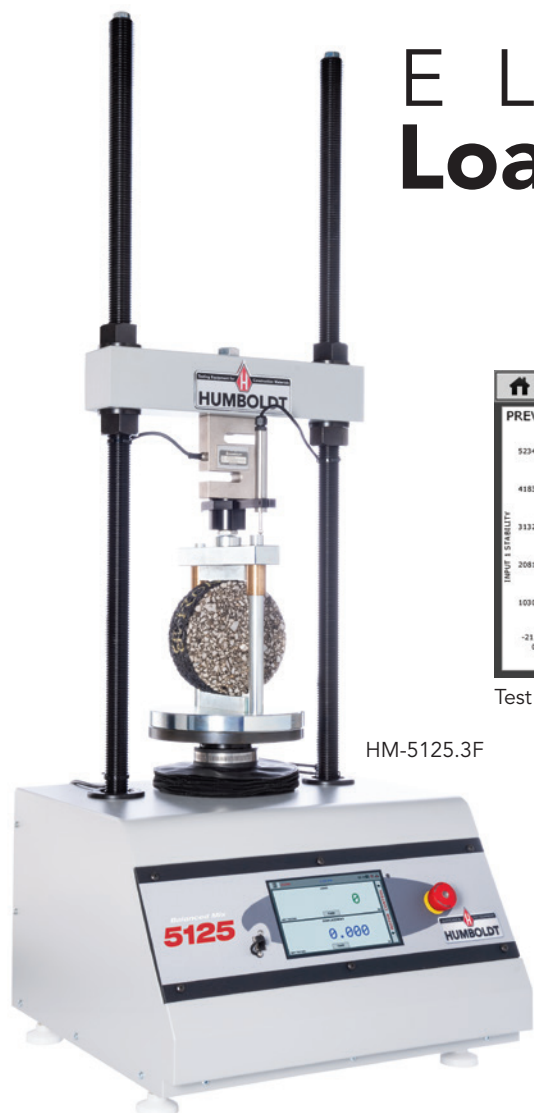
Water Bath, Economy 120V 60Hz H-1380
Water Bath, Economy 220V 50/60Hz H-1380.4F



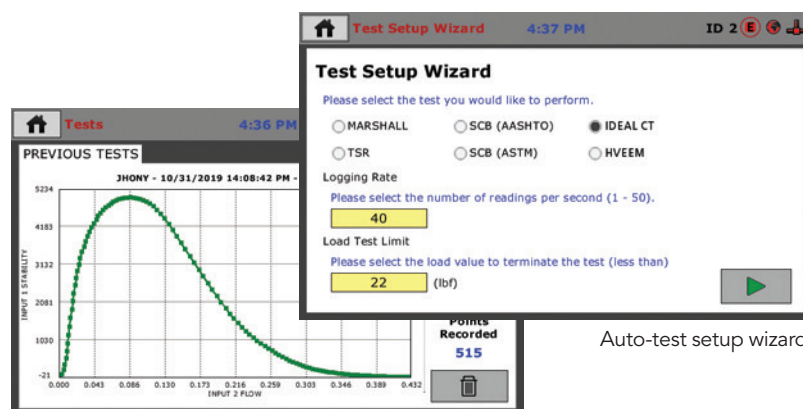
Ship wt. 18lbs. (8.16kg)

ELITE SERIES

Load Frames



HM-5125.3F



Test results curve

Auto-test setup wizard

HM-5125.3F Specifications

| | |
|----------------------|---|
| Load capacity | 11000 lbf (50kN) |
| Speed Range Testing: | As Defined by Test |
| Fast Approach: | 3.0 in/min (75.0 mm/min) |
| Data channels | 2 |
| Platen Size / Travel | 10" (254mm) / 4" (100mm) |
| Data storage | 1000 tests and up to 3000 readings per test |
| Clearance, vertical | 40" (1000mm) |
| Clearance, horiz. | 15" (380mm) |
| Voltage | 110/220V 50/60Hz. 5.0 amps |

Balanced Mix, Automated Load Frame

ASTM D8225, D8084 (LSU Method), Ideal-CT (TTI Method), D5581, D6931; AASHTO TP124 (IL Method), T245, T283; BS 598; EN12697-34

Humboldt's HM-5125.3F load frame has been designed to provide precise test rate control for the automated testing of balanced mix samples. It is also capable of handling Ideal-CT SCB (ASTM), SCB (AASHTO), Marshall, TSR and HVEEM tests. This easy-to-operate load frame allows you to easily choose your test and its parameters in the Test Setup Wizard for automated operation of the testing process and results.

The HM-5125's heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service. From educational institutions and consulting firms to high-volume commercial labs and construction projects, the HM-5125 Load Frame can perform these applications with ease.

The HM-5125 is built around Humboldt's integral, data logger with touch-screen control, which allows the load frames to be used as standalone devices capable of full test control and data logging.

Operators can see all the data in several formats at the machine during the testing procedure. For those wishing to print out test results, you can utilize Humboldt's, free Data Download Software. For iFIT applications, the user may wish to import the machine test data to Humboldt's Data Download software and then export from Humboldt Data Download to a file acceptable for the iFIT software. The iFIT is currently not stand alone and requires external PC software.

Standalone Control

Touch-Screen Controller Provides:

- Multi-channel data acquisition
- Hi-res, 7", waterproof, touch-screen provides total control and real-time graphical display of tests
- Machine/Test control and data acquisition via touch-screen
- Calibration of channels to load cell and transducer
- Real-time graphical chart and numerical display of tests via touch-screen display
- Effective sampling rate of 50 readings per second
- Stores up to 1000 tests with 3000 points per test
- 2 USB ports. One in front for data transfer and the rear port is for powering a wireless access point.

The HM-5125 is sold as a Load Frame ONLY, refer to the Testing Setup charts on this page and the next to perform specific tests.

Balanced Mix Load Frame,
10/220V 50/60 Hz

HM-5125.3F

Shipping wt. 300 lb (136kg)

Typical IDEAL-CT Testing Setup

| Description | Qty | Part # |
|--|-----|-------------|
| Balanced Mix load frame | 1 | HM-5125.3F |
| Load Cell, S-type 11,000 lbf (50kN) | 1 | HM-2300.100 |
| Strain Transducer 1" (25mm) | 1 | HM-2310.10 |
| Transducer Bracket | 1 | H-1327B |
| Lottman breaking head, 6" | 1 | H-1369 |

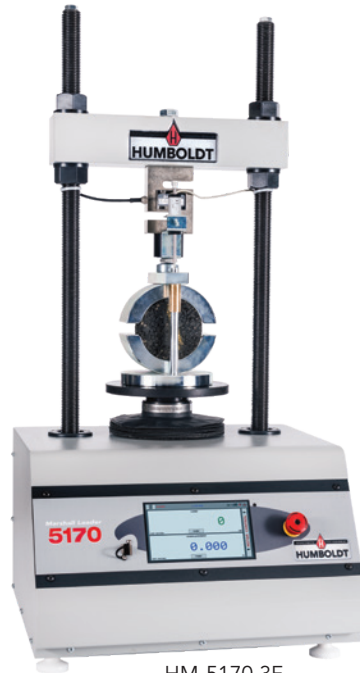
Typical SCB Testing Setup

| Description | Qty | Part # |
|--|-----|-------------|
| Balanced Mix load frame | 1 | HM-5125.3F |
| Load Cell, S-type 11,000 lbf (50kN) | 1 | HM-2300.100 |
| Strain Transducer 1" (25mm) | 1 | HM-2310.10 |
| Transducer Bracket | 1 | H-1327B |
| Semi-Circular Bend Test (SCB) Head | 1 | H-1351 |

NOTE: For Marshall and TSR testing see Note on page 293.



HM-5120A.3F



HM-5170.3F



NOTES

The HM-5125.3F, HM-5120A.3F and HM-5170.3F Load Frames are sold as a load frames only. (shown with typical setups, not included)

Marshall, TSR Load Frames

ASTM D8225, D5581, D6926, D6931; AASHTO T245, T283; BS 598; EN12697-34

Humboldt provides these two Elite Series Load Frames for doing Marshall and TSR testing. The two machines are identical except that the HM-5170 can also do CBR soil testing.

The HM-5120A and HM-5170 Load Frames have been specifically designed to handle Marshall and TSR applications. Their heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service. From educational institutions and consulting firms to high-volume commercial labs and construction projects, the Load Frames can perform these applications with ease.

The HM-5120A and HM-5170 are built around Humboldt's integral, data logger with touch-screen control, which allows the load frames to be used as standalone devices capable of full test control and data logging.

It is recommended that users operate the testing procedure from the front panel of the load frame, since Marshall testing is such a short, time-sensitive test. The waterproof, touch screens featured on these load frames provide a colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine during the testing procedure. Test data can then be transferred to a computer for use with Humboldt's NEXT Software for report generation. A Marshall-specific software module is also available for use with the NEXT software, which provides Marshall-specific setup and formatting, rather than the generic formatting provided with the included HM-5000SW NEXT software.

HM-5120 and HM-5170 Specifications

| | |
|----------------------|--|
| Load capacity | 11000 lbf (50kN) |
| Speed Setting | 2"/min. 50.8mm/min. |
| Data channels | 2 |
| Platen Size / Travel | 10" (254mm) / 4" (100mm) |
| Data storage | 1000 tests and up to 3000 readings per test |
| Clearance, vertical | 40" (1000mm) |
| Clearance, horiz. | 15" (380mm) |
| Voltage | 110/220V 50/60Hz. 5.0amps |

Standalone Control

Touch-Screen Controller Provides:

- Multi-channel data acquisition
- Hi-res, 7", waterproof, touch-screen provides total control and real-time graphical display of tests
- Machine/Test control and data acquisition via touch-screen
- Calibration of channels to load cell and transducer
- Real-time graphical chart and numerical display of tests via touch-screen display
- Effective sampling rate of 50 readings per second
- Stores up to 1000 tests with 3000 points per test
- 2 USB ports. One in front for data transfer and the rear port is for powering a wireless access point.

The HM-5120 and HM-5170 load frames are sold as a Load Frame ONLY, refer to the Testing Setup charts to the right for items needed to perform specific tests.

Marshall Load Frame, 110/220V 50/60 Hz HM-5120A.3F



Shipping wt. 300 lb (136kg)

Marshall CBR/LBR Frame, 110/220V 50/60 Hz HM-5170.3F



Shipping wt. 300 lbs (136kg)

Typical Marshall Testing Setup

| Description | Qty | Part # |
|--|-----|---------------------------|
| Load Frame (choose one) | 1 | HM-5120A.3F HM-5170.3F |
| Load Cell, S-type 11,000 lbf (50kN) | 1 | HM-2300.100 |
| Strain Transducer 1" (25mm) | 1 | HM-2305.10 |
| Transducer Bracket | 1 | HM-2305BRSQ |
| Marshall head, 4" Marshall head, 6" (choose one) | 1 | H-1349 H-1369 |
| Marshall Software Module | 1 | HM-5005SW |

Typical TSR Testing Setup

| Description | Qty | Part # |
|--|-----|---------------------------|
| Load Frame (choose one) | 1 | HM-5120A.3F HM-5170.3F |
| Load Cell, S-type 11,000 lbf (50kN) | 1 | HM-2300.100 |
| Strain Transducer 1" (25mm) | 1 | HM-2305.10 |
| Transducer Bracket | 1 | HM-2305BRSQ |
| Lottman head, 4" Lottman head, 6" (choose one) | 1 | H-1349 H-1369 |

NOTE: When using the HM-5125.3F for Marshall and TSR applications, use the HM-2310.10 Transducer and the H-1327B Transducer Bracket.

Humboldt MasterLoader Marshall Solution

ASTM D5581, D6926, D6931; AASHTO T245, T283; BS 598; EN12697-34

The HM-5030 Master Loader provides the ultimate solution for a lab looking to perform Marshall, Hveem and SCB testing, but would also like to be able to use the load frame for all their other testing needs as well. The digital MasterLoader provides that ability by easily handling asphalt compression testing, as well as soil tests such as CBR and triaxial tests including UU, CU, CD and UC.

The digital MasterLoader has the ability to work as a stand-alone unit, which can perform Marshall tests at the push of a button; or in conjunction with Humboldt's NEXT software, the Marshall software module and a computer, it can gather data in real-time data acquisition in the form of charts and graphs. The HM-5030 is ideal for road construction projects in either mobile or fixed labs, educational institutions and consulting firms.

Designed for applications requiring multi-purpose loading systems, such as road construction projects in either mobile or fixed labs, educational institutions and consulting firms, the HM-5030 Master Loader is ideal for just about any application from road construction to high-volume commercial and educational laboratories.

While the HM-5030 has been specifically designed for soil testing labs conducting multiple testing operations including: UU, CU and CD triaxial, UC, CBR and LBR, it is also perfect for running Marshall, Hveem, TSR and SCB asphalt tests as well. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5030 to perform any tests required up to its load capacity of 11000 lbf (50kN).

Like all Elite Series load frames, the HM-5030 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.



HM-5030.3F

Recommended Marshall, TSR and SCB Accessories for use with HM-5030, HM-5120 and HM-5170 Load Frames

| Marshall, TSR & SCB Accessories | |
|---------------------------------|--|
| Part # | Description |
| HM-2300.100 | S-type load cell, 11,000lbf (50kN) |
| HM-2310.10 | Strain Transducer, 1" (25mm) |
| HM-2305.10 | Strain Transducer, 1" (25mm) Required for HM-5120-5170 ONLY. |
| HM-4178BRT | Displacement transducer bracket |
| HM-2305BRSQ | Displacement transducer bracket Required for HM-5120-5170 ONLY. |
| HM-5005SW | Marshall software module |
| H-1342 | Marshall breaking head, 4" |
| H-1362 | Marshall breaking head, 6" |
| H-1349 | Lottman breaking head, 4" |
| H-1369 | Lottman breaking head, 6" |
| H-1351 | Semi-circular Bend Test Breaking Head |

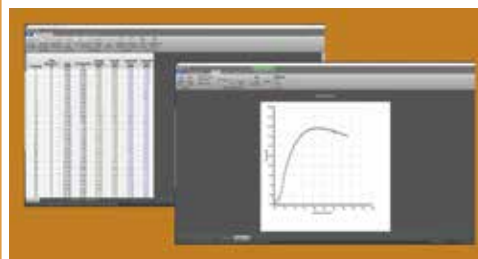
HM-5030.3F Specifications

| | |
|----------------------|---|
| Load capacity | 11000 lbf (50kN) |
| Speed Range Testing: | 0.00001 – 2.00000 in/min (0.00001 – 50.80000 mm/min) |
| Fast Approach: | 3.0 in/min (75.0 mm/min) |
| Data channels | 4 |
| Platen Size / Travel | 10" (254mm) / 4" (100mm) |
| Data storage | 1000 tests and up to 3000 readings per test |
| Clearance, vertical | 40" (1000mm) |
| Clearance, horiz. | 15" (380mm) |
| Voltage | 110/220V 50/60Hz. 5.0 amps |

Master Loader, 110/220V 50/60 Hz **HM-5030.3F**
Shipping wt. 300 lb (136kg)

NOTES

HM-5030.3F Load Frame is sold as a load frame only. (shown with typical Marshall setup)



NEXT Marshall Software Module

ASTM D5581, D6926, D6931; AASHTO T245, T283; BS 598; EN12697-34

Humboldt's NEXT software is used to control the operation of Humboldt's testing machines, as well as provide data acquisition and reporting of test data. The software provides a computer-based platform with the ability to configure testing machines and the testing process, specify testing parameters and limits, operate the machine during the testing and provide detailed reports of the data collected in tabular or graphical formats.

Humboldt's NEXT data acquisition software, in conjunction with compatible Humboldt testing equipment, provides a complete solution for the acquisition, recording and presentation of test data.

The Marshall-specific Module provides these added features to the NEXT software.

- Marshall-specific setup, which guides you through the process and includes selecting data collection parameters that best fit the Marshall test
- Input specific project information for each test, such as project name, client information, etc
- All Marshall-specific initial, intermediate, and final parameters required by ASTM and BS standards are dynamically calculated for you, based on your input of specimen information, such as size, weight, etc
- Tabulated test data, graphs and all Marshall-specific calculations are provided in real time, allowing you to monitor tests in process
- Generate Marshall-specific reports that include all graphs and data presented in a project

NEXT Marshall Software Module HM-5005SW

Download from Humboldt website





HM-2850.3F

Multi-Speed Load Frame

ASTM D5581, D6926, D6931, AASHTO T245, T283, BS 598, EN12697-34

The HM-2850 Multi-speed Load Frame is designed for those who want a high-quality, but simple, multi-purpose load frame without built-in data acquisition capabilities. The HM-2850 is ideal for applications where the operator is either not concerned with data acquisition; or, already has or is planning to construct their own data acquisition system. With its large 7" color, touchscreen, the HM-2850 provides the operator with the ability to precisely select any speed with four-decimal accuracy within the machine's speed range.

The HM-2850 features a quiet, direct drive stepper motor that provides a range of loading speeds from .00001 to 2.00000 in/min. This speed range is more than adequate for the majority of standard soil tests. The HM-2850 also incorporates a separate, dedicated control to accommodate 2.00 in/min. for use in Marshall and TSR Testing, as well as a rapid travel speed of 2.25 in/min for moving the platen into position quickly. Speeds are controlled through the use of edit keys and the digital display.

| Specifications | |
|------------------------|---|
| Load capacity | 11000 lbf (50kN) |
| Speed range | .00001 - 2.00000 in/min. .00001 - 50.80000 mm/min. |
| Platen Size / Travel | 8" (203mm) / 3" (76mm) |
| Clearance, vertical | 40" (812mm) |
| Clearance, horiz. | 11" (279mm) |
| Dimensions (l x w x h) | 17 x 22 x 51 inch (432 x 559 x 1295mm) |
| Voltage | 110/220V 50/60Hz. 5.0 amps |

Multi-Speed Load Frame, 110/220V 50/60 Hz HM-2850.3F
Shipping wt. 300 lb (136kg)



H-1339B

Marshall Compression Machine

ASTM D5581, D6926, D6931, AASHTO T245, T283, BS 598, EN12697-34

Compression machine designed specifically for testing the resistance to plastic flow of bituminous paving mixtures— the Marshall test. Machine has a one-speed motor with reversing switch that produces a uniform vertical movement of 2" (51mm) per minute. Unit includes a H-4454.100 calibrated load ring and dial indicator for determining test load. Load capacity is 11,000 lbf. (50kN). Maximum piston travel is 3.5" (88mm). Overall dimensions are: 18" x 18" x 38.5" H (457 x 457 x 978mm).

| | |
|--------------------------------|------------|
| Compression Machine, 120V 60Hz | H-1339B |
| Compression Machine, 220V 60Hz | H-1339B.2F |
| Compression Machine, 220V 50Hz | H-1339B.5F |
| Ship wt. 250lbs. (113.3kg) | |

Basic Marshall Test Set

ASTM D5581, D6926, D6931, AASHTO T245, T283, BS 598, EN12697-34

Basic test set for evaluating stability and plastic flow (Marshall tests) of bituminous paving mixtures. Includes all the basic testing equipment for performing these tests. Ideal setup for field lab applications, as well as dedicated Marshall test labs. Included in the set are: (1) H-1339B—Marshall compression machine; (1) H-1340— 4" hand compaction hammer; (2) H-1341A— 4" Marshall compaction molds; (1) H-1342—4" Marshall breaking head; (1) H-1343— mold holder for hand compactor; (1) H-1344— dial flowmeter with guide sleeve; (1) H-1347— pedestal for 4" hand compactor; (1) H-1348— 4" mold extractor, and (1) H-1390— water bath. 230V models include a H-1390.4F water bath.


H-1335
Marshall Test Set

Metric version includes: (1) H-1339B, 220V Marshall compression machine; (1) H-1340— 4" hand compaction hammer; (2) H-1341A— 4" Marshall compaction molds; (1) H-1342M—100mm Marshall breaking head; (1) H-1343— mold holder for hand compactor; (1) H-1344.2M— dial flowmeter with H-1390, 230V water bath.

| | |
|-------------------------------------|------------|
| Marshall Test Set, 120V 60Hz | H-1335 |
| Marshall Test Set, 220V 60Hz | H-1335.2F |
| Marshall Test Set, 220V 50Hz | H-1335.5F |
| Marshall Test Set-Metric, 230V 60Hz | H-1335M.2F |
| Marshall Test Set-Metric, 230V 50Hz | H-1335M.5F |
| Ship wt. 325lbs. (147.4kg) | |

Typical Setup for Marshall Testing with HM-2850 or H-1339B Load Frames

| Description | Qty | Part # |
|--|-----|--------------------|
| Marshall load frame (choose one) | 1 | H-1339B HM-2850 |
| Load Ring, 11,000 lbf (50kN) | 1 | H-4454.100 |
| Dial flow meter kit w/ Dial gauge 1.00" x 0.01" | 1 | H-1344 |
| Marshall breaking head, 4" | 1 | H-1342 |

Marshall Load Frame, Digital Upgrade Kit

Upgrade to provide data logging capabilities to a manual load frame.

| Data Logging Kit includes: | |
|----------------------------|------------------------------------|
| Part # | Description |
| HM-5320.3F | Elite Series Data Logger |
| HM-2310.100 | S-type load cell, 11,000lbf (50kN) |
| HM-2310.10 | Strain Transducer, 1" (25mm) |
| H-1327B | Displacement transducer bracket |

Digital Upgrade Kit, 110/220V 50/60 Hz H-1330.3F
Ship wt. 12 lbs. (5.4kg)



H-1342, H-1362
H-1342M



H-1349, H-1369
H-1349M, H-1369M



H-1344.2



H-1344



HA-1343, HA-1343M

Marshall Breaking Head

ASTM D6927

Marshall breaking heads consist of an upper and lower cylindrical segment having 3" inside radius of curvature for 6" samples and 2" for a 4" sample. The lower segment is mounted on a base with two perpendicular guide rods extending vertically from the base. One guide rod is larger than the other, with a correspondingly larger guide sleeve in the upper segment to ensure correct assembly. Guide sleeves in the upper segment bring the two sections together without appreciable binding or loose motion on the guide rods.

| | |
|----------------------------|--------|
| Marshall Breaking Head, 4" | H-1342 |
| Marshall Breaking Head, 6" | H-1362 |
| Ship wt. 25lbs. (11.3kg) | |

Marshall Breaking Head, Metric

Marshall breaking heads consist of an upper and lower cylindrical segment. The lower segment is mounted on a base with two perpendicular guide rods extending vertically from the base. One guide rod is larger than the other, with a correspondingly larger guide sleeve in the upper segment to ensure correct assembly. Guide sleeves in the upper segment bring the two sections together without appreciable binding or loose motion on the guide rods.

| | |
|-------------------------------|---------|
| Marshall Breaking Head, 100mm | H-1342M |
| Ship wt. 25lbs. (11.3kg) | |

Lottman Breaking Head

ASTM D6931, AASHTO T283

Breaking heads for testing tensile strength. H-1349 has 0.5" wide upper and lower segments for use on 4" samples. H-1369 has 0.75" wide upper and lower segments for use on 6" samples.

| | |
|------------------------------|---------|
| Lottman Breaking Head, 4" | H-1349 |
| Lottman Breaking Head, 6" | H-1369 |
| Lottman Breaking Head, 100mm | H-1349M |
| Lottman Breaking Head, 150mm | H-1369M |
| Ship wt. 10.2lbs. (4.6kg) | |

Dial Flowmeter Kit

ASTM D6927

Used to measure flow during Marshall testing. Consists of a special dial indicator with a maximum position brake assembly and a guide sleeve, which fits over either guide rod of a H-1342 or H-1362 Marshall breaking head. H-1344 has a range of 1.00" with 0.01" divisions and the H-1344M has a range of 25mm with 0.25mm divisions.

| | |
|----------------------------|---------|
| Dial Flowmeter Kit | H-1344 |
| Dial Flowmeter Kit, Metric | H-1344M |
| Ship wt. 2lbs. (.9kg) | |

Dial Gauge For Flowmeter

ASTM D6927

Consists of a special dial indicator with a maximum position brake assembly. The H-1344 has a range of 1.00" with 0.01" divisions and the H-1344M has a range of 25mm with 0.25mm divisions.

| | |
|----------------------------------|-----------|
| Dial Gauge For Flowmeter | H-1344.2 |
| Dial Gauge For Flowmeter, Metric | H-1344.2M |
| Ship wt. 1lbs. (.45kg) | |

Guide Sleeve For Flowmeter Kit

ASTM D6927

Guide sleeve for use with dial gauge to measure flow during Marshall testing. Device fits over either guide rod of a H-1342 or H-1362 Marshall breaking head and provides mounting of dial gauge.

| | |
|--------------------------------|----------|
| Guide Sleeve For Flowmeter Kit | H-1344.1 |
| Ship wt. 0.6lbs. (.27kg) | |

Asphalt Tack Bond Shear Strength Apparatus

AASHTO T114

The Asphalt Tack Bond Shear Strength Apparatus is used in a Marshall Stability Test Load Frame to measure shear strength of tack coat material between two asphalt layers. The heavy steel frame holds fixed and moveable shear plates. The moveable plate is centered over the shear plane and features roller bearings to minimize drag. Lateral load on the specimen is controlled by a calibrated spring and a dial indicator displays force. The shear plane gap is 0.5" (12.5mm), and maximum shear travel is also 0.5" (12.5 mm). Adapters are included for testing either 4" (102mm) or 6" (152mm) diameter samples. The Tack Bond Shear Strength Apparatus is compatible Marshall Load Frames with daylight openings of at least 10" (254mm). The HA-1343 Asphalt Tack Bond Shear Strength Apparatus tests 4" (102mm) and 6" (152mm) Marshall samples. The HA-1343M Asphalt Tack Bond Shear Strength Apparatus accommodates testing of 100mm and 150mm Marshall specimens.

| | |
|--------------------------------------|----------|
| Tack Bond Shear Strength Apparatus | HA-1343 |
| Tack Bond Shear Strength App. Metric | HA-1343M |
| Ship wt. 40lbs. (18.1kg) | |



H-1351



H-1357.3F



H-1358



Semi-Circular Bending (SCB) Head

ASTM D8044; AASHTO TP124

The H-1351 Semicircular Bend fixture has been designed for use with the test methods above. The H-1351 SCB head can be configured in two ways. The first utilizes the upper and lower segments of the breaking head. The lower segment is comprised of a base with two perpendicular guide rods extending vertically and an upper segment mounted to the lower segment by sliding on the vertical guide rods. The holes in the upper segment are lined with brass to reduce binding as it moves up and down the guide rods. In this configuration the upper swivel contact bar is mounted to the upper breaking head segment.

In the second configuration, the upper swivel contact bar is separated from the upper breaking head bar and is mounted directly to the load cell. If using this method, precise alignment can be achieved by using the alignment guide, which is included.

The H-1351 Semi-circular Bending Head can be used in conjunction with one of Humboldt's load frames, such as the HM-5030 Master Loader or HM-5120 Marshall frames. It may also be used with your present load frame, if the frame meets the test's speed requirements. Humboldt offers additional Data Loggers with instrumentation for data acquisition of the SCB test results using the SCB breaking head when used with your present load frame.

Semi-Circular Bending (SCB) Head H-1351

Ship wt. 25lbs. (11.3kg)

SCB Sample Preparation Saw

ASTM D8044

This sample preparation saw is used to prepare 50mm or 62mm asphalt specimen disks from gyro or field core samples for use in semi-circular bend (SCB) tests, ASTM D8044. The saw features customized precision alignment, which ensures precise parallel and perpendicular alignment, as well as a customized 16" (406mm) blade, which cuts samples quickly and precisely. It also features a custom fixture that takes the guesswork out of cutting specimen disks to size. Once the specimen is loaded, no clamping and re-clamping is required. Simply slide the table to the pre-configured offsets, 50mm or 62mm standard thickness sizes and lock the fixture in place with the two included dowel handles. The included cam handle brackets quickly secure 4" and 6" specimens into the fixture. The saw operates at 230V 60Hz, which is recommended, but can be also be used on 120V with a plug adapter (not provided). The saw can be bench mounted, but also comes with 4 adjustable legs for free-standing capability. The saw operates at 230V 60Hz, which is recommended, but can be also be used on 120V with a plug adapter (not provided).

SCB Sample Preparation Saw H-1357.3F

Ship wt. 252lbs. (114.3kg)

Half/Notch-Cut Prep Saw

This sample prep saw is used for cutting asphalt samples in half and cutting the required notch for semicircular bend test (SCB) testing samples. It has been customized to provide the degree of precision necessary for preparing test specimens. The standard configuration provides a notch cut for AASHTO TP124. An optional set of spacer blocks can be added for making the three different notch cuts for the Louisiana SCB, ASTM D8044 method, order H-1358.1. The saw is comprised of a 10" (254mm) tile saw and includes a 0.050" thick blade, which corresponds with the requirements for SCB testing. In addition, the saw features a custom, spring-clamp fixture, which provides quick loading and secure holding of asphalt specimens for halving and notch cutting. A precision-machined alignment block is provided to check the saw for both 75mm and 145mm settings. The saw can be bench mounted, but also comes with a folding stand for free-standing capability.

Half/Notch-Cut Prep Saw

H-1358

Ship wt. 92lbs. (41.7kg)

Nuclear Gauges

Choose from Two, High-Quality Gauge Models

HS-5001SD

HS-5001EZ

Humboldt's Moisture/Density Gauges Provide:

- High-quality gauges — built to take a beating
- Truly, field-serviceable with parts readily available
- Third-party calibration with no added costs from Humboldt
- Exceptional calibration, leak test and repair services



All Humboldt nuclear gauges are built rugged for the day-to-day rigors of construction projects. These gauges are built to last using high-quality Noryl® PPO material, which is one of the most dimensionally stable thermoplastics available. This produces a gauge housing that is less brittle than the competition resulting in less breakage. Humboldt also pays strict attention to sealing our gauges against dirt and dust, providing a better design and less electronic problems due to dust.

Humboldt gauges are also "Field Serviceable". If you have a problem with your Humboldt gauge, chances are we can quickly get a part out to you, which you can install on your own, saving you lots of time and money. Other manufacturers require you to send your gauge back to the factory for calibration.

We don't. You can send your gauge back to us or you can allow a third party to calibrate your gauge

without incurring any charges from Humboldt.

With Humboldt, You Get:

- **High-quality gauges, built to take a beating**
- **Truly, field serviceable with parts readily available**
- **Third-party calibration with no added costs from Humboldt**
- **Exceptional calibration, leak test and repair services**

Humboldt nuclear gauges are available in two models: the SD and EZ Gauges. The SD Gauge, which provides more efficient operation, data collection and processing than any other gauge in its class. Using state-of-the-art technology, the SD gauge brings you a host of features aimed at making your job easier. Featuring a 4.3" touchscreen, the SD Gauge provides intuitive operation of all

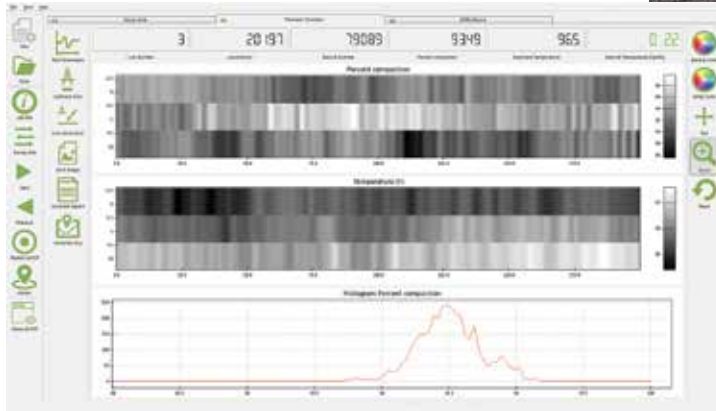
gauge operations. It also provides touch-pad operation as an alternative control method.

Our EZ gauge is not only easy to use, but has been proven to be the most rugged gauge in the industry. It's been used for years in many tough and demanding applications. It has always proven to be easy-to-operate, easy-to-power and easy-to-service. The EZ gauge features a menu-driven control panel with easy-to-use, built-in test routines and auto features, making testing a quick and accurate operation. It also features our innovative trigger release handle that eliminates pinched fingers while providing smooth operation. Unlike some competitors, all Humboldt nuclear gauges are manufactured with 100% new parts — no refurbished parts, sold as new.

See pages 8-15 for more information on Nuclear Gauges.



HA-6000A.3F



Humboldt Pavement Scanner

AASHTO PP98-19

Humboldt's Pavement Scanner with both radar compaction and infrared temperature sensors, generates maps of asphalt compaction and temperature with no nuclear sources needed.

The Humboldt Pavement Scanner measures asphalt pavement density using advanced radar technology without using nuclear sources. The radar sensor continuously scans the surface to produce compaction or density maps. Additionally, an integrated temperature sensor generates pavement temperature maps. Temperature differences indicate locations where the asphalt mix is not uniform in terms of temperature or mix (i.e., too little binder, different aggregate, etc.). Cold zones and improperly compacted zones lead to premature failure of the mat.

Data Visualization

The Humboldt Pavement Scanner produces two-dimensional maps of the work area rather than a handful of measurements at specific locations. These maps of compaction and temperature provide much more information than the spot measurements of traditional density gauges. The scanner has an integrated GPS so that compaction and temperature data can be exported into Google maps and sent to any smart device (cell phone or tablet) for viewing. The ability to view information in map form provides much better coverage, fast and easy interpretation.

A Better Alternative

The Pavement Scanner does not use any nuclear sources and does not emit dangerous radiation.

Costs and risks associated nuclear sources are eliminated. No more nuclear safety training classes. No more source licensing headaches. The pavement scanner has been designed for high reliability and to be easy to use. All cabling has been eliminated to improve ease of use, and end common problems associated with connectors and cables.

What the Researchers are Saying

When laying down an asphalt mat, research has shown that cold spots are not compacted properly. The IR temperature sensor clearly delineates these zones. Compaction measurements from the radar sensor can be made even after the mat has cooled. The Transportation Research Board has published a detailed study that illustrates the use of these instruments: Using Infrared and High-Speed Ground-Penetrating Radar for Uniformity Measurements on New HMA Layers, TRB, available at: <http://nap.edu/22769>.

- Maps of compaction and temperature provide a measure of uniformity that cannot be obtained with spot measurements from traditional density gauges.
- Costs and risks associated with nuclear sources are eliminated.
- No more nuclear safety training classes. No more source licensing headaches.
- No Cables in Operation. No cables to get frayed, and no damaged or dirty connectors to replace.
- Easy Charging— the shipping case's integrated charger can charge all system components simultaneously.

Specifications

| |
|---|
| 2GHz, bi-static radar antenna |
| Non-contacting IR temperature sensor |
| Requires the use of a Dell Latitude tablet computer. (purchased separately, see below) |
| WiFi connection between sensor and tablet for cableless operation |
| Durable construction with IP65 ingress protection |
| Positioning system includes wireless odometer, GPS and optional inertial measurements |
| Provides continuous real-time pavement density and temperature measurements |
| Generate maps of pavement density and temperature |
| Calibrate the unit from core measurements, in-lab or in-field. |
| Rechargeable 4400mAh LiFePO4 battery for up to 6 hours continuous operation Unit comes with spare battery and integral charging station located in case. |
| Shipping dimensions: 36" x 28" x 20" (91.4 x 71.1 x 50.8cm) |
| Weight: 99 lb (45kg) |

Complete system includes: a 2 GHZ radar antenna, scan cart, 2 batteries and carrying case with integral battery charger.

Required, but purchased separately— Dell Latitude tablet computer— HA-62000

Dell Latitude 7212, Rugged 11.6" FHD Touch-Screen - Intel Core i5-7300U, 256GB SSD, 16GB RAM, GPS, 2 Webcam, Windows 10 Professional, Wi-fi, Bluetooth.

Humboldt Pavement Scanner

HA-6000A.3F

Ship wt. 99lbs. (44.9kg)



HA-5300A.4F



Hamburg (Immersion) Wheel Tracker

AASHTO T324 (previous, current and proposed);
CT, TX; EN 12697-22

The Hamburg test, or immersion wheel tracking has become an extremely popular test method over the last few years. The Hamburg wheel tracker is built to withstand the demands of the busiest test labs. It is made of high quality stainless steel, uses the standard cantilevered arm system of loading the specimens and produces fully sinusoidal motion. In the NCHRP report - Hamburg Wheel-Track Test Equipment Requirements and Improvements to AASHTO T 324, the Cox/Cooper Hamburg was clearly the best performing machine. Since then the heaters and water flow have been upgraded, resulting in more rapid heating and improved temperature. A number of Hamburg wheel trackers do not correctly meet current AASHTO requirements and may fall further behind when the norm is updated. The Cox/Cooper machine meets all the requirements of the standards.

Features:

- Full rigid stainless-steel construction made in America for heavy duty
- The most rugged, precise and accurate Hamburg wheel tracker available
- True sinusoidal motion from Scotch Yoke drive which is much more durable and accurate than crank arm
- Measures 220 data points along the wheel path for standard and research analysis
- Auto arm lift for fully automated test procedure and user safety
- Mechanical recirculating water bath for accurate control of the water temperature to better than $\pm 0.9^\circ\text{F}$ (0.5°C)

- Two high accuracy transducers with an accuracy better than $\pm 0.03\text{mm}$, positioned in line with the wheel to ensure accurate measurement of the rut
- Realtime rut, rut profile, temperature x 3 and speed measurement throughout the test
- Accurate analysis software to automatically pick the inflection point and analyze the output data
- Air hood option for dry tests. The only reliable hood option for dry testing on the market with temperature precision across the whole sample of $\pm 0^\circ\text{F}$ (0.7°C).
- Built-in timer to start tests automatically
- Anytime remote access support

Software:

- Specifically written to meet AASHTO and DOT standards
- Stored test data can be analyzed and compared with other test data in Excel
- Data storage can adjust up to every cycle
- Any combination of data points can be analysed
- Utilities are included for calibration and trouble shooting
- Includes full software control of arms individually at outset and completion of test, with stainless steel frame, includes full software package, traceable calibration certificate and desk PC to perform testing according to AASHTO T324
- The user interface can be translated into the user's preferred language – please inquire

Hamburg Wheel Tracker, 220V 50/60Hz HA-5300A.4F
Hamburg Wheel Tracker, 415V 50/60Hz 3PH HA-5300A.7F



Ship wt. 1520lbs. (687kg)



INSTALLATION

Installation Verification and on-site Training are available for the Wheel Tracker please inquire.

| Specifications | |
|----------------------------|---|
| Wheel Speed | Variable between 15 and 30 cycles (30 to 60 passes) per minute |
| Wheel Load | $158 \pm 1.0\text{lb}$ ($705 \pm 4.5\text{N}$) |
| Variable Speed Range | 15 to 30 RPM |
| Slab Thickness | 2 to 4" (50 to 100mm), different thicknesses can be tested with spacers |
| Rut Depth Transducer Range | 2" (50mm) |
| Temperature Range | Ambient to 158°F (70°C) |
| Electrical Supply | 220-240V 15 A, 50/60Hz, 1 Ph (single phase with a neutral and ground) |
| Dimension (W x D x H) | 57" x 55" x 50" (1430 x 1380 x 1260mm) |
| Desktop PC | Included |



ACCESSORIES

Accessories are not included and should be ordered separately.

| Accessories | Model |
|--|------------|
| Stainless steel molds 12.6" x 10.2" x 2.4" (320 x 260 x 60mm) | HA-5300.1 |
| Plastic mold for double cores 6" tested simultaneously to be inserted in stainless steel mold 12.6" x 10.2" x 2.4" (320 x 260 x 60mm) | HA-5300.5 |
| Stainless steel wheel AASHTO T324-02 | HA-5300.6 |
| Rubberized Stainless steel wheel EN 12697-22 | HA-5300.7 |
| Powered winch and stainless steel mast | HA-5300.8 |
| Guarding, stainless steel | HA-5300.11 |
| Dry Hood | HA-5300.13 |

* Other mold sizes available, please inquire.





HA-5600.4F

| Specifications | |
|--------------------------|---|
| Maximum force | 4946lbf (22kN) |
| Load transducer | 5000lbs (22.2kN) |
| Maximum displacement | 0.2" (5.1mm) |
| Temperature range | 23 to 104°F (-5 to 40°C) |
| Electrical supply | 220V 50/60Hz |
| Frame dimensions (WxDxH) | 62" x 25" x 43" (1580 x 650 x 1100mm) |
| Working space (WxDxH) | 78" x 43" x 43" (2000 x 1100 x 1100mm) |
| Desktop PC | Not required |



Texas Overlay Test

ASTM WK26816, Tex-248-F

In recent years many mixture design methods have produced materials that are stiffer, leaner and more resistant to rutting, however, such materials are often more susceptible to fatigue and reflection cracking. The Texas Overlay Tester was designed to simulate the expansion and contraction movements that occur in the vicinity of joints or cracks and which result in reflection cracking in overlays. With the Cox/Cooper Texas Overlay Tester it is possible to characterize both the crack initiation and crack propagation properties of asphalt mixtures. Cox/Cooper have developed the Texas Overlay Tester, which is a dedicated, state-of-the-art piece of equipment for carrying out this test.

It automatically calculates critical fracture energy and crack resistance index according to Tex-248-F.

Features:

- Super rigid frame, necessary for true results
- Outputs ASTM and Texas methods
- Integral surface-mounted, touch-screen control
- Intelligently designed specimen gluing and "zero stress" carrying frame
- Fitted with high performance hydraulic actuator and powerpack
- Ergonomically designed for easy operation
- Data downloading via USB and up to 10,000 cycles per test

Overlay Tester, 240V 50/60Hz

HA-5600.4F

Ship wt. 1102 lbs. (500kg)

Texas Overlay Tester includes:

| HA-5600.4F Includes | Model |
|---|------------|
| Pair of Platens with pins for Texas Overlay | HA-5600.7 |
| "Zero Stress" carrying frame to align the two base plates and fix the specimen prior to testing with specimen alignment | HA-5600.8 |
| Cutting Template | HA-5600.10 |
| Two-part epoxy with minimum 24 hour tensile strength of 4.1MPa and 24hr shear strength of 13.8MPa in accordance with Tex-614-J (Devcon™ two-ton 30-Minute Plastic Steel Epoxy Cement) | HA-5600.11 |
| 2mm x 4.2mm spacer bar for plate separation and alignment | HA-5600.17 |
| 5 lb (2.25 kg) weight (in the shape of the specimen to ensure load is spread evenly and does not overhang the edges of the specimen) | HA-5600.9 |
| 0.25" width adhesive tape | HA-5600.12 |
| Permanent marker | HA-5600.13 |
| Glue removing agent | HA-5600.14 |
| Gluing Jig | HA-5600.15 |

| Accessories | Model |
|--|-----------|
| 10 lb (4.5 kg) weight (in the shape of the specimen to ensure load is spread evenly and does not overhang the edges of the specimen) | HA-5600.5 |
| Calibration Kit | HA-5600.6 |
| 0.25" x 6.25 mm spacer bar for plate separation and alignment | HA-5600.4 |



INSTALLATION

Installation Verification and on-site Training are available for the Overlay Testers please inquire.



ACCESSORIES

Accessories are not included and should be ordered separately.



H-3205.3F

H-3204

Shown with H-3206
Base Plate, not
included

Accelerated Polishing Machine

BS 812 Pt 114 EN 1097-8

The accelerated polishing machine polishes samples of aggregates, simulating actual road conditions, and is used in conjunction with the portable skid resistance tester to determine the polished stone value for aggregates used in road surfaces, and gives a measure of the resistance to skidding. Fourteen specimens are clamped around the "road wheel" of the polishing machine and subjected to two stages of polishing by a loaded rubber tire. First by corn emery, and secondly by emery flour. Use of the accelerated polishing machine and the skid resistance tester in road construction has had a major influence in reduction of accidents.

The H-3205 Features:

- Heavy welded steel mainframe, standing in adjustable pads
- Digital display pre-set timer and revolution counter
- Specimens are easily affixed and removed from testing wheel
- Water gravity fed from high level tank through calibrated flowmeter
- Used abrasive and water collected in removable tray
- Loaded tire raised and lowered to the running surface by mechanical lifting device
- Easily removed covers and guards protect operator during testing and safety switch ensures removable safety covers are in place
- Comes with four molds and two mold plates

The H-3205 includes: Overhead-mounted gravity feed water tank with variable adjustable flow meter and isolating valve; four (4) specimen molds; two (2) mold plates; flour spreader; corn feeder unit complete with flour feeder unit; tired wheel (flour); tired wheel (corn); Four (4) anti-vibration mounts; set of tools; spare set of rubber rings (4) for road wheel, weight and drip tray.

Acc, Polishing Machine, 120/220V 50/60Hz H-3205.3F
Ship wt. 463lbs. (210kg)

| H-3205 Accessories | Model |
|--------------------------------|----------|
| Corn emery, 20kg bag (graded) | H-3205.5 |
| Flour emery, 20kg bag (graded) | H-3205.6 |

Portable Skid Resistance Tester

ASTM E303; BS EN 1097-8; BS 812 Pt 114

Measures friction (skid resistance) on flat, cambered, or gradient road surfaces Originally developed by the Transport and Road Research Laboratory of Great Britain.

- Compact, easily transported and used in the field
- Can be used in remote locations, independent of any vehicle
- Enclosed bearings and working parts for protection against wear and contamination
- Heavy-duty frame construction
- Adjustable feet on base, a pendulum arm, having a spring-loaded rubber slider on the pendulum foot

Device is placed on the portion of the road surface to be tested It is then levelled, and the height of the center of suspension of the pendulum is adjusted to a fixed value which is read on a special gauge. The pendulum is then released from its horizontal position, to swing down freely until the rubber slider contacts the test surface. As the slider travels across the surface for a fixed distance, the pendulum is slowed and a frictionally-constrained pointer affixed to the pendulum arm measures the highest point in the pendulum arc. The position of the pointer is then read on a measuring arc graduated from 0 to 150 Pointer readings indicate the resistance to skidding of the test surface.

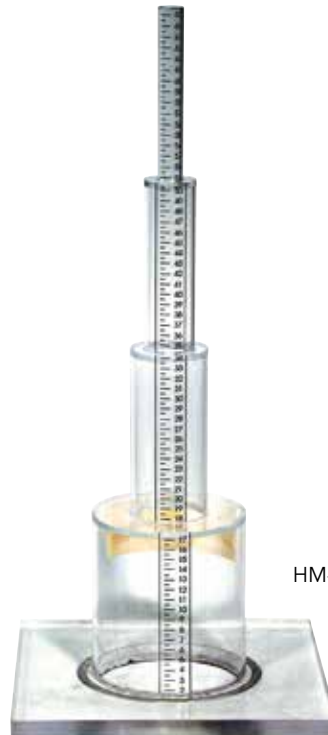
Portable Skid Resistance Tester H-3204
Ship wt. 88lbs. (39.9kg)

| H-3204 Accessories | Model |
|---|--------|
| Pink Lapping Paper - pack of 10 sheets (A4) | H-3203 |
| 1.25" Rubber-Mounted PSV Slider | H-3207 |
| 3.00" Rubber-Mounted TRL (55) Slider | H-3208 |
| 3.00" Rubber-Mounted Four S (96) Slider | H-3202 |
| 3.00" Rubber-Mounted CEN Slider (type 57) | H-3201 |
| Conditioned Pavigres Tiles 200x100 | H-3211 |
| Base Plate for Pendulum | H-3206 |
| Set of 3 spreader feet for CRT-Pendulum | H-3210 |





HM-9110
HM-9111



HM-9113.1

Asphalt Permeameter

These asphalt permeameters are compact, self-contained, easy-to-use units, which can be used in the lab or in the field. They are used to test the permeability of a compacted asphalt paving mixture by using the falling head method to determine hydraulic conductivity of saturated 4" or 6" samples. To use, place the specimen inside the metal cylinder, where it is held in place by a latex membrane. The unit is then pressurized by the built in hand pump. The expanding membrane pushes against the outer edge of the sample, filling in voids and preventing flow down the side of the core. The sample is then saturated from the bottom, and 500cc of water is allowed to flow through the sample while being timed. Both permeameters include a 500cc manometer with 15 ft of 0.25" OD water line, built-in hand pump and a pressure gauge.

Asphalt Permeameter, 4" **HM-9110**
Asphalt Permeameter, 6" **HM-9111**
Ship wt. 20lbs. (9kg)

| Asphalt Permeater Parts | Model |
|--------------------------|-----------|
| 4" Membranes (pkg. of 6) | HM-9110.2 |
| 6" Membranes (pkg. of 6) | HM-9111.2 |
| 4" O-rings (pkg. of 3) | HM-9110.1 |
| 6" O-rings (pkg. of 3) | HM-9111.1 |

NCAT Field Permeameter Kit

The NCAT field permeameter kit is a falling-head permeameter using Darcy's law to determine rate of water flow through asphalt pavement. This design was selected by the National Center for Asphalt Technology (NCAT) for its close correlation with laboratory test results. Testing and subsequent calculations can usually be completed in 10-15 minutes by one technician.

The HM-9113.1 permeameter is a supplied in two sections and constructed of rugged plastic. In use, sealing material is placed on the base plate and the unit seated against the pavement using gentle foot pressure and included base weights. After filling with water, outflow is observed using the clearly marked graduations. The smallest, uppermost tier allows rapid determinations in low-porosity pavements. The larger diameter tiers are used to accurately read flow on more porous pavements. The alternate top section can be used to replace the two top tiers with one larger diameter tier. This allows for extended test times on moderately permeable mats or for rapid filling when testing highly permeable mixes. The NCAT field permeameter kit provides the user with a complete operation package for using the NCAT field permeameter. It includes the 4-tiered HM-9113.1 permeameter; an alternate graduated top section; a filling tube; moldable sealant for sealing the permeameter to its base; a whisk broom for test site preparation and (4) 5lb (2.3kg) base weights to help seal the permeameter to the test surface.

NCAT Field Permeameter Kit **HM-9113**
Ship wt. 49lbs. (22.2kg)

NCAT Field Permeameter (Permeameter Only)

The NCAT field permeameter is for those who don't wish to buy the complete kit or who need to replace an existing one. This field permeameter is the same permeameter used in the HM-9113 kit. The HM-9113.1 permeameter is supplied in two sections and constructed of rugged plastic. In use, sealing material is placed on the base plate and the unit seated against the pavement using gentle foot pressure and included base weights. After filling with water, outflow is observed using the clearly marked graduations. The smallest, uppermost tier allows rapid determinations in low-porosity pavements. The larger diameter tiers are used to accurately read flow on more porous pavements.

NCAT Field Permeameter **HM-9113.1**
Ship wt. 14lbs. (6.3kg)



Shown with H-3221HA horizontal digital gauge and cover removed.

H-3220A



H-3221HA



H-3222



H-2790

Benkelman Beam

AASHTO T256

The Benkelman beam measures the deflection of a flexible pavement under moving wheel loads. Extremely accurate and easy to use. Direct-reading dial indicator eliminates need for conversion tables or field calculations. This pavement analysis tool provides the following features:

- Precision accuracy
- Easy to use on test site
- Lightweight, quick set-up
- Easy to transport, easy to store
- No need for conversions or field calculations, gauges are direct read

Order dial gauge separately.

Dial indicator vibrator system assures accurate pavement measurements. Telescoping design adds convenience, reduces weight, and saves storage space. Lightweight aluminum construction.

| Specifications | |
|-----------------|--|
| Main body | Aluminum with black finish 55" (1397mm) long |
| Probe beam | 8 ft. (2.4m) aluminum beam telescopes into body |
| Probe fulcrum | Provides lever ratio of 2:1, ball pivot bearing |
| Vibrator system | Assures measurement accuracy. Top-mounted operating switch for easy use. Requires 4 "D" size batteries |
| Dial indicators | Ordered separately. Adjusted for direct read |
| Leveling wheel | Elevation adjustment |
| Overall length | With beam fully extended 12 ft. (3.7m). |

Benkelman Beam

H-3220A

Ship wt. 62lbs. (28kg)

Digital Indicator, Horizontal

Horizontal-reading, digital indicator for use with the H-3220A Benkelman beam. No more laying on the ground to read a dial indicator. We've also redesigned the gauge cover on the beam, so that you can now store the new horizontal digital indicator mounted to the Benkelman beam, speeding set up and keeping the gauge and beam together, eliminating the chance of forgetting the gauge. Horizontal digital Indicator: 1.0" range x 0.001" resolution. Designed for use with the Humboldt H-3220A Benkelman beam. The indicator's 2:1 logic ratio allows it to provide direct readings of benkelman beam results without manual computations. Can be read in inches or metric units.

Digital Indicator, Horizontal

H-3221HA

Ship wt. 2lbs. (0.9kg)

Dial Indicator, Vertical, 1" x 0.002"

Vertical-reading, dial indicator for use with the H-3220A Benkelman beam. 1" range x 0.002" divisions

Dial Indicator, Vertical, 1" x 0.002"

H-3222

Ship wt. 1lbs. (0.5kg)

Dial Indicator, Vertical, 25 x 0.02mm

Vertical-reading, dial indicator for use with the H-3220A Benkelman beam. 25mm range x 0.02mm divisions

Dial Indicator, Vertical, 25 x 0.02mm

H-3222M

Ship wt. 3lbs. (1.4kg)

Bell/Buzzer Indicator

Sounds simultaneously with visual indicator, 9V DC battery.

Bell/Buzzer Indicator

H-2790B

Ship wt. 3lbs. (1.4kg)

High-Low Detector (Rolling Straight Edge)

Used to measure planeness of pavement surfaces, such as highways, airport runways, bridge decks, etc. Requires only one operator to detect, register, and dye mark high and low areas that need to be ground down or filled.

Operator has full view of variations which are magnified 16 times, on a vertical scale graduated in 0.125" (1mm) increments, so that magnified readings range up to 0.25" (6.4mm), high or low. The 16 ft. long model incorporates aluminum reinforcing riveted along both sides of the frame for added support and rigidity. Frame is constructed of rectangular aluminum and wheels are provided, one front and one rear with precision ball bearings and neoprene tires for support. Scraper blades keep wheels clean to maximize accuracy. Includes wheel stands for stabilizing during calibration, transport and storage. There is provision for checking wheel alignment. A steering handle is provided for easy positioning and movement, and provides a button for dye discharge. Marking dye is used to mark high and low areas on pavement. Dye can mount is designed for 12 oz. (340g) aerosol cans.

| | |
|-----------------|---------------------------|
| Shipping weight | H-2790: 166 lbs. (75.2kg) |
| | H-2791: 160 lbs. (100kg) |
| | H-2792: 414 lbs. (72.5kg) |

| | |
|---------------------------------------|--------|
| High-Low Detector, 10 ft. (3m) Span | H-2790 |
| High-Low Detector, 12 ft. (3.7m) Span | H-2791 |
| High-Low Detector, 16 ft. (4.9m) Span | H-2792 |

see table above

Bell/Buzzer Indicator

Provides audible alert, 9V DC battery

Bell/Buzzer Indicator

H-2790B

Ship wt. 3lbs. (1.4kg)

Dye, Aerosol Can, 12-pack

12 pack of 16oz. (454g) spray cans

Dye, Aerosol Can, 12-pack

H-2790D

Ship wt. 12lbs. (5.4kg)

Aerosol Cans cannot be shipped internationally.





HR-2801



HR-2802



HR-2500



HR-2508

Hand-Held Core Drill

The HR-2801 Hand-Held Core Drill can be used for hand-held drilling up to 4". Perfect tool for sample drilling and drilling smaller holes for ventilation, plumbing pipes, joints, electrical sockets and telecom cable openings. It is equipped with a LED indicator that shows when the drill is in a vertical or horizontal position and can also be calibrated to help guide the operator while angle drilling. The positioning system makes it possible for the operator to focus on drilling while controlling the position of the machine via the LED indicators. It is equipped with Softstart™, which slowly increases motor RPMs when starting, which reduces wear on the motor and brushes. The drill comes with a vacuum as standard for use in dry applications, such as drilling bricks, blocks or other building materials. Can be used for wet applications when drilling reinforced concrete. Includes case.

Hand-Held Core Drill, 120/220V 60Hz **HR-2801**
 Ship wt. 15.4lbs. (6.9kg)

| HR-2801 Hand-Held Drill | |
|--------------------------|-------------------|
| Motor | 115/230V 60Hz |
| Bit capacity, handheld | 4" |
| Bit capacity, with stand | 6" |
| Speeds (no load) | 900, 2150 4500 |
| Speeds (full load) | 500, 1400 2900 |
| Auger capacity | NA |

Small, 1-Speed Drill Stand

Perfect stand for drilling in walls and floors with the HR-2801 Hand-held Drill. Can also be used to angle drill and stitch drill. Maximum drill diameter is 10" (254mm) and max travel is 27" (685mm). Max tilt angle is 60°.

Small, 1-Speed Drill Stand **HR-2802**
 Ship wt. 16lbs. (5.9kg)

Core Drill, Electric

This core drill provides a flexible, multi-purpose vacuum/anchor bolt drilling system. It can be used for almost all applications involving floor, wall and ceiling placements, as well as hard-to-reach places. Includes a two-speed (350-900 RPM), 3.5 HP 20 amp heavy-duty motor, waterproof switch box, built-in water swivel, continuous duty oil-less vacuum pump, filter, hose, quick connections and has a 12-inch bit diameter capacity. The drill's 6" wheels provide easy maneuvering and its 10" (254mm) wide base is a vacuum pad anchor with more than 1000 pounds of vacuum force that solidly grips the drilling surface within seconds making it the ideal drill stand for floors, walls, ceilings, as well as, pavement. Requires water supply, if none is available order HR-2516 portable water pressure tank separately.

Features Include:

- 3.5 HP Milwaukee electric drill motor with 2-speed gear box
- Water swivel
- Drill stand with combination vacuum pad/anchor bolt base
- Large (6") rubber wheels

| HR-2500 | |
|-------------------|------------|
| Horse power | 3.5 |
| Motor: volts/amps | 115/20 |
| Cycle | 50/60 |
| Bit capacity | 12" |
| Auger capacity | NA |
| Column dimensions | 2.5" x 35" |
| Carriage travel | 22" |

Core Drill, Electric 120V 60Hz **HR-2500**
 Core Drill, Electric 230V 50/60Hz **HR-2500.4F**
 Ship wt. 130lbs. (60kg)

Core Drill, Hand-held, Gas-Powered

Hand-held, portable, ultra lightweight core drilling machine, gasoline powered; just add gasoline and water and start drilling. Perfect for road, bridge and fencing contractors. For fast, economic drilling—either vertical or horizontal—of concrete/asphalt and/or auger drilling into soil. One-person drilling, easy-to-handle, 22 lbs. overall weight. Quick set-up, easy-to-use, reliable. Honda 31cc, 4-cycle gasoline engine, high performance water swivel, bit locator. Accepts up to 6" diameter.

Features Include:

- Designed for concrete/asphalt surfaces
- Minimize drilling time with gasoline power
- Easy-to-use and quick to set up
- One-person, hand-held, core drill machine
- 31cc, gasoline powered engine - 4 cycle
- 7" bit diameter capacity
- Vertical or horizontal drilling
- Heavy-duty, quad precision ball bearing gear box

| HR-2508 | |
|----------------|---------------|
| Motor | 31cc, 4-cycle |
| Bit capacity | 6" |
| Auger capacity | NA |

Core Drill, Hand-held, Gas-Powered **HR-2508**
 Ship wt. 40lbs. (18kg)



HR-2503E



HR-2701



HR-2600

Core Drill, Mobile Stand, Gas-Powered

This core drill reduces job costs through the faster drilling speeds gained from the use of a gas-powered motor. This drill can be wheeled into place easily when mounted on its heavy-duty, sturdy platform or can also be mounted to a trailer, pickup or van.

Features Include:

- 17 HP gas-powered, electric-start drill head with electric start, with 8" or 16" bit capacity
- Accurate and easy drill positioning and platform movement with its 4" Delrin wheels
- Dead-weight base no anchor bolts required
- Drill stand

Standard Package Includes:

- Drill stand
- 17 HP gasoline-powered, electric-start engine
- Variable RPM (300-1500 bit RPM)
- Water swivel

Core Drill, Hitch-Mounted

This hitch-mounted system provides a mobile system, which provides fast set-up and drilling while ensuring consistent quality. Setup minimizes time required to do jobs reducing job costs.

Features Include:

- 15 HP gas-powered, electric-start drill head with electric start, with 16" bit capacity
- Accurate drilling with easy positioning and alignment of drill head
- Positioning arm swings 180° in semi-circle
- Multi-jointed arm allows drilling anyway within the arc of trailer-hitch mount
- Stand-alone, gasoline-powered system—no additional power supplies needed
- Easy, one-person mounting or removal using machine's own drill caddy

Standard Package Includes:

- Drill Head with up to 16" bit capacity
- Flexible position receiver mount bracket
- Drill caddy
- Variable RPM (300-1500 bit RPM)
- Water swivel
- Drive shaft stabilizer system

HR-2700 and HR-2701

| | |
|------------------------|-----|
| Horse power | 15 |
| Cycle | 4 |
| HR-2700 bit capacity | 16" |
| HR-2701 bit capacity | 16" |
| HR-2700 auger capacity | NA |
| HR-2701 auger capacity | 8" |

Core Drill, Hitch-Mount 16" Capacity HR-2700

Core Drill, Hitch-Mount, Auger Capability HR-2701
Ship wt. 604lbs. (274kg)

Core Drill, Trailer-Mounted

This complete stand-alone core drill rig offers field independence, versatility, dependability, and easy single-person operation. Provides mobile yet very stable drilling platform, which extends bit life. Provides exceptional solution for remote locations.

Features Include:

- 17 HP gasoline-powered drill head with electric start, with 16" bit capacity and a 24" travel
- Variable drill head positioning system, which allows drill head movement of approx. 43" side-to-side and 12" fore and aft for accurate hole placement;
- Hydraulic-assisted machine lift for single-handed removal and replacement of drill
- Lockable, weather-resistant toolbox
- 200-gal. water tank and 12 VDC water pump
- 5' x 8' steel-construction trailer, equipped with electric brakes and pre-wired for brake and tail lights.

HR-2600 and HR-2601

| | |
|------------------------|-----|
| Horse power | 17 |
| Cycle | 4 |
| HR-2600 bit capacity | 16" |
| HR-2601 bit capacity | 16" |
| HR-2600 auger capacity | NA |
| HR-2601 auger capacity | 8" |
| Carriage travel | 24" |

Core Drill, Trailer-Mount 16" Capacity HR-2600

Core Drill, Trailer-Mount, Auger Capability HR-2601
Ship wt. 2000lbs. (907kg)

| HR-2503E and HR-2504 | |
|-----------------------|-----|
| Horse power | 17 |
| Cycle | 4 |
| HR-2503E bit capacity | 8" |
| HR-2504 bit capacity | 16" |
| Auger capacity | NA |

Core Drill, Mobile Gas-Powered — 8" HR-2503E

Core Drill, Mobile Gas-Powered — 16" HR-2504
Ship wt. 413lbs. (187kg)


Z-Edge
for concrete


HR-2530.4



HR-2554

Core Drill Accessories

| Description | Model |
|---|---------|
| Extension rod, 9" (229mm); for drilling holes deeper than 12" (305mm) | HR-2510 |
| Strap wrench, 18" (457mm) allows bit removal from drill spindle without damage to bit barrel | HR-2514 |
| Angle drilling attachment for HR-2500. Tilts column to allow drilling from 90° to 45° angle from surface | HR-2515 |
| Portable water pressure tank. Hand-operated. 4 gallon (15 liter), delivers water under pressure when water supply is not available. | HR-2516 |
| Water trapping assembly, confines wastewater on surface and electric pump moves water into container | HR-2511 |
| Diamond bit edge dresser | HR-2512 |
| Replacement wheel for diamond bit edge dresser (HR-2512) | HR-2513 |

ExitPoint Through-hole Drill Guide

Accurately detect exit points before drilling and coring with the ExitPoint through-hole drill guide. The HR- is the easiest and fastest way to locate a precise spot, without measuring, before you start your project. Scans through most types of non-magnetic building materials, such as wood, drywall, gypsum panels, bricks, and poured concrete up, to 11.81 in. (300 mm) thick.

This simple, yet effective, tool saves time and money by reducing guesswork, rework, unnecessary holes, and costly broken drill bits. Ideal for cable and wire installations, concrete scanning, and anytime through-hole drilling is required.

ExitPoint Through-hole Drill Guide **HR-2599**

Ship wt. 1.4lbs. (0.64kg)

Diamond Drill Bits

These professional-quality, diamond, drill bits are designed for use in drilling asphalt and concrete. They have a total segment height of .320" (8.128mm), a diamond depth of .250" (6.350mm) and a segment base of .070 (1.778mm). The standard bit length is 13" (330.200mm) and the integral thread adapter is 1.25"– 7 thread.

Concrete drill bits are for critically hard concrete with heavy, steel reinforcement. Asphalt drill bits are for asphalt and concrete with soft, abrasive aggregate.

| Size | | Asphalt | Concrete |
|-------|-----|--------------|--------------|
| In. | mm | | |
| 1 | 25 | HR-2550.1 | HR-2530.1 |
| 1.125 | 29 | HR-2550.1125 | HR-2530.1125 |
| 1.25 | 32 | HR-2550.125 | HR-2530.125 |
| 1.5 | 38 | HR-2550.15 | HR-2530.15 |
| 1.75 | 44 | HR-2550.175 | HR-2530.175 |
| 1.875 | 63 | HR-2550.1875 | HR-2530.1875 |
| 2 | 51 | HR-2550.2 | HR-2530.2 |
| 2.25 | 57 | HR-2550.225 | HR-2530.225 |
| 2.5 | 63 | HR-2550.25 | HR-2530.25 |
| 2.75 | 70 | HR-2550.275 | HR-2530.275 |
| 3 | 76 | HR-2550.3 | HR-2530.3 |
| 3.5 | 89 | HR-2550.35 | HR-2530.35 |
| 4 | 100 | HR-2550.4 | HR-2530.4 |
| 4.25 | 108 | HR-2550.425 | HR-2530.425 |
| 4.5 | 114 | HR-2550.45 | HR-2530.45 |
| 5 | 127 | HR-2550.5 | HR-2530.5 |
| 5.5 | 140 | HR-2550.55 | HR-2530.55 |
| 6 | 152 | HR-2550.6 | HR-2530.6 |
| 6.25 | 159 | HR-2550.625 | HR-2530.625 |
| 7 | 178 | HR-2550.7 | HR-2530.7 |
| 8 | 203 | HR-2550.8 | HR-2530.8 |
| 9 | 230 | HR-2550.9 | HR-2530.9 |
| 10 | 254 | HR-2550.10 | HR-2530.10 |
| 11 | 280 | HR-2550.11 | HR-2530.11 |
| 12 | 305 | HR-2550.12 | HR-2530.12 |
| 13 | 330 | HR-2550.13 | HR-2530.13 |
| 14 | 350 | HR-2550.14 | HR-2530.14 |

Diamond Drill Bits, High-Performance, Small

These professional-quality, diamond drill bits are designed for drilling cured concrete with medium to soft aggregate with or without steel reinforcement. They have a total segment height of .400" (10.160mm) (.300" (7.620mm) diamond depth and .100 (2.54mm) segment base. The standard bit length is 13" (330.200mm) and the integral thread adapter is 1.25"– 7 thread.

| Size | | Medium*** |
|--------|----|-------------|
| Inches | mm | |
| 1/2 | 13 | HR-2570.5 |
| 5/8 | 17 | HR-2570.625 |
| 3/4 | 19 | HR-2570.75 |
| 7/8 | 22 | HR-2570.875 |
| 1 | 28 | HR-2570.1 |

CoreSnap Removal Tool

The CoreSnap allows you to remove a drilled sample from a roadbed at or below the tackline without prying or drilling completely through the old roadbed. The CoreSnap is placed down over a normally cut core and tighten the binding bolt with a 0.25" drive socket/ratchet. A quick lateral motion of the handle breaks the core sample away from the older mat beneath, allowing the core to be removed easily.

CoreSnap Removal Tool, 4" **HR-2554**
CoreSnap Removal Tool, 6" **HR-2556**

Ship wt. 10.4lbs. (4.7kg)



NOTES

Be advised that core drill bits have .125" walls and produce a core 0.25" smaller than the OD of the drill bit.



HA-5100.3F

**INSTALLATION**

Installation Verification and on-site Training are available for the Servo-Pneumatic Universal Testing Machine please inquire.

Servo-Pneumatic Universal Testing Machine (15.5kN)

ASTM D4123, D7369, D7313, D8044; AASHTO TP31, TP62, TP79, TP105, TP124, T307, T322, T342; NCHRP 9-19; EN 12697-24 Annex E, EN12697-25 Method A and B, EN 12697-26 Annex C and E

This machine is a development of the NAT which was developed by Keith Cooper and Professor Steven Brown at the University of Nottingham. The use of a high precision servo-pneumatic valve in conjunction with a low-friction actuator and sophisticated data acquisition and control, results in a performance that is equal to many servo-hydraulic systems.

Accurate, digitally generated waveforms are applied by the actuator producing repeatable stress variations in test specimens that are simulative of those in a road pavement due to moving traffic. The actuator is double-acting allowing both compressive and tensile forces to be applied. A tri-axial cell system is available for the measurement of the resilient modulus of unbound materials.

Features:

- Low cost dynamic loading universal test system ideally suited to testing asphalt and unbound granular materials
- High performance ceramic spool servo-valve
- Double acting low friction actuator with integral stroke transducer
- High quality stainless steel frame
- Accessories available to perform a range of standard and non standard test methods

Control System and Software

This machine can be controlled using our Standard Acquisition and Control System along with Universal Software™. Universal Software is user friendly, intuitive and reliable Windows® software developed using LabVIEW™. Universal test software

| Specifications | |
|--------------------------------|--|
| Maximum Load | 3500lbf (15.5kN) dependent on air pressure |
| Load Transducer | ±4496lbf (20kN) |
| Actuator Stroke | 1.2" (30mm) |
| Frequency | 0 to 30 Hz |
| Electrical Supply | 110/220V 50/60 Hz, 1 Ph |
| Compressed Air | 7-10 bar (100-145psi) @ 21cfm (600 lpm) |
| Dimensions | 31" x 40" x 76" (780 x 1000 x 1920mm) |
| Working Space Required (WxDxH) | 32.5" x 65" x 83" (825 x 1650 x 2100mm) |
| Desktop PC | Included |

for the development of test methods using static, sinusoidal, haversine, square, triangular with user selected frequencies and data collection rates. Stored test data can be imported into a spreadsheet package to be analyzed by the user. Utilities are included for transducer check, diagnostic routines and calibration.

cDAC™ Advanced Data Acquisition

Alternatively, our next generation digital data acquisition and control unit cDAC™ Advanced Data Acquisition System brought together in alliance with our flagship software DIMENSION™ gives you the power to perform the most demanding of tests with your materials testing equipment. cDAC™, our next generation, class-leading digital controller is unparalleled in its field and suitable for advanced testing required for research.

For more details on Control System & Software, please refer to page 311.

15.5kN Universal servo-pneumatic testing machine with standard control box., includes desktop PC with Universal software.

15.5kN Machine, Standard, 120/220V 50/60Hz HA-5100.3F
Ship wt. 79lbs. (36kg)

15.5kN Universal servo-pneumatic testing machine with cDAC control box, includes desk PC with Dimensions software.

15.5kN Machine, cDAC, 120/220V 50/60Hz HA-5101.3F
Ship wt. 79lbs. (36kg)

| Accessories | Model |
|--------------------------------|-----------|
| Temperature-controlled Cabinet | HA-5100.1 |

| Specifications | | |
|--------------------------------------|--|--|
| Model | UTM25 | UTM100 |
| Maximum force | 5620lbf (25kN) | 22481lbf (100kN) |
| Load transducer | 5620lbf (25kN) | 22481lbf (100kN) |
| Actuator stroke | 2" (50mm) | 4" (100mm) |
| Frequency range | 0 to 100Hz | 0 to 100Hz |
| Electrical supply | 220V 60 Hz, 3 Ph | 220V 60 Hz, 3 Ph |
| Frame and cabinet dimensions (WxDxH) | 39" x 51" x 94" (1000 x 1300 x 2400mm) | 45" x 47" x 108" (1150 x 1200 x 2750mm) |
| Powerpack dimensions (WxDxH) | 25" x 23" x 35" (630 x 580 x 890mm) | 27.5" x 37" x 43.7" (700 x 940 x 1110mm) |
| Working space (WxDxH) | 43" x 90.5" x 102" (1100 x 2300 x 2600mm) | 118" x 157" x 118" (3000 x 4000 x 3000mm) |
| Desktop PC | Included | Included |



Servo-Hydraulic Universal Testing Machine (25kN and 100kN)

ASTM D4123, D7369, D7313, D8044; AASHTO TP31, TP62, TP79, TP 105, TP124, T307, T322, T342; NCHRP 9-19; EN 12697-24 Annex E, EN12697-25 Method A and B, EN 12697-26 Annex C and E

The Servo-Hydraulic Universal Testing Machines are well-designed, versatile machine specifically developed for the testing of materials used in pavement construction.

25kN Machine Features:

- Designed to perform a range of tests on asphaltic paving materials, sub-grade soils and granular sub-base materials
- Double acting fatigue rated hydraulic actuator with integral stroke transducer
- Star servo valve with "Sapphire Technology"
- Motorized adjustable lower crosshead with automatic hydraulic frame clamping
- Integral programmable temperature controlled cabinet
- Accessories available to perform a range of standard and non-standard test methods

100kN Machine Features:

- Double rod, equal area, fatigue rated actuator
- Direct coupled Star Hydraulics servo valve with Sapphire Technology
- Direct coupled hydraulic safety block

- Axially mounted LVDT integral to the actuator
- Optional TCC is fully removable to allow increased daylight for testing large temperature-independent specimens

Control System and Software

This machine can be controlled using our Standard Acquisition and Control System along with Universal Software™. Universal Software is user friendly, intuitive and reliable Windows® software developed using LabVIEW™. Universal test software for the development of test methods using static, sinusoidal, haversine, square, triangular with user selected frequencies and data collection rates. Stored test data can be imported into a spreadsheet package to be analyzed by the user. Utilities are included for transducer check, diagnostic routines and calibration.

cDAC™ Advanced Data Acquisition

Alternatively, our next generation digital data acquisition and control unit cDAC™ Advanced Data Acquisition System brought together in alliance with our flagship software DIMENSION™ gives you the power to perform the most demanding of tests with your materials testing equipment. cDAC™, our next generation, class-leading digital controller is unparalleled in its field and suitable for advanced testing required for research.

For more details on Control System & Software, please refer to pages 310-311.

25kN Universal servo- hydraulic testing machine with integral temperature controlled cabinet, standard control box. Includes desk PC with Universal software.

25kN Machine, Standard, 220V 60Hz HA-5125.2F
Ship wt. 79lbs. (36kg)

25kN Universal servo- hydraulic testing machine with integral temperature controlled cabinet, cDAC control box. Includes desk PC with Dimensions software.

25kN Machine, cDAC, 220V 60Hz HA-5126.2F
Ship wt. 79lbs. (36kg)

100kN Universal servo-hydraulic testing machine, standard control box. Includes desk PC with Universal software. Temperature controlled cabinet available as an optional extra.

100kN Machine, Standard, 220V 60Hz HA-5135.2F
Ship wt. 79lbs. (36kg)

100kN Universal servo-hydraulic testing machine, cDAC control box. Includes desk PC with Dimensions software. Temperature controlled cabinet available as an optional extra.

100kN Machine, cDAC, 220V 60Hz HA-5136.2F
Ship wt. 79lbs. (36kg)



INSTALLATION

Installation Verification and on-site Training are available for the Servo-Hydraulic Universal Testing Machine.

Accessory Fixtures for Universal Testing Machines

| Standard | Accessory Description | Model | UTM-15.5kN | UTM-25kN | UTM-100kN |
|---|--|------------|------------|----------|-----------|
| NCHRP 9-19 AASHTO TP62 | Test system to perform dynamic modulus according to AASHTO TP62, SPT flow number (NCHRP 9-19), SPT flow time (NCHRP 9-19) | HA-5123.1 | ✓ | ✓ | ✓ |
| AASHTO T307 | Triaxial system to perform AASHTO T307 for 200x100mmØ specimens of unbound materials | HA-5123.2 | ✓ | ✓ | ✓ |
| | Triaxial system to perform AASHTO T307 for 200x100mmØ and 150x300mmØ specimens of unbound materials. To use with CRT-UTM-NU pillar extensions are required.* | HA-5123.3 | ✓ | ✓ | ✓ |
| | *Larger Pillars for UTM-NU (for T307+) | HA-5100.2 | ✓ | | ✗ |
| | Additional parts to upgrade from T307 to T307+ | HA-5123.5 | ✓ | ✓ | ✓ |
| AASHTO T322 | Indirect Tensile Creep measurement system according to AASHTO T322 | HA-5123.6 | ✓ | ✓ | ✓ |
| AASHTO TP 124 AASHTO TP 105 ASTM D8044 | Semi circular bending system to perform ASTM D8044, AASHTO TP 124 and TP 105 test | HA-5123.7 | ✓ | ✓ | ✓ |
| ASTM D7369 | Resilient modulus test system to perform ASTM D7369 | HA-5123.8 | ✓ | ✓ | ✓ |
| EN 12697-26 (Annex E) | Direct Compression & Tension Measurement System to perform test according to EN 12697-26 Annex E for CRT-UTM-NU | HA-5100.3 | ✓ | ✗ | ✗ |
| | Direct Compression & Tension Measurement System to perform test according to EN 12697-26 Annex E for CRT-UTM-HYD | HA-5123.10 | ✗ | ✓ | ✓ |
| EN 12697-26 (Annex C) EN 12697-24 (Annex E) | Indirect tensile fatigue measurement system to perform EN 12697-24 (Annex E) for 100mmØ specimens. To be used with CRT-ITSM-SET. | HA-5123.11 | ✓ | ✓ | ✓ |
| | Indirect tensile fatigue measurement system to perform EN 12697-24 (Annex E) with 100 & 150mmØ specimens. To be used with CRT-ITSM-SET. | HA-5123.12 | ✓ | ✓ | ✓ |
| | Indirect tensile stiffness modulus and fatigue measurement system to perform EN 12697-26 (Annex C) Ø100 & 150mm and EN 12697-24 (Annex E) Ø100mm specimens. | HA-5123.13 | ✓ | ✓ | ✓ |
| | Indirect tensile stiffness modulus measurement system to perform EN 12697-26 (Annex C) Ø100&150mm specimens. | HA-5123.14 | ✓ | ✓ | ✓ |
| | Add-on for CRT-FAT-SET for 150mmØ specimens. To be used with CRT-ITSM-SET and CRT-FAT-SET. | HA-5123.15 | ✓ | ✓ | ✓ |
| EN12697-25 (Method A & B) | Dynamic and static creep measurement system to perform EN12697-25 (Method A) | HA-5123.16 | ✓ | ✓ | ✓ |
| | Dynamic and static creep measurement system - confining stress to perform test according to EN 12697-25 Method B. | HA-5123.17 | ✓ | ✓ | ✓ |
| IAN 73/06 – Design Guidance for Road Pavement Foundations | PUMA - Precision Unbound Materials Analyser for 150mmØ specimens | HA-5123.18 | ✓ | ✓ | ✓ |
| | PUMA - Precision Unbound Materials Analyser for 300mmØ specimens | HA-5135.6 | ✗ | ✗ | ✓ |
| | Temperature Controlled Cabinet | HA-5100.1 | ✓ | ✗ | ✓ |



HA-5105.3F



cDAC™ Controller and Data Acquisition

The cDAC digital data acquisition and control unit coupled with DIMENSION™ software, gives you the power to perform the most demanding of tests with our Universal, Dynamic Testing Machines. Both are designed with the ease-of-use and reliability required for standard testing and the flexibility and advanced capabilities required for research.

DIMENSION™ Software Features:

- Profile builder gives ultimate flexibility to design and store custom testing routines
- Standard test library for quick and reliable testing to ASTM, AASHTO and CEN Standards
- Transducer database to store and manage your sensors
- Configurable waveform and summary data capture allows total control over the information gathered during a test
- Multi-lingual test screen shows a graphical view of all connected transducers and calculated values in real time
- Test data available in Excel™ compatible format for user analysis

cDAC™ Hardware Features:

Provides a configurable design to meet your needs with up to 7 modules (max. 4 of each type) from the following per cDAC unit: Interface, Acquisition, Digital and Servo.

Interface Module:

- 100Mbit/s Ethernet TCP/IP and UDP connection to PC provides for fast and robust communications
- RS232/422/485 serial port for connection to environmental chambers and other ancillary equipment
- USB port for direct data logging
- Atmel AT91SAM Smart ARM-based Micro-controller for high performance

Servo Module

- Dual 5kHz control loops per module
- 0.01 to 100Hz cycle frequency to meet all your testing needs.

- Digital on-the-y adjustment of all PID parameters
- Multichannel selectable feedback from any sensor (or sum of or difference between sensors) on any acquisition card
- Hardware function generator
- Bumpless transfer between control methods
- Texas instruments TMS320DSP digital signal processor
- 16-bit Analog Voltage ($\pm 10V$ and (0 to 10V) and Current ($\pm 40mA$, (0 to 20)mA, and (4 to 20mA) control output for servo valve or other control device

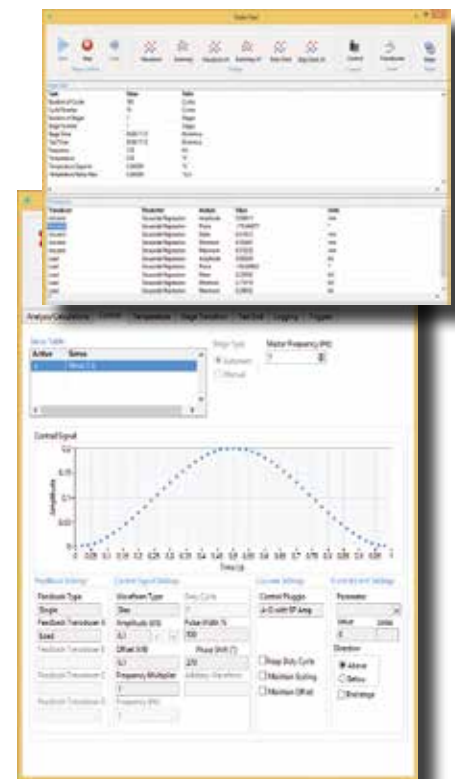
Digital Module

- 4 x 24V opto-isolated digital inputs with 100mA sink capacity (each can be configured as counters)
- 4 x 24V opto-isolated digital outputs to drive auxiliary hydraulic/pneumatic solenoid valves with 1.6A drive capacity per channel (each can be configured as a PWM source)
- NXP LPC2148 ARM7TDMI-S based high-performance 32-bit RISC micro-controller

Acquisition Module

- Any combination of up to 8 sensors per module (load cells, LVDTs, RTDs, strain gauge bridges, pressure transducers, and many more)
- TEDS (Transducer Electronic Datasheet) sensors for plug and play measurement
- Synchronous acquisition of all sensor measurements from all modules to eliminate data-skew
- Multiple segment 5th order polynomial linearization of sensors for supreme accuracy
- 24-bit resolution on all channels
- 5kHz acquisition rate per channel
- Anti-alias filters to prevent high-frequency interference
- Auto-ranging amplifiers with the following gain steps: 1/8, 1/4, 1/2, 1, 2, 4, 8, 16, 32, 64, 128
- (0 to 10)V, 24V, and (0 to 20)mA power supplies for sensors

cDAC Data Controller, 120/220V 50/60Hz HA-5105.3F
Shipping wt. 13lbs (6kg)





HA-5500.7F.3



| Specifications | |
|--------------------------------|---|
| Force Transducer | 2250lbf (10kN) |
| Specimen Transducer Range | $\pm 0.09"$ ($3 \times \pm 2.5\text{mm}$) |
| Actuator Stroke | 0.4" (10mm) |
| Frequency | 0.1 to 60 Hz |
| Electrical Supply | 415V 50Hz, 3 Ph |
| Compressed Air | 7-10 bar (100-145psi) @ 3.5cfm (100lpm) |
| Test Frame Dimensions | 41.5" x 43" x 83" (1050 x 1100 x 2100mm) |
| Working Space Required (WxDxH) | 81" x 83" x 90.5" (2050 x 2100 x 2300mm) |
| Desktop PC | Included |

Large Hydraulic, Four-Point Bending Beam Machine

ASTM D7460, AASHTO T321, EN 12697-24 Annex D, EN 12697-26 Annex B

The Large Hydraulic Four Point Bending Beam Machine uses advanced servo-hydraulic technology and a high-speed digital data acquisition and control system together with user-friendly software. During testing both graphical and tabular data are displayed on screen and test data is stored to disc in Microsoft® Excel® compatible format. The test frame is housed in a Temperature Controlled Cabinet with fan-assisted air circulation and a temperature range of -20 to 30°C. The unique constant torque clamping, and three-transducer deflection measurement system of the Large Hydraulic Four-Point Bending Beam Machine can be configured to accept different beam sizes. This means that the ratio between beam dimensions and maximum aggregate size of test specimens will satisfy the requirements of the relevant European specifications and will accept aggregates with diameters greater than 32mm diameter.

Features:

- Frequency range 0.1 to 60Hz
- High-quality, Servo-Hydraulic Four-Point Bending Machine
- Double-acting, fatigue-rated hydraulic actuator with integral stroke transducer

- Star servo valve with "Sapphire Technology"
- Can be used with simple one or research level three LVDT transducers
- Accepts various beam sizes: 380 to 660mm in length and 50 x 50mm and 100 x 100mm cross sections.
- Temperature Controlled Cabinet range -20 to 30°C
- Sinusoidal controlled strain or controlled stress fatigue test modes
- Constant torque motorized specimen clamping to eliminate errors due to localized beam indentation
- Self-contained loading system
- User friendly software for determination of fatigue resistance and stiffness modulus
- Capable of performing healing, modulus, fatigue multi-stage testing and camera triggering
- Supplied with traceable calibration certificate

Software:

- User friendly, intuitive and reliable Windows® software developed using LabVIEW™
- Specifically written to meet AASHTO and ASTM standards
- The user interface can be translated into the user's preferred language – please inquire

- Stored test data can be analyzed and compared with other test data utilizing a spreadsheet package
- Utilities are included for curve fitting of acquired data; testing of system's inputs and outputs; phase correction and a transducer database for storing calibration factors

Large, 4-Point Machine, 415V 50Hz, 3PH HA-5500.7F.3

Ship wt. 1435 lbs. (650kg)

Accessories are not included and should be ordered separately.

| Accessories | Model |
|---|-----------|
| Dummy PVC beam 2" x 2" x 15" (50 x 50 x 380 mm) | HA-5400.1 |
| Dummy PVC beam 4" x 4" x 26" (100 x 100 x 660 mm) | HA-5400.2 |
| Integrated compressed air option | HA-5400.3 |



INSTALLATION

Installation Verification and on-site Training are available for the Large Hydraulic, Four-Point Bending Beam Machine, please inquire.





INSTALLATION

Installation Verification and on-site Training are available for the Stand-Alone, Four-Point Bending Beam Machine please inquire.



HA-5400.3F

Stand-Alone, Four-Point Bending Beam Machine

ASTM D7460, AASHTO T321, EN 12697-24 Annex D, EN 12697-26 Annex B

The Stand Alone Four Point Bending Beam Machine uses advanced servo pneumatic technology and a high-speed digital data acquisition and control system together with user-friendly software. During testing both graphical and tabular data are displayed on screen and test data is stored to disc in Microsoft® Excel® compatible format. The clamps are at 118.5mm (4.67") centers (the distance between the outer clamp is 335.6mm (14") according to AASHTO specifications, but the height and width of the beam can be varied).

Features:

- Frequency range 0.1 to 30Hz¹
- Low cost pneumatic standalone four point bending machine
- Low-friction actuator and high-performance ceramic spool servo-valve
- On-specimen measurement system removes errors due to frame flexure
- Designed for AASHTO beam sizes
- Sinusoidal controlled strain or controlled stress fatigue test modes

- Constant torque motorized specimen clamping to eliminate errors due to localized beam indentation
- Self-contained loading system
- User friendly software for determination of fatigue resistance and stiffness modulus
- Capable of performing healing, modulus, fatigue multi-stage testing and camera triggering Software:
- User friendly, intuitive and reliable Windows® software developed using LabVIEW™
- Specifically written to meet AASHTO and ASTM standards
- The user interface can be translated into the user's preferred language – please inquire
- Stored test data can be analyzed and compared with other test data utilizing Excel
- Utilities are included for curve fitting of acquired data; testing of system's inputs and outputs; phase correction and a transducer database for storing calibration factors

Stand-alone, 4-Pt. Machine, 110/220V 50/60Hz HA-5400.3F



Ship wt. 79 lbs. (36kg)

| Specifications | |
|--------------------------------|---|
| Force Transducer | 2248lbf (10kN) |
| Specimen Transducer Range | ± 0.04" (1mm) |
| Actuator Stroke | 0.4" (10mm) |
| Frequency | 0.1 to 30 Hz |
| Electrical Supply | 110/220V 50/60Hz, 1 Ph |
| Compressed Air | 7-10 bar (100-145psi @ 21cfm (600 lpm) |
| Test Frame Dimensions | 18" x 7.5" x 22.5" (440 x 190 x 570mm) |
| Data Acquisition Enclosure | 15" x 11" x 5.5" (360 x 280 x 140mm) |
| Working Space Required (WxDxH) | 32.5" x 65" x 83" (826 x 1650 x 2100mm) |
| Desktop PC | Included |

| Accessories | Model |
|---|-----------|
| Dummy PVC beam 2" x 2" x 15" (50 x 50 x 380 mm) | HA-5400.1 |
| Cabinet, temperature-controlled | HA-5400.3 |





LABORATORY

| | |
|---|---------|
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| Model | HT-4795 | HT-4796 & HT-4796-2 | HT-4797 | HT-4798 |
|-----------------------|--|--|--|--|
| Type | Pt100 Platinum Precision, hand-held calibration thermometer | Pt100 Platinum Precision, hand-held thermometer | Dual Channel- Thermocouple High-Precision Digital Thermometer | Single Channel- Thermocouple High-Precision Digital Thermometer |
| Features | High Precision Accuracy, 2-channel measurement, Max./Min., USB Interface, Data Logger function for up to 6000 measurements | USB interface; High measuring accuracy; Integrated calibration function for simple compensation of sensor tolerances; Measuring channels are freely assignable; Recording maximum, minimum, hold and average values; Integrated sensor holder for one hand operation | | |
| Probe | order probes separately | order probes separately | order probes separately | order probes separately |
| Range | -328° to 1562°F -200° to +850°C | -328° to 1562°F -200° to +850°C | -200°C to +1760°C | -200°C to +1760°C |
| Resolution | 0.001°C from -200°C to +200°C remaining range 0.01°C | 0.01°C from -200°C to +200°C remaining range 0.1°C | 0.1°C & °F | 0.1°C & °F |
| Accuracy (Type K) | ±0.015°C from -50°C to +199.99°C ±0.025% of reading for the remaining range | ±0.03°C from -50°C to +199.99°C ±0.05% from -200°C to +200°C otherwise 0.05% of reading | ±0.2°C from -40°C to +200°C ±0.5°C from +201°C to +1000°C otherwise 1.0°C | ±0.2°C from -40°C to +200°C ±0.5°C from +201°C to +1000°C otherwise 1.0°C |
| Power | 9v battery | | | |
| Traceable Certificate | NIST Traceable Certificate available, please inquire. | | | |

Thermometer, High-Precision, Calibration

The HT-4795 precision hand-held thermometer is a 2-channel instrument that has a resolution of 0.001°C with a system accuracy of $\pm 0.015\text{K}$. It provides an excellent calibration reference for your other thermometers or operations requiring highly accurate readings. Simultaneous display of two measured values or differential. Records minimum, maximum, hold and average values. Integrated calibration function (according to EN60751 up to 14 points) Password-protected calibration function. Optional DE-Graph Windows Software for graphic and tabular documentation.

Thermocouple probe not included.

Thermometer, High-Precision HT-4795
Thermometer, High-Precision, 3 Pt. Cal. HT-4795C
Ship wt. 1.3lbs. (0.6kg)

Probes and Software for HT-4795, HT-4796 and HT-4796-2

| Range | Length x Dia. | Model |
|-----------------------------|---------------|-----------|
| -200 to +450°C & F | 230 x 3mm | HT-4795.1 |
| -200 to +450°C & F | 300 x 3mm | HT-4795.2 |
| -200 to +450°C & F | 150 x 3mm | HT-4795.3 |
| Smartgraph Windows Software | | HT-4795SW |
| USB Data Cable | | HT-4795UB |

Thermometer, Precision, Calibration

The HT-4796 and HT-4796-2 Hand-held Thermometers are high-precision, metrology-grade, NIST-traceable instruments. These high-accuracy thermometers are used when temperature measurement is critical and/or when online documentation is required. The HT-4796 and HT-4796-2 can also be used as a NIST Standard to verify and calibrate routinely used instruments. Optional Smartgraph Windows Software for graphic and tabular documentation. Features include: High-accuracy; USB interface; Records maximum, minimum, hold and average values, Measuring channels are freely assignable and integrated sensor holder for one hand operation

Thermocouple probe not included.

Thermometer, Precision, 1-channel HT-4796
Thermometer, Precision, 1 Ch.- 3 Pt. Cal. HT-4796C
Thermometer, Precision, 2-channels HT-4796-2
Thermometer, Precision, 2 Ch.- 3 Pt. Cal. HT-4796-2C
Ship wt. 2lbs. (0.9kg)

Probes for HT-4797 and HT-4798

| Range | Length x Dia. | Model |
|--|---------------|-----------|
| Probe Adapter for K – Mini Connector | | HT-4797.4 |
| K-Thermocouple Steel braided -40/480°C | 6000mm | HT-4797.1 |
| K- Immersion Probe -100 to +1100°C &F | 300 x 3mm | HT-4797.2 |

Thermometer, Precision

The HT-4797 and HT-4798 Digital Thermocouple Thermometers are an economically-priced solution for precision measurements of a wide range of temperature measuring needs. By using thermocouple types J, K, L, N, T a range of -200°C to +1370°C (-328°F to 2498°F) can be obtained. These instruments can be used in a wide variety of applications. Features include: USB interface; High measuring accuracy; Integrated calibration function for simple compensation of sensor tolerances; Measuring channels are freely assignable, Recording maximum, minimum, hold and average values and Integrated sensor holder for one hand operation.

Thermocouple probe not included.

Thermometer, Precision, 1-channel HT-4797
Thermometer, Precision, 3 Pt. Cal. HT-4797C
Thermometer, Precision, 2-channels HT-4798
Thermometer, Precision, 3 Pt. Cal. HT-4798C
Ship wt. 2lbs. (0.9kg)



HT-4510
HT-4511



HT-4505
HT-4506



HT-4015



HT-4500
HT-4501

| Model | HT-4510 & HT-4511 | HT-4505 & HT-4506 | HT-4015 | HT-4500 & HT-4501 |
|-----------------------|---|--|---|---|
| Type | Pt100 Platinum Precision, hand-held calibration thermometer | Pt100 RTD Platinum Precision, hand-held thermometer | Single Channel- Thermocouple High-Precision Digital Thermometer | Dual Channel- Thermocouple High-Precision Digital Thermometer |
| Features | High Precision Accuracy, 1 or 2-channel models, Max./Min./Avg., temp. hold function, Data Logger function for up to 6000 measurements | CT-3705DIG — w/memory CT-3706DIG — w/data logger Auto-lock connector, Max./Min. dual-display, data hold, power off | Memories, alarms, timer and min/max capabilities, backlit display, protective casing with flip-out Stand, °F and °C switchable, 0.625" high digits, hold button | MAX, MIN, HOLD, AVG functions 1-point-CAL-function USB Interface Memory: 20 Measurements Single and Dual Probe Models |
| Probe | includes Pt100 Insertion probe | includes precision Pt100 probe | 4', fast-response beaded probe, uses all type K probes | order probes separately |
| Range | -100°C to 300°C | -148 to 752°F (-100 to 400°C) | -328 to 2498°F -200 to 1370°C | -200°C to 1370°C |
| Resolution | 0.1°C, 0.1°F | 0.02°F, (0.01°C) | 0.1°/1° | 0.1°C from -99.9°C to 399.9°C, otherwise 1°C |
| Accuracy (Type K) | ±0.4°C (instrument only) | ±0.05% reading + .02°F (±0.05% reading + .01°C) | ±1°C from -50° to 740°C (-328 to 1364°F) otherwise ±2°C | ±0.5°C (instrument only) |
| Power | (3) AAA batteries | 9v battery | (3) AAA batteries | (2) AA batteries |
| Traceable Certificate | Yes, included | NIST Traceable Certificate available, please inquire. | Yes, included | NIST Traceable Certificate available, please inquire. |

Thermometer, Pt100 Platinum, Digital

The HT-4510 & HT-4511 Single and Dual-Probe Precision RTD Digital Thermometers can be used as a Laboratory Temperature Standard, for the verification and calibration of liquid-in-glass, digital and dial bi-metal thermometers. They can also be used to calibrate laboratory instruments such as freezers, refrigerators, incubators, ovens, etc. These precision Pt100 platinum thermometers meet EN 60751 standards and are traceable to NIST Standards, being furnished with a certificate of accuracy. The HT-4510 and HT-4511 are loaded with the features requested by most laboratories. Both models include Pt 100 Insertion probes. Battery life is approximately 100 hours.

Thermometer, Single, Pt100 Platinum HT-4510
Thermometer, Dual, Pt100 Platinum HT-4511



Ship wt. 2lbs. (0.9kg)

Probe for HT-4510 and HT-4511

| Description | Model |
|-------------|-----------|
| Pt100 Probe | HT-4510.1 |

Thermometer, "Supra" Precision Pt100 Platinum

The HT-4505 & HT-4506 are very accurate temperature measuring systems. With the accuracy of 0.1 °C and resolution of 0.01°C, these thermometers will fulfill the most critical measuring requirements in your lab. Both units include a Platinum temperature-measurement resistor (Pt 100/4-line type) 9" probe with 5" handle and 24" cable. Both units also provide a dual-display; data-hold function; max/min function; auto-lock connector and a large backlight LCD display.

The standard CT375DIG model includes: a Precision Pt-100 Probe, 9V Battery, Instruction Manual and Carry Case. The CT376DIG data logger model includes these same items, plus Windows software and a USB cable.

Thermometer, Standard, Pt100 Platinum HT-4505
Thermometer, Data Logger, Pt100 Platinum HT-4506



Ship wt. 2lbs. (0.9kg)

Accessories for HT-4505 and HT-4506

| Description | Model |
|-----------------------|-----------|
| Pt100 Insertion Probe | HT-4505.1 |
| Pt100 Immersion Probe | HT-4505.2 |
| RS-232 Cable | HT-4505.3 |
| AC Adapter | HT-4505.4 |

Thermometer, Total Range, Traceable

One of the fastest reading and technically advanced thermometers available. Unit is constructed for rugged applications and provides the use of all type-K probes. It also provides min/max capabilities, a 24-hour timer, alarms and a memory function.

Thermometer, Total Range, Traceable HT-4015
Ship wt. 1.3lbs. (0.6kg)

Thermometer, Type-K Precision Thermocouple

Handy, Robust temperature instrument with K-Type thermocouple inputs. Min/Max and Hold function. Stores 20 Measurements in Memory. 1-point CAL function and USB interface. AA battery with 160hr, life. Single and Dual-thermocouple models. Order probes separately.

Thermometer, Type K, Precision, Single HT-4500
Thermometer, Type K, Precision, Double HT-4501
Ship wt. 1.3lbs. (0.6kg)

Accessories for HT-4500 and HT-4501

| Description | Model |
|------------------------------------|-----------|
| K-Therm. Steel braided, -40/250°C | HT-4500.1 |
| K-Therm. Steel braided, -100/400°C | HT-4500.2 |
| Carry/Storage Case | HT-4500.3 |
| DE-Graph Windows Software | HT-4500.4 |



HT-4507 HT-4508



H-3558D



H-3564

| Model | HT-4507 & HT-4508 | HT-4509 | H-3558D | H-3564 |
|--------------------------|--|--|---|--|
| Type | 2 Channel, K-type 4 Channel, K-type thermometer data logger | 1 Channel,RTD Platinum Thermometer | Dual input, digital thermometer kit | Dual input, digital thermometer kit |
| Features | Auto Power Off, USB Interface Windows Software, Data Logger 16,000 Records Records Minimum / Maximum Temperature Hold Function | Auto Power Off, USB Interface Windows Software, Data Logger 16,000 Records Records Minimum / Maximum Temperature Hold Function | (1) Standard K-Probe, Push Button Operation, °F/°C Selectable, Min/Max temperature display, hold function | (2) SureGrip Piercing Probes, (4) bead probes and Case |
| Probe | Type-K | Platinum RTD stainless-steel | Type-K | Type-K, J, T, E |
| Range | -200/1370°C | -100 to 300°C (-148 to 572°F) | -58 to 2000°F -50 to 1093°C | -58 to 2000°F -50 to 1093°C |
| Resolution | 0.1°C (0.1°F) | 0.01°C (0.01°F) | 1°F/°C | 0.1 °C/°F/K <1000 and 1 °C/°F/K >1000 |
| Accuracy (Type K) | ±0.1%+0.7°C (±0.1%+1.4°F) | ± (0.1% + 0.2°C) below 200°C, ± (0.15% + 0.5°C) | ±0.3% +2°F (1°C) from 32 to 2000°F (1093°C) ±4°F (2°C) from -58 to 32°F (-50 to 0°C) | above -100°C: J, K, T, E-type: 0.05% below -100°C: ± 0.3°C |
| Stem Length | — | 5.9" probe, 0.1" dia. | Various | Various |
| Power | 1 x 9v battery | (4) AA batteries | (3) AA batteries or optional AC adapter | (3) AA batteries |
| Traceable Certificate | — | included | order: H-3558D-C | order: H-3564C |

Precision, Handheld, K-Type Data Loggers

Precision handheld thermocouple data logger are designed for advanced applications which require accurate temperature data collection over a period of time. The control interface is designed in a very intuitive way so that the user can locate the function by just looking at the panel. A real-time clock, providing your data with a time stamp so that every record can be traced back to the time the event occurred.

Windows Software is included that not only is used to transfer the recorded data, but also provides a virtual panel in the window to fully control the test.

Both models include: Calibration Certificate, Carrying Case, USB Cable, Windows Software, Instruction Manual, 1 9v Battery

2-Channel, Thermometer Data Logger HT-4507
4-Channel, Thermometer Data Logger HT-4508



Ship wt. 1.4lbs. (.63kg)



NOTES

See Probes and Accessories
on page 320.

Precision RTD Platinum Thermometer

High-precision thermometer is geared specifically for measuring temperatures in soil, ovens, gas systems, water baths, wastewater, incubators, chemical solutions, petroleum products, and extremely cold conditions. Innovative 0.01° resolution digital thermometer developed specifically for lab and plant use is the finest-performing RTD Platinum Thermometer ever designed. Accuracy of ± (0.1% + 0.2°C) below 200°C, ± (0.15% + 0.5°C) otherwise makes it ideal for experimental requirement. Ease of use makes it perfect for routine quality-control needs. One-button operation allows everyone in the lab to report identical readings and eliminates operator technique errors.

- Min/Max reading display
- Hold function to freeze current reading
- Countdown time function included
- Programmable high temperature alarm threshold

Precision RTD Platinum Thermometer HT4509
Ship wt. 1.4lbs. (.63kg)



Thermometer Kit, Digital, Hand-held

Heavy-duty design with 3.5"-digit LCD display. Range from -58 to 2000°F (-50 to 1093°C). Resolution is 1° F/°C. Accuracy is ±0.3% +2°F (1°C) from 32 to 2000°F (1093°C) and ±4°F (2°C) from -58 to 32°F (-50 to 0°C). Dual-input jacks for K thermocouples allow operator to monitor two locations. Other features include hold button, max temperature display and max memory. Supplied complete with removable rubber boot and one type-K 3.5" (89mm) stainless steel probe w/handle and 2 K wire probes.

Thermometer Kit, Digital, Hand-held H-3558D
Ship wt. 1.4lbs. (.63kg)

Thermometer Kit, Digital, Hand-held

Laboratory accuracy and fast response in a rugged dual-input contact thermometer. Operating range: -58 to 2000°F (-50 to 1093°C). Kit includes the Fluke 52II thermometer, (4) general purpose bead probes and (2) SureGrip™ piercing probes and a case. Can use K, J, T and E probes.

Thermometer Kit, Digital, Hand-held H-3564
Ship wt. 4.6lbs. (2.1kg)





| Model | H-3590 | H-3591 | H-3597A | H-3593A | H-3599 | H-3595A |
|--------------------------|---|---------------------------------------|---|--|---|--|
| Type | Infrared | Infrared | Infrared | Infrared | Infrared | Infrared |
| Probe | none | none | none | none | One type-K | none |
| Range | -25 to 999°F (-320 to 535°C) | -58 to 1832°F (-50 to 1000°C) | -76°F to 1832°F, -60°C to 1000°C | -58 to 1022°F (-50 to 550°C) | IR gun: -76 to 932°F (-60 to 500°C) probe: -76 to 1999°F (-60 to 1400°C) | -20 to 932°F -30 to 500°C |
| Accuracy | The greater of: ±1% of reading or ±2°F (±1°C), at 73°F (23°C) ambient temp. | 0.1° to 200°C | The greater of: ±1.5% of reading or ±2.7°F (±1.5°C), at 73°F (23°C) ambient temp. | 15-35°C: ±1°C, full range: ±2%, 2°C | IR: 15-35°C: ±1°C, full range: ±2%, 2°C probe: ±0.8%, 1°C | ±1°C (2°F) from 50°F to 86°F (10°C to 30°C), ±1.5% or ±1.5°C (3°F) |
| Repeatability | ±0.5% of reading or ±2°F (±1°C), whichever is greater | ±1.5% +2°C between -20 to 200°C | ±1.5% of reading -76°F to 1832°F (-60°C to 1000°C) | 0.15°C at 25°C, 0.75°C at 80°C | 0.15°C at 25°C, 0.75°C at 80°C | ±0.5% of reading or < ±1°C (±2°F) whichever is greater |
| Optics Target Size | 12:1 1" target dia. at 12" | 50:1 1" target dia. at 50" | 50:1 1" target dia. at 50" Dual-Laser shows target | 12:1 1" target dia. at 12" | 11:1 1" target dia. at 11" | 10:1 1" target dia. at 10" |
| Traceable Certificate | order: H-3590C | included | order: H-3597C | order: H-3593C | order: H-3599C | order: H-3595AC |
| Power | 9 volt | 9 volt | (2) AAA | 9 volt | AAA | 9 volt |

Thermometer, IR Gun, Heavy-Duty

Hand held and portable, the H-3590 infrared thermometer stand up to the day-to-day usage professionals require of their equipment. Feature backlit LCD and extra bright laser pointer, making it more visible in all conditions, especially outdoors. Includes tripod mount, display hold (7 seconds) and is switchable between °F and °C. Uses 9V alkaline or NiCd battery, included.

Thermometer, Wide-range Memory **H-3590**
 Ship wt. 3lbs. (1.4kg)

Thermometer, Wide-Range IR Gun, Traceable

Hand-held and portable, the H-3591 features 50:1 optics and a range of -58 to 1832°F (-50 to 1000°C). This thermometer features a traceable calibration certificate, back-lighting at the touch of a button, data hold, low battery indicator and °C/°F button.

Thermometer, Wide-Range IR Gun **H-3591**
 Ship wt. 4lbs. (1.8kg)

Thermometer, Pro IR Gun, Infrared

The professional IR thermometer is packed full of the features you need to make accurate infrared measurements. The H-3597A shows you exactly the size of your target every time. Its unique dual laser design highlights the outer edges of your target eliminating any guesswork or calculations. With a 50:1 target ratio you can be confident from long distance. It includes data functions like min, max, lock, and hi/low alarms. Includes ABS carrying case and two AAA batteries.

Thermometer, Pro IR Gun, Infrared **H-3597A**
 Ship wt. 3lbs. (1.4kg)

Thermometer, IR Gun, Infrared

Point and shoot simplicity. IR gun with high-quality 12:1 optics and laser pointer. Reads °C or °F.

Thermometer, Wide-range Memory **H-3593A**
 Ship wt. 1.2lbs. (.54kg)

Thermometer, IR Gun, K Thermocouple Combo

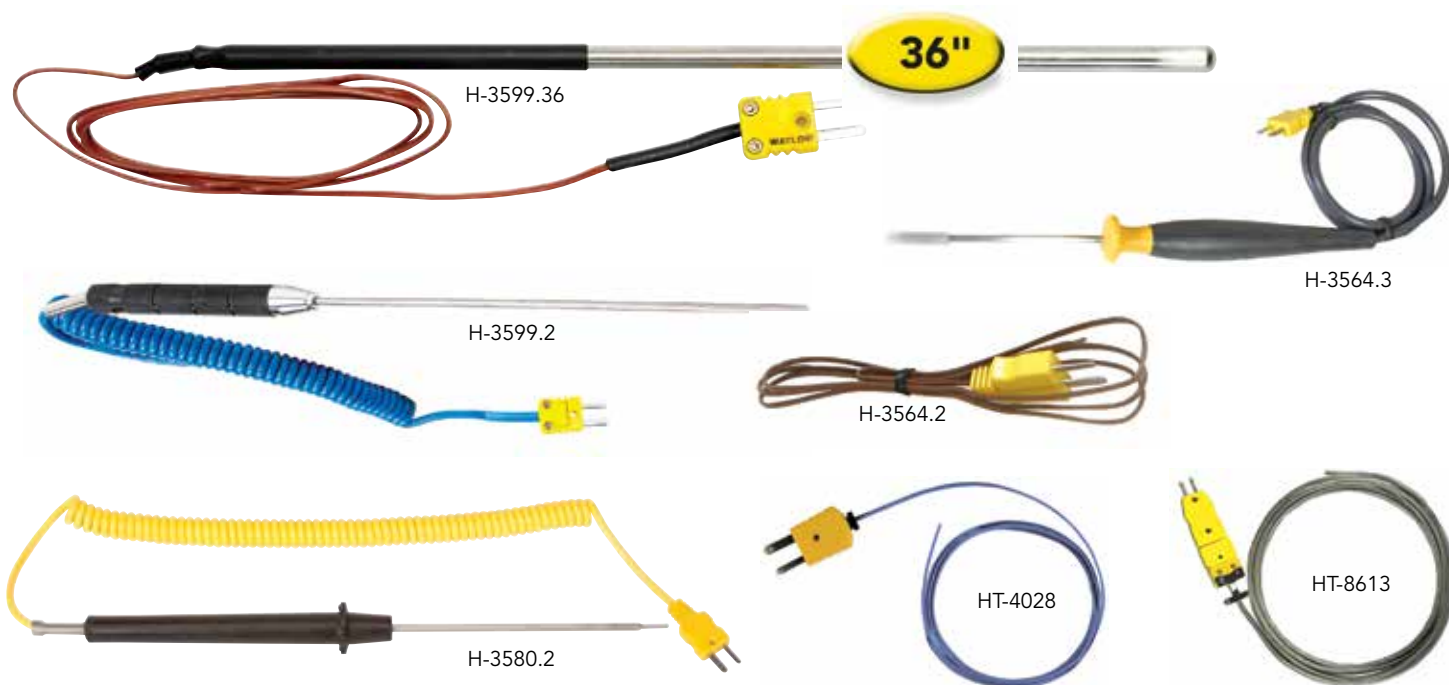
Infrared and type K thermocouple combo gun. High-quality 11:1 optics with laser pointer. Fast response type-K probe is included. You also get max, min, hold, diff, avg, hi/low alarm, backlit display and a °C/°F button.

IR Gun, K Thermocouple Combo **H-3599**
 Ship wt. 1.9lbs. (.86kg)

Thermometer, Mini-Laser IR Gun, Infrared

Pocket size, high-quality infrared gun with high-quality 10:1 optics and laser pointer. Operation is simple—aim, press trigger and read the backlit display. Reads °C or °F and has ergonomic grip handle. Uses 9V alkaline or NiCd battery, included.

Thermometer, Mini-Laser IR Gun **H-3595A**
 Ship wt. 1.3lbs. (.59kg)

**K-Probe, 8"**

Eight inch long, K thermocouple with 4.5" metal handle and 40" long coiled cable. Item is standard probe sold with H-3599 IR gun. Temperature range is: -76°F to 1999°F (-60°C to 1400°C). Accuracy is: $\pm 0.8\%$, 1°C. Compatible with K-type measurement instruments.

K-Probe, 8" **H-3599.2**
UPS Ship wt. 1.4lbs. (.64kg)

K-Probe 36"

Three foot long, K thermocouple is great for use in asphalt operations where you desire to know material temperatures in hoppers, trucks, piles, etc. Temperature range is: -30 to 1600°F. Heavy-duty .250 dia. probe, 36" long with spring transition and 40" of lead wire with mini, type-K plug.

K-Probe, 36" **H-3599.36**
UPS Ship wt. 2lbs. (.91kg)

K-Probes

K thermocouples are great for use in asphalt operations where you desire to know material temperatures in hoppers, trucks, piles, etc. Temperature range is: -30 to 1600°F. Heavy-duty .250 dia. probe, 36" long with spring transition and 40" of lead wire with mini, type-K plug.

K-Probe, 12" **H-3599.12**
K-Probe, 24" **H-3599.24**
UPS Ship wt. 2lbs. (.91kg)

K-Probe 5"

ASTM-E230-1993

5" stainless steel probe with 5 ft. PVC coiled cable and Nylon handle. Measurement range: -418 to 1650°F (-250 to 899°C). Compatible with K-type measurement instruments.

K-Probe 5" **H-3580.2**
UPS Ship wt. 1lbs. (.45kg)

K-Probe 4"

ASTM-E230-1993

4" stainless steel probe with 40" (1m) cable. Measurement range: -40 to 662°F (-40 to 350°C). Accuracy is $\pm 3.96^\circ\text{F}$ (2.2°C). Compatible with K-type measurement instruments.

K-Probe 4" **H-3564.3**
UPS Ship wt. 1.2lbs. (.54kg)

Bead Probe

40" (1m) wire length with maximum continuous temperature measurement: 500°F (260°C). Accuracy is: $\pm 1.1^\circ\text{C}$ (0-260°C). Fast response time. Not suitable for liquid immersion. Compatible with K-type measurement instruments.

Bead Probe **H-3564.2**
UPS Ship wt. 0.7lbs. (.32kg)

Bead Probe, Fast Response

Fast-Response, Type-K thermocouple, beaded probe. PTFE cable can withstand temperatures of -40 to 250°C continuous or 300°C short-term use. Dimensions: 0.06-inch diameter probe with cable length of 4 feet for use with all type-K thermometers in liquids, air/gas, and semisolids.

Bead Probe, Fast Response **HT-4028**
UPS Ship wt. 0.2lbs. (.009kg)

High-Temperature Probe

Ten-foot-long 0.19-inch diameter braided metal wire cable with smooth tip measures -73 to 982°C continuous or 1093°C short-term use. For use with all type-K thermometers in liquids, air/gas, and semisolids

High-Temperature Probe **HT-8613**
UPS Ship wt. 0.6lbs. (.27kg)

**Immersion Probes for (page 316)
HT-4797 & HT-4798**

| Range | Length x Dia. | Model |
|-----------------------------------|---------------|-----------|
| -40 to +752°F -40 to +400°C | 120 x 3mm | HT-4798.1 |
| -148 to +2012°F 100 to +1100°C | 300 x 1.5mm | HT-4798.2 |
| -148 to +2012°F 100 to +1100°C | 300 x 3mm | HT-4798.3 |

Pt100 Platinum Immersion Probes for HT-4794

| Range | Length x Dia. | Model |
|------------------------------|---------------|-----------|
| -58 to 662°F -50 to 350°C | 150mm x 3mm | HT-4794.1 |
| -58 to 662°F -50 to 350°C | 150mm x 3mm | HT-4794.2 |
| -58 to 662°F 50 to 350°C | 300mm x 3mm | HT-4794.3 |

**NOTES**

Use HT-4797.4 Thermocouple Adapter for attaching standard K-type probes to these thermometers.



H-2727D



H-3543



H-3560D



H-3561



HT-4105

HT-4142
HT-4143

H-3557D

Temperature/Humidity Instrument- Min/Max

The H-2727D measures both temperature and % relative humidity. It features min/max memory and switchable °F/°C. Temperature range is: 14° to 140°F / -10° to 60°C at $\pm 2^\circ\text{F}$ / $\pm 1^\circ\text{C}$ accuracy and 0.1°F/°C resolution. Measures 10 to 99% relative humidity at a resolution of 1.0% RH. Includes min/max memory capability. Uses (1) AAA battery.

Temperature/Humidity, Min/Max **H-2727D**
 Ship wt. 0.8lbs. (.36kg)

Minimum/Maximum Thermometer

Wall or desk-mount minimum/maximum thermometer with remote sensor. Sensor range is -58° to 158°F (-50° to 70°C). Switchable between °F and °C. Indoor/outdoor capabilities: outdoor temperature range: -58 to 158°F (-50 to 70°C) Indoor temperature range: 32 to 122°F (0 to 50°C), temperature accuracy: $\pm 2^\circ\text{F}/\pm 1^\circ\text{C}$, sensor cord length: 120" (304cm). Battery: 1 alkaline 1.5V, AAA.

Minimum/Maximum Thermometer **H-3543**
 Ship wt. 1.6lbs. (.72kg)

Maximum and Minimum Thermometer

Dual-scale thermometer has u-shaped capillary mounted in plastic 8" x 2.625" x 1" (203 x 67 x 25mm) with guard and mounting tab. Ranges: -20°F to 140°F in 2°F div. and -30°C to 60°C in 1°C div. thermometer indicates present, highest and lowest temperature since last indices setting. Indices are easily reset after each reading.

Maximum and Minimum Thermometer **H-3560D**
 Ship wt. 0.5lbs. (.22kg)

Min/Max Alarm, Digital Bottle Thermometer

Certified bottle thermometer monitors critical temperatures in ovens. Bottle probe filled with sand medium. An audible alarm will sound when the temperature rises above or goes below the set point temperature. Each thermometer serialized and is certified and traceable to NIST Thermometer probe is housed in an unbreakable plastic bottle filled with a buffering media, which maintains the thermometer reading when the instrument door is opened.

- Accuracy $\pm 0.5^\circ\text{C}$ and Resolution of 0.1°C
- °C and °F switchable
- Display size is 48mm x 21mm
- Thermometer size is 73mm x 52mm x 15mm

Min/Max, Digital Bottle Thermometer **H-3561**
 Ship wt. 1.6lbs. (.72kg)

Digital Indoor/Outdoor Thermometer °F

Thermometer displays current, minimum, and maximum temperatures. Most importantly, it captures and shows the exact time and date when the minimum and maximum temperature occurred. Ideal for monitoring solutions, refrigerators, and room temperature. Range is -40.0 to 176.0°F and -40.0 to 80.0°C with a resolution of 0.5° and accuracy of $\pm 1.5^\circ\text{C}$. Display's 0.375"-high digits show min/max of probe temperature or ambient temperature, time-of-day, and month/day. Wire mounting bracket permits easy probe placement. Sensor and 6-foot cable perform accurately even when both are under water. Comes with traceable certificate of calibration.

Digital In/Out Thermometer °F **HT-4105**
 Ship wt. 0.8lbs. (.36kg)

Big Digit, Alarm Thermometer, Traceable

Large, 1.125" high digits display probe temperatures and ambient temperatures, which can be seen from across a lab. This unique four-alert thermometer provides precise monitoring of even the slightest changes in temperature. Range is: -58 to 158°F or -50 to 70°C with a resolution of 0.1° and an accuracy of $\pm 1^\circ\text{C}$. Front panel controls are easy-to-set. Alarms can be set to activate at a temperature above, or below a setting or, between or outside two settings. Comes with traceable certificate of calibration.

Big Digit, Alarm Thermometer °F **HT-4142**
 Big Digit, Alarm Thermometer °C **HT-4143**
 Ship wt. 0.8lbs. (.36kg)

Digital Thermo-Timer

Versatile, 24-hour lab timer for use with ovens, incubators and other environmental chambers. Includes probe with 48" (1.2mm) long cable. Probe may be placed inside oven door for internal chamber temperature monitoring. Monitors and displays temperatures over a 0 to 200°C range at an accuracy of $\pm 2^\circ\text{C}$. Time and temperature functions may be used separately or simultaneously. Alarm sounds when programmed time or temperature high limits are reached. Display shows remaining time/temperature/high limit set points. Magnet permits mounting on side of oven. Uses AAA battery, not included.

Digital Thermo-Timer **H-3557D**
 Ship wt. 1lbs. (.45kg)

Digital Thermo-Timer Probe

Replacement probe for H-3557D thermo-timer.

Digital Thermo-Timer Probe **H-3557D-P**
 Ship wt. 0.2lbs. (.09kg)



| Model No. | Description | Range | Accuracy | Stem Length | Overall | Ship Wt. | Features |
|-----------|--|--------------------------------|------------------|-------------|-------------|--------------------|--|
| HT-4052 | Long-stem, digital thermometer | -58 to 302°F -50 to 150°C | ±2.0°F ±1.0°C | 8" | 11" | 0.8 lb. .36 kg | Traceable calibration certificate |
| HT-4052U | Long-stem, digital thermometer | -58 to 302°F -50 to 150°C | ± 0.2°C | 8" | 11" | 1.6 lb. .72 kg | Traceable calibration certificate |
| HT-4353 | Long-stem, digital thermometer | -58 to 572°F -50 to 300°C | ±2.0°F ±1.0°C | 11.375" | 14.375" | .5 lb. .22 kg | Traceable calibration certificate |
| HT-4353U | Longer-stem, digital thermometer | -58 to 572°F -50 to 300°C | ± 0.5°C | 11.375" | 14.375" | 1.1 lb. .50 kg | Traceable calibration certificate |
| HT-4149 | Long-stem, multi-angle digital thermometer | -58 to 536°F -50 to 280°C | ±2.0°F ±1.0°C | 8" | 10" | 1.0 lb. .45 kg | Traceable calibration certificate |
| HT-4149U | Long-stem, multi-angle digital thermometer | -58 to 536°F -50 to 280°C | ± 0.4°C | 8" | 10" | 0.8 lb. .36 kg | Traceable calibration certificate |
| HT-4050 | Digital, pocket thermometer w/sheath | -58 to 572°F | ± 1.5°C | 3.5" | 7" | 0.45 lb. .20 kg | Traceable calibration certificate, hold button |
| HT-4050U | Digital, pocket thermometer w/sheath | -50 to 300°C | ± 0.4°C | 3.5" | 7" | 0.3 lb. .13 kg | Traceable calibration certificate, hold button |
| HT-4049 | Digital, jumbo display thermometer | -58 to 302°F -50 to 150°C | ±2.0°F ±1.0°C | 5.25" | 6.5" | 0.45 lb. .20 kg | Traceable calibration certificate |
| HT-4049U | Digital, jumbo display thermometer | -58 to 302°F -50 to 150°C | ± 0.3°C | 5.25" | 6.5" | 0.8 lb. .36 kg | Traceable calibration certificate |
| HT-4039 | Digital, waterproof min/max thermometer | -58 to 572°F -50 to 300°C | ±2.0°F ±1.0°C | 4.75" | 10ft. cable | 0.6 lb. .27 kg | Traceable calibration certificate, min/max, waterproof |
| HT-4039U | Digital, waterproof min/max thermometer | -58 to 572°F -50 to 300°C | ± 0.5°C | 4.75" | 10ft. cable | 0.8 lb. .36 kg | Traceable calibration certificate, min/max, waterproof |
| H-3538D | Digital, waterproof calibratable thermometer | -40° to 450°F -40° to 232°C | ±2.0°F ±1.0°C | 5" | 6" | 0.8 lb. .36 kg | Field calibratable waterproof. max temp. |
| H-3541D | Digital, waterproof calibratable thermometer | -40 to 450°F -40 to 232°C | ±2.0°F ±1.0°C | 5" | 6.25" | 0.4 lb. .2 kg | Field calibratable waterproof. max temp. |

**Dial Thermometers, Pocket-Type**

| Model | Description | Range | Divisions | Ship Wt. |
|--------|--|--------------|-----------|--------------------|
| H-2633 | 1" dial, 5" long stem, includes plastic pocket case and clip. | 25 to 125°F | 1°F | 0.45 lb. .20 kg |
| H-2639 | 1" dial, 5" long stem, includes plastic pocket case and clip. | 50 to 550°F | 5°F | 0.25 lb. .11 kg |
| H-3550 | 1" dial, 5" long stem, includes plastic pocket case w/ calibration tool. | -40 to 180°F | 2°F | 0.2 lb. .09 kg |
| H-3552 | 1" dial, 5" long stem, includes plastic pocket case w/ calibration tool. | 0 to 220°F | 2°F | 0.7 lb. .32 kg |
| H-3553 | 1" dial, 5" long stem, includes plastic pocket case and clip. | 0 to 150°C | 2°C | 0.7 lb. .32 kg |
| H-3554 | 1" dial, 5" long stem, includes plastic pocket case and clip. | 0 to 250°C | 5°C | 0.7 lb. .32 kg |

Stick Thermometers, Pocket-Type

| Model | Description | Range | Divisions | Ship Wt. |
|---------|---|--------------|-----------|--------------------|
| H-3547 | 5" long stem. Non-toxic liquid thermometer. Features copper-plated bulb to resist cutting, includes metal pocket case and clip. | 0 to 120°F | 1°F | 0.2 lb. .09kg |
| H-3542A | 5" long stem. Non-toxic liquid thermometer, includes metal pocket case and clip. | -10 to 110°C | 1°C | 0.7 lb. .32 kg |
| H-3540 | 5" long stem. Large-bore, tempered glass with non-toxic liquid, includes metal pocket case and clip. | 0 to 220°F | 2°F | 0.05 lb. .02 kg |

Thermometers, Dual-Scale General Testing

| Model | Description | Range | Divisions | Ship Wt. |
|---------|---|----------------------------|-------------|-------------------|
| H-2631D | Direct-reading, all-metal dial thermometers for general use include °F and °C scales. Units have bi-metal element that actuates pointer over graduated dial. Stainless steel stem is 8" long x 0.15" (203 x 4mm). Dial face is 1-3/4" (45mm) dia. external adjustment allows recalibration. | 25 to 125°F 0 to 50°C | 1°F .5°C | 0.7 lb. .23 kg |
| H-2632D | | 0 to 220°F -10 to 100°C | 2°F 1°C | |
| H-2634D | | 50 to 500°F 0 to 260°C | 5°F 2°C | |

Thermometers, General Purpose Mercury Fahrenheit

| Model | Range | Div. | Length | Ship Wt. |
|--------|--------------|------|-------------|-------------------|
| H-2611 | -30 to 120°F | 1°F | 12" (305mm) | 1.5 lb. .09 kg |
| H-2613 | 0 to 230°F | 2°F | 12" (305mm) | |
| H-2615 | 0 to 300°F | 2°F | 12" (305mm) | |
| H-2617 | 20 to 500°F | 2°F | 16" (405mm) | |
| H-2619 | 20 to 750°F | 5°F | 16" (405mm) | |

Thermometers, General Purpose Mercury, Celsius

| Model | Range | Div. | Length | Ship Wt. |
|--------|--------------|------|-------------|-------------------|
| H-2612 | -35 to 50°C | 1°C | 305mm (12") | 1.1 lb. .36 kg |
| H-2614 | -20 to 110°C | 1°C | 305mm (12") | |
| H-2616 | -20 to 150°C | 1°C | 305mm (12") | |
| H-2618 | -10 to 260°C | 1°C | 405mm (16") | |
| H-2620 | -10 to 400°C | 2°C | 405mm (16") | |

**CAUTION**

CAUTION Some of these thermometers contain mercury. There are restrictions on their sale and shipment. Please check laws in your area or contact us before ordering. Due to Illinois law, Humboldt must drop-ship these items from New Jersey. Mercury Thermometers require ground shipment in the U.S. International and air shipments ship as Dangerous Goods.



Thermometers, Mercury-Free, Blue-Spirit Certified

These Thermometers are calibrated against NIST standards and comes with a calibration document showing corrections to the nearest tenth of a scale division traceable to NIST. These thermometers meet with all prescribed ASTM requirements. Each incorporates the ice point when not on scale (0 or 32°F) as a reference point enabling the user to validate and update the calibration document to insure accurate temperature measurements over the life of the thermometers.

- Each thermometer is calibrated against NIST Standards
- Certified at 5 temperatures with correction factors
- Traceable calibration document Included
- Blue-Spirit range (-38 to 155°C) or (-36 to 311°F)
- Mercury Range (-38 to 405°C) or (-36 to 761°F)

| Range | Div. | ASTM | Model |
|--------------|-------|------|-------------|
| -36 to 35°F | 0.2°F | S62F | H-2605.62FC |
| -38 to 2°C | 0.1°C | S62C | H-2605.62CC |
| 18 to 89°F | 0.2°F | S63F | H-2605.63FC |
| -8 to 32°C | 0.1°C | S63C | H-2605.63CC |
| 77 to 131°F | 0.2°F | S64F | H-2605.64FC |
| 25 to 55°C | 0.1°C | S64C | H-2605.64CC |
| 122 to 176°F | 0.2°F | S65F | H-2605.65FC |
| 50 to 80°C | 0.1°C | S65C | H-2605.65CC |
| 167 to 221°F | 0.2°F | S66F | H-2605.66FC |
| 75 to 105°C | 0.1°C | S66C | H-2605.66CC |
| 206 to 311°F | 0.5°F | S67F | H-2605.67FC |
| 95 to 155°C | 0.2°C | S67C | H-2605.67CC |

Thermometers, Mercury-Free Certified **See Table**
Ship wt. .8lbs. (0.36kg)

ASTM Thermometers, Mercury-Free, Blue-Spirit

These Thermometers provide a mercury-free alternative to ASTM mercury thermometers. They provide the same performance as a mercury thermometer, but use a blue liquid formula, which is nontoxic non-caustic, nonhazardous and biodegradable; and, meet or exceed the ASTM E2251 specifications for accuracy and tolerance of uncertainty. These thermometers are supplied with a one-point certification in accordance with ASTM E7 standards.

Non-Mercury, ASTM-Approved Precision Thermometers

| Range | Div. | ASTM | Model |
|---------------|-------|------|------------|
| -38 to +2°C | 0.1°C | 62C | H-2605.62C |
| -36 to +35°F | 0.2°F | 62F | H-2605.62F |
| -8 to +32°C | 0.1°C | 63C | H-2605.63C |
| +18 to 89°F | 0.2°F | 63F | H-2605.63F |
| +25 to 55°C | 0.1°C | 64C | H-2605.64C |
| +77 to 131°F | 0.2°F | 64F | H-2605.64F |
| +50 to 80°C | 0.1°C | 65C | H-2605.65C |
| +122 to 176°F | 0.2°F | 65F | H-2605.65F |
| +75 to 105°C | 0.1°C | 66C | H-2605.66C |
| +167 to 221°F | 0.2°F | 66F | H-2605.66F |
| +95 to 155°C | 0.2°C | 67C | H-2605.67C |
| +206 to 311°F | 0.5°F | 67F | H-2605.67F |

Non-Mercury, ASTM-Approved Application Thermometers

| Range | Div. | ASTM | Model |
|----------------|--------|------|-------------|
| -38 to 50°C | 1.0°C | 5C | H-2605.5C |
| -36 to 120°F | 2.0°F | 5F | H-2605.5F |
| -20 to 102°C | 0.2°C | 12C | H-2605.12C |
| -5 to 215°F | 0.5°F | 12F | H-2605.12F |
| -2 to +80°C | 0.1°C | 15C | H-2605.15C |
| 30 to 180°F | 0.5°F | 15F | H-2605.15F |
| 34 to 42°C | 0.1°C | 18C | H-2605.18C |
| 94 to 108°F | 0.2°F | 18F | H-2605.18F |
| 98 to 103°C | 0.1°C | 22C | H-2605.22C |
| 204 to 218°F | 0.2°F | 22F | H-2605.22F |
| 19 to 35°C | 0.02°C | 56C | H-2605.56C |
| 66 to 95°F | 0.05°F | 56F | H-2605.56F |
| -34 to 49°C | 0.5°C | 58C | H-2605.58C |
| -30 to 120°F | 1.0°F | 58F | H-2605.58F |
| -18 to 82°C | 0.5°C | 59C | H-2605.59C |
| 0 to 180°F | 1.0°F | 59F | H-2605.59F |
| 20 to 50°C | 0.1°C | 91C | H-2605.91C |
| 18.9 to 25.1°C | 0.01°C | 116C | H-2605.116C |
| 23.9 to 30.1°C | 0.01°C | 117C | H-2605.117C |
| 38.6 to 41.4°C | 0.05°C | 120C | H-2605.120C |
| -7 to 105°C | 0.5°C | 130C | H-2605.130C |
| 20 to 220°F | 1.0°F | 130F | H-2605.130F |

ASTM Thermometers, Mercury-Free **See Table**
Ship wt. 1.0lbs. (0.36kg)

Thermometers, Mercury-Free, Blue-Spirit

These Thermometers provide a mercury-free alternative to mercury thermometers. They provide the same performance as a mercury thermometer, but use a blue liquid formula, which is nontoxic non-caustic, nonhazardous and biodegradable. These thermometers use many of the same scales as ASTM mercury thermometers, but currently are not ASTM Compliant.

| Range | Div. | Model |
|------------------|-------|-------------|
| -20 to 150°C | 1.0°C | H-2604.1C |
| -38 to 50°C | 1.0°C | H-2604.5C |
| -5 to 110°C | 0.5°C | H-2604.9C |
| +38 to 82°C | 0.1°C | H-2604.14C |
| -2 to 80°C | 0.2°C | H-2604.15C |
| +30 to 200°C | 0.2°C | H-2604.16C |
| +19 to 27°C | 1.0°C | H-2604.17C |
| +49 to 57°C | 0.1°C | H-2604.19C |
| +57 to 65°C | 0.1°C | H-2604.20C |
| +79 to 87°C | 0.1°C | H-2604.21C |
| -38 to 42°C | 0.2°C | H-2604.33C |
| +25 to 105°C | 0.2°C | H-2604.34C |
| -20 to 50°C | 0.5°C | H-2604.57C |
| -1 to 175°C | 0.5°C | H-2604.113C |
| 0 to 302°F | 2.0°F | H-2604.1F |
| -36 to 120°F | 2.0°F | H-2604.5F |
| +20 to 230°F | 1.0°F | H-2604.9F |
| +30 to 180°F | 0.5°F | H-2604.15F |
| +66 to 80°F | 1.0°F | H-2604.16F |
| +60 to 160°F | 0.2°F | H-2604.17F |
| +120 to 134°F | 0.2°F | H-2604.19F |
| +134 to 148°F | 0.2°F | H-2604.20F |
| -36.5 to 107.5°F | 0.5°F | H-2604.33F |
| -4 to 122°F | 1.0°F | H-2604.57F |
| +30 to 350°F | 1.0°F | H-2604.113F |

Thermometers, Mercury-Free **See Table**
Ship wt. 0.8lbs. (0.36kg)

Custom Calibration Thermometers

Thermometers are available calibrated to any three (3) points up to 300°F. Please contact us at 1.800.544.7220 or 1.708.468.6300.

Cases for Thermometers

Leatherette protective cases are available for all thermometers. To order, please add a "C" suffix after the main model number, i.e.: H-2605C.5C.

PTFE-coated thermometers, which minimize breakage hazards and improve safe handling, are available. See PTFE coated column in table.

**CAUTION**

CAUTION These thermometers contain mercury. There are restrictions on their sale and shipment. Please check laws in your area or contact us before ordering. Due to Illinois law, Humboldt must drop-ship these items from New Jersey. Mercury Thermometers require ground shipment in the U.S. International and air shipments ship as Dangerous Goods.

| Application | ASTM | Range | Model | PTFE Coated | Subdiv. | Length | Immer- sion |
|------------------------------|------|---------------|-------------|--------------|----------------|------------------|-----------------|
| General use | 1F | 0-302°F | H-2600.1F | H-2600.1FT | 2.0°F 1.0°C | 12.5" 322mm | 3" 76mm |
| | 1C | -20-150°C | H-2610.1C | H-2610.1CT | | | |
| | 2F | 20-580°F | H-2600.2F | H-2600.2FT | | 15.325" 390mm | |
| | 2C | -5-300°C | H-2610.2C | H-2610.2CT | | | |
| | 3F | 20-760°F | H-2600.3F | H-2600.3FT | | 16.25" 413mm | |
| | 3C | -5-400°C | H-2610.3C | H-2610.3CT | | | |
| Cloud and pour | 5F | -36-120°F | H-2600.5F | H-2600.5FT | 2.0°F 1.0°C | 9.125" 231mm | 4.25" 108mm) |
| | 5C | -38-50°C | H-2610.5C | H-2610.5CT | | | |
| Low cloud and pour | 6F | -112-70°F | H-2600.6F | H-2600.6FT | 2.0°F 1.0°C | 9.125" 231mm | 3" 76mm |
| | 6C | -80-20°C | H-2610.6C | H-2610.6CT | | | |
| Low distillation | 7F | 30-580°F | H-2600.7F | H-2600.7FT | 2.0°F 1.0°C | 15.25" 386mm | Total |
| | 7C | -2-300°C | H-2610.7C | H-2610.7CT | | | |
| High distillation | 8F | 30-760°F | H-2600.8F | H-2600.8FT | 2.0°F 1.0°C | 15.25" 386mm | Total |
| | 8C | -2-400°C | H-2610.8C | H-2610.8CT | | | |
| Pesky-martens low | 9F | 20-230°C | H-2600.9F | H-2600.9FT | 1.0°F .5°C | 11.25" 287mm | 2.25" 57mm |
| | 9C | -5-110°C | H-2610.9C | H-2610.9CT | | | |
| Pesky-martens high | 10F | 200-700°F | H-2600.10F | H-2600.10FT | 5.0°F 2.0°C | 11.25" 287mm | 2.25" 57mm |
| | 10C | 90-370°C | H-2610.10C | H-2610.10CT | | | |
| Cleveland open flash | 11F | 20-760°F | H-2600.11F | H-2600.11FT | 5.0°F 2.0°C | 12.125" 308mm | 1" 25mm |
| | 11C | -6-400°C | H-2610.11C | H-2610.11CT | | | |
| Gravity | 12F | -5-215°F | H-2600.12F | H-2600.12FT | 0.5°F 0.2°C | 16.5" 420mm | total |
| | 12C | -20-102°C | H-2610.12C | H-2610.12CT | | | |
| Low softening point | 15F | 30-180°F | H-2600.15F | H-2600.15FT | 0.5°F 0.2°C | 15.625" 397mm | total |
| | 15C | -2-80°C | H-2610.15C | H-2610.15CT | | | |
| High softening point | 16F | 85-392°F | H-2600.16F | H-2600.16FT | 1.0°F .5°C | 15.625" 397mm | total |
| | 16C | 30-200°C | H-2610.16C | H-2610.16CT | | | |
| Saybolt viscosity | 17F | 66-80°F | H-2600.17F | H-2600.17FT | 0.2°F 0.1°C | 10.875" 275mm | total |
| | 17C | 19-27°C | H-2610.17C | H-2610.17CT | | | |
| | 18F | 94-108°F | H-2600.18F | H-2600.18FT | | | |
| | 18C | 34-42°C | H-2610.18C | H-2610.18CT | | | |
| | 19F | 120-134°F | H-2600.19F | H-2600.19FT | | | |
| | 19C | 49-57°C | H-2610.19C | H-2610.19CT | | | |
| | 20F | 134-148°F | H-2600.20F | H-2600.20FT | | | |
| | 20C | 57-65°C | H-2610.20C | H-2610.20CT | | | |
| | 21C | 79-87°C | H-2610.21C | H-2610.21CT | | | |
| | 22F | 204-218°F | H-2600.22F | H-2600.22FT | | | |
| Kinematic viscosity | 22C | 95-103°C | H-2610.22C | H-2610.22CT | | | |
| | 28F | 97.5-102.5°F | H-2600.28F | H-2600.28FT | 0.1°F 0.2°C | 12" 305mm | total |
| Aniline point | 28C | 36.6-39.4°C | H-2610.28C | H-2610.28CT | | | |
| | 33F | -36.5-107.5°F | H-2600.33F | H-2600.33FT | | | |
| Kinematic viscosity | 33C | -38-42°C | H-2610.33C | H-2610.33CT | 0.5°F 0.2°C | 16.5" 419mm | 2" 50mm |
| | 35F | 194-338°F | H-2600.35F | H-2600.35FT | | | |
| | 35C | 90-170°C | H-2610.35C | H-2610.35CT | | | |
| | 45F | 74.5-79.5°F | H-2600.45F | H-2600.45FT | 0.1°F 0.2°C | 12" 305mm | total |
| | 45C | 23.6-26.4°C | H-2610.45C | H-2610.45CT | | | |
| Tag closed tester, low range | 46C | 48.6-51.4°C | H-2610.46C | H-2610.46CT | | | |
| | 47F | 137.5-142.5°F | H-2600.47F | H-2600.47FT | | | |
| Precision | 47C | 58.6-61.4°C | H-2610.47C | H-2610.47CT | | | |
| | 57F | -4-122°F | H-2600.57F | H-2600.57FT | 1.0°F .5°C | 11.25" 287mm | 2.25" 57mm |
| | 57C | -20-50°C | H-2610.57C | H-2610.57CT | | | |
| | 63F | 18-89°F | H-2600.63F | H-2600.63FT | | | |
| Kinematic viscosity | 63C | -8-32°C | H-2610.63C | H-2610.63CT | .2°F .1°C | 15" 379mm | total |
| | 64F | 77-131°F | H-2600.64F | H-2600.64FT | | | |
| | 64C | 25-55°C | H-2610.64C | H-2610.64CT | | | |
| Bituminous softening point | 110F | 272.5-277.5°C | H-2600.110F | H-2600.110FT | .1°F .2°C | 12" 305mm | total |
| | 110C | 133.6-136.4°C | H-2610.110C | H-2610.110CT | | | |
| Bituminous softening point | 113F | 30-350°F | H-2600.113F | H-2600.113FT | 1.0°F .5°C | 16" 406mm | |
| | 113C | -1-175°C | H-2610.113C | H-2610.113CT | | | |

ASTM Thermometers, Mercury

ASTM Mercury Thermometers are made in accordance with specifications of the American Society for Testing and Material. Strict manufacturing procedures and quality controls ensure full compliance to ASTM E-1. These instruments are made from annealed glass and have been extensively aged for minimal scale error and stability. These thermometers were designed for specific testing and can be calibrated to your specific requirements.

ASTM Thermometers, PTFE-Coated

All ASTM Mercury Thermometers are available in PTFE-coated versions to minimize breakage and improve safety. See PTFE Coated column for part numbers.

Mercury Spill Clean-up Kit

For recovery and disposal of spills up to 500g. Includes gloves, two plastic spatulas for cleaning, mercury collector to swab spill, absorbent and activator to absorb mercury, plastic bag for disposal, instructions.

Mercury Spill Clean-up Kit**H-3632SK**

Ship wt. 1.3lbs. (0.58kg)



H-3568



H-4296A



H-3575A



H-4294



H-2260



H-2629



H-4296



HT-5011



H-4292

Bi-metal Oven Thermometer

Thermometer provides a 100 to 600°F (50 to 315°C) range at 25°F divisions. All-metal unit is 2.3" x 3.3" with baked-enamel finish on bezel. Features bi-metal coil movement and glass lens. the thermometer can hang or stand by itself.

Bi-metal Oven Thermometer H-3568
UPS Ship wt. 0.5lbs. (.23kg)

Surface Thermometer

Sensing element comes into direct contact with surface to be measured. Dial readout results from expansion or contraction of bi-metal. Unit is dual-magnet type, 2" (51mm) dia. x 0.5" (13mm) high.

Surface Thermometer, 0-250°F/2°F H-2628
Surface Thermometer, 0-500°F/5°F H-2628H
Surface Thermometer, 0-120°C/1°C H-2629
UPS Ship wt. 0.3lbs. (.13kg)

Digital Timer, Humboldt

Humboldt's portable digital timers automatically shuts off electrical equipment at a set time of up to 60 minutes or 60 seconds. Feature easy-to-use digital interface and two-plug, AC receptacle. The accuracy for both versions is 0.5%.

Digital Timer, Minute, 120V 50/60Hz H-4296A
Digital Timer, Minute, 220V 50/60Hz H-4296A.4F
Digital Timer, Second, 120V 50/60Hz H-4299
Digital Timer, Second, 220V 50/60Hz H-4299.4F
UPS Ship wt. 3.8lbs. (1.7kg)

Timer, Humboldt

The Humboldt universal timer automatically shuts off electrical apparatus at set time of up to 60 minutes. Features two receptacles and a 3-wire cord and plug.

Humboldt Timer, 120V 50/60Hz H-4296
Humboldt Timer, 220V 50/60Hz H-4296.4F
UPS Ship wt. 2.6lbs. (1.17kg)

Digital Timer/Clock, 24-Hour

Electronic digital timer/clock is programmed to sound for one minute when time is up. Unit counts down or up in seconds. LCD displays hours, minutes and seconds. Memory timer allows preset time to be stored. Unit has magnetic back for mounting to metal surfaces and can also clip on or stand on its own. Includes one 1.5 volt battery.

Digital Timer/Clock, 24-Hour H-3575A
UPS Ship wt. 0.7lbs. (0.32kg)

Countdown Timer, Giant Digit

Great for viewing from across a room, easily viewable from 50 ft. with 1.3" high numbers. Three-button intuitive operation eliminates reading instructions. Traceable timer has automatic bounce-back memory for repetitive timing. Timing range is 99 minutes, 59 seconds. Resolution is 1 second, accuracy is 0.01%. Individually, traceable calibration certificate is provided, and comes with easel bench stand and magnetic back for place-anywhere mounting.

Countdown Timer, Giant Digit HT-5011
UPS Ship wt. 0.6lbs. (0.27kg)

Timer, Bell-Type

Economical, manual mechanical timer has 60-minute time range. Signals with clear bell tone at end of set time for manual apparatus shut off.

Timer, Bell-Type H-4294
UPS Ship wt. 0.7lbs. (0.32kg)

Universal Lab Timer

Portable electric timer functions as elapsed-time indicator, interval timer and electrical apparatus on-off timer. Features time range of 60 minutes by minutes and seconds, 8". dial with two sets of numerals (use inner circle of small numerals as stop clock) and selective automatic buzzer alarm. Has two separate outlet receptacles for automatic switching of external appliances. Toggle switch controls one outlet, which can make or break circuit at "0." Circuit automatically breaks on second outlet after time interval.

Universal Lab Timer, 120V 50/60Hz H-4292
Universal Lab Timer, 220V 50Hz H-4292.5F
UPS Ship wt. 2.6lbs. (1.17kg)

Stopwatch

Time-out type stopwatch, used for timing operations and tests Start, stop and restart are activated by depressing the crown. Hands are reset by depressing pin on side of case. Features nickel-chromium case and anti-magnetic shock-resistant 7-jewel movement.

1/5 sec. movement, 1 rev = 60 sec H-2260
1/10 sec. movement, 1 rev = 30 sec H-2261
UPS Ship wt. 0.7lbs. (0.32kg)

Decide which digital scale is right for you with our website's Scale Selector Wizard.

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Decide which digital scale is right for you with our

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Input your capacity and readability to quickly view your available options...

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Select...

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Input your capacity and readability to quickly view your available options...

☐ Show only scales with 'Weigh Below' option

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Wide Selection

Humboldt provides a wide selection of digital and mechanical balances for laboratory and field use. If you are looking for highly precise measurement abilities, economical solutions, Humboldt has the right scale for you. Our scales and balances are built under strict standards by reputable manufacturers like Ohaus and Adam. Most digital models are available in English and/or metric versions, and can also be ordered with internal calibration.

Humboldt also stocks suspension scales for bulk materials and ASTM Class 1 calibration masses.

Digital Scale and Balance Comparison Chart

| Capacity | Readability | Model | Mfg. Series | Power | Platform size | Page |
|----------|-------------|----------|--|---------------|---------------------------|------|
| 200g | 0.01g | HB-4528A | Adam Core Balance CQT Compact Portable | AC / AA | 5.1" Dia. / 130mm | 335 |
| 220g | 0.001g | HB-4700A | Adam Nimbus Precision | AC | 4.7" (120mm) Dia. | 333 |
| 220g | 0.001g | HB-4620 | Ohaus Scout STX Portable | AC / AA | 3.7" dia. / 93mm dia. | 334 |
| 220g | 0.01g | HB-4621 | Ohaus Scout STX Portable | AC / AA | 4.7" dia. / 120mm dia. | 334 |
| 220g | 0.01g | HB-4720A | Ohaus Scout SPX Portable | AC / AA | 4.7" dia. / 120mm dia. | 334 |
| 250g | 0.1g | HB-4529A | Adam Core Balance CQT Compact Portable | AC / AA | 5.1" Dia. / 130mm | 335 |
| 300g | 0.01g | HB-4710A | Adam HCB Highland™ Precision | AC / Recharge | 4.7" Dia. / 120mm | 335 |
| 420g | 0.001g | HB-4701A | Adam Nimbus Precision | AC | 4.7" (120mm) Dia. | 333 |
| 420g | 0.001g | HB-5342A | Ohaus Adventurer Precision | AC | Ø 5.1" / 130 mm | 330 |
| 420g | 0.01g | HB-4622 | Ohaus Scout STX Portable | AC / AA | 4.7" dia. / 120mm dia. | 334 |
| 420g | 0.01g | HB-4724A | Ohaus Scout SPX Portable | AC / AA | 4.7" dia. / 120mm dia. | 334 |
| 420g | 0.1g | HB-4723A | Ohaus Scout SPX Portable | AC / AA | 4.7" dia. / 120mm dia. | 334 |
| 420g | 0.1g | HB-4623 | Ohaus Scout STX Portable | AC / AA | 4.7" dia. / 120mm dia. | 334 |
| 520g | 0.001g | HB-5352A | Ohaus Adventurer Precision | AC | 6.9" x 7.7" 175 x 195 mm | 330 |
| 600g | 0.01g | HB-4712A | Adam HCB Highland™ Precision | AC / Recharge | 4.7" Dia. / 120mm | 335 |
| 600g | 0.02g | HB-4711A | Adam HCB Highland™ Precision | AC / Recharge | 4.7" Dia. / 120mm | 335 |
| 600g | 0.1g | HB-4530A | Adam Core Balance CQT Compact Portable | AC / AA | 5.1" Dia. / 130mm | 335 |
| 620g | 0.001g | HB-4716A | Adam Nimbus Precision | AC | 4.7" (120mm) Dia. | 333 |
| 620g | 0.01g | HB-4624 | Ohaus Scout STX Portable | AC / AA | 4.7" dia. / 120mm dia. | 334 |
| 620g | 0.01g | HB-4725A | Ohaus Scout SPX Portable | AC / AA | 4.7" dia. / 120mm dia. | 334 |
| 620g | 0.1g | HB-4726A | Ohaus Scout SPX Portable | AC / AA | 5.5" x 6.7" / 140 x 170mm | 334 |
| 620g | 0.1g | HB-4625 | Ohaus Scout STX Portable | AC / AA | 5.5" x 6.7" / 140 x 170mm | 334 |

Digital Scale and Balance Comparison Chart

| | | | | | | |
|-------|--------|-----------|--|---------------|-----------------------------|-----|
| 720g | 0.001g | HB-5000 | Adam Equinox Precision Balance | AC | 4.3"ø / 110 mm ø | 332 |
| 720g | 0.001g | HB-5100 | Adam Solis Precision Balance | AC | 4.3"ø / 110 mm ø | 332 |
| 720g | 0.001g | HB-5001 | Adam Equinox Precision Balance | AC | 4.3"ø / 110 mm ø | 332 |
| 720g | 0.001g | HB-5101 | Adam Solis Precision Balance | AC | 4.3"ø / 110 mm ø | 332 |
| 820g | 0.001g | HB-4702A | Adam Nimbus Precision | AC | 4.7" (120mm) Dia. | 333 |
| 1000g | 0.01g | HB-4713A | Adam HCB Highland™ Precision | AC / Recharge | 4.7" Dia. / 120mm | 335 |
| 1100g | 0.1g | HB-4960 | Ohaus Navigator XL Portable | AC / battery | 7.6" x 8" / 194 x 203mm | 336 |
| 1200g | 0.001g | HB-5102 | Adam Solis Precision Balance | AC | 4.3"ø / 110 mm ø | 332 |
| 1200g | 0.001g | HB-5002 | Adam Equinox Precision Balance | AC | 4.3"ø / 110 mm ø | 332 |
| 1200g | 0.01g | HB-4626 | Ohaus Scout STX Portable | AC / AA | 5.5" x 6.7" / 140 x 170mm | 334 |
| 1200g | 0.01g | HB-4740A | Ohaus Scout SPX Portable | AC / AA | 5.5" x 6.7" / 140 x 170mm | 334 |
| 1500g | 0.05g | HB-4714A | Adam HCB Highland™ Precision | AC / Recharge | 4.7" Dia. / 120mm | 335 |
| 1500g | 0.1g | HB-4532A | Adam Core Balance CQT Compact Portable | AC / AA | 5.1" Dia. / 130mm | 335 |
| 1520g | 0.01g | HB-5315A | Ohaus Adventurer Precision | AC | 6.9" x 7.7" 175 x 195 mm | 330 |
| 1600g | 0.01g | HB-4703A | Adam Nimbus Precision | AC | 6.3" (160mm) Dia. | 333 |
| 1600g | 0.01g | HB-1602 | Pioneer Precision Balance | AC | 7.09" / 180mm | 331 |
| 1600g | 0.1g | HB-4950 | Ohaus Navigator QT Portable | AC / Recharge | 9.00" x 6.90" / 250 x 240mm | 336 |
| 2000g | 1g | HB-4534A | Adam Core Balance CQT Compact Portable | AC / AA | 5.1" Dia. / 130mm | 335 |
| 2100g | 0.001g | HB-5003 | Adam Equinox Precision Balance | AC | 4.3"ø / 110 mm ø | 332 |
| 2100g | 0.001g | HB-5103 | Adam Solis Precision Balance | AC | 4.3"ø / 110 mm ø | 332 |
| 2100g | 0.1g | HB-4961 | Ohaus Navigator XL Portable | AC / battery | 7.6" x 8" / 194 x 203mm | 336 |
| 2200g | 0.01g | HB-4627 | Ohaus Scout STX Portable | AC / AA | 5.5" x 6.7" / 140 x 170mm | 334 |
| 2200g | 0.01g | HB-4741A | Ohaus Scout SPX Portable | AC / AA | 5.5" x 6.7" / 140 x 170mm | 334 |
| 2200g | 0.01g | HB-2202 | Pioneer Precision Balance | AC | 7.09" / 180mm | 331 |
| 2200g | 0.01g | HB-5322A | Ohaus Adventurer Precision | AC | 6.9" x 7.7" 175 x 195 mm | 330 |
| 2200g | 0.01g | HB-5220 | Ohaus Explorer Precision | AC | 7.5" x 7.9" 190 x 200mm | 330 |
| 2200g | 0.1g | HB-4628 | Ohaus Scout STX Portable | AC / AA | 5.5" x 6.7" / 140 x 170mm | 334 |
| 2200g | 0.1g | HB-4727A | Ohaus Scout SPX Portable | AC / AA | 5.5" x 6.7" / 140 x 170mm | 334 |
| 2200g | 0.1g | HB-2201 | Pioneer Precision Balance | AC | 7.09" / 180mm | 331 |
| 2600g | 0.01g | HB-4704A | Adam Nimbus Precision | AC | 6.3" (160mm) Dia. | 333 |
| 2600g | 0.1g | HB-4533A | Adam Core Balance CQT Compact Portable | AC / AA | 5.1" Dia. / 130mm | 335 |
| 3000g | 0.1g | HB-4715A | Adam HCB Highland™ Precision | AC / Recharge | 4.7" Dia. / 120mm | 335 |
| 3000g | 0.1g | HB-4730 | Ohaus Ranger 3000 Compact Bench | AC / Recharge | 8.9" x 11.8" / 225 x 300mm | 336 |
| 3200g | 0.01g | HB-3202 | Pioneer Precision Balance | AC | 7.09" / 180mm | 331 |
| 3200g | 0.01g | HB-5004 | Adam Equinox Precision Balance | AC | 7.5" x 7.5" / 190 x 190mm | 332 |
| 3200g | 0.01g | HB-5005 | Adam Equinox Precision Balance | AC | 7.5" x 7.5" / 190 x 190mm | 332 |
| 3200g | 0.01g | HB-5104 | Adam Solis Precision Balance | AC | 7.5" x 7.5" / 190 x 190mm | 332 |
| 3200g | 0.01g | HB-5105 | Adam Solis Precision Balance | AC | 7.5" x 7.5" / 190 x 190mm | 332 |
| 3200g | 0.01g | HB-5004 | Adam Equinox Precision Balance | AC | 7.5" x 7.5" / 190 x 190mm | 332 |
| 3200g | 0.2g | HB-4951 | Ohaus Navigator XT Portable | AC / Recharge | 9.00" x 6.90" / 250 x 240mm | 336 |
| 3600g | 0.01g | HB-4705A | Adam Nimbus Precision | AC | 6.3" (160mm) Dia. | 333 |
| 4200g | 0.01g | HB-5343A | Ohaus Adventurer Precision | AC | 6.9" x 7.7" 175 x 195 mm | 330 |
| 4200g | 0.01g | HB-5420 | Ohaus Explorer Precision | AC | 7.5" x 7.9" 190 x 200mm | 330 |
| 4200g | 0.01g | HB-4202 | Pioneer Precision Balance | AC | 7.09" / 180mm | 331 |
| 4200g | 0.1g | HB-5344A | Ohaus Adventurer Precision | AC | 6.9" x 7.7" 175 x 195 mm | 330 |
| 4200g | 0.1g | HB-4201 | Pioneer Precision Balance | AC | 7.09" / 180mm | 331 |
| 4200g | 0.1g | HB-4539B | Adam Nimbus Precision | AC | 6.3" (160mm) Dia. | 333 |
| 4600g | 0.01g | HB-4706A | Adam Nimbus Precision | AC | 6.3" (160mm) Dia. | 333 |
| 5000g | 1g | HB-4535A | Adam Core Balance CQT Compact Portable | AC / AA | 5.1" (130mm) Dia. | 335 |
| 5100g | 0.5g | HB-4962 | Ohaus Navigator XL Portable | AC / battery | 7.6" x 8" / 194 x 203mm | 336 |
| 5200g | 0.01g | HB-5355AC | Ohaus Adventurer Precision | AC | 6.9" x 7.7" 175 x 195 mm | 330 |
| 6000g | 0.2g | HB-4731 | Ohaus Ranger 3000 Compact Bench | AC / Recharge | 8.9" x 11.8" / 225 x 300mm | 336 |
| 6200g | 0.01g | HB-5006 | Adam Equinox Precision Balance | AC | 7.5" x 7.5" / 190 x 190mm | 332 |
| 6200g | 0.01g | HB-5106 | Adam Solis Precision Balance | AC | 7.5" x 7.5" / 190 x 190mm | 332 |
| 6200g | 0.01g | HB-5622 | Ohaus Explorer Precision | AC | 7.5" x 7.9" 190 x 200mm | 330 |
| 6200g | 0.01g | HB-5107 | Adam Solis Precision Balance | AC | 7.5" x 7.5" / 190 x 190mm | 332 |
| 6200g | 0.01g | HB-5007 | Adam Equinox Precision Balance | AC | 7.5" x 7.5" / 190 x 190mm | 332 |
| 6200g | 0.1g | HB-5620 | Ohaus Explorer Precision | AC | 7.5" x 7.9" 190 x 200mm | 330 |
| 6200g | 0.1g | HB-4540B | Adam Nimbus Precision | AC | 6.3" (160mm) Dia. | 333 |
| 6200g | 0.1g | HB-4629 | Ohaus Scout STX Portable | AC / AA | 5.5" x 6.7" / 140 x 170mm | 334 |
| 6200g | 0.1g | HB-4729A | Ohaus Scout SPX Portable | AC / AA | 5.5" x 6.7" / 140 x 170mm | 334 |
| 6400g | 0.5g | HB-4952 | Ohaus Navigator XT Portable | AC / Recharge | 9.00" x 6.90" / 250 x 240mm | 336 |
| 8200g | 0.01g | HB-5008 | Adam Equinox Precision Balance | AC | 7.5" x 7.5" / 190 x 190mm | 332 |

Digital Scale and Balance Comparison Chart

| | | | | | | |
|---------------|-----------------|----------|--|-------------------|---------------------------------------|-----|
| 8200g | 0.01g | HB-5108 | Adam Solis Precision Balance | AC | 7.5" x 7.5" / 190 x 190mm | 332 |
| 8200g | 0.1g | HB-4541B | Adam Nimbus Precision | AC | 6.3" (160mm) Dia. | 333 |
| 8200g | 0.1g | HB-5382A | Ohaus Adventurer Precision | AC | 6.9" x 7.7" 175 x 195 mm | 330 |
| 8200g | 1.0g | HB-4630 | Ohaus Scout STX Portable | AC / AA | 5.5" x 6.7" / 140 x 170mm | 334 |
| 8200g | 1.0g | HB-4742A | Ohaus Scout SPX Portable | AC / AA | 5.5" x 6.7" / 140 x 170mm | 334 |
| 10000g | 0.5g | HB-4953 | Ohaus Navigator XT Portable | AC / Recharge | 9.00" x 6.90" / 250 x 240mm | 336 |
| 10000g | 1g | HB-4963 | Ohaus Navigator XL Portable | AC / battery | 7.6" x 8" / 194 x 203mm | 336 |
| 10200g | 0.01g | HB-5102C | Ohaus Explorer Precision | AC | 7.5" x 7.9" 190 x 200mm | 330 |
| 10200g | 0.1g | HB-5100C | Ohaus Explorer Precision | AC | 7.5" x 7.9" 190 x 200mm | 330 |
| 16000g | 1g | HB-4954 | Ohaus Navigator XT Portable | AC / Recharge | 9.00" x 6.90" / 250 x 240mm | 336 |
| 20000g | 1g | HB-4964 | Ohaus Navigator XL Portable | AC / battery | 7.6" x 8" / 194 x 203mm | 336 |
| 6kg | 0.02g | HB-3506 | Ohaus Ranger 7000 High Resolution, High Capacity | AC | 11" x 11" (280 x 280mm) | 339 |
| 12kg | 0.1g | HB-4543B | Adam Nimbus High Capacity | AC | 15.7" x 11.8" (400 x 300mm) | 338 |
| 12kg | 0.1g | HB-4943 | Adam Eclipse High Capacity | AC / Recharge | 9.4" x 9.4" (240 x 240mm) | 337 |
| 12kg | 0.1g | HB-4506A | Ohaus Explorer High Capacity | AC / Recharge | 15.7" x 11.8" (400 x 300mm) | 337 |
| 15kg | 0.01g | HB-3506 | Ohaus Ranger 7000 High Resolution, High Capacity | AC | 14.8" x 12.2" (377 x 311mm) | 339 |
| 15kg | 0.2g | HB-3515 | Ohaus Ranger 7000 High Capacity | AC | 14.8" x 12.2" (377 x 311mm) | 338 |
| 15kg | 0.5g | HB-4732 | Ohaus Ranger 3000 Compact Bench | AC / Recharge | 8.9" x 11.8" / 225 x 300mm | 336 |
| 16kg | 0.1g | HB-4945 | Adam Eclipse High Capacity | AC / Recharge | 9.4" x 9.4" (240 x 240mm) | 337 |
| 16kg | 0.1g | HB-4545B | Adam Nimbus High Capacity | AC | 15.7" x 11.8" (400 x 300mm) | 338 |
| 16kg / 35lb | .5g / 0.001lb | HB-4874 | Adam ABK Portable | AC / battery | 11.8" X 15.7" / 300mm X 400mm | 338 |
| 22kg | 0.1g | HB-4946 | Adam Eclipse High Capacity | AC / Recharge | 12.2" x 14.8" (311 x 377mm) | 337 |
| 24kg | 0.1g | HB-4508A | Ohaus Explorer High Capacity | AC / Recharge | 15.7" x 11.8" (400 x 300mm) | 337 |
| 25kg / 50lb | 1g / 0.002lb | HB-4840 | Ohaus Defender 5000 Bench | AC / opt. battery | 12 x 14" / 305 x 355mm | 340 |
| 30kg | 1g | HB-4733 | Ohaus Ranger 3000 Compact Bench | AC / Recharge | 8.9" x 11.8" / 225 x 300mm | 336 |
| 30kg / 66lb | .005kg / 0.01lb | HB-4830 | Ohaus Defender 3000 Bench | AC / C batteries | 12" X 14" / 30.5mm X 35.5mm | 340 |
| 32kg | 0.1g | HB-4947 | Adam Eclipse High Capacity | AC / Recharge | 12.2" x 14.8" (311 x 377mm) | 337 |
| 32kg / 70lb | 1g / 0.002lb | HB-4875 | Adam ABK Portable | AC / battery | 11.8" X 15.7" / 300mm X 400mm | 338 |
| 35kg | 0.1g | HB-3506 | Ohaus Ranger 7000 High Resolution, High Capacity | AC | 14.8" x 12.2" (377 x 311mm) | 339 |
| 35kg | 0.1g | HB-4546B | Adam Nimbus High Capacity | AC | 15.7" x 11.8" (400 x 300mm) | 338 |
| 35kg | 0.1g | HB-4510A | Ohaus Explorer High Capacity | AC / Recharge | 15.7" x 11.8" (400 x 300mm) | 337 |
| 35kg | 0.5g | HB-3535 | Ohaus Ranger 7000 High Capacity | AC | 14.8" x 12.2" (377 x 311mm) | 338 |
| 35kg / 75lb | .01kg / 0.02lb | HB-4774 | Adam CPWplus Portable | AC / AA | 12" sq / 300mm sq. | 339 |
| 50kg / 100lb | 2g / 0.005lb | HB-4841 | Ohaus Defender 5000 Bench | AC / opt. battery | 12 x 14" / 305 x 355mm | 340 |
| 50kg / 100lb | 2g / 0.005lb | HB-4842 | Ohaus Defender 5000 Bench | AC / opt. battery | 18 x 24" / 457 x 610mm | 340 |
| 60kg | 1g | HB-3560 | Ohaus Ranger 7000 High Capacity | AC | 14.8" x 12.2" (377 x 311mm) | 338 |
| 60kg / 130lb | 2g / 0.005lb | HB-4876 | Adam ABK Portable | AC / battery | 11.8" X 15.7" / 300mm X 400mm | 338 |
| 60kg / 130lb | 10g / 0.02lb | HB-4831 | Ohaus Defender 3000 Bench | AC / C batteries | 12" X 14" / 30.5mm X 35.5mm | 340 |
| 60kg / 130lb | 10g / 0.02lb | HB-4831 | Ohaus Defender 3000 Bench | AC / C batteries | 21.7" x 16.5" / 550mm x 420mm | 340 |
| 75kg / 165lb. | .02kg / 0.05lb | HB-4778 | Ohaus Digital Field Scale | Rechargeable | 11" x 12.4" x 1.8" (280 x 316 x 45mm) | 339 |
| 75kg / 165lb. | .02kg / 0.05lb | HB-4775A | Adam CPWplus Portable | AC / AA | 12" sq / 300mm sq. | 339 |
| 120kg / 260lb | 5g / 0.01lb | HB-4877 | Adam ABK Portable | AC / battery | 11.8" X 15.7" / 300mm X 400mm | 338 |
| 125kg / 275lb | 5g / .001lb | HB-4843 | Ohaus Defender 5000 Bench | AC / opt. battery | 18 x 24" / 457 x 610mm | 340 |
| 150kg / 330lb | 20g / 0.05lb | HB-4832 | Ohaus Defender 3000 Bench | AC / C batteries | 21.7" x 16.5" / 550mm x 420mm | 340 |
| 150kg / 330lb | 20g / 0.05lb | HB-4832 | Ohaus Defender 3000 Bench | AC / C batteries | 25.6" x 19.7" / 650mm x 500mm | 340 |
| 150kg / 330lb | .05kg / 0.1lb | HB-4776 | Adam CPWplus Portable | AC / AA | 12" sq / 300mm sq. | 339 |
| 200kg / 440lb | 0.1lb/.05kg | HB-4777 | Adam CPWplus Portable | AC / AA | 12" sq / 300mm sq. | 339 |
| 300kg / 660lb | 50g / 0.1lb | HB-4833 | Ohaus Defender 3000 Bench | AC / C batteries | 25.6" x 19.7" / 650mm x 500mm | 340 |



HB-5102



HB-5342

Ohaus Explorer Precision Balances

The Ohaus Explorer balance provides the ultimate in a precision balance by combining fast and highly accurate weighing results with intuitive weighing software, touchless user-programmable operation sensors, modular design and auto-cal internal calibration. The Explorer provides a large, angle-adjustable, touch-screen color display, highlighted by icon-driven application software, which provides 14 unique application modes. The Explorer features fast stabilization times and internal or external calibration models. The Explorer is also durable, featuring metal base construction with an ABS top housing, stainless pan, glass draft shield and a replaceable in-use cover.

The Explorer's modular design allows the user to configure the balance in almost any setup

needed, with a display that can be separated from the weighing base for detached control from a counter, the wall or tower-mounted. The balance also features an integral weigh-below hook for weigh-below weighing applications. The balance also uses a unique system of four touchless sensors located on the balance, which let you program functions like print, calibration, tare, etc. that can be activated by the wave of your hand.



See Chart for Models and Specifications

Ohaus Adventurer Precision Balances

The OHAUS Adventurer incorporates all of the applications necessary for routine weighing and measurement activities. With a color touchscreen, GLP/GMP compliance capabilities, two USB ports, and much more, the Adventurer is the most

complete balance in its class. The Adventurer allows you to operate and access its nine application modes and abundant features that eliminate the need to do several manual calculations through the modern color touchscreen. It also has six mechanical keys that provide tactile feedback and allow the operator to perform repetitive operations such as tare, zero, calibration, and print. It is available in external and internal calibration models. The internal calibration models perform routine calibration maintenance automatically. You can also save balance settings and transfer them to other Adventurers in your lab. The balance also features an integral weigh-below hook for weigh-below weighing applications.



See Chart for Models and Specifications

Ohaus Explorer Precision Balances

| Capacity | Readability | External Calibration | | Internal Calibration | | Repeatability | Linearity | Power | Pan Size | Ship Wt. |
|----------|-------------|----------------------|---------------|----------------------|---------------|---------------|-----------|-------|----------------------------|----------------|
| | | 120V 60Hz | 220V 50/60 Hz | 120V 60Hz | 220V 50/60 Hz | | | | | |
| 2200g | 0.01g | HB-5220 | HB-5220.4F | HB-5220C | HB-5220C.4F | ±0.01g | ±0.02g | AC | 7.5" x 8" (190 x 200mm) | 15 lb/6.8kg |
| 4200g | 0.01g | HB-5420 | HB-5420.4F | HB-5420C | HB-5420C.4F | ±0.01g | ±0.02g | | | 16.3 lb/7.38kg |
| 6200g | 0.01g | HB-5622 | HB-5622.4F | HB-5622C | HB-5622C.4F | ±0.01g | ±0.02g | | | |
| 6200g | 0.1g | HB-5620 | HB-5620.4F | HB-5620C | HB-5620C.4F | ±0.1g | ±0.1g | | | 10 lb/4.5kg |
| 10200g | 0.01g | — | — | HB-5102C | HB-5102C.4F | ±0.01g | ±0.02g | | | |
| 10200g | 0.1g | — | — | HB-5100C | HB-5100C.4F | ±0.1g | ±0.1g | | | |

Ohaus Adventurer Precision Balances

| Capacity | Readability | External Calibration | | Internal Calibration | | Repeatability | Linearity | Power | Pan Size | Ship Wt. |
|----------|-------------|----------------------|---------------|----------------------|---------------|---------------|-----------|-------|------------------------------|-------------|
| | | 120V 60Hz | 220V 50/60 Hz | 120V 60Hz | 220V 50/60 Hz | | | | | |
| 420g | 0.001g | HB-5342A | HB-5342A.4F | HB-5342AC | HB-5342AC.4F | ±0.001g | ±0.002g | AC | Ø 5.1" / 130 mm | 10 lb/4.5kg |
| 520g | 0.001g | HB-5352A | HB-5352A.4F | HB-5352AC | HB-5352AC.4F | ±0.001g | ±0.002g | | 7.7" x 6.9" (195 x 175mm) | |
| 1520g | 0.01g | HB-5315A | HB-5315A.4F | HB-5315AC | HB-5315AC.4F | ±0.01g | ±0.02g | | | |
| 2200g | 0.01g | HB-5322A | HB-5322A.4F | HB-5322AC | HB-5322AC.4F | ±0.01g | ±0.02g | | | |
| 4200g | 0.01g | HB-5343A | HB-5343A.4F | HB-5343AC | HB-5343AC.4F | ±0.01g | ±0.02g | | | |
| 4200g | 0.1g | HB-5344A | HB-5344A.4F | HB-5344AC | HB-5344AC.4F | ±0.1g | ±0.2g | | 12.6 lb (5.7kg) | |
| 5200g | 0.01g | — | — | HB-5355AC | HB-5355AC.4F | ±0.01g | ±0.02g | | | |
| 8200g | 0.1g | HB-5382A | HB-5382A.4F | HB-5382AC | HB-5382AC.4F | ±0.1g | ±0.2g | | | |





HB-5292DC



HB-5292T



HB-2201

Ohaus Explorer Accessories

| Description | Part # |
|--------------------------|-----------|
| Cable, display extension | HB-5292DC |
| Display tower mount | HB-5292T |
| Cable, RS232 PC 25-pin | HB-5392R |
| Cable, USB interface | HB-5392C |

Ohaus Adventurer Precision Accessories

| Description | Part # |
|------------------------|----------|
| Cable, USB interface | HB-5392C |
| Cable, RS232 PC 25-pin | HB-5392R |

Ohaus Pioneer Precision PX Balance

The Pioneer PX combines essential weighing functionality with competitive performance, offering high accuracy and repeatability for applications in laboratory, industrial and education settings. The Pioneer PX is affordably priced, and intuitively designed for intelligent operation with a second line display for additional information, and USB and RS-232 connectivity for easy communication.

- The PX offers high accuracy and repeatability for essential weighing applications in laboratory, industrial and education settings at an economical price point.

- Featuring a cast metal lower housing, sub-pan and stainless steel weighing pan, the PX is durably constructed for versatile, long-term use.

- The PX features a second line display for additional information or guidance, a static removal bar for convenient grounding, and USB and RS232 connectivity for easy communication.

A brightly lit dual line display shows the weight in an easy-to-read manner, while a dot-matrix second line provides additional information or guidance prompts to the user.

Featuring a cast metal lower housing, metal sub-pan, stainless steel weighing pan and removable draft-shield or side doors, the Pioneer is durably constructed for long-term use, and suitable for a variety of applications.

Standard RS-232 and USB device ports allow for easy connectivity to printers and other peripherals, allowing convenient capture of results. OHAUS' free data collection tool (SPDC) provides a simple

solution to import this data directly in formats such as Excel, Access, .txt, .csv, etc.

Allows the balance to be quickly calibrated and adjusted with the push of a button, thereby eliminating the expense and maintenance of separate calibration weights.

A static removal bar along the top of the draft-shield provides a convenient grounding location, allowing the user to discharge any static charge that may have accumulated prior to handling samples and weighing. This helps compliance with good weighing practices, while improving the stability and accuracy of results.



See Chart for Models and Specifications

Ohaus Pioneer Balance

| Capacity | Readability | External Calibration | | Internal Calibration | | Power | Pan Size | Ship Wt. |
|----------|-------------|----------------------|---------------|----------------------|---------------|-------|---------------------|-------------|
| | | 120V 60Hz | 220V 50/60 Hz | 120V 60Hz | 220V 50/60 Hz | | | |
| 1620g | 0.01g | HB-1602 | HB-1602.4F | HB-1602C | HB-1602C.4F | AC | Ø 7.09" (180 mm) | 11 lb/5.0kg |
| 2200g | 0.01g | HB-2202 | HB-2202.4F | HB-2202C | HB-2202C.4F | | | |
| 2200g | 0.1g | HB-2201 | HB-2201.4F | HB-2201C | HB-2201C.4F | | | |
| 3200g | 0.01g | HB-3202 | HB-3202.4F | HB-3202C | HB-3202C.4F | | | |
| 4200g | 0.01g | HB-4202 | HB-4202.4F | HB-4202C | HB-4202C.4F | | | |
| 4200g | 0.1g | HB-4201 | HB-4201.4F | HB-4201C | HB-4201C.4F | | | |



HB-5000.3F



HB-5104.3F

Equinox Precision Balances

Equinox precision balances bring remarkable precision to labs that perform highly detailed testing. The Equinox is ideal for research and quality assurance facilities, science education, precision counting, and production and manufacturing applications needing exceptionally precise results. A color touch screen display provides intuitive operation, with icon-driven menus and readily accessible applications and functions.

- Large, responsive 5" 800x480 pixel touch-screen display
- Level indicator and adjustable feet ensure proper balance setup for optimum weighing results
- Security slot for optional Kensington-type lock and cable to help prevent theft
- Large, grade 304 stainless steel pan allows swift cleaning
- RS-232 interface is available to provide speedy connection to computers and printers
- USB host for memory card

See Chart for Models and Specifications

Solis Precision Balances

With a high-resolution graphic display and intuitive features, Solis precision balances provide an outstanding solution for a variety of lab applications. Versatile and resilient, the Solis is ideal for research and quality assurance labs, science education, precision counting, and production and manufacturing applications needing precision results. The Solis keypad is simple to use, with easy-to-read buttons and helpful navigation arrows for uncomplicated operation.

- High-resolution graphic display is amply sized for clear visibility
- Level indicator and adjustable feet ensure proper balance setup for optimum weighing results
- Security slot for optional Kensington-type lock and cable to help prevent theft
- Large, grade 304 stainless steel pan allows swift cleaning
- RS-232 interface is available to provide speedy connection to computers and printers

See Chart for Models and Specifications

Equinox Precision Accessories

| Description | Part # |
|--|------------|
| Density kit for balance up to 0.001g readability | HB-5000.1 |
| In-use wet cover | HB-5000.2 |
| ATP Thermal Printer | HB-5000.3 |
| ATP Thermal Printer Paper | HB-5000.4 |
| AdamDU Data Collection Program | HB-4545B.3 |



HB-5000.2



HB-4545B.3



HB-5000.3



HB-5000.4

Adam Equinox and Solis Precision Balances

| Capacity | Readability | Equinox | Solis | Equinox | Solis | Repeatability | Linearity | Power | Pan Size | Ship Wt. |
|----------|-------------|----------------------|------------|----------------------|------------|---------------|-----------|---------------------------|-------------------|-------------------|
| | | External Calibration | | Internal Calibration | | | | | | |
| 720g | 0.001g | HB-5000.3F | HB-5100.3F | HB-5001.3F | HB-5101.3F | ±0.002g | ±0.003g | AC 120-220V 50/60Hz | 4.3"ø (110mmø) | 15.2lb (6.9kg) |
| 1200g | 0.001g | — | — | HB-5002.3F | HB-5102.3F | ±0.002g | ±0.003g | | | |
| 2100g | 0.001g | — | — | HB-5003.3F | HB-5103.3F | ±0.002g | ±0.05g | | | |
| 3200g | 0.01g | HB-5004.3F | HB-5104.3F | HB-5005.3F | HB-5105.3F | ±0.02g | ±0.03g | | | |
| 6200g | 0.01g | HB-5006.3F | HB-5106.3F | HB-5007.3F | HB-5107.3F | ±0.02g | ±0.03g | | | |
| 8200g | 0.01g | HB-5008.3F | HB-5108.3F | — | — | ±0.02g | ±0.04g | | | |



HB-4701A



HB-4703A

Adam Nimbus Precision Balances

The Nimbus series of balances offers a range of models that deliver precision readabilities from 0.0001g (0.1mg) to 0.1g. With a compact footprint and intuitive user interface, Nimbus provides a streamlined weighing experience. Enhanced processing power combines with efficient technology to produce a balance that weathers the storms in demanding laboratories. Experience the Nimbus by Adam Equipment.

Innovative design creates a smaller footprint, so the Nimbus occupies minimal space on the lab bench. An extruded aluminum base provides superior thermal transfer, offering greater stability and performance. Solid metal construction throughout the balance durably withstands chemicals and rigorous daily use.

Optimized configuration of the Nimbus's internal weighing system results in enhanced performance. Fabricated from a single block, the weighing sensor contains fewer parts than a traditional force motor balance, improving efficiency.

Features:

- Vivid, backlit LCD easily visible in any lighting conditions
- Color-coded keys facilitate quick recognition of the most frequently used buttons
- Level indicator and adjusting feet ensure proper balance setup for optimum weighing results
- Removable draft shield on models with 0.001g readability helps to reduce errors caused by air currents

- Robust metal housing protects internal components in harsh environments
- Sealed keypad protects against dirt and accidental spills
- USB and RS-232 interfaces provide speedy communication with computers and printers
- Large, grade 304 stainless steel pan allows swift cleaning
- External calibration allows for verification and adjustment with weights

See Chart for Models and Specifications

Adam Nimbus Precision Balances

| Capacity | Readability | External Calibration | | Power | Pan Size | Ship Wt. |
|----------|-------------|----------------------|---------------|-------|-------------------|-----------|
| | | 120V 60Hz | 220V 50/60 Hz | | | |
| 220g | 0.001g | HB-4700A | HB-4700A.4F | AC | 4.7" (120mm) Dia. | 15 lb/7kg |
| 420g | 0.001g | HB-4701A | HB-4701A.4F | | | |
| 620g | 0.001g | HB-4716A | HB-4716A.4F | | | |
| 820g | 0.001g | HB-4702A | HB-4702A.4F | | | |
| 1600g | 0.01g | HB-4703A | HB-4703A.4F | | 6.3" (160mm) Dia. | |
| 2600g | 0.01g | HB-4704A | HB-4704A.4F | | | |
| 3600g | 0.01g | HB-4705A | HB-4705A.4F | | | |
| 4200g | 0.1g | HB-4539B | HB-4539B.4F | | | |
| 4600g | 0.01g | HB-4706A | HB-4706A.4F | | | |
| 6200g | 0.1g | HB-4540B | HB-4540B.4F | | | |
| 8200g | 0.1g | HB-4541B | HB-4541B.4F | | | |

Accessories

| Description | Part # |
|-----------------------------|-------------|
| Weigh-below hook | HB-4541B.2 |
| In-use wet cover, 120mm pan | HB-4900.1 |
| In-use wet cover, 160mm pan | HB-4902.1 |
| Cable, RS232 | HB-4700ACB |
| Cable, USB | HB-4700AUSB |
| Data collection software | HB-4545B.3 |



HB-4624



HB-4740A

Ohaus Scout STX Portable Balance

Ideal for laboratory & industrial applications, the OHAUS Scout features an easy to navigate color touchscreen display & a slim design which allows stackable storage. Geared for superior performance with fast stabilization time and high resolution weighing results, these portable balances set a new standard for a broad range of weighing applications. Features also include superior overload protection and expanded connectivity options. Large, resilient color touchscreen allows for effortless operation of the Scout through its informative icon driven menu structure, guiding the user through every step of the weighing application. Stabilization time as fast as 1 sec means increased productivity in your facility. Equipped with advanced weighing technology, the Scout also ensures repeatable and reliable weighing results.

Integrated superior overload protection system rated at 10 times the capacity protects the balance in rugged and demanding environments. The space-saving, slim design allows for stackable storage.

- Display: 4.3" (109mm) full-color VGA graphic touchscreen display with user-controlled brightness
- Operation: AC adapter (included) or 4 AA batteries (not included)
- Communication: RS232, USB Host, USB Device, Ethernet or Bluetooth



See Chart for Models and Specifications

Ohaus Scout SPX Portable Balance

Ideal for laboratory and industrial applications, the OHAUS Scout comes in a slim design with large backlit LCD. Features include superior overload protection, multiple weighing units and application modes. Geared for high performance in your facility with fast stabilization time and high resolution weighing results, these portable balances set a new standard in laboratory and industrial weighing. Combined with a simplified 4 button operation, the Scout's large backlit display increases readability in low light working conditions, and is easier to view from a distance.

Integrated superior overload protection and impact-resistant pan support safeguard against shock and overloading the balance in rugged and demanding environments. Stabilization time as fast as 1 sec and advanced weighing technology, lead to improved productivity in your facility. Increased capacity unlocks a wider range of weighing applications.

- Display: Liquid crystal display (LCD) with backlight
- Operation: AC adapter (included) or 4 AA batteries (not included)
- Communication: RS232, USB Host, USB Device, Ethernet or Bluetooth



See Chart for Models and Specifications

Accessories

| Description | Part # |
|-----------------|-----------|
| Ethernet Kit | HB-4620.1 |
| Bluetooth Kit | HB-4620.2 |
| RS232 Kit | HB-4620.3 |
| USB Kit- Device | HB-4620.4 |
| USB Kit- Host | HB-4620.5 |

Ohaus Scout STX Portable Balance

| Capacity | Readability | 120V 60Hz | 220V 50/60 Hz | Repeatability | Units | Power | Pan Size | Ship Wt. |
|----------|-------------|-----------|---------------|---------------|---|------------------------|---------------------------|---------------|
| 220g | 0.001g | HB-4620 | HB-4620.4F | 0.002 | mg,g,k- g,ct,N,oz,oz- t,dwt,lb,l- b:oz,grn, hkt, sgt,twt,ti- cal,tola | AC (4) AA batteries | 3.7" dia. / 93mm dia. | 10.0 lb/4.5kg |
| 220g | 0.01g | HB-4621 | HB-4621.4F | 0.01 | | | 4.7" dia. / 120mm dia. | |
| 420g | 0.01g | HB-4622 | HB-4622.4F | 0.01 | | | | |
| 420g | 0.1g | HB-4623 | HB-4623.4F | 0.1 | | | 5.5" x 6.7" / 140 x 170mm | |
| 620g | 0.01g | HB-4624 | HB-4624.4F | 0.01 | | | | |
| 620g | 0.1g | HB-4625 | HB-4625.4F | 0.1 | | | | |
| 1200g | 0.01g | HB-4626 | HB-4626.4F | 0.02 | | | | |
| 2200g | 0.01g | HB-4627 | HB-4627.4F | 0.02 | | | | |
| 2200g | 0.1g | HB-4628 | HB-4628.4F | 0.1 | | | | |
| 6200g | 0.1g | HB-4629 | HB-4629.4F | 0.2 | | | | |
| 8200g | 1.0g | HB-4630 | HB-4630.4F | 1.0 | | | | |

Ohaus Scout SPX Portable Balance

| Capacity | Readability | 120V 60Hz | 220V 50/60 Hz | Repeatability | Units | Power | Pan Size | Ship Wt. | |
|----------|-------------|-----------|---------------|---------------|--|------------------------|---------------------------|-------------|--|
| 220g | 0.01g | HB-4720A | HB-4720A.4F | 0.01 | g, kg,ct,N,oz, ozt,dwt,lb, lb:oz,gm | AC (4) AA batteries | 4.7" dia. / 120mm dia. | 5 lb/2.26kg | |
| 420g | 0.01g | HB-4724A | HB-4724A.4F | 0.01 | | | | | |
| 420g | 0.1g | HB-4723A | HB-4723A.4F | 0.1 | | | 5.5" x 6.7" / 140 x 170mm | | |
| 620g | 0.01g | HB-4725A | HB-4725A.4F | 0.01 | | | | | |
| 620g | 0.1g | HB-4726A | HB-4726A.4F | 0.1 | | | | | |
| 1200g | 0.01g | HB-4740A | HB-4740A.4F | 0.02 | | | | | |
| 2200g | 0.01g | HB-4741A | HB-4741A.4F | 0.02 | | | | | |
| 2200g | 0.1g | HB-4727A | HB-4727A.4F | 0.1 | | | | | |
| 6200g | 0.1g | HB-4729A | HB-4729A.4F | 0.1 | | | | | |
| 8200g | 1.0g | HB-4742A | HB-4742A.4F | 1 | | | | | |





HB-4712A



HB-4532A



HB-4533A

Adam HCB Highland™ Precision Balances

Adam's Highland balances have what it takes for lab work. They feature multiple weighing units, RS-232 and USB interfaces, rechargeable battery pack and AC operation, capacity tracker, adjustable feet and level, lock down and more. Density and specific gravity determination are easy with the below balance weighing feature, and the removable draft shield eliminates wind disturbances outdoors or in drafty environments. ShockProtect™ provides overload protection, and the HandiCal™ internal calibration provides reliable readings. Includes Stainless steel pan; Removable draft shield; Auto power-off saves battery life; Dual, color-coated tare keys and a large, backlit display that is clear and quick to read.

See Chart for Models and Specifications

Adam Core Balance Compact Portable

The CQT provides a low-cost solution for field and lab usage. Complete with removable draft shield, AC adapter, adjustable feet and level and an integral security bracket. Ready for use out of the box, the CQT balances can operate with 6 AA batteries and an optional carrying case is available. Core balances include a removable draft shield helps when working on site where wind makes accurate readings difficult, and is battery-powered with six AA batteries. Includes weigh-below hook. An optional carrying case is available

See Chart for Models and Specifications

Adam 2600g Core Balance Field Kit

Designed to provide a reliable field balance to take the place of triple-beam balances. Balance comes with a durable, hard case and a weigh-below hook.

See Chart for Models and Specifications

| Adam HCB Highland™ Precision Balances | | | | | |
|---------------------------------------|-------------|-------------------|-----------|--------------|-------------|
| Capacity | Readability | Pan Size | 120V 60Hz | 220V 50/60Hz | Ship Wt. |
| 300g | 0.01g | 4.7" Dia. / 120mm | HB-4710A | HB-4710A.4F | 30lb/13.6kg |
| 600g | 0.02g | | HB-4711A | HB-4711A.4F | |
| 600g | 0.01g | | HB-4712A | HB-4712A.4F | |
| 1000g | 0.01g | | HB-4713A | HB-4713A.4F | |
| 1500g | 0.05g | | HB-4714A | HB-4714A.4F | |
| 3000g | 0.1g | | HB-4715A | HB-4715A.4F | |

| Description | Part # |
|------------------------|-----------|
| USB Interface cable | HB-4710CV |
| RS-232 Interface cable | HB-4700CB |
| HCB Carrying Case | HB-4710CS |

Adam Core Balance CQT Compact Portable

| Capacity | Readability | 120V 60Hz | 220V 50/60Hz | Repeatability | Linearity | Power | Pan Size | Ship Wt. |
|----------|-------------|-----------|--------------|---------------|-----------|-------------------|-------------------|--------------|
| 200g | 0.01g | HB-4528A | HB-4528A.4F | 0.01g | ±0.02g | AC / AA batteries | 5.1" Dia. / 130mm | 8 lb/3.6kg |
| 250g | 0.1g | HB-4529A | HB-4529A.4F | 0.1g | ±0.1g | | | 4 lb/1.8kg |
| 600g | 0.1g | HB-4530A | HB-4530A.4F | 0.1g | ±0.1g | | | 7 lb/3.1kg |
| 1500g | 0.1g | HB-4532A | HB-4532A.4F | 0.1g | ±0.2g | | | 7 lb/3.1kg |
| 2000g | 1g | HB-4534A | HB-4534A.4F | 1g | ±1g | | | 6 lb/2.7kg |
| 5000g | 1g | HB-4535A | HB-4535A.4F | 1g | ±1g | | | 3.7 lb/1.6kg |

Adam 2600g Core Balance Field Kit

| Capacity | Readability | 120V 60Hz | 220V50/60Hz | Repeatability | Linearity | Power | Pan Size | Ship Wt. |
|----------|-------------|-----------|-------------|---------------|-----------|-------------------|-------------------|--------------|
| 2600g* | 0.1g | HB-4533A | HB-4533A.4F | 0.1g | ±0.2g | AC / AA batteries | 5.1" Dia. / 130mm | 8.4 lb/3.8kg |

*2600g, Model HB-4533A is sold with a hard case (see picture)— perfect for field use, great upgrade to triple beam balances.



HB-4960



HB-4951



HB-4731

Ohaus Navigator XL Portable Balance

Designed with two touchless sensors that free up your hands, allowing you to focus on handling samples and keeping the scale free from contaminants. The touch-free sensors control; tare, zero, print, function, and backlight to help minimize touching the keypad. The balance stabilizes in less than one second to provide fast, accurate, and repeatable weighing results, which improve operator efficiency and increasing productivity. A bright backlit LCD display provides optimum visibility in any lighting condition, with large digits and indicators that make it fast and easy to read the weighing results. The balance includes an internal rechargeable battery that operates up to 100 hours, allowing it to be transported and used where a power outlet is not available.

 See Chart for Models and Specifications

Ohaus Navigator XT Portable Balance


The Navigator XT is designed with two touchless sensors that free up your hands, allowing you to focus on handling samples and keeping the scale free from contaminants. The touch-free sensors control; tare, zero, print, function, and backlight to help minimize touching the keypad. The balance stabilizes in less than one second to provide fast, accurate, and repeatable weighing results, which improve operator efficiency and increasing productivity. A bright backlit LCD display provides optimum visibility in any lighting condition, with large digits and indicators that make it fast and easy to read the weighing results. The balance includes an internal rechargeable battery that operates up to 100 hours, allowing it to be transported and used where a power outlet is not available.

 See Chart for Models and Specifications

Ohaus Ranger 3000 Compact Bench Scales

The Ranger 3000 can produce accurate results within 1 second. Its rapid stabilization time aids in waiting for the scale in weighing items. Its large LEDs and backlit LCD display makes it functional in almost any working condition. The scale uses AC power or a rechargeable battery, which is included. Battery life of up to 210 hours keeps it running when you need it. Its adjustable leveling feet, front level indicator and stability indicator make set up easy. It also includes an integral weigh-below hook.

- Internal, rechargeable battery provides up to 210 hours of running time
- Built-in carrying handle

 See Chart for Models and Specifications

Ohaus Navigator XL Portable Balances

| Capacity | Readability | 120V 60Hz | 220V 50/60Hz | Repeatability | Linearity | Power | Pan Size | Ship Wt. |
|----------|-------------|-----------|--------------|---------------|-----------|--------------|-------------------------|-------------|
| 1100g | 0.1g | HB-4960 | HB-4960.4F | 0.02g | ±0.02g | AC / battery | 7.6" x 8" / 194 x 203mm | 10 lb/4.5kg |
| 2100g | 0.1g | HB-4961 | HB-4961.4F | 0.04g | ±0.04g | | | |
| 5100g | 0.5g | HB-4962 | HB-4962.4F | 0.02g | ±0.02g | | | |
| 10000g | 1g | HB-4963 | HB-4963.4F | 0.02g | ±0.02g | | | |
| 20000g | 1g | HB-4964 | HB-4964.4F | 0.1g | ±0.1g | | | |

Ohaus Navigator XT Portable Balance

| Capacity | Readability | 120V 60Hz | 220V 50/60Hz | Units | Power | Pan Size | Ship Wt. |
|----------|-------------|-----------|--------------|--------------------------|-------------------|-----------------------------|--------------|
| 1600g | 0.1g | HB-4950 | HB-4950.4F | lb, oz, lb: oz, kg, g | AC / rechargeable | 9.00" x 6.90" / 250 x 240mm | 30 lb/13.6kg |
| 3200g | 0.19g | HB-4951 | HB-4951.4F | | | | |
| 6400g | 0.5g | HB-4952 | HB-4952.4F | | | | |
| 10000g | 0.5g | HB-4953 | HB-4953.4F | | | | |
| 16000g | 1g | HB-4954 | HB-4954.4F | | | | |

Ohaus Ranger 3000 Compact Bench Scales

| Capacity | Readability | Pan Size | 120V 60Hz | 220V 50/60Hz | Ship Wt. |
|----------|-------------|----------------------------|-----------|--------------|--------------|
| 3000g | 0.1g | 8.9" x 11.8" / 225 x 300mm | HB-4730 | HB-4730.4F | 11 lb/4.98kg |
| 6000g | 0.2g | | HB-4731 | HB-4731.4F | |
| 15kg | 0.5g | | HB-4732 | HB-4732.4F | |
| 30kg | 1g | | HB-4733 | HB-4733.4F | |

| Description | Part # |
|------------------------|------------|
| USB Interface kit | HB-4730USB |
| RS-232 Interface cable | HB-4730CB |
| In-use Cover | HB-4730UC |





HB-4945



HB-4946P



HB-4508A

Adam Eclipse High-Capacity Precision Balances

Eclipse high-capacity balances offer a range of models that deliver a precision readability of 0.1g. With a full spectrum of advanced features, the Eclipse series of precision and analytical balances provides unparalleled performance. Its elegant capacitive touch keypad and large display bring a balance of efficiency, durability, and intuitive operation to any laboratory. Every Eclipse is equipped with an elegant capacitive touch keypad containing color-coded keys, which enable uncomplicated navigation of the functions and features. Operating with a feather-light touch, the keys respond readily, even while wearing latex-gloves. The keypad's smooth surface allows fingerprints to be wiped off easily. Illuminated keys guide users through tasks, highlighting available options. Featuring one of the largest LCD readouts in the industry, the Eclipse displays sizable white digits on a deep-blue background, ensuring ultimate visibility.

A second line shows text prompts, instructions and any other relevant information. Clear, discernible symbols and multi-lingual text make operation easy, while prompts simplify even the most complex activities. The Eclipse achieves connectivity with precision and speed, whether it's basic data printing or advanced communication with a Laboratory Information Management System. Printouts with time, date, and other information are provided to comply with GLP requirements. USB and RS-232 interfaces optimize connections, while a third interface allows use of an optional remote display.



See Chart for Models and Specifications

Ohaus Explorer High-Capacity Precision Balances

The Explorer series includes three high-capacity, precision balances with capacities up to 35 kg. Explorer high-capacity balances offer the same intuitive and modular features as standard Explorer models, such as AutoCal™ fully-automatic internal calibration system, which can also be turned off, 1 second stabilization time, two touchless sensors for operation control, with additional functions and attributes to support higher capacity weighing applications. Balances include: 5.7" full-color touch screen (640 x 480 pixel), which is removable for remote or column-mount placement, QWERTY keyboard and numeric keypad to quickly input GLP and GMP data and other application data; Easy access communication ports include standard USB and RS232 and an optional third port of either RS232 or ethernet; die-casting housing, stainless steel pan and replaceable in-use cover; and, integral weigh below hook. Options include: touch screen column; rolling feet kit; rechargeable battery; cables and interface kits.



See Chart for Models and Specifications

| Adam Eclipse High-Capacity Balances | | | | | |
|-------------------------------------|-------------|----------------------------|-----------|--------------|----------------|
| Cap. | Readability | Platform | 120V 60Hz | 220V 50/60Hz | Ship Wt. |
| 12kg | 0.1g | 9.4 x 9.4" (240 x 240mm) | HB-4943 | HB-4943.4F | 16 lb / 7.3 kg |
| 16kg | 0.1g | 9.4 x 9.4" (240 x 240mm) | HB-4945 | HB-4945.4F | |
| 22kg | 0.1g | 12.2 x 14.8" (311 x 377mm) | HB-4946 | HB-4946.4F | |
| 32kg | 0.1g | 12.2 x 14.8" (311 x 377mm) | HB-4947 | HB-4947.4F | |

| Adam Eclipse High-Capacity Balances with Control Pillar | | | | | |
|---|-------------|----------------------------|-----------|--------------|----------------|
| Cap. | Readability | Platform | 120V 60Hz | 220V 50/60Hz | Ship Wt. |
| 12kg | 0.1g | 9.4 x 9.4" (240 x 240mm) | HB-4943P | HB-4943P.4F | 16 lb / 7.3 kg |
| 16kg | 0.1g | 9.4 x 9.4" (240 x 240mm) | HB-4945P | HB-4945P.4F | |
| 22kg | 0.1g | 12.2 x 14.8" (311 x 377mm) | HB-4946P | HB-4946P.4F | |
| 32kg | 0.1g | 12.2 x 14.8" (311 x 377mm) | HB-4947P | HB-4947P.4F | |

| Ohaus Explorer High-Capacity Balances | | | | | |
|---------------------------------------|-------------|-----------------------------|-----------|--------------|---------------|
| Cap. | Readability | Platform | 120V 60Hz | 220V 50/60Hz | Ship Wt. |
| 12kg | 0.1g | 15.7" x 11.8" (400 x 300mm) | HB-4506A | HB-4506A.4F | 26 lb / 12 kg |
| 24kg | 0.1g | 15.7" x 11.8" (400 x 300mm) | HB-4508A | HB-4508A.4F | |
| 35kg | 0.1g | 15.7" x 11.8" (400 x 300mm) | HB-4510A | HB-4510A.4F | |

| Adam Eclipse Accessories | Part # |
|--------------------------|------------|
| USB Interface kit | HB-4730USB |
| RS-232 Interface kit | HB-4730CB |
| In-use Cover | HB-4730UC |
| Weigh-below hook | HB-4541B.2 |
| Data capture software | HB-4545B.3 |

| Ohaus Explorer Accessories | Part # |
|----------------------------|-----------|
| Wheel kit (set of 4) | HB-4506RF |
| Rechargeable battery kit | HB-4506RB |
| Cable, display extension | HB-5292DC |
| Column kit | HB-4506T |
| Cable, RS232 PC 25-pin | HB-5392R |
| Cable, USB interface | HB-5392C |



HB-4775A



HB-4545B



Shown with optional column kit

HB-3535

Adam ABK Portable Scales

Adam's ABK portable scales are built tough to deliver reliable performance and effortless weighing. Designed for rugged industrial applications, a sleek, stainless steel indicator with superior sealing protects from dust, ensuring longevity. The scale's large, backlit display is vivid and easy-to-read, helping to streamline activities and reduce errors in data entry. Built-in limit lights make the ABK ideal for check weighing; the indicator shows when you are below your desired weight, at your required weight, or above your weight, and an audible alarm assists to give a secondary notification. Features include: Display hold function; stainless steel platform and indicator; RS232 data output, and rechargeable battery life of up to 90 hrs.

See Chart below for Models and Specifications

Adam Nimbus High-Capacity Precision Balances

Nimbus high-capacity balances offer a range of models that deliver a precision readability of 0.1g. With a compact footprint and intuitive user interface, Nimbus provides a streamlined weighing experience. Enhanced processing power combines with efficient technology to produce a balance that weathers the storms in demanding laboratories. Nimbus balances provide a vivid, backlit LCD for easy viewing in any lighting conditions. A level indicator and adjusting feet ensure proper balance setup for optimum weighing results. Color-coded keys facilitate quick recognition of the most frequently used buttons facilitating quick operation. Innovative design creates a smaller footprint, so the Nimbus occupies minimal space on the lab bench. An extruded aluminum base provides superior thermal transfer, offering greater stability and performance. Solid metal construction throughout the balance durably withstands chemicals and rigorous daily use. **Weigh-below hook can be ordered from the chart below.**

Adam Nimbus Precision Balances

see chart

Ship wt. 21lbs. (9.5kg)

Ohaus Ranger 7000 High-Capacity Balances

The Ranger 7000 balances were developed to thrive in rugged and harsh industrial environments. This modular scale was built with IP54 a cast-metal housing and sealed-metal indicator to ensure durability. The indicator can be separated from the platform and mounted to the wall or bench with the optional mounting kit accessory, allowing you to customize the placement of your scale based on the size and setup of your workstation. Additionally, a weigh-below hook offers the functionality to perform specific gravity tests or weigh items that cannot be easily placed on the weighing platform. The SmartText 2.0 software interface will have you easily using the Ranger 7000 for all of its unique and advanced features quickly. SmartText 2.0 makes an advanced scale very simple to use, and will greatly reduce training time for operators. Data produced by these balances can easily be exported through a standard RS232 or USB device port. Additional connectivity options include a second RS232, ethernet or standard USB port. Includes an integral weigh-below hook.

Ohaus Ranger 700 High Capacity Balances see chart

Ship wt. 10lbs. (4.53kg)

Adam ABK Portable Scales

| Capacity | Readability | 120V 60Hz | 220V 50/60Hz | Power | Pan Size | Ship Wt. |
|---------------|---------------|-----------|--------------|--------------|-------------------------------|--------------|
| 35lb. / 16kg | 0.001lb / .5g | HB-4874 | HB-4874.4F | AC / battery | 11.8" X 15.7" / 300mm X 400mm | 20 lb / 9 kg |
| 70lb / 32kg | 0.002lb / 1g | HB-4875 | HB-4875.4F | | | |
| 130lb / 60kg | 0.005lb / 2g | HB-4876 | HB-4876.4F | | | |
| 260lb / 120kg | 0.01lb / 5g | HB-4877 | HB-4877.4F | | | |

Adam Nimbus High Capacity Precision Balances

| Cap. | Readability | Platform | 120V 60Hz | 220V 50/60Hz |
|------|-------------|-----------------------------|-----------|--------------|
| 12kg | 0.1g | 15.7" x 11.8" (400 x 300mm) | HB-4543B | HB-4543B.4F |
| 16kg | 0.1g | 15.7" x 11.8" (400 x 300mm) | HB-4545B | HB-4545B.4F |
| 35kg | 0.1g | 15.7" x 11.8" (400 x 300mm) | HB-4546B | HB-4546B.4F |

Ohaus Ranger 7000 High-Capacity Balances

| Cap. | Readability | Platform | 120V 60Hz | 220V 50/60Hz |
|------|-------------|-----------------------------|-----------|--------------|
| 15kg | 0.2g | 14.8" x 12.2" (377 x 311mm) | HB-3515 | HB-3515.4F |
| 35kg | 0.5g | 14.8" x 12.2" (377 x 311mm) | HB-3535 | HB-3535.4F |
| 60kg | 1g | 14.8" x 12.2" (377 x 311mm) | HB-3560 | HB-3560.4F |

| Adam Nimbus Accessory | Part # |
|------------------------|-------------|
| Weigh-below hook | HB-4545B.1 |
| Nimbus HC In-use cover | HB-4545B.2 |
| RS-232 cable | HB-4700ACB |
| USB cable | HB-4700AUSB |
| Data capture software | HB-4545B.3 |

| Ohaus Ranger Accessory | Part # |
|------------------------------|------------|
| Rechargeable battery | HB-4506RB |
| Cable, display extension, 9m | HB-5292DC |
| Column kit | HB-4506T |
| RS232 kit | HB-3515.RS |



HB-3536



HB-4778



HB-4775A

Shown with
optional, hard
carrying case

Ohaus Ranger 7000 High-Resolution Balances

The Ranger 7000 high-resolution, high capacity balances provide enhanced resolution for even more accurate weighing in rugged and harsh industrial environments. Like the standard Ranger 7000 models these modular scales are built with IP54 a cast-metal housing and sealed-metal indicator to ensure durability. The indicator can be separated from the platform and mounted to the wall or bench with the optional mounting kit accessory, allowing you to customize the placement of your scale based on the size and setup of your workstation. Additionally, a weigh-below hook offers the functionality to perform specific gravity tests or weigh items that cannot be easily placed on the weighing platform. The SmartText 2.0 software interface will have you easily using the Ranger 7000 for all of its unique and advanced features quickly. SmartText 2.0 makes an advanced scale very simple to use, and will greatly reduce training time for operators. Data produced by these balances can easily be exported through a standard RS232 or USB device port. Additional connectivity options include a second RS232, ethernet or standard USB port. Includes an integral weigh-below hook.

Ohaus Ranger 700 High Capacity Balances see chart
Ship wt. 10lbs. (4.53kg)

Ohaus Digital Field Test Scale, 165 x 0.05 lbs.

The Digital Field Test Scale is designed for precise material testing in the construction industry. With a capacity of 165 lbs. and readability up to 0.05 lbs. you won't have to sacrifice precision for portability. Key features include the durable metal carrying case and internal battery with a 70-hour life between recharges, making the Field Test Scale a powerful addition to any job site.

- Designed for Precise In-the-Field Weighing
- The Field Test Scale comes packaged in a durable metal carrying case with steel latches and carrying handle, ensuring maximum portability for use anywhere on the job without limiting you to the lab.
- Equipped with a range of user-friendly features. The backlit LCD display allows for easy reading of results—even in low-light conditions. The internal battery means that you can operate for up to 70 hours between recharges.

Ohaus Digital Field Scale, 165 x 0.05 lbs. HB-4778
In-Use Cover HB-4778.1
Interface Kit, RS232-USB HB-4778.2
Ship wt. 17.6lbs. (8kg)

Adam CPWplus Portable Scales

The CPWplus line of industrial scales is one of our most popular scales for materials testing and general field use. With a steel base, stainless steel weighing pan, flexible remote indicator and splash-proof keypad, the CPWplus can handle harsh messy applications easily. The RS232 interface, AC adapter and wall-mount bracket make it a versatile solution for lab and field work. Uses 6 AA batteries.

Optional carrying case (HB-4775C) available for ease of portability. The CPWplus includes a large backlit LCD display on a flexible remote indicator; RS232 bi-directional interface; Hold function freezes reading; 9V adapter (included) or six AA batteries, and steel base, stainless weighing pan and splash-proof keypad.

See Chart for Models and Specifications

| Description | Part # |
|----------------------------|----------|
| CBWplus hard carrying case | HB-4775C |

| Ohaus Ranger 7000 High Resolution, High-Capacity Balances | | | | |
|---|-------------|-----------------------------|-----------|--------------|
| Cap. | Readability | Platform | 120V 60Hz | 220V 50/60Hz |
| 6kg | 0.02g | 11" x 11" (280 x 280mm) | HB-3506 | HB-3506.4F |
| 15kg | 0.1g | 14.8" x 12.2" (377 x 311mm) | HB-3516 | HB-3516.4F |
| 35kg | 0.1g | 14.8" x 12.2" (377 x 311mm) | HB-3536 | HB-3536.4F |

| Ohaus Ranger Accessory | Part # |
|------------------------------|------------|
| Rechargeable battery | HB-4506RB |
| Cable, display extension, 9m | HB-5292DC |
| Column kit | HB-4506T |
| RS232 kit | HB-3515.RS |

Ohaus Digital Field Scale

| Capacity | Readability | 120V 60Hz | Repeatability | Power | Pan Size | Ship Wt. |
|-------------|--------------|-----------|---------------|--------------|---------------------------------------|-------------------|
| 165lb./75kg | 0.05lb/.02kg | HB-4778 | 0.05lb/.02kg | AC / battery | 11" x 12.4" x 1.8" (280 x 316 x 45mm) | 10.8 lb / 4.89 kg |

Adam CPWplus Portable Scales

| Capacity | Readability | 120V 60Hz | 220V 50/60Hz | Repeatability | Power | Pan Size | Ship Wt. |
|--------------|--------------|-----------|--------------|---------------|-------------------|--------------------|-------------------|
| 75lb./35kg | 0.02lb/.01kg | HB-4774 | HB-4774.4F | 0.02lb/.01kg | AC / AA batteries | 12" sq / 300mm sq. | 10.8 lb / 4.89 kg |
| 165lb./75kg | 0.05lb/.02kg | HB-4775A | HB-4775A.4F | 0.05lb/.02kg | | | |
| 330lb./150kg | 0.1lb/.05kg | HB-4776 | HB-4776.4F | 0.1lb/.05kg | | | |
| 440lb./200kg | 0.1lb/.05kg | HB-4777 | HB-4777.4F | 0.1lb/.05kg | | | |



HB-4831



HB-4840



HB-4840P

Ohaus Defender® 3000 Bench Scales

The Defender 3000 feature a simple, yet rugged, tubular-frame design. Defender 3000 is OIML approved, NTEP certified, and Measurement Canada approved for use in all legal-for-trade applications. They include an indicator with tactile keys, backlit LCD display, built-in rechargeable battery operation and flexible mounting capabilities. These scales provide multiple weighing units: lb, oz, lb: oz, kg, g. Standard features of the Defender bench scales include: 304 stainless steel platform, aluminum IP67 load cell, as well as a painted tubular steel frame, column and indicator bracket.; Indicator features a high impact durable ABS housing with reversible face for either wall, column or table-top mounting; Adjustable non-slip rubber leveling feet with externally visible level indicator; 1" (25mm) high LCD weight display with high-contrast backlight; Built-in RS232 for printing and data connection. The ultra-long-lasting internal rechargeable battery provides operation on a single charge for up to 120 hours, ensuring uninterrupted operation for five straight days.

See Chart for Models and Specifications

Ohaus Defender® 5000 Standard Bench Scales

The OHAUS next generation Defender 5000 Series multi-functional bench scale is ideal for a multitude of applications, including production, packaging, inventory and shipping. Built durably and equipped with advanced features such as maximum configurability print output, GMP/GLP data output, library/ user management, and multiple connectivity options - the Defender 5000 is designed to simplify demanding industrial and commercial applications.

- Indicator guides the user through the operation with on-screen prompts and soft keys. The alphanumeric keypad and function keys allow for a simplified user experience. The construction is made of ABS plastic, powder-coated steel bracket.
- Durably constructed with a stainless steel platform, sand gray powder-coated steel frame and aluminum load cell. Supports up to 6,250e NTEP and Measurement Canada certified resolution for legal-for-trade applications.
- Multiple application modes and high storage capacity for greater flexibility. Features common industrial modes and supports a 50,000 item library

and 1,000 user profiles which can be downloaded/ uploaded for easy set-up with the included Micro SD Card. Also equipped with GLP/GMP output capability with time/date for result traceability. Alibi memory available.

- Multiple connectivity options for convenient data transfer and storage. Results can be stored in the Micro SD card. Data output via built-in RS232 or optional interfaces including 2nd RS232/RS485/ USB device, Ethernet, Bluetooth/WiFi, Analog Output and Discrete I/O with relays.

See Chart for Models and Specifications

| Description | Part # |
|--------------------------|-----------|
| Rechargeable battery kit | HB-4931RB |

| Defender Accessories | Part # |
|------------------------------|------------|
| Rechargeable battery | HB-4506RB |
| Cable, display extension, 9m | HB-5292DC |
| RS232 kit | HB-3515.RS |

Ohaus Defender 3000 Bench Scales

| Capacity | Readability | 120V 60Hz | 220V 50/60Hz | Power | Platform | Ship Wt. |
|---------------|---------------|-----------|--------------|-----------------------|-------------------------------|---------------|
| 66lb / 30kg | 0.01 lb / 5 g | HB-4830 | HB-4830.4F | AC / Optional battery | 14" x 12" / 355 x 305mm | 26 lb (12 kg) |
| 132lb / 60kg | 0.02lb / 10g | HB-4831 | HB-4831.4F | | | |
| 132lb / 60kg | 0.02lb / 10g | HB-4834 | HB-4834.4F | AC / Optional battery | 21.7" x 16.5" / 550mm x 420mm | 42 lb (19 kg) |
| 330lb / 150kg | 0.05lb / 20g | HB-4832 | HB-4832.4F | | | |
| 330lb / 150kg | 0.05lb / 20g | HB-4835 | HB-4835.4F | AC / Optional battery | 25.6" x 19.7" / 650mm x 500mm | 71 lb (32 kg) |
| 660lb / 300kg | 0.1lb / 50g | HB-4833 | HB-4833.4F | | | |

Ohaus Defender® 5000 Standard Bench Scales

| Capacity | Readability | Low Profile | 220V 50/60Hz | Column | 220V 50/60Hz | Power | Pan Size | Ship Wt. |
|---------------|--------------|-------------|--------------|----------|--------------|------------------------|-------------------------|----------------|
| 50lb / 25kg | 0.002lb x 1g | HB-4840 | HB-4840.4F | HB-4840P | HB-4840P.4F | AC Optional battery | 12 x 14" 305 x 355mm | 26.5lb 12kg |
| 100lb / 50kg | 0.005lb x 2g | HB-4841 | HB-4841.4F | HB-4841P | HB-4841P.4F | | 18 x 24" 457 x 610mm | 66.1lb 30kg |
| 100lb / 50kg | 0.005lb x 2g | HB-4842 | HB-4842.4F | HB-4842P | HB-4842P.4F | | | |
| 250lb / 125kg | .001lb x 5g | HB-4843 | HB-4843.4F | HB-4843P | HB-4843P.4F | | | |





H-4830

H-4825



H-4604



H-4835



H-4605



H-4739



H-4660



H-4785

Ohaus Cent-O-Gram and Dial-O-Gram Scales

Quality, high-precision overhead mechanical balances, the Ohaus Cent-O-Gram and Dial-O-Gram overhead balances offer the accuracy and convenience of an integrated weigh-below balance while allowing students to visualize mass measurement principles. Designed with a hanging pan system, both balances offer 10 times the readability of the Ohaus Triple Beam and Dial-O-Gram top-loading balances. The Vernier dial on the Dial-O-Gram 310 replaces two of the beams and is a great time saver. Both models provide 0.01g readability and a 3.5" diameter x 5" deep, stainless steel pan.

| | |
|-------------------------|--------|
| Cent-O-Gram, 311g | H-4825 |
| Dial-O-Gram, 310g | H-4830 |
| Ship wt. 15lbs. (6.8kg) | |

Ohaus Mechanical Balances, 2610g

The Ohaus 700 sSeries accommodates a large range of laboratory applications. Standard features include: Faster stability—three times faster stability reading than any other three-beam balance on the market; and, greater accuracy—outstanding beam quality allows for smooth positioning of the poise. Include weight sets. All of these balances have a 2610g capacity and a readability of 0.1g. They both feature the H-4609 weight set (Ohaus 750-SW/707) and a 6" diameter stainless steel platform.

| | |
|-------------------------------------|--------|
| 2610g Mechanical Balance | H-4603 |
| 2610g Mechanical Balance, 225g Tare | H-4604 |
| Ship wt. 12lbs. (5.4kg) | |

Ohaus Mechanical Balance, 2610g

This Ohaus 700 series balance comes with a 12" x 6" x 3" stainless steel scoop platform. Standard features include: Faster stability—three times faster stability reading than any other three-beam balance on the market; and, greater accuracy—outstanding beam quality allows for smooth positioning of the poise. Balance has a 2610g capacity and a readability of 0.1g and it features a H-4609 weight set (Ohaus 750-SW/707).

2610g Mechanical Balance, Scoop Platform H-4605
Ship wt. 9lbs. (4kg)

Ohaus Dial-O-Gram Balance, 2610g

The Ohaus Dial-O-Gram series combines the convenience of direct-reading dial calibration with the speed of magnetic damping for a balance that accurately and quickly weighs everything. Standard features include: Faster stability—three times faster stability reading than any other three-beam balance on the market; and, greater accuracy—outstanding beam quality allows for smooth positioning of the poise. Balance has a 2610g capacity and a readability of 0.1g; with a tare of 225g, plus it features a H-4609 weight set (Ohaus 750-SW/707).

2610g Dial-O-Gram Mechanical Balance H-4835
Ship wt. 14lbs. (6.35kg)

Ohaus Triple, Pro Mechanical Balance

The Triple Pro features 2610g capacity and 0.1g readability. Balance has integral covered mass storage, including weight set and built in handle for ease of use. Balance also features a storage lock to protect balance when not in use and a spring-loaded zero adjust compensator. Includes rod and clamp for fast set up of weigh-below applications like specific gravity.

Ohaus Triple, Pro Mechanical Balance H-4739
Ship wt. 12lbs. (5.4kg)

Ohaus Heavy-Duty, Field Test Scale

The field test scale is a very compact design and provides accurate weighings of a wide variety of heavy materials, even under the most adverse conditions. The large, 10" diameter, epoxy-coated steel, stabilized pan will hold oversized samples without tipping, and the weighted base keeps the entire scale rock steady. Two models are available: 16kg with a readability of 5g and a 36lb model with a readability of 0.01lb. Includes a set of slotted weights, stored in the base.

| | |
|--|--------|
| Ohaus Heavy Duty, Field Scale, English | H-4660 |
| Ohaus Heavy Duty, Field Scale, Metric | H-4665 |
| Ship wt. 22lbs. (9.9kg) | |

Ohaus Heavy-Duty, Solution Balance

The Ohaus heavy-duty solution balance is a dual-beam mechanical balance with a maximum capacity of 20 kilograms and a readability of 1 gram. A dual-faced Indicator plate allows front and rear weighing. The base and beam are constructed of cast aluminum and finished with a durable epoxy powder coating. A large lockable tare (2270g) and magnetic damping speeds up the weighing process. Readings up to 1100 grams may be taken directly off the two beams and the slotted mass set provided extends the weighing capacity to 20 kilograms. Features an 11" diameter stainless steel platform.

Ohaus Heavy Duty, Solution Balance H-4785
Ship wt. 41lbs. (18.95kg)



H-4660.10



H-4609



H-4615P



H-4615S



H-21170



H-4480A



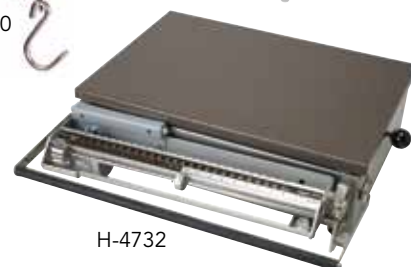
H-4603CC



H-4490



H-4621



H-4732

Field Scale Replacement Weights

Set includes: (1) 1lb; (2) 2 lb; (2) 5 lb, and (2) 10lb. (Can only be used with H-4660, not calibration weights.)

Field Scale Weights (avoirdupois) See chart below
 Ship wt. 22lbs. (10kg)

Field Scale Replacement Weights (Metric)

Set includes: (1) 500g; (1) 1 kg; (2) 2 kg, and (2) 5 kg. (Can only be used with H-4665, not calibration weights.)

Field Scale Weights (metric) See chart below
 Ship wt. 22lbs. (10kg)

Individual Weights

| Weight | Model | Weight | Model |
|--------|-----------|--------|----------|
| 1 lb. | H-4660.1 | 500g | H-4665.1 |
| 2 lb. | H-4660.2 | 1kg | H-4665.2 |
| 5 lb. | H-4660.5 | 2kg | H-4665.3 |
| 10 lb. | H-4660.10 | 5kg | H-4665.4 |

Polypropylene Scoop and Counterweight

Polypropylene scoop and counterweight. Ohaus # 703-00.

Polypropylene Scoop and Counterweight H-4615P
 Ship wt. 11lbs. (4.9kg)

Stainless Scoop and Counterweight

Stainless steel scoop and counterweight. Ohaus # 703-SO.

Stainless Scoop and Counterweight H-4615S
 Ship wt. 2lbs. (.9kg)

Under-Balance Weighing Kit

Rod and clamp assembly for doing under-balance weighing with Ohaus mechanical balances. Ohaus #183-00.

Under-Balance Weighing Kit H-21170
 Ship wt. 3.2lbs. (1.4kg)

Weight Set Replacement

Replacement weight set for mechanical balances. Include (2) 1000g and (1) 500g weight.

Weight Set Replacement H-4609
 Ship wt. 3lbs. (1.2kg)

Steel Carrying Case

Carrying case for mechanical balances.

Steel Carrying Case H-4603CC
 Ship wt. 10lbs. (4.5.4kg)

Dust Cover

Vinyl dust cover for mechanical balances.

Dust Cover H-4603C
 Ship wt. 2lbs. (.9kg)

Spring Scale, Circular

For field soil tests in mechanical analysis of aggregates, scale has 110 lb (50kg) x 8oz (200g). capacity. For direct reading, loose pointer can be set to any position on the 8" (203mm) dia. dial with thumbscrew. Overall dimensions: 8" x 1.625" x 16" (203 x 41 x 406mm).

Spring Scale H-4480A
 Ship wt. 4lbs. (1.7kg)

Spring Scale, Vertical

Heavy-duty spring balance for batch weighings with reliable accuracy and 70 lb (32kg) x 1lb (500g). capacity. Easy-to-read recessed gauge has deep-etched graduations. Adjustable indicator is set to zero for taring. Overall dimensions: 2" x 1.75" x 11" (51 x 45 x 279mm).

Spring Scale, Vertical H-4490A
 Ship wt. 8lbs. (3.6kg)

Suspension Scale, Digital Readout (US/metric)

High accuracy, compact digital hanging scale uses a 12-bit A/D converter for accuracy $\pm 0.1\%$ of applied load. Capacity is 250lb (113.4kg) with a resolution of .01lb (.01kg) and a $\pm 0.01\%$ accuracy. Weatherproof ABS plastic case assures maximum protection against moisture, dust and rough usage. High visibility, 0.5" high LCD digital readout provides easy reading of weights. Membrane push button switches allow simple trouble-free operation. Power is supplied by (1) 9-volt alkaline battery (not included). Peak hold, stainless steel hooks. Function keys for zero, lb/kg, on/off. Overall case size 3.75" W x 2" D x 6"H.

Suspension Scale, Digital Readout H-4621
 Ship wt. 4.7lbs. (2.1kg)

Portable Bench Platform Scale

Compact, self-contained scale is designed for rugged use, ideal for location or lab applications where scale can take a pounding. Complete with carrying handle, which doubles as a beam guard and allows convenient hanging from wall brackets, freeing bench and counter space. Weighs in lbs. only. 131 lbs capacity, Top: 125 lbs by 5 lbs; Left: 5 lbs x 1 oz; Right: 1 lb x 0.01 lb; Tare Bar: 0-10 lbs. Metric version weighs in kg only. 52kg capacity, Top: 50kg by 2kg; Left: 0-2 kg blank tare; Right: 2 kg x 0.01kg. The H-4732 is constructed of steel and cast aluminum with adjustable hardened steel pivots and self-aligning steel bearings. The built-in platform and steel locking mechanism ensure safe, secure operation and portability. Also features a stainless steel poise rail, the beams are mounted below the platform, allowing unrestricted visibility when weighing. Beam balance indicator ensures correct reading. Main frame has rubber cushion mounting for protection. Platform: 12" x 17" (305 x 432mm).

Portable Bench Platform Scale H-4732
Portable Bench Platform Scale (metric) H-4732M
 Ship wt. 32lbs. (14.5kg)

Scale Cover, Stainless Steel

Cover for use with H-4732 and H-4732M scales.

Scale Cover, Stainless Steel H-4732SC
 Ship wt. 20lbs. (9.1kg)

Portable Bench Platform Scale, Heavy-Capacity

Heavier capacity model of the H-4732 above. Weighs in lbs. only. 260 lbs capacity, Top: 250 lbs by 10 lbs; Left: 5 lbs x 1 oz; Right: 5 lbs x 0.1 lb; Tare Bar: 0-25 lbs. Complete with carrying handle, which doubles as a beam guard and allows convenient hanging from wall brackets, freeing bench and counter space.

Portable Bench Scale, Heavy-Capacity H-4748A
 Ship wt. 35lbs. (15.8kg)



H-4886SS



H-4889.250KG

**Electronic Balance Calibration Weights, Individual**

Stainless steel electronic balance calibration weights are available in ASTM classes 1 and 4 in sizes ranging from 10g to 30kg. Class 1 weights are for analytical balances and applications requiring high accuracy while Class 4 weights are typically used for balances less sensitive than 0.01g. Weights are available in a cylindrical design up to 5kg and a stackable grip-handle design from 5kg to 30kg for all necessary testing, calibration and adjustment.

All ANSI/ASTM E617 class weights meet or exceed specifications for tolerance, construction, surface finish, and magnetism as outlined in ANSI/ASTM E617. Weights 5kg and below are supplied in protective cases.

[See Chart for Below](#)

Calibration Weight Sets

Stainless steel calibration weight sets are available in ASTM class 1 with a 2100g capacity. Class 1 weights are for analytical balances and applications

requiring high accuracy. These sets are available with an accuracy certificate, or a traceable certificate. These sets include a convenient holder for the set. All ANSI/ASTM E617 class weights meet or exceed specifications for tolerance, construction, surface finish, and magnetism as outlined in ANSI/ASTM E617.

[See Chart for Below](#)

Calibration Weights, Individual

Individual stainless steel, heavy-capacity weights are an ideal solution for the calibration of large capacity scales.

[See Chart for Below](#)

Electronic Balance Calibration Weights, Individual, Stainless Steel

| ASTM Class 1 | | | ASTM Class 4 | |
|--------------|-------------|-----------------|--------------|-----------------|
| Weight | Std. Weight | Traceable Cert. | Std. Weight | Traceable Cert. |
| 30 kg | H-4888.30KG | H-4888.30KGT | H-4889.30KG | H-4889.30KGT |
| 25 kg | H-4888.25KG | H-4888.25KGT | H-4889.25KG | H-4889.25KGT |
| 24 kg | H-4888.24KG | H-4888.24KGT | H-4889.24KG | H-4889.24KGT |
| 20 kg | H-4888.20KG | H-4888.20KGT | H-4889.20KG | H-4889.20KGT |
| 16 kg | H-4888.16KG | H-4888.16KGT | H-4889.16KG | H-4889.16KGT |
| 10 kg | H-4888.10KG | H-4888.10KGT | H-4889.10KG | H-4889.10KGT |
| 8 kg | H-4888.8KG | H-4888.8KGT | H-4889.8KG | H-4889.8KGT |
| 5 kg | H-4888.5KG | H-4888.5KGT | H-4889.5KG | H-4889.5KGT |
| 4 kg | H-4888.4KG | H-4888.4KGT | H-4889.4KG | H-4889.4KGT |
| 3 kg | H-4888.3KG | H-4888.3KGT | H-4889.3KG | H-4889.3KGT |
| 2 kg | H-4888.2KG | H-4888.2KGT | H-4889.2KG | H-4889.2KGT |
| 1.5 kg | H-4888.15KG | H-4888.15KGT | H-4889.15KG | H-4889.15KGT |
| 1 kg | H-4888.1KG | H-4888.1KGT | H-4889.1KG | H-4889.1KGT |
| 600 g | H-4888.600G | H-4888.600GT | H-4889.600G | H-4889.600GT |
| 500 g | H-4888.500G | H-4888.500GT | H-4889.500G | H-4889.500GT |
| 400 g | H-4888.400G | H-4888.400GT | H-4889.400G | H-4889.400GT |
| 300 g | H-4888.300G | H-4888.300GT | H-4889.300G | H-4889.300GT |
| 200 g | H-4888.200G | H-4888.200GT | H-4889.200G | H-4889.200GT |
| 160 g | H-4888.160G | H-4888.160GT | H-4889.160G | H-4889.160GT |
| 150 g | H-4888.150G | H-4888.150GT | H-4889.150G | H-4889.150GT |
| 100 g | H-4888.100G | H-4888.100GT | H-4889.100G | H-4889.100GT |
| 80 g | H-4888.80G | H-4888.80GT | H-4889.80G | H-4889.80GT |
| 70 g | H-4888.70G | H-4888.70GT | H-4889.70G | H-4889.70GT |
| 60 g | H-4888.60G | H-4888.60GT | H-4889.60G | H-4889.60GT |
| 50 g | H-4888.50G | H-4888.50GT | H-4889.50G | H-4889.50GT |
| 40 g | H-4888.40G | H-4888.40GT | H-4889.40G | H-4889.40GT |
| 30 g | H-4888.30G | H-4888.30GT | H-4889.30G | H-4889.30GT |
| 20 g | H-4888.20G | H-4888.20GT | H-4889.20G | H-4889.20GT |
| 10 g | H-4888.10G | H-4888.10GT | H-4889.10G | H-4889.10GT |

Calibration Weights, Sets, Stainless Steel

| Model | Description |
|-----------|---|
| H-4888WS | Stainless steel electronic balance calibration weight set: 2100g capacity: 1kg, 500g, 300g, 200g, 100g, ASTM class 1 w/ accuracy certificate |
| H-4888WST | Stainless steel electronic balance calibration weight set: 2100g capacity: 1kg, 500g, 300g, 200g, 100g, ASTM class 1 w/ traceable certificate |
| H-4886SS | Metric economical stainless steel weight set: 2010g capacity: 1kg, 500g, 200g, (2) 100g, 50g, 20g, (2) 10g, 5g, (2) 2g, 1g w/ accuracy certificate |
| H-4886SSC | Metric economical stainless steel weight set: 2010g capacity: 1kg, 500g, 200g, (2) 100g, 50g, 20g, (2) 10g, 5g, (2) 2g, 1g w/ traceable certificate |
| H-4887SS | Metric economical stainless steel weight set: 4110g capacity: 2000g, 1000g, 500g, (2) 200g, 100g, 50g, (2) 20g, 10g, 5g, (2) 2g, 1g. w/ accuracy certificate |
| H-4887SST | Metric economical stainless steel weight set: 4110g capacity: 2000g, 1000g, 500g, (2) 200g, 100g, 50g, (2) 20g, 10g, 5g, (2) 2g, 1g. w/ traceable certificate |

Heavy-Capacity, Stainless Steel Calibration Weights

| ASTM Class 4 | | |
|--------------|-----------------|----------------------------|
| Weight | Standard weight | with traceable certificate |
| 250kg | H-4889.250KG | H-4889.250KGT |
| 200kg | H-4889.200KG | H-4889.200KGT |
| 180kg | H-4889.180KG | H-4889.180KGT |
| 150kg | H-4889.150KG | H-4889.150KGT |
| 100kg | H-4889.100KG | H-4889.100KGT |
| 80kg | H-4889.80KG | H-4889.80KGT |
| 75kg | H-4889.75KG | H-4889.75KGT |
| 60kg | H-4889.60KG | H-4889.60KGT |
| 50kg | H-4889.50KG | H-4889.50KGT |
| 40kg | H-4889.40KG | H-4889.40KGT |

Laboratory Ovens

Quality fan-forced circulation or gravity-convection ovens feature double-wall construction and heavy, welded-steel exterior. Work space is insulated from the outer cabinet with one inch of high-density mineral wool, and interiors are made of corrosive-resistant aluminized steel. Low-watt density incoloy-sheathed elements are used. Include automatic thermo control, pilot light heat indicator and either a top-mounted, mercury-free thermometer (0°-300°C) on the gravity convection models or a door-mounted, dial thermometer on the forced air models. All ovens come with two, adjustable shelves and a 6 ft., 3-wire power cord and grounded plug. Units also have scratch-proof rubber feet, full-length piano-hinged door and extruded thermoplastic door handle.

See Chart for Models and Specifications



H-30128



H-30105

H-30100

Laboratory Ovens – Forced Air

| Model | Max. Temp. | Description | Electric | Dimensions (W x D x H) |
|------------|------------|--|-----------------|--|
| H-30105 | 450°F | 0.6 cu. ft. (17L) capacity. Features bi-metal temperature controller, $\pm 2^\circ$ sensitivity. 800 watts. Shipping wt. 49 lbs. (22.2kg) | 115V, 60 Hz. | Inside: 12" x 10" x 8.25" (305 x 254 x 210mm) |
| H-30105.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 14" x 12.3" x 20.5" (356 x 305 x 521mm) |
| H-30115 | 450°F | 1.14 cu. ft. (32.3L) capacity. Features hydraulic temperature controller, $\pm 1^\circ$ sensitivity. 1050 watts. Shipping wt. 70 lbs. (31.7kg) | 115V, 60 Hz. | Inside: 13" x 13" x 11.6" (330 x 330 x 295mm) |
| H-30115.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 15" x 15" x 24.5" (381 x 381 x 622mm) |
| H-30125 | 450°F | 1.83 cu. ft. (51.8L) capacity. Features hydraulic temperature controller, $\pm 1^\circ$ sensitivity. 1500 watts. Shipping wt. 82 lbs. (31.7kg) | 115V, 60 Hz. | Inside: 18" x 12" x 14.6" (457 x 305 x 371mm) |
| H-30125.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 20" x 14" x 28.5" (508 x 356 x 724mm) |
| H-30131 | 450°F | 2.86 cu. ft. (81L) capacity. Features hydraulic temperature controller, $\pm 1^\circ$ sensitivity. 1500 watts. Shipping wt. 98 lbs. (44.5kg) | 115V, 60 Hz. | Inside: 18" x 14" x 19.8" (457 x 356 x 503mm) |
| H-30131.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 20" x 16.3" x 35" (508 x 414 x 890mm) |

Laboratory Ovens – Gravity Convection

| Model | Max. Temp. | Description | Electric | Dimensions (W x D x H) |
|------------|------------|---|-----------------|---|
| H-30100 | 450°F | 0.7 cu. ft. (19.8L) capacity. Features bi-metal temperature controller, $\pm 2^\circ$ sensitivity. 600 watts. Shipping wt. 44 lbs. (20kg) | 115V, 60 Hz. | Inside: 12" x 10" x 10" (305 x 254 x 254mm) |
| H-30100.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 14" x 12.3" x 17.5" (356 x 312 x 445mm) |
| H-30110 | 450°F | 1.27 cu. ft. (36L) capacity. Features hydraulic temperature controller, $\pm 1^\circ$ sensitivity. 750 watts. Shipping wt. 58 lbs. (26.3kg) | 115V, 60 Hz. | Inside: 13" x 13" x 13" (330 x 330 x 330mm) |
| H-30110.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 15" x 15.3" x 21.5" (380 x 389 x 546mm) |
| H-30120 | 450°F | 2.0 cu. ft. (56.6L) capacity. Features hydraulic temperature controller, $\pm 1^\circ$ sensitivity. 1200 watts. Shipping wt. 78 lbs. (35kg) | 115V, 60 Hz. | Inside: 18" x 12" x 15.6" (457 x 305 x 396mm) |
| H-30120.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 20" x 14.3" x 25.5" (508 x 362 x 6485mm) |
| H-30128 | 450°F | 3.0 cu. ft. (85L) capacity. Features hydraulic temperature controller, $\pm 1^\circ$ sensitivity. Shipping wt. 148 lbs. (67.1kg) | 115V, 60 Hz. | Inside: 18" x 14" x 21.8" (457 x 356 x 554mm) |
| H-30128.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 20" x 16.3" x 31.5" (508 x 414 x 800mm) |



NOTES

230V Models do not have wire plug.

Laboratory Ovens with Digital Control

These laboratory ovens feature the same durable, quality construction as the ovens on the previous page while offering easy temperature control and the stability of a full, PID microprocessor, which accurately maintains settings within $\pm 1^\circ\text{F}$ (0.5°C), even in varying ambient or power supply conditions. This feature helps to confirm temperature stability or indicate any control malfunction or power loss throughout a process period. The digital controller features large, easy-to-read LED numbers that continuously display set temperature and process temperature, as well as a setting lock mode that provides protection against accidental or inadvertent adjustments.

Features:

- Digital Microprocessor Control
- Forced air or Gravity Convection Designs
- Durable, Double-wall Construction with Scratch-resistant, Hammer Finish
- Corrosion-resistant Aluminized Interior
- Quality UL- and CSA-recognized components in all ovens



H-30100E

Advanced Design

Cabinets are as attractive as they are durable. Exteriors are painted light gray and have a hard, scratch-resistant hammer finish. Doors open with high-impact thermoplastic handles. Cabinets have heavy steel double-wall construction. Work space is insulated from the outer cabinet with one inch of high-density mineral wool, and interiors are made of corrosion-resistant aluminized steel.

Heating Elements

Energy-efficient, low-watt density, incoloy sheathed elements are engineered into a compact design for quick run-up and recovery times. Temperature uniformity is greatly improved by a perforated heat shield which absorbs radiant heat and distributes it more evenly throughout the product chamber.

See Chart for Models and Specification

Laboratory Ovens – Forced Air with Digital Control

| Model | Max. Temp. | Description | Electric | Dimensions (W x D x H) |
|-------------|------------|---|-----------------|--|
| H-30105E | 450°F | 0.7 cu. ft. (19.8L) capacity. Features bi-metal temperature controller, $\pm 2^\circ$ sensitivity. 600 watts. Shipping wt. 49 lbs. (22.2kg) | 115V, 60 Hz. | Inside: 12" x 10" x 10" (305 x 254 x 254mm) |
| H-30105E.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 14" x 12.3" x 17.5" (356 x 312 x 445mm) |
| H-30115E | 450°F | 1.27 cu. ft. (36L) capacity. Features hydraulic temperature controller, $\pm 1^\circ$ sensitivity. 750 watts. Shipping wt. 70 lbs. (31.7kg) | 115V, 60 Hz. | Inside: 13" x 13" x 13" (330 x 330 x 330mm) |
| H-30115E.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 15" x 15.3" x 21.5" (381 x 389 x 546mm) |
| H-30125E | 450°F | 2.0 cu. ft. (56.6L) capacity. Features hydraulic temperature controller, $\pm 1^\circ$ sensitivity. 1200 watts. Shipping wt. 82 lbs. (31.7kg) | 115V, 60 Hz. | Inside: 18" x 12" x 15.6" (457 x 305 x 396mm) |
| H-30125E.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 20" x 14.3" x 25.5" (508 x 362 x 648mm) |
| H-30131E | 450°F | 3.0 cu. ft. (85L) capacity. Features hydraulic temperature controller, $\pm 1^\circ$ sensitivity. 1500 watts. Shipping wt. 98 lbs. (44.5kg) | 115V, 60 Hz. | Inside: 18" x 14" x 21.8" (457 x 356 x 554mm) |
| H-30131E.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 20" x 16.3" x 31.5" (508 x 414 x 800mm) |

Laboratory Ovens – Gravity Convection with Digital Control

| Model | Max. Temp. | Description | Electric | Dimensions (W x D x H) |
|-------------|------------|---|-----------------|--|
| H-30100E | 450°F | 0.6 cu. ft. (17L) capacity. Features bi-metal temperature controller, $\pm 2^\circ$ sensitivity. 800 watts Shipping wt. 44 lbs. (20kg) | 115V, 60 Hz. | Inside: 12" x 10" x 8.25" (305 x 254 x 210mm) |
| H-30100E.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 14" x 12.3" x 20.5" (356 x 312 x 520mm) |
| H-30110E | 450°F | 1.14 cu. ft. (32.3L) capacity. Features hydraulic temperature controller, $\pm 1^\circ$ sensitivity. 1050 watts Shipping wt. 58 lbs. (26.3kg) | 115V, 60 Hz. | Inside: 13" x 13" x 11" (330 x 330 x 280mm) |
| H-30110E.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 15" x 15.3" x 25" (380 x 389 x 635mm) |
| H-30120E | 450°F | 1.83 cu. ft. (51.8L) capacity. Features hydraulic temperature controller, $\pm 1^\circ$ sensitivity. 1500 watts Shipping wt. 78 lbs. (35kg) | 115V, 60 Hz. | Inside: 18" x 12" x 14.2" (457 x 305 x 360mm) |
| H-30120E.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 20" x 14.3" x 29" (508 x 362 x 737mm) |
| H-30128E | 450°F | 2.86 cu. ft. (81L) capacity. Features hydraulic temperature controller, $\pm 1^\circ$ sensitivity. 1500 watts Shipping wt. 148 lbs. (67.1kg) | 115V, 60 Hz. | Inside: 18" x 14" x 19.8" (457 x 356 x 503mm) |
| H-30128E.4F | (232°C) | | 230V, 50/60 Hz. | Overall: 20" x 16.3" x 35" (508 x 414 x 890mm) |

**NOTES**

230V Models do not have wire plug.



H-30145



H-30145E with E-Series Digital Control

Laboratory Bench Ovens

These forced-air, convection ovens feature double-wall, steel construction, which provides reliable, even work-space temperature for testing applications. The ovens are constructed of corrosion-resistant, aluminized steel interiors and exteriors coated in an exclusive "high-tech" bronze polyester finish. The large, high-impact thermal plastic door handles provide durability and remain cool-to-the-touch during operation. Ovens come with (2) heavy-duty, chrome-plated wire shelves, which can support 80 lbs. (36kg). Additional shelves can be added. Ovens can accommodate up to 11 shelves (17 for the H-30135 models), which can be adjusted to 1.5" center increments.

See Chart for Models and Specifications

Laboratory Bench Ovens, Digital-Series

The Digital Series ovens take the standard forced-air, convection ovens and add a PID microprocessor controller with a digital display to provide greater uniformity, repeatability and resolution of heating operations. The precise micro-processor and the J-type thermocouple holds set temperatures accurately to $\pm 1^\circ\text{F}$ or $^\circ\text{C}$ with improved chamber temperature uniformity. Control features include large, easy-to-read dual LED display, which shows both the set and process temperatures at a glance. The ovens are constructed of corrosion-resistant, aluminized steel interiors and exteriors coated in an exclusive "high-tech" bronze polyester finish. The large, high-impact thermal plastic door handles provide durability and remain cool-to-the-touch during operation. Ovens come with (2) heavy-duty,

chrome-plated wire shelves, which can support 80 lbs. (36kg). Additional shelves can be added.

See Chart for Models and Specifications

Laboratory Bench Ovens, Accessories

| Description | Part # |
|-----------------------------------|----------|
| Shelf and Supports for all models | H-30145S |
| Exhaust Kit, 3" Pipe | H-30181 |
| Floor Stand for all models | H-30150 |
| Cabinet with 2 Slide-out Shelves | H-30155 |

| Model | Max. temp. | Description | Dimensions (W x D x H) |
|--------------|------------------|---|---|
| H-30140 | 300°F (149°C) | 7 cu. ft. (198L) capacity. Features calibrated dial-type temperature controller, 115V, 60 Hz, 1050 watts, 9.2 amps, Shipping wt. 185 lbs. (84kg) | Inside: 25.5" x 24" x 20" (648 x 610 x 508mm) Overall: 33" x 35.5" x 24" (838 x 902 x 610mm) |
| H-30140.4F | | 230V, 50/60Hz version of H-30140 | |
| H-30140E | | E-series digital control version of H-30140 | |
| H-30140E.4F | | 230V, 50/60Hz version of H-30140E | |
| H-30145 | 450°F (232°C) | 7 cu. ft. (198L) capacity. Features calibrated dial-type temperature controller, 115V, 60 Hz, 1920 watts, 16amps. Shipping wt. 185 lbs. (84kg) | Inside: 25.5" x 24" x 20" (648 x 610 x 508mm) Overall: 33" x 35.5" x 24" (838 x 902 x 610mm) |
| H-30145.4F | | 230V, 50/60Hz version of H-30145 | |
| H-30145E | | E-Series digital control version of H-30145 | |
| H-30145E.4F | | 230V, 50/60Hz version of H-30145E | |
| H-30135 | 450°F (232°C) | 10.6 cu. ft. (300L) capacity. Features calibrated dial-type temperature controller, 115V, 60 Hz, 1920 watts, 16 amps. Uses 20 amp grounded plug. Shipping wt. 225 lbs (102kg) | Inside: 25.5" x 24" x 30" (648 x 610 x 762mm) Overall: 33" x 35.5" x 34" (838 x 902 x 864mm) |
| H-30135.4F | | 230V, 50/60Hz version of H-30135 | |
| H-30135E | | E-series digital control version of H-30135 | |
| H-30135E.4F | | 230V, 50/60Hz version of H-30135E | |
| H-30160.4F | 550°F (287°C) | 6.6 cu. ft. (187L) capacity. Features calibrated dial-type temperature controller, 230V, 60 Hz, 3000 watts, 12.5 amps. Shipping wt. 195 lbs (77.1kg) | Inside: 25.5" x 22.5" x 20" (648 x 572 x 508mm) Overall: 33" x 35.5" x 24" (838 x 902 x 610mm) |
| H-30160E.4F | | E-series digital control version of H-30160.4F | |
| H-30160SS.4F | | Stainless steel version of H-30160.4F | |



NOTES

230V Models do not have wire plug.



H-32300



H-32333 (shown with Digital Controller)

H-32343
(shown with optional stand)

Large Capacity Bench Ovens

These economical, large-capacity, bench ovens are designed to handle a wide variety of applications, which require a maximum temperature of 400°F (204°C) with a $\pm 0.5\%$ control accuracy and $\pm 8^\circ\text{F}$ (4°C) uniformity for efficient drying of large samples. All models feature an analog thermocouple-actuated, temperature controller and a 1/3 HP motor with a 400 CFM blower. Ovens have 2" (51mm) 6 lb/cf industrial rockwool insulation and the built-in baffle helps reduce radiant heat and optimizes oven heating operation. All ovens have 304 stainless steel interiors, explosion venting latches and incoloy sheathed tubular heating

elements. All ovens feature a UL-listed control panel and meet the requirements of the National Fire Prevention Association Standard 86, industrial risk insurers, Factory Mutual and OSHA standards. Motor starter and heating element contactors are electrically interlocked to shut off heaters if power to the blower is interrupted, and, permits operation of the blower without heat for cooling.

Ovens include two (2) 50lb (22.7kg) capacity nickel-plated wire shelves, which can be placed on any of the 10 support channels, which are located on 3" centers. Extra shelves can be ordered to accommodate needs.

See Chart for Models and Specifications

Digital Controller Option

A Digital, microprocessor-based controller, which is thermocouple-actuated can be requested at time of order. Model is indicated by the DG2 suffix in the chart below.

| Description | Part # |
|--------------------------------|-----------|
| Floor stand for H-32300 models | H-32300.2 |
| Floor stand for H-32333 models | H-32333.2 |
| Floor Stand for H-32343 models | H-32343.2 |
| Shelf for H-32300 models | H-32300.1 |
| Shelf for H-32333 models | H-32333.1 |
| Shelf for H-32343 models | H-32343.1 |

| Volume Cu. ft (m) | Inside dim. W x D x H | Max. temp. | Control accuracy | Oven uniformity | Model | Voltage | Outer dimension W x D x H | Kw | Rise time | Ship. wt. |
|----------------------|---|--------------------|---------------------|-----------------------|-------------------|-----------------|---|-----|--------------|--------------------|
| 15.8 (.447) | 36" x 21" x 36" (910 x 530 x 910mm) | 400°F (204.4°C) | $\pm 0.5\%$ | $\pm 8^\circ\text{F}$ | H-32300.2F | 230V, 60Hz 1ph. | 40" x 28" x 47" (1020 x 710 x 1190mm) | 4.4 | 18 min. | 600 lbs (272kg) |
| | | | | | H-32300.2F.DIG2 | | | | | |
| | | | | | H-32300.2F.3 | 230V, 60Hz 3ph. | | | | |
| | | | | | H-32300.2F.3.DIG2 | | | | | |
| | | | | | H-32300.8F | 208V, 60Hz 1ph. | | | | |
| | | | | | H-32300.8F.DIG2 | | | | | |
| | | | | | H-32300.8F.3 | 208V, 60Hz 3ph. | | | | |
| | | | | | H-32300.8F.3.DIG2 | | | | | |
| 27 (.764) | 36" x 36" x 36" (910 x 910 x 910mm) | 400°F (204.4°C) | $\pm 0.5\%$ | $\pm 8^\circ\text{F}$ | H-32300.9F.3 | 460V, 60Hz 3ph. | 40" x 43" x 47" (1020 x 1090 x 1190mm) | 6.6 | 18 min. | 750 lbs (340kg) |
| | | | | | H-32300.9F.3.DIG2 | | | | | |
| | | | | | H-32333.2F | 230V, 60Hz 1ph. | | | | |
| | | | | | H-32333.2F.DIG2 | | | | | |
| | | | | | H-32333.2F.3 | 230V, 60Hz 3ph. | | | | |
| | | | | | H-32333.2F.3.DIG2 | | | | | |
| | | | | | H-32333.8F | 208V, 60Hz 1ph. | | | | |
| | | | | | H-32333.8F.DIG2 | | | | | |
| 36 (1.01) | 36" x 48" x 36" (910 x 1220 x 910mm) | 400°F (204.4°C) | $\pm 0.5\%$ | $\pm 8^\circ\text{F}$ | H-32333.8F.3 | 208V, 60Hz 3ph. | 40" x 55" x 47" (1020 x 1400 x 1190mm) | 6.6 | 22 min. | 850 lbs (385kg) |
| | | | | | H-32333.8F.3.DIG2 | | | | | |
| | | | | | H-32333.9F.3 | 460V, 60Hz 3ph. | | | | |
| | | | | | H-32333.9F.3.DIG2 | | | | | |
| | | | | | H-32343.2F | 230V, 60Hz 1ph. | | | | |
| | | | | | H-32343.2F.DIG2 | | | | | |
| | | | | | H-32343.2F.3 | 230V, 60Hz 3ph. | | | | |
| | | | | | H-32343.2F.3.DIG2 | | | | | |
| | | | | | H-32343.8F | 208V, 60Hz 1ph. | | | | |
| | | | | | H-32343.8F.DIG2 | | | | | |
| | | | | | H-32343.8F.3 | 208V, 60Hz 3ph. | | | | |
| | | | | | H-32343.8F.3.DIG2 | | | | | |
| | | | | | H-32343.9F.3 | 460V, 60Hz 3ph. | | | | |
| | | | | | H-32343.9F.3.DIG2 | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |



NOTES

50Hz Models are available upon request.

Heavy-Duty Forced-Air, Convection Ovens

Ideally suited for soil and asphalt testing, the Despatch LBB series ovens feature fast heat-up rates and precise, easy-to-read digital controls. Powerful open coil heating elements and a forward curved fan deliver faster heat-up rates and short processing times. Digital controls regulate temperatures within tight tolerances. A 0.75" (1.9cm) LED panel displays temperatures in large, bright, easy-to-read numbers. Temperatures can be reported in either Fahrenheit or Celsius. The LBB series ovens operate at temperatures up to 399°F (204°C) and use forced-convection airflow for uniform temperatures throughout the oven chamber. The LBB is designed and manufactured to provide years of dependable service. The fan and heater are top-mounted to prevent damage from spills. When spills do occur, the corrosion-resistant, stainless steel interior and nickel-plated shelves clean up easily. The motor is permanently lubricated and virtually maintenance free. Every LBB bench top oven is UL and C-UL listed, and receives a thorough performance test before shipping. Ovens come with two shelves, either standard shelves, which can handle up to 50 lbs. (22.7kg) or reinforced shelves, which can handle 200 lbs. (90.7kg) of material. See chart below for number and type of shelves included with each oven. Ovens meet AASHTO uniformity requirements of $\pm 3^\circ$ at 150°C. Motor and fan are located above the stainless steel oven chamber to prevent damage if materials are spilled.

See Chart for Models and Specifications

Heavy-Duty Laboratory Ovens

| Operating range | Chamber size W x D x H | Capacity cu. ft. (L) | Model | Despatch model | Overall size W x D x H | Electrical | Shelves included | Ship Wt. |
|--------------------------------|--------------------------------------|-------------------------|------------|----------------|---|---|----------------------------------|--------------------|
| 95°F to 399°F 35°C to 204°C | 18 x 18 x 12" (460 x 460 x 310mm) | 2.3 (65) | H-30356 | LBB1-23 | 24 x 24.5 x 26" (610 x 620 x 660mm) | 50/60Hz, 1ph, 120V 15 amps, 1.2KW heater | (2) Standard (max. 5 @ 2"Ø) | 205 lb (92 kg) |
| | | | H-30356.4F | | | 50/60Hz, 1ph, 240V 15 amps, 1.2KW heater | | |
| | 30 x 18 x 22" (760 x 460 x 560mm) | 6.9 (195) | H-30360 | LBB1-69 | 36 x 24.5 x 36.5" (920 x 630 x 930mm) | 50/60Hz, 1ph, 120V 21.6 amps, 2.4KW heater | (2) Reinforced (max. 5 @ 4"Ø) | 320 lb (146 kg) |
| | | | H-30360.4F | | | 50/60Hz, 1ph, 240V 10.8 amps, 2.4KW heater | | |
| | 30 x 20 x 35" (770 x 510 x 890mm) | 12.1 (343) | H-30364.4F | LBB2-12 | 36 x 26.5 x 51.5" (920 x 680 x 1310mm) | 50/60Hz, 1ph, 240V 16.4 amps, 3.6KW heater | (2) Reinforced (max. 8 @ 4"Ø) | 315 lb (142 kg) |
| | 37 x 24 x 35" (940 x 610 x 890mm) | 18 (510) | H-30366.4F | LBB2-18 | 43 x 30.5 x 51.5" (1100 x 780 x 1310mm) | 50/60Hz, 1ph, 240V 16.4 amps, 3.6KW heater | (2) Reinforced (max. 8 @ 4"Ø) | 485 lb (221 kg) |
| | 37 x 37 x 35" (940 x 940 x 890mm) | 27.7 (784) | H-30368.4F | LBB2-27 | 43 x 43.5 x 51.5" (1100 x 1110 x 1310mm) | 50/60Hz, 1ph, 240V 21.4 amps, 4.8KW heater | (2) Reinforced (max. 8 @ 4"Ø) | 587 lb (266 kg) |

High-Performance Forced-Air Bench-Top Ovens

The LAC high-performance bench-top oven uses horizontal recirculating airflow to ensure uniform temperatures throughout the oven. A high-volume fan circulates air through perforated, stainless steel walls to create a constant horizontal airflow across all sections of the oven. The result is proven reliability.

These ovens use a microprocessor-based temperature and hi-limit controller with large LCD display and real time clock for auto start capability. The LCD display shows temperature readings along with clear, detailed information on oven status. The controller features three operating modes for quick and easy operation: Manual mode, Timer mode and Profile mode. The data-logging functionality enables reporting and analyzing data files can be exported via the controller's USB port. Modbus RS485 communications are included for easy data access. In demanding production and laboratory applications such as curing, drying, sterilizing, aging and other process-critical procedures.

The Despatch LAC features sturdy, welded, double-wall construction, three inches (7.6cm) of glass fiber insulation and heavy-duty gaskets. Each oven receives a thorough quality and performance test before it is shipped. Heating elements carry a five-year warranty. All models are UL/C-UL listed.

See Chart for Models and Specifications



High-Performance Forced-Air Bench-Top Ovens

| Operating range | Chamber size W x D x H | Capacity cu. ft. (L) | Model | Despatch model | Overall size W x D x H | Electrical, Single Phase | Exhaust diameter (back) | Doors | Shelves included | Ship Wt. |
|-------------------------|------------------------------------|-------------------------|------------|----------------|--------------------------------------|--|----------------------------|-------|----------------------------------|----------------------|
| 40-260°C (104-500°F) | 18.8 x 18 x 19" (480x460x480mm) | 3.7 (105) | H-30322 | LAC1-38A | 31 x 27 x 38" (790 x 690 x 960mm) | 120V 50/60Hz, 16 amps, 1.6 KW heater | 2.5" (6.4cm) | 1 | (2) Standard (max. 9 @ 2" Ø) | 185 lb (84 kg) |
| | 18.8 x 18 x 19" (480x460x480mm) | 3.7 (105) | H-30322.4F | LAC1-38B | 31 x 27 x 38" (790 x 690 x 960mm) | 240V 50/60Hz, 9.2 amps, 1.8 KW heater | | 1 | (2) Standard (max. 9 @ 2" Ø) | 235 lb (106.4 kg) |
| | 23.8 x 20 x 24" (610x510x610mm) | 6.6 (187) | H-30324.4F | LAC1-67 | 36 x 29 x 43" (910x740x1100mm) | 240V 50/60Hz, 11.7 amps, 2.4 KW heater | | 1 | (2) Standard (max. 11 @ 2" Ø) | 203 lb (92 kg) |
| | 23.8 x 24 x 36" (610x610x900mm) | 12 (340) | H-30326.4F | LAC2-12 | 36 x 33 x 55" (91x84x139mm) | 240V 50/60Hz, 23.4 amps, 4.8 KW heater | | 1 | (2) Standard (max. 17 @ 2" Ø) | 360 lb (163 kg) |
| | 35.3 x 24 x 36" (900x610x900mm) | 18 (510) | H-30328.4F | LAC2-18 | 48 x 33 x 55" (1210x850x1390mm) | 240V 50/60Hz, 23.4 amps, 4.8 KW heater | | 2 | (2) Standard (max. 17 @ 2" Ø) | 720 lb (326.5 kg) |



H-30200



H-30204.4F



H-30216.4F



H-4947AC

Small Bench top Muffle Furnace

Small (0.07 cu.ft. 2.1L), 1520W bench top muffle furnace has ceramic fiber insulation, which provides faster heat-up and reduced energy consumption. Embedded heating element on top and both sides provides temperature uniformity. Digital single set point temperature control to 2012°F (1100°C) with single display showing actual temperature or set point. Drop-down door doubles as a convenient shelf for loading and unloading. Rear chamber port for monitoring temperatures with independent measuring devices. Shipped with power cord. Refer to table for specifications.

Bench top Furnace, 120V 50/60Hz H-30200

Bench top Furnace, 240V 50/60Hz H-30200.4F
Ship wt. 30.6lbs. (13.8kg)

Medium Bench top Muffle Furnace

Medium (0.2 cu.ft. 5.8L), 1800W bench top muffle furnace has ceramic fiber insulation, which provides faster heat-up and reduced energy consumption. Embedded heating element on top and both sides provides temperature uniformity. Digital single set point temperature control to 2192°F (1200°C) with single display showing actual temperature or set point. Drop-down door doubles as a convenient shelf for loading and unloading. Rear chamber port for monitoring temperatures with independent measuring devices. Shipped with power cord. Refer to table for specifications.

Bench top Furnace, 120V 50/60Hz H-30201

Bench top Furnace, 240V 50/60Hz H-30201.4F
Ship wt. 86lbs. (39kg)

Large, Premium Bench top Muffle Furnace

Large (0.5 cu.ft. 14L), 3095W bench top muffle furnace has ceramic fiber insulation, which provides faster heat-up and reduced energy consumption. Embedded heating element on top, bottom and both sides provides temperature uniformity. Digital single set point temperature control to 2192°F (1200°C) with single display showing actual temperature or set point. Drop-down door doubles as a convenient shelf for loading and unloading. Rear chamber port for monitoring temperatures with independent measuring devices. Shipped with power cord. Refer to table for specifications.

Bench top Furnace, 240V 50/60Hz H-30204.4F

Ship wt. 134lbs. (61kg)

Economical 1200°C Box Furnace

Small to medium-sized, economical box furnaces with a maximum working temperature of 1200°C. Furnaces exhibit excellent temperature uniformity and use a ceramic fiber board lining to ensure energy efficiency. Heating elements are designed in a unique configuration, which lays directly on a fiber-groove surface to ensure the longest heating element life, best heat radiation properties and minimum distortion of heating elements at high temperature. All models use long-life platinum/rhodium S-type thermocouple. 30-segment, easy-to-use PID programmable temperature controller, allows control of heating rates, dwells (time holds) and cooling rates. Safety feature includes a safety

interlock system to shut off power when furnace door open. Refer to table for specifications.

1200°C Box Furnace, 6" x 6" x 6" H-30209.4F

1200°C Box Furnace, 8" x 12" x 7" H-30216.4F
Ship wt. 600lbs. (272kg)

Gas Hotplate, Cylinder Gas

Two-burner, heavy-duty cast iron stove runs on cylinder gas. Designed for portability, this stove is perfect for any lab or location application. Burners are rated at 35,000 BTU and provide fast heating.

Gas Hotplate, Cylinder Gas H-4947AC

Ship wt. 44.7lbs. (20.2kg)

Gas Hotplate, Natural Gas

Two-burner, heavy-duty cast iron stove runs on natural gas. Designed for portability, this stove is perfect for any lab or location application. Burners are rated at 35,000 BTU and provide fast heating.

Gas Hotplate, Natural Gas H-4947AN

Ship wt. 44.1lbs. (20kg)

| Model | Max. temp | Dimensions chamber(W x D x H) | Electrical |
|------------|--------------------|---|-------------------------|
| H-30200 | 2012°F (1100°C) | 5" x 6" x 4.25" (127 x 152 x 108mm) | 120V, 12amps, 50/60Hz |
| H-30200.4F | | | 240V, 6.3amps, 50/60Hz |
| H-30201 | 2192°F (1200°C) | 7" x 10" x 5" (178 x 254 x 127mm) | 120V, 15amps, 150/60Hz |
| H-30201.4F | | | 240V, 7.5amps, 50/60Hz |
| H-30204.4F | 2192°F (1200°C) | 12.8" x 10" x 6.8" (330 x 254 x 180mm) | 240V, 12.9amps, 50/60Hz |
| H-30214.4F | 2192°F (1200°C) | 5" x 8" x 4" (127 x 203 x 102mm) | 208/240V 50/60Hz 1 ph. |
| H-30215.4F | 2192°F (1200°C) | 7" x 8" x 6" (178 x 203 x 152mm) | 208/240V 50/60Hz 1 ph. |

| Model | Max. temp | Dimensions chamber(W x D x H) | Electrical |
|------------|--------------------|--------------------------------------|------------------------|
| H-30209.4F | 2192°F (1200°C) | 6" x 6" x 6" (203 x 305 x 178mm) | 208/220V 50/60Hz 1 ph. |
| H-30216.4F | 2192°F (1200°C) | 8" x 12" x 7" (203 x 305 x 178mm) | 208/240V 50/60Hz 1 ph. |



Basic and Stirring Hotplates

Reflective white ceramic surface is acid- and alkali-resistant and easy to clean. Non-heating frame surrounds the heated ceramic plate for added protection. Fit virtually anywhere in the lab. Easy-to-set analog temperature control knob with graduated scale. LED display. Top plate and base design diverts liquids away from internal electronics. Safety warning system with visual alert protects user from accidental burns. Redundant temperature control systems for over temperature protection. Incorporated base mount holds support rods up to 13mm diameter—ideal when using thermometers or pH probes.

Economy Basic Hotplate See Table

Economy Stirring Hotplate See Table

Ship wt. 7" x 7": 11lbs. (5kg), 10" x 10": 16lbs. (7.3kg)

Heavy-Duty Hotplates

Electric hot plate with aluminum top plate outperforms other materials and provides superior temperature uniformity and stability. Hot plates feature a sturdy stainless steel case that resists spills and corrosion and supports heavy loads. Large top plate surface accommodate a 40 lb maximum load capacity. Heating surface resists warping and buckling. Embedded heating elements provide better heat transfer and have a longer life than "open-coil" designs. Perforated side plates allow air circulation—keep controls cool to the touch. For added safety, an indicator lights up when power is supplied to the heating element.

Heavy-Duty Hotplate, 12" x 12" See Table

Heavy-Duty Hotplate, 24" x 12" See Table

Ship wt. 12" x 12": 26lbs. (11.8kg), 24" x 12": 50lbs. (22.7kg)

Electric Hotplate

Dual-burner electric hot plate. Two 825-watt rapid heating burners. Infinite heat controls, heavy-gauge steel construction; chrome finish; phenolic feet. Includes 3-wire cord and plug. 6.5" (16.5cm) dia. heating elements: Overall: 20.5" x 8.75" x 4" (52 x 22 x 10cm). Warm-simmer rolling boil with adjustable controls.

Electric Hotplate

H-4949

Ship wt. 9.9lbs. (4.4kg)

Heat Gun, Industrial-grade

Powerful blower provides a high volumes of air needed for almost any application and convenient base allows for stationary use. Unit is 14.3 Amps and produces temperatures of 750-1000°F. Air intake regulator provides temperature adjustment and cool air setting is great for no-heat applications, adding versatility. Insulated nozzle. Protects operator, provides a cool exterior temperature.

Heat Gun, Industrial-grade

H-4958

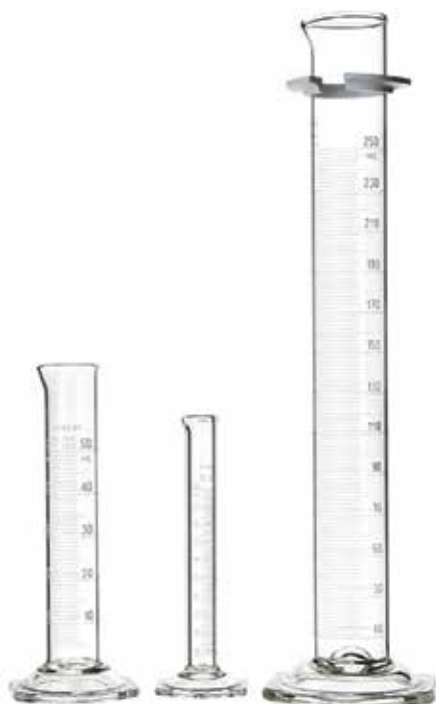
Ship wt. 6lbs. (2.7kg)

Basic and Stirring Hotplates

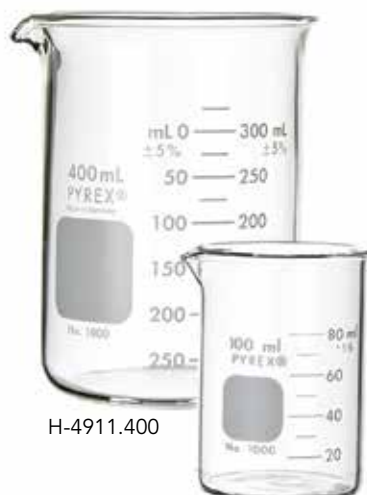
| Temperature range | Heating surface | Max. load | Electrical | Standard model | Stirring model | Stirring range |
|--------------------------------------|-----------------|------------------|--------------|----------------|----------------|----------------|
| Ambient to 540°C (Ambient to 1004°F) | 7" x 7" | 12lbs 5.4 kg | 120V 60Hz | H-4942 | H-4942S | 30 to 1200rpm |
| | | | 230V 50/60Hz | H-4942.4F | H-4942S.4F | |
| | 10" x 10" | 16 lbs 7.2 kg | 120V 60Hz | H-4943 | H-4943S | |
| | | | 230V 50/60Hz | H-4943.4F | H-4943S.4F | |

Heavy-Duty Hotplates

| Temperature range | Heating surface | Max. load | Electrical | Model | Watts |
|----------------------------|-----------------|------------------|--------------|-----------|------------|
| 38 to 371°C (100 to 700°F) | 12" x 12" | 26 lbs 11.7kg | 120V 60Hz | H-4952 | 1600 watts |
| | | | 230V 50/60Hz | H-4952.4F | |
| | 24" x 12" | 50 lbs 22.6kg | 120V 60Hz | H-4953 | 3200 watts |
| | | | 230V 50/60Hz | H-4953.4F | |



H-4915.050 H-4915.025 H-4915.250



H-4911.400

H-4911.100



H-4912P.1M

H-4912P.250

H-4912P.050

Graduated Cylinders, Glass

Glass graduated cylinders. Graduated circular divisions, double-numbered, reading up and down. Calibrated to deliver the indicated capacities. Packed one cylinder to a carton.

| Capacity | Graduated Range | Interval | Model |
|----------|-----------------|----------|------------|
| 10ml | 1-10 | .1 | H-4915.010 |
| 25ml | 2-25 | .2 | H-4915.025 |
| 50ml | 5-50 | 1 | H-4915.050 |
| 100ml | 10-100 | 2 | H-4915.100 |
| 250ml | 10-250 | 2 | H-4915.250 |
| 500ml | 25-500 | 5 | H-4915.500 |
| 1000ml | 50-1000 | 10 | H-4915.1M |
| 2000ml | 150-2000 | 20 | H-4915.2M |

Graduated Cylinders, Plastic

Polypropylene graduated cylinders are double scale with easy-to-read numbers. Stable base makes cylinders tip- and roll-proof. 10ml size has flared top for easy filling.

| Capacity | Graduated Range | Interval | Model |
|----------|-----------------|----------|-------------|
| 10ml | 1-10 | .2 | H-4916P.010 |
| 25ml | 2-25 | .5 | H-4916P.025 |
| 50ml | 5-50 | 1 | H-4916P.050 |
| 100ml | 10-100 | 2 | H-4916P.100 |
| 250ml | 30-250 | 2 | H-4916P.250 |
| 500ml | 50-500 | 5 | H-4916P.500 |
| 1000ml | 100-1000 | 20 | H-4916P.1M |
| 2000ml | 200-2000 | 20 | H-4916P.2M |

Graduated Beakers, Glass

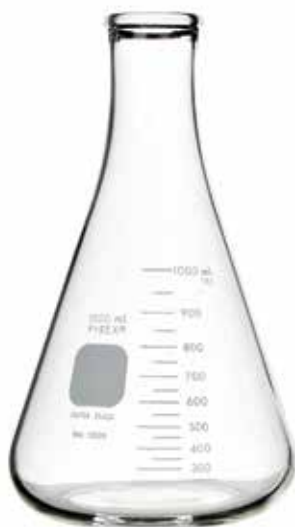
Griffin low-form beakers for general laboratory use have pour-out lip. Design provides greater strength via heavier uniform walls.

| Capacity | Graduated Range | Interval | Model |
|----------|-----------------|----------|------------|
| 50ml | 10-40 | 10 | H-4911.050 |
| 100ml | 20-80 | 10 | H-4911.100 |
| 250ml | 25-200 | 25 | H-4911.250 |
| 400ml | 25-325 | 25 | H-4911.400 |
| 600ml | 50-500 | 50 | H-4911.600 |
| 800ml | 50-750 | 50 | H-4911.800 |
| 1000ml | 50-950 | 50 | H-4911.1M |
| 2000ml | 50-1950 | 50 | H-4911.2M |
| 3000ml | 50-2950 | 50 | H-4911.3M |
| 4000ml | 50-3950 | 50 | H-4911.4M |

Graduated Beakers, Plastic

Low-form laboratory beakers with slightly tapered heavy walls provide firm grip and convenient stacking. Beakers have pour-out spout and graduation markings ($\pm 5\%$).

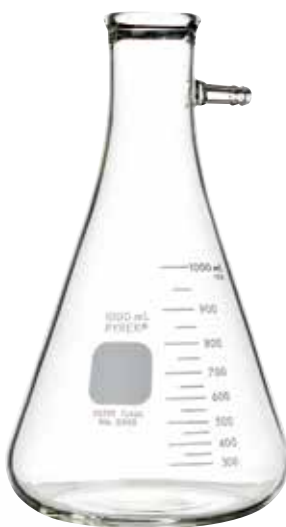
| Capacity | Graduated Range | Interval | Model |
|----------|-----------------|----------|-------------|
| 50ml | 10-50 | 10 | H-4912P.050 |
| 100ml | 25-100 | 25 | H-4912P.100 |
| 250ml | 50-250 | 10 | H-4912P.250 |
| 400ml | 100-400 | 50 | H-4912P.400 |
| 600ml | 100-600 | 100 | H-4912P.600 |
| 1000ml | 200-1000 | 200 | H-4912P.1M |
| 2000ml | 200-2000 | 200 | H-4912P.2M |



H-4917.2M



H-4913.250



H-4913.1M



H-4913.1MS



H-4913.250S



H-3401



H-3399

H-3398



H-3397

Erlenmeyer Flasks

Narrow-mouth flasks feature heavy-duty rim, volume graduations, tubulation and matte spot for temporarily identifying contents.

| Capacity | Graduated Range | Interval | Model |
|----------|-----------------|----------|------------|
| 250ml | 75-250 | 25 | H-4917.250 |
| 500ml | 150-500 | 50 | H-4917.500 |
| 1000ml | 200-1000 | 50 | H-4917.1M |
| 2000ml | 600-1800 | 200 | H-4917.2M |
| 4000ml | 1500-3500 | 500 | H-4917.4M |

Erlenmeyer Flasks—Vented

Narrow-mouth flasks feature heavy-duty rim, volume graduations, tubulation and matte spot for temporarily identifying contents.

| Capacity | Graduated Range | Interval | Model |
|----------|-----------------|----------|------------|
| 250ml | 75-250 | 25 | H-4913.250 |
| 500ml | 150-500 | 50 | H-4913.500 |
| 1000ml | 200-1000 | 50 | H-4913.1M |
| 2000ml | 600-1800 | 200 | H-4913.2M |
| 4000ml | 1500-3500 | 500 | H-4913.4M |

Rubber Stoppers for Erlenmeyer Flasks

Rubber stopper with brass hose fitting for use with Erlenmeyer flasks.

| Flask Size (ml) | Model |
|-----------------|-------------|
| 250 | H-4913.250S |
| 500 | H-4913.500S |
| 1000 | H-4913.1MS |
| 2000 | H-4913.2MS |
| 4000 | H-4913.4MS |

Polyethylene Dispensing Bottles

Easy-to-squeeze, resilient bottles provide excellent leak-proof dispensing service. Heavier flow rates can be accomplished by cutting back dispensing tip.

8 oz. (250ml) H-3398

16 oz. (500ml) H-3399

32 oz. (1000ml) H-3401



Ship wt. 0.5lbs. (0.2kg)

Guth Wash Bottle

Bottle has aspirator bulb with integral passageways and neck-mounted check-valve on a 1,000ml borosilicate Florence flask. Includes bent delivery tube and flexible tubing tip. Flask allows natural grip with either hand. Forefinger closes the opening while the other fingers squeeze the bulb ejecting a stream of liquid.

Guth Wash Bottle

H-3397



Ship wt. 2.1lbs. (0.9kg)

**Material Handling Scoops**

| Model | Size | Description | Ship Wt. |
|--------|---|---|------------------|
| H-1702 | 8" H x 15" W x 23" L (203 x 381 x 584mm) | Material handling scoop | 13.4 lb (6kg) |
| H-4308 | 15" x 30" x 4" (381 x 762 x 102mm) | Welded steel construction with open chute simplifies transfer or bag loading. Front swing-down handle folds inside pan to permit criss-cross stacking. Tapered scoop section controls flow. | 13.4 lb (6kg) |
| H-4309 | 12" x 20" x 4" (305 x 508 x 102mm) | | |

Moisture and Immersion Pans

| Model | Dimensions (LxWxD) | Description | Ship Wt. |
|-----------------------|---|---|--------------------|
| Straight Sides | | | |
| H-3700 | 18 x 18 x 1.5" deep (457 x 457 x 38mm) | Galvanized steel with wire-bound, rolled-top edges. Features 2 drop handles, straight sides. ASTM D2234, D2961 | 7 lb (4.5kg) |
| H-3710 | 24 x 24 x 4" deep (610 x 610 x 102mm) | Galvanized steel with wire-bound, rolled-top edges. Features 2 drop handles, straight sides. ASTM D346, D2013, D 2234 | 14 lb (6kg) |
| H-3712 | 24 x 24 x 6" deep (610 x 610 x 152mm) | | |
| Tapered Sides | | | |
| H-3705 | 18 x 18 x 3" deep (457 x 457 x 76mm) | Galvanized steel with wire-bound, rolled-top edges. Features 2 drop handles, tapered sides for nesting. ASTM D346, D2013, D2234 | 6.3 lb (2.8kg) |
| H-3707 | 18 x 18 x 3" deep (457 x 457 x 76mm) | Galvanized steel with wire-bound, rolled-top edges without handles | 6.2 lb (2.8 kg) |
| H-3723 | 10 x 20 x 3" deep (254 x 508 x 76mm) | Galvanized steel with wire-bound, rolled-top edges. Features 2 drop handles, tapered sides for nesting. | 5 lb (2.2kg) |
| H-3725 | 24 x 24 x 3" deep (610 x 610 x 76mm) | Galvanized steel with wire-bound, rolled-top edges. Features 2 drop handles, tapered sides for nesting. ASTM C192 | 9.9 lb (4.4kg) |
| H-3728 | 36 x 36 x 3" deep (914 x 914 x 76mm) | Galvanized steel with wire-bound, rolled-top edges. Features 2 drop handles, tapered sides for nesting. ASTM C192 | 20 lb (9kg) |

Stainless Steel Rectangular Pans

| Model | Dimensions (L x W x D) | Ship Wt. |
|---------|--|-------------------|
| H-3981S | 6.5" x 6" x 4.5"D (165 x 152 x 114) | 1.2 lb (1.4kg) |
| H-3981P | 6.375" x 5.375" x 4.5"D (165 x 152 x 114) | 1 lb (0.4kg) |
| H-3986S | 9.75" x 7.75" x 4.25"D (267 x 40 x 114) | 2.3 lb (1.0kg) |
| H-3967S | 13.5" x 6.75" x 5"D (343 x 171 x 127) | 3 lb (1.3kg) |
| H-3993S | 22" x 6.5" x 5.25"D (559 x 165 x 133) | 4.5 lb (2.0kg) |
| H-3996S | 15.5" x 8" x 7"D (394 x 204 x 178) | 5 lb (2.2kg) |

Tin Rectangular Mixing Pans

| Model | Dimensions (L x W x D) | Ship Wt. |
|--------|---|-------------------|
| H-3981 | 8 x 5.25 x 4.25" (203 x 133 x 108mm) | 2 lb (.9kg) |
| H-4934 | 9 x 4.5 x 2.75 (229 x 114 x 70mm) | 1.5 lb (1.3kg) |

Bakalon Rectangular Mixing Pan (Non-Stick)

| Model | Dimensions (L x W x D) | Ship Wt. |
|---------|--|-----------------|
| H-4359A | 18 x 13 x 1.875" D (457 x 330 x 47mm) | 3 lb (1.3kg) |

**Stainless Steel Rectangular Mixing Pans**

| Model | Dimensions (L x W x D) |
|----------|---|
| H-3969 | 10.375 x 6.375 x 2.5" (264 x 162 x 64mm) |
| H-4352.2 | 20.75 x 12.75 x 2.5" (527 x 323 x 63mm) |
| H-4352.4 | 20.75 x 12.75 x 4" (527 x 324 x 102mm) |
| H-4352.6 | 20.75 x 12.75 x 6" (527 x 324 x 152mm) |
| H-4353.2 | 13.875 x 12.75 x 2.5" (346 x 323 x 63mm) |
| H-4353.4 | 13.875 x 12.75 x 2.5" (346 x 323 x 63mm) |
| H-4353.6 | 13.875 x 12.75 x 6" (346 x 323 x 152mm) |
| H-4354.2 | 12.75 x 10.375 x 2.5" (342 x 264 x 64mm) |

Stainless Steel Rectangular Mixing Pans

| Model | Dimensions (L x W x D) |
|----------|--|
| H-4354.4 | 12.75 x 10.375 x 4" (342 x 264 x 102mm) |
| H-4354.6 | 12.75 x 10.375 x 6" (342 x 264 x 152mm) |
| H-4355.2 | 12.75 x 6.875 x 2.5" (342 x 174 x 64mm) |
| H-4355.4 | 12.75 x 6.875 x 4" (342 x 174 x 102mm) |
| H-4355.6 | 12.75 x 6.875 x 6" (342 x 174 x 152mm) |
| H-4356.2 | 14.875 x 10.25 x 2" (376 x 269 x 50mm) |
| H-4356.4 | 16.125 x 11.125 x 2.25" (409 x 282 x 57mm) |
| H-4356.6 | 18.125 x 12.375 x 2.375" (460 x 314 x 60mm) |

Aluminum Rectangular Mixing Pans (Non-Stick)

| Model | Size (L x W x D) |
|----------|--|
| H-4941 | 8" x 8" x 2" (203 x 203 x 51mm) |
| H-4351.2 | 15.375" x 10.875" x 2.375" (390 x 276 x 60mm) |
| H-4351.4 | 17.625" x 11.75" x 2.375" (447 x 298 x 60mm) |
| H-4351.6 | 25.75" x 17.75" x 3.5" (654 x 450 x 89mm) |

Stainless Steel Round Mixing Bowls & Pans

| Model | Dimensions (L x W x D) |
|----------|--|
| H-4936 | 7.25" x 3" (198 x 76mm) 1.5 qt. (1.4L) |
| H-4937 | 9.5" x 3.5" (241 x 89mm) 3 qt. (2.8L) |
| H-4938 | 12.5" x 5.5" (318 x 140mm) 8 qt. (7.6L) |
| H-4939 | 10.75" x 4.75" (273 x 121mm) 5.5 qt. (5.2L) |
| H-4939.5 | 17.5" x 6.5" (444 x 165mm) 16 qts. (13.9L) |

Aluminum Round Mixing Pans (Non-Stick)

| Model | Dimensions (L x W x D) |
|----------|-------------------------|
| H-4940.2 | 9" x 1.5" (228 x 38mm) |
| H-4940.4 | 10" x 1.5" (254 x 38mm) |
| H-4940.6 | 12" x 1.5" (304 x 38mm) |
| H-4940.8 | 15" x 1.5" (381 x 38mm) |



H-17150

H-4924.100



H-4924.200



H-4920.050



H-4920.1M



H-4923.1M



H-4923.500



H-4922.050



H-4922C.050

Moisture Dish, Aluminum

Inverted slip-in cover with beaded edge for tight sealing, can be handled with crucible tongs. Inside dia at top 2.25" x .75" deep (57mm x 19mm). Drawn aluminum construction.

Moisture Dish, Aluminum

H-17150

Ship wt. 0.2lbs. (0.09kg)

Evaporating Dishes, Nickel

Heavy gauge, pure nickel dishes with straight sides, flat bottom and pour lip.

| Capacity | Dia | Height | Model |
|----------|------------------|-------------------|------------|
| 40ml | 2.25" (57mm) | 1" (25mm) | H-4924.040 |
| 100ml | 2.75" (70mm) | 1.375" (35mm) | H-4924.100 |
| 200ml | 3.375" (86mm) | 1.7625" (46mm) | H-4924.200 |
| 300ml | 3.875" (98mm) | 2.25" (57mm) | H-4924.300 |

Evaporating Dishes, Nickel

See Table

Ship wt. 0.6lbs. (0.27kg)

Beakers, Aluminum or Nickel

Low-form laboratory beakers with pour spout. One-piece construction eliminates breakage.

| Capacity | Aluminum | Nickel |
|----------|------------|------------|
| 60ml | H-4920.060 | H-4921.060 |
| 125ml | H-4920.125 | H-4921.125 |
| 250ml | H-4920.250 | H-4921.250 |
| 500ml | H-4920.500 | H-4921.500 |
| 1,000ml | H-4920.1M | H-4921.1M |
| 2,000ml | H-4920.2M | H-4921.2M |

Beakers, Aluminum or Nickel

See Table

Ship wt. 0.6lbs. (0.3kg)

Measures, Stainless Steel

Stainless steel measures feature convenient handle and graduations in milliliters and ounces on inside.

| Capacity | Model |
|----------|------------|
| 500ml | H-4923.500 |
| 1,000ml | H-4923.1M |
| 2,000ml | H-4923.2M |

Measures, Stainless Steel

See Table

Ship wt. 1lb. (0.5kg)

Crucibles, Nickel

These nickel crucibles are constructed from pure heavy-sheet nickel. Suitable for fusions, including those with sodium peroxide. Highly resistant to dilute alkalis.

| Capacity | Top Dia. | Height | Crucible |
|----------|----------|--------|------------|
| 20ml | 38mm | 35mm | H-4922.020 |
| 30ml | 42mm | 45mm | H-4922.030 |
| 50ml | 45mm | 51mm | H-4922.050 |
| 75ml | 51mm | 57mm | H-4922.075 |
| 100ml | 60mm | 64mm | H-4922.100 |
| 250ml | 83mm | 83mm | H-4922.250 |
| 500ml | 102mm | 92mm | H-4922.500 |
| 1000ml | 127mm | 114mm | H-4922.1M |

Crucibles, Nickel

See Table

Ship wt. 0.8lbs. (0.36kg)

Crucibles Covers, Nickel

Covers for the nickel crucibles above. Choose by crucible size.

| Crucible | Cover | Crucible | Cover |
|----------|-------------|----------|-------------|
| 20ml | H-4922C.020 | 100ml | H-4922C.100 |
| 30ml | H-4922C.030 | 250ml | H-4922C.250 |
| 50ml | H-4922C.050 | 500ml | H-4922C.500 |
| 75ml | H-4922C.075 | 1000ml | H-4922C.1M |

Crucible Covers, Nickel

See Table

Ship wt. 0.5lbs. (0.2kg)

**Sample Cans**

Cans for receiving, transporting and storing sample materials, complete with friction-type lid. H-4183A, 1 gallon capacity (3.48L), can adequately hold all material from an average-sized density hole.

| Capacity | Dimensions | Model |
|-------------------|---------------------------------------|---------|
| 1 qt. (.94L) | 4.125" dia. x 4.875" (105 x 124mm) | H-4184A |
| 1 gal. (3.48L) | 6.5" dia. x 7" (165 x 178mm) | H-4183A |

Sample Cans

See Table
Ship wt. 1lbs. (0.5kg)

Moisture Boxes, Aluminum

Seamless aluminum, flat-bottom, straight-side box has tight fitting cover that fits bottom of box also. Sample is protected from exposure during weighing operations.

| Dia | Height | Model |
|-------------|--------------|--------|
| 2" (51mm) | .875" (22mm) | H-4926 |
| 2.5" (64mm) | 1.75" (44mm) | H-4927 |
| 3" (76mm) | 1" (25mm) | H-4928 |
| 3.5" (89mm) | 2" (51mm) | H-4929 |

Moisture Boxes, Aluminum

See Table
Ship wt. 0.2lbs. (0.09kg)

Sample Jars, Plastic with Caps

White plastic jar with cap. 4 oz. jars come 24 to a box, 8 oz. come 12 to a box and 16 oz. come 12 to a box.

| Capacity | Model |
|------------------------|-----------|
| 4 oz (113.4g), 24 ct. | H-4914.04 |
| 8 oz (226.8g), 12 ct. | H-4914.08 |
| 16 oz (453.6g), 12 ct. | H-4914.16 |

Sample Cups, Tin

| Capacity | Dimensions | Quantity | Model |
|-----------------|--|----------|-----------|
| 2.5 oz (71g) | 1.87" (47.5mm) ID, 1.42" (36mm) deep | 48 | H-1350.3A |
| 3 oz (85g) | 2.25" (57.1mm) ID, 1.42" (36mm) deep | 36 | H-1350.3 |
| 4.7 oz (133g) | 2.42" (61.5mm) ID, 1.67" (42.6mm) deep | 36 | H-1350.4A |
| 5.6 oz (159g) | 2.59" (66mm) ID, 1.72" (43.4mm) deep | 36 | H-1350.6A |
| 8.2 oz (232g) | 3.05" (77.5mm) ID, 1.97" (50mm) deep | 18 | H-1350.8A |
| 16 oz (454g) | 4" (102mm) ID, 2.375" (60.3mm) deep | 1 | H-1350.16 |
| 42.3 oz (1200g) | 6.12" (155mm) ID, 3" (76.2mm) deep | 1 | H-1350.42 |
| 70.5 oz (2000g) | 6.12" (155mm) ID, 5" (127mm) deep | 1 | H-1350.70 |

Sample Cups, Tin

Flat-bottom, seamless tin sample cups have telescoping covers. Hold samples for determining penetrations.

Sample Cups, Tin

See chart above

Evaporating Dishes, Porcelain

Shallow, porcelain dish has pour lip, glazed inside and partly glazed outside.

| Capacity | Top Dia | Height | Model |
|----------|---------|--------|--------------|
| 120ml | 90mm | 37mm | H-4930.120 |
| 250ml | 115mm | 45mm | H-4930.250 |
| 525ml | 165mm | 54mm | H-4930.500 |
| 765ml | 185mm | 54mm | H-4930.765 |
| 1,285ml | 215mm | 63mm | H-4930.M1285 |

Evaporating Dishes, Porcelain

See Table
Ship wt. Range: 1lb. (0.5kg) to 2.5lbs. (1.1kg)

Desiccator Jar

Heavy-walled, annealed jar has finely ground flanges and cover knob. Includes specimen plate. 5" (128mm) jar has 5" inside diameter and 5.25" (134mm) inside height, and, 8" (203mm) jar has 8" inside diameter and height.

Desiccator Jar, 5" (128mm) Dia.

H-4960

Desiccator Jar, 8" (203mm) Dia.

H-4961

Ship wt. 8lbs. (3.6kg)

Specimen Plate

Raised metal plate provides stable platform for samples.

Specimen Plate for H-4960

H-4960P

Specimen Plate for H-4961

H-4961P

Ship wt. 2lbs. (0.9kg)

Desiccab Desiccator

Stainless steel cabinet with Clear-Vue door eliminates danger of glass breakage. Interior has chemical-resistant finish; door is sealed with two firm-grip latches and molded rubber gasket. Includes glass desiccator tray and two heavy-gauge ceramic shelves that are fully adjustable with 0.5" (13mm) centers. Inside dimensions: 11.5" x 10" x 12" (292 x 254 x 305mm).

Desiccab Desiccator

H-4962

Ship wt. 21lbs. (9.5kg)

Drierite Desiccant, 8 mesh

ASTM D2041

Replacement desiccant for air drying unit. Protects vacuum pump by removing final traces of moisture.

Drierite Desiccant, 1 lb.

H-1757

Shipping wt. 2.5 lbs (1.1kg)

Drierite Desiccant, 5 lb.

H-1767

Shipping wt. 9 lbs (4kg)

**Scoops, Stainless Steel**

| Model | PTFE coated | Scoop no. | Nose | Bowl Vol./ water (oz/cu. in.) | Length | Bowl width | Depth | Ship Wt. | Overall length |
|--------|-------------|-----------|--------|-------------------------------|--------------|--------------|---------------|------------------|----------------|
| H-3734 | H-3734TC | — | Round | 3.3 (6.1) | 5" (114mm) | 2.5" (63mm) | 1" (25.4mm) | 2.5lbs (1.3kg) | 9" (228mm) |
| H-3735 | H-3735TC | — | Flat | 6.6 (12.2) | 5.5" (139mm) | 3" (76mm) | 1-1/2" (38mm) | 1 lbs (0.45kg) | 9.325" (236mm) |
| H-3736 | H-3736TC | — | Flat | 29 (53) | 8" (203mm) | 5.5" (139mm) | 2-1/2" (63mm) | 3.3 lbs (1.5kg) | 13.5" (343mm) |
| H-3738 | — | — | Curved | — | 2.5" (635mm) | 2.5" (635mm) | — | 0.5 lbs (0.23kg) | 9" (228mm) |

Scoops, Aluminum

| Model | PTFE coated | Scoop no. | Nose | Bowl Vol./ water (oz/cu. in.) | Length | Bowl width | Depth | Ship Wt. | Overall length |
|--------|-------------|-----------|--------|-------------------------------|----------------|---------------|-------------|-----------------|----------------|
| H-3729 | H-3729TC | 1 | Round | 13.5 (24.4) | 6.75" (172mm) | 4" (102mm) | 2.5" (64mm) | 2 lbs (0.9kg) | 10" (254mm) |
| H-3730 | H-3730TC | — | Square | 6.7 (12.2) | 6" (152mm) | 3.75" (95mm) | 2" (51mm) | 1 lbs (0.45kg) | 9.25" (235mm) |
| H-3731 | H-3731TC | 2 | Round | 20 (36.6) | 8.25" (210mm) | 5.25" (133mm) | 3" (76mm) | 2.1 lbs (0.9kg) | 12.25" (311mm) |
| H-3732 | H-3732TC | 3 | Round | 33 (61.02) | 10.25" (260mm) | 5.25" (146mm) | 3.5" (89mm) | 2.5 lbs (1.3kg) | 14.5" (368mm) |

Scoop, Plastic

| Model | PTFE coated | Scoop no. | Nose | Bowl Vol./ water (oz/cu. in.) | Length | Bowl Width | Depth | Ship Wt. | Overall length |
|--------|-------------|-----------|------|-------------------------------|------------|------------|------------|------------------|----------------|
| H-3727 | — | — | Flat | 67 (115.5) | 9" (228mm) | 4" (102mm) | 5.5" (139) | 0.5 lbs (0.23kg) | 9" (228mm) |

**Trowel, Plasterer-Type**

Plasterer-type trowel's flat rectangular blade is fastened to the mounting and wood handle with stainless steel pins. Dimensions: 4.5" x 10" (114 x 254mm).

Trowel, Plasterer-Type **H-3762**
 Ship wt. 1lbs. (0.45kg)

Trowel, Forged Steel

Forged steel trowel for mixing cement batches, filling molds, etc., has flat pointed blade and rubber/plastic handle. Dimensions: 2.75" x 5" (70 x 127mm).

Trowel, 2.75" x 5" (70 x 127mm) **H-3760**
Trowel, 5.25" x 10" (133 x 254mm) **H-3780**
 Ship wt. 0.4lbs. (0.2kg)

Trowel, ASTM

ASTM C109; AASHTO T106

Forged steel trowel for striking off molds, etc., has edges ground straight and rubber/plastic handle. Dimensions: 2.75" x 5" (70 x 127mm).

Trowel, ASTM **H-3761**
 Ship wt. 0.4lbs. (0.2kg)

Spoon

For mixing and transferring soils, handling corrosive chemicals, etc., stainless steel spoon is 13" (330mm) long.

Spoon **H-4974**
 Ship wt. 0.5lbs. (0.2kg)

Preparation Knife

Used for sample preparation and general lab work, knife has 6"-long thin, sharp blade and wood handle.)

Preparation Knife **H-4973**
 Ship wt. 0.5lbs. (0.2kg)

Spatulas, Straight Edge

ASTM C185, C780; AASHTO T137 (H-4907 only)

Flexible stainless steel blades with straight edges and rounded ends. Blade is riveted into wooden handle. H-4907 complies with ASTM C185, C780; AASHTO T137.

Spatula, 4" x .75" (102mm x 19mm) **H-4904**
Spatula, 6" x .875" (152mm x 22mm) **H-4906**
Spatula, 6" x .5" (152mm x 13mm), ASTM **H-4907**
Spatula, 8" x 1.25" (204mm x 32mm) **H-4908**
Spatula, 10" x 1.25" (254mm x 32mm) **H-4910**
 Ship wt. 0.5lbs. (0.2kg)

Step-Up and Down Transformers

Step-Up and down transformers allow the user to use 115-volt electrical equipment on a 230-volt line current, and allow 230-volt equipment to be used on 115V line current. Features case and core internally connected to third conductor of NEMA-standard cord and receptacle for safety. Has 3-conductor, 8" (2.4m) line cord and plug on primary side and female receptacle as output connection.

| Model | Power | Ship Wt. |
|------------|-------------|------------------|
| H-1042A | 300-watt. | 10 lbs. (4.5kg) |
| H-1042A.5 | 500-watt. | 12 lbs. (5.4kg) |
| H-1042A.7 | 750-watt. | 16 lbs. (7.3kg) |
| H-1042A.10 | 1,000-watt. | 17 lbs. (7.7kg) |
| H-1042A.15 | 1,500-watt. | 21 lbs. (9.5kg) |
| H-1042A.17 | 1,750-watt. | 21 lbs. (9.5kg) |
| H-1042A.20 | 2,000-watt. | 28 lbs. (12.7kg) |
| H-1042A.25 | 2,500-watt. | 28 lbs. (12.7kg) |
| H-1042A.30 | 3,000-watt. | 28 lbs. (12.7kg) |

Step-Up and down Transformers See table above
 see table

**Hammers**

| Size | Model |
|--|---------|
| 14 oz. Rock pick—pointed tip: nylon-vinyl grip | H-4891 |
| 22 oz. Rock pick—pointed tip; leather grip | H-4892 |
| 20 oz. Rock pick—chiseled edge; nylon-vinyl grip | H-4893 |
| 22 oz. Rock pick—pointed tip, 16.25" long | H-4894 |
| 3 lb. Crack hammer—painted w/nylon-vinyl grip | H-4895 |
| 3 lb. Cross peen hammer (for EDG) | H-4890A |

Rubber Mallets

| ASTM weight | Head (L x Dia) | Handle | Model |
|-------------------|-----------------------------|-------------------|--------|
| 3 lbs (1.2 kg) | 5 x 2.5" (127 x 64mm) | 12.75" (324mm) | H-4975 |
| 2 lbs (0.9 kg) | 3.75 x 2.25" (95 x 57mm) | 11" (280mm) | H-4976 |

Chisels

| Description | Length | Cut Point | Stock | Model |
|-------------------|--------------|---------------|--------------|---------|
| Pocket chisel | 12" / 305mm | .625" / 16mm | .375" / 10mm | H-4896C |
| Gad point chisel | 9" / 229mm | .75" / 19mm | .75" / 19mm | H-4897C |
| Splitting chisel | 8" / 203mm | 1.125" / 28mm | .75" / 19mm | H-4898C |
| Chisel w/guard | 8" / 203mm | 1.0" / 25.4mm | .75" / 19mm | H-4970 |
| Pocket chisel | 12" / 305mm | .625" / 16mm | .5" / 12.7mm | H-4896 |
| Concrete chisel | 10" / 254mm | 2" / 50.8mm | .625" / 16mm | H-4889 |
| Stone chisel | 8" / 203mm | 2.25" / 57mm | 1" / 25mm | H-4902 |
| Bull Point chisel | 12" / 305mm | point | .75" / 19mm | H-4903 |
| Concrete chisel | 8.5" / 216mm | 2.75" / 70mm | .75" / 19mm | H-4905A |

Goggles

| Description | Model |
|---|--------|
| Goggles, safety, Soft vinyl frame with replaceable lens | H-4900 |

**Brushes**

| Description | Handle | Bristle | Bristle length (mm) | Overall dimension (mm) | Model |
|--------------------------|-----------|------------------------|---|------------------------------|-----------|
| Wire scratch brush | Wood | Wire no. 26 gauge flat | 2" x 2" x 7" (51 x 51 x 178) | 7.75" x 2.625" (197 x 67) | H-4259 |
| Mold cleaning brush | Wood | Brass wire | 2" x .875" x 5.25" (25 x 22 x 133) | 10.25" (360) | H-3800 |
| Acid-proof crete brush | Plastic | Polypropylene | 2" x 3" x 4" (51 x 76 x 102) | 8.25" (210) | H-3639.8 |
| Acid-proof crete brush | Plastic | Polypropylene | 2" x 3" x 4" (51 x 76 x 102) | 20" (508) | H-3639.20 |
| Sieve brush, oval shaped | Plastic | Horsehair | 2.75" x 1.125" x .75" (70 x 29 x 19) | 10.5" (267) | H-3799 |
| Sieve brush, fine mesh | Wood | Horsehair | 2.5" x 1" x .375" (64 x 25 x 10) | 10.5" (267) | H-3770 |
| Sieve brush, coarse mesh | Wire loop | Wire | 0.5" x 0.5" x 1.375" (13 x 13 x 35) | 5.5" (140) | H-3772 |
| Sieve brush, fine mesh | Plastic | Wire | 1.5" x .75" x 0.125" (38 x 19 x 3) | 7.25" (184) | H-3773 |
| Sieve brush, fine mesh | Wood | Horsehair | 1.5" x 1.25" dia. (38 x 32) | 5.25" (133) | H-3774 |
| Table brush | Wood | Horsehair | 2.25" x 2" x 8" (57 x 51 x 203) | 13.5" (343) | H-3776 |

Straight Edge

ASTM C185, D558, D559, D560, D698;
AASHTO T137

For striking-off samples in containers, measures or molds. Ground steel with beveled edge.

Straight Edge

See Table

Ship wt. See table

Straight Edges

| Dimensions | Model |
|--|-----------|
| 8" Straightedge, 0.125 x 1.25 x 8" (3 x 32 x 203mm) Ship wt. 0.8lbs (0.36kg) | H-4144.8 |
| 12" Straightedge, 0.125 x 1.25 x 12" (3 x 32 x 305mm) Ship wt. 0.9lbs (0.41kg) | H-4144.12 |
| 16" Straightedge, 0.125 x 1.25 x 16" (3 x 32 x 406mm) Ship wt. 1.5lbs (0.7kg) | H-4144.16 |
| 24" Straightedge, 0.125 x 1.25 x 24" (3 x 32 x 610mm) Ship wt. 0.9lbs (0.41kg) | H-4144.24 |



H-4982

H-4983



H-4208

H-4209

H-4207

H-4206

H-4207A

H-3743.9
H-3743.10

H-3745



H-3742



H-3746



H-3740



H-4222D

Shovel, Round-Point

Heat-treated, high-carbon steel round-pointed blade has 27" (69cm) D-grip handle and full wooden yoke with steel casing.

Shovel, Round-Point

H-4982

Ship wt. 8.2lbs. (3.7kg)

Shovel, Square-Point

Heat-treated high-carbon steel 9.375 x 11.5" (24 x 29cm) square-pointed blade with 48" (122cm) handle.

Shovel, Square-Point

H-4983

Ship wt. 5lbs. (2.3kg)

Gloves, Rubber

For use in compaction, concrete and general lab work, medium thickness short-form gloves without gauntlets are chemical and abrasion resistant and feature curved fingers and contoured palm for ease while working.

Gloves, Rubber

H-3740

Ship wt. 0.3lbs. (0.14kg)

Gloves, Heavy-Weight, Heat-Resistant

Made from heavy-weight hot mill, synthetic fiber/cotton blend. Cotton acrylic liner with nitrile N-coating. Reversible.

Gloves, Heavy-Weight, Heat-Resistant

H-3742

Ship wt. 0.5lbs. (0.22kg)

Gloves, Heat-Resistant

Made with large thumb, fingers and loose-fitting palm with wide gauntlet, gloves feature one-piece full-length palm and finger portions, keeping seams to a minimum.

Gloves, Heat-Resistant

H-3746

Ship wt. 1.5lbs. (0.68kg)

Gloves, Nitrile-Coated, Hot Mill

Non-woven, felt insulation and a full-length heat barrier protect hands. Nitrile coating prevents cuts and abrasions. For use in handling hot objects up to 400°F.

Gloves, Nitrile-Coated, Size 9

H-3743.9

Gloves, Nitrile-Coated, Size 10

H-3743.10

Ship wt. 0.8lbs. (0.36kg)

Gloves, Heavy-Weight, Terrycloth

Made from heavy-weight hot mill, synthetic fiber/cotton blend. Cotton acrylic liner with nitrile N-coating. Reversible.

Gloves, Heavy-Weight, Terrycloth

H-3745

Ship wt. 1lbs. (0.5kg)

Sample Bags

Heavy-duty material, unlined sample bag. Bag has draw-cord closure and can be used for various applications involving soils, aggregates, sands and similar materials.

Sample Bags, 10" x 18" (254 x 457mm)

H-4206

Sample Bags, 17" x 32" (432 x 813mm)

H-4207

Ship wt. 0.5lbs. (0.22kg)

Sample Bags, Plastic-Lined

Heavy-duty material, plastic-lined sample bag. Bag has draw-cord closure and can be used for various applications involving soils, aggregates, sands and similar materials.

Sample Bags, 10" x 18" (254 x 457mm)

H-4208

Sample Bags, 17" x 32" (432 x 813mm)

H-4209

Ship wt. 0.7lbs. (0.31kg)

Sample Bags, Economy

Heavy-duty material, unlined sample bag. Bag has draw-cord closure and can be used for various applications involving soils, aggregates, sands and similar materials.

Sample Bags, 10" x 19" (254 x 483mm)

H-4206A

Sample Bags, 15" x 29" (381 x 737mm)

H-4207A

Ship wt. 0.25lbs. (0.1kg)

Durometer, Type D

ASTM D4318, D2240

Durometer used to test the hardness of the base of a liquid limit machine, as well as hard rubber and plastics, thermo plastics, flooring materials. Sharp cone point 30°. Precision construction delivers lifetime accuracy. Sealed springs maintain load deflection rate to a tolerance of .0004".

Durometer, Type D

H-4222D

Ship wt. 1.7lbs. (0.77kg)

Durometer, Type A

Durometer used to test soft rubber, plastics, and elastomers, printer's rolls. Flat cone point 35° included angle.

Durometer, Type A

H-4222A

Ship wt. 2.1lbs. (0.95kg)

Durometer, Type B

Durometer used to test harder elastomers and plastics. Paper and fibrous materials above 93 Duro A. Sharp Cone Point 30°.

Durometer, Type B

H-4222B

Ship wt. 3lbs. (1.4kg)

Durometer, Type C

Durometer used to test medium hard elastomers and plastics. Useful to avoid surface marks. Flat cone point 35° included angle.

Durometer, Type B

H-4222C

Ship wt. 3lbs. (1.4kg)



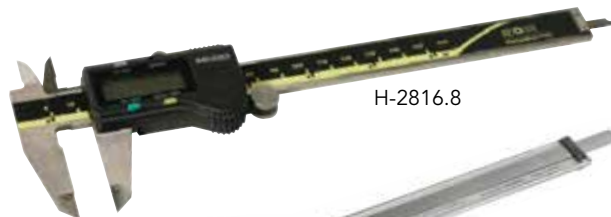
H-3570A



H-17300



H-1675



H-2816.8



H-2817



H-17270



H-17280



H-2817M

Rain Gauge

Heavy-duty plastic rain gauge. Can be attached to walls, posts and other structures with included bracket. Measures 5.5" (140mm) with 0.02" gradations for the first 0.5", .05" from 0.5 to 2" and 0.10" from 2 to 5.5".

Rain Gauge**H-3570A**

Ship wt. 2lbs. (0.9kg)

Mortar & Pestle (Plattner's)

For crushing small samples of ore. Made of hardened alloy tool steel. Mortar has flat-bottomed cylindrical cavity with removable sleeve for containing crushed material. Mortar: 3" (76mm), O.D. cavity: 1" dia x 0.25" deep (25mm x 6.4mm). Guide sleeve: 1.5" (38mm) long. Pestle: 1" dia x 3" long (25 x 76mm).

Mortar & Pestle (Plattner's)**H-17270**

Ship wt. 3.3lbs. (1.5kg)

Mortar & Pestle

Meets U.S. Pharmacopoeia XIX. Made from hardened tool steel in accordance with specifications for powdered glass test. Mortar has a flat-bottomed cylindrical cavity. Mortar: 76.2mm. O.D. cavity: 50.8mm dia x 43.9mm deep; pestle: 50.4mm dia, 108mm overall length.

Mortar & Pestle**H-17280**

Ship wt. 7lbs. (3.61g)

Mortar & Pestle, Hardened-Steel

Made of hardened alloy tool steel, this mortar and pestle is designed for crushing hard, tough substances. Pestle has ball-end to fit bottom of

mortar cavity. Mortar: 3" x 3" x 4.5"H (76 x 76 x 114mm); bore: 2" dia x 3" deep (51 x 76mm). Pestle: 9.5" (241mm) overall length.

Mortar & Pestle, Hardened-Steel**H-17300**

Ship wt. 16lbs. (7.3kg)

Mortar Only

Mortar: 3" x 3" x 4.5"H (76 x 76 x 114mm); bore: 2" dia x 3" deep (51 x 76mm).

Mortar Only**H-17301**

Ship wt. 3lbs. (1.4kg)

Pestle Only

Pestle: 9.5" (241mm) overall length. Designed to fit H-17301 Mortar.

Pestle Only**H-17302**

Ship wt. 10.2lbs. (4.6kg)

Mortar & Pestle, Compaction Mold

ASTM E28

Mortar and pestle compaction mold used to prepare powdered samples to test softening point of resins and other bituminous materials using ring-and-ball method. Mortar, pestle, sleeve, knockout button and ring support are cold-rolled steel.

Mortar & Pestle, Compaction Mold**H-1675**

Ship wt. 5lbs. (2.3kg)

Digital Calipers

May be used for outside, inside, depth and step measurements. Switchable from inches to millimeters. Accuracy is: $\pm 0.001"$ (0.025mm).

Digital Calipers, 6" (150mm)**H-2816****Digital Calipers, 8" (200mm)****H-2816.8****Digital Calipers, 6" (150mm), Calibrated****H-2816C**

Ship wt. 2lbs. (0.9kg)

Digital Calipers

May be used for outside, inside, depth and step measurements. Switchable from inches to millimeters. Accuracy is: $\pm 0.0015"$ (0.025mm).

Digital Calipers, 12" (300mm)**H-2816.12A**

Ship wt. 3.7lbs. (1.68kg)

Dial Calipers, Stainless Steel

Easy-to-read, black-face dial caliper with combination inch and metric scales on main beam feature 0.001"/0.1mm gradations, dial gauge reads in 0.001" gradations. Hardened and ground stainless steel main beam with hardened, ground and lapped measuring faces.

Digital Calipers, 6" (150mm), Stainless**H-2817M**

Ship wt. 1.5lbs. (0.68kg)

Dial Calipers, 6", Stainless Steel

Easy-to-read, 6", dial caliper. Scale features 0.001" gradations, hardened and ground stainless steel main beam with hardened, ground and lapped measuring faces.

Digital Calipers, 6", Stainless**H-2817**

Ship wt. 1.3lbs. (0.59kg)

Dial Calipers, Stainless Steel, Calibrated

6" (150mm) dial calipers with .001" accuracy. Dial movement for ultra-smooth sliding and high, shock protection. Can measure OD, ID, depth and steps. Lock screw for dial bezel and for holding sliding jaw position. Supplied with fitted case and calibration certificate.

Digital Calipers, 6" (150mm), Calibrated**H-2817C**

Ship wt. 1.2lbs. (0.54kg)



H-4460



H-4461A



HM-4470.10



H-4470

H-4466.30
H-4466.15
H-4466.10

HS-4156.14

Gauges, Dial

Indicators are built to American Gauge Design specifications for accuracy and are used in field and laboratory testing applications. Dials are high-quality, low-friction type, designed for long life and accurate repeatable readings. All dial indicators have continuous graduations and revolution counters that show revolutions of the indicator hand. They are furnished with a lug back (with a 90° mounting hole to be used vertically or horizontally), a regular contact point 0.25" long, and a dust cap. Dials listed are clockwise rotation; counter-clockwise rotation see note below.

Gauges, Dial

See Table

Ship wt. 1.3lbs. (0.6kg)

Gauges, Dial

| Range | Div. | Dia. | Brake | Model |
|--------|--------|-------|-------|----------|
| .200" | .0001" | 2.25" | No | H-4460 |
| .200" | .0001" | 2.25" | Yes | H-4461A |
| .300" | .0001" | 2.25" | No | H-4462 |
| .500" | .0001" | 2.25" | No | H-4471 |
| 1.000" | .001" | 2.25" | No | H-4158.1 |
| 2.000" | .001" | 2.75" | No | H-4463 |
| 3.000" | .001" | 3.25" | No | H-4464 |
| 4.000" | .001" | 2.75" | No | H-4465 |
| 5.000" | .001" | 2.75" | No | H-4466 |

Gauges, Dial Metric

| Range | Div. | Dia. | Brake | Model |
|-------|--------|------|-------|-----------|
| 12mm | .002mm | 57mm | No | H-4465.12 |
| 25mm | .010mm | 57mm | No | H-4465.25 |
| 50mm | .020mm | 70mm | No | H-4465.50 |

Indicators, Electronic, Digital

For use in all Humboldt instrumentation. Switchable inch/metric digital indicators are accurate to ± 0.0001 (0.002mm). Feature instant "0" at any spindle position, lock-in maximum reading, LCD display with .305"-high characters, infrared linear encoder, AC power or replaceable batteries. Order HM-4469.02 as a replacement indicator for H-4454-series proving rings—see pages 151-152.

Indicators, Electronic, Digital

See Table

Ship wt. 2.7lbs. (1.2kg)

| Range | Division | Model | Dia. |
|------------------------|-----------------------|-------------|-------------------|
| 0.2500" (6.250mm) | 0.0001" (0.002mm) | HM-4470.02 | 2-9/32" (51mm) |
| 0.2500" (6.250mm) | 0.00005" (0.001mm) | HM-4470.025 | 2-9/32" (51mm) |
| 0.6000" (15.000mm) | 0.0001" (0.002mm) | HM-4470.05 | 2-9/32" (51mm) |
| 1.0000" (25.400mm) | 0.0001" (0.002mm) | HM-4470.10 | 2-9/32" (51mm) |
| 2.0000" (50.800mm) | 0.0001" (0.002mm) | HM-4470.20 | 2-9/32" (51mm) |
| 4.0000" (101.600mm) | 0.0001" (0.002mm) | HM-4470.40 | 2-9/32" (51mm) |

Data Cable

Data cable for use with digital indicators and Data Loggers.

Data Cable

HM-4470C

Ship wt. 44.1lbs. (20kg)

Gauge Contact Point Extensions

Used in applications where gauges require longer contact points to ensure correct gauge placement. Contact points feature hardened steel points with polished tip to prevent scratching. Points fit all standard indicators and gauges. Not compatible with H-4471, H-4471CC, H-4465.12, and H-4465.12CC gauges.

| Contact Point | Model |
|-------------------------------|-----------|
| 0.25" (6.4mm) Gauge Extension | H-4466.2 |
| 0.5" (13mm) Gauge Extension | H-4466.5 |
| 1" (25mm) Gauge Extension | H-4466.10 |
| 1.5" (38mm) Gauge Extension | H-4466.15 |
| 2" (50mm) Gauge Extension | H-4466.20 |
| 3" (76mm) Gauge Extension | H-4466.30 |
| 6" (152mm) Gauge Extension | H-4466.6 |

ups

Ship wt. 0.5lbs. (0.2kg)

Indicator Holder, Magnetic, Swivel

Convenient, portable method of mounting dial indicators. The holder's magnetic base mounts easily on a flat or curved metallic surface. Non-magnetic stainless steel holding rod is 6 x 0.25" (154 x 6.4mm) and set in hardened ball socket so indicator may be mounted in almost any position.

Indicator Holder, Magnetic, Swivel

H-4470

ups

Ship wt. 1.3lbs. (0.6kg)

Magnetic Gauge Mount

Convenient, portable mount for mounting indicators and gauges. Mount has magnetic base, which mounts on metallic surfaces.

Magnetic Gauge Mount

HS-4156.14

ups

Shipping wt. 1.3 lb (0.58kg)

| | | | | | | | |
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This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Lined area for notes or index entries.



The image shows a blank index page from a technical manual. The page is white with a light gray header bar at the top. The header bar contains the word "INDEX" on the left, "Notes" in the center, and "395" on the right. Below the header, the page is filled with a grid of horizontal lines, which are part of a table of contents. The table of contents has two columns: the first column lists the index entries, and the second column lists the page numbers. The entries are listed in a standard, sans-serif font. At the bottom of the page, there is a footer bar containing the website address "www.humboldtmg.com", the phone number "1.800.544.7220", and the Humboldt logo, which consists of a stylized red and black "H" with the word "HUMBOLDT" in black text below it.

Lined area for notes, consisting of multiple horizontal lines.



This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Conversion Charts

Use the charts on these pages to convert between units. To convert, find the 1 value in the column of the unit you desire to convert. Moving left or right on the same row as the 1 value for the unit you want to convert reveals the conversion factor for the new unit.

| Weight (Mass) | | | | | | | |
|--------------------------|--------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Tonne (Mg) | kg | g | UK Ton | US Ton | cwt | lb | oz |
| 1 | 1000 | 10 ⁶ | 0.9842 | 1.1011 | 19.66 | 2.205 x 10 ³ | 3.527 x 10 ⁴ |
| 10 ³ | 1 | 1000 | 9.842 x 10 ⁻⁴ | 1.101 x 10 ⁻³ | 10966 x 10 ⁻² | 2.2046 | 35.274 |
| 10 ⁻⁶ | 10 ⁻³ | 1 | 9.842 x 10 ⁻⁷ | 1.101 x 10 ⁻⁶ | 1.966 x 10 ⁻⁵ | 2.204 x 10 ⁻³ | 3.527 x 10 ⁻² |
| 1.016 | 1016 | 1.016 x 10 ⁶ | 1 | 1.12 | 20 | 2240 | 35840 |
| 0.9081 | 908.1 | 9.081 x 10 ⁵ | 08928 | 1 | 17.856 | 2000 | 32000 |
| 5.085 x 10 ⁻² | 50.85 | 5.085 x 10 ⁴ | 0.05 | 0.0560 | 1 | 112 | 1792 |
| 4.536 x 10 ⁻⁴ | 0.4536 | 453.6 | 4.46 x 10 ⁻⁴ | 5 x 10 ⁻⁴ | 8.92 x 10 ⁻³ | 1 | 16 |
| 2.835 x 10 ⁻⁵ | 2.835 x 10 ⁻² | 28.349 | 2.79 x 10 ⁻⁵ | 3.125 x 10 ⁻⁵ | 5.580 x 10 ⁻⁴ | 6.25 x 10 ⁻² | 1 |

| Length | | | | | | | |
|--------------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------|
| km | m | mm | mile | yard | ft | in | 10 ⁻³ in |
| 1 | 1000 | 10 ⁶ | 0.6214 | 1094 | 3281 | 3.937 x 10 ⁴ | 3.937 x 10 ⁷ |
| 10 ⁻³ | 1 | 1000 | 6.214 x 10 ⁻⁴ | 1.0936 | 3.281 | 39.370 | 3.937 x 10 ⁴ |
| 10 ⁻⁶ | 10 ⁻³ | 1 | 6.214 x 10 ⁻⁷ | 1.094 x 10 ⁻³ | 3.281 x 10 ⁻³ | 3.937 x 10 ⁻² | 39.37 |
| 1.6094 | 1609.4 | 1.609 x 10 ⁶ | 1 | 1760 | 5280 | 63360 | 6.336 x 10 ⁷ |
| 9.144 x 10 ⁻⁴ | 0.9144 | 914.41 | 5.682 x 10 ⁻⁴ | 1 | 3 | 36 | 36000 |
| 3.048 x 10 ⁻⁴ | 0.3048 | 304.8 | 1.894 x 10 ⁻⁴ | 0.3333 | 1 | 12 | 12000 |
| 2.54 x 10 ⁻⁵ | 0.0254 | 25.4 | 1.578 x 10 ⁻⁵ | 2.778 x 10 ⁻² | 8.333 x 10 ⁻² | 1 | 1000 |
| 2.54 x 10 ⁻⁸ | 2.54 x 10 ⁻⁵ | 0.0254 | 1.578 x 10 ⁻⁸ | 2.778 x 10 ⁻⁵ | 8.333 x 10 ⁻⁵ | 10 ⁻³ | 1 |

| Area | | | | | | | | |
|--------------------------|-------------------------|-------------------------|-------------------------|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| km ² | m ² | cm ² | mm ² | sq. mile | acre | yd ² | ft ² | in ² |
| 1 | 10 ⁶ | 10 ¹⁰ | 10 ¹² | 0.38612 | 247.11 | 1.196 x 10 ⁶ | 1.076 x 10 ⁷ | 1.550 x 10 ⁹ |
| 10 ⁻⁶ | 1 | 10 ⁴ | 10 ⁶ | 3.86 x 10 ⁻⁷ | 3.86 x 10 ⁻⁴ | 1.11960 | 10.764 | 1550 |
| 10 ⁻¹⁰ | 10 ⁻⁴ | 1 | 100 | 3.86 x 10 ⁻¹¹ | 3.86 x 10 ⁻⁸ | 1.196 x 10 ⁻⁴ | 1.076 x 10 ⁻³ | 0.1550 |
| 10 ⁻¹² | 10 ⁻⁶ | 10 ⁻² | 1 | 3.86 x 10 ⁻¹³ | 3.86 x 10 ⁻¹⁰ | 1.196 x 10 ⁻⁶ | 1.076 x 10 ⁻⁵ | 1.550 x 10 ⁻³ |
| 2.590 | 2.59 x 10 ⁶ | 2.59 x 10 ¹⁰ | 2.59 x 10 ¹² | 1 | 639.96 | 3.097 x 10 ⁶ | 1.076 x 10 ⁷ | 4.01 x 10 ⁸ |
| 4.047 x 10 ⁻³ | 4047 | 4.047 x 10 ⁷ | 4.047 x 10 ⁹ | 1.563 x 10 ⁻³ | 1 | 4840 | 43560 | 6.273 x 10 ⁶ |
| 8.36 x 10 ⁻⁷ | 0.8361 | 8.36 x 10 ⁵ | 8.36 x 10 ⁵ | 3.228 x 10 ⁻⁷ | 2.066 x 10 ⁻⁴ | 1 | 9 | 1296 |
| 9.29 x 10 ⁻⁸ | 9.29 x 10 ⁻³ | 929 | 92900 | 3.587 x 10 ⁻⁸ | 2.296 x 10 ⁻⁵ | 0.1111 | 1 | 144 |
| 6.45 x 10 ⁻¹⁰ | 6.45 x 10 ⁻⁴ | 6.4516 | 645.16 | 2.491 x 10 ⁻¹⁰ | 1.594 x 10 ⁻⁷ | 7.716 x 10 ⁻⁴ | 6.944 x 10 ⁻³ | 1 |

| Volume | | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| m ³ | dm ³ liter | cm ³ (ml) | yd ³ | ft ³ | in ³ | UK gallon | US gallon |
| 1 | 10 ³ | 10 ⁶ | 1.3079 | 35.311 | 6102 | 219.97 | 264.17 |
| 10 ⁻³ | 1 | 10 ³ | 1.308 x 10 ⁻³ | 3.531 x 10 ⁻² | 61.02 | 0.2200 | 0.2642 |
| 10 ⁻⁶ | 10 ⁻³ | 1 | 1.308 x 10 ⁻⁶ | 3.531 x 10 ⁻⁵ | 6.102 x 10 ⁻² | 2.199 x 10 ⁻⁴ | 2.642 x 10 ⁻⁴ |
| 0.7646 | 764.6 | 7.646 x 10 ⁵ | 1 | 27 | 46650 | 168.19 | 201.99 |
| 2.832 x 10 ⁻² | 28.32 | 2.832 x 10 ⁻⁴ | 3.704 x 10 ⁻² | 1 | 1728 | 6.229 | 7.481 |
| 1.639 x 10 ⁻⁵ | 1.639 x 10 ⁻² | 16.387 | 2.144 x 10 ⁻⁵ | 5.787 x 10 ⁻⁴ | 1 | 3.605 x 10 ⁻³ | 4.329 x 10 ⁻³ |
| 4.546 x 10 ⁻³ | 4.546 | 4.546 x 10 ³ | 5.946 x 10 ⁻³ | 0.1605 | 277.42 | 1 | 1.2008 |
| 3.785 x 10 ⁻³ | 3.785 | 3.785 x 10 ³ | 4.951 x 10 ⁻³ | 0.1337 | 231 | 0.8327 | 1 |

| Density | | | | | |
|--|--------------------------|--------------------------|------------------------------|-------------------------------|--------------------------|
| Tonne/m³ Mg/m³ g/cm³ | kg/m³ | lb/in³ | UK Ton/yd³ | US Ton/ yd³ | lb/ft³ |
| 1 | 1000 | 0.03613 | 0.75247 | .08428 | 62.43 |
| 10 ⁻³ | 1 | 3.613 x 10 ⁻⁵ | 7.525 x 10 ⁻⁴ | 8.428 x 10 ⁻⁴ | 6.243 x 10 ⁻² |
| 27.680 | 27680 | 1 | 20.828 | 23.328 | 1.728 x 10 ³ |
| 1.3289 | 1.328 x 10 ³ | 4.801 x 10 ⁻² | 1 | 1.12 | 82.955 |
| 1.1865 | 1.1186 x 10 ³ | 4.287 x 10 ⁻² | 0.8928 | 1 | 74.074 |
| 1.602 x 10 ⁻² | 16.019 | 5.787 x 10 ⁻⁴ | 1.205 x 10 ⁻² | 1.35 x 10 ⁻² | 1 |

| Permeability | | | | | |
|--------------------------|--------------------------|-------------------------|------------------------|-------------------------|--------------------------|
| m/s | cm/s | m/year | Darcy | ft/yr | ft/day |
| 1 | 100 | 3.156 x 10 ⁷ | 1.04 x 10 ⁵ | 1.035 x 10 ⁸ | 2.835 x 10 ⁵ |
| 0.01 | 1 | 3.156 x 10 ⁵ | 1.04 x 10 ³ | 1.035 x 10 ⁶ | 2.834 x 10 ³ |
| 3.169 x 10 ⁻⁸ | 3.169 x 10 ⁻⁶ | 1 | 3.28 x 10 ³ | 3.281 | 8.982 x 10 ⁻³ |
| 9.66 x 10 ⁻⁶ | 9.66 x 10 ⁻⁴ | 304 | 1 | 1000 | 2.74 |
| 9.658 x 10 ⁻⁹ | 9.659 x 10 ⁻⁷ | 0.3048 | 10 ⁻³ | 1 | 2.738 x 10 ⁻³ |
| 3.527 x 10 ⁻⁶ | 3.527 x 10 ⁻⁴ | 111.33 | 0.365 | 365.25 | 1 |

| Force and Weight | | | | | |
|--------------------------|--------------------------|-----------------|--------------------------|--------------------------|-------------------------|
| MN | kN | N | kgf | tonf | lbf |
| 1 | 1000 | 10 ⁶ | 1.0196 x 10 ⁵ | 100.4 | 2.248 x 10 ⁵ |
| 10 ⁻³ | 1 | 10 ³ | 101.96 | 0.1004 | 224.82 |
| 10 ⁻⁶ | 10 ⁻³ | 1 | 0.10196 | 1.004 x 10 ⁻⁴ | 0.2248 |
| 9.807 x 10 ⁻⁶ | 9.807 x 10 ⁻³ | 9.807 | 1 | 9.842 x 10 ⁻⁴ | 2.2048 |
| 9.964 x 10 ⁻³ | 9.964 | 9964 | 1016 | 1 | 2240 |
| 4.448 x 10 ⁻⁶ | 4.448 x 10 ⁻³ | 4.448 | 0.45455 | 4.464 x 10 ⁻⁴ | 1 |

| Pressure, Stress and Modulus of Elasticity | | | | | | | | | | |
|--|---------------------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------|---------------------------|---|---------------------------|
| Mn/m² MPa | kN/m² kPa | kp kgf/cm² | bar | atm | m H₂O | ft H₂O | mm Hg | Ton/ft² | psi lbf/in² | lbf/ft² |
| 1 | 1000 | 10.197 | 10 | 9.869 | 102.2 | 355.2 | 7500.6 | 9.320 | 145.04 | 20866 |
| 0.001 | 1 | 1.019 x 10 ⁻² | 0.0100 | 9.87 x 10 ⁻³ | 0.1022 | 0.3352 | 7.5006 | 0.0093 | 0.14504 | 20.886 |
| 9.807 x 10 ⁻² | 98.07 | 1 | 0.9807 | 0.9678 | 10.017 | 32.866 | 735.56 | 0.9139 | 14.223 | 2048.1 |
| 0.100 | 100 | 1.0197 | 1 | 0.9869 | 10.215 | 33.515 | 750.06 | 0.9320 | 14.504 | 2088.6 |
| 0.1013 | 1.0133 | 1.0332 | 1.0132 | 1 | 10.351 | 33.959 | 760.02 | 0.9444 | 14.696 | 2116.2 |
| 9.788 x 10 ⁻³ | 9.7885 | 9.983 x 10 ⁻² | 9.789 x 10 ⁻² | 9.661 x 10 ⁻² | 1 | 3.2808 | 73.424 | 9.124 x 10 ⁻² | 1.4198 | 204.45 |
| 2.983 x 10 ⁻³ | 2.935 | 3.043 x 10 ⁻² | 2.984 x 10 ⁻² | 2.945 x 10 ⁻² | 0.3048 | 1 | 22.377 | 2.781 x 10 ⁻² | 0.43275 | 62.316 |
| 1.333 x 10 ⁻⁴ | 0.1333 | 1.3595 x 10 ⁻² | 1.333 x 10 ⁻³ | 1.315 x 10 ⁻³ | 1.362 x 10 ⁻² | 4.469 x 10 ⁻² | 1 | 1.243 x 10 ⁻³ | 1.934 x 10 ⁻² | 2.7846 |
| 0.1073 | 107.3 | 1.0942 | 1.0730 | 1.0589 | 10.960 | 35.960 | 804.78 | 1 | 15.562 | 2240 |
| 6.895 x 10 ⁻³ | 6.895 | 7.031 x 10 ⁻² | 6.895 x 10 ⁻² | 6.805 x 10 ⁻² | 0.7043 | 2.3108 | 51.714 | 6.426 x 10 ⁻² | 1 | 144 |
| 4.788 x 10 ⁻⁵ | 4.788 x 10 ⁻² | 4.883 x 10 ⁻⁴ | 4.788 x 10 ⁻⁴ | 4.725 x 10 ⁻⁴ | 4.891 x 10 ⁻³ | 1.605 x 10 ⁻² | 0.3591 | 4.464 x 10 ⁻⁴ | 6.944 x 10 ⁻³ | 1 |

\$ Pricing

Prices appearing on our website are U.S. List Prices exclusively. Orders for shipment outside the United States will not be accepted.



Shipping

Our goal in shipping is to provide our customers with their purchases quickly and cost effectively. To this end we try to offer several choices in shipping so our customers can decide how fast they need items vs. the costs involved to ship them.



Items Shippable by UPS

For all UPS-shippable items, our website will calculate the shipping costs at the time of your order corresponding to the shipping method you choose. These shipping costs are based on the parameters you choose in the shipping calculator, i.e. ground, overnight, 2-day, etc. or if the items are being shipped to a residential address.

Some items, typically large items that don't weigh much or small items that weigh a lot, may cost more to ship.

Orders placed on Friday involving Overnight or Next Day shipping, will not be delivered on Saturdays. If you need Saturday delivery or concerned about expedited delivery, please call.



Truck Shipments

Items requiring shipment by truck cannot currently be calculated in real time on our website. If you order an item that is clearly marked as a Truck Item, you will be able to checkout, but we will not charge your credit card. Our sales department will determine the shipping costs and contact you via email. Once we have an agreement from you for the shipping costs, the order and credit card information will be processed. Truck shipping costs will normally be provided within a couple of hours.

Truck shipments to a building without a lift gate will incur a \$150.00 Lift Gate Charge. This is a standard pass-along charge from all shipping companies.



Order Processing

We strive to ship all orders within 1-2 days of receiving them.



Tax

Tax is charged on all orders shipped to Illinois or North Carolina. Tax-exempt customers in these states need to have a tax exempt certificate on file with us to avoid being charged tax.



Out of Stock Items

While we strive to maintain an inventory second to none in our industry, there are times when something may be out of stock. In those cases, someone from Humboldt's sales department will contact you via email with the status of your order.



Guarantee

Humboldt Mfg. Co. products are guaranteed against defective materials and workmanship for a period of 12 months from the date of shipment. We will repair or replace such items as may prove

defective at our option. Under no condition will we allow labor charges or other expenses to repair defective merchandise without our prior approval.

Humboldt Mfg. Co. makes or implies no other warranties of any kind or nature of merchantability or fitness for particular purposes that exceed any previously stated obligation.

We accept no responsibility for damage or abuse to apparatus due to improper installation or operation. We accept no responsibility for and will not pay for any lost profits incidental, consequential, or special damages.

Returned Goods

← **It is the Customer's responsibility to inspect all shipments for visual damage upon receipt.**

Items may not be returned to Humboldt Mfg. Co. without a Return Goods Authorization (RGA) number which can be obtained by contacting the Sales Department. No item is returnable after 30 days from shipping to customer. All returns are subject to a restocking charge of 20% of selling price (\$20.00 minimum). Any use and/or damage by customer, or due to customer's improper repacking, is subject to further charges as necessary to place item(s) in a resalable condition. Items returned must be sent prepaid, no C.O.D. returns can be accepted.



Claims

All claims for shortage, breakage or other discrepancies should be filed with the carrier immediately upon receipt of the shipment.



Disclaimer of Responsibility Safe use of Equipment

Use of instruments, apparatus, and equipment described on this website may involve hazardous procedures and/or materials. Use may also be subject to regulatory limitations. Information on this website is not intended to address the many safety, legal, and regulatory issues associated with use. It is the responsibility of the user to:

1. Follow appropriate methods to insure that industry standards are met for all safety and health issues resulting from use.
2. Determine applicability of all regulatory limitations prior to use.
3. Be familiar with all applicable test standards and test procedures.
4. Comply with all applicable Federal, State and Local laws and regulations relating to the use of such goods. Neither Humboldt Mfg. Co. nor other manufacturers of equipment sold by Humboldt Mfg. Co. can assume any liability express or implied for user's failure to follow Industry standards for safety and health, or to comply with applicable regulatory limitations, standards, and procedures.

www.humboldtmfg.com
1.800.544.7220

Humboldt Mfg. Co.

875 Tollgate Road, Elgin, Illinois 60123
1.800.544.7220 toll free, 1.708.468.6300 main
1.708.456.0137 fax

Humboldt Scientific, Inc.

2525 Atlantic Avenue, Raleigh, North Carolina 27604
1.800.537.4183 toll free, 1.919.833.3190 main
1.919.833.5283 fax

