CATALOG ELEVEN



Testing Equipment for Construction Materials

HUMBOLDT

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Understanding product listings in the Humboldt Catalog

Item Name

Hydrometer Jar Bath

ASTM D422; AASHTO T88; UNE 103.102

Specifications

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

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.

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 ±1°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).

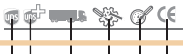
The H-4239A jar bath is fully-insulated and includes a circulating pump, which ensures a constant water temperature throughout bath. The H-4239A can accommodate (8) hydrometer jars at a time. All models include a stainless steel shelf, which supports specimens while allowing 2" of free circulating water above and below specimens. 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

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:

120V 60Hz	
120/220V 50/60Hz	.3F
220V 50/60Hz	.4F
220V 50Hz	.5F
220V 60Hz	.2F



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.

- Shipping weight
- CE compliant
- Calibration available
- Repair available
- Ships by truck freight
- Ships by UPS, but incurs dimensional charges
- Ships by UPS

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Testing Equipment for Construction Materials

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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.

Conversion Charts
Search By
Model Number,
Name,
ASTM, AASHTO Standards

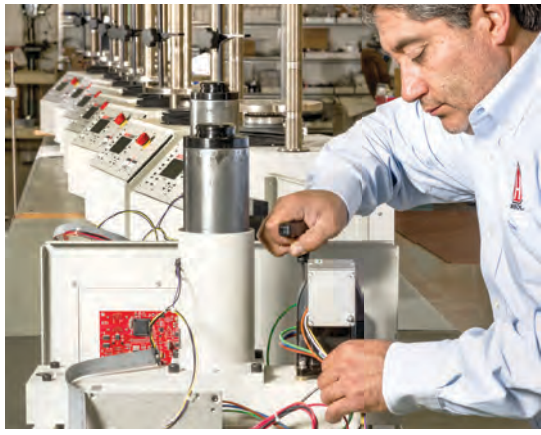
About Us

Humboldt Mfg. Co., located in the United States, is a leading manufacturer and supplier of construction materials testing equipment. Our equipment is used extensively throughout the world for testing soil, concrete, cement, asphalt and aggregate in construction projects. These projects include roads; bridges; dams; earthworks, and buildings. Humboldt is known for manufacturing high-quality, competitively-priced equipment designed to comply with ASTM and AASHTO testing standards, especially our geotechnical testing equipment, our nuclear gauge and the nuclear-free, electrical density gauge.









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.

Dealer Network

Humboldt Mfg. Co. products are available worldwide through our dealer network and directly from our factory. In the United States, our products are sold directly to customers via our website and sales force, as well as a select group of established dealers. Internationally, Humboldt Mfg. Co. sells through an extensive network of experienced and knowledgeable dealers. To purchase product internationally, you can find a list of our dealers on the contact page of our website, www.humboldtmfg.com, or you can request a quote for equipment through our website's quote cart system.

Testing Equipment For Construction Materials
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History

Humboldt began operations 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. In the past 50 years Humboldt has transformed into the company we are today, focused on the development, manufacturing and distribution of construction materials testing equipment, though the company still manufacturers a line of lab burners.

Quality

Humboldt has always been concerned with the quality of our products and since 2003, we have maintained a quality management system in accordance with ISO standards. This standard comprises the constant monitoring and continuous improvement of the company's processes. Today, Humboldt is certified to ISO 9001: 2008 standards. Our current certification can be viewed on our website.

As Humboldt goes forward, our focus is on the continual improvement of our testing equipment and maintaining diligent customer service. This effort has resulted in the development of our high-quality geotechnical equipment complimented by our advanced testing software modules and the electrical density gauge, a nuclear-free, moisture and density gauge alternative.

Service

Calibration and Repair

Humboldt provides dependable and economical calibration and repair services for the following Humboldt or competitors' devices:

- **Concrete Air Meters**
- **Rebound (Schmidt) Hammers**
- **Load Cells**
- **Load Rings**
- **Displacement Transducers**
- **Pressure Transducers**
- **Beam Breakers**
- **Penetrometers**
- **Speedy Moisture Testers**

Each calibration project includes complete inspection and documentation of the device prior to calibration. The device is then disassembled and/or cleaned, inspected, lubed if required, parts are replaced if necessary and then calibrated. All calibrations are performed on certified, NIST-traceable, calibrated devices and we provide the customer with a certificate documenting the calibration. Concrete air meters are cleaned and repaired as necessary before calibration. Calibration of air meters follows the ASTM procedure outlined in ASTM C231.

For calibration and repair information:
hmc@humboldtmfg.com • 1.800.544.7220



Cleaning concrete rebound hammer before reassembly and calibration



Calibrating a load ring on a NIST-traceable load frame



Load cell calibration matched to a specific load frame

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Testing Equipment For Construction Materials

HUMBOLDT

Nuclear Gauges

Choose from Two, High-Quality Gauge Models



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

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 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. Humboldt Scientific also offers gauge calibration and repair services and is certified to ISO 17025 and NIST-traceable standards in 3 and 5-block calibrations. We also provide leak test analysis services, rental and disposal services and radiation safety and certification classes.

Choose from one of four SD configurations:



HS-5001SD121
Measure to 12" (300mm) depth in 1" (25mm) increments

HS-5001SD122
Measure to 12" (300mm) depth in 2" (50mm) increments

HS-5001SD081
Measure to 8" (200mm) depth in 1" (25mm) increments

HS-5001SD082
Measure to 8" (200mm) depth in 2" (50mm) increments

Choose from one of four EZ configurations:



HS-5001EZ081
Measure to 8" (200mm) depth in 1" (25mm) increments

HS-5001EZ082
Measure to 8" (200mm) depth in 2" (50mm) increments

HS-5001EZ121
Measure to 12" (300mm) depth in 1" (25mm) increments

HS-5001EZ122
Measure to 12" (300mm) depth in 2" (50mm) increments

Testing Equipment for Construction Materials
HUMBOLDT
NUCLEAR GAUGES



HS-5001SD

HS-5001SD

Humboldt's NEW 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-50001SD 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 readouts 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 and is calibrated by the Five-block calibration method.

- Touch Screen Control
- WiFi Enabled
- GPS Equipped

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 six standard AA alkaline batteries. Car charger available.

NiMH

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.



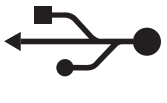
WiFi Enabled —

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 will be 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 any repair procedure.



Nuclear Density Gauge

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 and is calibrated by the Five-block calibration method.



- EZ Menu-Driven
- Direct Readouts
- AA batteries (2000hrs)

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 2000 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 any repair procedure.



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

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, O.2 TI

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:	25" 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)

Specifications

Electrical

Displays— HS-5001SD: HS-5001EZ:	 TFT, color LCD with back-light, 16:9, 480 x 272 pixel 4 lines x 20 alphanumeric w/ backlit liquid crystal display
Timer Stability:	0.01%
Power Supply Stability:	0.10%
Power Source— HS-5001SD: HS-5001EZ:	 NiMH battery (AA battery optional) Six alkaline AA-size batteries
Power Consumption— HS-5001SD: HS-5001EZ:	 Active—110mA — Battery Life—60 hours runtime 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

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 Teflon Impregnated
Post and Frame:	Computer-Machined 6061-T6 Aluminum, Anodized for Anti-corrosion
Index Rod:	7075 aluminum, Hard Coated and Teflon Impregnated
Top Shell:	Injection-Molded Noryl with Integral Color
Bearing:	Relieved Bronze with Neoprene Seals
Screws/Fittings:	Stainless Steel and Brass



Nuclear Density Gauge

Tool Set
HS-200112



HS-000176



HS-200145

HS-200127

HS-200130



HS-200313



HS-200177



HS-001057



HS-200152



HS-001067



HS-200153



HS-000185

Nuclear Gauge Tool Set
Tool kit includes: rod guide/scraper 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 nuclear gauge to take reading.

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)

Scraper 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 Scraper Plate to level the test site.

Scraper 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)

Software and Data Cable (infrared RS232)
Cable and software for connecting Humboldt Nuclear Gauge to a computer or printer via RS232 port. For EZ or C models only.

Software and Data Cable — HS-200313
Ship wt. 1lb (0.45kg)

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

Sign, Caution Radioactive Material — HS-001057
Ship wt. .01lb (0.004kg)

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)

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. 0.01lb (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. 0.01lb (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. 0.01lb (0.004kg)

Security Seal
Security seal for nuclear density gauge transport cases.

Security Seal — HS-2000185
Ship wt. 0.2lb (0.01kg)





HS-200820

HS-200800— Boxes include mounting bracket



HS-130508



HS-130512

Security Restraint for Nuclear Gauge

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)

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.

NOTE: 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.

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)

Mounting Bracket for all NUX Boxes	HS-200801

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, µSv/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 (1µR) to 100 mR/hr; µSv/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	±10% typical (NIST), ±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 **HS-130508**
Monitor 200, NIST Traceable **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 µSv/hr 0-50 mR/hr.
Gamma Sensitivity	1000 CPM/mR/hr referenced to Cs-137
Accuracy	±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)

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

Electrical Density Gauge



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, safety glasses.

Electrical Density Gauge	H-4114SD.3F
	Ship wt. 35lbs (15.8kg)

Electrical Density Gauge



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

NiMH

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.

Blue-tooth 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

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.

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

Electrical Density Gauge

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

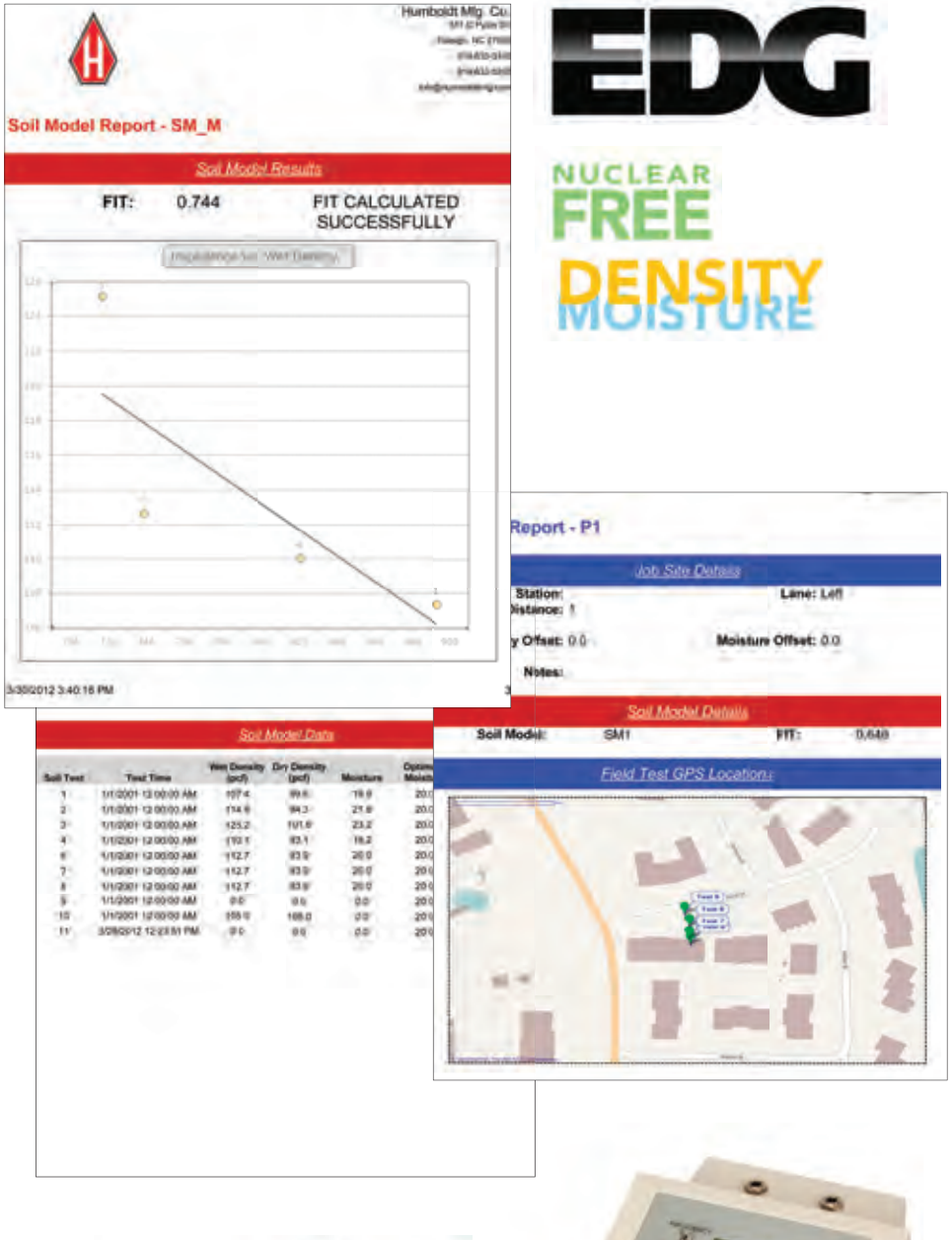
Shipping wt. 1.5 lbs (.68kg)

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)



EDG

NUCLEAR FREE DENSITY MOISTURE



Darts for EDG



H-4114.MCU





HD-4139.3F

Static Plate Load Tester

ASTM D1194, D1195, D1196; 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 Ev is determined from the load settlement line of the first load (Ev1) and the second load (Ev2). By comparing the initial deformation from Ev1 and the subsequent deformation of Ev2 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 revised 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 Ev1, Ev2, Ev1/Ev2 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 flexibilty in use

Static Plate Load Tester **HD-4139.3F**

Ship wt. 65lbs (29.4kg)



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

Printer Paper

Replacement paper for use with Plate Load Tester and LWD.

Printer Paper **HD-4129.5**

Shipping wt. 2 lbs (0.9kg)

Lightweight Deflectometer



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 of Lightweight Deflectometers from HMP— a deluxe model, the HD-4129.3F and a basic unit, the HD-4119.3F. Both units are the same mechanism and differ only in the controller used with each one.

The HD-4129.3F features 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 Bluetooth
- interface for a thermal printer and USB
- help function
- efficient and fast 32-bit processor
- internal memory for up to 1000 tests
- high-performance rechargeable battery

The graphic interface of the HD-4129.3F 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. This data can be exported from the control unit via USB or Bluetooth 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.

Lightweight Deflectometer

As the exclusive dealer for North America, Humboldt also maintains a calibration site in the U.S. for fast turn-around.



HD-4130.3F

Use of the web-based evaluation software: HMPre-port, 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
- Android App (HD-4129.3F and HD-4149.3F only)

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. 65lbs (29.4kg)

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. 25.7 lbs (11.7kg)

Printer Paper

Replacement paper for use with Plate Load Tester and LWD.

Printer Paper HD-4129.5

Shipping wt. 2 lbs (0.9kg)



HD-4129.01A

Electronic settlement measuring instrument	HD-4129.3F	HD-4119.3F
Settlement measuring range 0.1 bis 2.0 mm ± 0.02 mm	✓	✓
Measuring range Evd < 225 MN/m2	✓	✓
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, lightsensor-controlled and illuminated	✓	
Black/white		✓
Help function	✓	
Fast, efficient 32-bit processor	✓	
Bluetooth, USB, thermal printer interface	✓	✓
GPS	✓	✓
Dimensions in mm	210 x 100 x 31	211 x 100 x 26
Storage capacity, internal in measurement series	1000	500
Power supply:		
High-performance rechargeable lithium-polymer-battery 3.7 V, 6300 mAh	✓	
4 x R6 Batteries		✓
Menu navigation (18 languages available)	✓	✓
Loading Mechanism		
Total weight 15.0 kg	✓	✓
Drop weight 10.0 kg	✓	✓
Max. impact force 7.07 kN	✓	✓
Duration of impact 17.0 ± 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 15,0 kg, Material: zinc coated steel	✓	✓



HD-4129.05A

Compaction Uniformity



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-4249

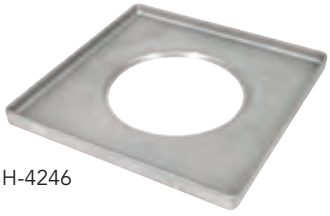

H-4238


H-4238L


H-4248


H-3821


H-4117


H-4246


H-4249P

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 H-4245
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 H-4238
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. Packaged in a 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 voluvessels. Includes: 100 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 Sample bags and ties.

Sample Bags and Ties H-4201
Shipping wt. 6 lbs (4.5kg)

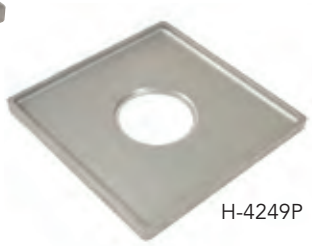

H-4166
H-4167


H-4166S
w/H-4166


H-4116


H-4166.10


H-4168


H-4249P


H-4166.5


H-4203.4
H-4203.3


H-4203DT.3
H-4203DT.4A

Voluvessel

ASTM D2167; AASHTO T205

Voluvessels 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 voluvessel is designed with a plastic cylinder, which screws into the density plate with the pump assembly mounted on top. Both voluvessels include a pressure-vacuum pump assembly, pressure gauge, quick-coupler valve, double-graduated cylinder, 10 balloons and a density plate. Voluvessels 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 Voluvessels 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).

Voluvessel, 1/20 ft³ (1600ml)	H-4166
Voluvessel, 1/13 ft³ (2230ml)	H-4167

Shipping wt. 15.7 lbs (7.3kg)

Voluvessel Saddle Weights

ASTM D2937

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

Voluvessel Saddle weights	H-4166S

Shipping wt. 72 lbs (33kg)

Balloons, 10pk

Package of 10 balloons for Voluvessel.

Balloons, 10pk	H-4168

Shipping wt. 0.2 lbs (0.09kg)

Pump Assembly, Replacement

Rubber-bulb, pump assembly for all Voluvessels.

Pump Assembly, all units	H-4166.10

Shipping wt. 0.6 lbs (0.27kg)

Voluvessel Base

ASTM D2167; AASHTO T205

Base for Voluvessels, 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)

Voluvessel Cylinder Seal Gasket

Replacement seal gasket for Voluvessels.

Voluvessel Base, H-4166 & H-4167	H-4166.5

Shipping wt. 3 lbs (4.5kg)

Voluvessel w/ Metal Guard

ASTM D2167; AASHTO T205

This Voluvessel 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. Th H-4116 Voluvessel is used with max.-sized soil particles of 0.5" (13mm) .

Voluvessel, 1/20 ft³ (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 relativity 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)

CBR, Shear Strength



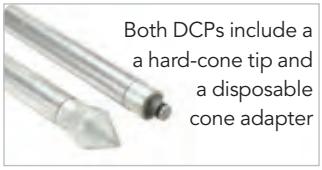
H-4219T



Threaded Ends



Both include a pelican case



Both DCPs include a a hard-cone tip and a disposable cone adapter



H-4219QC



Quick-Connect Ends

Dual-Mass Dynamic Cone Penetrometers
ASTM D6951

Developed by the Army Corps of Engineers, Dynamic Cone Penetrometers (DCPs) provide a low-cost, efficient test method for quickly determining in-situ CBR values of pavement base, sub base and sub grades. DCPs 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 DCPs comply with ASTM D6951 specifications and come with a chart to compute CBR values, as well as an Excel spreadsheet template, which automatically charts the test results.

Humboldt's DCPs are known for their high quality manufacturing and reliability, and, are available with either threaded connections or a quick-connect design. Both Humboldt DCPs 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 DCPs 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 DCPs 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, Threaded Ends **H-4219T**
Ship wt. 66lbs. (29.5kg)

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
CD	H-4219.CD
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

Dual-Mass DCP, Quick-Connect Ends **H-4219QC**
Ship wt. 60lbs. (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
CD	H-4219.CD
Go, No-Go Gauge	H-4219.3
Pelican Case	H-4219.16



H-4219QC.12
H-4219T.12
H-4219.8

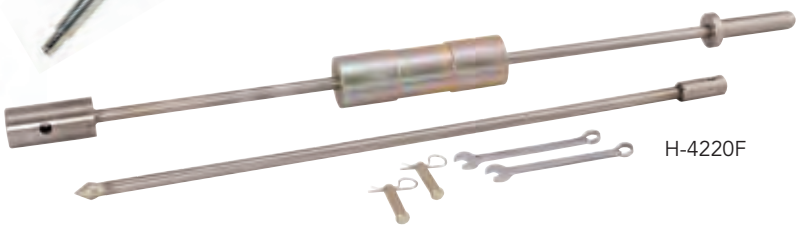


H-4219.100


H-4202A


H-4202.1A


H-4202.7A


H-4220F

Dynamic Cone Penetrometer for Shallow Insitu 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)

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)

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

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 31 for Shelby tubes.)

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

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 in (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


H-4227


H-4221


H-4221.1


H-4221.4


H-4221.3A


H-4139

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 ±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

Proctor Penetrometer Set

ASTM D1558

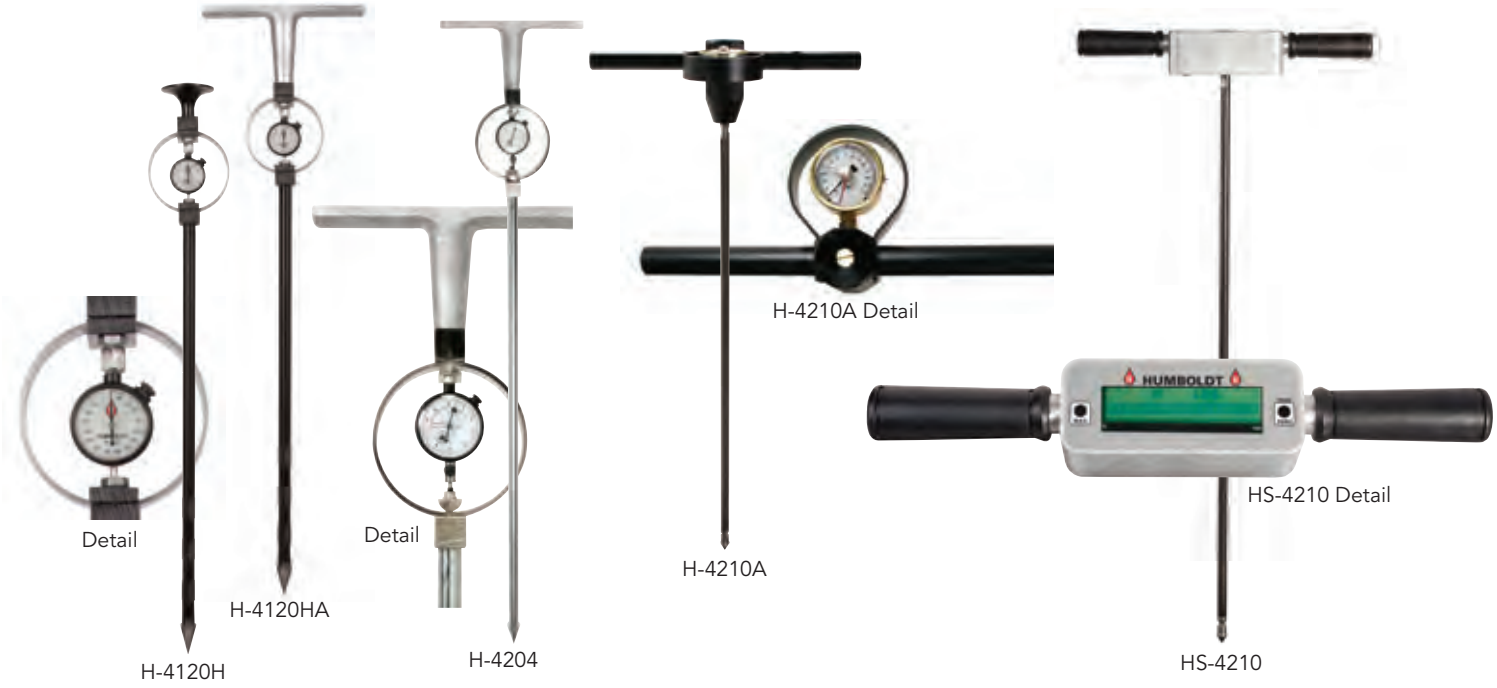
Establishes the moisture-penetration resistance relations of fine-grained soils. Includes these interchangeable needles (area in sq. in. or sq. cm): 1in.^{2} (6.45cm^2), 3/4 in.^{2} (4.84cm^2), 1/2 in.^{2} (3.22cm^2), 1/3 in.^{2} (2.15cm^2), 1/5 in.^{2} (1.29cm^2), 1/10 in.^{2} (.65cm^2), 1/20 in.^{2}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

Proctor Penetrometer Set **H-4139**

Ship wt. 17lb (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



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 degree cone with 0.5 sq. in. 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)

Description	Model
30° Cone, 0.5in²	H-4120H.4
Penetration Rod, 19" x .625"	H-4120H.3

Cone Penetrometer, Proving Ring
Used to determine the bearing capacity of subgrades, or to measure soil compaction. Light and easy to handle in the field. A rapid means of determining the penetration resistance of soil in shallow exploration surveys. Includes: 30°, 1 sq. in. (6.45 sq cm) cone; 250 lb. (1.1kN) capacity proving ring; brake type dial indicator, holds final reading until manually released; 0.75" (19mm) dia shaft, graduated at 6", (152mm) intervals; 0.75" (19mm) dia extension rod, graduated at 6" (152mm) intervals; cast aluminum

Cone Penetrometer, Proving Ring H-4204
Ship wt. 15.2lbs. (6.8kg)

Description	Model
30° Cone, 1in² (6.45cm²)	H-4204.3
Proving Ring w/ Dial Indicator	H-4204.1
Extension Rod, 37.25"	H-4204.4

Static Cone Penetrometer
Used in fine-grained, soft soils at shallow foundation and pavement subgrades to evaluate for soil consistency, level of compaction and bearing capacity. Unmatched for accuracy, reliability and ease of use. Pressure gauge with 0-70kg/cm 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 1.5cm. 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)

Description	Model
60° Cone, 3cm² max area	H-4210.3
60° Cone, 1.5cm² 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

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

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 subgrades 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.

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

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, 1.5cm² max area	H-4210.1
60° Cone, 3cm² max area	H-4210.3

Penetrometers


H-4200


H-4200F
H-4195F


H-4195


H-4205


H-4212MH


H-4212

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. Direct-reading scale—in tons/sq ft, or kg/sq cm—corresponds to equivalent unconfined compressive strength. Range: 0 to 4.5 tons. 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 H-4200
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/sq ft, or kg/sq cm—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 H-4200F
Adapter Foot for H-4195 H-4195F
Ship wt. 0.4lb (0.2kg)

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/cm^2. 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)

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.

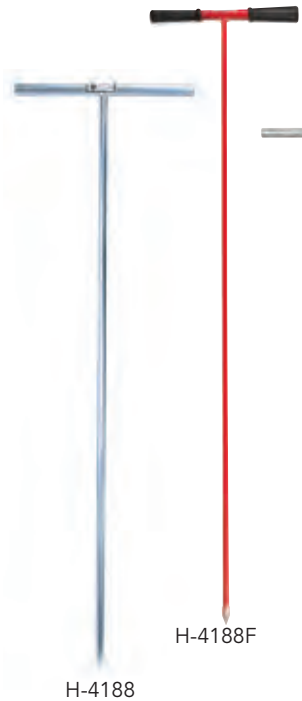
The pocket shear vane can be used to gather a large number of readings including those from different failure planes without the need to prepare and trim samples. The device can be used on any reasonably flat surface that is slightly larger than the vane surface being used. The pocket shear vane can 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.

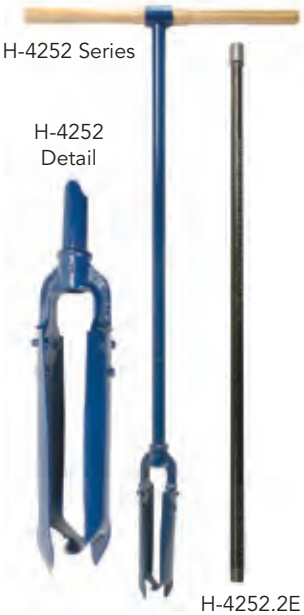
Pocket Shear Vane, Plastic H-4212
Ship wt. 1.3lbs (0.6kg)















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)

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

Soil Sampling Tube

For use in collecting soft soil samples in 0.75" core sample size. Depth capacity is about 39". Includes sampler tube, one tip, two extension rods, handle and fiberboard case.

Soil Sampling Tube — H-4362

Ship wt. 4.2lbs (2.2kg)

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 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)

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)

Sampling Augers



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-Connnect

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 and 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)

Sampling Auger Kits



H-4418.23



H-4419.23



H-4416.2



H-4449



H-4451

H-4452

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 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 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)

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)

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)

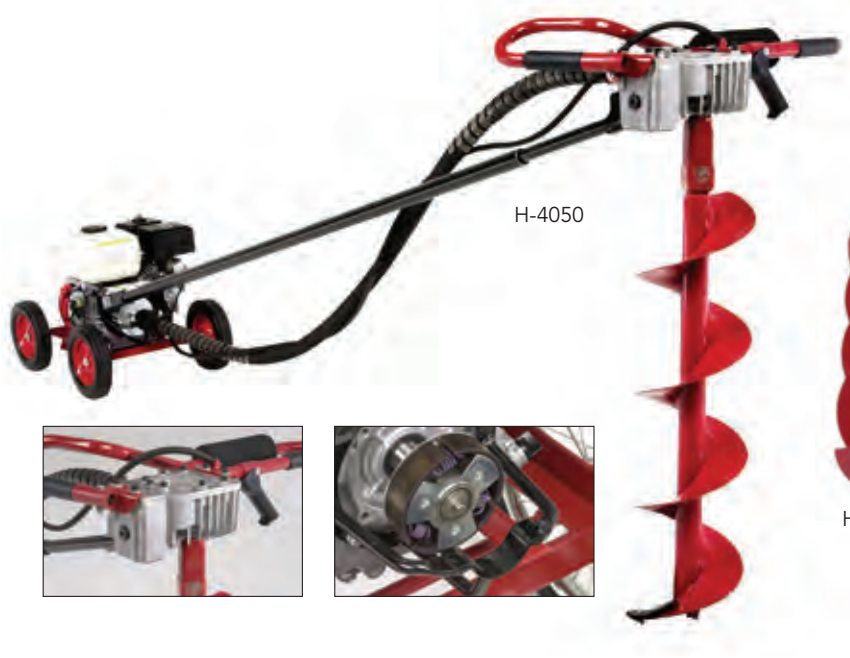
Universal Slip (Strap) Wrench

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)

Earth Drill & Augers



H-4050



H-4052A.6



H-4040.150

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

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)





H-4210.3C



H-4210W



H-4210.5P
H-4210.25P



H-4210.3AW



H-4202.7A



H-4202.7A mounted to a H-4202.1 drive hammer and a 10" shelby tube.

Shelby Tubes

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. For melting pots, please see page 190.

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 23).

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.

Shelby Tubes Heads — See Table
Ship wt. See Table

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

AW= 3 threads per inch
AWJ= 5 threads per inch

ACCESSORIES

For Knives, Go to page 317
For Pans, Go to pages 312-313

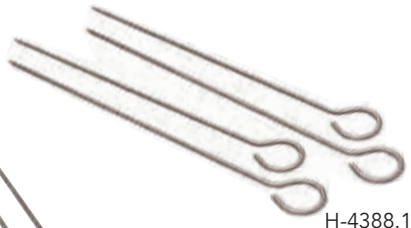
Resistivity



H-4385D


H-4385


H-4388


H-4388.1

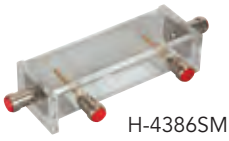


H-4385.5


H-4387


H-4385.1


H-4386


H-4386SM

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 10MΩ (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 bluetooth-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 1MΩ range: ±1.6% ±1LS Display Digit 1MΩ to 10MΩ range: ±5% ±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 1.1MΩ 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" x 1.5" x 1.25" (222 x 38 x 32mm) and H-4386SM: 4.375" x 1.125" x 1.5" (111 x 29 x 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 cm³ (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

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" x 20" (1.9 x 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)



H-4967



H-4965A



H-4966



H-4377

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.**

	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 (7.5kg)

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 for International orders 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 (12.7kg)

Calibration Kit for 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 accuracy and pressure leaks, with instructions for simple re-calibrations. Includes case.

Calibration Kit for Speedy® Tester H-4965A
Ship wt. 20lbs (9.1kg)

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-4963.15
Speedy Scoop	H-4963.15
Speedy Brush, wire handle	H-4963.16A
Brush, for scale pan	H-4963.14
Pulverizer, steel ball	H-4963B

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 the it registers 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)

CBR, Infiltrometer, Guelph, Color





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) 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. 289lbs. (172kg)

Double Ring Infiltrometer

ASTM D3385

Ideal for field testing, as well as lab use. Two stainless steel rings measure 12 and 24 dia x 20"H (304.8 and 609.6 dia x 508mm). Rings have double thick welded top edge for increased stability when driving into the soil. A mariotte 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. Main flow valve in base platform, bleed valve next to 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 mariotte tubes with 3,000 ml and 10,000 ml capacities.

Double Ring Infiltrometer HM-4502
Ship wt. 148lbs (72.5kg)

Guelph Permeameter Kit

ASTM D5126

The Guelph permeameter is an easy-to-use instrument for quickly and accurately measuring in-situ, hydraulic conductivity in all types of soils. The equipment can be transported, assembled, and operated easily by one person. Measurements can be made in 1/2 to 2 hours, depending on soil type, and require 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.

Guelph Permeameter Kit HSM-2100
Ship wt. 33lbs (14.9kg)



H-4368A

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, 5YR, 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)


HUMBOLDT
HUMBOLDT
HUMBOLDT

Aggregate



Aggregate Washers 57
Air Jet Sieve 61
Classification 65
Falling Sand 67
Fineness 66
L.A. Abrasion 66
Micro-Deval 67
Moisture 64
Sample Splitters 38-41
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Testing Equipment For Construction Materials

HUMBOLDT

Sample Splitters



H-3962, H-3964



H-3980, H-3985



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



H-3970,
H-3975

Humboldt Sample Splitters

Model	Material Size (max.)	Chutes Number	Chutes Width	Hopper L x W inches (mm)	Pans (incl.)	Ship wgt. lbs. (kg)	Steel Pan Pan Model #	Steel Pan L x W x H" (mm)	Stainless Steel Pan Pan Model #	Stainless Steel Pan 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 6.5" x 4.5" (165 x 165 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 6.5 x 5.5" (165 x 165 x 140mm)
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-3971C



H-3973



H-3974

Chutes		Hopper Size	Hopper Volume	Pans	Pan Capacity	Ship wt.	Model	Pan
Number	Width in. (mm)	L x W— inches (mm)	cu. inch (mm)	(furnished)	cu. inch (mm)	lbs. (kg)		
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



H-4135

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 constructed of cold-rolled steel, or in some cases, stainless steel— see chart below for quantity and construction of pans included. Also refer to the chart below for ordering replacement or extra pans. All splitters include pans, scoop and cleaning brush. See chart below 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 rejects 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) aluminum high-back (notched L-shape) pans are supplied with the H-3971C micro splitter and two (2) stainless steel 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' (1.5m x 2.4m) ASTM Canvas H-4136
5' x 5' (1.5m) Square Canvas H-4135
Shipping wt. 4.5 lbs (2kg)

Sample Splitters



H-4393



H-4288
H-4288FC



H-4289



H-4290

Model	Gilson #	Maximum Particle Size in. (mm)	Hopper Capacity ft³ (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 2" (51mm). It is convenient to use in floor or bench-top positions. This splitter provides accurate, representative samples o 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)

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 in.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)

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	-	-	-	-
	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

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 1in (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)

Screen Shakers


H-4283A


H-4276A


H-4273B

Gilson Testing Screens
ASTM E11; ISO 565

Gilson 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. Gilson 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.

Gilson 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)

Gilson 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)

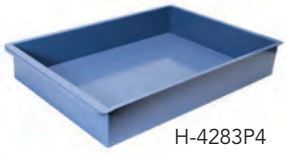

H-4295A
H-4297A


H-4288.1


H-4285


H-4283P3


H-4273DP


H-4283P4


H-4284, H-4284.5


H-4286


H-4283SE


H-4273CP


H-4307

Gilson 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)

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 Shaker Accessories

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

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. (0.3m³) 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. (0.23m³) 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)

Screen Trays

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	H-4278WC5.000	NA	NA
106mm	4.24"	SS	H-4278C4.240	H-4278WC4.240	NA	NA
100mm	4"	S	H-4278C4.000	H-4278WC4.000	NA	NA
90mm	3.5"	S	H-4278C3.500	H-4278WC3.500	NA	NA
75mm	3"	S	H-4278C3.000	H-4278WC3.000	INQUIRE	INQUIRE
63mm	2.5"	S	H-4278C2.500	H-4278WC2.500	INQUIRE	INQUIRE
53mm	2.12"	SS	H-4278C2.120	H-4278WC2.120	INQUIRE	INQUIRE
50mm	2.00"	S	H-4278C2.000	H-34278WC2.000	H-4398C2.000	H-4398WC2.000
45mm	1.75"	S	H-4278C1.750	H-4278WC1.750	H-4398C1.750	H-4398WC1.750
37.5mm	1.50"	S	H-4278C1.500	H-4278WC1.500	H-4398C1.500	H-4398WC1.500
31.5mm	1.25"	S	H-4278C1.250	H-4278WC1.250	H-4398C1.250	H-4398WC1.250
26.5mm	1.06"	SS	H-4278C1.060	H-4278WC1.060	H-4398C1.060	H-4398WC1.060
25.0mm	1.00"	S	H-4278C1.000	H-4278WC1.000	H-4398C1.000	H-4398WC1.000
22.4mm	.875"	S	H-4278C.875	H-4278WC.875	H-4398C.875	H-4398WC.875
19.0mm	.750"	S	H-4278C.750	H-4278WC.750	H-4398C.750	H-4398WC.750
16.0mm	.625"	S	H-4278C.625	H-4278WC.625	H-4398C.625	H-4398WC.625
13.2mm	.530"	SS	H-4278C.530	H-4278WC.530	H-4398C.530	H-4398WC.530
12.5mm	.500"	S	H-4278C.500	H-4278WC.500	H-4398C.500	H-4398WC.500
11.2mm	.438"	S	H-4278C.438	H-4278WC.438	H-4398C.438	H-4398WC.438
9.5mm	.375"	S	H-4278C.375	H-4278WC.375	H-4398C.375	H-4398WC.375
8.0mm	.312"	S	H-4278C.312	H-4278WC.312	H-4398C.312	H-4398WC.312
6.7mm	.265"	SS	H-4278C.265	H-3910WC.265	H-4398C.265	H-4398WC.265
6.3mm	.250"	S	H-4278C.250	H-4278WC.250	H-4398C.250	H-4398WC.250
5.6mm	No. 3-1/2	SS	H-4278F3-1/2	H-4278WF3-1/2	H-4398F3-1/2	H-4398WF3-1/2
4.75mm	No. 4	S	H-4278F4	H-4278WF4	H-4398F4	H-4398WF4
4.00mm	No. 5	SS	H-4278F5	H-4278WF5	H-4398F5	H-4398WF5
3.35mm	No. 6	SS	H-4278F6	H-4278WF6	H-4398F6	H-4398WF6
2.80mm	No. 7	SS	H-4278F7	H-4278WF7	H-4398F7	H-4398WF7
2.36mm	No. 8	SS	H-4278F8	H-4278WF8	H-4398F8	H-4398WF8
2.00mm	No. 10	SS	H-4278F10	H-4278WF10	H-4398F10	H-4398WF10
1.70mm	No. 12	SS	H-4278F12	H-4278WF12	H-4398F12	H-4398WF12
1.40mm	No. 14	SS	H-4278F14	H-4278WF14	H-4398F14	H-4398WF14
1.18mm	No. 16	SS	H-4278F16	H-4278WF16	H-4398F16	H-4398WF16
1.00mm	No. 18	SS	H-4278F18	H-4278WF18	H-4398F18	H-4398WF18
850µm	No. 20	SS	H-4278F20	H-4278WF20	H-4398F20	H-4398WF20
710µm	No. 25	SS	H-4278F25	H-4278WF25	H-4398F25	H-4398WF25
600µm	No. 30	SS	H-4278F30	H-4278WF30	H-4398F30	H-4398WF30
500µm	No. 35	SS	H-4278F35	H-4278WF35	H-4398F35	H-4398WF35
425µm	No. 40	SS	H-4278F40	H-4278WF40	H-4398F40	H-4398WF40
355µm	No. 45	SS	H-4278F45	H-4278WF45	H-4398F45	H-4398WF45
300µm	No. 50	SS	H-4278F50	H-4278WF50	H-4398F50	H-4398WF50
250µm	No. 60	SS	H-4278F60	H-4278WF60	H-4398F60	H-4398WF60
212µm	No. 70	SS	H-4278F70	H-4278WF70	H-4398F70	H-4398WF70
180µm	No. 80	SS	H-4278F80	H-4278WF80	H-4398F80	H-4398WF80
150µm	No. 100	SS	H-4278F100	H-4278WF100	H-4398F100	H-4398WF100
125µm	No. 120	SS	H-4278F120	H-4278WF120	H-4398F120	H-4398WF120
106µm	No. 140	SS	H-4278F140	H-4278WF140	H-4398F140	H-4398WF140
90µm	No. 170	SS	H-4278F170	H-4278WF170	H-4398F170	H-4398WF170
75µm	No. 200	SS	H-4278F200	H-4278WF200	H-4398F200	H-4398WF200
63µm	No. 230	SS	H-4278F230	H-4278WF230	H-4398F230	H-4398WF230
53µm	No. 270	SS	H-4278F270	H-4278WF270	H-4398F270	H-4398WF270
45µm	No. 325	SS	H-4278F325	H-4278WF325	H-4398F325	H-4398WF325
38µm	No. 400	SS	H-4278F400	H-4278WF400	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

Non-ASTM sizes— .125" and .0125"— are available, please inquire.

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 with brass frame and mesh, brass frame with stainless steel mesh or stainless frame and mesh. Brass sieves are cost efficient while stainless sieves tend to last longer and have sag-resistant 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 stacks 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



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)	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
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	–	–



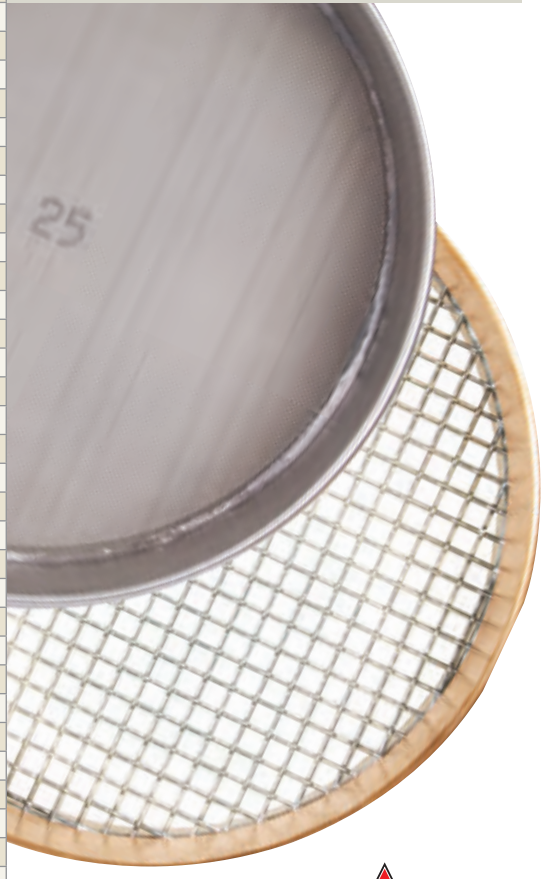
USA Standard ASTM Test Sieves

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
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	–	–



12"

305mm



Inspection Test Sieves

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.

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.

12"

305mm

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	–	–



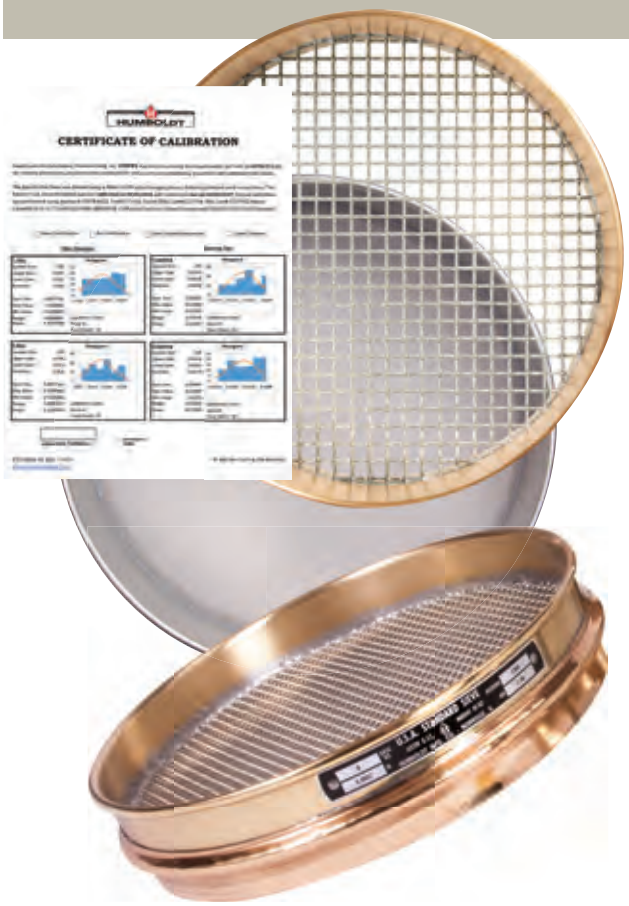
Calibration Test Sieves

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.

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	–	–

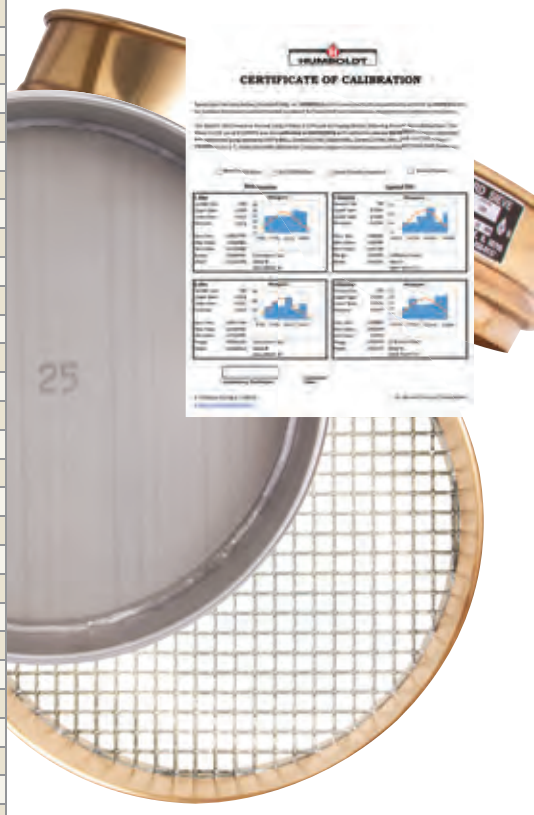
Sieve Size	Brass Frame Stainless Mesh			Stainless Frame Stainless Mesh	
	Full Height 3" (75mm)	Inter. Height 2" (50mm)	Half Height 1.625" (41mm)	Full Height 3" (75mm)	Half Height 1.625" (41mm)
4" (100mm)	HC-3912CS4.000	HC-3922CS4.000	HC-3932CS4.000	HC-3912CSS4.000	HC-3932CSS4.000
3-1/2" (90mm)	HC-3912CS3.500	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	–	–

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.

12"

305mm



Deep, USA Standard ASTM Test Sieves



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-3910CS.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

USA Standard ASTM Test Sieves



3" 5" 6" 10"

76mm 127mm 152mm 254mm

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

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-3913FS20	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



Sieves


Sieve Pans and Covers


H-2813


H-3802


H-4329.5


H-3772
H-3774
H-3773
H-3770
H-3799

Larger Brushes on Page 319

Sieve Covers and Pans

Use the charts below to order covers and bottom or separator pans for all sizes of sieves.

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 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

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

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	—

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)

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)

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)

Sieve Brushes

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)

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, 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; 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)

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)



H-4391



H-4100 Series



H-3903



H-3902

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" (190mm), .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.

Sieve Set, Rocker-Type H-4391

Shipping wt. 24 lbs (19kg)

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

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.

18" Brass Frame, Riddle Sieves See chart

18" Brass Frame Riddle Sieves

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

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)

Sieves, Wet Washing



H-3948



H-3945



H-3942, H-3943

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. 15 lbs (7kg)

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)

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 to the right lists the most popular sizes.

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.

Wet Wash Sieves, Replaceable Mesh — See chart

Wet Wash Sieves, Deep Frame (other mesh sizes available, inquire: 1.800.544.7220)

Size in. (mm)	Description dia. x depth	Model	Ship wt. lbs. (kg)
8" x 4" (203 x 102mm)	No. 200 SS mesh	H-3945	3.5 (3.2)
	No. 200 SS mesh with back-up cloth	H-3945RC	
8" x 6" (203 x 152mm)	No. 200 SS mesh	H-3946	2.7 (3.6)
	No. 200 SS mesh with back-up cloth	H-3946RC	
8" x 8" (203 x 203mm)	No. 200 SS mesh	H-3947	3.7 (4.0)
	No. 200 SS mesh with back-up cloth	H-3947RC	
12" x 4" (305 x 102mm)	No. 200 SS mesh	H-3928FS200	4.1 (5.0)
	No. 200 SS mesh with back-up cloth	H-3928FS200RC	
12" x 6" (305 x 152mm)	No. 200 SS mesh	H-3929FS200	5.1 (5.9)
	No. 200 SS mesh with back-up cloth	H-3929FS200RC	
12" x 8" (305 x 203mm)	No. 200 SS mesh	H-3938FS200	5.8 (6.3)
	No. 200 SS mesh with back-up cloth	H-3938FS200RC	

Wet Wash Sieves, Replaceable Mesh (other mesh sizes available, inquire: 1.800.544.7220)

Size in. (mm)	Description dia. x depth	Model	Ship wt. lbs. (kg)
8" x 4" (203 x 102mm)	Sieve with No. 200 SS mesh and back-up cloth	H-3942	2.8 (3.2)
	Sieve with No. 325 SS mesh and back-up cloth	H-3942FS325	
8" x 6" (203 x 152mm)	Sieve with No. 200 SS mesh and back-up cloth	H-3943	6 (3.6)
	Sieve with No. 325 SS mesh and back-up cloth	H-3943FS325	
8" (203mm)	No. 200 SS replacement mesh only	H-3942.200	0.25 (.5)
	No. 325 SS replacement mesh only	H-3942.325	
	Gasket for wet wash sieve	H-3942G	

All Wet Wash Sieves are available from 50-400 mesh. Call 1-800-544-7220 to order mesh sizes not listed.

Wet Washing, Aggregate Washers



H-3807



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



H-3806



H-3949A

H-3880

Cement Wet Washing Sieves
ASTM E11; AASHTO M92

Stainless steel mesh sieves with nickel-plated brass frame have replaceable mesh and solder-less 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 mesh sizes from 50 to 400 mesh, for those not listed, contact Humboldt: 1.800.544.7220

Cement, Wet Washing Sieves — See chart

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-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

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 Test Standard No. 158 (Method 211)

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)

Aggregate Washer
ASTM C117

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 11" dia. x 13"D (27 x 33cm) and locks in four angle positions. Includes valve and .375" goose-neck water tube. O.D. 24" x 20" x 27" H (610 x 508 x 686mm). **Order USA Standard Sieve, 200 mesh separately from chart at right.**

Aggregate Washer, 120V 60Hz — H-3949A
Aggregate Washer, 220V 50Hz — H-3949A.5F
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 connect 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)

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

Sieve Shakers



HA-4425, HA-4430



HA-4425V, HA-4430V



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-4425 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 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-4425
Sieve Shaker, Digital Timer, 220V 60Hz	HA-4425.2F
Sieve Shaker, Digital Timer, 220V 50Hz	HA-4425.5F

Shipping wt. 72 lbs (32.6kg)

Large Sieve Shaker, Digital, 120V 60Hz	HA-4430
Large Sieve Shaker, Digital, 220V 60Hz	HA-4430.2F
Large Sieve Shaker, Digital, 220V 50Hz	HA-4430.5F

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 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 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-4425V
Variable Speed Shaker, Digital, 220V 60Hz	HA-4425V.2F
Variable Speed Shaker, Digital, 220V 50Hz	HA-4425V.5F

Large Shaker, Digital, Variable 120V 60Hz	HA-4430V
Large Shaker, Digital, Variable 220V 60Hz	HA-4430V.2F
Large Shaker, Digital, Variable 220V 50Hz	HA-4430V.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-4320, H-4322


H-4321, H-4327

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)

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 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)

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)

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 Shakers


H-4315A


H-4312

Mary Ann® Sieve Sifter
ASTM C136

The "Original Mary Ann" sieve sifter has been a standard of the industry for years. This totally-enclosed unit can be used with 8" or 12" sieves. Sieve stacks up to 26" (660mm) in height can be set into place quickly with no clamping needed. The Mary Ann design angles the sieves at 45° while rotation from a 1/3hp motor and tapping from hardwood-faced aluminum hammers promote action to accomplish the sieving process. The support stand also serves as a sieve storage rack. Assembled Sifter requires 18" x 40" (457 x1016mm) of floor space. Unit Dimensions: 18" x 26" x 58" (457 x 660 x 1473mm).

Mary Ann® Sieve Sifter, 120V 60Hz H-4315A
Mary Ann® Sieve Sifter, 230V 50Hz H-4315A.5F
Shipping wt. 140 lbs (64kg)

Rotary Lab Sieve Sifter
ASTM C136

The rotary lab sieve sifter borrows its design from the Mary Ann sieve sifter. Like the Mary Ann, it is a totally enclosed unit, which can be used with 8" or 12" sieves. Sieve stack capacity is six full-height (3") 12" sieves with a bottom pan. Unit timing is controlled by a digital count-down controller with a large, red LED display. Operation can be set from 1 to 99 minutes. Settings can be saved between tests to speed operation and provide repeatability of tests. Dimensions: 19" x 24" x 58" (483 x 610 x 1473mm).

Rotary Lab Sieve Sifter, 120V 60Hz H-4312
Rotary Lab Sieve Sifter, 230V 50/60Hz H-4312.4F
Shipping wt. 215 lbs (98kg)

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 Humboldt Sieve Shaker, Digital, Variable Humboldt, Economy Sieve Shaker	HA-4425 HA-4425V H-4325	3	76	16			C136	60	Yes	1/4	15" x 15" x 45" (381 x 381 x 1143mm)
		5	127	12				60			
		8	203	10		18		30			
Large Sieve Shaker, Digital Timer Large Sieve Shaker, Digital, Variable Large Economy Sieve Shaker	HA-4430 HA-4430V H-4330	8	203	11		19	C136	60	Yes	1/4	21" x 18" x 47" (533 x 457 x 1194mm)
		10	254	7				60			
		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					
Mary Ann Sieve Sifter	H-4315A	8	203	10			C136	99 Digital	No	1/3	13" x 35" x 45" (330 x 889 x 1143mm)
		12	305	6							
Rotary Lab Sieve Sifter	H-4312	8	203	10		20	C136	99 Digital	No	1/3	19" x 24" x 58" (483 x 610 x 1473mm)
		12	305	6							
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)
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)

* includes top cover and pan

Air-Jet Sieve, Specific Gravity



H-4334A.2

H-4334A.3F



H-4334A.3



H-4334A.4



H-3373A



H-3360

H-4335F200



H-3380



H-3381

Micron Air-Jet Sieving Apparatus

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 20µ particle size range. Unit adapts to 75mm diameter electro-formed sieves in 90mm drums for 45µ to 5µ. 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.

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

Model	Description
H-4334A.2	HEPA Vacuum System
H-4334A.3	High-Efficiency HEPA Vacuum System
H-4334A.4	High-Efficiency Cyclone

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)

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)

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)

Testing Equipment for Construction Materials
HUMBOLDT

Specific Gravity


H-2710A.1


H-2713B


H-2712A


H-2712A.6


HB-4508A

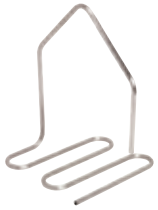

HB-3515


H-3351


H-3353


H-3371


H-3355
H-3356


H-2715


H-3372

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 feature; and, a crank-operated shelf that lets you bring the water tank up to the sample, making for easier sample immersion.

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

Specific Gravity Bench Set

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

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

Order a weigh-below scale 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

Polyethylene tank, 30 gal. (113.5L), which measures 18" x 18" x 18" (457 x 457 x 457mm) 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)

Recommended Scales:

Ohaus Explorer High-Capacity Balance

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

24,000g x 0.1g Precision Balance HB-4508A
Ship wt. 29lbs. (12.5kg)

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 Precision Balance HB-3515
Ship wt. 32lbs. (13.4kg)

See page 294-295 for additional choices in balances for use in this application.

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)

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.

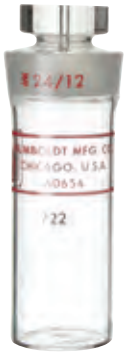
Utility Bucket H-3372
Shipping wt. 4 lbs (1.6kg)


H-3383F
H-3383L


H-3393


H-3400


H-3460


H-2640


H-3386


H-3385


H-3387


H-2660

Specific Gravity Flask (Phunque Flask)

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 stopper100ml 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
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, 25ml H-3385
Specific Gravity Bottle, 50ml H-3386
Specific Gravity Bottle, 100ml H-3387
Shipping wt. 0.3 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)

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)

Moisture



H-4967
(includes pelican case)



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.**

	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 for International orders do not contain reagent, order separately.

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)

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)

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-4963.15
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
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.

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



H-3420



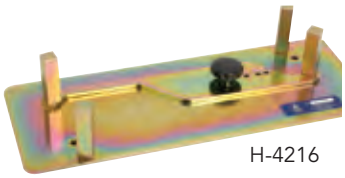
H-1680A



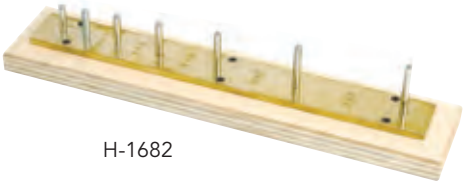
H-1686



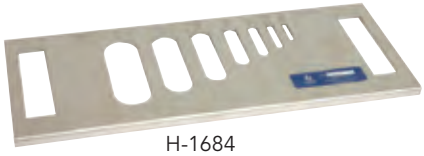
H-3422



H-4216



H-1682



H-1684

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)

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

Void Content Apparatus, Fine Aggregate

ASTM C1252; AASHTO TP33

Used to determine the uncompacted void content of a fine aggregate sample. Indicates the angularity, sphericality, 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)

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

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 course 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)

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

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

Ship wt 2lbs. (1kg)

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 = l: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)

L.A. Abrasion, Slake, Flakiness



H-3860D



H-3860.100
(shown with H-3860A, not included)



HM-4100



HM-4100.2



Flakiness Sieves

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 cutout. 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.

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

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-4100
Slake Durability, 220V 50Hz	HM-4100.5F

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-4100.1
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-4100.2
Shipping wt. 45lbs (20.4kg)

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)

Micro-Deval, Falling Sand



H-3875



H-3875.1

H-3875.2



HP-1160



HP-1108

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 .75hp, 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).

Optional H-3876 model is equipped with thermally protected motor to meet stricter requirements in some areas. Check your local code before ordering. Slightly different equipment meeting European standard EN 1097-1 is also available and can be quoted upon request.

Micro-Deval, 120V 60Hz	H-3875
Micro-Deval, 230V 50Hz	H-3875.5F
Micro-Deval, 120V 60Hz	H-3876

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)

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 206 and 12" sieves from page 207. Wet wash sieving can be useful at completion of the abrasion cycle, see pages 214-215 for wet-sieving accessories.

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)

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)

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 (0.2kg)


HUMBOLDT
HUMBOLDT
HUMBOLDT
HUMBOLDT
HUMBOLDT
5030
HUMBOLDT

Soil Lab



Atterberg Limits 82-83
CBR 78-80
Classifier 81
Compaction. 76-77
Expansion 89
Hydrometer Tests. 85
Molds 74
Mold Accessories 75
Permeability 88-90
Plastic Limit 81
Processors, Soil 73
Sample Extraction 72
Sand Equivalent 84
Shrinkage Limit 81
Volume Change 89

GEOTECHNICAL TEST EQUIPMENT

HUMBOLDT


H-4185

H-4185.RT


H-4185.100
(shown with ejector,
not included)


H-4155A


H-4150


H-4257


H-4258

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)

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)

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)


H-4215


H-4199


H-3839


H-3843A

Rapid Soil Processor

Compact all-metal soil processor allows customer to produce five-point moisture density relationship test results in about 5 hours. Processor also handles samples for rapid compaction of a family of curves test. Processes up to 30 lbs. of lean-to-fat and tough clays at field moisture in fewer than 15 minutes. Automatically separates and retains up to .75" rocks from soil to prolong screen life. Processes soil to pass a No. 4 screen. Offset rotating drum is motor driven; pre-set adjustments aren't necessary. Automatic operation frees up technician's time. Order easy-to-install replacement screen separately. Replacement parts are available. 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

Soil Grinder, Humboldt

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

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)

Laboratory Bench Mixer, 12Qt.

The Hobart model HL-120 bowl has a 12-qt. (0.401 cu. ft.) mixing capacity and a 15-minute motor-driven timer. Includes stainless-steel bowl, flat-type aluminum grid beater and aluminum dough hook. Base dimension: 14.75" x 20" x 29.6125" (375 x 508 x 750cm).

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

Shipping wt. 185 lbs (84kg)

Laboratory Bench Mixer, 20Qt.

The Hobart HL-200 mixer has a positive gear drive and planetary mixing action to deliver positive results. Includes stainless-steel bowl and flat-type aluminum grid beater. Base dimension: 21" x 21.5" x 41.25" (533 x 546 x 1048cm).

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

Shipping wt. 230 lbs (104kg)


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 ft^3. 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 ft^3. 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 ft^3. 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 ft^3, 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 ft^3. 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 ft^3,. 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 ft^3,. 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"

ASTM D1883; AASHTO T193

Compaction mold with a volume of 1/13.33 ft^3, 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 solid 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 below.

LBR Mold, 6" H-4163

Shipping wt. 22 lbs (10kg)

Compaction Split Mold, 2.8"

Compaction mold with a volume of .0214 ft^3. 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

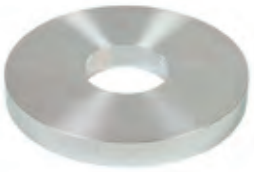
Shipping wt. 7.8 lbs (3.5kg)


H-4174


H-4172


H-4158


H-4158.1


H-4175


H-4177


H-4176


H-4179


H-4153


H-4147


H-4154FP


H-4154


H-4178BR


H-4178

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.

Dial Indicator H-4158.1
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

Replacement Hammers, New Style	
4" Round Hammer	H-4169.2415
6" Pie-Shape Hammer	H-4169.2416
Replacement Hammers, Old Style	
4" Round Hammer	H-4169.415
6" Pie-Shape Hammer	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.


H-4170A


H-4160A


H-4173

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.

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.

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)

Compaction Hammer, 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.

Compaction Hammer, Manual H-4160A
Shipping wt. 9.2 lbs (4.2kg)

Compaction Hammer, 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, Manual, AASHTO H-4170A
Shipping wt. 15.6 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 cohesionless, 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 tableis 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)

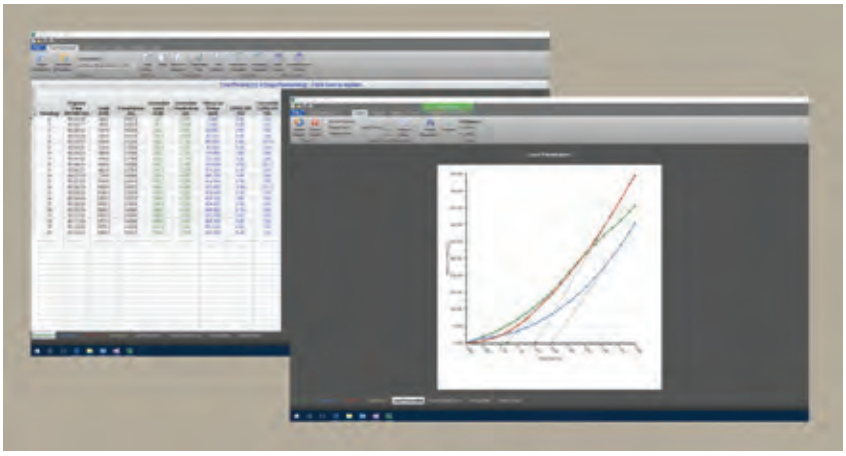
Tamper for Compaction Hammer
ASTM D7382-08

Replacement tamper and foot for compaction hammer.

Tamper and Foot H-4115.5
Shipping wt. 14 lbs (6kg)



HM-5030.3F



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; 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 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, calibration, 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

See page 94-95 for more information on Humboldt's NEXT Software.

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

See pages 112-113 for more information on the HM-5030 Master Loader and its Stand-alone and Computer-controlled capabilities



HM-5150.3F



HM-2850.3F

CBR/LBR Specific Automatic Load Frame

ASTM D1883; AASHTO T193; BS 1377 Part 4

The HM-5150 Loader has been specifically designed to handle CBR and LBR applications. Its 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 CBR and LBR Loader can handle these applications with ease.

The HM-5150 is built around Humboldt's integral, 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.

The HM-5150 is sold as a load frame only. For CBR or LBR testing it is recommended that you purchase the following items: a HM-2300.100 S-type, 10,000 lbf (50kN) load cell, a HM-2305.10 1" (25mm) strain transducer, a H-4178 Penetration piston with stud, a HM-2305BRT Displacement transducer bracket and the HM-5001SW Next test-specific CBR/LBR software module.

Humboldt's Next software and HM-5001SW Next test-specific CBR/LBR software module are included with the HM-5150 load frame. This software provides robust machine control, calibration, data acquisition and report generation for those using a computer to control load frame operations.

In stand-alone mode, the HM-5150 load frame provides 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 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 enhanced CBR and LBR-specific software module.

Specifications

Part #	Description
Load Capacity	10000 lbf (50kN)
Speed Range	0.05 in/min.(1.27mm/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

Typical CBR/LBR Setup for HM-5150.3F

Part #	Description
HM-2300.100	(1) S-type load cell, 10,000lbf (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) CBR/LBR reporting software

CBR/LBR Auto Load Frame, 110/220V 50/60 Hz HM-5150.3F

Shipping wt. 258 lbs (117kg)

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 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 .0001 to 2.2500 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 a digital display.

Specifications

Part #	Description
Load Capacity	11000 lbf (50kN)
Speed Range	.0001 to 2.2500 inch/min .0025-57.1500 mm/min
Platen Size [Travel]	10" (254mm) [3" (76mm)]
Clearance	32" (812mm) Vertical 11" (279mm) Horizontal
Current	9 Amps @ 125V 4.5 Amps @ 250V
Dimensions	17 x 22 x 51" (432 x 559 x 1295mm)

Typical CBR Setup for HM-2850

Part #	Description
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

Multi-Speed Load Frame, 110/220V 50/60 Hz HM-2850.3F

Shipping wt. 258 lbs (117kg)

Load Frames, CBR



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. 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).

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 in^2 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-4170A	(1) Density hammer
H-4144.12	(1) Straight edge, 12-inch
H-4174	(1) Cutting edge

CBR Mechanical Test Set H-4152
Ship wt. 379lbs. (172kg)

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)


H-4165


H-4180A


H-4180D


H-4254


H-4253


H-4262


HM-4501

Harvard Miniature Compaction Apparatus
Used for moisture density tests using small samples, its compaction action duplicates the kneading action of a sheepsfoot 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 ft^3 (129m^3) 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 ft^3 m^3 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)

Unconfined Soil Testers
These Unconfined soil testers allow for quick and accurate determination of unconfined compressive strength of cohesive soils in the field or lab. The H-4180A Tester is a "Rimac" replacement. It can be used for on-site pile tonnage or foundation bearing capacity estimates. Its light and compact design provides portability for everyday field use. Load Ring readout provides fast and easy-to-read direct load values in pounds during field work. Both testers are sturdily made of light and durable aluminum and feature a geared, hand-wheel loading system. Both include a load ring and a wide 4" platen. The H-4180A features an adjustable height scale, while the H-4180D features a dial indicator to determine vertical travel. The H-4180D is supplied with a calibraiton chart for precise measurement readings.

Unconfined Soil Tester, 500lb (2.25kN) H-4180A
Unconfined Soil Tester, 1000lb (4.54kN) H-4180D
Shipping wt. 18 lbs (8.2kg)

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, and (1) H-4915.025 graduated cylinder All components are also available individually.

Shrinkage Limit Set H-4254
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)

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)

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)

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 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)

Atterberg Limits


H-4230


H-4228


H-4226


H-4234


H-4233
(shown with base, not included)


H-4915.025


H-4232


H-4229P


H-4222D


H-4229


H-1350.3A

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	
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
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

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 268.

Durometer (D Scale) H-4222D
Shipping wt. 1.7 lbs (0.7kg)


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 micrometric 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 micrometric 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-4237A. Its electronic, digital, programmable timer automatically releases the plunger head and ensures a free-falling cone during the five second test. Overall dimensions are: 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

Sand Equivalent


H-4340


H-4378


H-4342 H-4342.2


HM-3930


H-4374


H-4379


H-4374.C

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 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
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	H-1350.3SP
Standard stock solution	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 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)

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)

Cover for 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 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, pipet 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)



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 ±1°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 x406 mm)

Overall dimensions: 48"L x 11"W x 19"D (1220 x 280 x483 mm)

Hydrometer Jar Bath, 120V 60Hz H-4239A
Hydrometer Jar Bath, 220V 50/60Hz H-4239A.4F

Shipping wt. 195lbs (88 kg)

Soil Hydrometer A

ASTM D422; 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 D422; 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). Total length: 11" (280mm).

Soil Hydrometer B H-4242

Shipping wt. 1.3lbs (0.59 kg)

Hydrometer Analysis Set

ASTM D422; AASHTO T88

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

Hydrometer Analysis Set, 120V 60Hz H-4263A
Hydrometer Jar Bath, 220V 50/60Hz H-4263A.4F

Shipping wt. 225lbs (102 kg)

Hydrometer Jar

ASTM D422; 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 Dispersion Mixer

ASTM D422; 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)


HM-5804

HM-5802


HM-5894


HM-5892


HM-3915

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)

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)

Permeameter Replacement Parts	
HM-5801 Replacement Screens 2.5" (2)	HM-5801.7
HM-5801 & HM-5891A Replacement Screens 2.485" (3)	HM-5801.8
Perforted Plate 2.5"	HM-5801.9

Shelby Tube Permeameter

The Shelby tube permeameter allows you to perform permeability tests within a Shelby tube without removing the sample. Ideal for cohesionless 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)

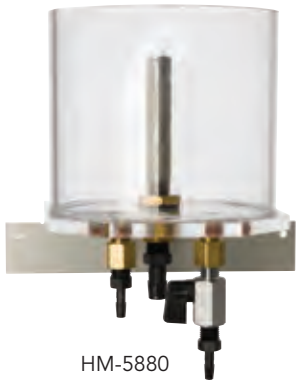
Tubing for use with Permeameter Cells

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)




HM-5880


H-4145


H-4146

Dual Manometer Tube Stand
ASTM D2434

Economical manometer tube setup for use with many permeameters. 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 many permeameters. 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; rails for wall mounting with easy height adjustment 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 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)

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


HM-4150.3F


HM-4140.3F


HM-4150A


HM-4160.3F


HM-4160A

Humboldt FlexPanels

ASTM D5084; BS 1377 Part 6 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 course 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 triaxial 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 hookups. 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 facing 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 0.1 cc (ml)					
Top	Not Applicable		10cc x 0.02 cc (ml)					
Base	Not Applicable		10cc x 0.02 cc (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 pres sure 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 fluoroelastomer 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 fluoroelastomer 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)



Rear of panel showing quick-connect hookups and plumbing.



HM-4190





HM-4188.28

Triaxial cells can also be used for permeability testing.



HM-4199B-6

HM-4199B-4

HM-4199B

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-4199.35SSB
1.4"			HM-4188.14	HM-4199.14T	HM-4188.14B	HM-4188.14SS	HM-4199.14SST	HM-4199.14SSB
38mm			HM-4188.38	HM-4199.38T	HM-4188.38B	HM-4188.38SS	HM-4199.38SST	HM-4199.38SSB
1.5"			HM-4188.15	HM-4199.15T	HM-4188.15B	HM-4188.15SS	HM-4199.15SST	HM-4199.15SSB
50mm			HM-4188.50	HM-4199.50T	HM-4188.50B	HM-4188.50SS	HM-4199.50SST	HM-4199.50SSB
2.0"			HM-4188.20	HM-4199.20T	HM-4188.20B	HM-4188.20SS	HM-4199.20SST	HM-4199.20SSB
70mm			HM-4188.70	HM-4199.70T	HM-4188.70B	HM-4188.70SS	HM-4199.70SST	HM-4199.70SSB
2.8"			HM-4188.28	HM-4199.28T	HM-4188.28B	HM-4188.28SS	HM-4199.28SST	HM-4199.28SSB
100mm			HM-4188.100	HM-4199.100T	HM-4188.100B	HM-4188.100SS	HM-4199.100SST	HM-4199.100SSB
4.0"			HM-4188.40	HM-4199.40T	HM-4188.40B	HM-4188.40SS	HM-4199.40SST	HM-4199.40SSB

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 anondized 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

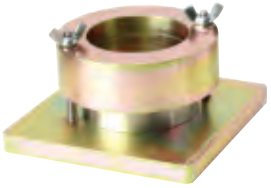
For those who plan to do triaxial tests in addition to permeability testing, consider using HM-4199B or HM-4199SS triaxial cells for the added convenience of using one cell for both tests. See page 117.


HM-5405

HM-4184.399T


HM-2415


HM-3701


HM-1975-D


HM-1972-1E

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
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 enquire.

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


HUMBOLDT
5470
5030
HUMBOLDT

Soil Mechanics



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GEOTECHNICAL TEST EQUIPMENT

HUMBOLDT

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 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 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 Humboldt NEXT software test-specific modules, see pages 94-95.

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 machines provide a complete solution for the calibration, acquisition, recording and presentation of testing data in data tabulation and graphic chart formats.



Upgrade your existing equipment to the NEW Humboldt Elite Series

Upgrades to our new Elite Series machines are available. 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 right for available upgrades.

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

control and monitoring of all testing functions





Choose: Stand-Alone or Computer Control

NEXT SOFTWARE

CONTROL, DATA ACQUISITION AND REPORTING



Humboldt's, NEXT 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 sampling rate of 50 readings per second
- Stores unlimited 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 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 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, calibration, data acquisition and report generation for those using a computer to control load frame operations.

With Humboldt's NEXT 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 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.

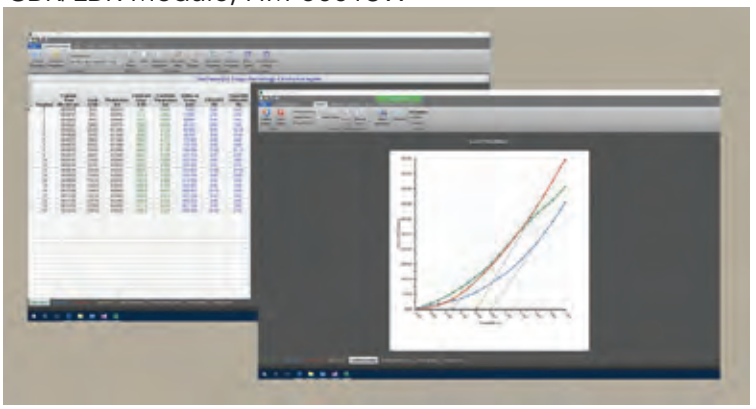
NEXT Test-Specific Software Modules

Humboldt NEXT 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.

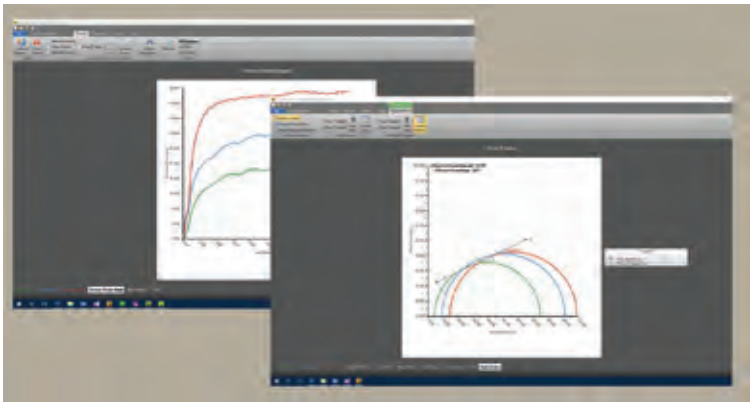
- test-specific setup, which guides you through the process and includes selecting data collection parameters that best fit the specific test
- input specific project information for each test, such as project name, client information, etc
- all test-specific initial, intermediate, and final parameters 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 enquire

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

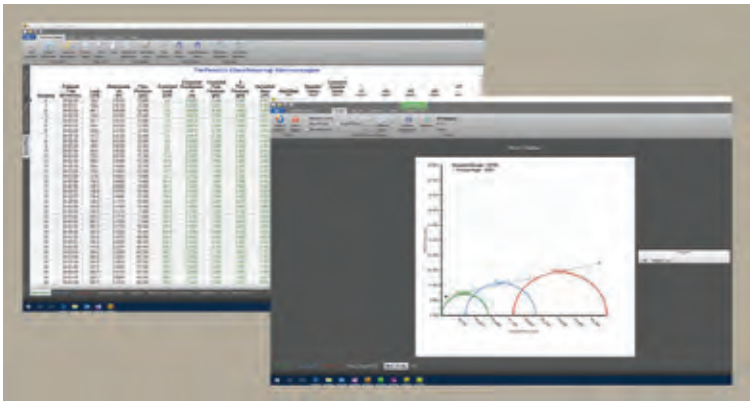
CBR/LBR Module, HM-5001SW



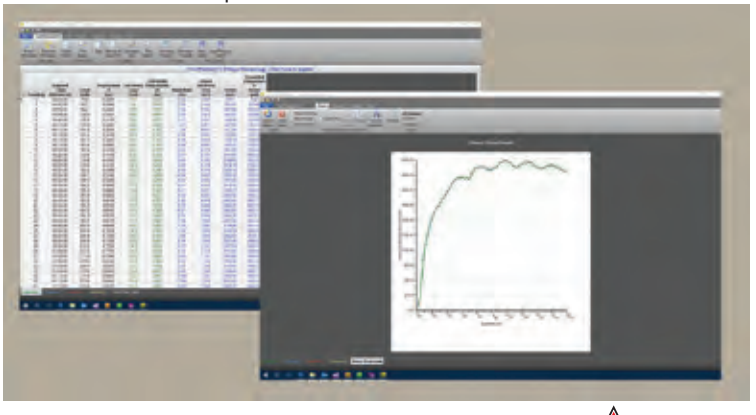
Unconsolidated Undrained (UU) Module, HM-5002SW



Consolidated Undrained (CU) Module, HM-5003SW



Unconfined Compression (UC) Module, HM-5004SW



ELITE SERIES
Automated Consolidation



HM-5470.3F

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 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.

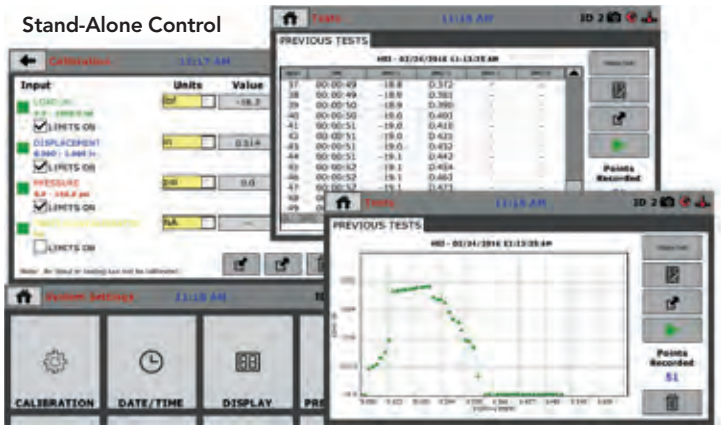
Once a sample has been placed onto the test platform and the test conditions set, the ConMatic IPC performs all consolidation tests, including moving to the next stress level, without operator assistance. The system automatically moves through the different test parameters specified by the user with incremental consolidation tests typically being completed in 24 to 48 hours. The Humboldt NEXT software 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 an accurate stepper motor. Test results are recorded and rendered in real-time on the computer screen while test data is stored and calculations are performed automatically. The Humboldt NEXT software provides:

- Live tests 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.

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 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
Emergency stop	Large button
24-bit differential analog to digital converter	2
Ambient temperature sensor	1
Firmware Update	Ethernet or flash drive

Stand-Alone Control



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 the ConMatic IPC automated consolidation system. 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:

- 2-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 both 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

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 calibration, 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 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 unlimited 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.

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 includes:	
(1) S-type load cell 2,000 lbs (10kN) with 0.75" adapter	HM-2300.20
(1) Linear strain transducer, 1.0" (25mm)	HM-2310.10
(1) Linear strain transducer Bracket	M-2310BR
(1) NEXT consolidation software module	HM-5100SW
(1) Ball 0.625" 440 stainless steel	HM-001076

ConMatic IPC, 120/220V 50/60Hz HM-5470.3F
Shipping wt. 52 lbs (23.85kg)

Additional Items needed for setup:

Consolidation Installation and Spare Parts Kit
Installation and spare parts kit provides tubing, fasteners and tools to complete an installation of pneumatic consolidation equipment.
Consolidation Installation and Spare Parts Kit HM-4168

ConMatic IPC System Requirements:

AC Supply: 110/220 VAC 50/60 Hz 5 Amp

Air Supply: Air Supply: Clean and dry (air filter, water trap), minimum: 100 psi (700kpa) continuous air supply, 10CFM (0.3 m^3/min)



HM-2432A.3F

ConMatic System Requirements:

AC Supply: 110/220 VAC 50/60 Hz 5 Amp

Air Supply: Air Supply: Clean and dry (air filter, water trap), minimum: 100 psi (700kpa) continuous air supply, 10CFM (0.3 m3/min)

ConMatic Consolidation Machine

ASTM: D2435, D4546, AASHTO: T216, BS:1377:5

Compact and easy-to-use, the HM-2432A.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.

- 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

Unit 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) coupled to one of the Humboldt data loggers.

ConMatic TSF, 120/220V 50/60Hz HM-2432A.3F
ConMatic kgf/cm², 120/220V 50/60Hz HM-2432AM.3F

Shipping wt. 48 lbs (21.7kg)

Typical HM-2432A.3F Consolidation Setup:

Part #	Description
Pneumatic Consolidation	
HM-2432A.3F	ConMatic 32 TSF
HM-1220.XX	Fixed ring consolidation cell
H-4471CC	Dial gauge, 0.5" X .0001" CC

Typical HM-2432M.3F Consolidation Setup:

Part #	Description
Pneumatic Consolidation	
HM-2432AM.3F	ConMatic 32 TSF
HM-1220.XX	Fixed ring consolidation cell
H-4465.12CC	Dial gauge, 12mm X .002mm CC

Part Numbers ending in .XX require a size code to be entered referring to the sample size to be tested. For Consolidation samples, sizes are: .20 = 2.0"; .242 = 2.42"; .25 = 2.5"; .30 = 3.0"; .40 = 4.0"; .50 = 50mm; .70 = 70mm; .75 = 75mm, and .100 = 100mm. *Metric applications: Use HM-1122 weight set (32kg)

Typical Consolidation Data Acquisition Setups Using Humboldt Data Loggers



HM-2432A.3F shown with HM-5320.3F Data Logger for semi-automatic control and data acquisition with strain transducers.





HM-2432A.3F shown with HM-5330.3F Data Logger for semi-automatic control and data acquisition with digital indicators.

Data acquisition setup for Pneumatic consolidation using analog transducer and Logger	
HM-2432A.3F or HM-2432AM.3F	ConMatic 32 TSF or ConMatic 32 Kgf/cm²
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

When used with one of Humboldt's 4-channel data loggers, the HM-2432A Consolidation machine becomes a semi-automatic pneumatic loading machine, which with the touch-screen monitor of the data logger provides test control and live test monitoring in either a stand-alone or computer-controlled configuration. While pneumatic loads are controlled by manual valve controls located on the front panel of the consolidation machine, 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 software.

Stand-Alone Control

The 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. 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
- 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

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 provides a complete solution for the calibration, acquisition, recording and presentation of consolidation testing data in data tabulation and graphic chart formats.

Data acquisition setup for Pneumatic consolidation using digital indicator and Logger	
HM-2432A.3F or HM-2432AM.3F	ConMatic 32 TSF or 32 Kgf/cm²
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

- 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 unlimited 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.



HM-1100A

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

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 comes with standard, mechanical dial gauges
- The HM-1100A is also available 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)


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-100.3: 115 lb (52.1kg)

Part Numbers ending in .XX require a size code to be entered referring to the sample size to be tested.
For Consolidation samples, sizes are: .20 = 2.0"; .242 = 2.42"; .25 = 2.5"; .30 = 3.0"; .40 = 4.0"; .50 = 50mm; .70 = 70mm; .75 = 75mm, and .100 = 100mm. *Metric applications: Use HM-1122 weight set (32kg)

Typical Consolidation Data Acquisition Setups Using Humboldt Data Loggers



Dead weight consolidation w/ analog data acquisition	
HM-1100A	Dead weight consolidation frame-front Load
HM-1120 or HM-1123	Weight set, 16 TSF or 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	Logger 4-CH analog data acquisition
HM-5100SW	NEXT consolidation reporting software

When used with one of Humboldt's 4-channel data loggers, the HM-1100 Consolidation frame becomes a semi-automatic machine, which with the touch-screen monitor of the data logger provides test control and live test monitoring in either a stand-alone or computer-controlled configuration. While loads are still controlled by manually adding weights, 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 software.

Stand-Alone Control

The 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. 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
- 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

NEXT software is included with the Humboldt Data Loggers.

This software, calibration, data acquisition and report generation for those using a computer to control consolidation testing operations.

In addition, operators have the ability to view 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

Dead weight consolidation w/ digital data acquisition	
HM-1100A	Dead Weight consolidation frame-front load
HM-1120 or HM-1123	Weight set, 16 TSF or 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	Logger 4-CH digital data acquisition
HM-5100SW	NEXT consolidation reporting software

even a complete geotechnical lab, Humboldt's NEXT software provides a complete solution for the calibration, acquisition, recording and presentation of consolidation testing data in data tabulation and graphic chart formats.

- 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 unlimited 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.

Fixed Ring Consolidation Cell

ASTM: D2435, D4546, AASHTO: T216, BS:1377:5

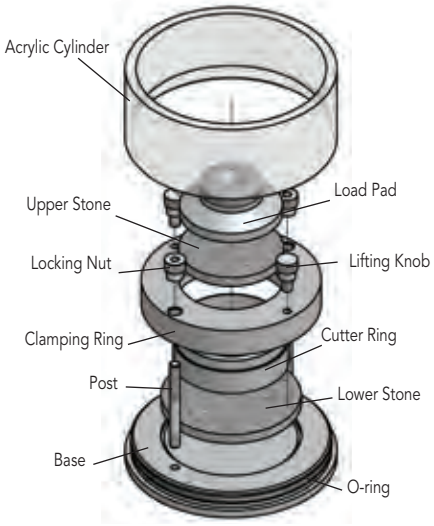
Complete cell assembly features stainless steel construction and self-trimming cutter ring. Cutter ring rests inside clamping ring on lower porous stone, which is larger than the sample. The top porous stone and loading pad rest on the sample. The assembly is fixed on the cell base and enclosed within 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

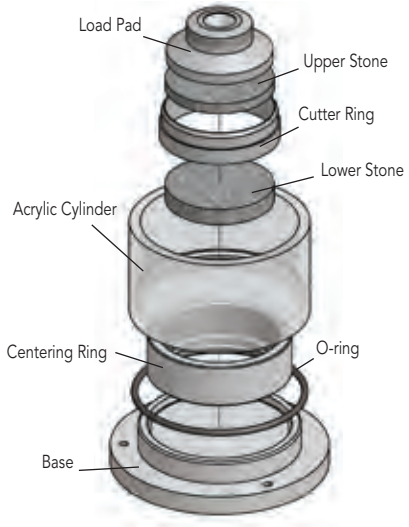
Complete cell assembly features stainless steel construction with self-trimming cutter ring. Similar in construction to a fixed ring cell with the exception that the lower porous stone fits inside the cutter ring and can move vertically within it. The sample ring is also free to move vertically. The cell comes complete with all the parts illustrated in the drawing below.

Floating Ring Consolidation Cell — See Chart

Shipping wt. 6 lb (2.27kg)



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

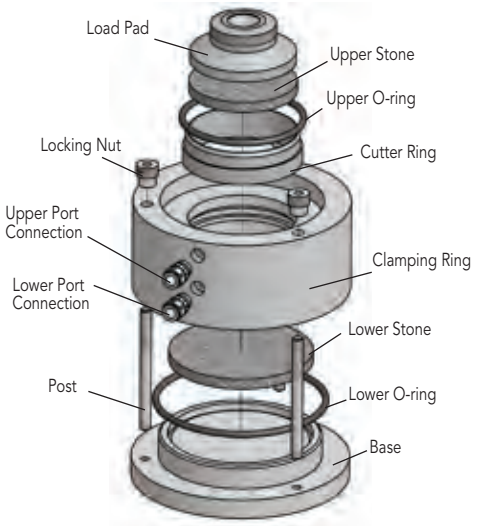
Similar in construction to a fixed ring cell with the exception that the saturated sample and water are sealed from the atmosphere. Complete cell assembly features stainless steel construction and self-trimming cutter ring. Base features outlet port and 10cc pipette for monitoring water level. The cell 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



Consolidation Cell Components									
	2.0"	2.42"	2.5"	3.0"	4.0"	50mm	70mm	75mm	100mm
Load pad	HM-1220.20.10	HM-1220.24.10	HM-1220.25.10	HM-1220.30.10	HM-1220.40.10	HM-1220.50.10	HM-1220.70.10	HM-1220.75.10	HM-1220.100.10
Upper stone	HM-4184.1985	HM-4184.240	HM-1220.25.11* HM-4184.2485	HM-4184.2985	HM-4184.3985	HM-4184.1955	HM-4184.274	HM-4184.2940	HM-4184.3925
Lower stone (floating)	HM-4184.1985	HM-4184.240	HM-4184.2485	HM-4184.2985	HM-4184.3985	HM-4184.1955	HM-4184.274	HM-4184.2940	HM-4184.3925
Lower stone (fixed & permability)	HM-4184.331	HM-4184.331	HM-4184.331	HM-4184.331	HM-4184.4375T	HM-4184.331	HM-4184.331	HM-4184.331	HM-4184.4375T
Acrylic cylinder (fixed)	HM-1220.25.2	HM-1220.25.2	HM-1220.25.2	HM-1220.25.2	HM-1220.40.2	HM-1220.25.2	HM-1220.25.2	HM-1220.25.2	HM-1220.40.2
Acrylic cylinder (floating)	HM-1210.25.2	HM-1210.25.2	HM-1210.25.2	HM-1210.25.2	HM-1210.40.2	HM-1210.25.2	HM-1210.25.2	HM-1210.25.2	HM-1210.40.2
Centering ring (floating)	HM-1210.20.12	HM-1210.24.12	HM-1210.25.12	HM-1210.30.12	HM-1210.40.12	HM-1210.50.12	HM-1210.70.12	HM-1210.75.12	HM-1210.100.12
Clamping ring (permability)	HM-1230.20.9	HM-1230.24.9	HM-1230.25.9	HM-1230.30.9	HM-1230.40.9	HM-1230.50.9	HM-1230.70.9	HM-1230.75.9	HM-1230.100.9
Clamping ring (fixed)	HM-1220.20.9	HM-1220.24.9	HM-1220.25.9	HM-1220.30.9	HM-1220.40.9	HM-1220.50.9	HM-1220.70.9	HM-1220.75.9	HM-1220.100.9
Base (floating & permability)	HM-1230.25.1	HM-1230.25.1	HM-1230.25.1	HM-1230.25.1	HM-1230.40.1	HM-1230.25.1	HM-1230.25.1	HM-1230.25.1	HM-1230.40.1
Base (fixed)	HM-1220.25.1	HM-1220.25.1	HM-1220.25.1	HM-1220.25.1	HM-1220.40.1	HM-1220.25.1	HM-1220.25.1	HM-1220.25.1	HM-1220.40.1
Cutter ring (all)	HM-1220.20.8	HM-1220.24.8	HM-1220.25.8	HM-1220.30.8	HM-1220.40.8	HM-1220.50.8	HM-1220.70.8	HM-1220.75.8	HM-1220.100.8
Lower o-ring (floating & permability)	HM-003053	HM-003053	HM-003053	HM-003053	HM-003056	HM-003053	HM-003053	HM-003053	HM-003056
Lower o-ring (fixed)	HM-003052	HM-003052	HM-003052	HM-003052	HM-003024	HM-003052	HM-003052	HM-003052	HM-003024
Upper o-ring (permability)	HM-003057	HM-003058	HM-003054	HM-003059	HM-003060	HM-003057	HM-003061	HM-003062	HM-003063
Post (all)	HM-1220.25.3	HM-1220.25.3	HM-1220.25.3	HM-1220.25.3	HM-1220.25.3	HM-1220.25.3	HM-1220.25.3	HM-1220.25.3	HM-1220.25.3
Locking nut (all)	HM-1220.25.5	HM-1220.25.5	HM-1220.25.5	HM-1220.25.5	HM-1220.25.5	HM-1220.25.5	HM-1220.25.5	HM-1220.25.5	HM-1220.25.5
Lifiting knob (all)	HM-1220.25.6	HM-1220.25.6	HM-1220.25.6	HM-1220.25.6	HM-1220.25.6	HM-1220.25.6	HM-1220.25.6	HM-1220.25.6	HM-1220.25.6
Port connection upper (permability)	HM-003027	HM-003027	HM-003027	HM-003027	HM-003027	HM-003027	HM-003027	HM-003027	HM-003027
Port connection lower (permability)	HM-003055	HM-003055	HM-003055	HM-003055	HM-003055	HM-003055	HM-003055	HM-003055	HM-003055
Filter paper	HM-4189.20	HM-4189.25	HM-4189.25	HM-4189.30	HM-4189.40	HM-4189.20	HM-4189.28	HM-4189.30	HM-4189.40
Calibration disk (used for consolidation or round shear box.)	HM-1220.20.4	HM-1220.24.4	HM-1220.25.4	HM-1220.30.4	HM-1220.40.4	HM-1220.50.4	HM-1220.70.4	HM-1220.75.4	HM-1220.100.4

*this stone has a threaded stud; order HM-4184.2485 if no stud is desired.





HM-1240.25

Trimming Turntable for 2.5" Consolidation Specimens

Trims samples down to correct sizing.

Trimming Turntable, 2.5" Consolidation HM-1240.25

Shipping wt. 5lb (2.27kg)

Individual Weights							
TSF Weight	0.125 (1/8)	0.25 (1/4)	0.50 (1/2)	1.0	2.0	4.0	
Model No.	HM-1120.125	HM-1120.250	HM-1120.500	HM-1120.1	HM-1120.2	HM-1120.4	
Kg Weight	0.5 kg	1.0 kg	2.0 kg	4.0 kg	5.0 kg	8.0 kg	10.0 kg
Model No.	HM-1122.05	HM-1122.1	HM-1122.2	HM-1122.4	HM-1122.5	HM-1122.8	HM-1122.10

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)

ELITE SERIES
Direct Shear

Direct/Residual Shear Apparatus

ASTM: D3080; AASHTO: T236, BS:1377:7

Humboldt's Elite Series Direct Shear machines provide the materials testing lab with a choice of a pneumatic loading and several dead-weight machines for direct shear testing applications. The HM-5760 is a 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.

The HM-5750 machines are dead-weight loading machines, which come in an analog and a digital configuration. These machines also take advantage of our touch-screen monitor to provide test control and live test monitoring in either a stand-alone or computer-controlled configuration.

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 Direct Shear machines 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 direct shear machines provide 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.

Pneumatic Direct/Residual Shear Apparatus

ASTM: D3080; AASHTO: T236, BS:1377:7

The Humboldt HM-5760 Direct/Residual Shear apparatus is a fully-automated system utilizing pneumatic loading to apply vertical loads to a sample eliminating the need for loading weights used in dead weight-type systems.

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-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.

The HM-5760 is supplied complete with two 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 Direct Shear software module. Shear box assemblies and related accessories are not included and should be ordered separately.

Pneu. Direct/Residual Shear Apparatus HM-5760.3F

Shipping wt. 168 lb (76kg)



HM-5760.3F

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.
Data storage	1000 tests and up to 3000 readings per test
Dimensions (L x D x H)	30" x 15.5" x 22" (760 x 394 x 558mm)
Voltage	110/220V 50/60Hz - 6.5amps

Dead-Weight Direct/Residual Shear Machines



HM-5750A.3F

Counter-balance device for ASTM D3080 compliance. Not available anywhere else. Also available as a retrofit kit. HM-2560A.1



HM-5750D.3F

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, 4-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 box squares 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.

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, 4-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 box squares 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.

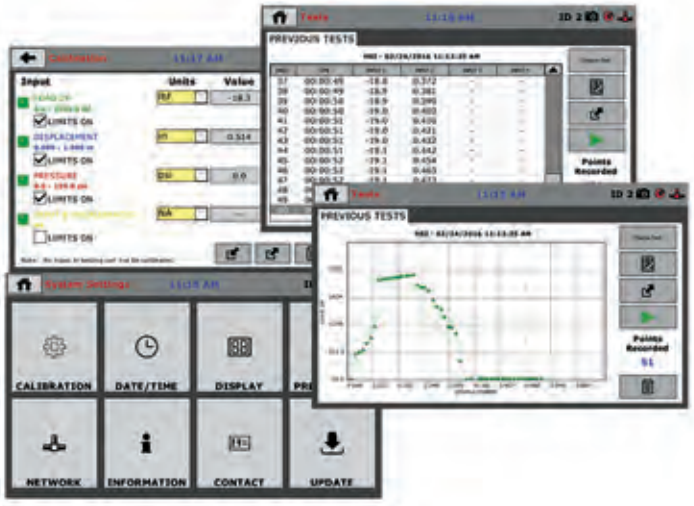
Direct Shear Apparatus, Digital HM-5750D.3F
Shipping wt. 300 lb (136kg)

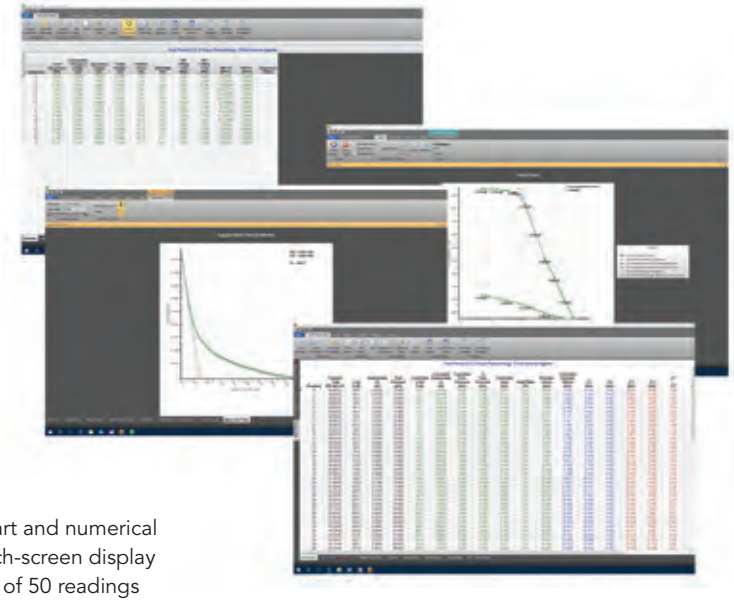
HM-5750A & D Specifications:	
Horiz. movement	2" (50mm) Maximum
Horiz. shear force	2000 lbf (10kN)
Vertical load	2000 lbf (10kN)
Data Channels	3
Speed Range	0.00001 to 0.49999 in./min. 0.00001 to 12.9999 mm/min.
Data storage	1000 tests and up to 3000 readings per test
Dimensions (L x D x H)	40" x 10" x 45" (1016 x 254 x 1143mm)
Voltage	110/220V 50/60Hz - 6.5amps

Direct Shear Installation and Spare Parts Kit
Installation and spare parts kit provides tubing, fasteners and tools to complete an installation of pneumatic consolidation equipment. See page 76.

Installation and Spare Parts Kit HM-4168
Shipping wt. 4.5 lb (2.0kg)

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 Elite Series Direct Shear machines. 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:

- 3 or 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 both 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

Next software and the enhanced Consolidation module, HM-5011SW, 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.

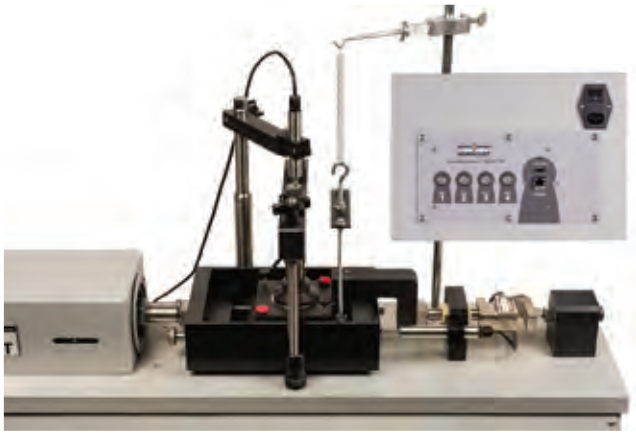
So, whether you are controlling a single consolidation machine, controlling multiple machines or even a complete geotechnical lab, Humboldt's NEXT software, in conjunction with Humboldt's ConMatic IPC, provides a complete solution for the calibration, acquisition, recording and presentation of consolidation testing data in data tabulation and graphic chart formats.

- Machine control, and data acquisition via networked computer
- Provides the ability to use 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 unlimited 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.

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	3-4 Channels
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
Emergency stop	Large button
24-bit differential analog to digital converter	4
Ambient temperature sensor	1
Limit switches	2
Firmware Update	Ethernet or flash drive

Typical Test Setup for HM-5760 and (HM-5560)

Part #	Description
HM-5760.3F	**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-5700SW	NEXT Direct Shear software module
HM-2751.XX(S/D)	Shear box assembly (specify size)
HM-2702.XX(S/D)	Shear box cutter (specify size)
HM-2703.XX(S/D)	Dolly/tamper (specify size)



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 HM-5750D

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-5750D.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



Part Numbers ending in .XX require a size code to be entered referring to the sample size to be tested.
For direct/residual shear samples, sizes are: .20 = 2.0"; .242 = 2.42"; .25 = 2.5"; .40 = 4.0"; .50 = 50mm; .60 = 60mm, and .100 = 100mm. **NOTE:** use "S" for square and "D" for round samples.

Direct Shear



HM-5560.3F

Counter-balance device for ASTM D3080 compliance. Not available anywhere else. Also available as a retrofit kit. HM-2560A.1



HM-5750.3F

Pneumatic Direct/Residual Shear Apparatus
ASTM: D3080; AASHTO: T236, BS:1377:7

The HM-5560 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-5560, pneumatic loads are controlled by manual valve controls located on the front panel for easy use. The HM-5560 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-5560 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-5560 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.

HM-5560 Specifications:	
Horiz. movement	1" (25.4mm) maximum
Horiz. shear force	2,000 lbf (10kN)
Vertical load	2,000 lbf (10kN)
Speed range	0.00001 to 0.49999 in/min. (0.00001 to 12.99999 mm/min.)
Voltage	110/220 VAC 50/60HZ
Current	6.5 amps
Analog to digital	24 bit
Data storage	3000 readings
Data collection rate	50 readings per second
Ethernet connection	for network connectivity
Dimension (W x D x H)	30" x 15.5" x 22" (L x D x H) (760 x 394 x 558mm)
Weight	140 lb (64 kg)

Pneu. Direct/Residual Shear Apparatus HM-5560.3F
Shipping wt. 200 lb (90.7kg)

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 box squares 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.

HM-5750 & HM-5750M Specifications:	
Horiz. movement	2" (50mm) Maximum
Horiz. shear force	2000 lbf (10kN)
Vertical load	2000 lbf (10kN)
Speed Range	0.00001 to 0.49999 in./min. 0.00001 to 12.9999 mm/min.
Dimensions (L x D x H)	40" x 10" x 45" (1016 x 254 x 1143mm)
Voltage	110/220V 50/60Hz - 6.5amps

Direct Shear Apparatus, Manual HM-5750.3F
Direct Shear Apparatus, Manual Metric HM-5750M.3F
Shipping wt. 330 lb (149kg)


HM-2751.60S

HM-2751.25D


HM-2701.25D

HM-2701.60S



Shearbox Assemblies	
Round	Model
2.0"	HM-2751.20D
2.42"	HM-2751.24D
2.5"	HM-2751.25D
4.0"	HM-2751.40D
50mm	HM-2751.50D
60mm	HM-2751.60D
100mm	HM-2751.100D
Square	Model
2.0"	HM-2751.20S
2.42"	HM-2751.24S
2.5"	HM-2751.25S
4.0"	HM-2751.40S
50mm	HM-2751.50S
60mm	HM-2751.60S
100mm	HM-2751.100S

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-5560.3F Shearbox Assemblies*	
Round	Model
2.0"	HM-2701.20D
2.42"	HM-2701.24D
2.5"	HM-2701.25D
4.0"	HM-2701.40D
50mm	HM-2701.50D
60mm	HM-2701.60D
100mm	HM-2701.100D
Square	Model
2.0"	HM-2701.20S
2.42"	HM-2701.24S
2.5"	HM-2701.25S
4.0"	HM-2701.40S
50mm	HM-2701.50S
60mm	HM-2701.60S
100mm	HM-2701.100S

*Can also be used with legacy product HM-2560A.3F

Accessory	Model
Cutter	HM-2702.XXS/D
Dolly tamper	HM-2703.XXS/D
Porous plate	HM-2704.XXS/D
Calibration disk, square	HM-2755.XXS
Calibration disk, round*	HM-1220.XX.4
Replacement Pressure Ball 5/8" 440 Stainless Steel	HM-001076

* Can be used for shear boxes and consolidation cells.

Part Numbers ending in .XX require a size code to be entered referring to the sample size to be tested.
For direct/residual shear samples, sizes are: .20 = 2.0"; .242 = 2.42"; .25 = 2.5"; .40 = 4.0"; .50 = 50mm; .60 = 60mm,and .100 = 100mm.
NOTE: use "S" for square and"D" for round samples.

Installation and Spare Parts Kit HM-4168: Direct Shear Installation and Spare Parts Kit Installation and spare parts kit provides tubing, fasteners and tools to complete an installation of pneumatic direct shear equipment.

Pneumatic Direct Shear Requirements:
AC Supply: 110/220 VAC 50/60 Hz 5 Amp **Air Supply:** Air Supply: Clean and dry (air filter, water trap), minimum: 100 psi (700kpa) continuous air supply, 10CFM (0.3 m3/min)

Individual Weights							
TSF weight	0.125 (1/8)	0.25 (1/4)	0.50 (1/2)	1.0	2.0	4.0	
Model no.	HM-1120.125	HM-1120.250	HM-1120.500	HM-1120.1	HM-1120.2	HM-1120.4	
Kg weight	0.5 kg	1.0 kg	2.0 kg	4.0 kg	5.0 kg	8.0 kg	10.0 kg
Model No.	HM-1122.05	HM-1122.1	HM-1122.2	HM-1122.4	HM-1122.5	HM-1122.8	HM-1122.10



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)

High Capacity Direct Shear



HM-5780 and HM-5790 Specifications:	
HM-5780 Strain Rate	0.002" to 0.2"/min 0.0508 mm to 5.08 mm/min
HM-5790 Strain Rate	0.000004" to .4"/min 0.0001 mm to 10 mm/min
Data Channels	4
Data storage	1000 tests and up to 3000 readings per test
Dimensions (L x D x H)	43" x 23" x 40" (1090 x 584 x 1020mm)
Voltage	110/220V 50/60Hz - 6.5amps

High-Capacity Direct Shear Apparatus
ASTM D5321, D6243

The High-Capacity Direct Shear Machine has been specifically designed for testing large, 12" (305mm) square soil sample sizes of soil and soil/geosynthetics. Samples are mounted in a two-piece shear ring assembly, horizontally divided in half. The bottom half is held securely in place while a vertical confining force is applied. Horizontal force is then directed against the upper half of the ring to shear the specimen.

Sample loads are obtained by the use of four pneumatic pistons. This concept increases the accuracy and sensitivity of light load settings. Two, small-diameter rolling diaphragm pistons are capable of applying light loads to 1,000 lbs (454kg) and the two, larger pistons apply loads up to 10,000 lbs (45kN) or 20,000 lbs (90kN) depending on the model.

In stand-alone mode, these direct shear machines provide 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. Applying the vertical load is accomplished by setting the precision regulator to the required pressure per the calibration chart. Load settings are verified on a pressure readout that reads to two decimal places and is accurate to 0.25%. The horizontal shear rate is set using the digital thumb wheel on the control panel. Limit switches are used to set the home position of the shear rings and to limit the travel to 4" (300mm).

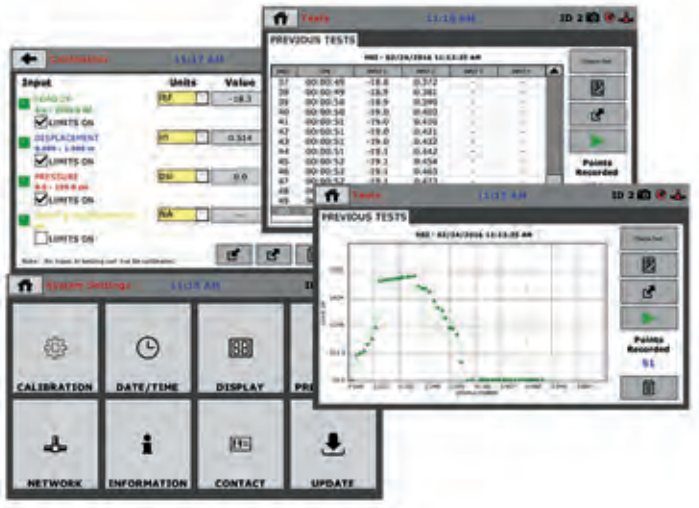
Consolidation and shear displacement are measured by linear displacement transducers and displayed on the digital readout. Shear load is measured from a load cell attached to the water chamber. The included software imports data onto spreadsheets such as Excel® for analysis and reporting. Displayed values on the readout can be viewed at anytime.

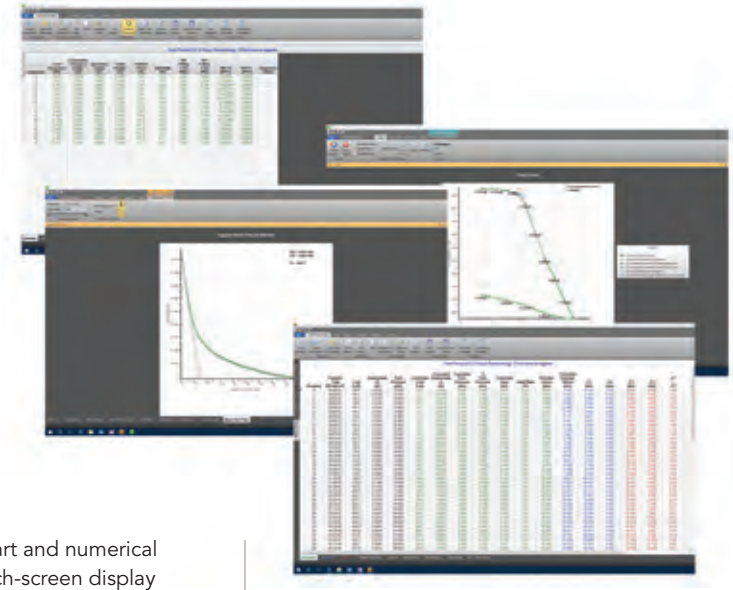
Loading and unloading the specimen and shear ring assembly to and from the water chamber is simplified using the Compaction Table. Pulling the loaded shear rings onto the convenient table rollers allows the entire assembly to slide easily into and out of the chamber. Sample compaction, geotextile placement, and specimen preparation can be performed on the table, before placing the assembly directly into the water chamber with little effort.

The direct shear is designed for harsh lab environments. All steel parts are powder coated and aluminum parts are hard-coat anodized for corrosion resistance. Casters on the machine and compaction table allow for easy movement in the lab.

These direct shear machines include the compaction table and the top and bottom shear rings. The top ring measures 12" x 12" x 4" (305 x 305 x 102mm), and the bottom ring measures 12" x 16" x 4" (305 x 406 x 102mm). Software and data cable are also included. A 120psi (827kPa) source of clean, dry, compressed air is required for operation.

45kN Large Direct Shear 110/220VAC 50/60 Hz HM-5780.3F
Shipping wt. 1025 lb (465kg)





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. 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:

- 2-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 both 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

Next software is included with the High-Capacity Direct Shear. This software provides calibration, data acquisition and report generation for those using a computer to control consolidation testing operations.

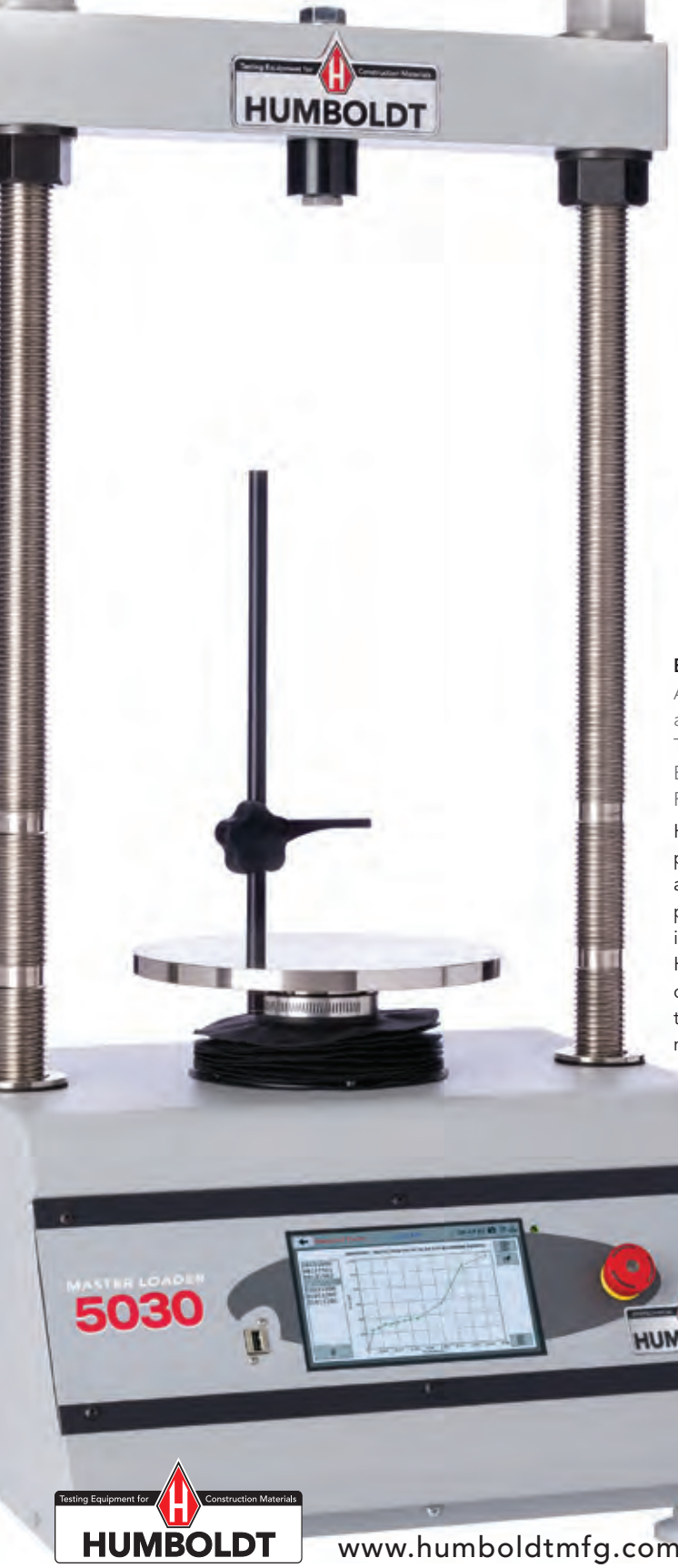
In addition, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, while also providing report generating capabilities using the consolidation test-specific software module.

So, whether you are controlling a single consolidation machine, controlling multiple machines or even a complete geotechnical lab, Humboldt's NEXT software provides a complete solution for the calibration, 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 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 unlimited 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.

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 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
Emergency stop	Large button
24-bit differential analog to digital converter	4
Ambient temperature sensor	1
Limit switches	2
Firmware Update	Ethernet or flash drive

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 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.



HM-5030 MASTER LOADER

Load capacity	11000 lbf (50kN)
Speed range	0 - 3.0000 in/min. 0 - 75.0000 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-5020 TRIAXIAL LOADER

Load capacity	3000 lbf (15kN)
Speed range	0 - 3.0000 in/min. 0 - 75.0000 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 - 5.0amps

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. 300 lb (54kg)



HM-5040 GRAND LOADER

Load capacity	22000 lbf (100kN)
Speed range	0 - .4999 in/min. 0 - 12.5000 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 - 5.0amps

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. It's wider stance and large vertical and horizontal clearances allows it to accommodate much large sample 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

Grand Loader, 110/220V 50/60 Hz HM-5040.3F

Shipping wt. 300 lb (54kg)

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, calibration, 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 the consolidation test-specific software module.

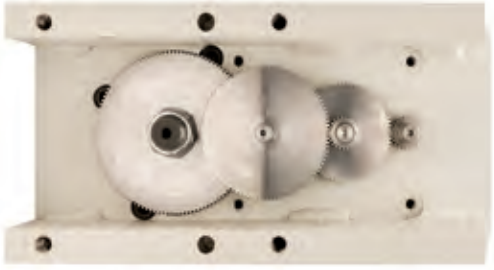
So, whether you are controlling a single load frame, controlling multiple machines or even a complete geotechnical lab, Humboldt's NEXT software, in conjunction with Humboldt's Elite Series Load Frames provide a complete solution for the calibration, acquisition, recording and presentation of testing 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 unlimited 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.

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 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
Emergency stop	Large button
24-bit differential analog to digital converter	4
Ambient temperature sensor	1
Limit switches	2
Firmware Update	Ethernet or flash drive



Humboldt stepper motor, precision gears and gear box used on all Elite Series Load Frames ensure smooth operation and precise results.

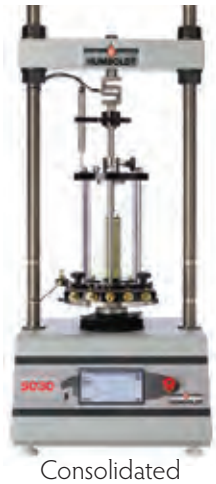
Typical Test Setups with HM-5030



CBR/LBR



Unconfined Compression



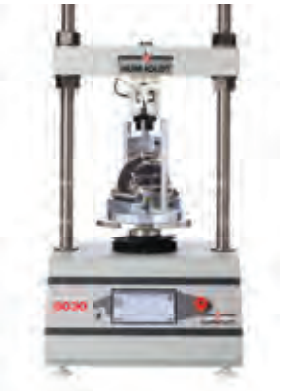
Consolidated Drained and Undrained



Unconsolidated Undrained



Marshall



Semi-Circular Bending

Triaxial Load Frames



HM-2850.3F

HM-2850 load frame shown with optional components for conducting CU Triaxial tests.

Specifications	
Load capacity	11000 lbf (50kN)
Speed range	0 - 3.0000 in/min. 0 - 75.0000 mm/min.
Platen Size / Travel	8" (203mm) / 3" (76mm)
Clearance, vertical	40" (1000mm)
Clearance, horiz.	15" (380mm)
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 0.0001 to 2.2500 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:
SHH04—3/4"-16 Bolt x 3.5" long
WF04—Washer for SHH04 Bolt

CU/UU Triaxial Setup with HM-2800

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
NEXT software basic, user defined	included
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-2800

Components	
Load	
50kN (11240 lbf) capacity	HM-2850.3F
Upper unconfined platen	HM-2002
Displacement indicator platform	HM-3000.10.2
Displacement indicator rod	HM-3000.10.1
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-4199B-6

HM-4199B-4

HM-4199B


HM-4199.28

Triaxial Cells
Triaxial Cells are available for use with sample sizes from 1.4" (35mm) to 6" (150mm). 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 a choice of 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 available (stainless steel for use with hazardous materials). When ordering, specify top cap and base pedestal for desired sample size. Order porous stones separately, see page 79. Cell dimensions are: 13.75" H x 8.75" dia. (349.2 x 222.3mm); overall diameter is: 11" (279.4mm).

Cell	Height	Overall Dia.	Weight
HM-4199B	13.75	11	15 lb (7kg)
HM-4199B-4	15	11.75	28 lb (13kg)
HM-4199B-6	25.5	12.75	120 lb (54kg)

Triaxial Cells — See Table
Shipping wt. See Table

Size	Cell	Aluminum, Anodized			Stainless Steel (for Hazardous Materials)		
		Set*	Top Cap	Pedestal	Stainless Steel*	Top Cap	Pedestal
35mm	HM-4199B or HM-4199SS	HM-4199.35	HM-4199.35T	HM-4199.35B	HM-4199.35SS	HM-4199.35SST	HM-4199.35SSB
1.4"		HM-4199.14	HM-4199.14T	HM-4199.14B	HM-4199.14SS	HM-4199.14SST	HM-4199.14SSB
38mm		HM-4199.38	HM-4199.38T	HM-4199.38B	HM-4199.38SS	HM-4199.38SST	HM-4199.38SSB
1.5"		H M-4199.15	HM-4199.15T	HM-4199.15B	HM-4199.15SS	HM-4199.15SST	HM-4199.15SSB
50mm		HM-4199.50	HM-4199.50T	HM-4199.50B	HM-4199.50SS	HM-4199.50SST	HM-4199.50SSB
2.0"		HM-4199.20	HM-4199.20T	HM-4199.20B	HM-4199.20SS	HM-4199.20SST	HM-4199.20SSB
70mm		HM-4199.70	HM-4199.70T	HM-4199.70B	HM-4199.70SS	HM-4199.70SST	HM-4199.70SSB
2.8"		HM-4199.28	HM-4199.28T	HM-4199.28B	HM-4199.28SS	HM-4199.28SST	HM-4199.28SSB
100mm	HM-4199B-4 or HM-4199SS-4	HM-4199.100	HM-4199.100T	HM-4199.100B	HM-4199.100SS	HM-4199.100SST	HM-4199.100SSB
4.0"		HM-4199.40	HM-4199.40T	HM-4199.40B	HM-4199.40SS	HM-4199.40SST	HM-4199.40SSB
150mm	HM-4199B-6 or HM-4199SS-6	HM-4199.150	HM-4199.150T	HM-4199.150B	HM-4199.150SS	HM-4199.150SST	HM-4199.150SSB
6"		HM-4199.60	HM-4199.60T	HM-4199.60B	HM-4199.60SS	HM-4199.60SST	HM-4199.60SSB

*Set contains Top Cap and Base Pedestal
NOTE: Cell sizes 35mm, 1.4",38mm and 1.5" include HM-4199B.20 piston extension.

Triaxial Distribution Panels



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-2450A.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-2450A.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
Max. output pressure	150	10	1
Pressure resolution	0.1	0.01	0.001
Display	LCD		
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, which 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)



HM-4140.3F HM-4150.3F HM-4150A HM-4160.3F 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

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 88-89 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)

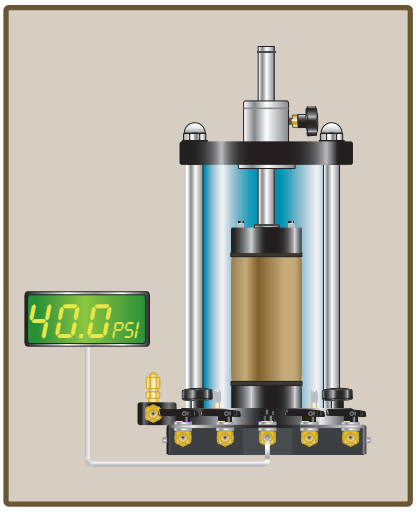
Control Panel, 2-Cell (kPa), 120/220V 50/60Hz — HM-4160M.3F
Shipping wt. 125 lb (56kg)

Auxiliary Panel, 1-Cell — HM-4150A
Shipping wt. 77 lb (34.9kg)

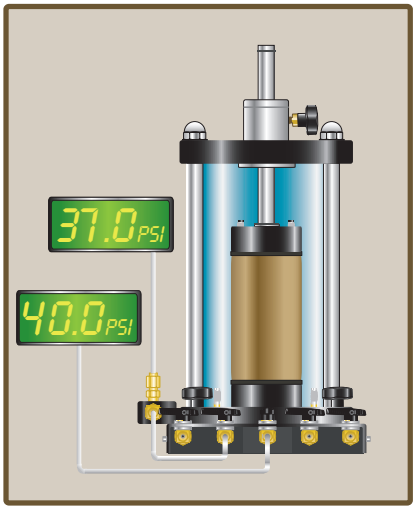
Auxiliary Panel, 2-Cell — HM-4160A
Shipping wt. 275 lb (124.7kg)

	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 0.1 cc (ml)					
Top	Not Applicable		10cc x 0.02 cc (ml)					
Base	Not Applicable		10cc x 0.02 cc (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)

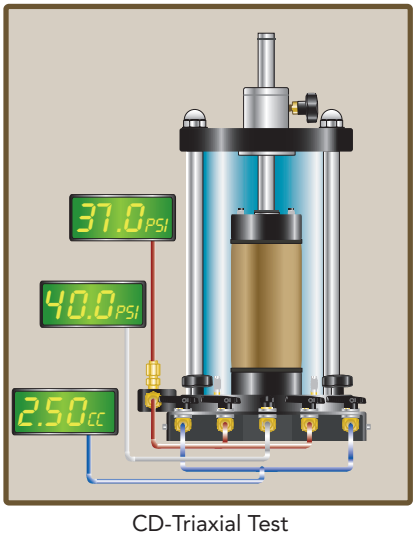
Triaxial Setups



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-2900. 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 122-123 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 124-125 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 126-127 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
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		
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
Pore Pressure/Volume Change		
Pore Pressure Transducer	HM-4170	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-4199B-4	1
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX	1
Installation Kit	HM-4167	1

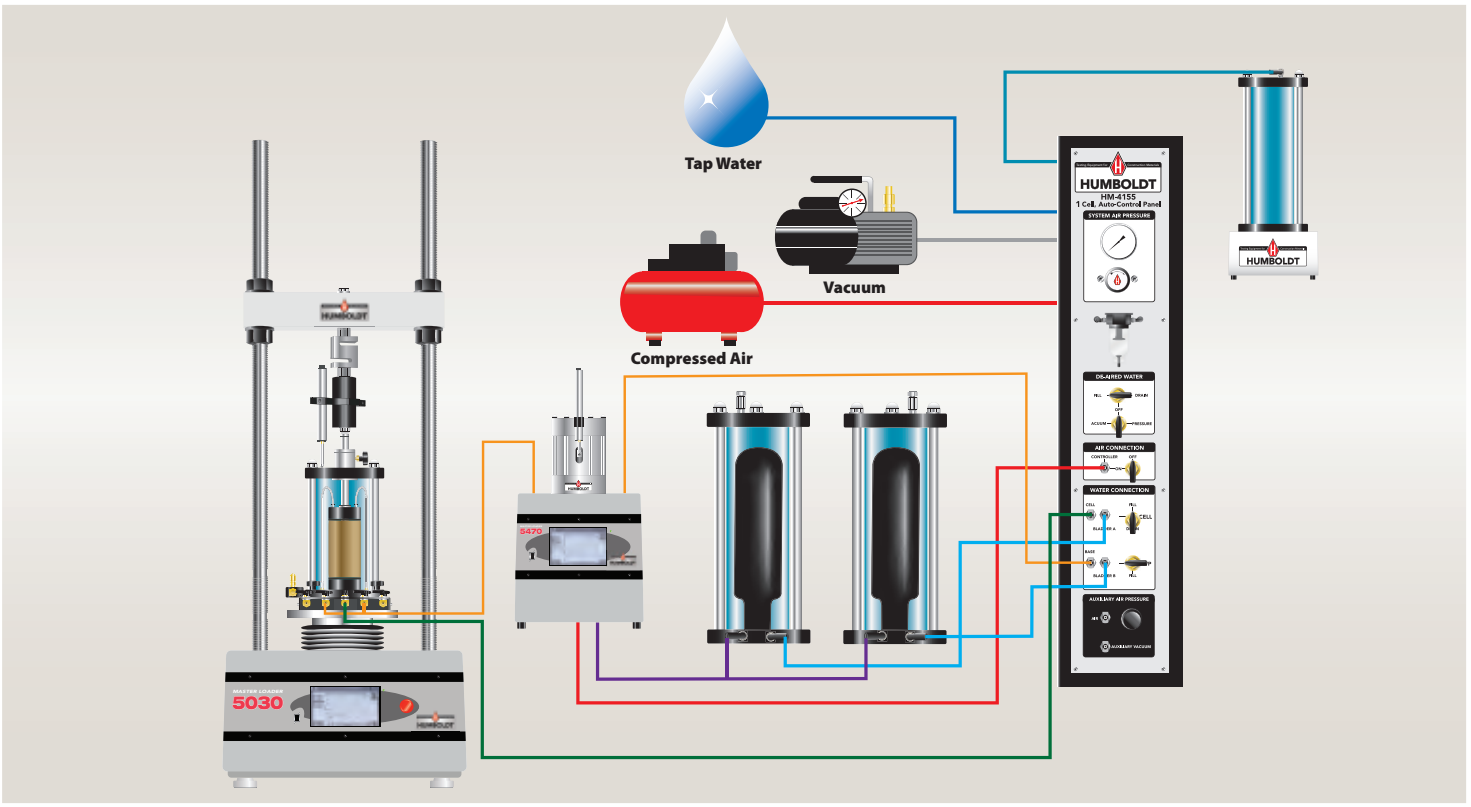
Automatic Pressure Control System, 3-Cell Setup

Components		
Load Frame (choose 1 below)		
50kN(11240 lbf) capacity	HM-5030.3F	1
15kN (3372 lbf) capacity	HM-5020.3F	1
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		
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
Pore Pressure/Volume Change		
Pore Pressure Transducer	HM-4170	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-4199B-4	3
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX	3
Installation Kit	HM-4167	1

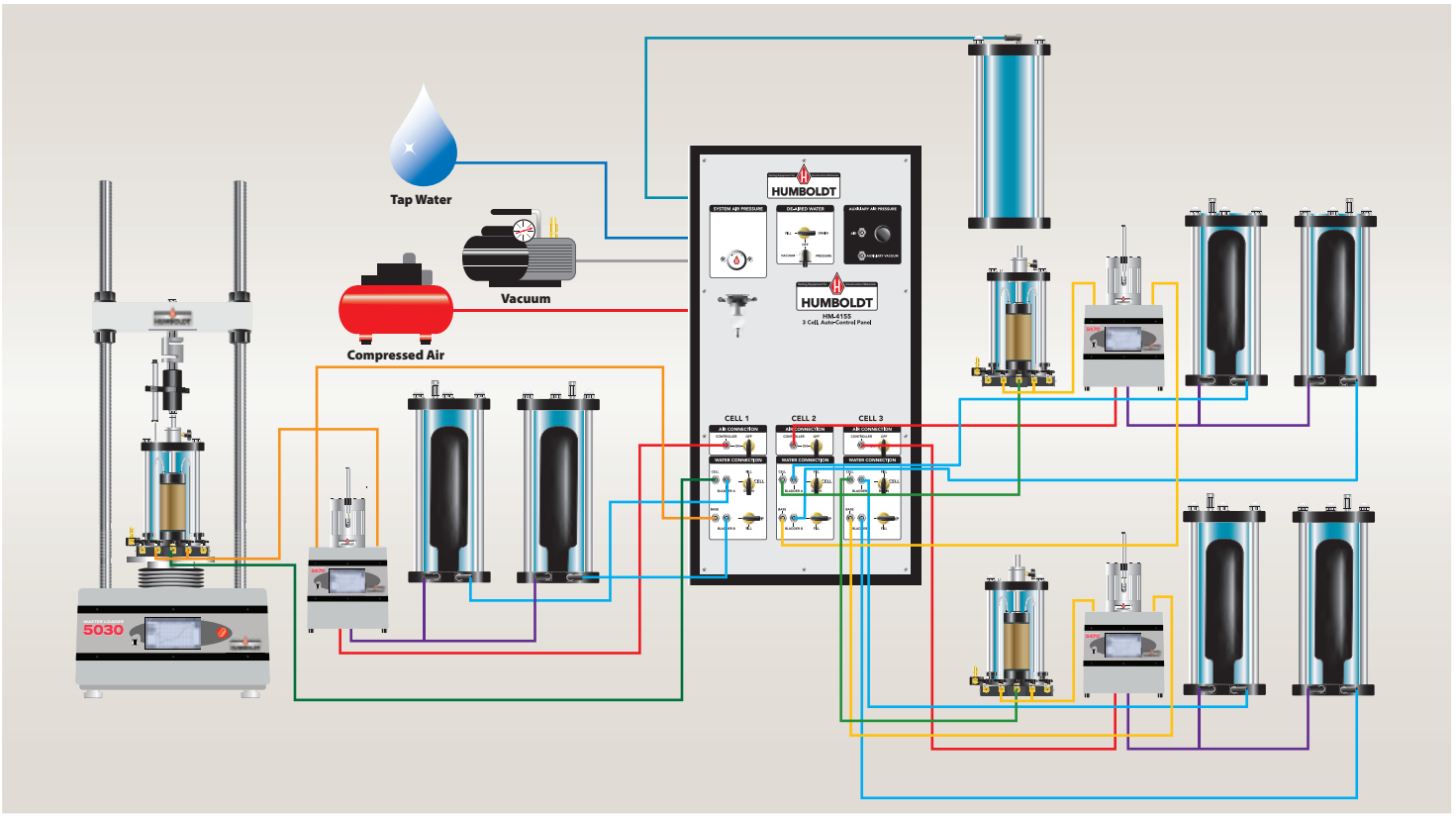
Triaxial Installation Kit
Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. See page 76 for kit contents and other individual set up items.

Standard Triaxial Sample Prep Accessories:
(See page 79 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			



Automatic Pressure Control System,1-Cell Setup



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
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-4199B-4	1
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX	1
Installation Kit	HM-4167	1

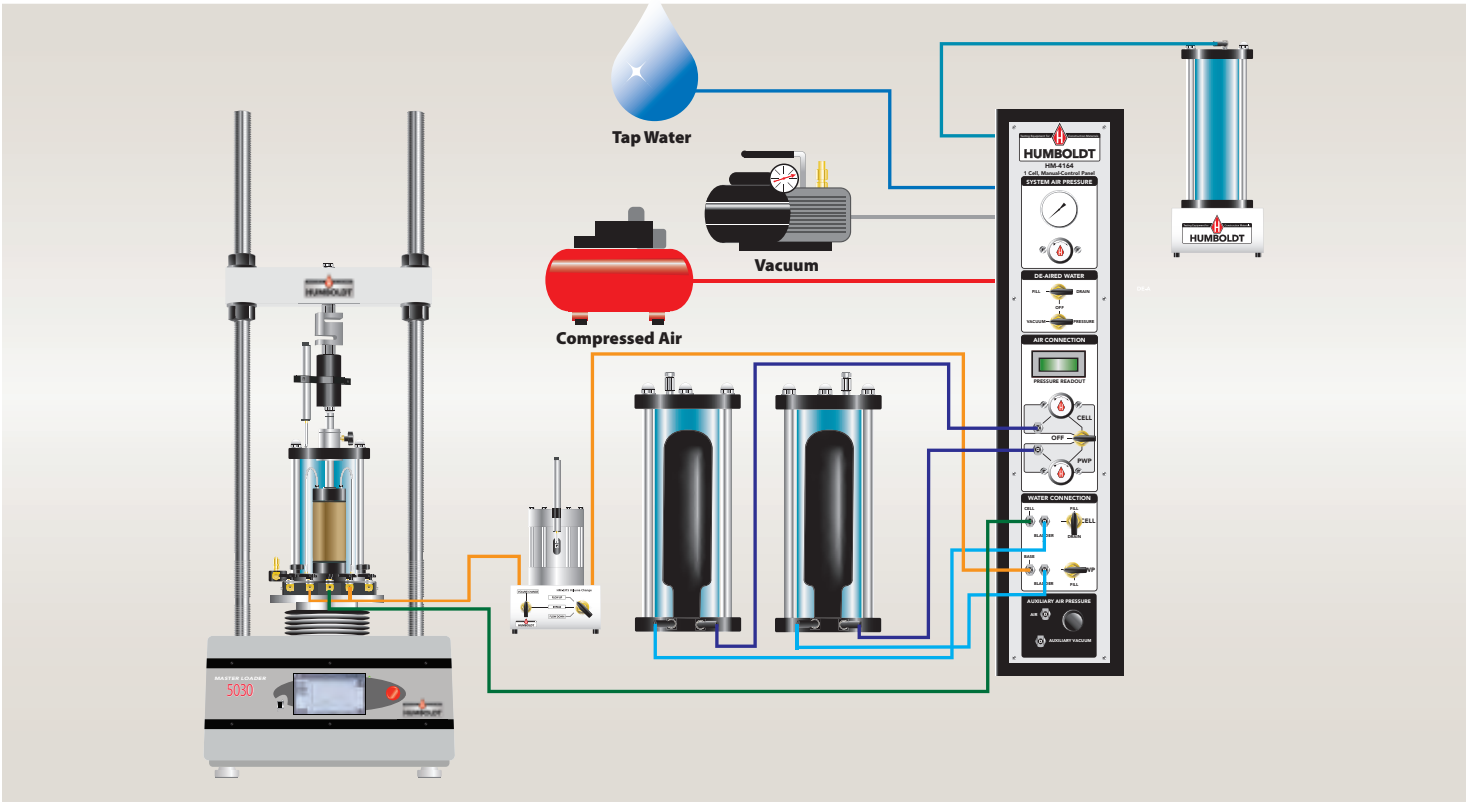
Manual Pressure Control System, 3-Cell Setup

Components		
Load Frame (choose 1 below)		
50kN (11240 lbf) capacity	HM-5030.3F	1
15kN (3372 lbf) capacity	HM-5020.3F	1
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-2325A.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-4199B-4	3
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX	3
Installation Kit	HM-4167	1

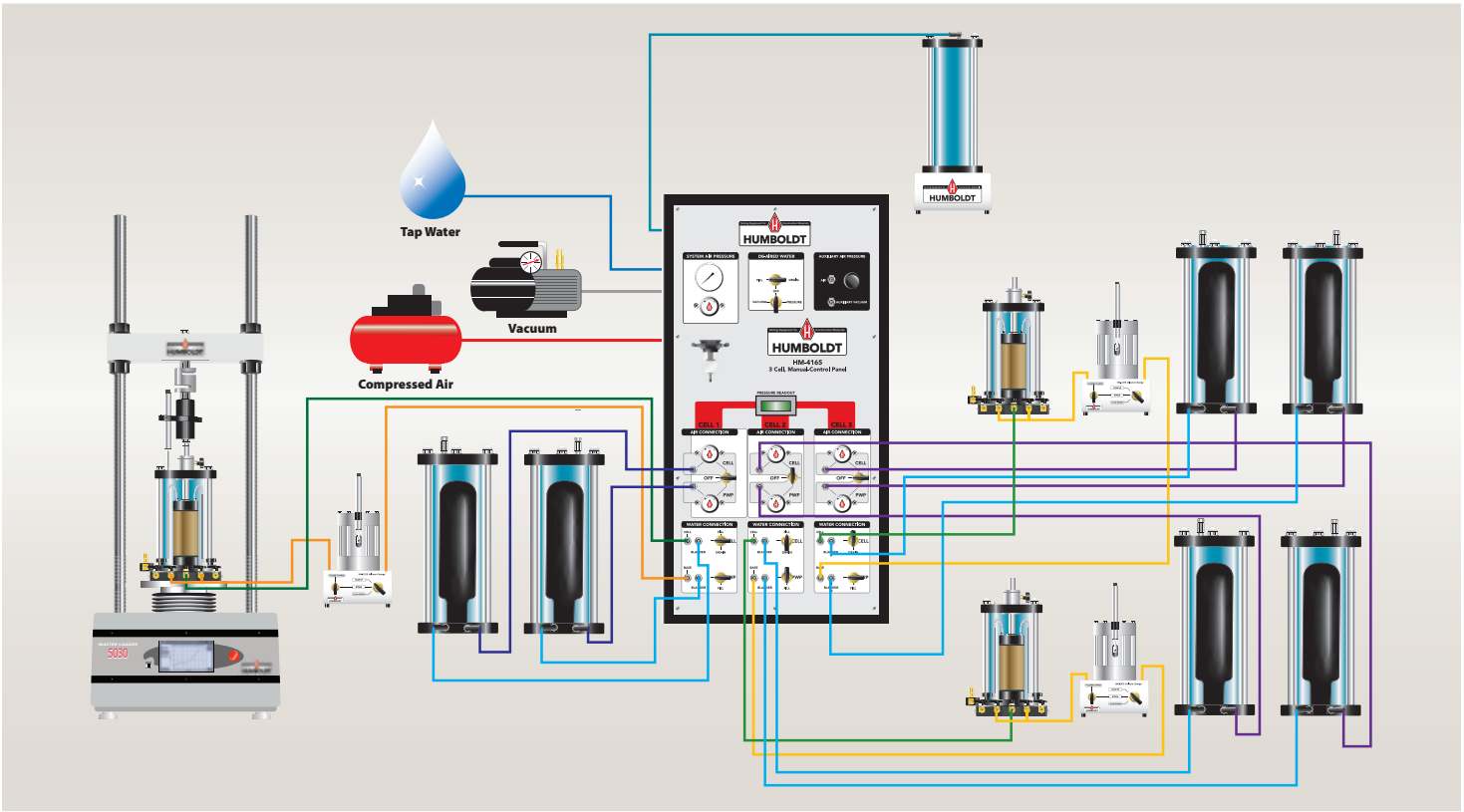
Triaxial Installation Kit
Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. See page 76 for kit contents and other individual set up items.

Standard Triaxial Sample Prep Accessories:
(See page 79 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			



Manual Pressure Control System,1-Cell Setup



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
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-4199B-4	1
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX	1
Installation Kit	HM-4167	1

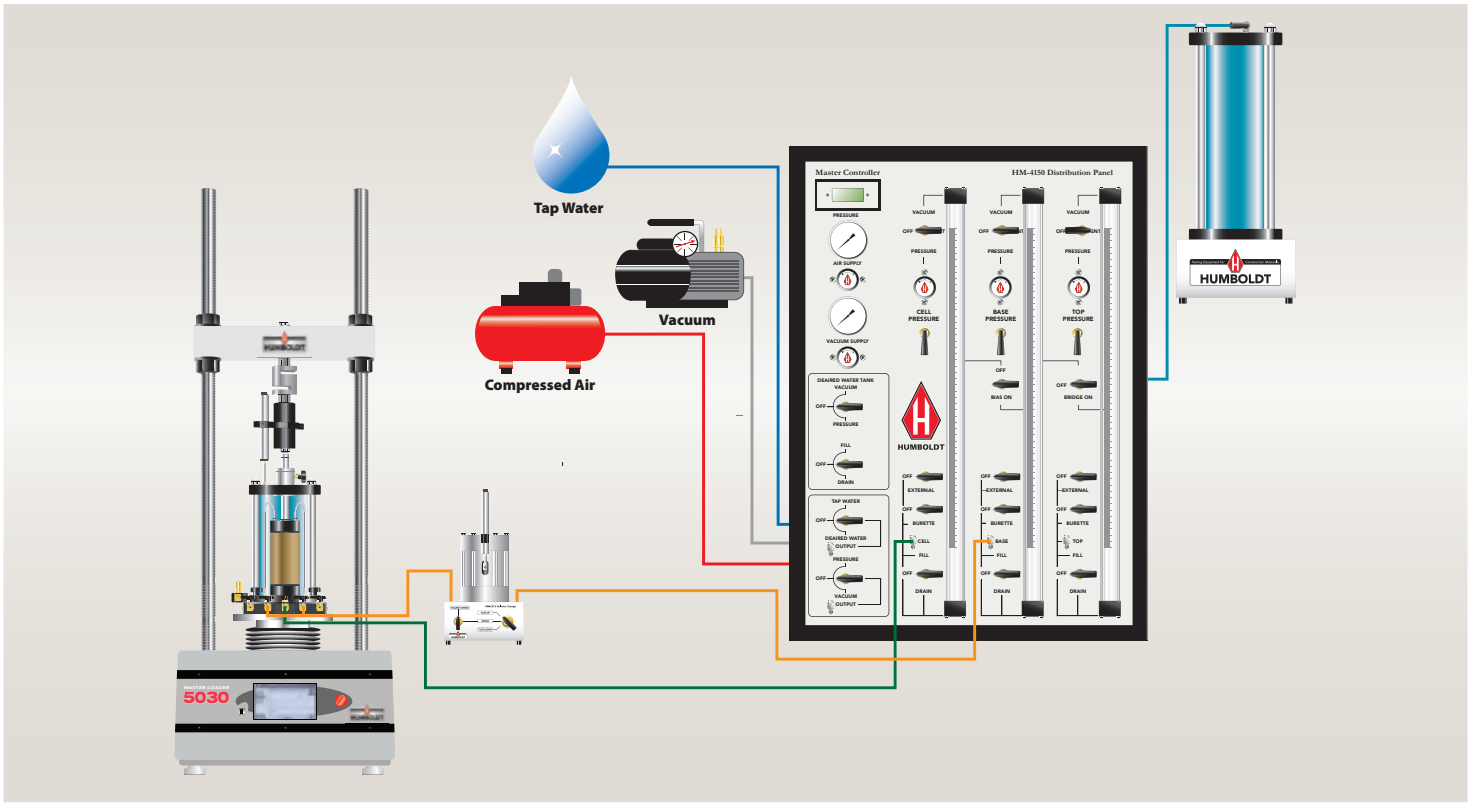
FlexPanel Pressure Control System, 3-Cell Setup

Components		
Load Frame (choose 1 below)		
50kN (11240 lbf) capacity	HM-5030.3F	1
15kN (3372 lbf) capacity	HM-5020.3F	1
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-2325A.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-4199B-4	3
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX	3
Installation Kit	HM-4167	1

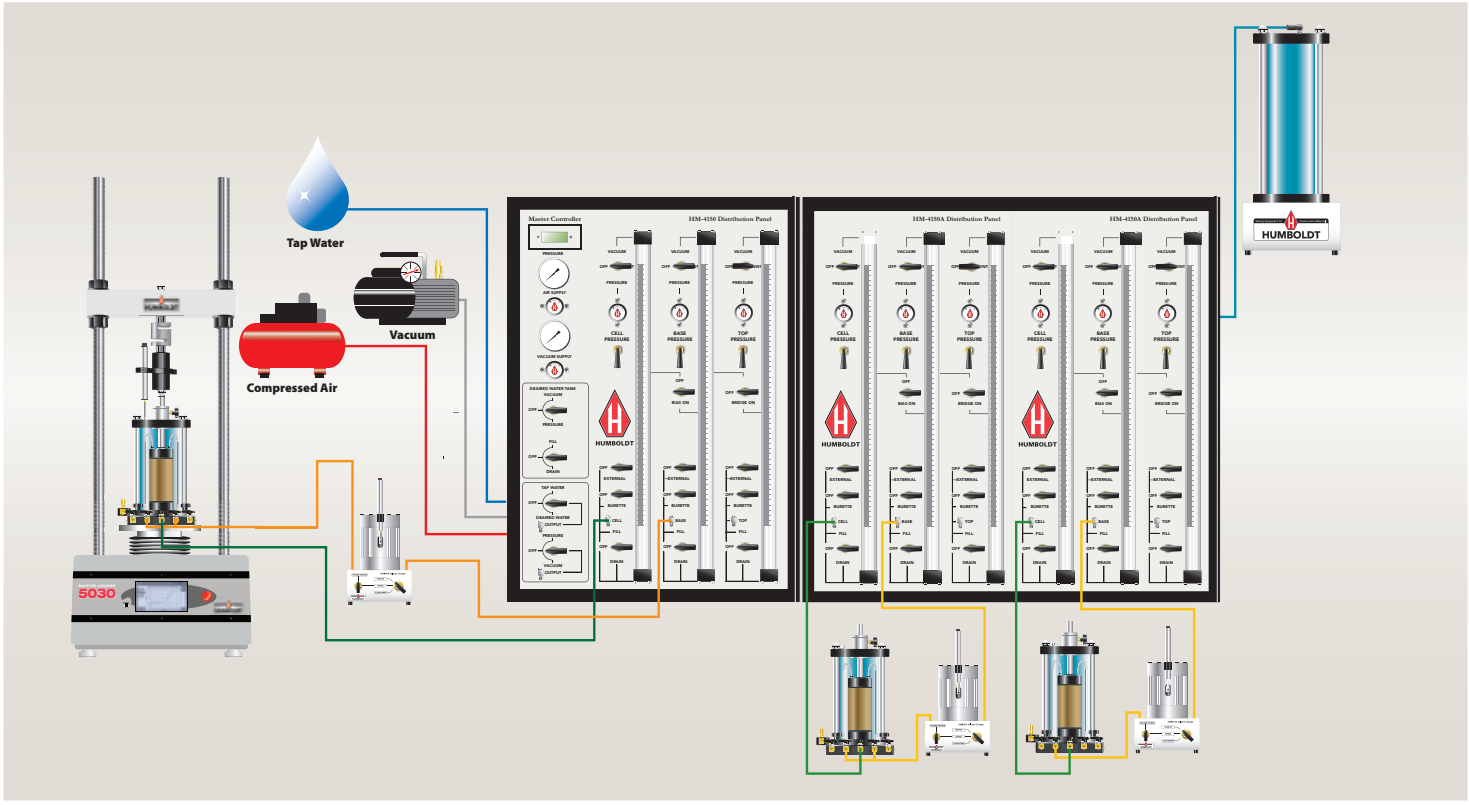
Triaxial Installation Kit
Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. See page 76 for kit contents and other individual set up items.

Standard Triaxial Sample Prep Accessories:
(See page 79 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			



FlexPanel Pressure Control System,1-Cell Setup



FlexPanel Pressure Control System, 3-Cell Setup



HM-5240.3F



HM-5250.3F



HM-2315
Shown with HM-2310 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) 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 NEXTsoftware. 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)
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)


HM-4151A


HM-4187H


HM-2310.10


HM-2310BR



HM-4187A.3F


HM-4170



HM-4221


HM-4222


HM-4223

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 130) 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 130).

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 ft^3, Female NPT inlet/outlet size is 0.25 NPTF, bowl size is 1.75 lbs, Height 11 Inches, Width 4.625", Includes one charge of desiccant

Refrigeration Dryer, 115V 60Hz 1ph 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)

Triaxial Setup Accessories



HM-4220


HM-4167


HM-4168


H-1763A


HM-4196.25


HM-4196.12


HM-003175


HM-4150.45


HM-4150.22AS


HM-4197.25


HM-4197.12


HM-4150.78


HM-003176


HM-4150.44


HM-4150.72

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 Gal50 Lt.
Noise Level	42 db/A
Max Pressure	120 PSI (8 Bar)
Operating Pressure	90-120 PSI6-8 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 Installation Kit — HM-4167
Shipping wt. 4.5 lbs (2.04kg)

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

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 Installation Kit — HM-4168
Shipping wt. 4.5 lbs (2.04kg)

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

Pressure Regulators	
Pressure regulator 2-150 psi w/ fittings	HM-4150.22AS
Positive bias regulator w/ fittings	HM-4150.23AS



HM-3818.28


HM-4173


HM-3130


HM-4198


HM-4189FS



HM-4174
HM-4174M

HM-3130.20

HM-3175

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)

Soil Sample Trimmer

Sample trimmer for cutting samples to precise diameters. The HM-3130 handles samples up to 3" and HM-3140 handles 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 and saw separately.

Soil Sample Trimmer, 1" to 3" — HM-3130
Soil Sample Trimmer, 1" to 4" — HM-3140
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-3130.10	4.0"	HM-3130.40
1.4"	HM-3130.14	35mm	HM-3130.35
1.875"	HM-3130.18	38mm	HM-3130.38
2.0"	HM-3130.20	50mm	HM-3130.50
2.5"	HM-3130.25	70mm	HM-3130.70
2.8"	HM-3130.28	100mm	HM-3130.100
3.0"	HM-3130.30		

Top Platens for Soil Trimmer — See Chart
Shipping wt. 1 lb (0.45kg)

Length Comparator

ASTM D2166, D2850, D4767, BS 1377:8

Length comparator designed to quickly and accurately measure the height of soil samples to within ±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)

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)

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)

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)

Triaxial Sample Prep



Latex Membranes, 0.012"	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-4180.14	HM-4180.15	HM-4180.20	HM-4180.28	HM-4180.40	HM-4180.60	HM-4180.14	HM-4180.15	HM-4180.20	HM-4180.28	HM-4180.40	HM-4180.60
Latex Membranes, 0.025"	HM-4180.14T	HM-4180.15T	HM-4180.20T	HM-4180.28T	HM-4180.40T	HM-4180.60T	HM-4180.14T	HM-4180.15T	HM-4180.20T	HM-4180.28T	HM-4180.40T	HM-4180.60T

Made from non-porous latex rubber. 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.

Membrane Stretcher	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-4181.14	HM-4181.15	HM-4181.20	HM-4181.28	HM-4181.40	HM-4181.60	HM-4181.14	HM-4181.15	HM-4181.20	HM-4181.28	HM-4181.40	HM-4181.60

Simple & effective method of sheathing (encasing) sample with latex membrane without creasing or damaging the sleeve.

O-Rings	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-4182.14	HM-4182.15	HM-4182.20	HM-4182.28	HM-4182.40	HM-4182.60	HM-4182.14	HM-4182.15	HM-4182.20	HM-4182.28	HM-4182.40	HM-4182.60

For sealing membranes from confining fluid and sample. Neoprene. 12/pkg.

O-Ring Placing Tool	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-4183.14	HM-4183.15	HM-4183.20	HM-4183.28	HM-4183.40	HM-4183.60	HM-4183.14	HM-4183.15	HM-4183.20	HM-4183.28	HM-4183.40	HM-4183.60

Positions rings to seal membrane with minimum disturbance to specimen.

Porous Stones	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-4184.35	HM-4184.38	HM-4184.50	HM-4184.70	HM-4184.100	HM-4184.150	HM-4184.14	HM-4184.15	HM-4184.20	HM-4184.28	HM-4184.40	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).

Membrane Tester	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-4185.14	HM-4185.15	HM-4185.20	HM-4185.28	HM-4185.40	HM-4185.60	HM-4185.14	HM-4185.15	HM-4185.20	HM-4185.28	HM-4185.40	HM-4185.60

Tester is easy to use for quick visual detection of possible flaws in membranes.

2-Part Split Miter Box	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-3847.35	HM-3847.38	HM-3847.50	HM-3847.70	HM-3847.100	HM-3847.150	HM-3847.14	HM-3847.15	HM-3847.20	HM-3847.28	HM-3847.40	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	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-3827.35	HM-3827.38	HM-3827.50	HM-3827.70	HM-3827.100	—	HM-3827.14	HM-3827.15	HM-3827.20	HM-3827.28	HM-3827.40	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	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-4186.14	HM-4186.15	HM-4186.20	HM-4186.28	HM-4186.40	HM-3847.60	HM-4186.14	HM-4186.15	HM-4186.20	HM-4186.28	HM-4186.40	HM-3847.60

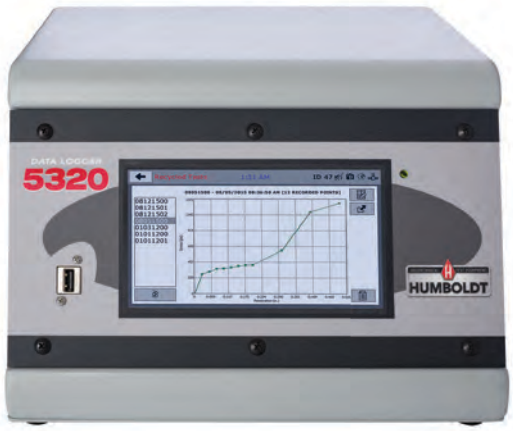
Used to trim sample ends or cut sample to a specific length.

Filter Paper	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-4189.15	HM-4189.15	HM-4189.20	HM-4189.28	HM-4189.40	HM-4189.60	HM-4189.15	HM-4189.15	HM-4189.20	HM-4189.28	HM-4189.40	HM-4189.60

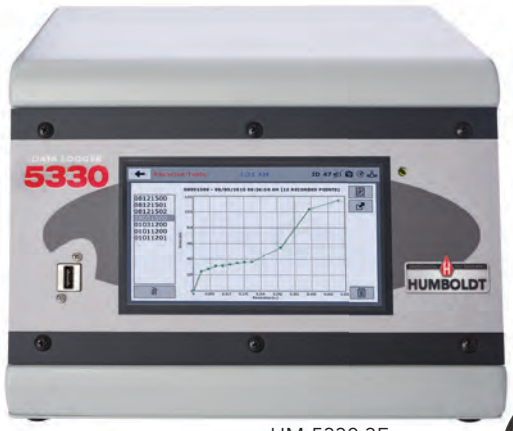
Used to prevent soil from penetrating into porous stones or into a panel. 100/pkg.

Acrylic Disk	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-4179.35	HM-4179.38	HM-4179.50	HM-4179.70	HM-4179.100	HM-4179.150	HM-4179.14	HM-4179.15	HM-4179.20	HM-4179.28	HM-4179.40	HM-4179.60

Acrylic disk used in UU triaxial tests.



HM-5320.3F



HM-5330.3F





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 speed	up to 50 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

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, calibration 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.

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.

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)


HM-2300.020

HM-2300.100


HM-2300.020S


HM-2300.020P shown mounted on crossbar with LSCT and ram


HM-2003E


H-4178.2

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)

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 triaxial cell. Positioning the load cell within the triaxial cell eliminates the possible drag effect introduced by using a plunger between the sample and an externally-mounted load

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, 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)

Load Cells are wired for use with Humboldt Equipment. Please contact us when needing wiring for other manufacturers' equipment.

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:	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, 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, Swivel Top	HM-2003E

Shipping wt. 5.2 lb (2.35kg)

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)



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 ± 0.1% of full scale deflection
- Hysteresis-compensated with linearity better than ± 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 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 used with CBR piston.

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 Strain Transducer Bracket
Bracket used to mount HM-2305 LSCTs.

Linear Strain Transducer Bracket HM-2305BRT
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 ±.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
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.

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)

Data Acquisition


H-4454. 050D

H-4454. 050


HM-4470.10


H-4158.1


H-4665.25CC


H-4470


H-4466.30
H-4466.15
H-4466.10

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)

Digital Indicators

Switchable inch/metric digital indicator is accurate to ±.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)

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-4461A, H-4466 and H-4465.08. 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)



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)


HUMBOLDT
5070
HUMBOLDT
HUMBOLDT
HUMBOLDT

Concrete



Air Meters 140-143
Beam Testing 151
Compression Testing 162-171
Consistency 147
Corrosion 178-180
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Cylinder Capping 160-161
Cylinder Molds 153
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Testing Equipment For Construction Materials

HUMBOLDT



H-2784


H-2784.500


H-2783

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 10 different 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 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.

Humboldt Super Air Meter **H-2784**
Ship wt. 4lbs. (15.9kg)

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. 4lbs. (15.9kg)

Humboldt Concrete Air Meter

ASTM C231, AASHTO T152

The H-2783 air meter features the Humboldt, all-brass super pump, the most reliable and highest quality pump available. The meter's easy-to-use, 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. A large, easy-to-read, 4-inch diameter, direct percentage gauge with calibration adjustments is accurate to the nearest 0.1%. The bucket features cast handles, which improve usability, especially when using bucket 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.

Humboldt Concrete Air Meter **H-2783**
Ship wt. 3lbs. (15.9kg)


H-2789


H-2793


H-2788

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. 3 lb (1.3kg)


H-2786C


H-2786


H-2756


H-2755


H-2786P

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)

Air Meter Replacement Accessories

Item	Part No.
Calibration Vessel, plastic	H-2783.30
Calibration Vessel, metal	H-2785.31
Calibration Tube (outside)	H-2785.32
Calibration Tube (inside)	H-2785.33
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
Plastic Case, Horizontal	H-2783.62H
Wooden Case, Press-Ur-Meter	H-2785.38
Plastic Case, Press-Ur-Meter, Horizontal	H-2785.38HP

Press-Ur-Meter Concrete Air Meter
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. The kit includes a wood or 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 Concrete Air Meter — H-2786P
Press-Ur-Meter with vertical wood case — H-2786
Ship wt. 30lbs. (15.9kg)


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)

Chace Concrete Air Indicator Kit
AASHTO T199

(Isopropyl-Alcohol Method) Complete kit for measuring air content of fresh concrete includes H-2755 air indicator, instructions, cleaning brush and plastic squeeze-type bottle for alcohol in plastic storage box. Kit does not replace conventional air meters.

Chace Concrete Air Indicator Kit — H-2756
Ship wt. 1.4lbs. (1.8kg)

Chace Concrete Air Indicator
AASHTO T199

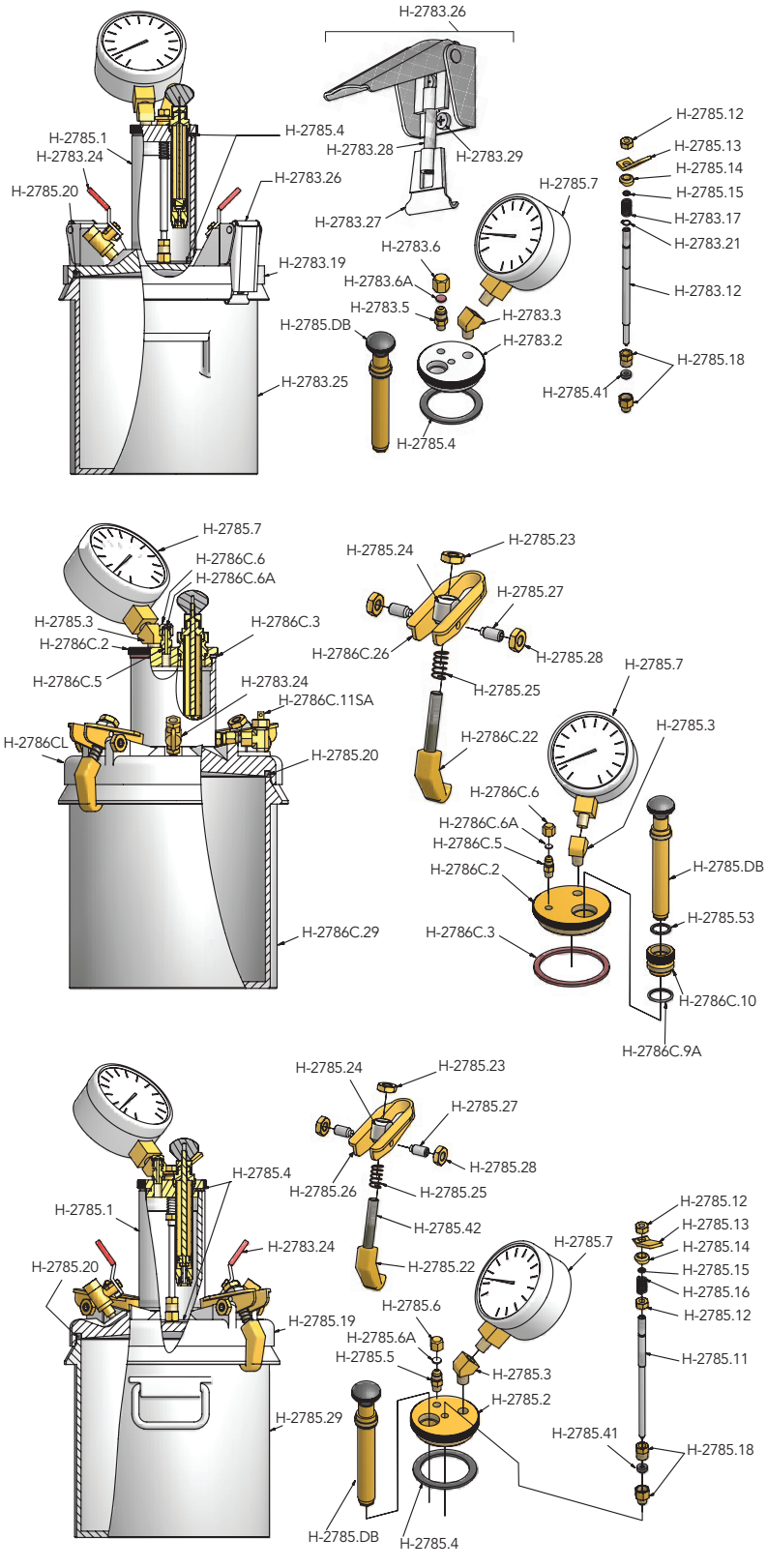
For quick field checks for air content of fresh concrete in about three minutes, pocket-sized unit air meter is furnished with instructions and correlation chart. Unit does not replace conventional air meters. Overall dimensions: 6.25 x 1.125" dia. (159 x 29mm).

Chace Concrete Air Indicator — H-2755
Ship wt. 0.25lbs. (.45kg)

Chace Air Indicator Glass Filter Tube Only
AASHTO T199

Chace Glass Filter Tube only — H-2755.2
Ship wt. 0.2lbs. (.45kg)

Air Meter Replacement Parts



Humboldt provides Repair and calibration services for air meters
Call: 1.800.544.7220

H-2783 Air Meter Replacement Items

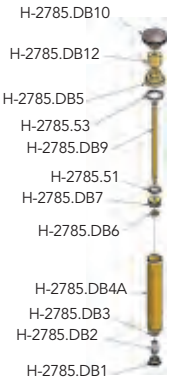
Part No.	Description	Part No.	Description
H-2785.1	Pressure chamber	H-2785.18	Needle valve seat assembly
H-2783.2	Pressure chamber cap	H-2783.19	Cover
H-2783.3	Pressure chamber elbow	H-2785.20	Cover O-ring
H-2785.4	Pressure chamber gasket	H-2783.21	Needle valve spring retainer
H-2783.5	Air-release stem	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-2785.1	Pressure chamber	H-2785.20	Cover O-ring
H-2783.2	Pressure chamber cap	H-2783.24	Cover Petcock
H-2783.3	Pressure chamber elbow	H-2785.22	Clamp with stud
H-2785.4	Pressure chamber gasket	H-2785.23	Clamp nut
H-2783.5	Air-release stem	H-2785.24	Clamp trunnion
H-2783.6	Air-release cap	H-2785.25	Clamp spring
H-2783.6A	Release cap gasket	H-2785.26	Clamp toggle
H-2785.7	Air meter gauge	H-2785.27	Clamp toggle set screw
H-2783.12	Needle valve stem	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-2783.17	Needle valve spring	H-2785.DB	Super Pump Assembly
H-2785.18	Needle valve seat assy.	H-2785.55	Gasket replacement kit
H-2785.19	Cover		

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-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.DB9	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



H-2795P



H-2796A



H-3650



ASTM Unit Weight Measures

Non-ASTM Unit Weight Measures

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)

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)

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.

Strike-Off Plates — see chart

Ship wt. see chart

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)

NOTE: Use 2" larger plate than the diameter of the unit weight measure.

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

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 Unit Weight Measures — see chart

Ship wt. see chart

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

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 Unit Weight Measures — see chart

Ship wt. see chart

See Pages 297 to 298 for Portable Scales for use in Unit Weight measure





H-3635



H-3637 and H-3635 Slump Cone Sets feature Easy-Carry Configuration



H-3645



H-3655



H-3637



H-3656



H-3643

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**
Ship wt. 34.5lbs. (18kg)

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)


H-3640
H-3640M


H-3640P


H-3650
H-3651


H-3636


H-3725


H-4901


H-3639.8


H-3800


H-3731


H-3638


H-3760


H-3639.20

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, ASTM C138M, ASTM C143, ASTM C143M, ASTM C173, ASTM C173M, ASTM C31, ASTM C31M, AASHTO M 205, AASHTO T 119, AASHTO T 152, 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)

Initial Set


H-4134


H-4134F


H-4132


HC-4972


H-4133

H-4133N

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 500psi.

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)

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 RS-232 interface.

Cementometer Moisture Meter HC-4972
Ship wt. 7lbs. (3.1kg)

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 16mm^2). 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.

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



H-3647



H-3648



H-3649



H-2950.RCA



H-4137

Vebe Consistometer

EN 12350-3; BS1881:104; UNI 9419

The Vebe Consitometer 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

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

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)

Mold Assembly for Vibrating Table Apparatus

ASTM C1176, C470

Test mold assembly for use with the H-3649 cylinder mold vibrating table apparatus. Test mold is 6" x 12"and can be locked into place on the vibrating table.

Test Mold Assembly	H-2950.RCA

Ship wt. 1.15lbs. (9.1kg)

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, 16mm^2).

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

Maturity



H-2682



HG-4040



Installation Example of HG-4040

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, and**
- 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 with120V 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

Smart Rock, 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 formwork, 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 onsite 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 onsite.

SmartRock can be used to monitor the temperature of fresh and hardened concrete. This can provide information on:

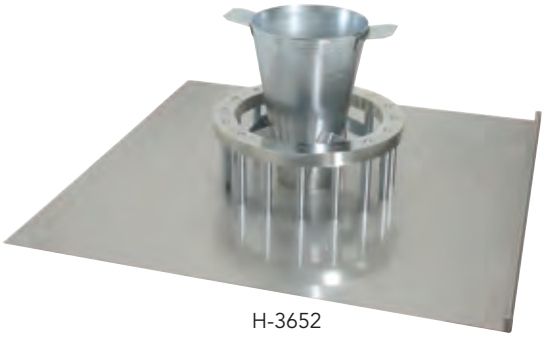
- Hardening of concrete (formwork removal timing)
- Optimization of curing conditions
- Heating and cooling processes
- Quality control in the field
- Concrete maturity
- Estimation of strength (ASTM C1074)
- Concrete mix design optimization

Features and Benefits

- Wireless Bluetooth technology
- Ruggedized and waterproof design
- Real-time data (e.g. temperature, strength, maturity, max-min temperature) display
- Continuous measurement and recording of temperature
- Easy activation through tying the wires together (this can be used onsite to hold the sensor around rebar)
- Extended temperature sensor for deep elements and mass concrete
- Maturity calibration curve database
- Long battery life (about 4 months in room temperature)
- Operation software (Android and iOS apps) for smartphone and tablet
- Easy data sharing
- Extended cable for temperature measurement, within 45 cm (18") from the concrete surface
- Measurement and calculation in both metric and imperial units

Smart Rock Maturity Sensor, 18"	HG-4040
Smart Rock Maturity Sensor, 10 ft.	HG-4040.10
Smart Rock Maturity Sensor, 20 ft.	HG-4040.20

Ship wt. 1lbs. (0.4kg)



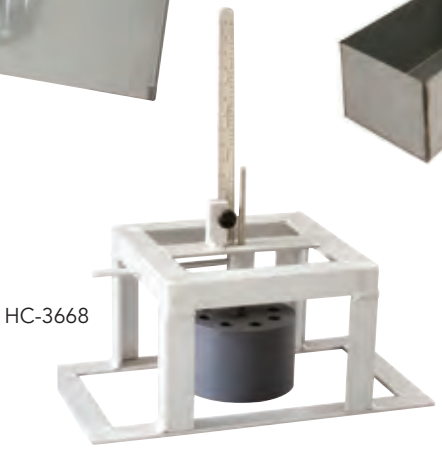
H-3652



H-3658



HC-3666



HC-3668



HC-3665

J-Ring Test Set

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 engraved positioning rings.

J-Ring Test Set, Smooth Rods	H-3652
J-Ring Test Set, Rebar Rods	H-3652R
	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, Engraved, Stainless	H-3653
Slump Cone	H-3640

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)

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)

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)


H-3847A


H-3849A


H-3849A.G



H-3846A

Utility Mixer with Steel Drum

ASTM C192

Drum mixing capacity is 3 cu. ft. (85 Liters). Drum size: 5.5 cu. ft. (156 Liters). Compact, sturdy, lightweight concrete mixer for concrete, mortar, etc., can be bolted to floor or skid for permanent installation. Convenient drum lock allows the operator to secure the drum in one of five positions. Welded steel frame and heavy bushings for a long dependable life. Precision case, one-piece ring gear provides years of service. Quad-mixing system utilizes a four-piece, replaceable paddle and blade combination that creates four different mixing patterns for a more consistent mix. Overall dimensions (mixer only): 41" x 26" x 55" (1041 x 660 x 1397mm) **See chart for tow kit options.**

Utility Mixer with Steel Drum	
1/2HP Electric, 110V 60Hz	H-3847A
1/2HP Electric, 220V 60Hz	H-3847A.2F
1/2HP Electric, 220V 50Hz	H-3847A.5F
3.5HP Gasoline Motor	H-3847A.G
	Ship wt. 366lbs. (166kg)

Utility Mixer with Poly Drum

ASTM C192

Drum mixing capacity is 3 cu. ft. (85 Liters). Drum size: 5.5 cu. ft. (156 Liters). Compact, sturdy, lightweight concrete mixer for concrete, mortar, etc., can be bolted to floor or skid for permanent installation. Convenient drum lock allows the operator to secure the drum in one of five positions. Welded steel frame and heavy bushings for a long dependable life. Precision case, one-piece ring gear provides years of service. Non-stick, polyethylene drum provides easy clean-up and is replaceable. Sturdy, in-mold mixing blades. Overall dimensions: 41" x 26" x 55" (1041 x 660 x 1397mm).**See chart for tow kit options.**

Utility Mixer with Poly Drum	
1/2HP Electric, 110V 60Hz	H-3849A
1/2HP Electric, 220V 60Hz	H-3849A.2F
1/2HP Electric, 220V 50Hz	H-3849A.5F
3.5HP Gasoline Motor	H-3849A.G
	Ship wt. 346lbs. (156kg)

Poly Drum Replacement

3 cu. ft. replacement liner for H-3849 mixer.

Poly Drum Replacement	H-3849PL
	Ship wt. 29lbs. (13.1kg)

Lightweight Wheelbarrow Mixer

ASTM C192

Drum mixing capacity is 3 cu. ft. (85 Liters). Lightweight, portable mixer only weighs 125 lbs. High-torque, 1/2 HP 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
1/2HP Electric, 220V 60Hz	H-3846A.2F
1/2HP Electric, 220V 50Hz	H-3846A.5F
	Ship wt. 121lbs. (54kg)

Poly Drum Cover

Snug-fitting drum cover for H-3849 mixer.

Poly Drum Cover	H-3849PC
	Ship wt. 29lbs. (13.1kg)


Hand Tow Kit


H-3849PC


H-3849PL


High-Speed Tow Kit

H-3847 Tow Kit Options	Hand Tow Kit	High-Speed Tow Kit
Mixer with Hand Tow Kit with 2.75" x 10" Semi-Pneumatic Tires	H-3847AHT	H-3847AHS
	H-3847AHT.2F	H-3847AHS.2F
	H-3847AHT.5F	H-3847AHS.5F
	H-3847AHT.G	H-3847AHS.G
H-3849 Tow Kit Options	**Hand Tow Kit**	**High-Speed Tow Kit**
Mixer with High-Speed Tow Kit with 4.8" x 12" Pneumatic Tires	H-3849AHT	H-3849AHS
	H-3849AHT.2F	H-3849AHS.2F
	H-3849AHT.5F	H-3849AHS.5F
	H-3849AHT.G	H-3849AHS.G



H-3030A



H-3030CL

Concrete Beam Tester

Self-contained, shock-proof portable concrete beam tester accurately and easily determines flexural strengths of 6" x 6" cross-section test beams. Hydraulically driven unit uses center-point loading method with continuous readings to the break and retains maximum reading to eliminate lost data. Gauge resets to zero for repeat tests. Lightweight aluminum unit has dual registration of modulus of 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.

The unit is not in full compliance with ASTM C293 since it uses a hand pump, but numerous government agencies including Illinois DOT have found its results acceptable for their purposes.

Concrete Beam Tester

16", Single-Point	H-3030A
18", Single-Point	H-3032A
18", Third-Point	H-3033A

Ship wt. 87lbs. (39.4kg)

Concrete Beam Tester w/ Micro-pump

ASTM C293,C78; AASHTO T177

By adding the Micro-pump to our Beam Tester allows the user to put a continuous load pressure to the beam, which complies 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.

Concrete Beam Tester w/ Micro-pump

16", Single-Point	H-3030CL
18", Single-Point	H-3032CL
18", Three-Point	H-3033CL

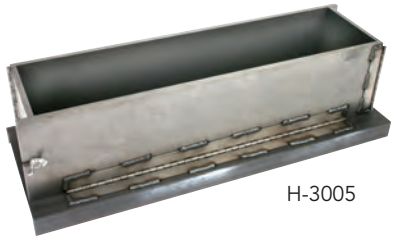
Ship wt. 90lbs. (40.8kg)

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



H-3005

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



H-3009

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

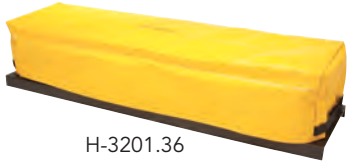


H-3007

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



H-3201.36

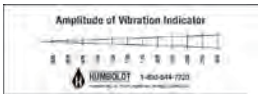
Cube Molds and Mold Strippers


H-3755


H-2999A


H-3041S


H-3041SMA



H-3754A


H-3753


H-2827


H-2827MP


H-2905.1 H-3650


H-3045 H-3046

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
Ship wt. 27lbs. (12kg)

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)

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)

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)

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. 90lbs. (41kg)

Replacement Blade for Strippers H-3046.1
Ship wt. 1lbs. (1.9kg)


H-3046.1

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



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



TempGuard Insulated Cylinder Molds

C31, C39, C192, C470, C496; AASHTO T22, T23, T126, T198, M205

TempGuard (patent pending) cylinder molds are a convenient and easy-to-use insulated concrete cylinder mold. TempGuard cylinders improve field curing year-round and save you time and money. Because TempGuard keeps the concrete test cylinder at a more consistent and constant temperature, which better matches the project concrete, you get a more realistic representation of the project concrete's actual properties and they are easy to strip. Available in cartons of (36) 4" x 8" cylinders with lids.

TempGuard Cylinder Molds 18 lbs (8.2kg) H-3042



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 Testing


H-2977S.6
H-2977S.12


H-2977C


H-2970.1


H-2970A


HC-2963


HC-2965
HC-2966

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)

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)

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)

Perfa-Cure Curing Box, Heating & Cooling

ASTM C31; AASHTO T23

Lightweight Perfa-Cure Curing Box provides storage and protection for concrete test specimens on the job site to meet required initial curing conditions. Users plug in the unit and set the thermostat to the desired temperature. This model provides both heating and cooling functions. The heating panel uses a safe, aluminum base to radiate heat. The cooling feature uses a blower fan to circulate cool air inside the box and automatically switch from heating to cooling based on conditions. The green indicator light illuminates when the unit is in operation. Compliant with current ASTM C31 and AASHTO T23 specifications for initial curing of concrete test specimens in the field. Robust carrying handles on each end make transporting empty units easy. The Heater Panel and AC Cooling Units on the inner lid are easily replaceable. A max-min registering thermometer is mounted inside the box to monitor curing conditions. Accommodates (10) 6" x 12" (152 x 305mm) or (32) 4" x 8" (102 x 203mm) concrete cylinders

Perfa-Cure Box, Heating & Cooling **HC-2965**
Perfa-Cure Box, Heating Only **HC-2966**
Ship wt. 40lbs. (18kg)

Perfa-Cure Mini Curing Box, Heat Only

ASTM C31; AASHTO T23

Small, Lightweight Perfa-Cure Curing Box provides storage and protection for concrete test specimens on the jobsite to meet required initial curing conditions. Provides heat only. Accommodates (4) 6" x 12" (152 x 305mm) or (10) 4" x 8" (102 x 203mm) concrete cylinders

Perfa-Cure Minni, Heat Only **HC-2963**
Ship wt. 30lbs. (13.6kg)


H-2968


H-2969.6


H-2985


H-2986A


H-2988A


H-2735

Concrete Curing Box, Deluxe

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. 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, Deluxe, 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)

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)

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)

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)

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


H-2734
H-2735.5F


H-2737


H-2738


H-2914B

Fogging Fan for Humidity Control

Designed specifically for small spaces that need a dependable unit in environments up to 100% RH (relative humidity). Well suited for areas between 16 to 30 feet in length, (and can be used in smaller areas down to 12 foot) this model has a maximum fogging output of 5 GPH and can propel fog up to 20 feet. The H-2734 utilizes a two-blade fan, making it about 30% quieter than larger units. The nozzle-free fans can atomize ordinary water supplies into a very fine mist-like fog. Utilizing high-speed centrifugal force and powerful air flow, these units can propel a misty-fog stream up to 20 feet away.

The powerful H-2734 is engineered to withstand humid conditions as high as 100% RH and above, and corrosive environments containing salts, lime, ammonia and other acidic compounds. Units are constructed of impenetrable components like Nema 4 connections, all 304 SST hardware, UV stabilized polyethylene plastics, PVC dip-coated steel, and sulfuric anodized aluminum. Standard configuration includes a 1/2 HP Baldor wash-down-duty motor that is specifically designed for wet, corrosive environments, 115/230V, 1ph, 60Hz.

Included with unit is an: adjustable-angle hanging bracket; visual flowmeter panel with strainer, 12 ft. SJO indoor/outdoor, heavy-duty power cord; 20 ft. Poly-flo water line tubing; 16 ft. water drainage line; 100% stainless steel hardware, and easy-to-follow operator's manual.

Fogging Fan, 115V, 50/60Hz — H-2734
Ship wt. 60lbs. (27kg)

Fogging Fan for Humidity Control

Similar to the H-2734 Fan above, but utilizes a 1/3 HP Baldor wash-down-duty motor that is specifically designed for wet, corrosive environments.

Fogging Fan, 240V, 50/60Hz — H-2735.5F
Ship wt. 48lbs. (22kg)

Accessories for H-2734 & H-2735.5F

Description	Part No.
Floor Stand (Econo)	H-2734.1
Ceiling Support	H-2734.2
Wall Mount	H-2734.3
24-Hour Timer	H-2734.4
Humidistat	H-2734.5

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.

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)

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.

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

HumiDisk Humidifier

HumiDisk is a small, sturdy and easy-to-install humidifier. It operates on a standard water supply line and is based on a simple and effective principle. By exploiting the centrifugal force produced by a spinning disk, the humidifier atomizes the water into very fine droplets that can easily be absorbed by the surrounding air, humidifying and cooling at the same time. The energy consumption is just 34 W/(kg/h).

HumiDisk is easy to install and requires minimum maintenance. Operating conditions are 34 to 95°F (1.1 to 35°C), 0–100% RH non-condensing. The humidifier can be fitted with optional heaters that are activated automatically at temperatures around 0°C, allowing operation down to -2°C.

The unit is supplied with assembly brackets for easy wall mounting, or can be hung from the ceiling using metal chains.

HumiDisk, 120 60Hz — H-2914B
HumiDisk, 220V 50/60Hz — H-2914B.4F
Ship wt. 8lbs. (3.6kg)


H-2736


H-2732


H-2736.SW


H-2743


H-2736.3


H-2736.2


H-2736.1


H-2736.4


H-2743.1

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)

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

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 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. 0.5bs. (.22kg)

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)

Thermo Recorder, Temperature/RH Logger

The thermo recorder is a data logger capable of measuring, displaying and recording temperature and humidity. It features one temperature channel and one humidity channel. The measuring accuracy of ±2.5%RH enables more precise measurements and allows for measurement within a wider range. The data recorded into the unit can then be downloaded quickly via USB communication cable to your computer whereby with the exclusive software you can easily process the data into graphs, tables, save to files and/or print it out to help you analyze the data collected. Humidity measuring range: 0 to 99%RH. The H-2743 with the sensor included in this package can simultaneously measure and record temperature in a range of -30 to 80°C and humidity in a range of 0 to 99% RH. Data recording capacity: 8,000 readings × 2 channels. One channel can record and hold up to 8,000 measurement readings. At the longest recording interval of 60 minutes, recording can continue consecutively for one year. Low energy consumption design gives you ten months of continuous operation with only one AA alkaline battery. This enables measuring and recording over long periods of time.

Thermo Recorder, Temp./RH Logger H-2743
Ship wt. 1l.3bs. (.58kg)

Extension Cable for Thermo Logger

3 ft. cable for use in extending distance between logger and sensor

Extension Cable for Thermo Logger H-2743.1
Ship wt. 0.5bs. (.22kg)


HC-2980




HC-2971


HC-2972

Specimen Grinding Machine

ASTM standards 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 by proper locking stirrups. See chart for specimen types and sizes.

The revolving abrasive head is radially and alternatively 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 in 0.05mm graduations by using the top handwheel. The machine is made from rugged plate and is supplied complete with: control panel; coolant/decantation tank for water and emulsifying oil; motor pump; set of abrasive sectors; safety chip guard that automatically stops the machine if it is removed.

Specimen Grinder, 120V, 60Hz HC-2980
Specimen Grinder, 240V, 60Hz HC-2980.2F
Cylinder End Grinder, 240V, 50Hz HC-2980.5F

Ship wt. 904lbs. (410kg)

NOTE: Must separately purchase the appropriate Locking Stirrups or Fast Locking Device for application to be used. Not included with Grinder.

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, 100, 150, 4" x 8"and 6" x 12". Complete with distance piece 60mm high. **Note: must purchase HC-2980.3 for proper operation.**

Locking Stirrups, Cylinders HC-2980.2

Ship wt. 25 lb (11.3kg)

HC-2975 Specifications	
Specimen Size	6" x 12" (152 x 305mm) cylinder 4" x 8" (102 x 203mm)cylinder 3" x 6" (75 x 150mm) cylinder 6" Cubes 100mm Cube 150mm Cube 200mm Cube 390 x 250mm Block
Table Dims.	30.5" x 11.0" (775 x 280mm)
Head Stroke	8.5" (215mm)
Wheel Dia.	13" (330mm)
Wheel Speed	1400rpm
Power Supply	400V 50Hz 3ph 4500W
Dimensions	48" x 42.5" x 68" (W x D x H) (1220 x 1080 x 1730mm)

Locking Stirrups, Cubes

For use with cube specimens, 100, 150 and 200mm. Complete with distance piece 60mm high.

Locking Stirrups, Cubes HC-2980.3

Ship wt. 25 lb (11.3kg)

Locking Stirrups, Block

For use with block specimens 390 x 250mm.

Locking Stirrups, Block HC-2980.4

Ship wt. 25 lb (11.3kg)

Abrasive Grinding Sections

Set of 8 abrasive grinding sections provide excellent grinding capabilities and long life.

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)

Masonry Saw

Saw for use in cutting concrete and mortar cylinders and blocks. Blade capacity is 20" (508mm), which allows a cutting depth of 8" (203mm). Capable of cutting 8" x 8" x 16" block. Unit features a 3hp, 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 below.

Masonry Saw, 230V, 60Hz HC-2970.2F
Masonry Saw, 230V, 50Hz HC-2970.5F

Ship wt. 334lbs. (152kg)

Masonry Saw Blade, 20"

High-quality, 20" fast cutting blade for a variety of materials. Designed for dry or wet cutting. The segment height is .275", segment thickness is .125".

Masonry Saw Blade, 20" HC-2971

Ship wt. 15lbs. (6.8kg)

Saw Blade, Silent Runner 20"

A diamond blade for medium to large jobs and maximum production at a low cost per cut. It features a laminated core for maximum noise reduction. The segment height is .390", segment thickness is 14".

Saw Blade, Silent Runner 20" HC-2972

Ship wt. 15bs. (6.8kg)


H-2819.12


HC-2817


H-2939


H-2945


H-2900.4
H-2900.6


H-2938



H-2937
H-2937M


H-2945G


H-2943

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, Cetified	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 ±.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 gradations on one end of 0.10" (2.5mm) apart and the other end is every 2mm.

Core Length Measuring Device	H-2939

Ship wt. 10.4bs. (0.1kg)

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)

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)

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)

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)

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. Instrument has a range of 5.5 to 6.5 inches; readings can be made to hundredths or thousandths in decimals.

Concrete Micrometer	H-2938

Ship wt. 3.8lbs. (1.7kg)

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, Welded	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)

Cylinder Capping

H-2952



H-2925A



H-2946C



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)

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)

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 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)

Econ-o-Cap Cylinder Pads	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
Old-Style Cylinder Pads	**Part #**
6.1875" Pad, 50 Durometer	H-2946DOCP50
6.1875" Pad, 60 Durometer	H-2946DOCP60
6.1875" Pad, 70 Durometer	H-2946DOCP70

Econ-o-Cap Capping Pads see chart above
see chart above

Econ-o-Cap Capping Rings
ASTM C1231; AASHTO T22

Single Cylinder Rings, sold individually.

Econ-o-Cap Sets	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

H-2951 Kit



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

Introducing Humboldt's New HC-5090 and HC-5070 Compression Machine Controllers

Humboldt's new concrete compression machine controllers are designed to make breaking cylinders, cubes and beams easier and more precise. Available in a bolt-on and a console configuration, Humboldt's new HC-5090 and HC-5070 concrete compression machine controllers deliver a whole new level of speed, accuracy and ease-of-use for compression machines. Their 7" color screens provide a large and clean layout of information and makes quick, visual monitoring a breeze.

However, what really makes these controllers stand out from other controllers are their four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configurations or accessed through a LAN-net-worked computer using Humboldt's Next Software.

These controllers allow you to control up to four different compression frames from a single, hydraulic power pack, as well as compressometers/extensometers with ease all directly from the controller or from a networked computer.

Auto Testing

The controllers are set up to run standard tests, such as ASTM C39, C78, C109, C293, C469, C496, C1019 and C1604 among others at the push of a button. Just pick the test you want to run and the controller will handle it, and, at the end of the test the piston will return to the start position for the next test. The controller can also automatically hold a load at any desired point for a specific time.

Calibration

Also, the controllers provide several calibration features that will make calibrating your machine a breeze, as well as accurate, including automatic calibration and micro adjustments of up to 10 points for dialing in the calibration accuracy.

In stand-alone mode, these controllers provide 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 graph formats. The 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 generating capabilities using Humboldt's NEXT software. Both controllers feature four independent, data acquisition channels provide you with enough options to control all your data needs with one controller. A typical setup would provide logging of Load, Stress and Rate in channel one. With channels two and three, you could monitor a compressometer/extensometer set up and with the fourth channel you could monitor a separate load frame set up for flexural testing. All this information could simultaneously be tracked at the controller interface or by a networked computer at any location.



HC-5090.3F

Controller Specifications	
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 (1kH)
Logging speed	50 reading per second
Multi-test storage	1000
Points per test	2500

Both Controllers provide:

- 4-channel data acquisition
- Hi-res, 7", waterproof, touch-screen provide total control and real-time graphical display of tests
- Machine control and data acquisition via machine touch-screen or network PC
- Real-time graphical chart and numerical display of test via touch-screen display or network PC
- Basic, user-defined software included
- Effective sampling rate of 1 reading per second
- Stores up to 1000 tests with 3000 points per test
- USB port provides data transfer to thumb drive, PC or tablet, plus it can power a wireless access point for wireless communications

Perfect for Upgrades

Looking to upgrade the controller on your existing compression machines? The HCM-5090 is the perfect controller for that. It is easy to install and the result is you will now have an advanced controller for your compression machine with all the features, including standard test programs, easy and accurate calibration, four data channels, data acquisition and all the other features the HCM-5090 offers.

Controller	HC-5090.3F
UPS	Ship wt. 6lbs. (2.7kg)
Console Controller	HC-5070
Console Controller	HC-5070.4F
	Ship wt. 200 lbs. (90.7kg)



HC-5070 Console Controller shown with Compression machine set up to break cylinders and an auxiliary machine for beams.



HC-5070

Compression Testing



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 ±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.
- Three choices of digital control (see page 109)
- Optional test platens and accessories available on pages 169-170
- 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 166 for models and ordering information.

HCM-2500 Series Compression Machines
Ship wt. 885 lbs. (401kg)



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 ±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.
- Three choices of digital control (see page 109)
- Optional test platens and accessories available on pages 169-170
- **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 66 for models and ordering information.

HCM-3000 Series Compression Machines
Ship wt. 1078 lbs. (488kg)



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 ±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.
- Three choices of digital control (see page 109)
- Optional test platens and accessories available on pages 169-170
- 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 166 for models and ordering information.

HCM-4000 Series Compression Machines
Ship wt. 1700 lbs. (771kg)

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.





Shown with Optional Flexural Attachment for Beams.



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 ±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.
- Three choices of digital control (see page 109)
- Optional test platens and accessories available on pages 169-170
- 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 166 for models and ordering information.

HCM-5000 Series Compression Machines

Ship wt. 2500 lbs. (1134kg)

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 ±5% of indicated load
- Standard configuration includes no platens. Order HCM-0119Al for beam testing
- Three choices of digital control (see page 109)
- Optional test platens and accessories available on pages 169-170
- Available as an auxiliary frame design with no controller or pump; includes mounting stand, load frame selector valve and overload protection.
- **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 166 for models and ordering information.

HCM-0030 Series Compression Machines

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 ±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. 655lbs. (297kg)

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.

Concrete Compression Machine Ordering Matrix

HCM-4000iHA.5F

- Load Capacity
- Load Indicating System: iH or i7
- Pump: 1/2hp use no suffix; 3/4hp use P suffix; Automatic use A suffix
- Electrical Configuration: 110V 60Hz use no suffix; 220V 60Hz use .2F suffix; 220V 50Hz use .5F suffix; 220V 50/60Hz use .4F suffix

HCM-0030 Series Compression Machines	Capacity	Controller	Electrical	Pump Size and Control
HCM-0030iHA	30,000 lbs. (133.5 kN)	iH	120V 60Hz	1hp Automatic
HCM-0030iHA.4F			230V 50-60Hz	
HCM-0030iH			120V 60Hz	1/2hp Manual
HCM-0030iH.2F			230V 60Hz	1/2hp Manual
HCM-0030iH.5F			230V 50Hz	1/2hp Manual
HCM-0030i7		i7	120V 60Hz	1/2hp Manual
HCM-0030i7.2F			230V 60Hz	1/2hp Manual
HCM-0030i7.5F			230V 50Hz	1/2hp Manual

HCM-1000 Series Compression Machines	Capacity	Controller	Electrical	Pump Size and Control
HCM-1000iHA	100,000 lbs. (445 kN)	iH	120V 60Hz	1hp Automatic
HCM-1000iHA.4F			230V 50-60Hz	
HCM-1000iH			120V 60Hz	1/2hp Manual
HCM-1000iH.2F			230V 60Hz	1/2hp Manual
HCM-1000iH.5F			230V 50Hz	1/2hp Manual
HCM-1000i7		i7	120V 60Hz	1/2hp Manual
HCM-1000i7.2F			230V 60Hz	1/2hp Manual
HCM-1000i7.5F			230V 50Hz	1/2hp Manual

HCM-2500 Series Compression Machines	Capacity	Controller	Electrical	Pump Size and Control
HCM-2500iHA	250,000 lbs. (1,112 kN)	iH	120V 60Hz	1hp Automatic
HCM-2500iHA.4F			230V 50-60Hz	
HCM-2500iH			120V 60Hz	1/2hp Manual
HCM-2500iHP				3/4hp Manual
HCM-2500iH.2F			230V 60Hz	1/2hp Manual
HCM-2500iHP.2F				3/4hp Manual
HCM-2500iH.5F			230V 50Hz	1/2hp Manual
HCM-2500iHP.5F				3/4hp Manual
HCM-2500i7		i7	120V 60Hz	1/2hp Manual
HCM-2500i7P				3/4hp Manual
HCM-2500i7.2F			230V 60Hz	1/2hp Manual
HCM-2500i7P.2F				3/4hp Manual
HCM-2500i7.5F			230V 50Hz	1/2hp Manual
HCM-2500i7P.5F				3/4hp Manual

HCM-3000 Series Compression Machines	Capacity	Controller	Electrical	Pump Size and Control
HCM-3000iHA	300,000 lbs. (1,334 kN)	iH	120V 60Hz	1hp Automatic
HCM-3000iHA.4F			230V 50-60Hz	
HCM-3000iH			120V 60Hz	1/2hp Manual
HCM-3000iHP				3/4hp Manual
HCM-3000iH.2F			230V 60Hz	1/2hp Manual
HCM-3000iHP.2F				3/4hp Manual
HCM-3000iH.5F			230V 50Hz	1/2hp Manual
HCM-3000iHP.5F				3/4hp Manual
HCM-3000i7		i7	120V 60Hz	1/2hp Manual
HCM-3000i7P				3/4hp Manual
HCM-3000i7.2F			230V 60Hz	1/2hp Manual
HCM-3000i7P.2F				3/4hp Manual
HCM-3000i7.5F			230V 50Hz	1/2hp Manual
HCM-3000i7P.5F				3/4hp Manual

HCM-4000 Series Compression Machines	Capacity	Controller	Electrical	Pump Size and Control
HCM-4000iHA	400,000 lbs. (1,780 kN)	iH	120V 60Hz	1hp Automatic
HCM-4000iHA.4F			230V 50-60Hz	
HCM-4000iHP			120V 60Hz	3/4hp Manual
HCM-4000iHP.2F			230V 60Hz	3/4hp Manual
HCM-4000iHP.5F			230V 50Hz	3/4hp Manual
HCM-4000i7P		i7	120V 60Hz	3/4hp Manual
HCM-4000i7P.2F			230V 60Hz	3/4hp Manual
HCM-4000i7P.5F			230V 50Hz	3/4hp Manual

HCM-5000 Series Compression Machines	Capacity	Controller	Electrical	Pump Size and Control
HCM-5000iHA	500,000 lbs. (2,224 kN)	iH	120V 60Hz	1hp Automatic
HCM-5000iHA.4F			230V 50-60Hz	
HCM-5000iHP			120V 60Hz	3/4hp Manual
HCM-5000iHP.2F			230V 60Hz	3/4hp Manual
HCM-5000iHP.5F			230V 50Hz	3/4hp Manual
HCM-5000i7P		i7	120V 60Hz	3/4hp Manual
HCM-5000i7P.2F			230V 60Hz	3/4hp Manual
HCM-5000i7P.5F			230V 50Hz	3/4hp Manual

Concrete Compression Machine Ordering Matrix

HCM-4000B Masonry Series Block Machines	Capacity	Controller	Electrical	Pump Size and Control
HCM-4000BiHA	400,000 lbs. (1,780kN)	iH	120V 60Hz	1hp Automatic
HCM-4000BiHA.4F			230V 50-60Hz	
HCM-4000BiHP			120V 60Hz	3/4hp Manual
HCM-4000BiHP.2F			230V 60Hz	3/4hp Manual
HCM-4000BiH.5F			230V 50Hz	1/2hp Manual
HCM-4000BiHP.5F				3/4hp Manual
HCM-4000Bi7P		i7	120V 60Hz	3/4hp Manual
HCM-4000Bi7P.2F			230V 60Hz	3/4hp Manual
HCM-4000Bi7P.5F			230V 50Hz	3/4hp Manual

HCM-5000B Masonry Series Block Machines	Capacity	Controller	Electrical	Pump Size and Control
HCM-5000BiHA	500,000 lbs. (2,224kN)	iH	120V 60Hz	1hp Automatic
HCM-5000BiHA.4F			230V 50-60Hz	
HCM-5000BiHP			120V 60Hz	3/4hp Manual
HCM-5000BiHP.2F			230V 60Hz	3/4hp Manual
HCM-5000BiH.5F			230V 50Hz	1/2hp Manual
HCM-5000BiHP.5F				3/4hp Manual
HCM-5000Bi7P		i7	120V 60Hz	3/4hp Manual
HCM-5000Bi7P.2F			230V 60Hz	3/4hp Manual
HCM-5000Bi7P.5F			230V 50Hz	3/4hp Manual

HCM-4000P Masonry Series Prism Machines	Capacity	Controller	Electrical	Pump Size and Control
HCM-4000PiHA	400,000 lbs. (1,780kN)	iH	120V 60Hz	1hp Automatic
HCM-4000PiHA.4F			230V 50-60Hz	
HCM-4000PiHP			120V 60Hz	3/4hp Manual
HCM-4000PiHP.2F			230V 60Hz	3/4hp Manual
HCM-4000PiH.5F			230V 50Hz	1/2hp Manual
HCM-4000PiHP.5F				3/4hp Manual
HCM-4000Pi7P		i7	120V 60Hz	3/4hp Manual
HCM-4000Pi7P.2F			230V 60Hz	3/4hp Manual
HCM-4000Pi7P.5F			230V 50Hz	3/4hp Manual

HCM-5000P Masonry Series Prism Machines	Capacity	Controller	Electrical	Pump Size and Control
HCM-5000PiHA	500,000 lbs. (2,224kN)	iH	120V 60Hz	1hp Automatic
HCM-5000PiHA.4F			230V 50-60Hz	
HCM-5000PiHP			120V 60Hz	3/4hp Manual
HCM-5000PiHP.2F			230V 60Hz	3/4hp Manual
HCM-5000PiH.5F			230V 50Hz	1/2hp Manual
HCM-5000PiHP.5F				3/4hp Manual
HCM-5000Pi7P		i7	120V 60Hz	3/4hp Manual
HCM-5000Pi7P.2F			230V 60Hz	3/4hp Manual
HCM-5000Pi7P.5F			230V 50Hz	3/4hp Manual



HCM-720

i7 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 available as a retrofit package.

i7 Digital Indicator — HCM-720
Ship wt. 13 lbs. (5.9kg)

Optional 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)

Compression Testing



shown with optional Platen Carrier Bracket

HCM-5000P

Masonry Series Compression Machines

ASTM C39, C140, C1314, E4, AASHTO T-22

Masonry series machines are available in two capacities: 400,000 (1,780kN) and 500,000 (2,224kN) with a testing range from 1 to 100% of machine capacity, with an accuracy of ±5% of indicated load. Masonry series compression testing machines are available in two load frame configurations for testing single- or two-block masonry prisms of full-sized block up to 12" (304 mm) wide.

- Tests blocks, masonry prisms, pavers and retaining wall units
- 400,000 to 800,000 (1,780 to 3,559kN) testing range with accuracy of ±5% of indicated load
- 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 block and prism machines, see pages 169-170.

See Pages 166-167- for models and ordering information.

HCM-4000B Series Block Machines — Ship wt. 1,700 lbs. (771kg)

See Page 111 for models and ordering information.

HCM-4000P Series Prism Machines — Ship wt. 1,700 lbs. (771kg)

See Page 111 for models and ordering information.

HCM-5000B Series Block Machines — Ship wt. 2700 lbs. (1224kg)

See Page 111 for models and ordering information.

HCM-5000P Series Prism Machines — Ship wt. 2700 lbs. (1224kg)



HCM-0802

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)



HCM-0190SP

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)

Masonry Series Compression Machines

Specification	HCM-4000B	HCM-4000P	HCM-5000B	HCM-5000P
Vertical Opening	18.375" (467mm)	26.750" (679mm)	18.375" (467mm)	26.750" (679mm)
Horizontal Opening	13.312" (338mm)	13.312" (338mm)	14" (356mm)	14" (356mm)
Piston Stroke	2.5" (63.5mm)	2.5" (63.5mm)	2.5" (63.5mm)	2.5" (63.5mm)
Lower Platen, Dim.	12" x 16" (305 x 407mm)	12" x 16" (305 x 407mm)	13" x 16" (330 x 407mm)	13" x 16" (330 x 407mm)
Upper Platen, Dia.	6.5" (165mm)	6.5" (165mm)	6.5" (165mm)	6.5" (165mm)
Oil Reservoir Cap.	2 gal (7.6 liter)	2 gal (7.6 liter)	2 gal (7.6 liter)	2 gal (7.6 liter)
Overall Width	39.875" (1013mm)	39.875" (1013mm)	30" (762mm)	30" (762mm)
Overall Depth	20" (508mm)	20" (508mm)	23.75" (603mm)	23.75" (603mm)
Overall Height	63.625" (1616mm)	71.625" (1819mm)	63.625" (1540mm)	68.875" (1749mm)


HCM-0101


HCM-0113


HCM-0112A


HCM-0107P


HCM-0119A

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 crosshead 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
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
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.

Machines	HCM-2500	HCM-3000
Attachment	HCM-0119A	HCM-0117A
Machines	HCM-4000	HCM-5000
Attachment	HCM-0119A	HCM-0119A
Machines	HCM-0030	
Attachment	HCM-0119A	

Flexural Beam Attachment — see chart above
Ship wt.134 lbs. (60.7kg)

Compression Testing



HCM-0120



HCM-00127



HCM-0135



HCM-0718

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 CM-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)

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)

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 crosshead 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

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)

AbleCable

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)

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-0612	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-0612	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

Supplied: Item comes with machine, NR: Not required



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

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 miniloggers, 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 miniloggers, see right.

Compressometers see chart above
Ship wt. 10 lbs. (4.5kg)

Data Acquisition Setups

ASTM C469

You can fully automate your test data collection, as well as control any concrete compression frame with the Humboldt HC-5090.3F Controller.

The HCM-5090's four independent, data acquisition channels provide you with enough options to control all your data needs with one controller. A typical setup would provide logging of Load, Stress and Rate in channel one. With channels two and three, you could monitor a compressometer/extensometer set up and with the fourth channel you could monitor a separate load frame set up for flexural testing. All this information could simultaneously be tracked at the controller interface or by a networked computer at any location. In standalone mode, this controller provides a 7" (178mm) touch-screen controller, provides you finger-tip control of your testing processes, as well as providing real-time, visual views of your data in both tabular and graph formats. These new 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 generating capabilities using Humboldt's NEXT software

Humboldt Controller, 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 plug for HCM-5090

Pressure Transducer HM-4177
Ship wt. 1lbs. (453g)



HCM-5090.3F



HM-2310.04



HM-4177

Rebound Test Hammers



Concrete Rebound Hammers
ASTM C805, D5873; BS 1881: Part 202; ISOIDIS8045; ENV 206; IGJ/T 23-2001

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

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

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/mm^2) 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/mm^2) — H-2975LM
Ship wt. 4.8lbs. (2.2kg)

Digi-Schmidt Concrete Test Hammer

The Digi-Schmidt concrete Test hammer couples the original Schmidt hammer with rebound measuring sensors and microprocessor technology to provide an instrument designed for applications requiring numerous measurements. The method is rapid, reproducible, and has resolution previously unattainable by manual models.

The hammer is connected to a control and display unit by means of a connecting cable. Strength values are shown digitally as they are taken and also displayed as groups of bars on the 128 x 128 pixel graphic LCD. Mean value and standard deviation for a preset number of measurements are computed and displayed. Via the menu display, the user can select: hammer impact direction (up, down, horizontal, etc.); desired engineering units (psi, MPa, kg/cm^2, or N/mm^2), and indicate the specimen size and type (cylinders, cubes, etc.) for the strength data to be predicted.

The instrument measuring range is 1,450 to 10,150 psi (10-70 N/mm^2) using 2.207 Nm impact energy. Accuracy is ±0.2R with 0.5R reproducibility. Rebound vs. strength correlation curves for 7 and 28 day strengths are installed in memory, or the users own data may be installed via keyboard entry. The Internal memory holds 5000 measurements, each with date and time. Data can be transferred via the RS-232C interface to a PC in Microsoft Excel using the included cable and software. Direct printing is possible.

The Digi-Schmidt consists of the test hammer, control and display unit, connecting cable, PC cable, carrying strap, rubbing stone, instruction manual and a plastic carrying case.

Digi-Schmidt Concrete Test Hammer — H-2976
Ship wt. 12lbs. (5.4 kg)

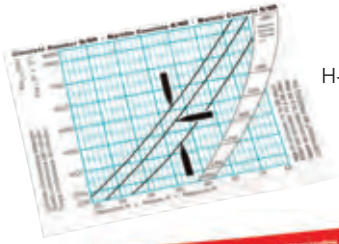
Silver Schmidt Hammer

The Proceq Silver Schmidt test hammer has been redesigned to provide unmatched accuracy, repeatability and easy, intuitive operation. The Silver Schmidt features quicker and more accurate testing while addressing the previous insufficiencies of the traditional hammers. With the Silver Schmidt 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 eliminates cocking the hammer for each blow and recording the results, the Silver Schmidt 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. 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.



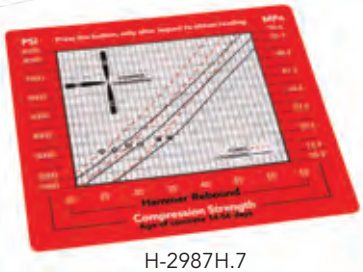
H-2975.27



H-2975.25
H-2975.25N



H-2975NRP

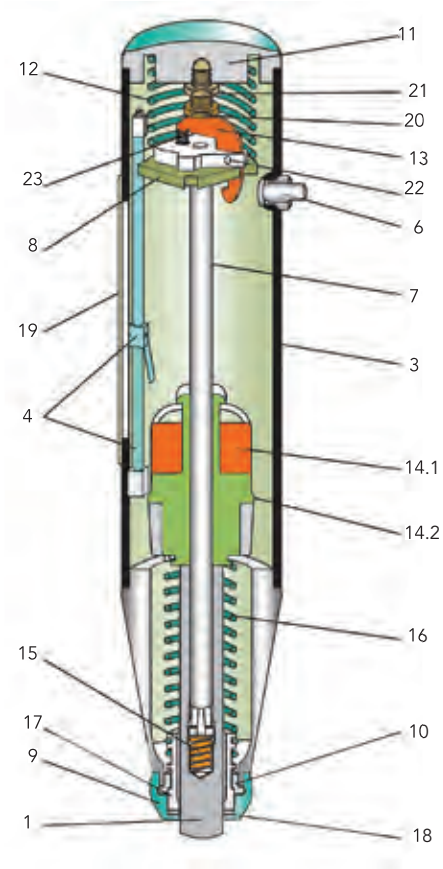


H-2987H.7



H-2972

Humboldt provides repair and calibration services for concrete rebound hammers, Call: 1.800.544.7220



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. 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.

Silver Schmidt Hammer H-2971STN
Ship wt. 4.9lbs. (2.2kg)

Silver Schmidt Hammer w/ Hammerlink Software

Same as H-2971STN, but includes complete Hammerlink software. Hammerlink software features include: extended memory usage; rapid uniformity assessment with summary view; sorting of data; user-defined conversion curves (polynomial and exponential); user-defined statistical methods; highlighting of mean, median and outliers; carbonation correction; print outs, and export to third party software.

Silver Schmidt w/ Software H-2971U
Ship wt. 4.3lbs. (1.9kg)

Schmidt Hammer, Type NR

The H-2975NR Schmidt® hammer, type NR, 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 H-2975NR includes an integral paper strip recorder, which provides rebound values as a bar chart on a paper strip, providing a hard-copy record of the test data. One roll of paper can document 4,000 test impacts.

Schmidt Hammer, Type NR H-2975NR
Ship wt. 6.5lbs. (2.9kg)

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

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. 58bs. (26.3kg)

Conversion Chart Labels

Replacement conversion chart for rebound hammers.

Conversion Chart Label (psi) H-2987H.7
Conversion Chart Label (psi) H-2975.25
Conversion Chart Label (N/mm2) H-2975.25N
Ship wt. 0.5lbs. (0.22kg)

Replacement Paper for NR Hammer

Five-pack of chart paper used with the type NR Schmidt hammers.

Replacement Paper (NR Hammer) H-2975NRP
Ship wt. 0.9lbs. (0.4kg)

Optional Printer Cable (Digi-Schmidt)

Five-pack of chart paper used with the type NR Schmidt hammers.

Optional Printer Cable (Digi-Schmidt) H-2976C
Ship wt. 0.5lbs. (0.4kg)

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

Strength, Pull-Off


H-2978


HC-2978



HC-2985

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)

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 — H-2978.01
Windsor Gold Probe Kit — H-2978.03
Ship wt. 0.4lbs. (0.1kg)

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.

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)

Pull-off Tester, DY-2
ASTM C1583, D4541, D7234, D7522; BS 1881 Part 207; EN 1542, 1015, 1348; ISO 4624

Pull-off testing is one of the most widely used test methods in the construction industry. This is reflected in the huge number of standards dedicated to the method. It has long been known that one of the major influences on the result of a pull-off test is operator influence in the application of a constant load rate. The DY-2 pull-off testers, with their integrated, feedback-controlled motor remove this variable completely, by providing a fully automated test at a constant load rate, which can be verified.

The DY-2 pull-off testers are also unique, in that they record every single test parameter required by specifications:

- Test disc size;
- Maximum load applied;
- Automatic calculation of bond strength;
- Applied load rate with graphical record;
- Time and date of the test;
- Complete time of test, and
- Failure mode.

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 Accessories

Item	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 Disc Set, Alum.	HC-2985.6
100 x 100mm/M10 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


HC-2988


HC-2989


HC-2957


HC-2957D


HC-2958

Bond Test Kit with 15 and 25kN Gauges
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 is 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; 15kN and 25kN gauges; 10 x 50 mm steel bond discs; 10 x 75 mm steel bond discs and a calibration certificate

Bond Test with 15 and 25kN Gauges HC-2988
Ship wt. 50lbs. (22.6kg)

Bond Tester with Digital Gauge (Wireless App)
ASTM D4541,D7234

This Bond Test Kit features a wireless, mobile App and digital gauge. 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 and eye-bolts. Test results are produced in real-time visual graphs for each test.

The Bond Tester enables engineers to confirm adequate direct tensile strength or bonding strength between two layers after repairs. The tensile load of up to 25kN is applied to the fixing mechanically and hydraulics are used to register the load through an accurate analog gauge, making the tester very reliable. (Requires WiFi 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.

The Bond Test Kit comes with a digital gauge that covers a range from 0 to 25kN.

Bond Tester w/Digital Gauge (App) HC-2989
Ship wt. 42lbs. (19kg)

Anchor Test Kit with 15 and 25kN Gauges

The 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 two gauges, 15 and 25kN, 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 with 15 and 25kN Gauges HC-2957
Ship wt. 25lbs. (11.3kg)

Anchor Test Kit with Digital Gauge (Wireless App)

The 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 ta digital gauge, to suit most applications; threaded rods, studs and slotted button adapters in 1/4", 3/8" and 7/8" sizes and a calibration certificate.

Anchor Test with Digital Gauge HC-2957D
Ship wt. 42lbs. (19kg)

Wireless App and Digital Gauge for Testers

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 WiFi 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)

Bond and Anchor Test Accessories

Item	Part No.
50mm Hexagon Extension Legs	HC-2988.1
75mm Hexagon Extension Legs	HC-2988.2
100mm Hexagon Extension Legs	HC-2988.3
5kN Gauge	HC-2988.4
10kN Gauge	HC-2988.5
20kN Gauge	HC-2988.6

Special size adaptors available, please enquire.

Ground Penetrating Radar





Quantum Mini Concrete Scanner

ASTM C803; BS 1881

With the benefits of deep lower frequency 1000 MHz antenna and a high resolution 2000 MHz antenna in a compact form factor, the Quantum Mini is suitable for ALL concrete scanning applications.

The dual frequency Quantum Mini by US Radar is the only concrete scanning GPR you will ever need. It features a 1000 MHz antenna for analyzing deep structures and targets under slabs. It also features a 2000 MHz antenna for high resolution analysis of fine targets. It is no longer necessary to have to choose antennas or find out afterwards that the scan should have been done with a different antenna. The Quantum Mini offers these benefits in a compact, wireless form factor that is perfect for scanning walls, floors, ceilings, etc.

All other concrete scanners on the market only offer ONE frequency or the other. This means the average user must sacrifice depth for high resolution scales, or vice versa.

With both 1000 and 2000 MHz antennas, you get the detail associated with high resolution, while also being able to see far beyond the concrete slab. This ensures concrete can be properly laid and that a firm understanding of what lies underneath is achieved. Dual frequency gives users the assurance of a job well done.

The Quantum Mini offers a variety of software in on-board and desktop configurations including:

- GPS
- 3D
- Google Earth Integration
- Satellite Imaging Integration
- Report Generation
- and more!

The Quantum Mini is also compatible with a wide variety of third party processing software packages.

Specifications
Radar Controller Computer
Processor: Multi-core Intel Atom
Radar interface: proprietary military connector
32 GB Solid State Hard Drive
10.1 Inch daylight readable LCD Color display
Power Supply: 10.5-18V DC @ 25W
Operating System: Windows 7 Embedded
System Scan Modes
Trigger Modes: Free run, timed interval, shaft encoder, manual
Maximum Sampling Rate: 100 gigasamples per second
Nominal Sampling Rate: 650,000,000 samples per second
Gain: 45dB hardware, 90 dB Software, 60 dB Software Flat Gain
Radar Head Electronics Specifications
Sampling Interval: 10 ps-6.4 nsl
Time Range Adjustment Interval: 10 ps
Pulse Repetition Frequency: 0.1-4 MHz-adjustable
Sample per Trace: 2-8192, Adjustable
Effective Bandwidth (typ.): >4 GHz
Stacking: Automatic
Transmitter
Dual Frequency 1000 & 2000 MHz

Quantum Mini Concrete Scanner HC-2975
Ship wt. 25lbs (11.4kgs)

Zircon MT 6 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 inches (152 mm) 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 MT 6 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 1⁄2 inch (13 mm) and depth to the nearest inch (25 mm)

Helps map out the grid of metal through any non-metallic construction material, including concrete, tile, and marble

Zircon MT 6 Rebar Locator HC-2976
Ship wt. 3lbs (1.4kgs)



HC-2983A

HC-2981A

HC-2982A

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 180 mm 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)

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 rebars.

Profometer PM630AI	HC-2982A
Profometer PM650AI	HC-2984A
	Ship wt. 15lbs. (6.8kg)


HC-2873
(shown with electrode not included)

HC-2873.2


HC-2873.3


HC-2873.4

HC-2873.5


HC-2873.6


HC-2873.7

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
- 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 touchscreen; 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
Antiglare 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


HC-2873.1

Profometer 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



HG-9049



H-2872



HG-9036

Giatec XCell™
ASTM C876

Giatec XCell™ is a novel tablet/smartphone-based NDT probe for fast, accurate and efficient detection of in-situ analysis of corrosion in reinforced concrete structures. It benefits from an advanced Bluetooth-enabled, maintenance-free sensor that measures the corrosion potential and sends it wirelessly to a tablet for generating half-cell contour plots (i.e. corrosion maps) in real-time. The results can be shared easily with remote locations. Giatec XCell™ significantly reduces the labor cost associated with data collection and subsequent contour plot generation and reporting.

The results are analyzed using the Android-based application on site for the identification of locations with high probability of corrosion. The output includes an equipotential contour map for the examined area. The measured potential values are indicative of corrosion probability. The contour plots are color coded for more clarity.

Three models of the Giatec XCell™ are available. These include the HG-9049, which is essentially the half-cell electrode. With this model the user can download an app from the Google play store for free and install it on their Android smartphone. The mobile app records the measurements sequentially, but does not generate contour plots. The HG-9050 adds a tablet and tablet app for contour plot generation, carrying support, and basic extension arm. The HG-9051 adds an advanced extension arm instead of the basic model, a verification kit (an accurate reference electrode and filling solution), and an extension reel, all in a larger carrying case.

Giatec XCell™ Essential Pkg.	HG-9049
Giatec XCell™ Enhanced Pkg.	HG-9050
Giatec XCell™ Comprehensive Pkg.	HG-9051

Ship wt. 9lbs. (4kg)

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 ±0.1mA. 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 Optional, user-friendly PC software and USB connection to computers is also available.

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, gauged vacuum pump assembly, desiccator assembly

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" (100mmm) Dia. .	HG-9028
Rubber Gasket Core - Pair 3.75" (95mm) Dia	HG-9039
Test Cable Set	HG-9022
Temperature Sensor	HG-9023

Corrosion, Ultrasonic


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. Capable of providing dynamic modulus of elasticity. Measuring range: 0 - 3000 µs - accuracy +/- 0,1 µs

- 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

The Pundit Lab+ 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-2984
Pundit Lab+ Ultrasonic Test Device	H-2983

Ship wt. 13.4lbs. (6kg)

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 Ultrasonic Pulse Velocity and 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 µs
Resolution	0.1 µs (< 793 µs), 1 µs (> 793 µs
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-6440

Rapid Ultrasonic Pulse Echoing Imaging

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 Array (Pulse Echo) — **HC-6450**
Ship wt. 13.2lbs. (6kg)

Rapid Ultrasonic Pulse Echoing Upgrade Kit

Upgrade Kit for upgrading Pundit 200 to 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.

Pundit 250 Array (Pulse Echo) — **HC-6451**
Ship wt. 5.5lbs. (2.4kg)

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

Cross Hole Ultrasonic Monitor

ASTM D6760; AFNOR NF P 94-160-1

The CHUM (Cross Hole Ultrasonic Monitor) uses the Crosshole Sonic Logging (CSL) method (ASTM D6760-08) 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).

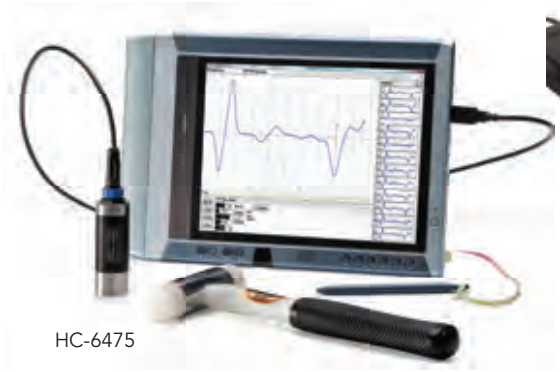
Main features:

- 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 — **H-6440**
Ship wt. 20lbs. (9.1kg)



HC-6475



H-2851



HC-6485

Pulse Echo Foundation Tester
ASTM D5882

Piletest's Pile Echo Tester (PET) is a user-friendly, highly flexible solution for testing a large number of deep foundations quickly and accurately. Requiring little-to-no training, PET is a modular, computer independent system that attaches to the USB port of any regular notebook or a Tablet PC. The PET system utilizes the pulse-echo method (compliant to the ASTM D5882-07 international standard). To test a pile, the user strikes it with PET's lightweight hand-held hammer. The resulting signal, or reflectogram, is captured by PET's digital accelerometer. It is than transmitted to the computer to produce information about the pile's length and shape.

Main Advantages

- Ease of use: PET's user-friendly software makes it possible to master the system in less than a day. No additional expensive training is required
- Excellent signal quality: PET's super low noise level enables the system to handle extremely long piles.
- Computer independence: Unlike other system based on an embedded computer (which may quickly become obsolete) PET connects to the USB port of your regular notebook computer or Tablet PC.
- Labor saving: PET includes a number of labor-saving features, such as advanced project organization; software suggested wave velocity; Smart Trigger™ and AutoSort to reject anomalous blows; one-touch controls of scale, amplification, and filtering; plus many more features.
- Robustness: Specially designed for testing piles, shafts and caissons in construction site environments. The PET sensor is IP67 waterproof and comes with a three (3) year warranty.

The PET Pro USB package includes:

- A digital transducer with waterproof USB cable
- A nylon hammer, spare tips, special putty
- Testing, analysis and reporting software (unlimited number of licenses)
- Interpretation assistance package

Specifications	
Temp. Range	-20°C to 55°C
Pile Lengths	2m to 80m
Productivity	up to 100 piles per hour
Sensitivity	100mV/g
Linearity	within 1%, 0 to 50g
Resonance Frequency	30kHz
Sampling Frequency	50kHz
Sampling Resolution	24 bit

Pulse Echo Foundation Tester HC-6475
Ship wt 10lbs. (4.5kg)

Impact Echo Concrete Test System
ASTM C1383-98a

System includes one pistol-grip transducer and one dual-head wave speed transducer. This will cover all possible testing needs. For determining the depth of surface-opening cracks, one end of the dual-head transducer can be used in conjunction with the pistol grip transducer. By itself, the dual-head transducer is used for independent measurements of wave speed. The system also includes a laptop computer and the necessary software to operate the system.

The pistol grip transducer is used for routine impact-echo testing. When the transducer is put in place on the test surface it is armed by depressing a trigger or button. The pistol grip transducer is armed with a trigger on the underside of the handle. It is especially well suited to flat surfaces.

The dual-head provides accurate measurements of depth and thickness by measuring the wave speed (speed of sound) in concrete, which can vary from about 3000 to 6000 meters/sec, depending on concrete quality and type of aggregate. The dual-head transducer shown is used only for independent measurements of wave speed (required for determining plate or slab thickness in accordance with ASTM standard C1383-98a). It cannot be used for impact-echo testing. Wave speed can be measured using a single cylindrical or pistol grip transducer only if tests can be performed on a slab of precisely known thickness in the region of the structure where testing will be carried out (not acceptable under ASTM standard C1383-98a).

Other configurations are available, please contact Humboldt for information.

Impact Echo Concrete Test System H-2851
Ship wt. 29 lbs. (13.1 kg.)

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)



H-2879



H-2879.200

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 of early compressive strength. This makes it one of the most versatile NDT methods for concrete.

- Waterproof and designed to float
- 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

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)

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)

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

Specifications	
Measurement Channels	4
Measurement Display	Yes
LCD Display Area	65 x 33 mm
Dimensions of Device	200 × 160 × 70 mm
Software.	Surf™ Data Monitor



HG-9037.3F



HG-9035.3F

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 × 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
ups	Ship wt. 15 lbs. (6.8 kg.)

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 (±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: the RCON2™ unit, power adapter, test cable set, alligator test clip, sample holder, verification kit, Fresh concrete probe, User manual, communication software, USB cable, conductive gels, and 2 pairs of contact sponges

Giatec RCON2™ Complete	HG-9035.3F
ups	Shipping wt. 16 lbs. (7.2 kg.)
Giatec RCON2™ Device only	HG-9011.3F
ups	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	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

Freeze-Thaw



HC-3186S

Specifications	
Condensor 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.

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 include:

- 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.
- Complete report generation from with the Humboldt NEXT software. Test data can also be exported to computers via a network or thumb drive.
- Remote control and monitoring via network and internet.

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. These graphs and tabular data can be used to produce reports of tests within the Humboldt NEXT software or downloaded to other computers or software for reports.

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

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

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

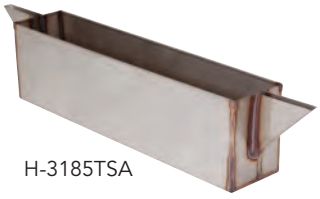
Freeze-Thaw, Flexural Resonance



H-3195, H-3198, H-3198M



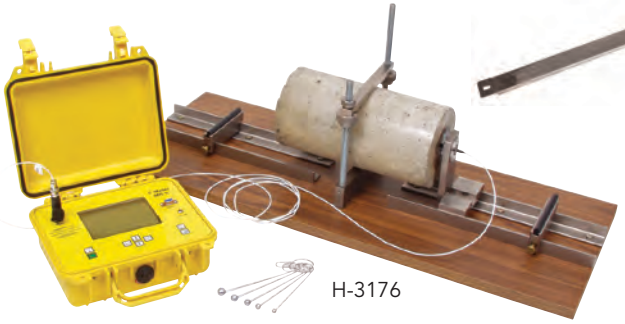
H-3185TA



H-3185TSA



H-3185SH



H-3176



HC-3177

Replacement Parts

Item	Part No.
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)

A very detailed instruction manual accompanies each sonometer. The chassis measures 17" x 14" x 11" (43 x 36 x 28cm). Standard voltage characteristics are 115/60/1

Sonometer, 115V 60Hz — H-3175
Sonometer, 230V 50Hz — H-3175.5F
Ship wt. 50 lb. (22.7kg)

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: Youngs modulus of elasticity, modulus of rigidity, Poissons 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 (v) (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)

Moisture in Slabs

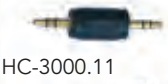

HC-3000


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 waterborne 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 gravitiy 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)

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



HC-2994

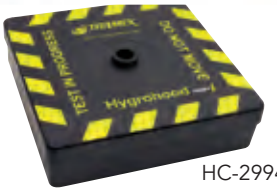

HC-2995A


HC-2990



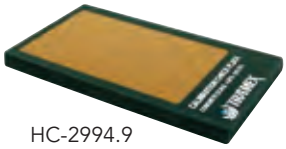
HC-2993B


HC-2994.4



HC-2994.7


HC-2994.2



HC-2994.9


HC-2994.8

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 insitu method, and ASTM F2420 RH hood method.

Concrete Moisture Meter — HC-2994
Ship wt 3lbs. (1.6kg)

Concrete Inspection Kit

ASTM F2659, F21703

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 simultaniously.

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)

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
Calibraton 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

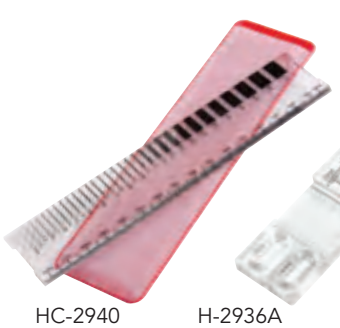
ASTM E1907, F1869

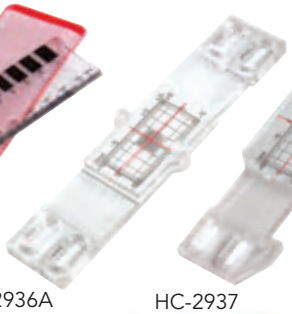
The vapor emission test is used for determining the moisture acceptability for the placement of floor coverings and coatings over concrete slab surfaces. Using this method, users can easily quantify the volume of water vapor emitting from a 1,000 square foot concrete slab over a 24-hour period. Commonly 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.

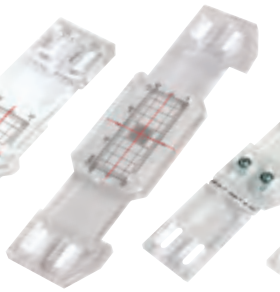
Vapor Emission Test Kit
12-pak (10,000 sq. ft. coverage) — HC-2993B
3-pak (1,000 sq. ft. coverage) — HC-2993A
Ship wt 4.4lbs. (1.9kg)

For use with HC-3000 and HC-3001

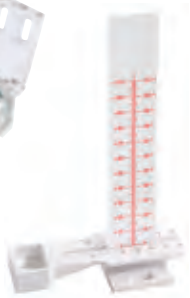
Crack Monitors


HC-2940


H-2936A


HC-2937


HC-2938


HC-2939


HC-2942A


HC-2943



HC-2964


HC-2944


H-2816.8

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)


HC-2941


HC-2947


HC-2948


HC-2955


HC-2956


HC-2950

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)

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 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.

The HC-2955 downloads data to a PC via a mini-USB cable using a graphic user interface on a PC computer. Datalogger capacity is: 51062 readings or 18236 readings with redundant CRC, Acquisition frequency is adjustable from 10 seconds to 91 hours. Includes software.

Concrete Crack Data Logger HC-2955

Ship wt. 1lb. (.45kg)

Concrete Crack Data Logger, Wifi

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 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.

The HC-2956 downloads data to a PC via a wireless connection using a graphic user interface on a PC computer. Datalogger capacity is: 51062 readings or 18236 readings with redundant CRC, Acquisition frequency is adjustable from 10 seconds to 91 hours. Includes software.

Concrete Crack Data Logger HC-2956

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.

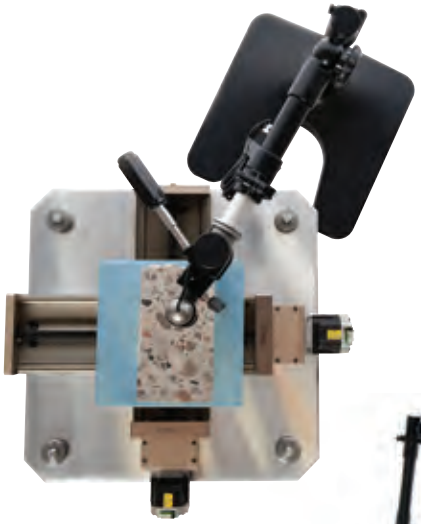
Concrete Crack Measuring Microscope HC-2950

Ship wt. 2lb. (0.9kg)

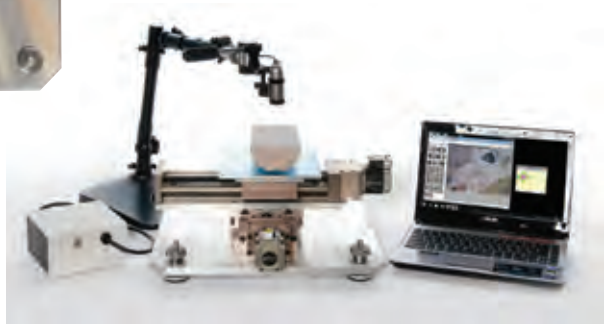
Strain, Linear Traverse



H-3230



H-2964A



H-2964A (shown with computer, not included)

Multi-Length Strain Gauge Set

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 002mm 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-3230.16
Punch Bar, Metric	H-3230.16M

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)


147465
VICATRONIC
HUMBOLDT

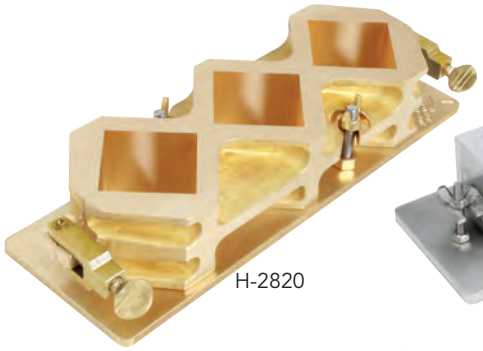
Cement



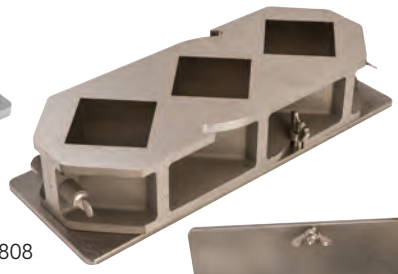
Blaine Air. 207
Bleeding, Cement 210
Calorimeter 203
Cube Testing 196-197
Expansion 200-201
Flow Properties 208-209
Length Change 202
Mixing 198-199
Mud Testing 211
Orgainic Impurities 203
Test Sand 199
Vicat Testing 204-206
Water Retention 210

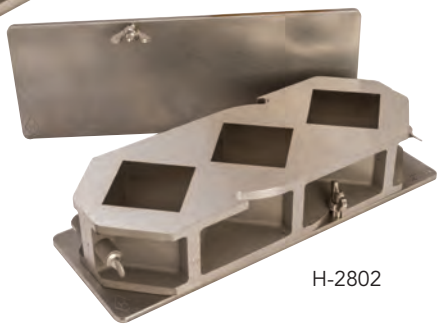
Testing Equipment For Construction Materials

HUMBOLDT


H-2820


H-2810

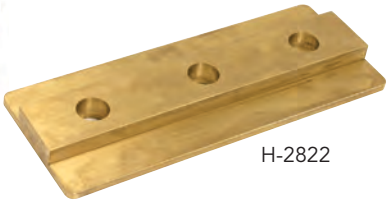

H-2808

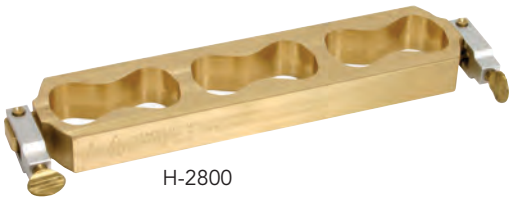

H-2802


H-2821


H-2823


H-2809


H-2822


H-2800

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, 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, 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, Econ-o-Cube

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)

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, 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)

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, 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.

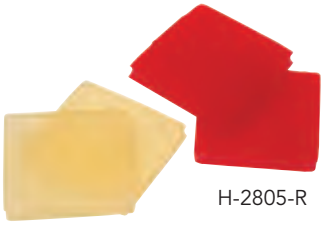
Briquette Mold H-2800

Ship wt. 3.5lbs. (1.5kg)


H-2860

H-2860W


H-2817

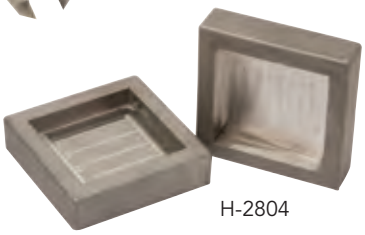

H-2805-R

H-2805-A


H-3855


H-2812


H-2816.8


H-2804

Tamper, Rubber Compound
Rubber compound tamper is 6" (152mm) long with 0.5 x 1" (13 x 25mm) cross section.

Tamper, Rubber Compound H-2860
Ship wt. 0.3lbs. (0.14kg)

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)

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 lose 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 enquire.

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.

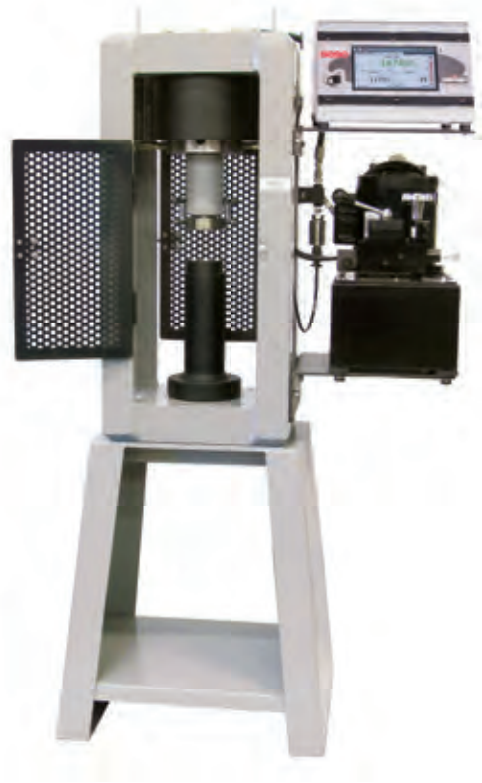
2" Cube Compression Pads, Red H-2805-R
Ship wt. 0.25lbs. (0.11kg)

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-2804-R and (2) H-2804-A.

2" Cube Compression Pads Set H-2805
Ship wt. .5lbs. (.22kg)



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 ±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)



HC-3851


H-3852


H-3853

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 with15 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), 230V 60Hz HC-3851.2F
Ship wt. 125lbs. (56kg)

Mortar Mixer, 5L (5.3qt)
ASTM C277, 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 ±5 rpm or 285 ±10rpm.

Features touchscreen-operated control panel, which provides fast, easy control in seven 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, three-phase DC 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 ±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, 5L (5.3qt), 120V 60Hz H-3852
Mortar Mixer, 5L (5.3qt), 230V 50/60Hz H-3852.4F
Ship wt. 250lbs. (113kg)

Mortar Mixer w/ Program Control and Sand Feed
ASTM C277, C305; AASHTO T162; EN 196
DIN 1164; BS 3892; ISO 679; NF P15-411

Mixer with 5L (5.3qt) capacity provides automatic program control and sand feed with manually-controlled cement and water supply. Provides software with 4 standard programs installed: ASTM C109, C305-6, EN 196 -1+3 and DIN 1164-5+7. 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 ±5 rpm or 285 ±10rpm.

Features touchscreen-operated control panel, which provides fast, easy control in seven 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, three-phase DC 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 ±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, 120V 60Hz H-3853
Mortar Mixer w/Program, 230V 50/60Hz H-3853.4F
Ship wt. 170lbs. (77kg)



H-3841


H-3844


H-3841.1


H-3841.2


H-3841HW





H-3820 H-3825


H-3341 H-3342


H-3340

ASTM-Compliant Mixer, 5-Qt. (4.73L)
ASTM C227, 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.

ASTM-Compliant Mixer, 120V 60Hz	H-3841
ASTM-Compliant Mixer, 230V 60Hz	H-3841.2F
ASTM-Compliant Mixer, 230V 50Hz	H-3841.5F

Ship wt. 55lbs. (25kg)

Mixer Components for H-3841 ASTM Mixer

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
Wire loop whip— stainless Steel, 0.25" dia. wire	H-3841HW

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 166 for information.

Humboldt Extreme-Duty Whisk	H-3841HW

Ship wt. 3lbs. (1.3kg)

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.)

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 (850µ) 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 (150µ) sieve, 75% on a No. 50 (300µ) 30% on a No. 40 (425µ) and 2% on a No. 30 (600µ). 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)

Expansion


H-3251


H-3256


H-2905.1

H-3252


H-3251RC
H-3257


H-3260


H-3265


H-3243B


H-3243A

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: 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
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	14.3 lbs (6.4kg)	H-3270

Prism Molds

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

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)

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)

Mortar Bar Container, 9" x 11" x 15.5"

ASTM C227, C1260

Stainless steel container for storing test specimens has tight-fitting cover that prevents moisture loss. Supports up to 36 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, 1.25" x 3.5" x 12"

ASTM C227, C1260

Stainless steel. Dimensions: 1.25" x 3.5" x 12" (32 x 89 x 305mm) ID Tight-fitting cover prevents moisture loss. Capacity not more than 315ml of water, which completely immerses three specimens supported above bottom of container.

Mortar Bar Container — H-3264
Ship wt. 16lbs. (7.2kg)

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

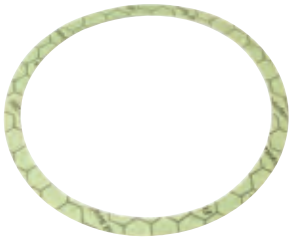
Test bar holder for 5"-long (127mm) samples.

Test Bar Holder — H-3243A
Ship wt. 4lbs. (1.8kg)


H-3240


H-3240.22

H-3240.21M
H-3240.21N


H-3242


H-3240.4


H-3240.3


H-3244


H-3245


H-3267.1


H-3267

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

ASTM C227

Test bar holder 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 **H-3267.1**

Ship wt. 4lbs. (1.8kg)

Mortar Bar Holder and Container, Round

ASTM C227

Plastic container includes test bar holder that supports 8 bars vertically. Holder has feet that elevate it from the base of the container providing space for water. Dimensions: 6" x 17" (152 x 432mm).

Mortar Bar Holder and Container **H-3267**

Ship wt. 6.1lbs. (2.7kg)

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.

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

Length Change Comparison



H-3250



H-3250D



H-3250.8

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
Dial indicator	H-3250.3
Digital indicator, 120V 60Hz	H-3250.3D
Digital indicator, 220V 50Hz	H-3250.3D.4F
Anvil with collar (one each)	H-3250.4
Anvil only	H-3250.4.4
Collar only	H-3250.4.3
Elevating screw, nut collar & anvil assembly	H-3250.7
Adapter for 5" specimens	H-3250.8

Custom size Invar Reference Bars are available, please enquire: 1.800.544.7220.


H-3493A


H-3492A


H-3491


H-3490A



H-3161


H-3320


H-3805

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	H-3493A
Test Set, w/o Sodium Hydroxide	H-3493AX

Ship wt. 6.8lbs. (3kg)

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. (0.3kg)

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)

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; 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)

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)

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)

Vicat Testing



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 C1191, 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

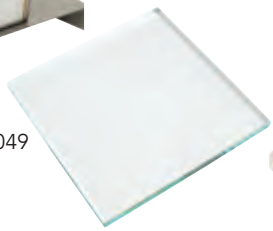
Used to evaluate unsanded plaster. Features an aluminum cone, 1.625" x 3.625" (41.3 x 92.08mm) and blunted to a hemisphere a distance of .125" (3.2mm) for an overall length of 3.5" (88.9mm) and plunger assembly with adjustable indicator. Total plunger weight is 200g. Includes frame with bakelite platform, 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)


H-3080


H-3086


H-3065


H-3049

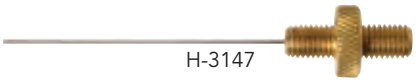

H-3138


H-3136


H-3840


H-3055 H-3060.1 H-3085.1 H-3110 H-3130 H-3134.1 H-3135.1 H-3137.1


H-3070, H-3072


H-3147


H-3072M


H-3075, H-3073

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)

Conical Mold, Brass

Brass mold, 76mm dia. x 40mm high. For use with H-3085 vicat apparatus.

Conical 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

Vicat Testing


H-3057



H-3052


HA-3056

Vicat Apparatus, Computer Controlled

ASTM C191 Method B; AASHTO T131; EN 196-3, EN 480-2; DIN 1164; BS4550

Computer-controlled Vicat needle apparatus with six (6) 2" x 3" test stations positioned in a rectangular water bath. The 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 ±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. 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, Automatic, 120V 60Hz H-3057.3F

CE Ship wt.115lbs. (52kg)

8-station model available, please call.

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

UPS Ship wt. 37.6lbs. (17kg)

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

UPS Ship wt. 0.1lbs. (0.04kg)

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 and T-wrench and delay timer.

Vicat Apparatus, Auto, 120V 50/60Hz HA-3056

Vicat Apparatus,, Auto, 230V 50/60Hz HA-3056.4F

UPS Ship wt. 37lbs. (17.6kg)


H-3810


H-3056.3F


H-3058.3F


H-3059.3F


H-3812


H-3813B


H-3816.1M


H-3811


H-3814


H-3058.1


H-3056.1


H-3817


H-3817.20

Blaine Air Permeability Apparatus
ASTM C204; AASHTO T153

Determines fineness of Portland cement in terms of specific surface expressed as total surface area in square centimeters per gram of cement. Consists of: calibrated U-tube manometer, ground glass joint, stainless steel test cell and plunger, rubber aspirator bulb and perforated disc. Includes 8 oz (226.8g) bottle of red manometer fluid, filter paper, wood block for holding test cell during filling and funnel. Mounted on finished wood panel with rubber-footed base.

Blaine Air Permeability Apparatus **H-3810**

Ship wt. 7lbs. (3.1kg)

Blaine Air Permeability (H-3810) 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

Blaine Apparatus, Semi-Automatic
ASTM C204; AASHTO T153, EN 196; DIN 1164; BS 4550

The Semi-automatic Blaine Apparatus provides more accuracy and precision than provided by the manual Blaine Apparatus. 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 inlcudes: the unit with an electric pump and time registration; filter papers (12.8mm, 1000pk; fill oil (50ml); Plug; thermometer; brush and funnel.

Blaine Apparatus, Dyckerhoff **H-3056.3F**

Ship wt. 15lbs. (6.8kg)

Electronic Blaine Apparatus, Dyckerhoff
ASTM C204; AASHTO T153, EN 196; DIN 1164; BS 4550

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 approximately ca. 75 cm^3.

Electronic Blaine Apparatus, Dyckerhoff **H-3058.3F**

Ship wt. 5lbs. (2.2kg)

PC-Controlled Blaine Apparatus, Dyckerhoff
ASTM C204; AASHTO T153, EN 196; DIN 1164; BS 4550

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 Measuring cell dia. is 41 mm (1.6"). Volume of measuring cell is approximately ca. 75 cm^3. Comes complete with fill oil, syringe with tube, tamper, round, 41mm filter paper (500pcs) and 13mm dust filters (10pcs). **Does not include PC, which is required for use.**

Electronic Blaine Apparatus, Dyckerhoff **H-3059.3F**

Ship wt. 47lbs. (21.3kg)

Description	Model
Filter paper discs, 12.8mm, pkg 1000 for H-3056	H-3056.1
Filter paper discs, 41mm, pkg 500 for H-3058, H-3059	H-3058.1


H-3624


H-3620


H-3624F


H-4144.8


H-3621


H-3622
H-3622M

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 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 50Hz **H-3625.5F**
Ship wt. 80lbs. (36kg)

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)

Pedestal Form
Wooden form used to create a concrete base for flow tables

Pedestal Form **H-3624F**
Ship wt. 28lbs. (12.7kg)

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)

Counter, Automatic
Can be used to upgrade H-3625 motorized flow table so a pre-determined 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 Flow Cone Set
ASTM C939

Test set for measuring the flow of grout for pre-placed, aggregate concrete. Intended for neat grout and grouts containing fine aggregate capable of passing a No. 8 sieve and grouts which have an eflux time of less than 35 seconds. Kit includes: (1) H-2834 0.5" (13mm) or 0.75" (19mm) interchangeable orifice flow cone and adjustable point gauge assembly, (1) H-2833 stand, and (1) H-2834SSB stainless steel, 6 liter beaker.

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).

Grout Flow Cone, 0.5" (13mm)	H-2834
Grout Flow Cone, 0.75" (19mm)	H-2835

Ship wt. 10lbs. (4.5kg)

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)

Grout Box
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 Box H-2838

Ship wt. 17.3lbs. (7.84kg)

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)

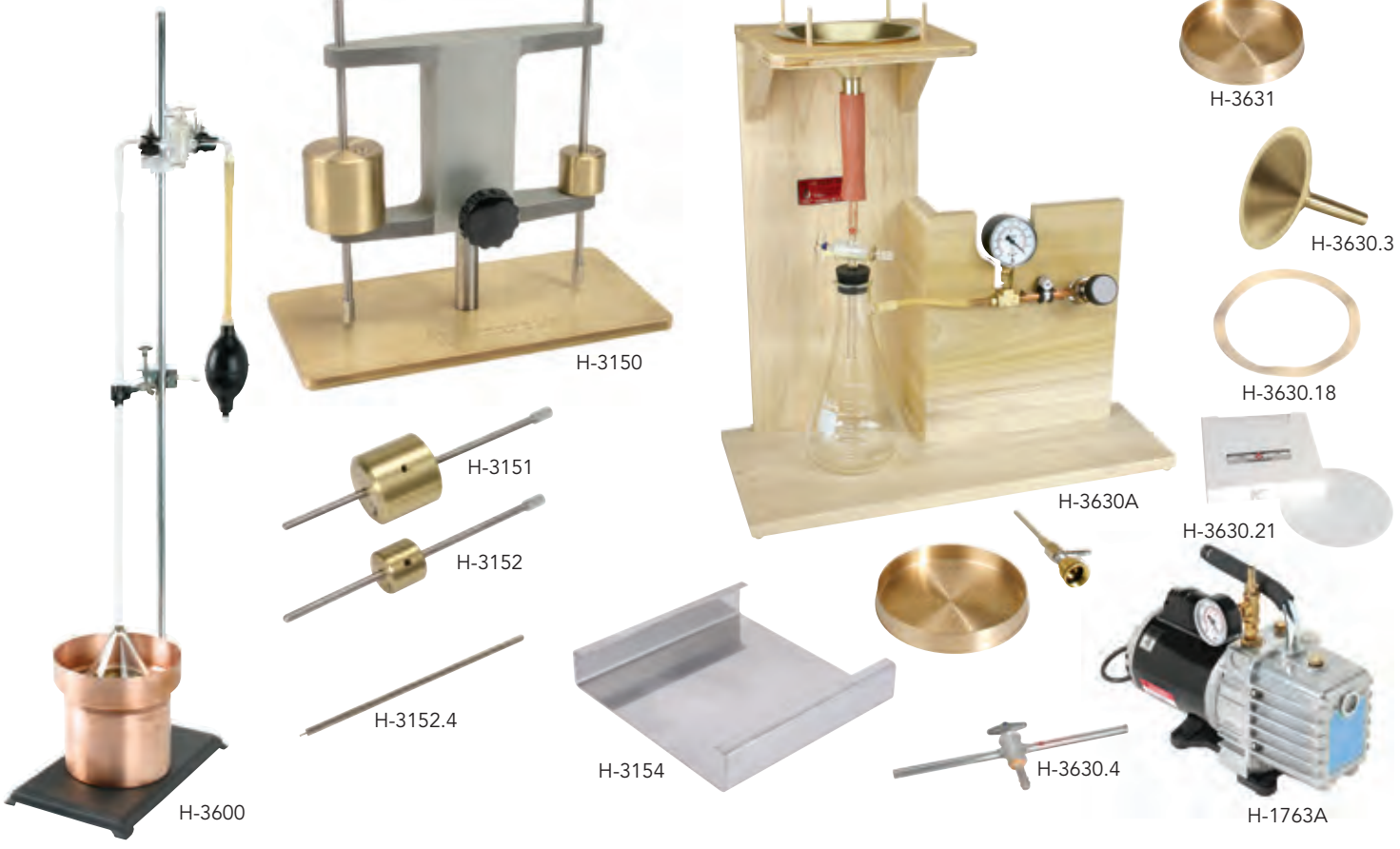
Weight, 3 lb

3 lb weight for use with micrometer bridge setup

Weight, 3 lb H-2905.3

Ship wt. 3lbs. (1.4kg)

Gillmore, Water Retention, Bleeding



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)

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. 1/4lb. (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 Apparatus Accessories and 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. 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



HC-2843



HC-2842



HC-2845



H-4790



H-2818HD



H-2818

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-2843

Ship wt. 1lbs. (0.45kg)

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)

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. It's 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/cm^3); 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)

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)


HUMBOLDT
5120
HUMBOLDT
HUMBOLDT
HUMBOLDT
HUMBOLDT
15.2

Asphalt



Marshall, Accessories 223
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Testing Equipment For Construction Materials

HUMBOLDT



Heavy-Duty, Auto Marshall Compactor
ASTM D6926, D5581, AASHTO T245, PTM705

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-1360A
H-1360AF


H-1360B
H-1360BF


H-1347M

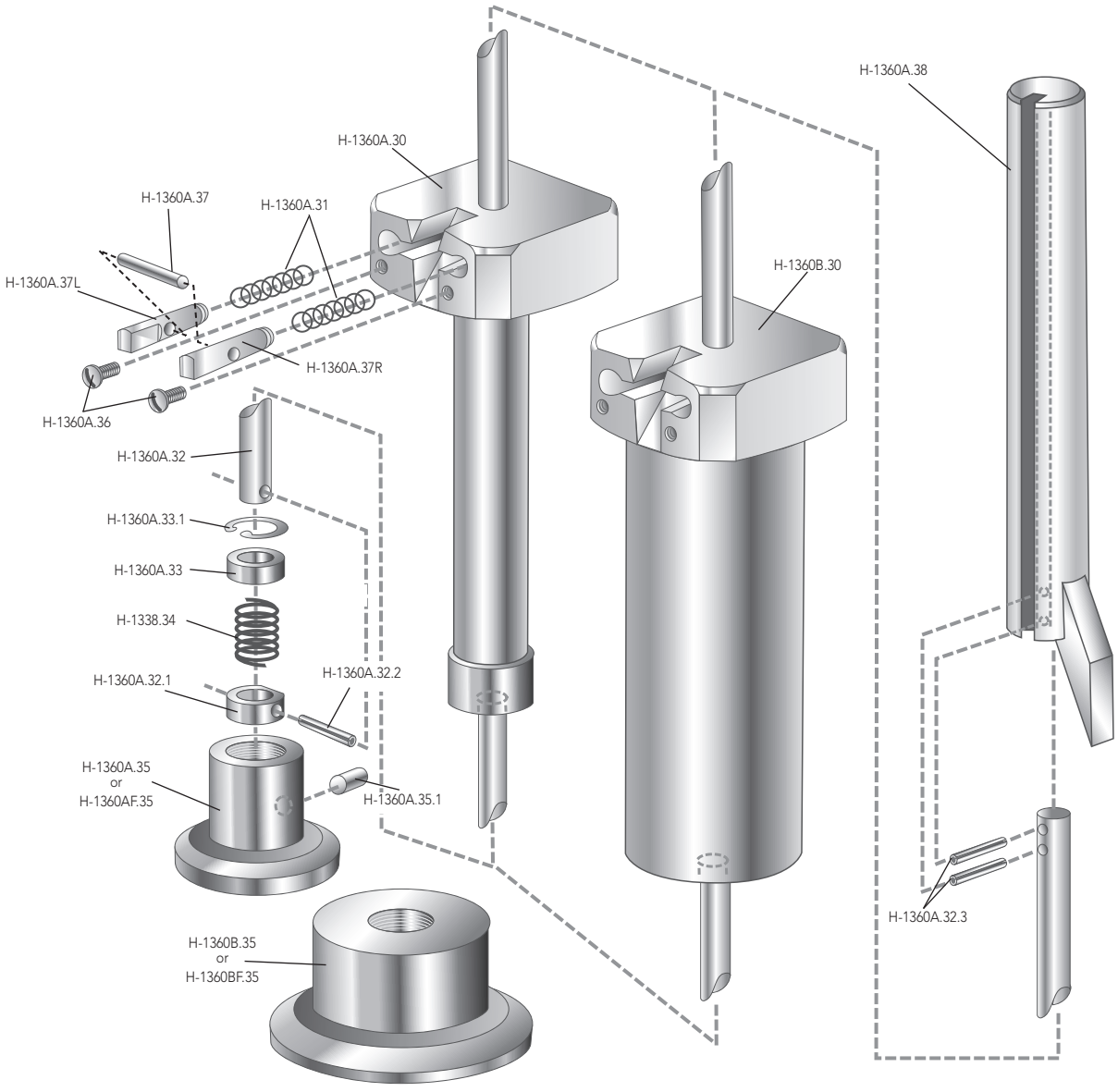

H-1334BA
H-1334BA.4F



Ovens and hotplates can be used to facilitate the heating of molds and hammers for better testing control. See page 251 for ovens and page 256 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-1347M
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-1336D


H-1346D


H-1356D

4" Automatic, Single Compactor with Stationary Base

ASTM D6926, AASHTO T245, PTM705

This compactor automatically compacts samples at a preset number of hammer blows 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-1336D
4" Single Compactor, 230V 60Hz	H-1336D.2F
4" Single Compactor, 230V 50Hz	H-1336D.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


H-1338A
H-1338B
H-1338C

H-1341A

H-1337

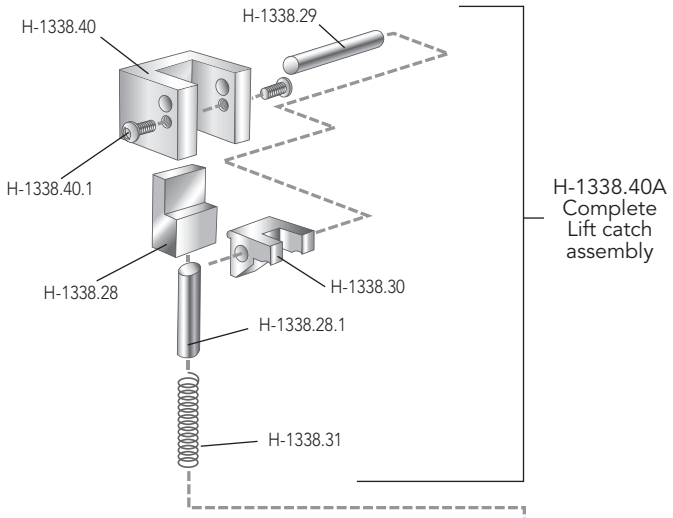

H-1347.3M
H-1347.2M
H-1347M


H-1334B
H-1334B.4F

To facilitate the heating of molds and hammers,
See page 251 for Ovens and page 256 for Hotplates.

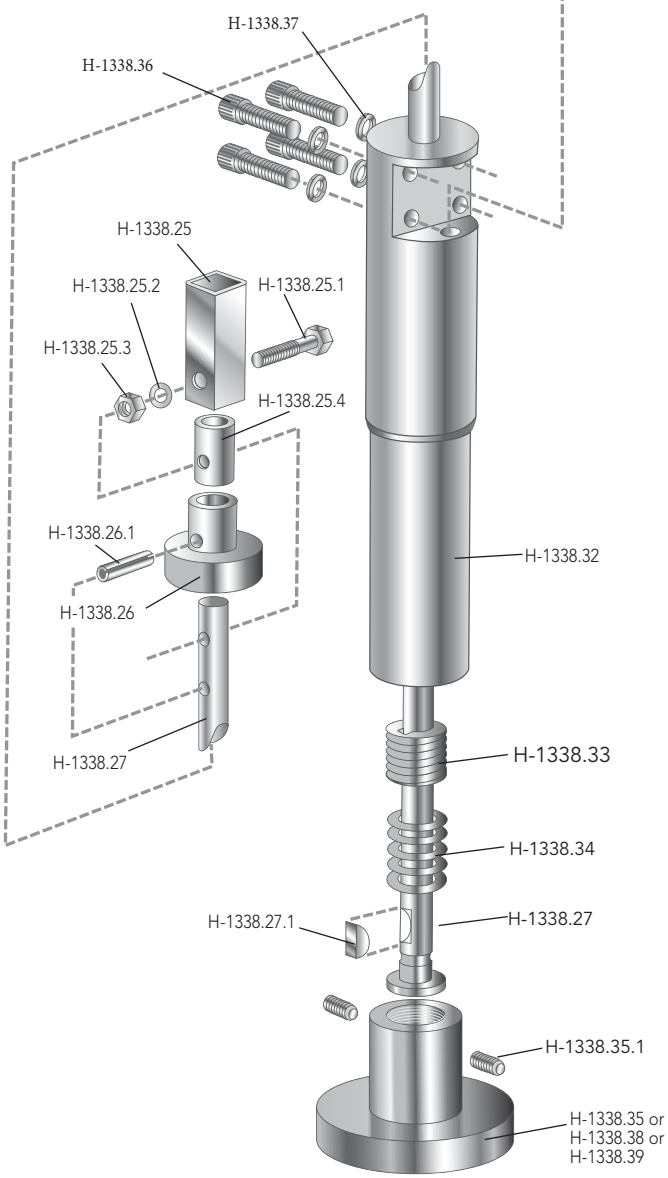
Lift Catch Assembly and Replacement Parts

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




H-1345


H-1340

H-1340G


H-1343


H-1347


H-1345.5

H-1345.6


H-1328A

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

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)



Ovens and hotplates can be used to facilitate the heating of molds and hammers for better testing control. See page 251 for ovens and page 256 for hotplates.


H-1367, H-1367MM


H-1361


H-1341A


H-1337, H-1337MM


H-1353A


H-1355


H-1341P
H-1361P


H-1348
H-1363


H-1331

Marshall Compaction Mold, 6" or 150mm
ASTM D6926, AASHTO T245

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, AASHTO T245

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, AASHTO T245

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, AASHTO T245

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

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

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

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)

Marshall and SCB Load Frames



HM-5030.3F

The HM-5030 Master Loader provides the ultimate solution for a lab looking to perform Marshall, Hveemand 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 with the aid of Humboldt's NEXT software, the Marshall software module and a computer, it can be automated to run tests and 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.

Humboldt MasterLoader Marshall Solution

ASTM D5581, D6926, D6931; AASHTO T245, T283; BS 598; EN12697-34

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

See pages 112-115 for more information on the HM-5030 Master Loader and its Stand-alone and Computer-controlled capabilities

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.

Load capacity	11000 lbf (50kN)
Speed range	0 - 3.0000 in/min. 0 - 75.0000 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)

Marshall, TSR, SCB Load Frame

ASTM D5581, D6926, D6931; AASHTO T245, T283; BS 598; EN12697-34

HM-5120 Loader has been specifically designed to handle Marshall, TSR and SCB applications. Its 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-5120 Loader can handle these applications with ease.

The HM-5120 is built around Humboldt's integral, 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. Adding the Marshal-specific Software Module allows you to better control your Marshall test procedure. The HM-5120 is sold as a Load Frame ONLY, refer to the recommended accessories chart for items needed to perform Marshall and TSR and SCB testing.



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 transfered to a computer for use with Humboldt's Next Software for report generation.

This machine can also be controlled from a computer using Humboldt's NEXT software. This software provides robust machine control, data acquisition and report generation. Because the HM-5120 is connected to your network, your computer can be placed in the your lab, in the next room or at a different location. Adding the Marshal-specific Software Module allows you to better control your Marshall test by guiding you through the specific process.

The HM-5120 is sold as a Load Frame ONLY, refer to the recommended accessories chart for items needed to perform Marshall and TSR and SCB testing.

Load capacity	11000 lbf (50kN)
Speed range	2 in/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. 5.0 amps

Marshall Load Frame, 110/220V 50/60 Hz **HM-5120.3F**

Shipping wt. 300 lb (136kg)

Humboldt's HM-5030 amd HM-5120 load frames are part of our Elite Series of load frames, which provide both stand-alone and computer control options. 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 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.

Stand-Alone 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
- Control both 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.

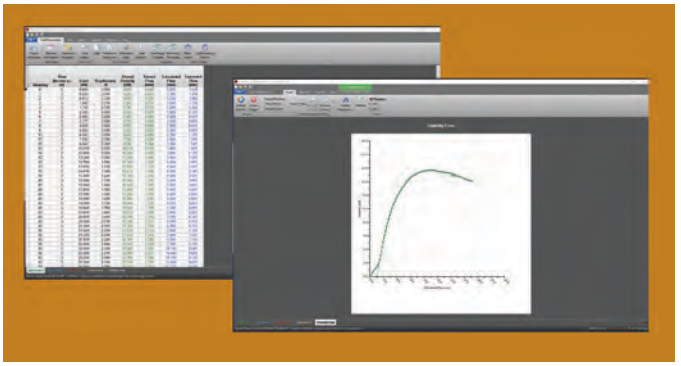
Computer Control

Humboldt's Next software is included with all Elite Series Load Frames. 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.

- 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 unlimited 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

HM-5005SW Marsahll Software Module



See page 94-95 for more information on Humboldt's NEXT Software.

- 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.

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; 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 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, calibration, 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 Marshall Software Module HM-5005SW

Download



Semi-Circular Bending setup shown on HM-5030

Recommended Marshall, TSR and SCB Accessories for use with HM-5030 and HM-5120 Load Frames

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 ONLY.
HM-4178BRT	Displacement transducer bracket
HM-2305BRT	Displacement transducer bracket Required for HM-5120 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

Marshall Load Frames



HM-2850



H-1339B



H-1335
Basic Marshall Test Set

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 .0001 to 2.2500 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	.0001 - 2.2500 in/min. 0.00254 - 57.1500 mm/min.
Platen Size / Travel	8" (203mm) / 3" (76mm)
Clearance, vertical	40" (1000mm)
Clearance, horiz.	15" (380mm)
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)

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).

Typical Setup for Marshall Testing

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

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)

Chart Recorder Accessory Kit

This kit is comprised of a H-1329LR chart recorder, an LVDT and a H-2300.100 load cell for converting a H-1339B Marshall compression machine into an automatic Marshall compression tester and recorder. Includes LVDT sensor, electronic load cell and plotter assembly.

Chart Recorder Kit, 120V 60Hz H-1329CK
Chart Recorder Kit, 220V 50Hz H-1329CK.5F

Ship wt. 18lbs. (8.2kg)

Digital Accessory Kit

Four-channel digital display for use with the H-1339. Includes: s-type 11,000 lbf (50kN) load cell; 0.4" (10mm) linear strain transducer; transducer bracket, and 4-channel miniLogger.

Digital Accessory Kit H-1324A.3F

Ship wt. 10lbs. (4.5kg)

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.

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 guide sleeve; (1) H-1347– pedestal for 4" hand compactor; (1) H-1348– 4" mold extractor, and (1) 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)



H-1342, H-1362
H-1342M



H-1349, H-1369
H-1349M, H-1369M



H-1351



H-4454.100



H-4454.100D



H-1344.2



H-1344

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)	

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 the 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, which 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.

Semi-Circular Bending (SCB) Head	H-1351
Ship wt. 25lbs. (11.3kg)	

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)	

Marshall Test Load Ring
ASTM E74

These calibrated load rings with dial gauges come with a unique serial numbered for positive identification. The dial gauges read in inches, but each load ring comes with a calibration chart showing lbf vs. deflection in inches, kN vs. deflection in millimeters and kN vs. deflection in inches for easy conversions. Units are calibrated in lbs. force every 20 lbs. from 0 to 1,000 lbs. and every 50 lbs. from 1,000 to 11,000 lbs. with adequate deflection to interpolate to 10 lbs., in kg force and kN. Comes with 3/4"-16 female, threaded mount.

11,000 lbf (4,550kgf, 50kN)	H-4454.100
5,500 lbf (2,500kgf, 25kN)	H-4454.050
Ship wt. 11lbs. (4.9kg)	

Marshall Test Digital Load Ring
ASTM E74

Calibrated load rings with digital indicators come with a unique serial numbered for positive identification. Each load rings comes with a calibration chart showing the relationship between deflection and pounds force for the individual ring. Units are calibrated in lbf every 20 lbs. from 0 to 1,000 lbs. and every 50 lbs. from 1,000 to 11,000 lbs. with adequate deflection to interpolate to 10 lbs., in kg force and kN. Comes with 3/4"-16 female, threaded mount.

11,000 lbf (4,550kgf, 50kN)	H-4454.100D
5,500 lbf (2,500kgf, 25kN)	H-4454.050D
Ship wt. 11lbs. (4.9kg)	

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)	

Water Baths


H-1394


H-1392, H-1390


H-1380

- 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 +/-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: 17 gallons (63.4L) 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


Typical Rice Test Setup


H-1750

H-1755A


H-1750

H-1751

Pycnometer Size Comparison.


H-1820


H-1749


H-12090


H-1754D

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 165 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. 4lbs. (1.8kg)

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)

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)

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)

Rice Test


H-1756.3F


H-1826.3F


H-1782



HA-1665


H-1753 shown in use with H-1782


H-4296A


H-4296

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-1756A 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 ±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)

Auto Rice Controller
ASTM D2041; AASHTO T209, T283

The AutoRice is an automatic control unit allowing laboratory technicians to conduct maximum specific gravity tests with the press of a button. Designed to accurately control and monitor the vacuum preessure, vacuum time and shaker vibration frequency, 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.

AutoRice Controller HA-1665
Ship wt. 25lbs. (11.4kg)

Digital Timer, Humboldt
Humboldt's portable digital timers automatically shuts off electrical equipment at a set time of up to 60 minutes or 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)


H-1762


H-1764


H-1770


H-1763A


H-1759


H-1758

H-1757


H-1766.2


H-1768.3


H-1766.3

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 condensible 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)

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 dru 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 regenerarted 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)

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)


H-3839


H-3843A


H-3842A


H-3841.1


H-3841.2

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 2 1.5" 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


H-3843AHW


H-3842HW

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

Extreme-duty whisks for previous models, H-3842 (Hobart A-120) and H-3843 (Hobart A-200) are available, please call.

Replacement parts for previous models, H-3842 (Hobart A-120) and H-3843 (Hobart A-200) are available, please call.


H-1690


H-1692


H-1690.2


H-1690.3


H-1692.9


H-4122


H-4122QF


H-1691


H-1690.1


H-1692.5


H-1692.8A


H-4121

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

Sample Buckets (25pk)
Use Funnel to significantly reduce the hopper size when reduction of smaller samples is desired.

Sample Buckets (25pk) H-4121

Shipping wt. 3lbs (1.4kg)

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-5100.3F

Specifications	
Maximum Load	Electronically limited to 3500lbf (15.5kN)
Load Transducer	Normally 87psi (600 kPa) Maximum 145psi (1000 kPa)
Actuator Stroke	1.2" (30mm)
Frequency	0 to 30 Hz
Electrical Supply	110/260V 50/60 Hz, 1 Ph
Compressed Air	100-145psi (7-10 bar) @ 600 L/min (21cfm)
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



HA-5105

Servo-Pneumatic Universal Testing Machine (15.5kN)
ASTM D7369, D4123, D3497, D7313; AASHTO TP31, TP62, TP79, T307; EN 12697 Annex A, B, C, D and E, EN 12697-44 SCB; NCHRP 1-28A,19, 9-29

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
- Double acting low friction actuator with integral stroke transducer
- Utilizes high performance ceramic spool servo-valve
- High quality stainless steel frame
- Accessories available to perform a range of standard and non standard test methods

Software:

- User friendly, intuitive and reliable Windows® software developed using LabVIEW™
- Standard test software available to meet specific EN, ASTM and AASHTO test methods
- 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 analysed by the user
- Utilities are included for transducer check, diagnostic routines and calibration

Software:

- User friendly, intuitive and reliable Windows® software developed using LabVIEW™
- Standard test software available to meet specific EN, ASTM and AASHTO test methods
- 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 importedinto a spreadsheet package to be analysed by the user
- Utilities are included for transducer check, diagnostic routines and calibration

15.5kN Univ. Testing Machine 115-260V 50/60Hz HA-5100.3F
Ship wt. 79 lbs. (36kg)

cDAC Advanced Data Acquisition System
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 , Servo. Integral SIL-4 safety relay to ensure the highes level of user safety. Universal input 110 to 264V 50/60Hz. 250W power supply.

- 20-bit resolution, 5kHz per channel
- will accept any voltage transducer in any channel using TEDS thermocouples
- 1024 data points per cycle
- up to 16 digital input and output channels
- Ethernet, USB,RS232 to PC communication

cDAC Advanced Data Acquistion HA-5105
Shipping wt. 20 lbs (9.1kg)

Specifications	
Maximum Load	Electronically limited to 5620lbf (25kN)
Load Transducer	Variable dependant on capacity
Actuator Stroke	2" (50mm)
Frequency	0 to 70 Hz
Electrical Supply	230V 60 Hz, 3 Ph 400V 50Hz, 3-Ph
Compressed Air	100-145psi (7-10 bar) @ 100 L/min (21cfm)
Cabinet Dimensions	40" x 52" x 95" (825 x 1300 x 2400mm)
Power Pack Dimensions	25" x 23" x 35" (630 x 580 x 890mm)
Working Space Required (WxDxH)	40" x 52" x 95" (825 x 1300 x 2400mm)
Desktop PC	Included



HA-5105



HA-5200.3F

Servo-Hydraulic Universal Testing Machine (25kN)
ASTM D7369, D4123, D3497, D7313; AASHTO TP31, TP62, TP79, T307; EN 12697 Annex A, B, C, D and E, EN 12697-44 SCB; NCHRP 1-28A,19, 9-29; INVE 749, 754

The Servo-Hydraulic Universal Testing Machine (CS-UTM-HYD) is a well-designed, inexpensive machine specifically developed for the testing of materials used in pavement construction.

A motorized, adjustable crosshead reduces the time between test setups. The programmable temperature cabinet provides the possibility to perform frequency/temperature sweeps. Accurate waveforms are digitally generated and applied by the actuator producing repeatable conditions that are simulative of those created by moving or static vehicles. The actuator is double-acting allowing both compressive and tensile forces to be applied. Various systems are available for the measurement of the modulus of unbound materials.

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
- Utilizes 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

Software:

- User friendly, intuitive and reliable Windows® software developed using LabVIEW™
- Standard test software available to meet specific EN, ASTM and AASHTO test methods
- 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 analysed by the user
- Utilities are included for transducer check, diagnostic routines and calibration

25kN Univ. Testing Machine, 400V 50Hz HA-5200.7F
Ship wt. 79 lbs. (36kg)

cDAC Advanced Data Acquisition System
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 , Servo. Integral SIL-4 safety relay to ensure the highes level of user safety. Universal input 110 to 264V 50/60Hz. 250W power supply.

- 20-bit resolution, 5kHz per channel
- will accept any voltage transducer in any channel using TEDS thermocouples
- 1024 data points per cycle
- up to 16 digital input and output channels
- Ethernet, USB,RS232 to PC communication

cDAC Advanced Data Acquistion HA-5105
Shipping wt. 20 lbs (9.1kg)

Digital Controller, Accessories



HA-5105


HA-5110, HA-5110


HA-5112

cDAC Controller and Data Acquisition

cDAC is a digital data acquisition and control unit, which when used with DIMENSION software, gives you the power to perform the most demanding of tests with your materials testing equipment. Both are designed with the ease of use and reliability required for standard testing and the flexibiilty and advace ccapabilities required for research.

A Congurable design to meet your needs with up to 7 modules (max. 4 of each type) from the fol-lowing per cDAC unit: Interface, Acquisition, Dig-ital, Servo. Integral SIL-4 safety relay to ensure the highest level of user safety. Universal input (110 to 264)VAC, (47 to 63)Hz,250W power supply.

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 Microcontroller 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 (±10V and (0 to 10V) and Current (±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 hig-performance 32-bit RISC microcontroller

Acquisition Module

- Any combination of up to 8 sensors per module (load cells, LVDTs, RTDs, strain gauge bridges, pressure transducers, and many, 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 ampliers with the following gain steps: 1/8, 1/4, ½, 1, 2, 4, 8, 16, 32, 64, 128
- (0 to 10)V, 24V, and (0 to 20)mA power supplies for sensors
- Texas instruments TMS320DSP digital signal processor

Dimension Features

- Transducer database to store and manage your sensors
- Standard test library for quick and reliable testing to ASTM, AASHTO, CEN Standards
- Configurable waveform and summary data capture allows total control over the information gathered during a test
- Profile builder gives ultimate exibility to design and store custom testing regimes
- Test screen shows a graphical view of all connected transducers and calculated values in real time

cDAC Controller and Data Acquisition — HA-5105
Shipping wt. 13lbs (6kg)

Triaxial System T307

AASHTO T307

Use the HA-5110 triaxial system to perform T307 on 8" (200mm) and 4" (100mm) specimens of unbound material. It can be used to perform EN12697-25B on 4" (100mm) specimens if ordered with steel platens.

For T307+ use the HA-5111 for 12" (300mm) and 6" (150mm), 8" (200mm) and 4" (100mm) specimens of unbound material. It can be used for EN12697-25B if ordered with steel platens.

Triaxial System T307 — HA-5110
Triaxial System T307+ — HA-5111
Shipping wt. 15lbs (7kg)

Resilient Modulus Test System

ASTM D4123; AASHTO TP31

Resilient modulus test system to perfrom AASHTO TP31 and ASTM D4123. Test software to meet the latest standard specifications.

Resilient Modulus Test System — HA-5112
Shipping wt. 10lbs (4.5kg)

Resilient Modulus Test System

ASTM D7369

Resilient modulus test system to perfrom ASTM D7369. Test software to meet the latest standard specifications.

Resilient Modulus Test System — HA-5113
Shipping wt. 10lbs (4.5kg)



HA-5114



HA-5115



HA-5117



HA-5118



HA-5119



HA-5121



HA-5122



HA-5120

Simple Performance Test

AASHTO TP62

Test system to perform dynamic modulus according to AASHTO TP62 Simple Performace Test. Test software to meet the latest standard specifications.

Simple Performance Tes HA-5114
Shipping wt. 15lbs (7kg)

Indirect Tensile Creep

ASTM D6931

Indirect tensile creep is determined by applying a static load of fixed magnitude along the diametral axis of a specimen. The horizontal and vertical deformations measured near the center of the specimen are used to calculate a tensile creep compliance as a function of time. It can also be used for other tests, such as ASTM D6931. Only available with hydraulic option.

Indirect Tensile Creep HA-5115
Shipping wt. 10.2lbs (4.6kg)

Indirect Tensile Modulus and Fatigue

EN 12697-26 (C & E)

Indirect tensile stiffnes modulus and fatigue measurement system EN 12697-26 (Annex C and E). Test software to meet latest standard specifications.

Indirect Tensile Modulus & Fatigue HA-5116
Shipping wt. 25lbs (11.3kg)

Dynamic and Static Creep

EN 12697-25 (A)

Dynamic and static creep measurement system to perform EN 12697-25 (Method A) and DD226. Test software to meet latest standard specifications.

Dynamic and Static Creep HA-5117
Shipping wt. 6lbs (2.7kg)

Direct Compression and Tension

EN 12697-26 (D & E)

Direct compression and tension measurement system to perform EN 12697-26 Annex D and E. Test software to meet latest standard specifications.

Direct Compression and Tension HA-5118
Shipping wt. 5lbs (2.3kg)

Dynamic and Static Creep Flow

EN 12697-25 (A)

Dynamic and static creep (flow) measurement system with confining stress to perform EN 12697-25 Method B Test software to meet latest standard specifications. Note: this item can be used to perform EN 12697-25 Method A if a 3.8" (96mm) top platen is ordered. Software is also available to perform Flow Time and Flow Number.

Dynamic and Static Creep Flow HA-5119
Shipping wt. 515lbs (7kg)

Tack Coat Quality Tester

Proposed standard method of test for determining the tack coat quality of asphalt pavement in the field or laboratory.

Tack Coat Quality Tester HA-5121
Shipping wt. 7lbs (3.2kg)

Asphalt Beam Fatigue Test Fixture

Asphalt Beam Fatigue Testing Fixture is used to determine the fatigue life of asphalt aggregate mixtures. Asphalt beam fatigue testing fixture is proven to meet SHRP M009 and UC Berkeley specifications for fatigue life testing of asphalt aggregate mixtures.

Asphalt Beam Fatigue Test Fixture HA-5122
Shipping wt. 15lbs (7kg)

Precision Unbound Material Analyzer

The Precision Unbound Material Analyzer (PUMA) is a new type of laboratory test equipment designed to fill the gap between expensive and complex laboratory tools, such as triaxial cells, and more empirical methods, such as the California Bearing Ratio test. It is designed to generate realistic values of modulus for use in road pavement design. The PUMA can be used to test unbound, hydraulically bound and asphaltic materials. It has been designed as a low cost, easy-to-use practical tool, but one that is capable of generating scientifically meaningful data (Modulus and Resistance to Permanent Deformation), for use in road pavement design. It can be used to test specimens made from granular material, soil or lightly stabilized material etc. with a maximum particle size of 1.24" (31.5mm).

The Puma is proposed as a direct equivalent to the Springbox with the advantage that initial stress conditions can be accurately controlled. It is a simple test, suited to generic specification, which holds the promise of increased confidence in pavement foundation design, particularly in cases where favorable weather conditions during construction result in unrepresentatively high Dynamic Plat Test (DPT) values or in cases where stabilized soils or cold-mix asphalt are employed.horizontal, and the number of load cycles if desired.

Precision Unbound Material Analyzer HA-5120
Shipping wt. 10lbs (4.55kg)

Hamburg Wheel Tracker



HA-5300.4F

Hamburg Wet and Dry Wheel Tracker

AASHTO T324; EN 12697-22; Various State standards

The Hamburg (Immersion) wheel tracking test is used to evaluate the resistance to rutting and moisture susceptibility of asphalt mixtures. AASHTO-T324 is the generally referred to test standard, although many states modify this procedure to meet their specific requirements. Outside of the U.S. both AASHTO-T234 and EN12697-22 are followed.

What differentiates the Hamburg from other wheel tracking methods is the use of water to condition the temperature of the specimens rather than air. It is believed that the water, in some tests, strips the aggregate which creates a tertiary phase that is distinct from the permanent deformation which occurs in dry wheel tracking tests. The use of stainless steel wheels on a weighted cantilevered arm, in conjunction with water has led some people to refer to Hamburg wheel tracking as a 'torture test'. Certainly it is the case that less well constructed machines will shake to pieces due to the aggressive nature of the test. The Cox Hamburg is manufactured in California from thick solid stainless steel. Painted steel panels and parts are not an option for the Hamburg test. Our Hamburg is built to last decades not just a couple of years, which is why it comes with a five year warranty.

A rigid frame construction is also essential for accurate results. Cheaply produced machines will flex machine and quality of test results go hand in

hand. and vibrate with deeper rut depths. Quality

The Cox Hamburg will output more precise and accurate results than any other Hamburg machine – guaranteed.

Specifications	
Wheel Speed	Variable between 15 and 30 cycles (30 to 60 passes) per minute
Wheel Load	158 ± 1.0lbf (705 ± 4.5N)
Variable Speed Range	15 to 30 RPM
Slab Thickness	2-4" (50 - 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, 1 Ph (single phase with a neutral and ground)
Dimension (WxDxH)	57" x 55" x 50" (1430 x 1380 x 1260mm)
Desktop PC	Included

Features:

- Full super rigid stainless steel construction
- The most rugged, precise and accurate Hamburg wheel tracker available
- Auto arm lift for fully automated test procedure and user safety
- True sinusoidal motion
- Mechanical recirculating water bath for accurate control of the water temperature to better than ±0.5C
- Two displacement transducers with a resolution of 0.01mm, positioned in line with the wheel to ensure accurate measurement of the rut
- Continuous rut and rut profile measurement throughout the test
- Analysis software to automatically pick the inflection point and analyse the output data
- Air hood option for dry tests
- Stainless steel and rubber wheels available
- Built-in timer to start tests automatically
- AASHTO T324, a variety of DOT methods and EN12697-22
- Anytime remote access support
- Quality build in the USA

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

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

Hamburg Wheel Tracker, 240V 50/60Hz **HA-5300.4F**

Ship wt. 1520lbs. (687kg)

Accessories	Model
*Stainless steel molds 12.6" x 10.2" x 2.4" (320 x 260 x 60mm)	HA-5300.1
Stainless Steel molds: 12.6" x 10.2" x 4" (320 x260x 100mm) deep	HA-5300.2
Stainless steel molds 12" x 12" x 2" (305 x 305 x 50mm)	HA-5300.3
Stainless steel molds 12" x 12" x 4" (305 x 305 x 100mm)	HA-5300.4
*Plastic mold for double cores 6" tested simultaneously to be inserted in stainless steel mold 12.6" x 10.2" x 4" (320 x 320 x 260mm)	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
Stainless steel base and working parts option	HA-5300.9
Guarding, powder coated steel	HA-5300.10
Guarding, stainless steel	HA-5300.11
Chiller assembly	HA-5300.12
Air Heating hood	HA-5300.13

*Included with machine– 2 of each.

Specifications	
Maximum Roller Load	6750 lbf (30kN) over 12" (305mm) roll width
Trolley Travel	±6" (150mm) or ±8"(200mm)
Speed	Variable up to 10 cycles/min.
Slab Thickness	1.6 to 5.3" (40 to 135mm)
Electrical Supply	110V 60 Hz, 1 Ph 240V 50Hz, 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



HA-5700

Hydraulic Compact Steel Roller Compactor
ASTM D04 - WK34713; EN 12697-33 STEEL ROLLER

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:

- Steel wheeled roller segments
- Solid machine frame
- Optional heated head for reducing mixture sticking to roller during compaction
- Model for compaction of 320 x 260mm (12.6 x 10.2 inch) and 305 x 400 mm (12 x 15.75 inch) slabs
- Slab depth from 40 to 135 mm (1.6 to 5.3 inch)
- 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 & Sons Wheel Trackers so that compacted slabs can be wheel-tracked without de-molding
- Maximum compaction load of 30kN (6750lbf) per 305 mm (12 inch) roll width (equivalent to largest on-site static rollers)
- Speed control
- HMI for operator selection of number of passes
- Vibrating roller option with adjustable frequency to simulate on-site vibratory rollersdard and non-standard test methods

Hydraulic Compact Steel Roller Compactor HA-5700
Hydraulic Compact Steel Roller Compactor HA-5700.5F

Ship wt. 79 lbs. (36kg)

Accessories	Model
Steel and aluminum quick release mold for roller compactor or wheel tracker, 12" x 15.75" x 2" (305 x 400 x 50mm) deep	HA-5700.3
Steel and aluminum quick release mold for roller compactor or wheel tracker, 12" x 15.75" x 4" (305 x 400 x 100mm) deep	HA-5700.4

Beam Bending Test



HA-5500.3F

Specifications	
Force Transducer	2250lbf (10kN)
Specimen Transducer Range	±0.09" (3 x ±2.5mm)
Actuator Stroke	0.4" (10mm)
Frequency	0.1 to 60 Hz
Electrical Supply	400V 50Hz, 3 Ph
Compressed Air	100-145psi (7-10 bar) @ 100 L/min (3.5cfm)
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 CRT-LH4PT-BB 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

CRT-LH4PT-BB 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.

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
- Utilises Star servo valve with "Sapphire Technology"
- Unique, three-transducer, on-specimen deflection measurement system
- 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
- Supplied with certification of a UKAS-accredited calibraton
- Covered for noise reduction

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, Hydraulic Four-Point Bending Beam,

400V 50Hz, 3PH	HA-5500.7F.3
208-230V 60Hz, 3PH	HA-5500.2F.3

Ship wt. 1435 lbs. (650kg)

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

Specifications	
Force Transducer	2248lbf (10kN)
Specimen Transducer Range	± 0.04" (1mm)
Actuator Stroke	0.4" (10mm)
Frequency	0.1 to 30 Hz
Electrical Supply	110/260V 50/60Hz, 1 Ph
Compressed Air	100-145psi (7-10 bar) @ 600 L/min (21cfm)
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



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 CS-SA4PT-BB 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 inch) centers (the distance between the outer clamps is 335.6mm (14 inches) according to AASHTO specifications but the height and width of the beam can be varied).

Features:

- Frequency range 0.1 to 30Hz[1]
- Low cost pneumatic stand alone four point bending machine
- Utilizes a low-friction actuator and high performance ceramic spool servo-valve
- On-specimen measurement system removes errors due to frame flexure
- Accepts 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

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

Four-Point Bending Beam, 110/220V 50/60Hz HA-5400.3F

Ship wt. 79 lbs. (36kg)

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


HA-5000

Specifications	
Speed	Normally 30 rpm
Stress	Normally 87psi (600 kPa) Maximum 145psi (1000 kPa)
Actuator Stroke	9.85" (250mm)
Internal Angle of Gyration	0.2 to > 2°
Electrical Supply	115V +-10% 50/60 Hz 230V +-10% 50/60 Hz
Specimen Ø mm (inch)	6 " (150mm) and 4 (100mm)
Compressed Air	100-145psi (7-10 bar) @ 350 L/min (12.5cfm)
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

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 (6 and 4inch) 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 (especially important for rubberized asphalt)
- 150 mm and 100 mm (6 and 4 inch) internal Ø molds can be tested without changing parts
- Cold mix (emulsion) materials can be compacted and the expelled fluid collected
- Ethernet and multiple USB connections for data acquisition and control system
- User friendly LabVIEW™ software displays results in real time
- Machine calibrated with traceable equipment
- Option for mold up to 300 mm (11.8 inch) high
- Manufactured in California

Software:

- User friendly, intuitive and reliable Windows® software developed using LabVIEW™
- 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 & 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, 115V 50/60Hz **HA-5000**
Superpave Gyratory, 230V 50/60Hz **HA-5000.4F**

Ship wt. 1120 lbs. (508kg)

Accessories Included	Model
Specimen Extruder, Manual (1)	HA-5000.1
6" (150mm) Internal Ø mold & platens with specimen temperature measurement (1)	HA-5000.2
6" (150mm) Internal Ø mold & platens (1)	HA-5000.3
Shear force display	HA-5000.13
Specimen Temperature Measurement	HA-5000.14
6" (150mm) circle filter papers (100pk)	HA-5000.15

Accessories	Model
4" (100mm) Internal Ø mold & platens, slotted for emulsion mix	HA-5000.4
4" (100mm) Internal Ø mold & platens, slotted– includes features for specimen temperature measurement	HA-5000.5
6" (150mm) Internal Ø mold & platens, slotted for emulsion mix	HA-5000.6
4" (100mm) Internal Ø mold & platens (1)	HA-5000.8
4" (100mm) Split Mold	HA-5000.9
6" (150mm) Spacer to compact 2.5" (63mm) height on Gyratory	HA-5000.10
Spacer, 100mm to compact 63mm height on HA-5000	HA-5000.11
Calibration kit for internal angle lead	HA-5000.12
Specimen Extruder, Automatic	HA-5000.17
4" (100mm) Circle Filter Paper (100 pk)	HA-5000.16

Specifications	
Verticle Load (150mm)	10 to 1000 kPa (1000 kPa–10 bar) (800 kPa–8 bar) (700 kPa–7 bar)
Verticle Load (100mm)	23 to 1500 kPa with 7 bar compressor
Vertical Load Control	Auto electronic system
Gyration 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, 4" (100mm)	HA-5950.1
Specimen Cylinder, 6" (150mm)	HA-5950.2
Cylinder w/Holes, 4" (100mm)	HA-5950.3
Cylinder w/Holes, 6" (150mm)	HA-5950.4
Penetration Pistion, 4" (100mm)	HA-5950.5
Penetration Pistion, 6" (150mm)	HA-5950.6
Metallic Disk, 4" (100mm)	HA-5950.7
Metallic Disk, 6" (150mm)	HA-5950.8
Filter Paper, 4" (100mm)	HA-5950.9
Filter Paper, 6" (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



HA-5950.14



HA-5950.1, HA-5950.2



HA-5950.3, HA-5950.4



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 rspecified by ASTM, AASHTO Specifications.

Superpave Gyratory, 230V 50/60Hz **HA-5950.4F**

Ship wt. 529lbs. (240kg)

Overlay Tester



HA-5600

Overlay Tester

ASTM WK26816; CS-TOT

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 (CS-TOT) 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 CS-TOT it is possible to characterize both the crack initiation and crack propagation properties of asphalt mixtures. Cox & Sons has developed the CS-TOT, which is a dedicated, state-of-the-art piece of equipment for carrying out this test.

Features:

- Dedicated no compromise Texas Overlay machine
- Designed according to the proposed ASTM
- Integral surface-mounted, touch-screen control
- Double GSF cold rolled container slides for ultra accurate inline sample deformation
- Intelligently designed specimen gluing and "zero stress" carrying frame
- Fitted with high performance hydraulic actuator and powerpack
- Ergonomically designed for easy operation

Overlay Tester, 120V 60Hz	HA-5600
Overlay Tester, 240V 50Hz	HA-5600.5F

Ship wt. 1102 lbs. (500kg)

Accessories	Model
Disc-shaped, compact tension fixtures	HA-5600.1
Semi-circular bending * (-5 °C to + 40 °C)	HA-5600.2
"Zero Stress" carrying frame to align the two base plates and fix the specimen prior to testing with specimen alignment	HA-5600.3
0.25" (6.25 mm) spacer bar for plate separation and alignment	HA-5600.4
10 lb (4.5kg) 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

Specifications	
Measurement Interval	0.01
Waveform Type	Cyclic triangular and constant displacement or a combination
Maximum Displacement	0.025 to 0.2 (0.6 to 5.1mm)
Resolution of Displacement Measurment	0.00004" (1 µm)
Control Loop Rate	>1000 Hz
Load Cell Capacity	5500 lb (25kN)
Load Cell Accuracy	0.25 %FS
Cycle Time	5 to 1000 s
Cycle Time Measurement Resolution	0.1%
Temperature Control Range	23 to 104°F (-5 to 40°C)
Temperature Control Accuracy	±0.9°F (0.5°C)
Ambient Temperature Range	59 to 86°F (15 to 30°C)
Test End Conditions	(0 to 100)% load reduction and/or (0 to 10000) cycles
Specimen Dims Length: Height: Width:	5.9 ± 0.08" (150 ± 2mm) 1.5 to 2 ± 0.02" (38 to 50 ± 0.5mm) 3" (76mm)
Plate Dims Length: Height (Optional): Width:	11.8" (300mm) 0.51 or 0.75" (13 or 19mm) 5.9" (150mm)
Base Plate Material	Stainless steel
Base Plate Hardness (Brinell)	95 (Not lower than that of 6061-T6 aluminum)
Plate Groove Depth x Width	0.059 x 0.051" (1.5 x 1.3mm)
Plate Groove Separation	0.25" (6.35mm)
Initial Separation of Plates	0.079" (2mm)
Vertical movement of sample (% of crack opening)	<3
Dimensions (WxDxH)	62" x 25" x 43" (1580 x 650 x 1100mm)

H-1640B.4F





H-1641T

Pressure Aging Vessel (PAV3), 230V 50/60Hz
ASTM D6521-05; AASHTO R280-6; 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, benchtop 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 ± 0.1°C. Temperature uniformity is ± 0.5°C. Pressurization is programmable from 1 hour to 99 hours. This enables AASHTO R28, ASTM D5621, 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 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

Vacuum Degassing Oven (VDO)
ASTM D6521-05; AASHTO R28-06

The vacuum degassing oven (VDO) 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 ±1.0kPa (25.5Hg). The network-ready 7in (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 ±5°C. Soak and degass 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" x16" x12" (610 x 406 x 304mm).



H-1642



H-1642T

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

Specifications

Description	Model
Operating pressure	15±1.0 kPa (25.5Hg)
Temperature range	Ambient to 200°C
Temp. resolution	0.1° C
Accuracy	± 5° 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) 12 (pk)	H-1641T.1
Sample container, 4 oz. (118ml) 12 (pk)	H-1641T.6
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

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 ±2mm 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.

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 50Hz H-1642.5F
Shipping wt. 520 lbs (235.8kg)

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 -400C to 250C temperature range is effciently 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


H-30069.2F

H-30068.2F


H-30068.6

include: Deflection Plot, Load Plot, Bath Temperature, Stirrer Speed, Specimen size, Testing Times, Load, and Testing Company.

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 efifciently 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 n 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 e cient data input.

BBR3 Touch, 120V 60Hz H-1642T
BBR3 Touch, 230V 50Hz H-1642T.5F
Shipping wt. 250 lbs (115kg)

H-1641T VDO 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

Rolling Thin Film Oven

ASTM D2872; AASHTO T240; EN 12591;CTM 346

The Rolling Thin Film Oven (RFTO) 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 ±1°F at 325°F (±0.5°C at163°C).

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 RFTO 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 oven includes a 200 to 14,000 ml/min flow meter, moisture meter, 0 to 100 psi air pressure gauge with regulator, rotating (15rpm) test rack and eight glass specimen jars. Overall dimensions 40"W x 36"H x 26"D (1016 x 3292 x 660mm). A clean, dry compressed air source is required for oven operation.

Rolling Thin Film Oven, 208-230V 60Hz H-30068.2F
Rolling Thin Film Oven, 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 200°C (390°F)
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

Lab stand with wheels	H-30068.6
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 flowmeter	H-30068.9
ASTM 13C Thermometer	H-2610.13C
Additional specimen bottles	H-30068.12
Oven Tongs	H-30068.1

Bitumen Testing



H-1637.3F



H-1631



HA-1635

Rotational Viscometer and Rheometer
ASTM D4402; AASHTO T316

The Fungilab Master Series Expert L range rotational viscometer and Thermosphere with a precison-temperature controller provide an excellent solution for those looking for SHRP asphalt binder testing equipment specifically designed to meet the requirements of AASHTO T316/ASTM D4402 high-temperature test methods. The H-1637 Master Series Expert provides a measuring range of 20-6,000,000 cP with 54 speeds in a range from 0.01 to 200 rpm. A graphic display delivers clear data readings and an intuitive full-touch keypad provides efficient data selection. A USB connection allows for data transfer to a PC Excel format. The thermosphere features temperature control to 300°C with 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.

Viscometer/Thermosphere includes: TL5 spindle, alignment bracket, thermocontainer with safety guard and insulating cap, extracting tools and temperature controller.

Rotational Viscometer, 100/240V 50/60Hz H-1637.3F
Shipping wt. 120 lbs (54.4kg)

Viscometer/Rheometer Accessories and Parts

Thermosphere chambers, 100pk.	H-1637.1
Thermosphere chambers, 50pk.	H-1637.2
Spindle (TL5)	H-1637.3
Spindle (TL6)	H-1637.4
Spindle (TL7)	H-1637.5
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

Loss-on-Heat Thin Film Oven
ASTM D6, D1754; AASHTO T47, T179; BS2000

This dual-purpose 16ft^3 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 are: 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 50Hz H-1631.5F
Shipping wt. 300 lbs (136kg)

Loss-On-Heat Oven Accessories

Sample container, ASTM D6	H-1631.1
Thin film oven pan, stainless steel for ASTM D1754	H-1540

Dynamic Shear Rheometer
ASTM D7175; AASHTO MP1, R29; T315

The Dynamic Shear Rheometer (DSR) has been specifically designed to satisfy the demands of high throughput grade testing of Asphalt binders (bitumen), to AASHTO (American Association of State Highway and Transportation Officials) industry standards.

The DSR asphalt rheometer is proven as the benchmark system for Quality Control testing to industry standards in regulated markets worldwide.

Developed in close association with industry researchers to meet all instrument criteria and test protocols of AASHTO (American Association of State Highway and Transportation Officials) standards. Compact, integrated unit designed specifically for ease of use and robustness in high throughput Asphalt binder (bitumen) test enviroments. Air bearing and mechanical bearing options to provide robust and cost-effective measurement platforms for any industrial laboratory or remote field testing location.

Integrated fluid immersion cell specifically based on patented principle for temperature control of highly thermally-sensitive asphalt or bitumen samples. Rapid thermal equilibration and elimination of thermal gradients in the sample - essential for consistent and reliable data, and optimized sample throughput. Excellent temperature stability and accuracy, with a resolution of ± 0.01°C. Rapid, robust manual gap set, with pre-set gaps for AASHTO tests for simplicity of use. Active thermal mode to ensure constant gap is maintained for all temperature test points. Plate measuring systems (both upper and lower plates) designed to comply with industry standards (AASHTO). Dedicated AASHTO specification QC software package (TruGrade) available

Dynamic Shear Rheometer, 120V 60Hz HA-1635
Dynamic Shear Rheometer, 220V 50Hz HA-1635.5F
Shipping wt. 240lbs (109kg)



F85930-33
F85938



AY1087X1



H-30145E



H-1304

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)

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

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 anderol oil.

Ignition Furnace Accessory Package — AY1087X1
Shipping wt. 75 lbs (34kg)

Heavy-Duty Lab Bench Oven

ASTM D6925

Forced draft oven capable of maintaining 437°F (225°C), more than adequate for both short-term aging of asphalt samples and heating aggregates, asphalt binders and equipment for use in ASTM D6925. The .7ft3 (198L) capacity provides ample room for all applications. The oven features a calibrated dial-type temperature controller (model H-30145) or a digital PID microprocessor temperature controller (model H-30145E). These 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).

Dimensions are: 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 Oven, 120V 60Hz — H-30145
Lab Bench Oven, 120V 60Hz — H-30145E
Lab Bench Oven, 230V 50/60Hz — H-30145.4F
Lab Bench Oven, 230V 50/60Hz — H-30145E.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

Rhoma-Sol™ Specialty Emulsifier

Spray-on solution used in the removal of asphalt and tack oil from tessting, 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)

See page: 303-307 for more bench oven choices, as well as accessories. See page 320 for gloves for use with these ovens.

Ductility





Interior of HA-1068 showing test molds, screw drive and disengage lever.

Elite Series Automated Ductilometer

ASTM D113, D5892, D6084,

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 carraige 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.

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 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.

Computer Control

Humboldt's Next software is included with the HA-1068 ductility machine. This software provides robust machine control, calibration, data acquisi-tion and report generation for those using a com-puter 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.

The HA-1068 Ductilometer is available with or without a circulating temperature controller. The temperature controller provides a solid-state, thermostatically controlled bath and circulator to maintain water temperature within a ±0.9°F (±0.5°C). The termperature 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 Control-ler 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 ± 0.9°F (± 0.5°C). Tem-perature 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)	



Interior of HA-1060 showing test molds, screw drive and disengage lever.



Interior of HA-1060 showing force determination transducer set up.



H-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, while also providing the ability to control the machine from a networked computer or just port data from the controller to a networked computer or by USB

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 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 carraige 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 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.

Computer Control

Humboldt's Next software is included with the HA-1060 Ductilometer. This software provides robust machine control, calibration, data acquisi-tion and report generation for those using a com-puter 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.

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 **H-1060.4F**
Shipping wt. 1066 lbs (484kg)

Ductility



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 ± 0.18°F (± 0.1°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

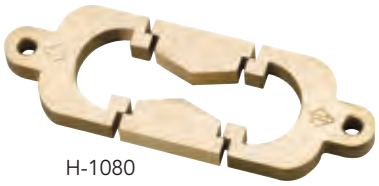
Shipping wt. 200 lbs (90.7kg)

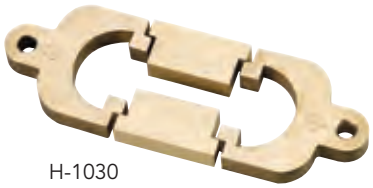
Circulating Temperature Controller

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 ± 0.9°F (± 0.5°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).

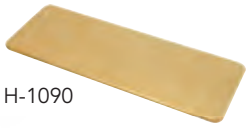
Circulating Temp.Control, 120V 60Hz	H-1068CB
Circulating Temp.Control, 220V 60Hz	H-1068CB.2F
Circulating Temp.Control, 220V 50Hz	H-1068CB.5F

Shipping wt. 80 lbs (36.2kg)

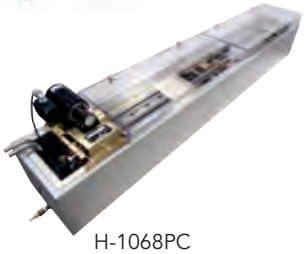

H-1080


H-1030


H-1090.3


H-1090


H-1068.100


H-1068PC


HA-1061


HA-1062


HA-1063

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 pieces, designed to 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)

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 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 accomodate 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)

Force Determination Kit for 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 133 for more information.

Force Determination Kit HA-1063
Shipping wt. 30 lbs (13.6kg)

Penetrometers


H-1200


H-1240


H-1240D


H-1250


H-1252

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)

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

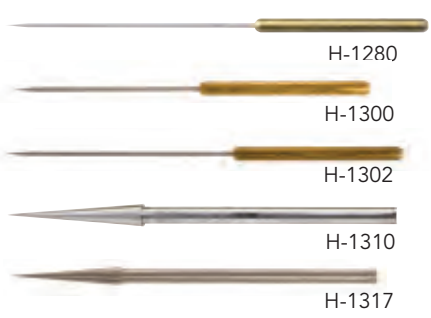
ASTM D5

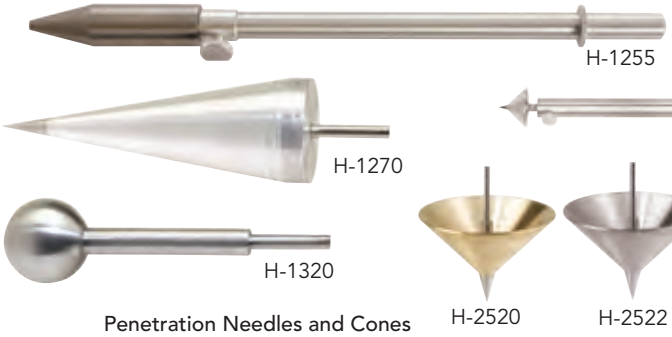
Plastic transfer dish has flat bottom, straight sides and metal centering lugs with magnet in the bottom. Size is: 3.75" dia. x 3.25" deep (95 x 83mm).

Transfer Dish H-1352
Shipping wt. 0.9 lb (0.4kg)


H-1392


H-1352







Penetration Needles and Cones

Bituminous materials ASTM D5; AASHTO 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
	Standard hardened stainless steel needle, 40-45mm exposed needle length. Certified to ASTM accuracy by independent laboratory. Wt. 2.5g.	H-1300
	Long hardened stainless steel needle, 50-55mm exposed needle length. Wt. 2.5g.	H-1290
	Long hardened stainless steel needle, 50-55mm exposed needle length. Certified to ASTM accuracy by independent laboratory. Wt. 2.5g.	H-1302
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
	Same as H-1310. Certified to ASTM accuracy	H-1317
Battery paste	Hardened stainless steel tip with special plunger. Total wt. 60g ± .050g.	H-1255
Joint sealant for asphalt & concrete pavements ASTM D5329	Resilience ball penetration tool. Total wt. 27.5g.	H-1320

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
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
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
	Hollow 90° stainless steel cone, highly polished stainless tip. Removable nut and stem. Wt. 102.5g.	H-2522
ASTM D2884	Hollow 90° Magnesium cone and plunger. Total cone wt. 30.0g	H-2524
Food, Paste, Paints U.S. Dept of Agriculture	Hollow 90° Aluminum cone and tip. Total wt. 35g	H-2529
Applications requiring 90· cones, ASTM D217, D937 ASA std. Z11.3	Stainless steel replacement tip, nut and stem.	H-2525

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

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 at left

Tin Sample Cups
Flat-bottom, seamless tin sample cups have telescoping covers. Hold samples for determining penetrations.
Tin Sample Cups See chart at left

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


H-4929


H-1350.70

Testing Equipment for Construction Materials
HUMBOLDT


H-1720


H-1730


H-1745
H-1735


H-1733


H-1722

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 ± 0.01°C within the range of 20°C to 100°C (±0.01°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" d ia 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)

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)

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)

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)



H-1741H H-1741V



H-1746.7



H-1747.1

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: ±0.5mm 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)

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 to right

Shipping wt. 2 lbs (.9kg)

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)

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 Viscometers

Viscometer Size/No.	Viscosity Range (Poise)	Approx. Constant poise/second at 300mm Hg Vacuum			Model
		at B	at C	at 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



H-2165



H-2166A

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 furol 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 ±0.05°F (±0.03°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 termperature viscosity bath designed for use with one to four Automatic Saybolt Viscosity Timing Sensors. **Bath is sold with no timers, order auto timers separately.** Fetures 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 termperatures. Steel cabinet has leveling feet and a chemical-resitant polyurethane-epoxy finish.

Temperature range is ambient to 464°F (240°C) and temperature stability is ±0.05°F (±0.03°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 vicosity 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)


H-2183


H-2171


H-2180


H-2175

H-2177


H-2176


H-2189


H-2199


H-2174
H-2174C


H-2173


H-2196

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.

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	4	H-2176
or Borosilicate flask for H-2166	4	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-2166 H-2166.4F
Viscometer tube	4	H-2180
Universal orifice	4	H-2173
Receiving flask for H-2165	4	H-2176
or Borosilicate flask for H-2166	4	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

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, includes wrench	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-1530.2


H-1535


H-2560


H-1400


H-1510

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°C ±0.1° (77°F ±0.2°) 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)

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)

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

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.



H-1569



H-1570



H-1595

Shown with Thermometers, not included, order separately



H-1596



H-1575



H-1588



H-8900



H-8980

Softening Point Apparatus, Double
ASTM D36, 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
ASTM D36, E28; AASHTO T53

Ring and ball method Apparatus for softening point determinations for use with asphalts, pitches, tars and most resins. Includes burner, beaker, support stand, 4 rings, wire gauze with ceramic center, thermometer clamp, 4 shouldered rings and stems with hardened steel ball. **Order required thermometer separately.**

Softening Point Apparatus, Quad H-1570

Shipping wt. 2lbs (.9kg)

Softening Point Apparatus Set w/ Burner
ASTM D36, E28; AASHTO T53

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)

Softening Point Apparatus Set w/ Hotplate
ASTM D36, E28; AASHTO T53

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
120V 60Hz H-1596
220V 50/60Hz H-1596.4F

Shipping wt. 18.4lbs (8.3kg)

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

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.

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" 99.5mm) 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" (89mm)	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

Samplers, Flash Point, Residue




H-2400


H-1990


H-2495

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 of flash points of liquids having a flash point up to 230°F (110°C) and cutback asphalts with flash points of less than 200°F (93°C). Includes Pyrex cup, base and liquid bath with overflow, pivoting ignition taper with pilot light and reference bead and thermometer holder. **Order H-2610.9C thermometer, leveling device and draft shield separately.**

Tag, Open-Cup Tester, 120V 60Hz	H-1990
Tag, Open-Cup Tester, 230V 50/60Hz	H-1990.4F
Tag, Open-Cup Tester, Gas	H-1995

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
Draft shield	H-1990.3
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

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

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

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.



H-2095

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

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



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 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.

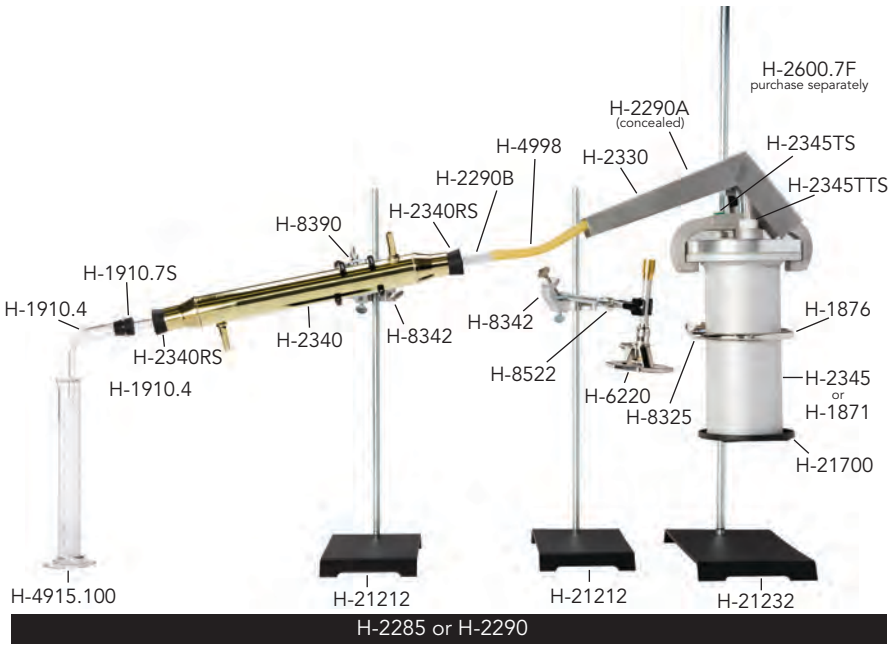
Thermometer position is adjustable and provides the ability to raise the thermometer out of the way to facilitate the placement and removal of the test cup. Flame size is adjustable through the use of the built-in needle valve. **Order thermometer separately.**

Cleveland Flash Tester, Natural Gas H-2100

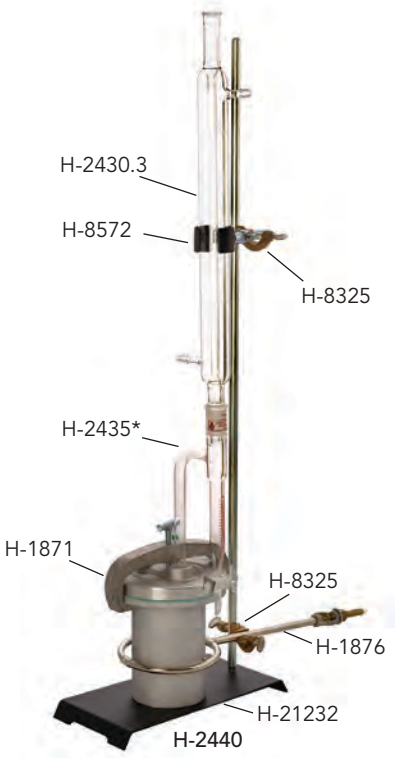
Shipping wt. 19lbs (8.6kg)

Replacement Parts

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



H-2285 or H-2290



H-2440, H-2442

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, ptfe	H-2345TS
Stoppers, rubber (2)	H-2340RS
Stopper, rubber	H-1910.7S

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.

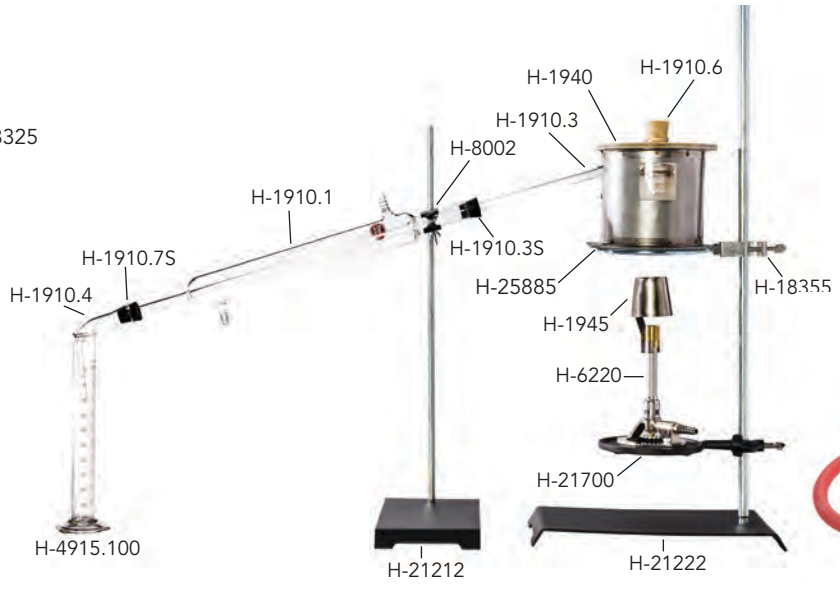
Description	Model
Ring burner	H-1876
Aluminum still, 0.95L	H-1871
Distillation trap, 20ml, 25ml, or 10ml	H-2435.25 H-2435.10
Condenser, liebig	H-2430.3
Support stand	H-21232
Clamp, brass	H-8325
Clamp, round jaw, coated	H-8572

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)



H-2430



H-1910





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)

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

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)

Distillation Accessories


H-2345 H-1871


H-1876


H-1940


H-1946


H-2330


H-2348


H-1945


H-2340


H-2435.25


H-2435.10


H-2435.5


H-2435.20

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 tubulure. 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)

Distillation Shield
ASTM D402; AASHTO T78
Use with H-1880. 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-1880. 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)

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)



H-1451


H-1456


H-1461

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 page: 188.

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)

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 a 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-1452.4F

Shipping wt. 90lbs (40.8kg)

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 page: 188.

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)

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.

Extractor, 1500g, 115V 60Hz	H-1456
Extractor, 3000g, 115V 60Hz	H-1471

Shipping wt. 70lbs (31.7kg)

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 page: 188.

Extractor, 1500g, 115V 60Hz	H-1461
Extractor, 1500g, 220V 50/60Hz	H-1461.4F
Extractor, 1500g, 115V 60Hz	H-1465
Extractor, 1500g, 220V 50/60Hz	H-1465.4F

Shipping wt. 114lbs (51.7kg)

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

See page 264 for centrifuge extractor filter paper.


H-1485.627


H-1449


H-1857A

Filter Papers for Centrifuge Extractors
All filter papers for centrifuge extractors have a medium speed and a flow rate of 85 ml/min. The thickness is 0.71" with a 4 micron retention. Filters come in packages of 100.

Extractor / Size	Model
H-1451, H-1452 (9.75"OD x 1.75"ID)	H-1481.627
H-1474 (11.625"OD x 5"ID)	H-1485.627
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

Filter Papers for Centrifuge Extractors See chart
Shipping wt. 4lbs (1.81kg)

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.

Vacuum Extractor H-1449
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

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)

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-1499


H-1495


H-1495.1
H-1499.1

H-1495.2A
H-1499.2A




H-1494A




H-1497.613


H-1440

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)

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 Centigrade or Fahrenheit. 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 capacity— 800 watts; 1

2-qt capacity— 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)

Filter Papers for Reflux Extraction

Filter papers for use with reflux extractor sets.

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

(40cm filter paper is used with H-1499 only)


HUMBOLDT
HUMBOLDT

Pavement



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Testing Equipment For Construction Materials

HUMBOLDT


HR-2800


HR-2850


HR-2500


HR-2508

Hand-Held Core Drill (only)
The HR-2800 core drill is available alone or in the HR-2850 kit with the optional, anchor-bolt base. The core drill provides a powerful 3-speed motor and comes standard with all fittings, including a 360° positionable, t-handle for support. It can be used with drill bits of up to 3" diameter in the hand-held mode, or up to 4" diameter with the optional stand. Includes positioning level on top of the drill.

Held Core Drill (only), 120V 60Hz **HR-2800**
Hand Core Drill (only), 220V 50/60Hz **HR-2800.4F**
Ship wt. 26lbs. (11.8kg)

Core Drill with Base Stand
The HR-2850 core drill combines the HR-2800 Hand-held, electric motor drill, described above with the optional, anchor-bolt base. The base is roughly 6" x 9" with a 31" tall column. It features a smooth gear action and a dumb bell handle for ease of use in tight areas. The drill features a hand rest on the back/top of the drill to ease drilling operations. And, the stand's locking collar holds the drill firmly for accurate drilling.

HR-2800	
Motor	1500 watts
Bit capacity	3-4"
Speeds (3)	900, 2000 4000
Auger capacity	NA

Core Drill with Base Stand, 120V 60Hz **HR-2850**
Core Drill with Base Stand, 220V 50/60Hz **HR-2850.4F**
Ship wt. 41lbs. (18.6kg)

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

HR-2503E and HR-2504	
Horse power	17
Cycle	4
HR-2503E bit capacity HR-2504 bit capacity	8" 16"
Auger capacity	NA

Core Drill, Mobile Gas-Powered — 8" HR-2503E
Core Drill, Mobile Gas-Powered — 16" HR-2504
Ship wt. 413lbs. (187kg)

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 HR-2701 bit capacity	16"
HR-2700 auger capacity HR-2701 auger capacity	NA 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 HR-2601 bit capacity	16"
HR-2600 auger capacity HR-2601 auger capacity	NA 8"
Carriage travel	24"

Core Drill, Trailer-Mount 16" Capacity HR-2600
Core Drill, Trailer-Mount, Auger Capability HR-2601
Ship wt. 2000lbs. (907kg)

Drill Bits, Core Removal


HR-2514


HR-2512


HR-2516


HR-2530.4


HR-2550.25



Be advised that core drill bits have .125" walls and produce a core 0.25" smaller than the OD of the drill bit.


HR-2599


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		For	For
In.	mm	Asphalt	Concrete
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)

Benkelman Beam, High-Low Detect



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
DG
Ship wt. 12lbs. (5.4kg)

Skid Resistance, Polishing



H-3205.3F



Shown with H-3206 Base Plate, not included

H-3204

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 preset 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.

Dimensions: 32"x 32"x 48" (82 x 82 x 123cm)

Accelerated Polishing Machine **H-3205.3F**

Ship wt. 463lbs. (210kg)

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 & 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 leveled, 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. Dimensions (include carrying case): 31" x 25.5" x 9" (787 x 648 x 229mm).

Portable Skid Resistance Tester **H-3204**

Ship wt. 88lbs. (39.9kg)

H-3204 Accessories	Model
Rubber slider, 1.25", for lab use	H-3207
Rubber slider, 3", for field use	H-3208
Laboratory base plate	H-3206



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	HM-9110.2
6" Membranes	HM-9111.2
4" O-rings	HM-9110.1
6" O-rings	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)


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ADAM
Eclipse
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Laboratory



Balance Calibration Weights 301
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Testing Equipment For Construction Materials

HUMBOLDT



HT-4795
Shown with Probe, not included

HT-4796
Shown with Probe, not included

HT-4797

HT-4798

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 Probe–Thermocouple High-Precision Digital Thermometer	Single Probe–Thermocouple High-Precision Digital Thermometer
Features	High Precision Accuracy, 2-channel measurement, Max./Min., USB Interface, DataLogger 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	Dual-probes, order separately	Single-probe, order separately	Dual-probes, order separately	Single-probe, order separately
Range	-328° to 1562°F -200° to +850°C	-328° to 1562°F -200° to +850°C	-200°C to +1370°C	-200°C to +1370°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	0.01°C & °F	0.01°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
Stem Length	Various			
Power	9v battery			
Traceable Certificate	NIST Traceable Certificate availalble			

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 ± 0.015K. It provides an excellent calibration reference for your other thermometers. 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. For 3-point calibration certification, order HT-4795C.

Thermocouple probe not included.

Thermometer, Precision	HT-4795
Thermometer, Precision, 3 Pt. Cal.	HT-4795C
Thermocouple Probe, 6"	HT-4795.1
Thermocouple Probe, 12"	HT-4795.2

Ship wt. 1.3lbs. (0.6kg)

Thermometer, Precision, Calibration

The HT-4796 and HT-4796D Handheld Thermometers are high-precision, metrology-grade, NIST-traceable instruments. These high-accuracy thermometers are used when temperature measurement are critical and/or when online documentation is required. The HT-4796 and HT-4796D can also used as a NIST Standard to verify and calibrate routinely used instruments. Optional DE-Graph 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, 3 Pt. Cal.	HT-4796C
Thermometer, Precision, 2-channels	HT-4796-2
Thermometer, Precision, 3 Pt. Cal.	HT-4796-2C
Thermocouple Probe, 6"	HT-4795.1
Thermocouple Probe, 12"	HT-4795.2

Ship wt. 2lbs. (0.9kg)

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-4794



HT-4793



HT-4132



HT-4015

MERCURY FREE

Model	HT-4794	HT-4793	HT-4132	HT-4015
Type	Pt100 Platinum Thermometer, accepts Pt100 ohm probes	Thermocouple, accepts 2 K probes	RTD platinum thermometer with traceable certificate	Total-range,rough-Use thermometer with traceable certificate
Features	F & C switchable. Min-Max, Hold Functions, 19 temperature memory function, Calibration Function, RS232 Interface, Optional Windows Software, Stores 16 Temperature Measurements	F & C switchable, Min-Max, Hold, Average Values Functions, 10 temperature memory function, Timer, High & Low Alarm, Backlight, PVC Protective Casing, Flip Out Stand	°F and °C switchable, one-button operation, low-battery, bad probe indicator, 0.5" high digits, computer output capability	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
Probe	Pt 100 Platinum probe, order separately	Dual-probes, order separately	Platinum, (100-ohm) 4-wire probe for use with soils, liquids, air/gas	Supplied with 4', fast-response beaded probe, uses all type K probes
Range	-100° to 850°C/-148° to 1562°F	-200° to 1370°C/-328° to 2498°F	-58 to 752°F -50 to 400°C	-328 to 2498°F -200 to 1370°C
Resolution	0.1° C&F. -100 to 399.9°C Otherwise 1.0°C	0.1°	0.01° below 200°C and 0.1° above 200°C	0.1°/1°
Accuracy (Type K)	±0.3°C (0.7°F)	±1.0°C/1.8°F from -49° to +740°C & -52° to 1364°F ±2.0°C/4.0°F Below & Above	0.1% + 0.2°C below 200°C and ± 0.15% + 0.5°C above 200°C	±1°C from -50° to 740°C (-328 to 1364°F) otherwise ±2°C
Stem Length	—	—	6 inches	cable length 4'
Power	2 AA Batteries.	3 AAA Batteries	9-volt battery (AC adapter available)	(3) AAA batteries
Traceable Certificate	ISO 17025/IEC Traceable Certificate included	ISO 17025/IEC Traceable Certificate included.	Yes, included	Yes, included

Thermometer, Pt100 Platinum

Handy, Robust temperture instrument has 4-wire technology for Pt100. Min/Max and Hold function. Integrated probe holder for one hand operation. The HT-4794 provides °F and °C switchable readings and an RS232 connection interface. Stores 16 temperature measurements. Includes a calibration function.

Thermometer, Pt100 Platinum HT-4794

Ship wt. 2lbs. (0.9kg)

Thermometer, Dual-K Probe, NIST Traceable

NIST Traceable Digital "K" Thermocouple Thermometer with 10 memeory storage. Recallable Min/Max function and high-low audible alarm function. Count up timers from 23hr 59 min to 1 min. Low battery indicator and back lit screen. Includes PVC boot for protection and flip-out stand.

Thermometer, Dual K Probe, NIST HT-4793

Ship wt. 2lbs. (0.9kg)

Thermometer, RTD Platinum, Traceable

One button operation, great for QC and processes. Platinum (100-ohm) 4-wire probe. Has low battery/bad probe indicator and can be output to a computer. See page 278 for data acquisition software and cable.

Thermometer, RTD Platinum, Traceable HT-4132

Ship wt. 1.5lbs. (0.7kg)

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)

See Probes and Accessories on Page 280

MERCURY FREE

See Probes and Accessories on Page 230



Computer Data Acquisition Software
Powerful and easy-to-use computer data capture program for HT-4132 digital thermometers. The software allows connecting up to eight instruments all running simultaneously on one computer. The software captures data in the background, tech for other tasks. Records interval readings from 1 to 10,000 seconds; displays minimum/maximum readings; and utilizes an alarm mode that permits the user to be notified visually, audibly, and by email when an alarm is triggered. Unlimited readings are saved to a file that can be viewed and printed as is, or printed in any report or spreadsheet format. Networking server/client capability allows the captured data to be monitored on a remote workstation. Readings may be streamed to cell phones or anywhere via email every minute or in any time interval. 24/7 notification of audible/visual alarms are sent to user's computer, remote computer, via email anywhere, and by email to cell phones. Program automatically installs in less than two minutes. Absolutely no user programming, no user keystrokes, no user entries are required. Simply connect the cable to the instrument and to a USB port (or serial port) and data is captured. Operation is straight forward plug and play. It is that easy. It is designed to work with Windows® 98/Me/NT/2000/XP/Vista/Windows 7. Includes a CD, a 6-foot cable (supplied USB, serial, and instrument connections) cable plugs into the instrument and computer. Multiple accessory extension cables expand cable length to 300 feet.

Data Acquisition Software for HT-4132 HT-4136
Ship wt. 5lbs. (2.2kg)


H-3558D



H-3564

Model	H-3558D	H-3564
Type	Dual input, digital thermometer kit	Dual input, digital thermometer kit
Features	(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	Type-K, J, T, E
Range	-58 to 2000°F -50 to 1093°C	-58 to 2000°F -50 to 1093°C
Resolution	1°F/C	0.1 °C/°F/K <1000 and 1 °C/°F/K >1000
Accuracy (Type K)	±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	Various	Various
Power	(3) AA batteries or optional AC adapter	(3) AA batteries
Traceable Certificate	order: H-3558D-C	order: H-3564C



Data Logger for HT-4132 Thermometer
Complete DAS–4™ System captures and stores up to 8000 bytes (over 1000 readings). Great for those who want to capture field readings and upload to computer. Readings may be taken at intervals from 1 second to 99 hours. Stored readings may be downloaded to any PC and viewed. Includes Windows CD, a 3-foot cable (supplied USB, serial, and instrument connections). Cable plugs into instrument and computer. Four AA alkaline batteries supplied.

Data Logger for HT-4132 Thermometer HT-4325
Ship wt. 3lbs. (1.3kg)

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)


H-3590


H-3591


H-3597A


H-3599


H-3593A


H-3595A



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, backlighting 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.

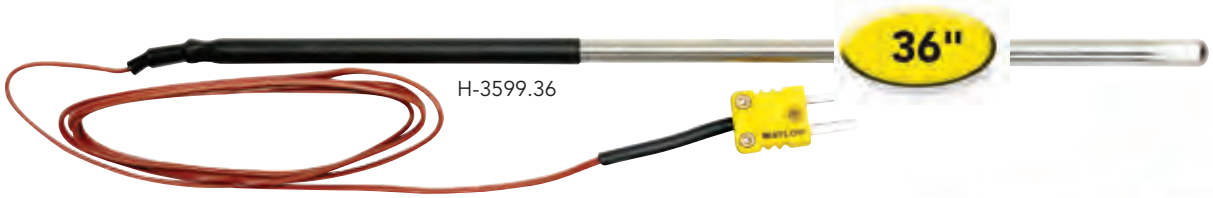
Thermometer, Wide-range Memory H-3593A
Ship wt. 1.2lbs. (.54kg)

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)



H-3599.36


H-3564.3


H-3599.2


H-3564.2


H-3580.2


HT-4028


HT-8613

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: ±0.8%, 1°C. Compatible with K-type measurement instruments.

K-Probe, 8" — H-3599.2
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
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
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 ±3.96°F (2.2°C). Compatible with K-type measurement instruments.

K-Probe 4" — H-3564.3
Ship wt. 1.2lbs. (.54kg)

Bead Probe
40" (1m) wire length with maximum continuous temperature measurement: 500°F (260°C). Accuracy is: ±1.1°C (0-260°C). Fast response time. Not suitable for liquid immersion. Compatible with K-type measurement instruments.

Bead Probe — H-3564.2
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
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
Ship wt. 0.6lbs. (.27kg)

AC Adapter for HT-4132
AC adapter for use with HT-4132 data logging thermometer shown on page 227

AC Adapter for HT-4132 — HT-4132.2
Ship wt. 1lbs. (.45kg)

Immersion Probes for 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



H-2727D



H-3557D



HT-4142



HT-4105



H-3543



H-3560D

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 ±2°F / ±1°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)

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 ±2°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)

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 ±1°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 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 ±1.5°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)

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: ±2°F/±1°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: -40°F to 120°F in 2°F div. and -40°C to 50°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)

Thermometers, Digital, Stem



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.


H-2639


H-3550


H-2634D


H-3547


H-3542A


H-3540


H-2612

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 plastic 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 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



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.

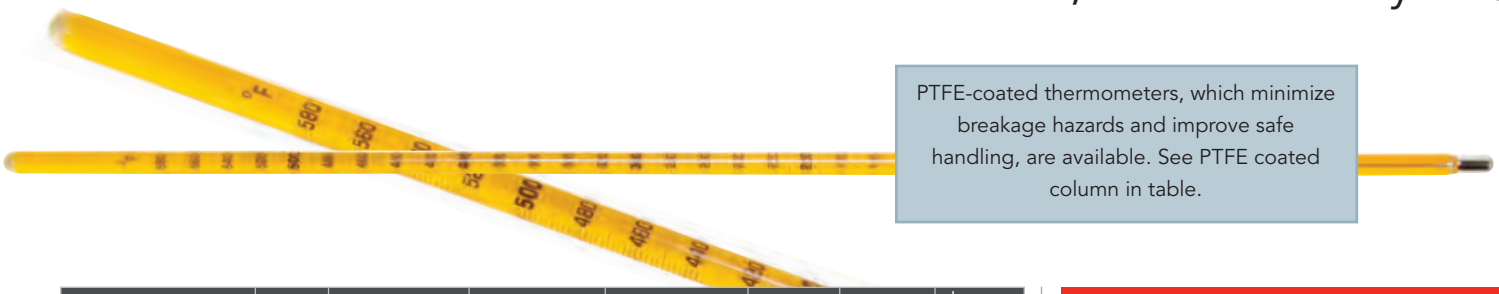
Range	Div.	Model
-20 to 150°C	1.0°C	H-2604.1C
-38 to 50°C	1.0°C	H-2604.5C
-5 to 110°C	0.5°C	H-2604.9C
+38 to 82°C	0.1°C	H-2604.14C
-2 to 80°C	0.2°C	H-2604.15C
+30 to 200°C	0.2°C	H-2604.16C
+72 to 126°C	1.0°C	H-2604.17C
+49 to 57°C	0.1°C	H-2604.19C
+57 to 65°C	0.1°C	H-2604.20C
+79 to 87°C	0.1°C	H-2604.21C
-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.

Thermometers, ASTM Mercury



PTFE-coated thermometers, which minimize breakage hazards and improve safe handling, are available. See PTFE coated column in table.

Application	ASTM	Range	Model	PTFE Coated	Subdiv.	Length	Immersion
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			
	22C	95-103°C	H-2610.22C	H-2610.22CT			
Kinematic viscosity	28F	97.5-102.5°F	H-2600.28F	H-2600.28FT	0.1°F 0.2°C	12" 305mm	total
	28C	36.6-39.4°C	H-2610.28C	H-2610.28CT			
Aniline point	33F	-36.5-107.5°F	H-2600.33F	H-2600.33FT	0.5°F 0.2°C	16.5" 419mm	2' 50mm
	33C	-38-42°C	H-2610.33C	H-2610.33CT			
	35F	194-338°F	H-2600.35F	H-2600.35FT			
	35C	90-170°C	H-2610.35C	H-2610.35CT			
Kinematic viscosity	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			
	46C	48.6-51.4°C	H-2610.46C	H-2610.46CT			
	47F	137.5-142.5°F	H-2600.47F	H-2600.47FT			
	47C	58.6-61.4°C	H-2610.47C	H-2610.47CT			
Tag closed tester, low range	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			
Precision	63F	18-89°F	H-2600.63F	H-2600.63FT	.2°F .1 °C	15" 379mm	total
	63C	-8-32°C	H-2610.63C	H-2610.63CT			
	64F	77-131°F	H-2600.64F	H-2600.64FT			
	64C	25-55°C	H-2610.64C	H-2610.64CT			
Kinematic viscosity	110F	272.5-277.5°C	H-2600.110F	H-2600.110FT	.1°F .2°C	12" 305mm	
	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			

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.

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)

Testing Equipment for Construction Materials HUMBOLDT


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
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
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
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
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
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
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
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
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
Ship wt. 0.7lbs. (0.32kg)









H-4361A.4



H-4360A.7

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 µs/cm	-2.00 to 16.00 pH –1999 to 1999 mV
Resolution	0.01 pH 1 mV 0.1 °C	0.01 pH	0.01 pH	1µs/cm	0.01 pH 1 mV 0.1 °C
Accuracy	± 0.01 pH ± 1 mV ± 0.5 °C	± 0.05 pH	± 0.1pH	± 1.5% FS	± 0.01 pH ± 1 mV ± 0.5 °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 °C to 100 °C	0.0 to 99.0 °C	N/A	N/A	-5 °C to 110 °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 & electrochemistry 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)

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)

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

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 ±pH Accuracy, 1-pint	H-4360A.10
pH 12.45 ±pH Accuracy, 1-pint	H-4360A.12
pH 1.68 ±pH Accuracy, 1-pint	H-4360A.2
pH 4.01 ±pH Accuracy, 1-pint	H-4360A.4
pH 7.00 ±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 ±pH Accuracy, 20 pack	H-4361A.10
pH 4.01 ±pH Accuracy, 20 pack	H-4361A.4
pH 7.00 ±pH Accuracy, 20 pack	H-4361A.7
Deionized Water, 20 pack	H-4361A.00

Digital Scale and Balance Comparison Chart

Capacity	Readability	Model	Mfg. series	Power	Platform size	Page No.
200g	0.01g	HB-4528A	Adam Core Balance CQT Compact Portable	AC / AA	5.1" Dia. / 130mm	296
220g	0.001g	HB-4620	Ohaus Scout STX Portable	AC / AA	3.7" dia. / 93mm dia.	291
220g	0.01g	HB-4621	Ohaus Scout STX Portable	AC / AA	4.7" dia. / 120mm dia.	291
220g	0.01g	HB-4720A	Ohaus Scout SPX Portable	AC / AA	4.7" dia. / 120mm dia.	291
220g	0.001g	HB-4900	Adam Eclipse Precision	AC	4.7" (120mm) Dia.	292
220g	0.001g	HB-4700A	Adam Nimbus Precision	AC	4.7" (120mm) Dia.	293
250g	0.1g	HB-4529A	Adam Core Balance CQT Compact Portable	AC / AA	5.1" Dia. / 130mm	296
300g	0.01g	HB-4710A	Adam HCB Highland™ Precision	AC / Recharge	4.7″ Dia. / 120mm	295
420g	0.001g	HB-5342A	Ohaus Adventurer Precision	AC	Ø 5.1" / 130 mm	290
420g	0.01g	HB-4622	Ohaus Scout STX Portable	AC / AA	4.7" dia. / 120mm dia.	291
420g	0.1g	HB-4623	Ohaus Scout STX Portable	AC / AA	4.7" dia. / 120mm dia.	291
420g	0.01g	HB-4724A	Ohaus Scout SPX Portable	AC / AA	4.7" dia. / 120mm dia.	291
420g	0.1g	HB-4723A	Ohaus Scout SPX Portable	AC / AA	4.7" dia. / 120mm dia.	291
420g	0.001g	HB-4901	Adam Eclipse Precision	AC	4.7" (120mm) Dia.	292
420g	0.001g	HB-4701A	Adam Nimbus Precision	AC	4.7" (120mm) Dia.	293
520g	0.001g	HB-5352A	Ohaus Adventurer Precision	AC	6.9" x 7.7" 175 x 195 mm	290
600g	0.02g	HB-4711A	Adam HCB Highland™ Precision	AC / Recharge	4.7″ Dia. / 120mm	295
600g	0.01g	HB-4712A	Adam HCB Highland™ Precision	AC / Recharge	4.7″ Dia. / 120mm	295
600g	0.1g	HB-4530A	Adam Core Balance CQT Compact Portable	AC / AA	5.1" Dia. / 130mm	296
620g	0.01g	HB-4624	Ohaus Scout STX Portable	AC / AA	4.7" dia. / 120mm dia.	291
620g	0.1g	HB-4625	Ohaus Scout STX Portable	AC / AA	5.5" x 6.7" / 140 x 170mm	291
620g	0.01g	HB-4725A	Ohaus Scout SPX Portable	AC / AA	4.7" dia. / 120mm dia.	291
620g	0.1g	HB-4726A	Ohaus Scout SPX Portable	AC / AA	5.5" x 6.7" / 140 x 170mm	291
620g	0.001g	HB-4902	Adam Eclipse Precision	AC	6.3" (160mm) Dia.	292
620g	0.001g	HB-4716A	Adam Nimbus Precision	AC	4.7" (120mm) Dia.	293
820g	0.001g	HB-4903	Adam Eclipse Precision	AC	6.3" (160mm) Dia.	292
820g	0.001g	HB-4702A	Adam Nimbus Precision	AC	4.7" (120mm) Dia.	293
1000g	0.01g	HB-4713A	Adam HCB Highland™ Precision	AC / Recharge	4.7″ Dia. / 120mm	295
1020g	0.001g	HB-4904	Adam Eclipse Precision	AC	6.3" (160mm) Dia.	292
1100g	0.1g	HB-4960	Ohaus Navigator XL Portable	AC / battery	7.6" x 8" / 194 x 203mm	296
1200g	0.01g	HB-4626	Ohaus Scout STX Portable	AC / AA	5.5" x 6.7" / 140 x 170mm	291
1200g	0.01g	HB-4740A	Ohaus Scout SPX Portable	AC / AA	5.5" x 6.7" / 140 x 170mm	291
1500g	0.05g	HB-4714A	Adam HCB Highland™ Precision	AC / Recharge	4.7″ Dia. / 120mm	295
1500g	0.1g	HB-4532A	Adam Core Balance CQT Compact Portable	AC / AA	5.1" Dia. / 130mm	296
1520g	0.01g	HB-5315A	Ohaus Adventurer Precision	AC	6.9" x 7.7" 175 x 195 mm	290
1600g	0.01g	HB-4906	Adam Eclipse Precision	AC	6.3" (160mm) Dia.	292
1600g	0.01g	HB-4703A	Adam Nimbus Precision	AC	6.3" (160mm) Dia.	293
1600g	0.1g	HB-4950	Ohaus Navigator XT Portable	AC / Recharge	9.00" x 6.90" / 250 x 240mm	296
1620g	0.001g	HB-4905	Adam Eclipse Precision	AC	6.3" (160mm) Dia.	292
2000g	1g	HB-4534A	Adam Core Balance CQT Compact Portable	AC / AA	5.1" Dia. / 130mm	296
2100g	0.1g	HB-4961	Ohaus Navigator XL Portable	AC / battery	7.6" x 8" / 194 x 203mm	296
2200g	0.01g	HB-5322A	Ohaus Adventurer Precision	AC	6.9" x 7.7" 175 x 195 mm	290
2200g	0.01g	HB-5220	Ohaus Explorer Precision	AC	7.5" x 7.9" 190 x 200mm	290
2200g	0.01g	HB-4627	Ohaus Scout STX Portable	AC / AA	5.5" x 6.7" / 140 x 170mm	291
2200g	0.1g	HB-4628	Ohaus Scout STX Portable	AC / AA	5.5" x 6.7" / 140 x 170mm	291
2200g	0.01g	HB-4741A	Ohaus Scout SPX Portable	AC / AA	5.5" x 6.7" / 140 x 170mm	291
2200g	0.1g	HB-4727A	Ohaus Scout SPX Portable	AC / AA	5.5" x 6.7" / 140 x 170mm	291
2600g	0.01g	HB-4907	Adam Eclipse Precision	AC	6.3" (160mm) Dia.	292
2600g	0.01g	HB-4704A	Adam Nimbus Precision	AC	6.3" (160mm) Dia.	293
2600g	0.1g	HB-4533A	Adam Core Balance CQT Compact Portable	AC / AA	5.1" Dia. / 130mm	296
3000g	0.1g	HB-4715A	Adam HCB Highland™ Precision	AC / Recharge	4.7″ Dia. / 120mm	295
3000g	0.1g	HB-4730	Ohaus Ranger 3000 Compact Bench	AC / Recharge	8.9" x 11.8" / 225 x 300mm	295
3200g	0.2g	HB-4951	Ohaus Navigator XT Portable	AC / Recharge	9.00" x 6.90" / 250 x 240mm	296
3600g	0.01g	HB-4908	Adam Eclipse Precision	AC	6.3" (160mm) Dia.	292
3600g	0.01g	HB-4705A	Adam Nimbus Precision	AC	6.3" (160mm) Dia.	293
4200g	0.01g	HB-5343A	Ohaus Adventurer Precision	AC	6.9" x 7.7" 175 x 195 mm	290
4200g	0.1g	HB-5344A	Ohaus Adventurer Precision	AC	6.9" x 7.7" 175 x 195 mm	290
4200g	0.01g	HB-5420	Ohaus Explorer Precision	AC	7.5" x 7.9" 190 x 200mm	290
4200g	0.1g	HB-4911	Adam Eclipse Precision	AC	6.3" (160mm) Dia.	292
4200g	0.1g	HB-4539B	Adam Nimbus Precision	AC	6.3" (160mm) Dia.	293
4600g	0.01g	HB-4909	Adam Eclipse Precision	AC	6.3" (160mm) Dia.	292
4600g	0.01g	HB-4706A	Adam Nimbus Precision	AC	6.3" (160mm) Dia.	293
5000g	1g	HB-4535A	Adam Core Balance CQT Compact Portable	AC / AA	5.1" Dia. / 130mm	296

Digital Scale and Balance Comparison Chart

Capacity	Readability	Model	Mfg. series	Power	Platform size	Page No.
5100g	0.5g	HB-4962	Ohaus Navigator XL Portable	AC / battery	7.6" x 8" / 194 x 203mm	296
5200g	0.01g	HB-5355AC	Ohaus Adventurer Precision	AC	6.9" x 7.7" 175 x 195 mm	290
6000g	0.2g	HB-4731	Ohaus Ranger 3000 Compact Bench	AC / Recharge	8.9" x 11.8" / 225 x 300mm	295
6200g	0.01g	HB-5622	Ohaus Explorer Precision	AC	7.5" x 7.9" 190 x 200mm	290
6200g	0.1g	HB-5620	Ohaus Explorer Precision	AC	7.5" x 7.9" 190 x 200mm	290
6200g	0.1g	HB-4629	Ohaus Scout STX Portable	AC / AA	5.5" x 6.7" / 140 x 170mm	291
6200g	0.1g	HB-4729A	Ohaus Scout SPX Portable	AC / AA	5.5" x 6.7" / 140 x 170mm	291
6200g	0.01g	HB-4910	Adam Eclipse Precision	AC	6.3" (160mm) Dia.	292
6200g	0.1g	HB-4912	Adam Eclipse Precision	AC	6.3" (160mm) Dia.	292
6200g	0.1g	HB-4540B	Adam Nimbus Precision	AC	6.3" (160mm) Dia.	293
6400g	0.5g	HB-4952	Ohaus Navigator XT Portable	AC / Recharge	9.00" x 6.90" / 250 x 240mm	296
8200g	0.1g	HB-5382A	Ohaus Adventurer Precision	AC	6.9" x 7.7" 175 x 195 mm	290
8200g	1.0g	HB-4630	Ohaus Scout STX Portable	AC / AA	5.5" x 6.7" / 140 x 170mm	291
8200g	1.0g	HB-4742A	Ohaus Scout SPX Portable	AC / AA	5.5" x 6.7" / 140 x 170mm	291
8200g	0.1g	HB-4541B	Adam Nimbus Precision	AC	6.3" (160mm) Dia.	293
10000g	0.5g	HB-4953	Ohaus Navigator XT Portable	AC / Recharge	9.00" x 6.90" / 250 x 240mm	296
10000g	1g	HB-4963	Ohaus Navigator XL Portable	AC / battery	7.6" x 8" / 194 x 203mm	296
10200g	0.01g	HB-5102C	Ohaus Explorer Precision	AC	7.5" x 7.9" 190 x 200mm	2490
10200g	0.1g	HB-5100C	Ohaus Explorer Precision	AC	7.5" x 7.9" 190 x 200mm	290
16000g	1g	HB-4954	Ohaus Navigator XT Portable	AC / Recharge	9.00" x 6.90" / 250 x 240mm	296
20000g	1g	HB-4964	Ohaus Navigator XL Portable	AC / battery	7.6" x 8" / 194 x 203mm	296
8lb./4kg	0.0002lb/0.1g	HB-4644	Adam CBK Bench	AC / battery	8.9" x 10.8" (225 x 275mm)	298
12kg	0.1g	HB-4943	Adam Eclipse High Capacity	AC / Recharge	9.4 x 9.4" (240 x 240mm)	295
12kg	0.1g	HB-4506A	Ohaus Explorer High Capacity	AC / Recharge	15.7" x 11.8" (400 x 300mm)	294
12kg	0.1g	HB-3515	Ohaus Ranger 7000 High Capacity	AC / Recharge	14.8" x 12.2" (377 x 311mm)	294
12kg	0.1g	HB-4543B	Adam Nimbus High Capacity	AC	15.7" x 11.8" (400 x 300mm)	294
15kg	0.5g	HB-4732	Ohaus Ranger 3000 Compact Bench	AC / Recharge	8.9" x 11.8" / 225 x 300mm	295
35lb. / 16kg	0.001lb / .5g	HB-4874	Adam ABK Portable	AC / battery	11.8" X 15.7" / 300mm X 400mm	297
35lb./16kg	0.001lb/0.5g	HB-4636A	Adam CBK Bench	AC / battery	8.9" x 10.8" (225 x 275mm)	298
35lb./16kg	0.001lb/0.5g	HB-4636AWB	Adam CBK Bench	AC / battery	8.9" x 10.8" (225 x 275mm)	298
16kg	0.1g	HB-4545B	Adam Nimbus High Capacity	AC	15.7" x 11.8" (400 x 300mm)	294
16kg	0.1g	HB-4945	Adam Eclipse High Capacity	AC / Recharge	9.4 x 9.4" (240 x 240mm)	295
22kg	0.1g	HB-4946	Adam Eclipse High Capacity	AC / Recharge	12.2 x 14.8" (311 x 377mm)	295
24kg	0.1g	HB-4508A	Ohaus Explorer High Capacity	AC / Recharge	15.7" x 11.8" (400 x 300mm)	294
60lb. / 30kg	0.005lb / 2g	HB-4930	Ohaus Defender 5000 Low Profile	AC / C batteries	12" X 14" / 30.5mm X 35.5mm	298
66lb. / 30kg	0.01lb / .005kg	HB-4830	Ohaus Defender 3000 Bench	AC / C batteries	12" X 14" / 30.5mm X 35.5mm	297
30kg	1g	HB-4733	Ohaus Ranger 3000 Compact Bench	AC / Recharge	8.9" x 11.8" / 225 x 300mm	295
70lb / 32kg	0.002lb / 1g	HB-4875	Adam ABK Portable	AC / battery	11.8" X 15.7" / 300mm X 400mm	297
70lb./32kg	0.002lb/1g	HB-4635A	Adam CBK Bench	AC / battery	8.9" x 10.8" (225 x 275mm)	298
70lb./32kg	0.002lb/1g	HB-4635AWB	Adam CBK Bench	AC / battery	8.9" x 10.8" (225 x 275mm)	298
35kg	0.1g	HB-3535	Ohaus Ranger 7000 High Capacity	AC / Recharge	14.8" x 12.2" (377 x 311mm)	294
35kg	0.1g	HB-4510A	Ohaus Explorer High Capacity	AC / Recharge	15.7" x 11.8" (400 x 300mm)	294
35kg	0.1g	HB-4546B	Adam Nimbus High Capacity	AC	15.7" x 11.8" (400 x 300mm)	294
75lb./35kg	0.02lb/.01kg	HB-4774	Adam CPWplus Portable	AC / AA	12" sq / 300mm sq.	297
32kg	0.1g	HB-4947	Adam Eclipse High Capacity	AC / Recharge	12.2 x 14.8" (311 x 377mm)	295
100lb./48kg	0.005lb/2g	HB-4634A	Adam CBK Bench	AC / battery	8.9" x 10.8" (225 x 275mm)	298
100lb./48kg	0.005lb/2g	HB-4634AWB	Adam CBK Bench	AC / battery	8.9" x 10.8" (225 x 275mm)	298
110lb./50kg	0.05lb/0.02kg	HB-4770	Ohaus ES Bench	AC / AA	12.2 x 10.8 in. / 310 x 270mm	298
110lb./50kg	0.05lb/0.02kg	HB-4769	Ohaus ES Bench	AC / AA	20.5 x 15.7 in. / 520 x 400mm	298
130lb / 60kg	0.005lb / 2g	HB-4876	Adam ABK Portable	AC / battery	11.8" X 15.7" / 300mm X 400mm	297
132lb / 60kg	0.02lb / 10g	HB-4831	Ohaus Defender 3000 Bench	AC / C batteries	12" X 14" / 30.5mm X 35.5mm	297
150lb / 60kg	0.01lb / 5g	HB-4931	Ohaus Defender 5000 Low Profile	AC / C batteries	12" X 14" / 30.5mm X 35.5mm	298
165lb./75kg	0.05lb/.02kg	HB-4775A	Adam CPWplus Portable	AC / AA	12" sq / 300mm sq.	297
220lb./100kg	0.1lb/0.05kg	HB-4771	Ohaus ES Bench	AC / AA	20.5 x 15.7 in. / 520 x 400mm	298
250lb / 100kg	0.02lb / 10g	HB-4932	Ohaus Defender 5000 Low Profile	AC / C batteries	15.7" X 19.7" / 400mm X 500mm	298
260lb / 120kg	0.01lb / 5g	HB-4877	Adam ABK Portable	AC / battery	11.8" X 15.7" / 300mm X 400mm	297
300lb / 150kg	0.02lb / 10g	HB-4933	Ohaus Defender 5000 Low Profile	AC / C batteries	16.5" X 21.7" / 420mm X 550mm	298
330lb / 150kg	0.05lb / 20g	HB-4832	Ohaus Defender 3000 Bench	AC / C batteries	19.7" X 25.6" / 500mm X 650mm	297
330lb./150kg	0.1lb/.05kg	HB-4776	Adam CPWplus Portable	AC / AA	12" sq / 300mm sq.	297
440lb./200kg	0.1lb/.05kg	HB-4777	Adam CPWplus Portable	AC / AA	12" sq / 300mm sq.	297
440lb./200kg	0.2lb/0.1kg	HB-4772	Ohaus ES Bench	AC / AA	20.5 x 15.7 in. / 520 x 400mm	298
600lb / 300kg	0.05lb / 20g	HB-4934	Ohaus Defender 5000 Low Profile	AC / C batteries	17" X 22" / 42mm X 55mm	298
660lb / 300kg	0.1lb / 50g	HB-4833	Ohaus Defender 3000 Bench	AC / C batteries	19.7" X 25.6" / 500mm X 650mm	297


HB-5342


HB-5102



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

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 Accessories

Description	Part #
Cable, USB interface	HB-5392C
Cable, RS232 PC 25-pin	HB-5392R

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 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			
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			
5200g	0.01g	—	—	HB-5355AC	HB-5355AC.4F	±0.01g	±0.02g			
8200g	0.1g	HB-5382AC	HB-5382AC.4F	—	—	±0.1g	±0.2g			12.6 lb (5.7kg)

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 7.9" 190 x 200mm	15 lb/6.8kg
4200g	0.01g	HB-5420	HB-5420.4F	HB-5420C	HB-5420C.4F	±0.01g	±0.02g			
6200g	0.01g	HB-5622	HB-5622.4F	HB-5622C	HB-5622C.4F	±0.01g	±0.02g			16.3 lb/7.38kg
6200g	0.1g	HB-5620	HB-5620.4F	HB-5620C	HB-5620C.4F	±0.1g	±0.1g			
10200g	0.01g	—	—	HB-5102C	HB-5102C.4F	±0.01g	±0.02g			10 lb/4.5kg
10200g	0.1g	—	—	HB-5100C	HB-5100C.4F	±0.1g	±0.1g			


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	220V	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				
620g	0.01g	HB-4624	HB-4624.4F	0.01				
620g	0.1g	HB-4625	HB-4625.4F	0.1			5.5" x 6.7" / 140 x 170mm	
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	220V	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				
620g	0.01g	HB-4725A	HB-4725A.4F	0.01				
620g	0.1g	HB-4726A	HB-4726A.4F	0.1			5.5" x 6.7" / 140 x 170mm	
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-4904

Adam Eclipse Precision Balances

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 effciency, durability, and intuitive operation to any laboratory. Every Eclipse is out fitted 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 sizeable white digits on a deep-blue background, ensuring ultimate visibility. A second line shows text prompts, instructions and any other relevant information. Clear, discernable 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.

- The illuminated capacitive touch keypad provides responsive operation, and its durable, smooth surface can be easily wiped down
- Vivid, backlit LCD easily visible in any lighting conditions
- Capacity tracker built into display for easily monitoring possible overloads
- USB and RS-232 interfaces provide speedy communication with computers and printers
- Printouts include date and time for data tracking within Good Laboratory Practices (GLP) guidelines
- Robust metal housing protects internal components in harsh environments
- Large, grade 304 stainless steel pan allows swift cleaning
- Level indicator and adjusting feet ensure proper balance setup for optimum weighing results
- Removable draught shield on models with 0.001g readability helps to reduce errors caused by air currents

See Chart for Models and Specifications

Adam Eclipse Precision Balances

Capacity	Readability	External Calibration		Power	Pan Size	Ship Wt.
		120V 60Hz	220V 50/60 Hz			
220g	0.001g	HB-4900	HB-4900.4F	AC	4.7" (120mm) Dia.	15 lb/7kg
420g	0.001g	HB-4901	HB-4901.4F			
620g	0.001g	HB-4902	HB-4902.4F		6.3" (160mm) Dia.	
820g	0.001g	HB-4903	HB-4903.4F			
1020g	0.001g	HB-4904	HB-4904.4F			
1620g	0.001g	HB-4905	HB-4905.4F			
1600g	0.01g	HB-4906	HB-4906.4F			
2600g	0.01g	HB-4907	HB-4907.4F			
3600g	0.01g	HB-4908	HB-4908.4F			
4200g	0.1g	HB-4911	HB-4911.4F			
4600g	0.01g	HB-4909	HB-4909.4F			
6200g	0.01g	HB-4910	HB-4910.4F			
6200g	0.1g	HB-4912	HB-4912.4F			

Accessories

Description	Part #
Weight-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-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 #
Weight-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-3535


HB-4506A


HB-4545B

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 SmarText 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 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.

Ohaus Explorer High Capacity Balances see chart
Ship wt. 27.5lbs. (12.47kg)

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				
Cap.	Readability	Platform	120V 60Hz	220V 50/60Hz
15kg	0.1g	14.8" x 12.2" (377 x 311mm)	HB-3515	HB-3515.4F
35kg	0.1g	14.8" x 12.2" (377 x 311mm)	HB-3535	HB-3535.4F

Ohaus Explorer High-Capacity Balances				
Cap.	Readability	Platform	120V 60Hz	220V 50/60Hz
12kg	0.1g	15.7" x 11.8" (400 x 300mm)	HB-4506A	HB-4506A.4F
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 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 Accessory	Part #
Rechargeable battery	HB-4506RB
Cable, display extension, 9m	HB-5292DC
Column kit	HB-4506T
RS232 kit	HB-3515.RS

Ohaus Explorer Accessory	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

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


HB-4712A


HB-4712A


HB-4731

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 e ciency, durability, and intuitive operation to any laboratory. Every Eclipse is equipped with an elegant capacitive touch keypad containing colour-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 ngerprints to be wiped o easily. Illuminated keys guide users through tasks, highlighting available options. Featuring one of the largest LCD readouts in the industry, the Eclipse displays sizeable white digits on a deep-blue background, ensuring ultimate visibility. A second line shows text prompts, instructions and any other relevant information. Clear, discernable 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 optimise connections, while a third interface allows use of an optional remote display.

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

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

Adam Eclipse High-Capacity Balances			Standard Model		With Control Pillar	
Cap.	Readability	Platform	120V 60Hz	220V 50/60Hz	120V 60Hz	220V 50/60Hz
12kg	0.1g	9.4 x 9.4" (240 x 240mm)	HB-4943	HB-4943.4F	HB-4943P	HB-4943P.4F
16kg	0.1g	9.4 x 9.4" (240 x 240mm)	HB-4945	HB-4945.4F	HB-4945P	HB-4945P.4F
22kg	0.1g	12.2 x 14.8" (311 x 377mm)	HB-4946	HB-4946.4F	HB-4946P	HB-4946P.4F
32kg	0.1g	12.2 x 14.8" (311 x 377mm)	HB-4947	HB-4947.4F	HB-4947P	HB-4947P.4F

Description	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

Adam HCB Highland™ Precision Balances					
Capacity	Readability	Pan Size	120V	220V	Ship Wt.
300g	0.01g	4.7" Dia. / 120mm	HB-4710A	HB-4710A.4F	30lb/13.6kg
600g	0.02g		HB-4711A	—	
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

Ohaus Ranger 3000 Compact Bench Scales					
Capacity	Readability	Pan Size	120V 60Hz	220V50/60Hz	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-4532A


HB-4533A


HB-4960


HB-4951

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

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

Adam Core Balance CQT Compact Portable

Capacity	Readability	120V 60Hz	220V50/60Hz	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

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

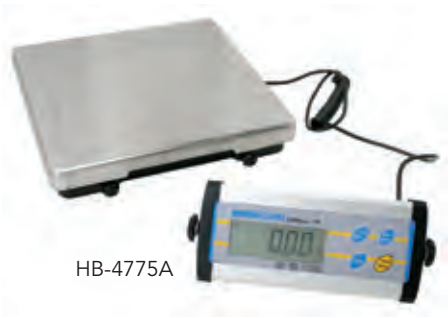
*2600g, Model HB-4533A is sold with a hard case (see picture)— perfect for field use, great upgrade to triple beam balances.

Ohaus Navigator XL Portable Balances

Capacity	Readability	120V	220V	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	220V	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	0.2g	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				


HB-4775A


HB-4874



HB-4831

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

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 for Models and Specifications

Ohaus Defender Bench Scales

The Defender 3000 feature a simple, yet rugged, tubular-frame design. 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 pan with painted carbon steel frame and aluminum IP67 load cell; 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-in/25mm high LCD weight display with high-contrast backlight; Built-in RS232 for printing and data connection; AC adapter and internal rechargeable battery.

See Chart for Models and Specifications

Description	Part #
Rechargeable battery kit	HB-4931RB

Adam CPWplus Portable Scales

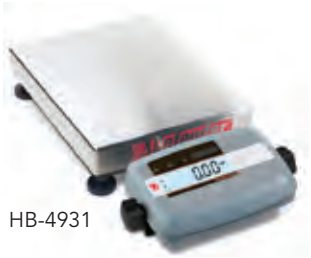
Capacity	Readability	Model	Model	Repeatability	Power	Pan Size	Ship Wt.
75lb./35kg	0.02lb/.01kg	HB-4774	HB-4774.4F	0.02lb/.01kg	AC / AA batteries	12" sq / 300mm sq.	10.8 lb / 4.89 kg
165lb./75kg	0.05lb/.02kg	HB-4775A	HB-4775A.4F	0.05lb/.02kg			
330lb./150kg	0.1lb/.05kg	HB-4776	HB-4776.4F	0.1lb/.05kg			
440lb./200kg	0.1lb/.05kg	HB-4777	HB-4777.4F	0.1lb/.05kg			

Adam ABK Portable Scales

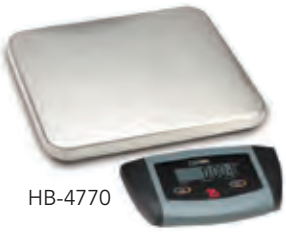
Capacity	Readability	Model	Model	Power	Pan Size	Ship Wt.
35lb. / 16kg	0.001lb / .5g	HB-4874	HB-4874.4F	AC / battery	11.8" X 15.7" / 300mm X 400mm	20 lb / 9 kg
70lb / 32kg	0.002lb / 1g	HB-4875	HB-4875.4F			
130lb / 60kg	0.005lb / 2g	HB-4876	HB-4876.4F			
260lb / 120kg	0.01lb / 5g	HB-4877	HB-4877.4F			

Ohaus Defender 3000 Bench Scale

Capacity	Readability	Model	Model	Power	Pan Size	Ship Wt.
66lb. / 30kg	0.01lb / .005kg	HB-4830	HB-4830.4F	AC / C batteries	12" X 14" / 30.5mm X 35.5mm	33 lb / 15 kg
132lb / 60kg	0.02lb / 10g	HB-4831	HB-4831.4F			33 lb / 15 kg
330lb / 150kg	0.05lb / 20g	HB-4832	HB-4832.4F		19.7" X 25.6" / 500mm X 650mm	60 lb / 27.2 kg
660lb / 300kg	0.1lb / 50g	HB-4833	HB-4833.4F			


HB-4931


HB-4772


HB-4770


HB-4635A

Ohaus Low-Profile Defender Bench Scales

The OHAUS Defender 5000 series low-profile scales are a feature-rich line of bench scales, combining an ABS plastic indicator with painted steel bases and mounting brackets. The Defender 5000 offers a multi-functional indicator with multiple weighing units (kg, g, lb, oz, lb: oz (decimal), metric tonnes and a user-definable unit) and software modes to meet your requirements. Standard features Include: painted steel bases with ABS indicator; quick display of results using large LCD with high-contrast white backlight; easy- to-operate with 4-key membrane keypad with raised tactile keys; Weighs in one or more units: kg, g, lb, oz, lb: oz (decimal), metric tonnes and user-definable custom unit; Internal power supply with universal line cord or 6 C batteries (80 hr. battery life), and base and indicator connected using quick connect plug.

See Chart for Models and Specifications

Description	Part #
Rechargeable Battery Kit	HB-4931RB

Ohaus ES Bench Scale

The Ohaus ES Low profile bench scale brings utility and economy together. Easy, two-button operation and a large display guarantee accurate and unmistakable results. The unique 3-way mounting bracket allows you to mount the indicator to the scale base, above the scale platform, or on any vertical surface. For simple weighing at a favorable cost, this scale is the one to choose.

Features: auto-zero tracking; large platform with leveling feet; battery saving auto-off timer, (after 5 minutes of inactivity); large backlit LCD display on flexible remote indicator; RS232 bi-directional interface; hold function freezes reading; steel base, stainless weighing pan and splash-proof keypad.

Ohaus ES Bench Scale — See Table
Ship wt. See Table

Adam CBK Bench Scale

Repetitive weighing tasks are fast and simple with a large stainless steel platform, backlit display, and a graphic capacity tracker to show how much weighing range is used or available. Amber, green and red indicators make check weighing applications trouble free and quickly show operators if a sample is under or over the preset limits. The CBK includes features like a RS232 interface, date & time, a built-in rechargeable battery pack and AC adapter, to make it ideal for production, warehousing or even in the field.

Features: Large backlit LCD with capacity tracker; Colored LED check limit indicators; Stainless steel pan; 5 weighing units (g, Kg, lb, oz, lb;oz); Rechargeable battery; RS-232 interface with multi-language, date and time output.

Adam CBK Bench Scale — See Table
Ship wt. See Table

In-Use Cover — HB-4636CV
Ship wt. 5lbs. (2.2kg)

Hard Case for CBK Scales — HB-4635C
Ship wt. 9lbs. (4.0kg)

Ohaus Defender 5000 Low Profile Bench Scale

Capacity	Readability	Model	Model	Power	Pan Size	Ship Wt.
60lb. / 30kg	0.005lb / 2g	HB-4930	HB-4930.4F	AC / C batteries	12" X 14" / 30.5mm X 35.5mm	60 lb / 27.2 kg
150lb / 60kg	0.01lb / 5g	HB-4931	HB-4931.4F			30.9 lb / 10.7 kg
250lb / 100kg	0.02lb / 10g	HB-4932	HB-4932.4F		15.7" X 19.7" / 400mm X 500mm	30 lb / 13.6 kg
300lb / 150kg	0.02lb / 10g	HB-4933	HB-4933.4F		16.5" X 21.7" / 420mm X 550mm	30 lb / 13.6 kg
600lb / 300kg	0.05lb / 20g	HB-4934	HB-4934.4F		17" X 22" / 42mm X 55mm	30 lb / 13.6 kg

Ohaus ES Bench Scale

Capacity	Readability	Model	Model	Power	Units	Pan Size	Ship Wt.
110lb./50kg	0.05lb/0.02kg	HB-4770	HB-4770.4F	AC / AA batteries	lb, oz, kg, lb: oz	12.2 x 10.8 in. / 310 x 270mm	35 lb / 16 kg
110lb./50kg	0.05lb/0.02kg	HB-4769	HB-4769.4F		lb, oz, kg, lb: oz	20.5 x 15.7 in. / 520 x 400mm	35 lb / 16 kg
220lb./100kg	0.1lb/0.05kg	HB-4771	HB-4771.4F		lb, oz, kg, lb: oz		
440lb./200kg	0.2lb/0.1kg	HB-4772	HB-4772.4F		lb, oz, kg		

Adam CBK Bench Scale

Capacity	Readability	Model	Model	Repeatability	Power	Pan Size	Ship Wt.
8lb./4kg	0.0002lb/0.1g	HB-4644	HB-4644.4F	0.0002lb/0.1g	AC / battery	8.9" x 10.8" (225 x 275mm)	5 lb / 2.2 kg
35lb./16kg	0.001lb/0.5g	HB-4636A	HB-4636A.4F	0.001lb/.5g	AC / battery	8.9" x 10.8" (225 x 275mm)	10.9 lb / 5.3 kg
70lb./32kg	0.002lb/1g	HB-4635A	HB-4635A.4F	0.002lb/1g			
100lb./48kg	0.005lb/2g	HB-4634A	HB-4634A.4F	0.005lb/2g			
Weigh-Below Models							
35lb./16kg	0.001lb/0.5g	HB-4636AWB	HB-4636AWB.4F	0.001lb/.5g	AC / battery	8.9" x 10.8" (225 x 275mm)	15 lb / 6.8 kg
70lb./32kg	0.002lb/1g	HB-4635AWB	HB-4635AWB.4F	0.002lb/1g			
100lb./48kg	0.005lb/2g	HB-4634AWB	HB-4634AWB.4F	0.005lb/2g			


H-4825

H-4830


H-4604


H-4605


H-4835


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)

Scales & Balances


H-4660.10


H-4609


H-21170


H-4480A


H-4490


H-4621


H-4615P


H-4615S


H-4603CC


H-4732

Field Scale Replacement Weights
Set includes: (1) 1lb; (2) 2 lb; (2) 5 lb, and (2) 10lb

Field Scale Weights (avoirdupois) **H-4660**
Ship wt. 22lbs. (10kg)

Field Scale Replacement Weights (Metric)
Set includes: (1) 500g; (1) 1 kg; (2) 2 kg, and (2) 5 kg

Field Scale Weights (metric) **H-4665**
Ship wt. 22lbs. (10kg)

Weight	Model
1 lb.	H-4660.1
2 lb.	H-4660.2
5 lb.	H-4660.5
10 lb.	H-4660.10

Weight	Model
500g	H-4665.1
1kg	H-4665.2
2kg	H-4665.3
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 ± 0.1% of applied load. Capacity is 250lb (113.4kg) with a resolution of .01lb (.01kg) and a ±.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)

Balance Calibration Weights





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.
27 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
25 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
13 kg	H-4888.16KG	H-4888.16KGT	H-4889.16KG	H-4889.16KGT
11 kg	H-4888.10KG	H-4888.10KGT	H-4889.10KG	H-4889.10KGT
9 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
2 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
900 g	H-4888.600G	H-4888.600GT	H-4889.600G	H-4889.600GT
1 kg	H-4888.500G	H-4888.500GT	H-4889.500G	H-4889.500GT
680 g	H-4888.400G	H-4888.400GT	H-4889.400G	H-4889.400GT
450 g	H-4888.300G	H-4888.300GT	H-4889.300G	H-4889.300GT
680 g	H-4888.200G	H-4888.200GT	H-4889.200G	H-4889.200GT
220 g	H-4888.160G	H-4888.160GT	H-4889.160G	H-4889.160GT
220 g	H-4888.150G	H-4888.150GT	H-4889.150G	H-4889.150GT
220 g	H-4888.100G	H-4888.100GT	H-4889.100G	H-4889.100GT
220 g	H-4888.80G	H-4888.80GT	H-4889.80G	H-4889.80GT
220 g	H-4888.70G	H-4888.70GT	H-4889.70G	H-4889.70GT
220 g	H-4888.60G	H-4888.60GT	H-4889.60G	H-4889.60GT
220 g	H-4888.50G	H-4888.50GT	H-4889.50G	H-4889.50GT
220 g	H-4888.40G	H-4888.40GT	H-4889.40G	H-4889.40GT
130 g	H-4888.30G	H-4888.30GT	H-4889.30G	H-4889.30GT
1 kg	H-4888.20G	H-4888.20GT	H-4889.20G	H-4889.20GT
90 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
272kg	H-4889.250KG	H-4889.250KGT
226kg	H-4889.200KG	H-4889.200KGT
180kg	H-4889.180KG	H-4889.180KGT
158kg	H-4889.150KG	H-4889.150KGT
113kg	H-4889.100KG	H-4889.100KGT
99kg	H-4889.80KG	H-4889.80KGT
79kg	H-4889.75KG	H-4889.75KGT
68kg	H-4889.60KG	H-4889.60KGT
54kg	H-4889.50KG	H-4889.50KGT
45kg	H-4889.40KG	H-4889.40KGT

Testing Equipment for Construction Materials
HUMBOLDT

Muffle & Box Furnaces


H-30200


H-30204.4F


H-30216.4F


H-30210.4F

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, 4" x 5" x 8" H-30214.4F
1200°C Box Furnace, 6" x 7" x 8" H-30215.4F
1200°C Box Furnace, 7" x 8" x 12" H-30216.4F
Ship wt. 600lbs. (272kg)

High-Temperature, 1500°C Box Furnace
Small to medium-sized, low-cost box furnaces with a maximum working temperature of 1500°C. Furnaces exhibit excellent temperature uniformity and use a ceramic fiber board lining to ensure energy efficiency. Long lasting high-temperature silicon carbide heating elements are designed in a unique U-shaped configuration to ensure the longest heating element life, best heat radiation properties at high temperatures, and easy exchange. 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

1500°C Box Furnace, 4" x 5" x 8" H-30210.4F
1500°C Box Furnace, 6" x 7" x 8" H-30211.4F
1500°C Box Furnace, 7" x 8" x 12" H-30212.4F
1500°C Box Furnace, 12" x 12" x 16" H-30213.4F
Ship wt. 517lbs. (234.7kg)

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-30216.4F	2192°F (1200°C)	8" x 12" x 7" (203 x 305 x 178mm)	208/240V 50/60Hz 1 ph.
H-30210.4F	2732°F (1500°C)	5" x 8" x 4" (127 x 203 x 102mm)	208/220V 50/60Hz 1 ph.
H-30211.4F	2732°F (1500°C)	7" x 8" x 6" (178 x 203 x 152mm)	208/220V 50/60Hz 1 ph.
H-30212.4F	2732°F (1500°C)	8" x 12" x 7" (203 x 305 x 178mm)	208/220V 50/60Hz 1 ph.
H-30213.4F	2732°F (1500°C)	12" x 16" x 12" (305 x 406 x 305mm)	208/220V 50/60Hz 1 ph.

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 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	437°F (225°C)	0.6 cu. ft. (17L) capacity. Features bi-metal temperature controller, ±2° sensitivity. Shipping wt. 49 lbs. (22.2kg)	115V, 60 Hz, 800 watts	Inside: 12" x 10" x 8.6" (305 x 254 x 218mm) Overall: 14" x 12" x 20.5" (356 x 305 x 521mm)
H-30105.4F			230V, 50/60 Hz 800 watts.	
H-30115	437°F (225°C)	1.14 cu. ft. (32L) capacity. Features hydraulic temperature controller, ±1° sensitivity. Shipping wt. 70 lbs. (31.7kg)	115V, 60 Hz, 1000 watts	Inside: 13" x 13" x 11.6" (330 x 330 x 295mm) Overall: 15" x 15" x 24.5" (381 x 381 x 622mm)
H-30115.4F			230V, 50/60 Hz 1000 watts.	
H-30125	437°F (225°C)	2 cu. ft. (56L) capacity. Features hydraulic temperature controller, ±1° sensitivity. Shipping wt. 82 lbs. (31.7kg)	115V, 60 Hz, 1600 watts	Inside: 18" x 12" x 14.6" (457 x 305 x 371mm) Overall: 20" x 14" x 28.5" (508 x 356 x 724mm)
H-30125.4F			230V, 50/60 Hz 1600 watts.	
H-30131	437°F (225°C)	2.86 cu. ft. (81L) capacity. Features hydraulic temperature controller, ±1° sensitivity. Shipping wt. 98 lbs. (44.5kg)	115V, 60 Hz, 1600 watts	Inside: 18" x 14" x 19.6" (457 x 356 x 498mm) Overall: 20" x 16" x 33.5" (508 x 406 x 851mm)
H-30131.4F			230V, 50/60 Hz 1600 watts.	

Laboratory Ovens – Gravity Convection

Model	Max. Temp.	Description	Electric	Dimensions (W x D x H)
H-30100	437°F (225°C)	0.7 cu. ft. (20L) capacity. Features bi-metal temperature controller, ±2° sensitivity. Shipping wt. 44 lbs. (20kg)	115V, 60 Hz, 600 watts	Inside: 12" x 10" x 10" (305 x 254 x 254mm) Overall: 14" x 12.3" x 17.5" (356 x 312 x 445mm)
H-30100.4F			230V, 50/60 Hz 600 watts.	
H-30110	437°F (225°C)	1.27 cu. ft. (35L) capacity. Features hydraulic temperature controller, ±1° sensitivity. Shipping wt. 58 lbs. (26.3kg)	115V, 60 Hz, 1000 watts	Inside: 13" x 13" x 13" (330 x 330 x 330mm) Overall: 15" x 15" x 21" (381 x 381 x 534mm)
H-30110.4F			230V, 50/60 Hz 1000 watts.	
H-30120	437°F (225°C)	2 cu. ft. (56L) capacity. Features hydraulic temperature controller, ±1° sensitivity. Shipping wt. 78 lbs. (35kg)	115V, 60 Hz, 1200 watts	Inside: 18" x 12" x 16" (457 x 305 x 406mm) Overall: 20" x 14" x 25" (508 x 356 x 635mm)
H-30120.4F			230V, 50/60 Hz 1200 watts.	
H-30128	437°F (225°C)	3.0 cu. ft. (85L) capacity. Features hydraulic temperature controller, ±1° sensitivity. Shipping wt. 148 lbs. (67.1kg)	115V, 60 Hz, 1600 watts	Inside: 18" x 14" x 21.8" (457 x 356 x 554mm) Overall: 20" x 16.3" x 31.5" (508 x 414 x 800mm)
H-30128.4F			230V, 50/60 Hz 1600 watts.	

Bench Ovens



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 ±1°F or 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	



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 ±0.5% control accuracy and ±8°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	Shpg. wt.
15.8 (.447)	36" x 21" x 36" (91 x 53 x 91cm)	400°F (204.4°C)	±0.5%	±8°F	H-32300.2F	230V,60Hz 1ph.	40" x 28" x 47" (102 x 71 x 119cm)	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					
					H-32300.9F.3	460V,60Hz 3ph.				
					H-32300.9F.3.DIG2					
27 (.764)	36" x 36" x 36" (91 x 91 x 91cm)	400°F (204.4°C)	±0.5%	±8°F	H-32333.2F	230V,60Hz 1ph.	40" x 43" x 47" (102 x 109 x 119cm)	6.6	18 min.	750 lbs (340kg)
					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					
					H-32333.8F.3	208V,60Hz 3ph.				
					H-32333.8F.3.DIG2					
					H-32333.9F.3	460V,60Hz 3ph.				
					H-32333.9F.3.DIG2					
36 (1.01)	36" x 48" x 36" (91 x 122 x 91cm)	400°F (204.4°C)	±0.5%	±8°F	H-32343.2F	230V,60Hz 1ph.	40" x 55" x 47" (102 x 140 x 119cm)	6.6	22 min.	850 lbs (385kg)
					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					



H-30366.4F

H-30360.4F

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 ±3° 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	Shpg. wt.
95°F to 399°F 35°C to 204°C	18 x 18 x 12" (46 x 46 x 31cm)	2.3 (65)	H-30356 H-30356.4F	LBB1-23	24 x 24.5 x 26" (61 x 62 x 66cm)	50/60Hz, 1ph, 120V 15 amps, 1.2KW heater 50/60Hz, 1ph, 240V 15 amps, 1.2KW heater	(2) Standard (max. 5 @ 2"Ø)	205 lb (92 kg)
	30 x 18 x 22" (76 x 46 x 56cm)	6.9 (195)	H-30360 H-30360.4F	LBB1-69	36 x 24.5 x 36.5" (92 x 63 x 93cm)	50/60Hz, 1ph, 120V 21.6 amps, 2.4KW heater 50/60Hz, 1ph, 240V 10.8 amps, 2.4KW heater	(2) Reinforced (max. 5 @ 4"Ø)	320 lb (146 kg)
	30 x 20 x 35" (77 x 51 x 89cm)	12.1 (343)	H-30364.4F	LBB2-12	36 x 26.5 x 51.5" (92 x 68 x 131cm)	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" (94 x 61 x 89cm)	18 (510)	H-30366.4F	LBB2-18	43 x 30.5 x 51.5" (110 x 78 x 131cm)	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" (94 x 94 x 89cm)	27.7 (784)	H-30368.4F	LBB2-27	43 x 43.5 x 51.5" (110 x 111 x 131cm)	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



H-30326.4F

H-30322.4F

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	Shpg. wt.
40-260°C (104-500°F)	18.8 x 18 x 19" (48x46x48cm)	3.7 (105)	H-30322	LAC1-38A	31 x 27 x 38" (79 x 69 x 96cm)	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" (48x46x48cm)	3.7 (105)	H-30322.4F	LAC1-38B	31 x 27 x 38" (79 x 69 x 96cm)	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" (61x51x61cm)	6.6 (187)	H-30324.4F	LAC1-67	36 x 29 x 43" (91x74x110cm)	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" (61x61x90cm)	12 (340)	H-30326.4F	LAC2-12	36 x 33 x 55" (91x84x139cm)	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" (90x61x90cm)	18 (510)	H-30328.4F	LAC2-18	48 x 33 x 55" (121x85x139cm)	240V 50/60Hz, 23.4 amps, 4.8 KW heater		2	(2) Standard (max. 17 @ 2"Ø)	720 lb (326.5 kg)

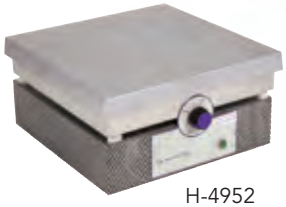
Reinforced Shelf


H-4943


H-4943S


H-4954


H-4944S


H-4952


H-4953


H-4949


H-4958

Economy 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)

Cimarec® Basic and Stirring Hotplates

Consistent, repeatable temperatures are achieved with microprocessor-controlled technology; ideal for repetitive procedures. Durable low-profile, cast aluminum hot plates come with seamless reflective white ceramic top that provides excellent visibility, resist alkali and acids and is easy to clean. Integral ring-stand holder accommodates 0.5'' (1.3 cm) diameter support rod.— ideal when using thermometers or pH probes. StirTrac™ technology offers improved slow speed stirring, consistent speed control, and stronger magnetic coupling. Digital hot plate features an LED that indicates temperature setting in 5° increments. The warning light signal system goes off when heating surface is 50°C (122°F); protects user from accidental burns.

Cimarec® Basic Hotplate — See Table
Cimarec® Stirring Hotplate — See Table
Ship wt. 7" x 7": 10lbs. (4.5kg), 10" x 10": 16.5lbs. (7.5kg)

Heavy-Duty 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.

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)

Economy Basic and Stirring Hotplates

Temperature range	Heating surface	Max. load	Electrical	Standard model	Stirring model	Stirring r angle
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	

Cimarec® 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"	8.6 lbs 3.9kg	120V 60Hz	H-4954	H-4944S	50 to 1200rpm
			230V 50/60Hz	—	H-4944S.4F	
	10" x 10"	16 lbs 7.2kg	120V 60Hz	H-4955A	H-4945AS	
			230V 50/60Hz	H-4955A.4F	H-4945AS.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-4947AC


H-4466.30
H-4466.15
H-4466.10


H-4470


H-4460


H-4461A


HM-4470.10

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)

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

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
Ship wt. 1.3lbs. (0.6kg)

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"	2.75"	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 85 and 161.

Indicators, Electronic, Digital — See Table
Ship wt. 2.7lbs. (1.2kg)

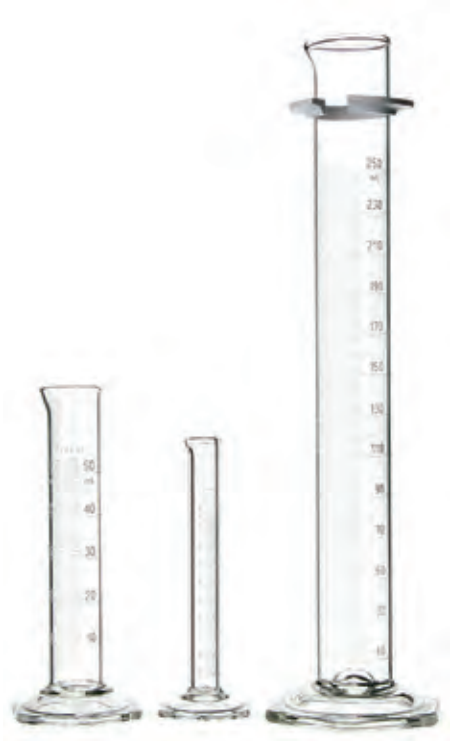
Range	Division	Model	Dia.
0.2500" (6.250mm)	0.0001" (0.002mm)	HM-4470.02	2-9/32" (51mm)
0.2500" (6.250mm)	0.00005" (0.001mm)	HM-4470.025	2-9/32" (51mm)
0.6000" (15.000mm)	0.0001" (0.002mm)	HM-4470.05	2-9/32" (51mm)
1.0000" (25.400mm)	0.0001" (0.002mm)	HM-4470.10	2-9/32" (51mm)
2.0000" (50.800mm)	0.0001" (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

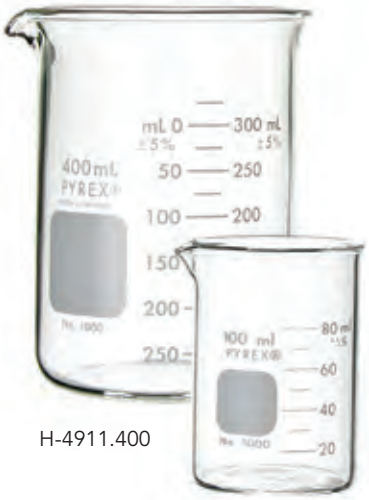
Data cable for use with digital indicators and Data Loggers.

Data Cable — HM-4470C
Ship wt. 44.1lbs. (20kg)

Graduated Cylinders & Beakers



H-4915.050 H-4915.025 H-4915.250



H-4911.400

H-4911.100

H-4912P.1M



H-4912P.250

H-4912P.050



H-4916P.050 H-4916P.500

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.

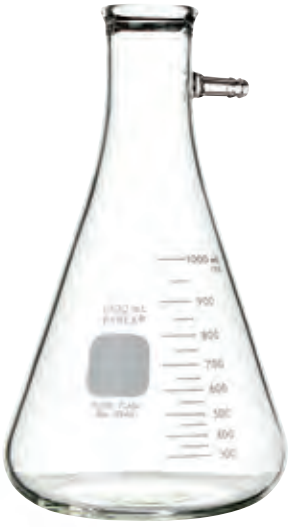
Capacity	Graduated Range	Interval	Model
50ml	10-40	10	H-4911.050
100ml	20-80	10	H-4911.100
250ml	25-200	25	H-4911.250
400ml	25-325	25	H-4911.400
600ml	50-500	50	H-4911.600
800ml	50-750	50	H-4911.800
1000ml	50-950	50	H-4911.1M
2000ml	50-1950	50	H-4911.2M
3000ml	50-2950	50	H-4911.3M
4000ml	50-3950	50	H-4911.4M

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 (±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-3399

H-3398

H-3399XL


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 Flask

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.

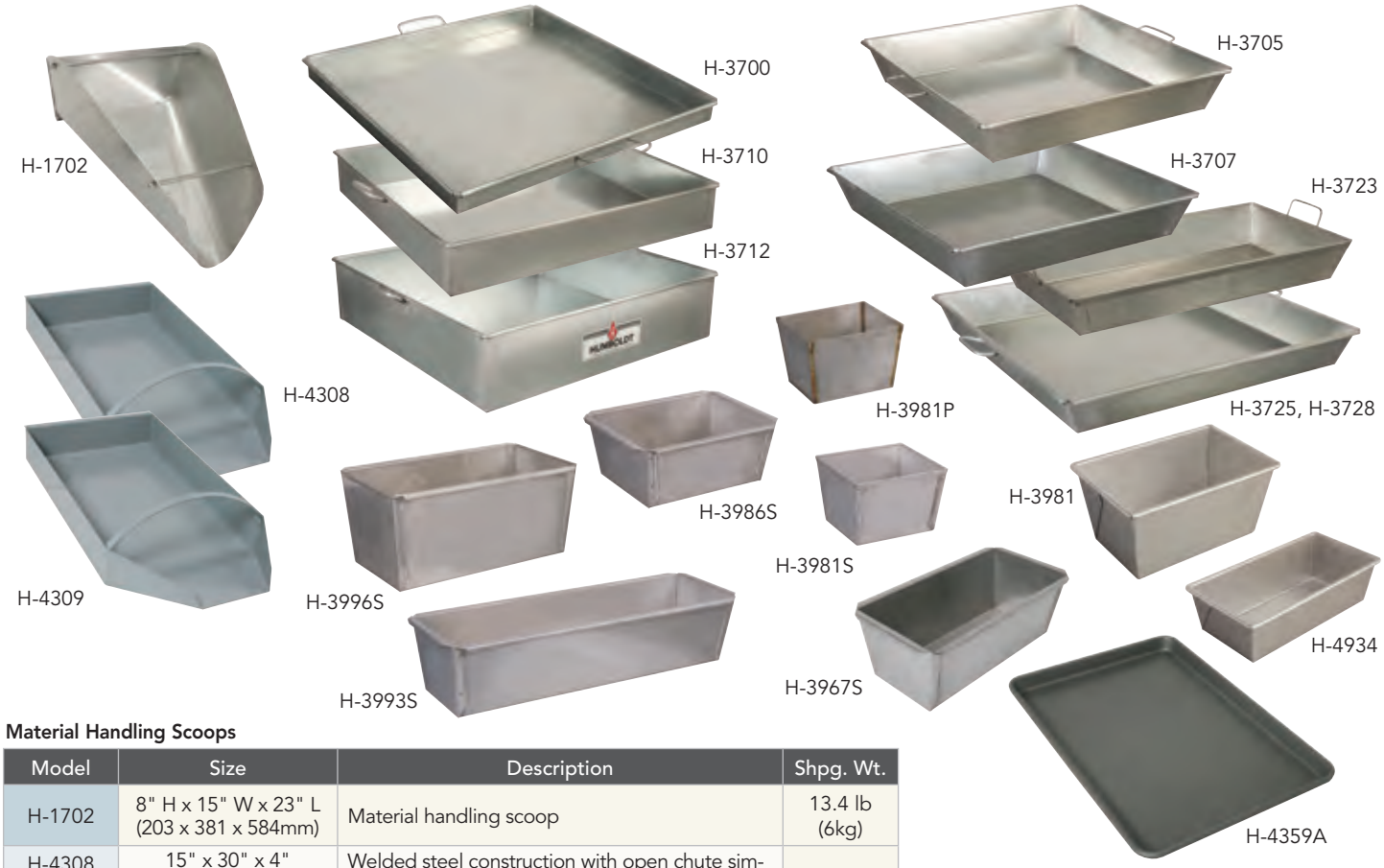
8 oz. (250ml)	H-3398
16 oz. (500ml)	H-3399
32 oz. (1000ml)	H-3399XL
	Ship wt. 0.5lbs. (0.2kg)

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)

Scoops & Pans



Material Handling Scoops

Model	Size	Description	Shpg. 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	Shpg. 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)	Shpg. 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	10.5" x 5.5" x 4.5"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)	Shpg. 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)	Shpg. Wt.
H-4359A	18 x 13 x 1.875" D (457 x 330 x 47mm)	3 lb (1.3kg)

H-3969





H-4352.2, H-4352.4, H-4352.6



H-4353.2, H-4353.4, H-4353.6



H-4354.2, H-4354.4, H-4354.6



H-4355.2, H-4355.4, H-4355.6



H-4351.2, H-4351.4, H-4351.6



H-4941



H-4356.2, H-4356.4, H-4356.6



H-4940.2, H-4940.4,
H-4940.6, H-4940.8



H-4936, H-4937, H-4938,
H-4939, H-4939.5

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 x10.375 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 x10.375 x 4" (342 x 264 x 102mm)
H-4354.6	12.75 10.375 x 6" (342 x 264 x 152mm)
H-4355.2	12.75 x 6.875 x 2.5" (342x 174 x 64mm)
H-4355.4	12.75 x 6.875 x 4" (342x 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)

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)

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)

Crucibles, Beakers, Dishes


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 alkalies.

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	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)



H-4183A H-4184A



H-4927



H-4914.08



H-4930.250



H-4960



H-4962

Sample Cans

Cans for receiving, transporting and storing sample materials, complete with friction-type lid. H-4183, 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)

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
7655ml	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)

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 Jars, Plastic with Caps — See Table

Ship wt. 4lbs. (1.8kg)

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)

Scoops


H-3734TC


H-3734


H-3732TC


H-3730TC


H-3735


H-3730


H-3731


H-3738


H-3736


H-3727

Scoops, Stainless Steel

Model	PTFE coated	Scoop no.	Nose	Bowl Vol./ water (oz/cu. in.)	Length	Bowl width	Depth	Shpg. 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	Shpg. 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	Shpg. 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	shipg. 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, Chisels



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-3740


H-3742


H-3743.9
H-3743.10


H-3745


H-4206


H-4207


H-3746


H-4207A


H-4208


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-17300


H-1675


H-17280


H-17270


H-2816.8


H-2817

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: ±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: ±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 features 0.001"/0.1mm graduations, 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, Stainless Steel
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.

Digital Calipers, 6" (150mm), 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)

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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	2.205×10^3	3.527×10^4
10^3	1	1000	9.842×10^{-4}	1.101×10^{-3}	10966×10^{-2}	2.2046	35.274
10^{-6}	10^{-3}	1	9.842×10^{-7}	1.101×10^{-6}	1.966×10^{-5}	2.204×10^{-3}	3.527×10^{-2}
1.016	1016	1.016×10^6	1	1.12	20	2240	35840
0.9081	908.1	9.081×10^5	08928	1	17.856	2000	32000
5.085×10^{-2}	50.85	5.085×10^4	0.05	0.0560	1	112	1792
4.536×10^{-4}	0.4536	453.6	4.46×10^{-4}	5×10^{-4}	8.92×10^{-3}	1	16
2.835×10^{-5}	2.835×10^{-2}	28.349	2.79×10^{-5}	3.125×10^{-5}	5.580×10^{-4}	6.25×10^{-2}	1

Length							
km	**m**	**mm**	**mile**	**yard**	**ft**	**in**	**10^{-3} in**
1	1000	10^6	0.6214	1094	3281	3.937×10^4	3.937×10^7
10-3	1	1000	6.214×10^{-4}	1.0936	3.281	39.370	3.937×10^4
10^{-6}	10^{-3}	1	6.214×10^{-7}	1.094×10^{-3}	3.281×10^{-3}	3.937×10^{-2}	39.37
1.6094	1609.4	1.609×10^6	1	1760	5280	63360	6.336 x 107
9.144 x 10-4	0.9144	914.41	5.682×10^{-4}	1	3	36	36000
3.048 x 10-4	0.3048	304.8	1.894×10^{-4}	0.3333	1	12	12000
2.54 x 10-5	0.0254	25.4	1.578×10^{-5}	2.778×10^{-2}	8.333×10^{-2}	1	1000
2.54 x 10-8	2.54×10^{-5}	0.0254	1.578×10^{-8}	2.778×10^{-5}	8.333×10^{-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	1.196×10^6	1.076×10^7	1.550×10^9
10^{-6}	1	10^4	10^6	3.86×10^{-7}	3.86×10^{-4}	1.11960	10.764	1550
10^{-10}	10^{-4}	1	100	3.86×10^{-11}	3.86×10^{-8}	1.196×10^{-4}	1.076×10^{-3}	0.1550
10^{-12}	10^{-6}	10^{-2}	1	3.86×10^{-13}	3.86×10^{-10}	1.196×10^{-6}	1.076×10^{-5}	1.550×10^{-3}
2.590	2.59×10^6	2.59×10^{10}	2.59×10^{12}	1	639.96	3.097×10^6	1.076×10^7	4.01×10^8
4.047×10^{-3}	4047	4.047×10^7	4.047×10^9	1.563×10^{-3}	1	4840	43560	6.273×10^6
8.36×10^{-7}	0.8361	8.36×10^5	8.36×10^5	3.228×10^{-7}	2.066×10^{-4}	1	9	1296
9.29×10^{-8}	9.29×10^{-3}	929	92900	$3.587x\ 10^{-8}$	2.296×10^{-5}	0.1111	1	144
6.45×10^{-10}	6.45×10^{-4}	6.4516	645.16	2.491×10^{-10}	1.594×10^{-7}	7.716×10^{-4}	6.944×10^{-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	1.308×10^{-3}	3.531×10^{-2}	61.02	0.2200	0.2642
10^{-6}	10^{-3}	1	1.308×10^{-6}	3.531×10^{-5}	6.102×10^{-2}	2.199×10^{-4}	2.642×10^{-4}
0.7646	764.6	7.646×10^5	1	27	46650	168.19	201.99
2.832×10^{-2}	28.32	2.832×10^{-4}	3.704×10^{-2}	1	1728	6.229	7.481
1.639×10^{-5}	1.639×10^{-2}	16.387	2.144×10^{-5}	5.787×10^{-4}	1	3.605×10^{-3}	4.329×10^{-3}
4.546×10^{-3}	4.546	4.546×10^3	5.946×10^{-3}	0.1605	277.42	1	1.2008
3.785×10^{-3}	3.785	3.785×10^3	4.951×10^{-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	3.613×10^{-5}	7.525×10^{-4}	8.428×10^{-4}	6.243×10^{-2}
27.680	27680	1	20.828	23.328	1.728×10^{3}
1.3289	1.328×10^{3}	4.801×10^{-2}	1	1.12	82.955
1.1865	1.1186×10^{3}	4.287×10^{-2}	0.8928	1	74.074
1.602×10^{-2}	16.019	5.787×10^{-4}	1.205×10^{-2}	1.35×10^{-2}	1

Permeability					
m/s	**cm/s**	**m/year**	**Darcy**	**ft/yr**	**ft/day**
1	100	3.156×10^{7}	1.04×10^{5}	1.035×10^{8}	2.835×10^{5}
0.01	1	3.156×10^{5}	1.04×10^{3}	1.035×10^{6}	2.834×10^{3}
3.169×10^{-8}	3.169×10^{-6}	1	3.28×10^{3}	3.281	8.982×10^{-3}
9.66×10^{-6}	9.66×10^{-4}	304	1	1000	2.74
9.658×10^{-9}	9.659×10^{-7}	0.3048	10^{-3}	1	2.738×10^{-3}
3.527×10^{-6}	3.527×10^{-4}	111.33	0.365	365.25	1

Force and Weight					
MN	**kN**	**N**	**kgf**	**tonf**	**lbf**
1	1000	10^{6}	1.0196×10^{5}	100.4	2.248×10^{5}
10^{-3}	1	10^{3}	101.96	0.1004	224.82
10^{-6}	10^{-3}	1	0.10196	1.004×10^{-4}	0.2248
9.807×10^{-6}	9.807×10^{-3}	9.807	1	9.842×10^{-4}	2.2048
9.964×10^{-3}	9.964	9964	1016	1	2240
4.448×10^{-6}	4.448×10^{-3}	4.448	0.45455	4.464×10^{-4}	1

Pressure, Stress and Modulus of Elasticity										
Mn/m² MPa	**kN/m² kPa**	**kp kgf/cm²**	**bar**	**atm**	**m H_2O**	**ft H_2O**	**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	1.019×10^{-2}	0.0100	9.87×10^{-3}	0.1022	0.3352	7.5006	0.0093	0.14504	20.886
9.807×10^{-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
9.788×10^{-3}	9.7885	9.983×10^{-2}	9.789×10^{-2}	9.661×10^{-2}	1	3.2808	73.424	9.124×10^{-2}	1.4198	204.45
2.983×10^{-3}	2.935	3.043×10^{-2}	2.984×10^{-2}	2.945×10^{-2}	0.3048	1	22.377	2.781×10^{-2}	0.43275	62.316
1.333×10^{-4}	0.1333	1.3595×10^{-2}	1.333×10^{-3}	1.315×10^{-3}	1.362×10^{-2}	4.469×10^{-2}	1	1.243×10^{-3}	1.934×10^{-2}	2.7846
0.1073	107.3	1.0942	1.0730	1.0589	10.960	35.960	804.78	1	15.562	2240
6.895×10^{-3}	6.895	7.031×10^{-2}	6.895×10^{-2}	6.805×10^{-2}	0.7043	2.3108	51.714	6.426×10^{-2}	[1]	144
4.788×10^{-5}	4.788×10^{-2}	4.883×10^{-4}	4.788×10^{-4}	4.725×10^{-4}	4.891×10^{-3}	1.605×10^{-2}	0.3591	4.464×10^{-4}	6.944×10^{-3}	[1]

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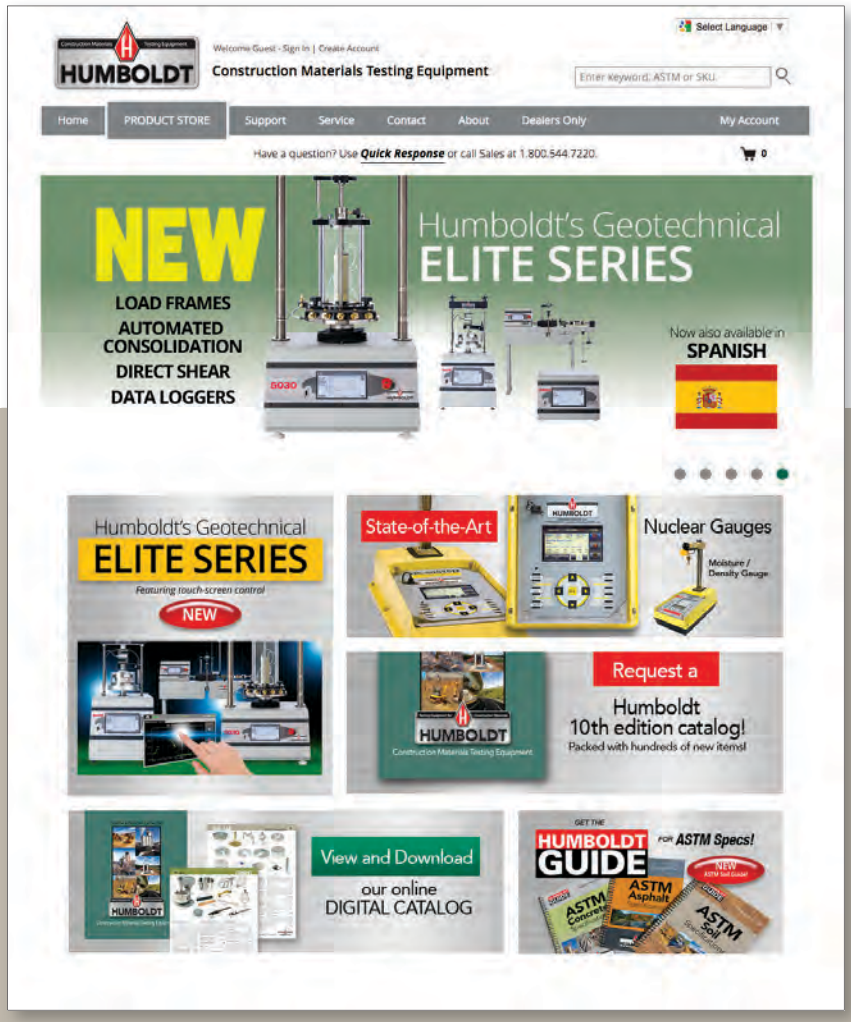
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