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Gilson Test Sieves

GILSON TEST SIEVES
ASTM E11; ISO 565, 3310-1

Throughout this catalog you will find many references to ASTM and ISO test methods and specifications. ASTM International (American Society for Testing and Materials) and ISO (International Organization for Standardization) are two different groups with similar goals of establishing standardized methods and criteria for testing material. ASTM is the predominant specifying organization in the United States and North America, and in recent years, has sought to expand their effectiveness around the world. With its global influence, ISO has standards already in place in many countries. In recent years, the two organizations have actively pursued a "Harmonization" program to insure that documents governing similar procedures are more compatible.

Gilson offers test sieves meeting the most widely used specifications:

- ASTM E11, Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
- ISO 565, Test sieves -- Metal Wire Cloth, Perforated Metal Plate and Electroformed Sheet – Nominal Sizes of Openings
- ISO-3310-1, Test Sieves -- Technical Requirements and Testing -- Part 1: Test Sieves of Metal Wire Cloth

ASTM and ISO sieves are constructed to specifications and tolerances that are very similar, in some cases identical. An ASTM #30 test sieve uses exactly the same cloth as an ISO 600µm sieve for example, and ASTM 3/8in and ISO 9.5mm mesh is the same, along with many others. ISO sieves are available in a greater number of opening sizes and may be a good choice if a specific size is needed for a QC/QA application. Common ASTM test sieve frames have 3in (76mm), 8in (203mm), 12in (305mm) or sometimes other diameters, referenced in inch units. Most ISO sieves are constructed with either 200mm or 300mm frames, so ASTM and ISO sieves will not nest together in a stack. Gilson 8in or 12in Sieve Shakers are designed to accept stacks of 8", 12", 200mm or 300mm test sieves with no difference in performance. Gilson also stocks all popular sizes of both ASTM and ISO test sieves, so you can be confident that your order will be shipped right away.

Immediate shipment is available for all popular sizes. ASTM and ISO Test Sieves are categorized in three different classes. All are serial numbered and supplied with a certificate.

- **Compliance Test Sieves** are manufactured with wire cloth that has been inspected and measured in roll or sheet quantities prior to being cut and mounted in the individual sieve frames. Opening sizes are not measured in individual sieves. Each Compliance Sieve is supplied with a certificate of manufacturing compliance, but no statistical documentation is given. Compliance Sieves are designed for applications where a basic, reliable degree of accuracy and repeatability are sufficient.
- **Inspection Test Sieves** have a specified number of openings measured in each sieve after the cloth is mounted in the frame. There is a 99% confidence level that the standard deviation of these openings is within the maximum allowed by ASTM or ISO. Inspection Sieves are a good choice in applications where accuracy and repeatability are critical. Each Inspection Sieve consists of a Compliance Sieve with added Inspection Sieve Verification service.
- **Calibration Test Sieves** have about twice as many openings measured as Inspection Sieves. The higher number of openings measured on each sieve increases the confidence level to 99.73% that the standard deviation of these openings is within the maximum allowed by ASTM or ISO. Calibration Sieves should be used in applications where a very high degree of accuracy is required. Each Calibration Sieve consists of a Compliance Sieve with added Calibration Sieve Verification service.

Mesh Opening
Opening Sizes are listed in millimeter (mm) or micrometer (µm) units, and ASTM sieves include traditional inch and number designations. Gilson offers all mesh sizes, but not all sizes are available in every frame diameter or height. Common coarse sizes are also listed. Normally, every second or fourth size is used, although precision testing may require consecutive sizes. Additional sieves are often inserted into the sequence to avoid overloading of individual sieves or to better define a particular size range.

Frame Diameter
Frames should accommodate the entire sample volume with enough surface area to avoid overloading individual sieves. The diameter selected must also fit the sieve shaker being used. Gilson stocks the most common size diameter sieves.

Frame Height
Sieve frames are designated as Full-Height or Half-Height. Intermediate-Height

Stainless Steel Sieves

Combination Sieve

Stainless Steel 8in Pan

sieves are also available for 12in diameters. Half or Intermediate-Height frames allow a greater number of sieves to be used when stack height is limited. Large particles require Full-Height frames for free movement during agitation for more efficient separation. Black rubber O-Rings are included with ISO Test Sieves and optionally available for ASTM sieves.

Frame and Cloth Material

- Stainless Steel Frame with Stainless Steel Cloth is a popular choice and assures a sieve with the longest possible service life. This is the best choice where extreme wear, contamination, or sanitation is an issue.
- Combination Brass Frame with Stainless Steel Cloth offers adequate service life. The frames of these sieves feature a stainless steel skirt for added durability.
- Brass Frame with Brass Cloth is acceptable for light-duty applications. Coarse-series sieves are not available with brass cloth.

Backing Cloth

Backing Cloth prevents sagging and tearing and improves service life of finer mesh sieves. #35 stainless steel mesh reinforcement is located below the primary sieve cloth, increasing the strength of the primary sieve cloth and reducing distortion of the openings during use. Backing Cloth is available at extra cost for sieves with stainless steel mesh finer than ASTM E11 #70 or ISO565/3310-1 212µm on any frame diameter. To order, add the suffix "BU" to the model number of the sieve. These sieves are made-to-order and are non-returnable.

Pans and Covers

- Pans are positioned at the bottom of the sieve stack to collect fines. Extended-Rim Pans insert into the middle of a stack, allowing two samples to be tested at once.
- Covers are not necessary with most Gilson sieve shakers, but are needed for rotary sifters, shakers from some other manufacturers, or shaking by hand. The Cover-with-Ring model has a wire finger loop in the center to facilitate removal.

Gilson Sieve Verification Services

Gilson Verification can be performed on any test sieve or Gilson screen tray, used or new. An optical comparator with NIST traceable calibration measures opening sizes and wire diameters on each sieve, and a statistical analysis assures the standard deviations are within ASTM or ISO requirements for Inspection or Calibration grades. Sieves, trays, or wire cloth units are not included in the purchase price of the verification services. Because wire cloth stretches, sags, or tears, and abrasive materials can reduce wire diameters, a verification process should also be set up to regularly verify that working sieves still meet desired specifications. These services are ordered separately by specifying the appropriate model number given in our listing for Test Sieve and Screen Tray Verification and Services. To Reverify used sieves, contact a Gilson customer service representative for Reverification services. Sieves with backing cloth installed cannot be reverified.

Standard Reference Materials (SRM's)

Sieve Reference Materials are precisely sized glass beads or powders for performance testing of sieves. They are traceable to the National Institute of Standards and Technology (NIST), or European Community Bureau of Reference (BCR). SRM's fit easily into internal quality programs following guidelines in ASTM E2427, Sieve Acceptance by Performance Testing. User-Prepared Reference Materials can also be utilized under E2427 in the same manner as SRM's. Because user materials are non-standard, they are not traceable and require more handling. In addition, the user must determine acceptable tolerances for statistical analysis.

Sieve Shakers

The proper sieve shaker saves considerable time and effort, and yields superior accuracy, consistency, and repeatability compared to manual shaking or hand sieving methods for particle sizing. Effective agitation lifts all particles off the sieve cloth, reorients them, and allows them to be repeatedly "tried" to different openings at different angles. Careful review of shaker specifications allows optimal choices for different materials and applications. Greater sample volumes and large particle topsize may indicate selection of Gilson Testing Screen, Test-Master® or Porta-Screen® models for efficient processing.

Sieve Frame Heights

Sieve		Frame Height Measurements		
Diameter	Frame Designation	Stacked in (mm)	Overall in (mm)	Above Cloth in (mm)
3in (76mm)	FH HH	1-1/8 (28.6) 5/8 (15.9)	1-3/4 (44.5) 1-1/4 (31.8)	1-1/4 (31.8) 5/8 (15.9)
6in (152mm)	FH HH	1-7/8 (47.6) 1-1/8 (28.6)	2-5/8 (66.7) 1-7/8 (47.6)	1-3/4 (44.5) 1 (25.4)
8in (203mm)	FH HH	2-1/8 (54) 1-1/8 (28.6)	2-5/8 (66.7) 1-5/8 (41.3)	2 (50.8) 1 (25.4)
200mm	FH HH	2-1/8 (54) 1-1/8 (28.6)	2-5/8 (66.7) 1-5/8 (41.3)	1.96 (50) .98 (25)
10in (254mm)	FH	3-1/8 (79.4)	4 (101.6)	3 (76.2)
12in (305mm)	FH IH HH	3-3/8 (85.7) 2-1/8 (54) 1-3/4 (44.5)	4-1/4 (108) 3 (76.2) 2-5/8 (66.7)	3-1/4 (82.6) 2 (50.8) 1-5/8 (41.3)
300mm	FH HH	2-1/2 (63.5) 1-1/2 (38.1)	3 (76.2) 2 (50.8)	1.96 (50) .98 (25)
18in (457mm)	FH	4-1/4 (108)	5-1/2 (139.7)	4.5 (114.3)

Combination Sieve

8in Diameter Stainless Steel Test Sieves

SS-8R Gilson Tapping Sieve Shaker shown with Sieves

8in Diameter ASTM E11 Test Sieves

	Sieve Designation		Stainless Cloth Stainless Frame		Stainless Cloth Brass Frame		Brass Cloth Brass Frame	
	Alt.	Std.	Full Ht.	Half Ht.	Full Ht.	Half Ht.	Full Ht.	Half Ht.
COARSE SERIES	4in	100.0mm	V8SF 4"	V8SH 4"	V8CF 4"	—	—	—
	3-1/2in	90.0mm	V8SF 3-1/2"	V8SH 3-1/2"	V8CF 3-1/2"	—	—	—
	3in	75.0mm	V8SF 3"	V8SH 3"	V8CF 3"	—	—	—
	2-1/2in	63.0mm	V8SF 2-1/2"	V8SH 2-1/2"	V8CF 2-1/2"	—	—	—
	2.12in	53.0mm	V8SF 2.12"	V8SH 2.12"	V8CF 2.12"	—	—	—
	2in	50.0mm	V8SF 2"	V8SH 2"	V8CF 2"	—	—	—
	1-3/4in	45.0mm	V8SF 1-3/4"	V8SH 1-3/4"	V8CF 1-3/4"	—	—	—
	1-1/2in	37.5mm	V8SF 1-1/2"	V8SH 1-1/2"	V8CF 1-1/2"	—	—	—
	1-1/4in	31.5mm	V8SF 1-1/4"	V8SH 1-1/4"	V8CF 1-1/4"	—	—	—
	1.06in	26.5mm	V8SF 1.06"	V8SH 1.06"	V8CF 1.06"	—	—	—
	1in	25.0mm	V8SF 1"	V8SH 1"	V8CF 1"	—	—	—
	7/8in	22.4mm	V8SF 7/8"	V8SH 7/8"	V8CF 7/8"	V8CH 7/8"	—	—
	3/4in	19.0mm	V8SF 3/4"	V8SH 3/4"	V8CF 3/4"	V8CH 3/4"	—	—
	5/8in	16.0mm	V8SF 5/8"	V8SH 5/8"	V8CF 5/8"	V8CH 5/8"	—	—
	0.530in	13.2mm	V8SF .530"	V8SH .530"	V8CF .530"	V8CH .530"	—	—
	1/2in	12.5mm	V8SF 1/2"	V8SH 1/2"	V8CF 1/2"	V8CH 1/2"	—	—
	7/16in	11.2mm	V8SF 7/16"	V8SH 7/16"	V8CF 7/16"	V8CH 7/16"	—	—
	3/8in	9.5mm	V8SF 3/8"	V8SH 3/8"	V8CF 3/8"	V8CH 3/8"	—	—
	5/16in	8.0mm	V8SF 5/16"	V8SH 5/16"	V8CF 5/16"	V8CH 5/16"	—	—
	0.265in	6.7mm	V8SF .265"	V8SH .265"	V8CF .265"	V8CH .265"	—	—
	1/4in	6.3mm	V8SF 1/4"	V8SH 1/4"	V8CF 1/4"	V8CH 1/4"	—	—
	No.3-1/2	5.6mm	V8SF #3-1/2	V8SH #3-1/2	V8CF #3-1/2	V8CH #3-1/2	—	—
	No.4	4.75mm	V8SF #4	V8SH #4	V8CF #4	V8CH #4	—	—
FINE SERIES	No.5	4.0mm	V8SF #5	V8SH #5	V8CF #5	V8CH #5	—	—
	No.6	3.35mm	V8SF #6	V8SH #6	V8CF #6	V8CH #6	—	—
	1/8in[1]	3.18mm	V8SF 1/8"	V8SH 1/8"	V8CF 1/8"	V8CH 1/8"	—	—
	No.7	2.8mm	V8SF #7	V8SH #7	V8CF #7	V8CH #7	—	—
	No.8	2.36mm	V8SF #8	V8SH #8	V8CF #8	V8CH #8	V8BF #8	V8BH #8
	No.10	2.0mm	V8SF #10	V8SH #10	V8CF #10	V8CH #10	V8BF #10	V8BH #10
	No.12	1.7mm	V8SF #12	V8SH #12	V8CF #12	V8CH #12	V8BF #12	V8BH #12
	No.14	1.4mm	V8SF #14	V8SH #14	V8CF #14	V8CH #14	V8BF #14	V8BH #14
	No.16	1.18mm	V8SF #16	V8SH #16	V8CF #16	V8CH #16	V8BF #16	V8BH #16
	No.18	1.0mm	V8SF #18	V8SH #18	V8CF #18	V8CH #18	V8BF #18	V8BH #18
	No.20	850µm	V8SF #20	V8SH #20	V8CF #20	V8CH #20	V8BF #20	V8BH #20
	No.25	710µm	V8SF #25	V8SH #25	V8CF #25	V8CH #25	V8BF #25	V8BH #25
	No.30	600µm	V8SF #30	V8SH #30	V8CF #30	V8CH #30	V8BF #30	V8BH #30
	No.35	500µm	V8SF #35	V8SH #35	V8CF #35	V8CH #35	V8BF #35	V8BH #35
	No.40	425µm	V8SF #40	V8SH #40	V8CF #40	V8CH #40	V8BF #40	V8BH #40
	No.45	355µm	V8SF #45	V8SH #45	V8CF #45	V8CH #45	V8BF #45	V8BH #45
	No.50	300µm	V8SF #50	V8SH #50	V8CF #50	V8CH #50	V8BF #50	V8BH #50
	No.60	250µm	V8SF #60	V8SH #60	V8CF #60	V8CH #60	V8BF #60	V8BH #60
	No.70	212µm	V8SF #70	V8SH #70	V8CF #70	V8CH #70	V8BF #70	V8BH #70
	No.80	180µm	V8SF #80	V8SH #80	V8CF #80	V8CH #80	V8BF #80	V8BH #80
	No.100	150µm	V8SF #100	V8SH #100	V8CF #100	V8CH #100	V8BF #100	V8BH #100
	No.120	125µm	V8SF #120	V8SH #120	V8CF #120	V8CH #120	V8BF #120	V8BH #120
	No.140	106µm	V8SF #140	V8SH #140	V8CF #140	V8CH #140	V8BF #140	V8BH #140
	No.170	90µm	V8SF #170	V8SH #170	V8CF #170	V8CH #170	V8BF #170	V8BH #170
	No.200	75µm	V8SF #200	V8SH #200	V8CF #200	V8CH #200	V8BF #200	V8BH #200
	No.230	63µm	V8SF #230	V8SH #230	V8CF #230	V8CH #230	V8BF #230	V8BH #230
	No.270	53µm	V8SF #270	V8SH #270	V8CF #270	V8CH #270	V8BF #270	V8BH #270
	No.325	45µm	V8SF #325	V8SH #325	V8CF #325	V8CH #325	V8BF #325	V8BH #325
	No.400	38µm	V8SF #400	V8SH #400	V8CF #400	V8CH #400	—	—
	No.450	32µm	V8SF #450	V8SH #450	V8CF #450	V8CH #450	—	—
	No.500	25µm	V8SF #500	V8SH #500	V8CF #500	V8CH #500	—	—
	No.635	20µm	V8SF #635	V8SH #635	V8CF #635	V8CH #635	—	—
	Regular Pan		V8SFXPN	V8SHXPN	V8BFXPN	V8BHXPN	V8BFXPN	V8BHXPN
	Extended Rim Pan		V8SFXPE	V8SHXPE	V8BFXPE	V8BHXPE	V8BFXPE	V8BHXPE
	Regular Cover		V8SFXCV		V8BFXCV			
	Cover with Ring		V8SFXCR		V8BFXCR			

[1]*Not a standard ASTM size.*

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12in Diameter ASTM E11 Test Sieves

	Sieve Designation		Stainless Cloth Stainless Frame			Stainless Cloth Brass Frame			Brass Cloth Brass Frame		
	Alt.	Std.	Full Ht.	Inter. Ht.	Half Ht.	Full Ht.	Inter. Ht.	Half Ht.	Full Ht.	Inter. Ht.	Half Ht.
COARSE SERIES	4in	100.0mm	V12SF 4"	V12SI 4"	—	V12CF 4"	V12CI 4"	—	—	—	—
	3-1/2in	90.0mm	V12SF 3-1/2"	V12SI 3-1/2"	—	V12CF 3-1/2"	V12CI 3-1/2"	—	—	—	—
	3in	75.0mm	V12SF 3"	V12SI 3"	—	V12CF 3"	V12CI 3"	—	—	—	—
	2-1/2in	63.0mm	V12SF 2-1/2"	V12SI 2-1/2"	—	V12CF 2-1/2"	V12CI 2-1/2"	—	—	—	—
	2.12in	53.0mm	V12SF 2.12"	V12SI 2.12"	—	V12CF 2.12"	V12CI 2.12"	—	—	—	—
	2in	50.0mm	V12SF 2"	V12SI 2"	—	V12CF 2"	V12CI 2"	—	—	—	—
	1-3/4in	45.0mm	V12SF 1-3/4"	V12SI 1-3/4"	—	V12CF 1-3/4"	V12CI 1-3/4"	—	—	—	—
	1-1/2in	37.5mm	V12SF 1-1/2"	V12SI 1-1/2"	—	V12CF 1-1/2"	V12CI 1-1/2"	—	—	—	—
	1-1/4in	31.5mm	V12SF 1-1/4"	V12SI 1-1/4"	—	V12CF 1-1/4"	V12CI 1-1/4"	—	—	—	—
	1.06in	26.5mm	V12SF 1.06"	V12SI 1.06"	—	V12CF 1.06"	V12CI 1.06"	—	—	—	—
	1in	25.0mm	V12SF 1"	V12SI 1"	V12SH 1"	V12CF 1"	V12CI 1"	V12CH 1"	—	—	—
	7/8in	22.4mm	V12SF 7/8"	V12SI 7/8"	V12SH 7/8"	V12CF 7/8"	V12CI 7/8"	V12CH 7/8"	—	—	—
	3/4in	19.0mm	V12SF 3/4"	V12SI 3/4"	V12SH 3/4"	V12CF 3/4"	V12CI 3/4"	V12CH 3/4"	—	—	—
	5/8in	16.0mm	V12SF 5/8"	V12SI 5/8"	V12SH 5/8"	V12CF 5/8"	V12CI 5/8"	V12CH 5/8"	—	—	—
	0.530in	13.2mm	V12SF .530"	V12SI .530"	V12SH .530"	V12CF .530"	V12CI .530"	V12CH .530"	—	—	—
	1/2in	12.5mm	V12SF 1/2"	V12SI 1/2"	V12SH 1/2"	V12CF 1/2"	V12CI 1/2"	V12CH 1/2"	—	—	—
	7/16in	11.2mm	V12SF 7/16"	V12SI 7/16"	V12SH 7/16"	V12CF 7/16"	V12CI 7/16"	V12CH 7/16"	—	—	—
	3/8in	9.5mm	V12SF 3/8"	V12SI 3/8"	V12SH 3/8"	V12CF 3/8"	V12CI 3/8"	V12CH 3/8"	—	—	—
	5/16in	8.0mm	V12SF 5/16"	V12SI 5/16"	V12SH 5/16"	V12CF 5/16"	V12CI 5/16"	V12CH 5/16"	—	—	—
	0.265in	6.7mm	V12SF .265"	V12SI .265"	V12SH .265"	V12CF .265"	V12CI .265"	V12CH .265"	—	—	—
	1/4in	6.3mm	V12SF 1/4"	V12SI 1/4"	V12SH 1/4"	V12CF 1/4"	V12CI 1/4"	V12CH 1/4"	—	—	—
	No.3-1/2	5.6mm	V12SF #3-1/2	V12SI #3-1/2	V12SH #3-1/2	V12CF #3-1/2	V12CI #3-1/2	V12CH #3-1/2	—	—	—
	No.4	4.75mm	V12SF #4	V12SI #4	V12SH #4	V12CF #4	V12CI #4	V12CH #4	—	—	—
FINE SERIES	No.5	4.0mm	V12SF #5	V12SI #5	V12SH #5	V12CF #5	V12CI #5	V12CH #5	—	—	—
	No.6	3.35mm	V12SF #6	V12SI #6	V12SH #6	V12CF #6	V12CI #6	V12CH #6	—	—	—
	1/8in[1]	3.18mm	V12SF 1/8"	V12SI 1/8"	V12SH 1/8"	V12CF 1/8"	V12CI 1/8"	V12CH 1/8"	—	—	—
	No.7	2.8mm	V12SF #7	V12SI #7	V12SH #7	V12CF #7	V12CI #7	V12CH #7	—	—	—
	No.8	2.36mm	V12SF #8	V12SI #8	V12SH #8	V12CF #8	V12CI #8	V12CH #8	V12BF #8	V12BI #8	V12BH #8
	No.10	2.0mm	V12SF #10	V12SI #10	V12SH #10	V12CF #10	V12CI #10	V12CH #10	V12BF #10	V12BI #10	V12BH #10
	No.12	1.7mm	V12SF #12	V12SI #12	V12SH #12	V12CF #12	V12CI #12	V12CH #12	V12BF #12	V12BI #12	V12BH #12
	No.14	1.4mm	V12SF #14	V12SI #14	V12SH #14	V12CF #14	V12CI #14	V12CH #14	V12BF #14	V12BI #14	V12BH #14
	No.16	1.18mm	V12SF #16	V12SI #16	V12SH #16	V12CF #16	V12CI #16	V12CH #16	V12BF #16	V12BI #16	V12BH #16
	No.18	1.0mm	V12SF #18	V12SI #18	V12SH #18	V12CF #18	V12CI #18	V12CH #18	V12BF #18	V12BI #18	V12BH #18
	No.20	850µm	V12SF #20	V12SI #20	V12SH #20	V12CF #20	V12CI #20	V12CH #20	V12BF #20	V12BI #20	V12BH #20
	No.25	710µm	V12SF #25	V12SI #25	V12SH #25	V12CF #25	V12CI #25	V12CH #25	V12BF #25	V12BI #25	V12BH #25
	No.30	600µm	V12SF #30	V12SI #30	V12SH #30	V12CF #30	V12CI #30	V12CH #30	V12BF #30	V12BI #30	V12BH #30
	No.35	500µm	V12SF #35	V12SI #35	V12SH #35	V12CF #35	V12CI #35	V12CH #35	V12BF #35	V12BI #35	V12BH #35
	No.40	425µm	V12SF #40	V12SI #40	V12SH #40	V12CF #40	V12CI #40	V12CH #40	V12BF #40	V12BI #40	V12BH #40
	No.45	355µm	V12SF #45	V12SI #45	V12SH #45	V12CF #45	V12CI #45	V12CH #45	V12BF #45	V12BI #45	V12BH #45
	No.50	300µm	V12SF #50	V12SI #50	V12SH #50	V12CF #50	V12CI #50	V12CH #50	V12BF #50	V12BI #50	V12BH #50
	No.60	250µm	V12SF #60	V12SI #60	V12SH #60	V12CF #60	V12CI #60	V12CH #60	V12BF #60	V12BI #60	V12BH #60
	No.70	212µm	V12SF #70	V12SI #70	V12SH #70	V12CF #70	V12CI #70	V12CH #70	V12BF #70	V12BI #70	V12BH #70
	No.80	180µm	V12SF #80	V12SI #80	V12SH #80	V12CF #80	V12CI #80	V12CH #80	V12BF #80	V12BI #80	V12BH #80
	No.100	150µm	V12SF #100	V12SI #100	V12SH #100	V12CF #100	V12CI #100	V12CH #100	V12BF #100	V12BI #100	V12BH #100
	No.120	125µm	V12SF #120	V12SI #120	V12SH #120	V12CF #120	V12CI #120	V12CH #120	V12BF #120	V12BI #120	V12BH #120
	No.140	106µm	V12SF #140	V12SI #140	V12SH #140	V12CF #140	V12CI #140	V12CH #140	V12BF #140	V12BI #140	V12BH #140
	No.170	90µm	V12SF #170	V12SI #170	V12SH #170	V12CF #170	V12CI #170	V12CH #170	V12BF #170	V12BI #170	V12BH #170
	No.200	75µm	V12SF #200	V12SI #200	V12SH #200	V12CF #200	V12CI #200	V12CH #200	V12BF #200	V12BI #200	V12BH #200
	No.230	63µm	V12SF #230	V12SI #230	V12SH #230	V12CF #230	V12CI #230	V12CH #230	V12BF #230	V12BI #230	V12BH #230
	No.270	53µm	V12SF #270	V12SI #270	V12SH #270	V12CF #270	V12CI #270	V12CH #270	V12BF #270	V12BI #270	V12BH #270
	No.325	45µm	V12SF #325	V12SI #325	V12SH #325	V12CF #325	V12CI #325	V12CH #325	V12BF #325	V12BI #325	V12BH #325
	No.400	38µm	V12SF #400	V12SI #400	V12SH #400	V12CF #400	V12CI #400	V12CH #400	—	—	—
	No.450	32µm	V12SF #450	V12SI #450	V12SH #450	V12CF #450	V12CI #450	V12CH #450	—	—	—
	No.500	25µm	V12SF #500	V12SI #500	V12SH #500	V12CF #500	V12CI #500	V12CH #500	—	—	—
	No.635	20µm	V12SF #635	V12SI #635	V12SH #635	V12CF #635	V12CI #635	V12CH #635	—	—	—
	Regular Pan		V12SFXPN	—	V12SHXPN	V12BFXPN	V12BFXPN	V12BHXPN	V12BFXPN	V12BIXPN	V12BHXPN
	Extended Rim Pan		V12SFXPE	V12SIXPE	V12SHXPE	V12BFXPE	V12BFXPE	V12BHXPE	V12BFXPE	V12BIXPE	V12BHXPE
	Regular Cover		V12SFXCV			V12BFXCV					
	Cover with Ring		V12SFXCR			V12BFXCR					

[1]*Not a standard ASTM size.*

8in Diameter Stainless Steel
Full Height Test Sieves and Pan

8in Diameter Stainless Steel
Half Height Test Sieves

12in Diameter Stainless Steel
Full Height Test Sieves

12in Diameter Stainless Steel
Half Height Test Sieves

technote

The latest edition of ASTM E11 incorporates a new range of opening sizes for test sieves (supplemental sizes), intended to supplement existing sizes. Gilson is offering these Metric Alternative sizes in stainless steel cloth installed in conventional 3in, 8in, and 12in diameter stainless steel or combination frames.

8in & 12in Diameter ASTM E11 Supplemental Sieve Sizes

Supplemental Sizes	8in Diameter		12in Diameter		
	Stainless Cloth Stainless Frame		Stainless Cloth Stainless Frame		
	Full Ht.	Half Ht.	Full Ht.	Int. Ht.	Half Ht.
56.0mm	V8SF 56M	V8SH 56M	V12SF 56M	V12SI 56M	V12SH 56M
40.0mm	V8SF 40M	V8SH 40M	V12SF 40M	V12SI 40M	V12SH 40M
35.5mm	V8SF 35.5M	V8SH 35.5M	V12SF 35.5M	V12SI 35.5M	V12SH 35.5M
28.0mm	V8SF 28M	V8SH 28M	V12SF 28M	V12SI 28M	V12SH 28M
20.0mm	V8SF 20M	V8SH 20M	V12SF 20M	V12SI 20M	V12SH 20M
18.0mm	V8SF 18M	V8SH 18M	V12SF 18M	V12SI 18M	V12SH 18M
14.0mm	V8SF 14M	V8SH 14M	V12SF 14M	V12SI 14M	V12SH 14M
10.00mm	V8SF 10M	V8SH 10M	V12SF 10M	V12SI 10M	V12SH 10M
9.0mm	V8SF 9M	V8SH 9M	V12SF 9M	V12SI 9M	V12SH 9M
7.1mm	V8SF 7.1M	V8SH 7.1M	V12SF 7.1M	V12SI 7.1M	V12SH 7.1M
5.0mm	V8SF 5M	V8SH 5M	V12SF 5M	V12SI 5M	V12SH 5M
4.5mm	V8SF 4.5M	V8SH 4.5M	V12SF 4.5M	V12SI 4.5M	V12SH 4.5M
3.55mm	V8SF 3.55M	V8SH 3.55M	V12SF 3.55M	V12SI 3.55M	V12SH 3.55M
3.15mm	V8SF 3.15M	V8SH 3.15M	V12SF 3.15M	V12SI 3.15M	V12SH 3.15M
2.5mm	V8SF 2.5M	V8SH 2.5M	V12SF 2.5M	V12SI 2.5M	V12SH 2.5M
2.24mm	V8SF 2.24M	V8SH 2.24M	V12SF 2.24M	V12SI 2.24M	V12SH 2.24M
1.80mm	V8SF 1.80M	V8SH 1.80M	V12SF 1.80M	V12SI 1.80M	V12SH 1.80M
1.60mm	V8SF 1.60M	V8SH 1.60M	V12SF 1.60M	V12SI 1.60M	V12SH 1.60M
1.25mm	V8SF 1.25M	V8SH 1.25M	V12SF 1.25M	V12SI 1.25M	V12SH 1.25M
1.12mm	V8SF 1.12M	V8SH 1.12M	V12SF 1.12M	V12SI 1.12M	V12SH 1.12M
900µm	V8SF 900U	V8SH 900U	V12SF 900U	V12SI 900U	V12SH 900U
800µm	V8SF 800U	V8SH 800U	V12SF 800U	V12SI 800U	V12SH 800U
630µm	V8SF 630U	V8SH 630U	V12SF 630U	V12SI 630U	V12SH 630U
560µm	V8SF 560U	V8SH 560U	V12SF 560U	V12SI 560U	V12SH 560U
450µm	V8SF 450U	V8SH 450U	V12SF 450U	V12SI 450U	V12SH 450U
400µm	V8SF 400U	V8SH 400U	V12SF 400U	V12SI 400U	V12SH 400U
315µm	V8SF 315U	V8SH 315U	V12SF 315U	V12SI 315U	V12SH 315U
280mm	V8SF 280U	V8SH 280U	V12SF 280U	V12SI 280U	V12SH 280U
224µm	V8SF 224U	V8SH 224U	V12SF 224U	V12SI 224U	V12SH 224U
200µm	V8SF 200U	V8SH 200U	V12SF 200U	V12SI 200U	V12SH 200U
160µm	V8SF 160U	V8SH 160U	V12SF 160U	V12SI 160U	V12SH 160U
140µm	V8SF 140U	V8SH 140U	V12SF 140U	V12SI 140U	V12SH 140U
112µm	V8SF 112U	V8SH 112U	V12SF 112U	V12SI 112U	V12SH 112U
100µm	V8SF 100U	V8SH 100U	V12SF 100U	V12SI 100U	V12SH 100U
80µm	V8SF 80U	V8SH 80U	V12SF 80U	V12SI 80U	V12SH 80U
71µm	V8SF 71U	V8SH 71U	V12SF 71U	V12SI 71U	V12SH 71U
56µm	V8SF 56U	V8SH 56U	V12SF 56U	V12SI 56U	V12SH 56U
50µm	V8SF 50U	V8SH 50U	V12SF 50U	V12SI 50U	V12SH 50U
40µm	V8SF 40U	V8SH 40U	V12SF 40U	V12SI 40U	V12SH 40U
36µm	V8SF 36U	V8SH 36U	V12SF 36U	V12SI 36U	V12SH 36U

3in Diameter Stainless Steel Test Sieves

SS-3 shown with 3in Stainless Steel Sieves

3in Diameter ASTM E11 Test Sieves

	Sieve Designation			Stainless Cloth Stainless Frame		Stainless Cloth Brass Frame	
	Alt.	Std.	Supplemental	Full Ht.	Half Ht.	Full Ht.	Half Ht.
COARSE	3/8in	9.5mm	—	V3SF 3/8"	—	—	—
	—	—	9.0mm	V3SF 9M	—	—	—
	5/16in	8.0mm	—	V3SF 5/16"	—	—	—
	—	—	7.1mm	V3SF 7.1M	—	—	—
	0.265in	6.7mm	—	V3SF .265"	—	—	—
	1/4in	6.3mm	—	V3SF 1/4"	—	—	—
	No.3-1/2in	5.6mm	—	V3SF #3-1/2	V3SH #3-1/2	V3CF #3-1/2	V3CH #3-1/2
	—	—	5.0mm	V3SF 5M	V3SH 5M	V3CF 5M	V3CH 5M
	No.4	4.75mm	—	V3SF #4	V3SH #4	V3CF #4	V3CH #4
	—	—	4.5mm	V3SF 4.5M	V3SH 4.5M	V3CF 4.5M	V3CH 4.5M
FINE SERIES	No.5	4.0mm	—	V3SF #5	V3SH #5	V3CF #5	V3CH #5
	—	—	3.55mm	V3SF 3.55M	V3SH 3.55M	V3CF 3.55M	V3CH 3.55M
	No.6	3.35mm	—	V3SF #6	V3SH #6	V3CF #6	V3CH #6
	—	—	3.15mm	V3SF 3.15M	V3SH 3.15M	V3CF 3.15M	V3CH 3.15M
	No.7	2.8mm	—	V3SF #7	V3SH #7	V3CF #7	V3CH #7
	—	—	2.5mm	V3SF 2.5M	V3SH 2.5M	V3CF 2.5M	V3CH 2.5M
	No.8	2.36mm	—	V3SF #8	V3SH #8	V3CF #8	V3CH #8
	—	—	2.24mm	V3SF 2.24M	V3SH 2.24M	V3CF 2.24M	V3CH 2.24M
	No.10	2.0mm	—	V3SF #10	V3SH #10	V3CF #10	V3CH #10
	—	—	1.80mm	V3SF 1.8M	V3SH 1.8M	V3CF 1.8M	V3CH 1.8M
	No.12	1.7mm	—	V3SF #12	V3SH #12	V3CF #12	V3CH #12
	—	—	1.60mm	V3SF 1.6M	V3SH 1.6M	V3CF 1.6M	V3CH 1.6M
	No.14	1.4mm	—	V3SF #14	V3SH #14	V3CF #14	V3CH #14
	—	—	1.25mm	V3SF 1.25M	V3SH 1.25M	V3CF 1.25M	V3CH 1.25M
	No.16	1.18mm	—	V3SF #16	V3SH #16	V3CF #16	V3CH #16
	—	—	1.12mm	V3SF 1.12M	V3SH 1.12M	V3CF 1.12M	V3CH 1.12M
	No.18	1.0mm	—	V3SF #18	V3SH #18	V3CF #18	V3CH #18
	—	—	900µm	V3SF 900U	V3SH 900U	V3CF 900U	V3CH 900U
	No.20	850µm	—	V3SF #20	V3SH #20	V3CF #20	V3CH #20
	—	—	800µm	V3SF 800U	V3SH 800U	V3CF 800U	V3CH 800U
	No.25	710µm	—	V3SF #25	V3SH #25	V3CF #25	V3CH #25
	—	—	630µm	V3SF 630U	V3SH 630U	V3CF 630U	V3CH 630U
	No.30	600µm	—	V3SF #30	V3SH #30	V3CF #30	V3CH #30
	—	—	560µm	V3SF 560U	V3SH 560U	V3CF 560U	V3CH 560U
	No.35	500µm	—	V3SF #35	V3SH #35	V3CF #35	V3CH #35
	—	—	450µm	V3SF 450U	V3SH 450U	V3CF 450U	V3CH 450U
	No.40	425µm	—	V3SF #40	V3SH #40	V3CF #40	V3CH #40
	—	—	400µm	V3SF 450U	V3SH 450U	V3CF 450U	V3CH 450U
	No.45	355µm	—	V3SF #45	V3SH #45	V3CF #45	V3CH #45
	—	—	315µm	V3SF 315U	V3SH 315U	V3CF 315U	V3CH 315U
	No.50	300µm	—	V3SF #50	V3SH #50	V3CF #50	V3CH #50
	—	—	280µm	V3SF 280U	V3SH 280U	V3CF 280U	V3CH 280U
	No.60	250µm	—	V3SF #60	V3SH #60	V3CF #60	V3CH #60
	—	—	224µm	V3SF 224U	V3SH 224U	V3CF 224U	V3CH 224U
	No.70	212µm	—	V3SF #70	V3SH #70	V3CF #70	V3CH #70
	—	—	200µm	V3SF 200U	V3SH 200U	V3CF 200U	V3CH 200U
	No.80	180µm	—	V3SF #80	V3SH #80	V3CF #80	V3CH #80
	—	—	160µm	V3SF 160U	V3SH 160U	V3CF 160U	V3CH 160U
	No.100	150µm	—	V3SF #100	V3SH #100	V3CF #100	V3CH #100
	—	—	140µm	V3SF 140U	V3SF 140U	V3CF 140U	V3CH 140U
	No.120	125µm	—	V3SF #120	V3SH #120	V3CF #120	V3CH #120
	—	—	112µm	V3SF 112U	V3SH 112U	V3CF 112U	V3CH 112U
	No.140	106µm	—	V3SF #140	V3SH #140	V3CF #140	V3CH #140
	—	—	100µm	V3SF 100U	V3SH 100U	V3CF 100U	V3CH 100U
	No.170	90µm	—	V3SF #170	V3SH #170	V3CF #170	V3CH #170
	—	—	80µm	V3SF 80U	V3SH 80U	V3CF 80U	V3CH 80U
	No.200	75µm	—	V3SF #200	V3SH #200	V3CF #200	V3CH #200
	—	—	71µm	V3SF 71U	V3SH 71U	V3CF 71U	V3CH 71U
	No.230	63µm	—	V3SF #230	V3SH #230	V3CF #230	V3CH #230
	—	—	56µm	V3SF 56U	V3SH 56U	V3CF 56U	V3CH 56U
	No.270	53µm	—	V3SF #270	V3SH #270	V3CF #270	V3CH #270
	—	—	50µm	V3SF 50U	V3SH 50U	V3CF 50U	V3CH 50U
	No.325	45µm	—	V3SF #325	V3SH #325	V3CF #325	V3CH #325
	—	—	40µm	V3SF 40U	V3SH 40U	V3CF 40U	V3CH 40U
	No.400	38µm	—	V3SF #400	V3SH #400	V3CF #400	V3CH #400
	—	—	36µm	V3SF 36U	V3SH 36U	V3CF 36U	V3CH 36U
	No.450	32µm	—	V3SF #450	V3SH #450	V3CF #450	V3CH #450
	No.500	25µm	—	V3SF #500	V3SH #500	V3CF #500	V3CH #500
	No.635	20µm	—	V3SF #635	V3SH #635	V3CF #635	V3CH #635
	Regular Pan Extended Rim Pan			V3SFXPN V3SFXPE	V3SHXPN V3SHXPE	V3BFXPN V3BFXPE	V3BHXPN V3BHXPE
	Regular Cover Cover with Ring			V3SFXCV V3SFXCVR		V3BFXCV V3BFXCVR	

alsoavailable

Sieves can be verified to Inspection or Calibration grades under ASTM E11 or ISO 565 and 3310-01 specifications. See our separate listings for Test Sieve and Screen Tray Verification and Services.

VIDEO ONLINE

Acrylic Frame Sieves with Stainless Steel Mesh

Acrylic Frame Precision Sieves with Electroformed Mesh

3IN ACRYLIC FRAME TEST SIEVES

ASTM E11, E161; ISO 565, 3310-1, 3310-3

3in (76mm) diameter sieves have clear acrylic frames for enhanced sample visibility during testing, and are precision machined for improved fit and reduced sample loss. Frames are available fitted with conventional ASTM E11 stainless steel woven-wire cloth or ASTM E161 Precision Electroformed nickel mesh. Each sieve is supplied with a Certificate of Compliance to the appropriate ASTM Standard. Clear Acrylic Spacers are available if fewer sieves are used in the stack.

Woven-wire sieves are available in sizes from 5.60mm (No. 3 ½) to 20µm (No. 635) in ASTM E11 Compliance Grade, and can be Verified or Reverified to Inspection or Calibration grades using Gilson Verification Services. Stack height relative to metal frame sieves allows up to twice as many sieves in a stack. Acrylic frame woven wire sieve heights are approximately 0.8in (20.3mm).

3in Acrylic Frame Sieves are required for the GA-6 Gilsonic Autosiever, and a recommended alternative to metal-frame sieves for the SS-3 Gilson Performer III Sieve Shaker, where the reduced height of the acrylic frames allows up to fourteen sieves in a stack.

Precision Electroformed Sieves feature greater accuracy and opening size selection, making them a better solution for precision particle sizing operations. Opening sizes are available from 150µm (No.100) to 5µm and include sizes meeting ASTM E161 and ISO 565 requirements. E161 Precision Electroformed Sieves have tolerances to ±2µm, two to ten times lower than ASTM E11 woven-wire sieves, and some openings are equivalent to E11 sizes. When calibrated with Standard Reference Materials (SRM's), electroformed sieves can serve as a reliable reference standard. Their increased height limits the number that can be used in a stack. Acrylic frame electroformed sieve heights are approximately 1.4in (36.8mm).

3in Diameter Acrylic Frame ASTM E11 Test Sieves[1]

Sieve Designation		Stainless Steel Mesh	ASTM E161 Precision Electroformed
Alt.	Std.		
No.3-1/2	5.60mm	GAA-20	—
No.4	4.75mm	GAA-21	—
No.5	4.00mm	GAA-22	—
No.6	3.35mm	GAA-23	—
No.7	2.80mm	GAA-24	—
No.8	2.36mm	GAA-25	—
No.10	2.00mm	GAA-26	—
No.12	1.70mm	GAA-27	—
No.14	1.40mm	GAA-28	—
No.16	1.18mm	GAA-29	—
No.18	1.00mm	GAA-30	—
No.20	850µm	GAA-31	—
No.25	710µm	GAA-32	—
No.30	600µm	GAA-33	—
No.35	500µm	GAA-34	—
No.40	425µm	GAA-35	—
No.45	355µm	GAA-36	—
No.50	300µm	GAA-37	—
No.60	250µm	GAA-38	—
No.70	212µm	GAA-39	—
No.80	180µm	GAA-40	—
No.100	150µm	GAA-41	GAA-62
No.120	125µm	GAA-42	GAA-63
No.140	106µm	GAA-43	GAA-63A
—	105µm	—	GAA-64
—	100µm	—	GAA-65
—	95µm	—	GAA-66
No.170	90µm	GAA-44	GAA-67
—	85µm	—	GAA-68
—	80µm	—	GAA-69
No.200	75µm	GAA-45	GAA-70
—	70µm	—	GAA-71
—	65µm	—	GAA-72
No.230	63µm	GAA-46	GAA-72A
—	60µm	—	GAA-73
—	55µm	—	GAA-74
No.270	53µm	GAA-47	GAA-74A
—	50µm	—	GAA-75
No.325	45µm	GAA-48	GAA-76
—	40µm	—	GAA-77
No.400	38µm	GAA-49	GAA-77A
—	35µm	—	GAA-78
No.450	32µm	GAA-50	GAA-78A
—	30µm	—	GAA-79
No.500	25µm	GAA-51	GAA-80
No.635	20µm	GAA-52	GAA-81
—	15µm	—	GAA-82
—	10µm	—	GAA-83
—	5µm	—	GAA-84

[1]*Inquire for sizes not listed.*

alsoavailable

3in Acrylic Frame Test sieves can be verified to Inspection or Calibration grades under ASTM E11 or ISO 565 and 3310-1 specifications. See our separate listing for Test Sieve and Screen Tray Verification and services.

6in Stainless Steel Sieves

10in Stainless Steel Sieves

18in Brass Frame with Stainless Steel Mesh

6in, 10in, & 18in Diameter ASTM E11 Test Sieves

	Sieve Designation		6in Diameter		10in Diameter	18in Diameter
			Stainless Cloth Stainless Frame		Stainless Cloth Stainless Frame	Stainless Cloth Brass Frame
	Alt.	Std.	Full Ht.	Half Ht.	Full Ht.	Full Ht.
COARSE SERIES	4in	100.0mm	–	–	V10SF 4"	V18CF 4"
	3-1/2in	90.0mm	–	–	V10SF 3-1/2"	V18CF 3-1/2"
	3in	75.0mm	–	–	V10SF 3"	V18CF 3"
	2-1/2in	63.0mm	–	–	V10SF 2-1/2"	V18CF 2-1/2"
	2.12in	53.0mm	–	–	V10SF 2.12"	V18CF 2.12"
	2in	50.0mm	–	–	V10SF 2"	V18CF 2"
	1-3/4in	45.0mm	–	–	V10SF 1-3/4"	V18CF 1-3/4"
	1-1/2in	37.5mm	–	–	V10SF 1-1/2"	V18CF 1-1/2"
	1-1/4in	31.5mm	–	–	V10SF 1-1/4"	V18CF 1-1/4"
	1.06in	26.5mm	–	–	V10SF 1.06"	V18CF 1.06"
	1in	25.0mm	V6SF 1"	–	V10SF 1"	V18CF 1"
	7/8in	22.4mm	V6SF 7/8"	–	V10SF 7/8"	V18CF 7/8"
	3/4in	19.0mm	V6SF 3/4"	–	V10SF 3/4"	V18CF 3/4"
	5/8in	16.0mm	V6SF 5/8"	–	V10SF 5/8"	V18CF 5/8"
	0.530in	13.2mm	V6SF .530"	–	V10SF .530"	V18CF .530"
	1/2in	12.5mm	V6SF 1/2"	–	V10SF 1/2"	V18CF 1/2"
	7/16in	11.2mm	V6SF 7/16"	–	V10SF 7/16"	V18CF 7/16"
	3/8in	9.5mm	V6SF 3/8"	–	V10SF 3/8"	V18CF 3/8"
	5/16in	8.0mm	V6SF 5/16"	–	V10SF 5/16"	V18CF 5/16"
	0.265in	6.7mm	V6SF .265"	–	V10SF .265"	V18CF .265"
	1/4in	6.3mm	V6SF 1/4"	–	V10SF 1/4"	V18CF 1/4"
	No.3-1/2	5.6mm	V6SF #3-1/2	V6SH #3-1/2	V10SF #3-1/2	V18CF #3-1/2
	No.4	4.75mm	V6SF #4	V6SH #4	V10SF #4	V18CF #4
FINE SERIES	No.5	4.0mm	V6SF #5	V6SH #5	V10SF #5	V18CF #5
	No.6	3.35mm	V6SF #6	V6SH #6	V10SF #6	V18CF #6
	1/8in[1]	3.18mm	V6SF 1/8"	V6SH 1/8"	V10SF 1/8"	V18CF 1/8"
	No.7	2.8mm	V6SF #7	V6SH #7	V10SF #7	V18CF #7
	No.8	2.36mm	V6SF #8	V6SH #8	V10SF #8	V18CF #8
	No.10	2.0mm	V6SF #10	V6SH #10	V10SF #10	V18CF #10
	No.12	1.7mm	V6SF #12	V6SH #12	V10SF #12	V18CF #12
	No.14	1.4mm	V6SF #14	V6SH #14	V10SF #14	V18CF #14
	No.16	1.18mm	V6SF #16	V6SH #16	V10SF #16	V18CF #16
	No.18	1.0mm	V6SF #18	V6SH #18	V10SF #18	V18CF #18
	No.20	850µm	V6SF #20	V6SH #20	V10SF #20	V18CF #20
	No.25	710µm	V6SF #25	V6SH #25	V10SF #25	V18CF #25
	No.30	600µm	V6SF #30	V6SH #30	V10SF #30	V18CF #30
	No.35	500µm	V6SF #35	V6SH #35	V10SF #35	V18CF #35
	No.40	425µm	V6SF #40	V6SH #40	V10SF #40	V18CF #40
	No.45	355µm	V6SF #45	V6SH #45	V10SF #45	V18CF #45
	No.50	300µm	V6SF #50	V6SH #50	V10SF #50	V18CF #50
	No.60	250µm	V6SF #60	V6SH #60	V10SF #60	V18CF #60
	No.70	212µm	V6SF #70	V6SH #70	V10SF #70	V18CF #70
	No.80	180µm	V6SF #80	V6SH #80	V10SF #80	V18CF #80
	No.100	150µm	V6SF #100	V6SH #100	V10SF #100	V18CF #100
	No.120	125µm	V6SF #120	V6SH #120	V10SF #120	V18CF #120
	No.140	106µm	V6SF #140	V6SH #140	V10SF #140	V18CF #140
	No.170	90µm	V6SF #170	V6SH #170	V10SF #170	V18CF #170
	No.200	75µm	V6SF #200	V6SH #200	V10SF #200	V18CF #200
	No.230	63µm	V6SF #230	V6SH #230	V10SF #230	V18CF #230
	No.270	53µm	V6SF #270	V6SH #270	V10SF #270	–
	No.325	45µm	V6SF #325	V6SH #325	V10SF #325	–
	No.400	38µm	V6SF #400	V6SH #400	V10SF #400	–
	No.450	32µm	V6SF #450	V6SH #450	V10SF #450	–
	No.500	25µm	V6SF #500	V6SH #500	V10SF #500	–
	No.635	20µm	V6SF #635	V6SH #635	V10SF #635	–
	Regular Pan		V6SFXPN	V6SHXPN	V10SFXPN	V18BFXPN
	Extended Rim Pan		V6SFXPE	V6SHXPE	V10SFXPE	–
	Regular Cover		V6SFXCV	V6SFXCV	V10SFXCV	V18BFXCV
	Cover with Ring		V6SFXCR	V6SFXCR	V10SFXCR	–

200mm ISO Test Sieves

300mm ISO Test Sieves

helpfulhint

- ISO Test Sieves are available with opening sizes up to 125mm (5in). Please inquire for openings larger than 63mm.
- ISO Test Sieves are supplied with sieve seal gasket.
- ISO Sieves with 200mm or 300mm frames do not stack with ASTM 8in (203mm) or 12in (305mm) sieves.
- Many ISO sizes are available with 8in (203mm) or 12in (305mm) frames in ASTM E11 supplemental sizes listed separately.
- Sieve Verification Services for ISO Sieves can be found in a separate listing within this section.

ISO 200/300mm Test Sieves

	ISO 565, 3310-1	200mm				300mm	
		Stainless Cloth Stainless Frame		Stainless Cloth Brass Frame		Stainless Cloth Stainless Frame	
		Full Ht.	Half Ht.	Full Ht.	Half Ht.	Full Ht.	Half Ht.
COARSE SERIES	63.0mm	V200SF 63M	V200SH 63M	V200CF 63M	V200CH 63M	V300SF 63M	V300SH 63M
	56.0mm	V200SF 56M	V200SH 56M	V200CF 56M	V200CH 56M	V300SF 56M	V300SH 56M
	53.0mm	V200SF 53M	V200SH 53M	V200CF 53M	V200CH 53M	V300SF 53M	V300SH 53M
	50.0mm	V200SF 50M	V200SH 50M	V200CF 50M	V200CH 50M	V300SF 50M	V300SH 50M
	45.0mm	V200SF 45M	V200SH 45M	V200CF 45M	V200CH 45M	V300SF 45M	V300SH 45M
	40.0mm	V200SF 40M	V200SH 40M	V200CF 40M	V200CH 40M	V300SF 40M	V300SH 40M
	37.5mm	V200SF 37.5M	V200SH 37.5M	V200CF 37.5M	V200CH 37.5M	V300SF 37.5M	V300SH 37.5M
	35.5mm	V200SF 35.5M	V200SH 35.5M	V200CF 35.5M	V200CH 35.5M	V300SF 35.5M	V300SH 35.5M
	31.5mm	V200SF 31.5M	V200SH 31.5M	V200CF 31.5M	V200CH 31.5M	V300SF 31.5M	V300SH 31.5M
	28.0mm	V200SF 28M	V200SH 28M	V200CF 28M	V200CH 28M	V300SF 28M	V300SH 28M
	26.5mm	V200SF 26.5M	V200SH 26.5M	V200CF 26.5M	V200CH 26.5M	V300SF 26.5M	V300SH 26.5M
	25.0mm	V200SF 25M	V200SH 25M	V200CF 25M	V200CH 25M	V300SF 25M	V300SH 25M
	22.4mm	V200SF 22.4M	V200SH 22.4M	V200CF 22.4M	V200CH 22.4M	V300SF 22.4M	V300SH 22.4M
	20.0mm	V200SF 20M	V200SH 20M	V200CF 20M	V200CH 20M	V300SF 20M	V300SH 20M
	19.0mm	V200SF 19M	V200SH 19M	V200CF 19M	V200CH 19M	V300SF 19M	V300SH 19M
	18.0mm	V200SF 18M	V200SH 18M	V200CF 18M	V200CH 18M	V300SF 18M	V300SH 18M
	16.0mm	V200SF 16M	V200SH 16M	V200CF 16M	V200CH 16M	V300SF 16M	V300SH 16M
	14.0mm	V200SF 14M	V200SH 14M	V200CF 14M	V200CH 14M	V300SF 14M	V300SH 14M
	13.2mm	V200SF 13.2M	V200SH 13.2M	V200CF 13.2M	V200CH 13.2M	V300SF 13.2M	V300SH 13.2M
	12.5mm	V200SF 12.5M	V200SH 12.5M	V200CF 12.5M	V200CH 12.5M	V300SF 12.5M	V300SH 12.5M
	11.2mm	V200SF 11.2M	V200SH 11.2M	V200CF 11.2M	V200CH 11.2M	V300SF 11.2M	V300SH 11.2M
	10.0mm	V200SF 10M	V200SH 10M	V200CF 10M	V200CH 10M	V300SF 10M	V300SH 10M
	9.5mm	V200SF 9.5M	V200SH 9.5M	V200CF 9.5M	V200CH 9.5M	V300SF 9.5M	V300SH 9.5M
	9.0mm	V200SF 9M	V200SH 9M	V200CF 9M	V200CH 9M	V300SF 9M	V300SH 9M
	8.0mm	V200SF 8M	V200SH 8M	V200CF 8M	V200CH 8M	V300SF 8M	V300SH 8M
	7.1mm	V200SF 7.1M	V200SH 7.1M	V200CF 7.1M	V200CH 7.1M	V300SF 7.1M	V300SH 7.1M
	6.7mm	V200SF 6.7M	V200SH 6.7M	V200CF 6.7M	V200CH 6.7M	V300SF 6.7M	V300SH 6.7M
	6.3mm	V200SF 6.3M	V200SH 6.3M	V200CF 6.3M	V200CH 6.3M	V300SF 6.3M	V300SH 6.3M
	5.6mm	V200SF 5.6M	V200SH 5.6M	V200CF 5.6M	V200CH 5.6M	V300SF 5.6M	V300SH 5.6M
	5.0mm	V200SF 5M	V200SH 5M	V200CF 5M	V200CH 5M	V300SF 5M	V300SH 5M
	4.75mm	V200SF 4.75M	V200SH 4.75M	V200CF 4.75M	V200CH 4.75M	V300SF 4.75M	V300SH 4.75M
	4.50mm	V200SF 4.5M	V200SH 4.5M	V200CF 4.5M	V200CH 4.5M	V300SF 4.5M	V300SH 4.5M
FINE SERIES	4.00mm	V200SF 4M	V200SH 4M	V200CF 4M	V200CH 4M	V300SF 4M	V300SH 4M
	3.55mm	V200SF 3.55M	V200SH 3.55M	V200CF 3.55M	V200CH 3.55M	V300SF 3.55M	V300SH 3.55M
	3.35mm	V200SF 3.35M	V200SH 3.35M	V200CF 3.35M	V200CH 3.35M	V300SF 3.35M	V300SH 3.35M
	3.15mm	V200SF 3.15M	V200SH 3.15M	V200CF 3.15M	V200CH 3.15M	V300SF 3.15M	V300SH 3.15M
	2.80mm	V200SF 2.8M	V200SH 2.8M	V200CF 2.8M	V200CH 2.8M	V300SF 2.8M	V300SH 2.8M
	2.50mm	V200SF 2.5M	V200SH 2.5M	V200CF 2.5M	V200CH 2.5M	V300SF 2.5M	V300SH 2.5M
	2.36mm	V200SF 2.36M	V200SH 2.36M	V200CF 2.36M	V200CH 2.36M	V300SF 2.36M	V300SH 2.36M
	2.24mm	V200SF 2.24M	V200SH 2.24M	V200CF 2.24M	V200CH 2.24M	V300SF 2.24M	V300SH 2.24M
	2.00mm	V200SF 2M	V200SH 2M	V200CF 2M	V200CH 2M	V300SF 2M	V300SH 2M
	1.80mm	V200SF 1.8M	V200SH 1.8M	V200CF 1.8M	V200CH 1.8M	V300SF 1.8M	V300SH 1.8M
	1.70mm	V200SF 1.7M	V200SH 1.7M	V200CF 1.7M	V200CH 1.7M	V300SF 1.7M	V300SH 1.7M
	1.60mm	V200SF 1.6M	V200SH 1.6M	V200CF 1.6M	V200CH 1.6M	V300SF 1.6M	V300SH 1.6M
	1.40mm	V200SF 1.4M	V200SH 1.4M	V200CF 1.4M	V200CH 1.4M	V300SF 1.4M	V300SH 1.4M
	1.25mm	V200SF 1.25M	V200SH 1.25M	V200CF 1.25M	V200CH 1.25M	V300SF 1.25M	V300SH 1.25M
	1.18mm	V200SF 1.18M	V200SH 1.18M	V200CF 1.18M	V200CH 1.18M	V300SF 1.18M	V300SH 1.18M
	1.12mm	V200SF 1.12M	V200SH 1.12M	V200CF 1.12M	V200CH 1.12M	V300SF 1.12M	V300SH 1.12M
	1.00mm	V200SF 1M	V200SH 1M	V200CF 1M	V200CH 1M	V300SF 1M	V300SH 1M
	900µm	V200SF 900U	V200SH 900U	V200CF 900U	V200CH 900U	V300SF 900U	V300SH 900U
	850µm	V200SF 850U	V200SH 850U	V200CF 850U	V200CH 850U	V300SF 850U	V300SH 850U
	800µm	V200SF 800U	V200SH 800U	V200CF 800U	V200CH 800U	V300SF 800U	V300SH 800U
	710µm	V200SF 710U	V200SH 710U	V200CF 710U	V200CH 710U	V300SF 710U	V300SH 710U
	630µm	V200SF 630U	V200SH 630U	V200CF 630U	V200CH 630U	V300SF 630U	V300SH 630U
	600µm	V200SF 600U	V200SH 600U	V200CF 600U	V200CH 600U	V300SF 600U	V300SH 600U
	560µm	V200SF 560U	V200SH 560U	V200CF 560U	V200CH 560U	V300SF 560U	V300SH 560U
	500µm	V200SF 500U	V200SH 500U	V200CF 500U	V200CH 500U	V300SF 500U	V300SH 500U
	450µm	V200SF 450U	V200SH 450U	V200CF 450U	V200CH 450U	V300SF 450U	V300SH 450U
	425µm	V200SF 425U	V200SH 425U	V200CF 425U	V200CH 425U	V300SF 425U	V300SH 425U
	400µm	V200SF 400U	V200SH 400U	V200CF 400U	V200CH 400U	V300SF 400U	V300SH 400U
	355µm	V200SF 355U	V200SH 355U	V200CF 355U	V200CH 355U	V300SF 355U	V300SH 355U
	315µm	V200SF 315U	V200SH 315U	V200CF 315U	V200CH 315U	V300SF 315U	V300SH 315U
	300µm	V200SF 300U	V200SH 300U	V200CF 300U	V200CH 300U	V300SF 300U	V300SH 300U
	280µm	V200SF 280U	V200SH 280U	V200CF 280U	V200CH 280U	V300SF 280U	V300SH 280U
	250µm	V200SF 250U	V200SH 250U	V200CF 250U	V200CH 250U	V300SF 250U	V300SH 250U
	224µm	V200SF 224U	V200SH 224U	V200CF 224U	V200CH 224U	V300SF 224U	V300SH 224U
	212µm	V200SF 212U	V200SH 212U	V200CF 212U	V200CH 212U	V300SF 212U	V300SH 212U
	200µm	V200SF 200U	V200SH 200U	V200CF 200U	V200CH 200U	V300SF 200U	V300SH 200U
	180µm	V200SF 180U	V200SH 180U	V200CF 180U	V200CH 180U	V300SF 180U	V300SH 180U
	160µm	V200SF 160U	V200SH 160U	V200CF 160U	V200CH 160U	V300SF 160U	V300SH 160U
	150µm	V200SF 150U	V200SH 150U	V200CF 150U	V200CH 150U	V300SF 150U	V300SH 150U
	140µm	V200SF 140U	V200SH 140U	V200CF 140U	V200CH 140U	V300SF 140U	V300SH 140U
	125µm	V200SF 125U	V200SH 125U	V200CF 125U	V200CH 125U	V300SF 125U	V300SH 125U
	112µm	V200SF 112U	V200SH 112U	V200CF 112U	V200CH 112U	V300SF 112U	V300SH 112U
	106µm	V200SF 106U	V200SH 106U	V200CF 106U	V200CH 106U	V300SF 106U	V300SH 106U
	100µm	V200SF 100U	V200SH 100U	V200CF 100U	V200CH 100U	V300SF 100U	V300SH 100U
	90µm	V200SF 90U	V200SH 90U	V200CF 90U	V200CH 90U	V300SF 90U	V300SH 90U
	80µm	V200SF 80U	V200SH 80U	V200CF 80U	V200CH 80U	V300SF 80U	V300SH 80U
	75µm	V200SF 75U	V200SH 75U	V200CF 75U	V200CH 75U	V300SF 75U	V300SH 75U
	71µm	V200SF 71U	V200SH 71U	V200CF 71U	V200CH 71U	V300SF 71U	V300SH 71U
	63µm	V200SF 63U	V200SH 63U	V200CF 63U	V200CH 63U	V300SF 63U	V300SH 63U
	56µm	V200SF 56U	V200SH 56U	V200CF 56U	V200CH 56U	V300SF 56U	V300SH 56U
	53µm	V200SF 53U	V200SH 53U	V200CF 53U	V200CH 53U	V300SF 53U	V300SH 53U
	50µm	V200SF 50U	V200SH 50U	V200CF 50U	V200CH 50U	V300SF 50U	V300SH 50U
	45µm	V200SF 45U	V200SH 45U	V200CF 45U	V200CH 45U	V300SF 45U	V300SH 45U
	40µm	V200SF 40U	V200SH 40U	V200CF 40U	V200CH 40U	V300SF 40U	V300SH 40U
	38µm	V200SF 38U	V200SH 38U	V200CF 38U	V200CH 38U	V300SF 38U	V300SH 38U
	36µm	V200SF 36U	V200SH 36U	V200CF 36U	V200CH 36U	V300SF 36U	V300SH 36U
	32µm	V200SF 32U	V200SH 32U	V200CF 32U	V200CH 32U	V300SF 32U	V300SH 32U
	25µm	V200SF 25U	V200SH 25U	V200CF 25U	V200CH 25U	V300SF 25U	V300SH 25U
	20µm	V200SF 20U	V200SH 20U	V200CF 20U	V200CH 20U	V300SF 20U	V300SH 20U
	Pan	V200SF XPN	V200SH XPN	V200BF XPN	V200BH XPN	V300SF XPN	V300SH XPN
	Cover	V200S XCV	V200S XCV	V200B XCV	V200B XCV	V300S XCV	V300S XCV

Find Estimated Ship Weights for all our products in the Ship Weight Index

AJA-212

Precision Electroformed Sieves

MICRON AIR JET SIEVE®

These 200mm diameter sieves are made exclusively for the old-style Micron Air Jet Sieve® instrument. They are supplied in ASTM E11 Compliance Grade, but may be upgraded to Inspection or Calibration Grade. See separate Gilson Test Sieve Verification Service listing for details. Sieves are constructed with stainless steel frame and mesh, and fitted with special sealing gaskets.

ASTM E11 Sieves for Micron Air Jet Sieve®

Sieve Designation		Stainless Steel Mesh
Alt.	Std.	
No.4	4.75mm	AJA-245
No.5	4.00mm	AJA-244
No.6	3.35mm	AJA-243
No.7	2.80mm	AJA-242
No.8	2.36mm	AJA-241
No.10	2.00mm	AJA-240
No.12	1.70mm	AJA-239
No.14	1.40mm	AJA-238
No.16	1.18mm	AJA-237
No.18	1.00mm	AJA-236
No.20	850µm	AJA-235
No.25	710µm	AJA-234
No.30	600µm	AJA-233
No.35	500µm	AJA-232
No.40	425µm	AJA-231
No.45	355µm	AJA-230
No.50	300µm	AJA-229
No.60	250µm	AJA-228
No.70	212µm	AJA-227
No.80	180µm	AJA-226
No.100	150µm	AJA-224
No.120	125µm	AJA-223
No.140	106µm	AJA-222
No.170	90µm	AJA-220
No.200	75µm	AJA-218
No.230	63µm	AJA-217
No.270	53µm	AJA-216
No.325	45µm	AJA-214
No.400	38µm	AJA-213
No.450	32µm	AJA-212
No.500	25µm	AJA-211
No.635	20µm	AJA-210

technote

The new-style AJ-103 and AJ-105 Mikro Air Jet do not require special Micron Air Jet Sieves® with the large sealing gasket. They will accept either 200mm or standard 8in sieves fitted with the SSA-9 Low Profile O-Ring.

ASTM PRECISION ELECTROFORMED SIEVES

ASTM E161; ISO 565, 3310-3

The ±2µm opening tolerances of Precision Electroformed Sieves are consistently more accurate than woven-wire sieves, and sizes are available to 5µm. Electroformed sieve cloth is formed using electrodeposition of nickel, producing a planar mesh with very consistent square openings. Each sieve is measured at over 100 random openings and supplied with a Certificate of Compliance to meet listed standards. The accuracy, efficiency and size range of Electroformed Sieves make them a better solution for precision particle sizing operations. When used with precision vibratory or sonic shakers, Electroformed Sieves are often more productive than woven wire sieves with standard mechanical shakers.They perform well for dry or wet sieving conditions, and can be used with dispersing or wetting agents. When calibrated with glass beads or other reference materials, electroformed sieves can serve as a reliable reference standard.

Electroformed sieves have stainless steel 8in (203.2mm) or 3in (76.2mm) diameter full or half-height frames. Stacking heights for eight inch diameter frames are 2in (50.8mm) and 1in (25.4mm). For three inch frames, stacking heights are 3in (76.2mm) and 1in (25.4mm). The Lines Per Inch (LPI) value indicates the number of openings of the specified size occurring in one linear inch (25.4mm). Higher LPIs are more fragile while low LPIs have thicker metal, but fewer openings. Standard electroformed cloth has a support grid that increases strength and durability, but blocks some openings and reduces sieving efficiency. To order sieves without this support grid, add a "U" to model numbers (price is same). Cloth is bonded to the frame with an epoxy ring. Frames stack with ASTM E11 woven-wire sieves.

Electroformed sieves are precision instruments and ultrasonic cleaning is recommended for normal maintenance. Gilson assumes no responsibility for damage in use, and electroformed sieves are nonreturnable when supplied as ordered. Delivery time is 4 to 6 weeks. Sieves with larger openings or other LPIs can be quoted on request. Special frames in 200mm or 12in (305mm) diameter (20µm mesh and larger only) can also be quoted.

ASTM E161 Precision Electroformed Sieves[1]

Sieve Designation		8in Frame		3in Frame	
Opening Size	LPI	Full Ht.	Half Ht.	Full Ht.	Half Ht.
75µm	150	V8EF-075	V8EH-075	V3EF-075	V3EH-075
70µm	181	V8EF-070	V8EH-070	V3EF-070	V3EH-070
63µm	181	V8EF-063	V8EH-063	V3EF-063	V3EH-063
60µm	181	V8EF-060	V8EH-060	V3EF-060	V3EH-060
53µm	250	V8EF-053	V8EH-053	V3EF-053	V3EH-053
50µm	250	V8EF-050	V8EH-050	V3EF-050	V3EH-050
45µm	250	V8EF-045	V8EH-045	V3EF-045	V3EH-045
40µm	300	V8EF-040	V8EH-040	V3EF-040	V3EH-040
38µm	300	V8EF-038	V8EH-038	V3EF-038	V3EH-038
32µm	300	V8EF-032	V8EH-032	V3EF-032	V3EH-032
30µm	300	V8EF-030	V8EH-030	V3EF-030	V3EH-030
25µm	400	V8EF-025	V8EH-025	V3EF-025	V3EH-025
20µm	400	V8EF-020	V8EH-020	V3EF-020	V3EH-020
15µm	400	V8EF-015	V8EH-015	V3EF-015	V3EH-015
10µm	500	V8EF-010	V8EH-010	V3EF-010	V3EH-010
5µm	500	V8EF-005	V8EH-005	V3EF-005	V3EH-005
Pan		V8SFXPN	V8SHXPN	V3SFXPN	V3SHXPN
Cover		V8SFXCV	V8SHXCV	V3SFXCV	V3SHXCV
Extended Rim Pan		V8SFXPE	V8SHXPE	V3SFXPE	V3SHXPE

[1]The chart shows our most popular Precision Electroformed Sieve sizes. Please contact us if your size is not listed.

WT-34C #325

VIDEO ONLINE

NEW PRODUCT

Stainless Steel Wet-Wash Sieves

WT-84C #200

DEEP FRAME WET-WASH SIEVES

ASTM C117, D1140, E11; AASHTO T 11

Wet-wash sieves are used for fines content determinations, or to wash away excessive fines when preparing specimens for particle size testing. All wet-wash sieves have extra-deep frames above the wire cloth to contain wash water, but will also nest with standard pans and covers. Gilson's all-stainless steel Wet-Wash Sieves offer great value, better durability, and much longer service life than brass models. Popular models listed are normally in stock, and feature stainless steel cloth in ASTM No.100, No.200, and No.325 sizes, with stainless steel or brass frames in 12in (305mm), 8in (203mm), or 3in (76mm) diameters.

Inquire for additional mesh sizes. Reinforced Backing Cloth is recommended for extended service life when using the finer mesh sizes frequently. This can be specified at an additional charge by adding the suffix, "BU" to the model number when ordering. Sieves ordered with Backing Cloth are non-returnable when supplied as ordered. Deep Frame Wet Wash Sieves have holes in the lower flange for water drainage.

Sieves ship with ASTM E11 Compliance Grade certification. Gilson Sieve Verification Services are available for certification to Inspection or Calibration Grade requirements. Overall wet-wash sieve height is approximately 0.75—1in (19—25mm) greater than height above cloth.

Deep Frame Wet-Wash Sieves

Frame Diameter x Depth in (mm)	Sieve Designation Alt. (Std.)	Stainless Steel Cloth Stainless Steel Frame	Stainless Steel Cloth Brass Frame
12x8 (305x203)	No. 100 (150um) No. 200 (75µm) No. 325 (45µm)	WT-128S #100 WT-128S #200 WT-128S #325	WT-128C #100 WT-128C #200 WT-128C #325
8x8 (203x203)	No. 100 (150µm) No. 200 (75µm) No. 325 (45µm)	WT-88S #100 WT-88S #200 WT-88S #325	WT-88C #100 WT-88C #200 WT-88C #325
8x6 (203x152)	No. 100 (150µm) No. 200 (75µm) No. 325 (45µm)	WT-86S #100 WT-86S #200 WT-86S #325	— — —
8x4 (203x102)	No. 100 (150µm) No. 200 (75µm) No. 325 (45µm)	WT-84S #100 WT-84S #200 WT-84S #325	WT-84C #100 WT-84C #200 WT-84C #325
3x4 (76x102)	No. 100 (150µm) No. 200 (75µm) No. 325 (45µm)	WT-34S #100 WT-34S #200 WT-34S #325	WT-34C #100 WT-34C #200 WT-34C #325

helpfulhint

Wet-wash sieves with back-up cloth or special mesh sizes are made to order and are nonreturnable.

Find Estimated Ship Weights for all our products in the Ship Weight Index

REPLACEABLE MESH WET-WASH SIEVES

Replacement Screen includes stainless steel backing cloth to reinforce the testing grade mesh.

Top

Replacement Screen

Rubber Gasket

Bottom

SV-125 shown with Polyester Cloth

SV8-2F shown with Sieve Cloth and SV8-2C

WT-206

WTA-54

REPLACEABLE MESH WET-WASH SIEVES
ASTM C117, D1140, E11; AASHTO T 11

Replaceable Mesh Sieves for wash-sieving save significant expense. Interchangeable screens change out quickly when worn beyond acceptable limits. Unique cartridge assemblies combine ASTM E11 testing-grade stainless steel wire cloth with sturdy back-up cloth for long life and replacement convenience. Replacement screens are held securely in place using a rubber gasket and stainless steel fasteners. The 8in (203mm) diameter brass frames nest with conventional sieves and pans. Available in 4in (102mm) or 6in (152mm) heights. Replaceable Screens include back-up cloth and are available in No.200 or No.325 mesh.

Replaceable Mesh Wet-Wash Sieves	
No.200, 4in height	WT-204
No.200, 6in height	WT-206
No.325, 4in height	WT-324
No.325, 6in height	WT-326
Accessories	
No.200 Replacement Screen	WTA-53
No.325 Replacement Screen	WTA-54

TWO-PART REPLACEABLE MESH SIEVES

Non-Metallic Two-Part 8in (203mm) Transparent Polycarbonate Frames are designed for use with disposable Polyester or Nylon monofilament fabric squares. Two-part frames have 1/4in (6.4mm) wall and press together to tension mesh between them. Inexpensive mesh may be replaced when contaminated or blinded. Assembled sieves nest with each other but not with standard metallic sieves. Sieves have approximately a 2in (51mm) stacking height, 2.75in (70mm) overall height, and 2in (51mm) depth to cloth. Frames are not autoclavable.

Brass Two-Part 8in (203mm) Frames can be fitted with 10in (255mm) polyester or nylon monofilament mesh squares. Cloth is placed between the sieve frame and skirt and the two parts are pressed together. Using a fresh cloth eliminates sample contamination from previous tests. Frames are available for fine or coarse cloth. Frames nest with each other or with conventional 8in (203mm) diameter standard sieves.

Polyester or Nylon Cloth Squares are specially designed to fit in either a non-metallic or brass two part frame. Cloth of either Nylon or Polyester is cut into 10in squares. Polyester is recommended for most applications. Each square has a resilient material embedded in the mesh in a circular shape. This material helps cloth to seal with the accompanying two part frame. PM-2 and NM-2 size monofilament cloth choices do not require the resilient material.

Two-Part Replaceable Mesh Sieves		
Nonmetallic Sieve for No.100 & Finer Mesh		SV-125
Nonmetallic Sieve for No.20—No.80 Mesh		SV-126
Brass Sieve for No.100 & Finer Mesh		SV8-2F
Brass Sieve for No.20—No.80 Mesh		SV8-2C
Accessories		
Description	**Polyester**	**Nylon**
No.20—No.80 (850—180µm)	PM-1	NM-1
No.100—No.230 (150—63µm)	PM-2	NM-2
No.270, No.325, No.400 (53µm, 45µm, 38µm)	PM-3	NM-3
No.450, No.500, No.635 (32µm, 25µm, 20µm)	PM-4	NM-4
Nominal 15, 10, 7µm	PM-5	NM-5
Polyethylene Film Square for Pan	PM-10	—

SV-155, SV-165 & SV-205 shown with SV-216

SSA-820 shown with Sieves

VIDEO ONLINE

SSA-803 shown with 8in full-height Sieves

3IN NON-METALLIC SIEVES

Clear, durable polycarbonate frame sieves are 3in (76mm) in diameter and hand-made by Gilson for special applications. Polyester mesh has opening sizes from No.50 (300µm) to No.635 (20µm), as well as 7, 10 and 15µm. Mesh and frame assembly is secured with heat-cured acrylic cement and silicone sealant. An elastic polylefin band covers the frame joint and provides an effective seal when nesting. Sieves are autoclavable and microwaveable for drying.

Transparent frames make it easy to visually monitor specimen performance during separation or liquid levels during wet-sieving operations. Sieves are approximately 1.75in (45mm) overall height, 1.25in (32mm) stacked, and 2.9in (73mm) inside diameter. These sieves do not nest with standard metallic sieves. Special SV-217 Wet-Test Pan is 2.5in (64mm) deep and has drain for 0.4in (9.5mm) tube connection. SV-218 Extended-Rim Pan can be inserted in the middle of a sieve stack, allowing more than one specimen to be tested at a time. Specify opening size when ordering.

3in Non-Metallic Sieves	
No.35—No.45 (500—355µm)	SV-135
No.50—No.80 (300—180µm)	SV-155
No.100—No.200 (150—75µm)	SV-165
No.230—No.400 (63—38µm)	SV-185
No.450—No.635 (32—20µm)	SV-205
Nominal 15, 10, 7µm	SV-206
Accessories	
Sieve Cover	SV-215
Regular Pan	SV-216
Wet-Test Pan	SV-217
Extended-Rim Pan	SV-218
3/8in (9.5mm) Vinyl Tubing, per foot	WT-4

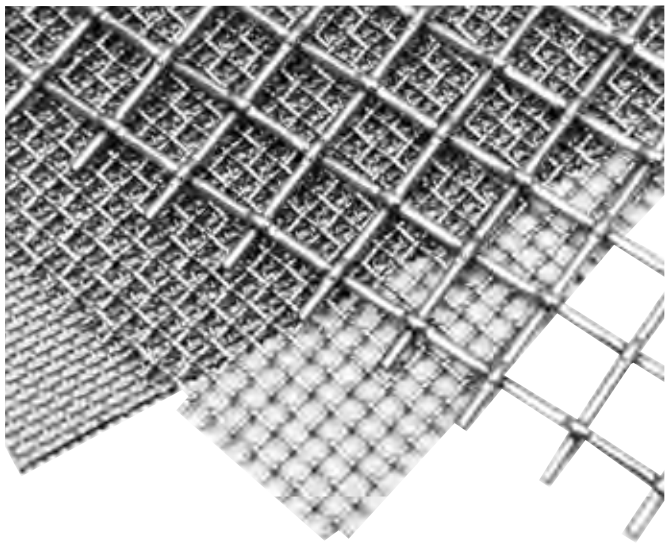
SIEVE STORAGE RACKS

SSA-820 Wall-Mount Sieve Rack creates wall-mounted storage for 8in (203mm) diameter sieves. Sieves are held on edge in eleven individual 3in (76mm) wide compartments, each holding one full-height or two half-height sieves. Compartment bottoms are neoprene lined and inclined to keep sieves in place. Holes are provided for mounting on 16in (406mm) centers and for bolting racks together vertically and/or horizontally. Rack construction is all stainless steel with rubber feet for desk or counter top use. The bottom front flange has a 1.25in (32mm) high area to label slots for sieve sizes. **Product Dimensions:** 34.25x9x11in (870x229x279mm), WxDxH.

SSA-822 Adjustable Wall-Mount Sieve Rack for 12in (305mm) diameter sieves is similar in design to SSA-820, but has slots every 0.5in (13mm) for variable placement of the eight supplied dividers. Capacity is eight full-height or fourteen half-height sieves. Additional dividers are available in sets of five as SSA-823. Sieve Rack Units are shipped with instructions for simple user assembly. **Product Dimensions:** 36.25x13x15.75in (921x330x400mm), WxDxH.

SSA-803 Adjustable Bench Sieve Rack holds all sieves up to 12in (305mm) diameter properly, preventing damage and optimizing organization and efficiency. Stainless steel rack has non-skid rubber feet, and is supplied with two permanent and two adjustable rubber-coated sieve support rods. Unit accommodates twenty full-height (forty half-height) 8in sieves, twelve full-height (twenty four half-height) 12in sieves, or forty full-height 3in sieves. SSA-804 Support Rod Set contains two rubber-covered rods, and may be used to increase the capacity for 3in full-height sieves to eighty. **Product Dimensions:** 26x13x13in (660x330x330mm), WxDxH.

Sieve Storage Racks	
Wall-Mount Sieve Rack	SSA-820
Adjustable Wall-Mount Sieve Rack	SSA-822
Adjustable Bench Sieve Rack	SSA-803
Accessories	
Dividers for SSA-822	SSA-823
Support Rod Set for SSA-803	SSA-804



ASTM Testing Grade Wire Cloth

Polyester Screen Cloth

ASTM TESTING GRADE WIRE CLOTH

ASTM E11; AASHTO M 92

Quality ASTM E11 testing grade wire cloth also meets AASHTO M 92 and is the same used in test sieves and screen trays. Stainless steel cloth is available in all E11 sizes, and brass cloth has openings from 2.36mm to 45µm (No.8 to No. 325). Inquire for wire cloth meeting ISO 565 and 3310 requirements.

Gilson supplies cut wire cloth within the limitations of roll size. Most sizes are in stock up to 34x40in (864x1,016mm); inquire for larger dimensions. Each piece of wire cloth cut is priced per full square foot, so one 10x10in cut piece will be priced as a full square foot. Inquire for pricing if multiple small pieces or special shapes are required. It can be beneficial to purchase by the square foot to avoid unnecessary cutting charges. Cloth cut to order is nonreturnable.

ASTM Testing Grade Wire Cloth

Mesh Size	Stainless Steel	Brass
4in—1/4in (100—6.3mm)	WC-3S	—
No.8—No.170 (2.36mm—90µm)	WC-5S	WC-5
No.200 (75µm)	WC-200S	WC-200
No.230 (63µm)	WC-230S	WC-230
No.270 (53µm)	WC-270S	WC-270
No.325 (45µm)	WC-325S	WC-325
No.400 (38µm)	WC-400S	WC-400
No.450 (32µm)	WC-450S	—
No.500 (25µm)	WC-500S	—
No.635 (20µm)	WC-635S	—

POLYESTER OR NYLON SCREEN CLOTH

For special applications where metallic wire cloth cannot be used, choose Polyester or Nylon cloth with openings equivalent to No.6 to No.635. Both materials have very consistent opening sizes, but average openings and thread diameter may vary substantially from ASTM E11 tolerances for metallic woven wire cloth.

Polyester has good abrasion resistance, and is very resistant to most acids and alkalis up to pH of 9-10. It has very good wet stability. Nylon has excellent abrasion resistance, high tensile strength, and is resistant at high pH conditions, but tends to stretch in water.

Screen Cloth is supplied cut within the limitations of standard 46in (1,168mm) roll width. Each piece of cloth cut is priced by full square feet, so one 10x10in cut piece will be priced as a full square foot. Inquire for pricing if multiple small pieces, special shapes or wider pieces are required. It can be beneficial to purchase by the square foot to avoid unnecessary cutting charges. Cloth cut to order is nonreturnable.

Polyester or Nylon Screen Cloth

Mesh Size	Polyester	Nylon
No.6—No.18 (3.35—1.00mm)	PM-A	NM-A
No.20—No.80 (850—180µm)	PM-B	NM-B
No.100—No.230 (150—63µm)	PM-C	NM-C
No.270—No.400 (53—38µm)	PM-D	NM-D
No.450—No.635 (32—20µm)	PM-E	NM-E
15, 10, or 7µm	PM-F	NM-F

QUALITY CONTROL FOR SIEVING OPERATIONS

Establishing a “Master” set of new Inspection or Calibration grade sieves is a good way to set up a sieving quality control program for ISO 9001 or other quality control/quality assurance plans. Each Verified Inspection or Calibration test sieve is supplied with documentation assuring compliance with ASTM or ISO requirements and can be used to correlate accuracy and ongoing performance of working sieves. Percent retained values from any number of working sieves are periodically compared to the equivalent Master sieve to check for loss of accuracy, and results are tracked over time. Acceptable tolerances are established by the user, but quality control programs looking for the highest accuracy accept up to a 1% variation. It is important to maintain the verification status of the Master set, preferably by periodically returning the sieves to the sieve manufacturer for re-verification

Frequent use and abrasive materials eventually reduce wire diameters and cause an increase in opening sizes that cannot be detected visually. Scheduled correlation testing insures working sieves are used to their maximum service life, yet still removed from use as soon as accuracy has degraded further than standards allow. Disruption caused by sending test sieves off-site for verification is minimized.

Materials with known properties are required for correlation testing. Standard Reference Materials (SRMs) are prepared in specific size ranges under carefully controlled manufacturing processes. These precisely-sized glass beads or powders are supplied with certificates of compliance traceable to established standards, such as National Institute of Standards and Technology (NIST) or the European Community Bureau of Reference (BCR). User-prepared reference materials can also be formulated from actual production materials using methods in ASTM E2427. User materials are non-standard, are not traceable, and require more effort to prepare. The correlation tests should be performed on a scheduled basis, and results for each serial numbered sieve should be recorded and filed.

Master Sieves

INITIAL SETUP

Master Sieves % Retained	Sieve	Working Sieves % Retained
15.0	Sieve 1	15.5
8.7	Sieve 2	9.0
32.2	Sieve 3	31.6
17.1	Sieve 4	16.7
25.2	Sieve 5	24.6
1.8	Pan	2.6

Working Sieves

Master Sieves

SCHEDULED RECHECK

Master Sieves % Retained	Sieve	Working Sieves % Retained
15.0	Sieve 1	15.2
8.7	Sieve 2	7.6
32.2	Sieve 3	31.4
17.1	Sieve 4	15.8
25.2	Sieve 5	24.2
1.8	Pan	5.8

Working Sieves

GV-65 Calibration Verification shown with Sieve

GV-66 Calibration Verification shown with Screen Tray

Certificate of E11 Compliance for all Sieves

TEST SIEVE & SCREEN TRAY VERIFICATION SERVICES

ASTM E11, E2427; ISO 565, 3310-1

There have been extensive revisions to ASTM standard E11, *Specification for Wire Cloth and Sieves for Testing Purposes*. Gilson is leading the way in educating our customers about the latest specification and making these products available. The specification affects all test sieves, screen trays, and wire cloth, and changes the way the mesh openings are evaluated by looking at the statistical distribution of aperture sizes, rather than just the average opening sizes. In addition to a more accurate and reliable system of evaluation, the new ASTM E11 standard also allows compatibility with ISO 565 and 3310-1 requirements. There are now three grades, or classes of ASTM or ISO test sieves available; Compliance, Inspection and Calibration.

- **Compliance Test Sieves** are manufactured with wire cloth that has been inspected and measured in roll or sheet quantities prior to being cut and mounted in the individual sieve frames. Opening sizes are not measured in individual sieves. Each Compliance sieve is supplied with a certificate of manufacturing compliance, but no statistical documentation is given. Compliance sieves are designed for applications where a basic, reliable degree of accuracy and repeatability are sufficient.

- **Inspection Test Sieves** have a specified number of openings measured in each sieve after the cloth is mounted in the frame. There is a 99% confidence level that the standard deviation of these openings is within the maximum allowed by ASTM or ISO. Inspection Sieves are a good choice in applications where accuracy and repeatability are critical. Each Inspection Sieve consists of a Compliance Sieve with added Inspection Sieve Verification service.

- **Calibration Test Sieves** have about twice as many openings measured as Inspection Sieves. The higher number of openings measured on each sieve increases the confidence level to 99.73% that the standard deviation of these openings is within the maximum allowed by ASTM or ISO. Calibration Sieves should be used in applications where a very high degree of accuracy is required. Each Calibration Sieve consists of a compliance sieve with added Calibration Sieve Verification service.

New Gilson Test Sieves are guaranteed to meet the requirements of ASTM or ISO for Compliance, Inspection or Calibration grades as ordered, but for continued assurance of performance, procedures should be in place to regularly check working sieves as they age. Wire cloth stretches, sags, or even tears, and abrasive materials reduce wire diameter, causing increased opening sizes and loss of accuracy over time.

These same verification services are also available for screen trays used in Gilson Testing Screens, Test-Master®, Porta-Screen® and Gilso-Matic® machines.

Gilson Reverification Services can be performed on used ASTM or ISO Test Sieves or Screen Trays. Simply add "R" suffix to the model number of the desired verification grade. An optical comparator with NIST traceable calibration measures opening and wire diameter sizes on each sieve. Certification reports are produced for the appropriate grade. These services are available for all ASTM and ISO sieve sizes and types, and are ordered by specifying model numbers for Inspection Sieve Verification, or Calibration Sieve Verification. Sieves are not included in the verification purchase price. When reverifying used sieves, contact a Gilson customer service representative.

Master-Matched Sieves are ASTM E11 8in diameter stainless steel or combination sieves from No.8 (2.36mm) to No.325 (45µm) with openings closely matched to a master set of sieves in Gilson's reference laboratory. Master-Matched Sieves are verified to meet ASTM E11, then performance-selected using NIST traceable Standard Reference Materials to correlate with the master set. Each sieve is performance tested to insure it yields ±2.5% by weight of the value of the master sieve.

Test Sieve & Screen Tray Verification Services	
Inspection Test Sieve Verification, ASTM E11	GV-60[1]
Calibration Test Sieve Verification, ASTM E11	GV-65[1]
Inspection Test Sieve Verification, ISO 565 and 3310-1	GV-62[1]
Calibration Test Sieve Verification, ISO 565 and 3310-1	GV-63[1]
Inspection Screen Tray Verification, ASTM E11	GV-61[1]
Calibration Screen Tray Verification, ASTM E11	GV-66[1]
Inspection Screen Tray Verification, ISO 565 and 3310-1	GV-64[1]
Calibration Screen Tray Verification, ISO 565 and 3310-1	GV-67[1]
Master-Matched Sieves	MM-70

[1]To specify Reverified Sieves, add "R" suffix to model number of desired Verification grade.

HOW TO REVERIFY YOUR TEST SIEVES AND SCREEN TRAYS

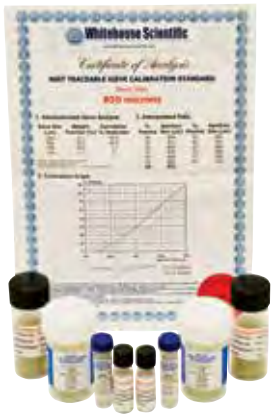
EMAIL
Email sieveservices@gilsonco.com to obtain the necessary return authorization form.

CLEAN
Clean your sieves or screen trays, removing all debris or potentially hazardous materials.

PACK
Pack sieves or screen trays in a cardboard box with packing materials and authorization form inside.

SHIP
Ship sieves or screen trays to 7975 North Central Drive, Lewis Center, OH 43035.

EXPECT
Expect to receive reverified sieves or screen trays back within 2-3 weeks.



Whitehouse Sieve Standards

WHITEHOUSE SIEVE STANDARDS

Whitehouse Sieve Standards provide a unique method of calibrating No.6 (3.35mm) and finer sieves with traceability to NIST. Calibrations can be performed in minutes, with no need to ship the sieves back or have them out of service. Periodic checks serve as an indicator of when to replace sieves. Each Whitehouse Standard comes as five single-use vials of glass beads for use with a single sieve size. A single vial is used for 8in or 200mm sieves, while two to five vials are used for sieves up to 18in or 450mm in diameter. After processing, the average aperture is quickly read from the calibration graph provided.

Whitehouse has been selected by the Community Bureau of Reference (BCR) to produce standards for the European Community. Whitehouse Sieve Standards are traceable to NIST and NPL as well as to BCR. The highly spherical beads are made from 2.45 specific gravity soda-lime glass and certified for size using electroformed sieves with checks using microscopy and image analysis.

Whitehouse Sieve Standards

Sieve Size	Nominal Wt. per Vial, g	Number of Vials	Model
No.635 (20µm)	0.8	5	BS-391
No.500 (25µm)	0.8	5	BS-392
No.450 (32µm)	1.0	5	BS-393
No.400 (38µm)	1.0	5	BS-394
No.325 (45µm)	1.0	5	BS-395
No.270 (53µm)	1.0	5	BS-396
No.230 (63µm)	1.0	5	BS-397
No.200 (75µm)	1.0	5	BS-398
No.170 (90µm)	1.0	5	BS-399
No.140 (106µm)	1.0	5	BS-400
No.120 (125µm)	1.0	5	BS-401
No.100 (150µm)	1.5	5	BS-402
No.80 (180µm)	1.5	5	BS-403
No.70 (212µm)	1.5	5	BS-404
No.60 (250µm)	2.5	5	BS-405
No.50 (300µm)	2.5	5	BS-406
No.45 (355µm)	2.5	5	BS-407
No.40 (425µm)	2.5	5	BS-408
No.35 (500µm)	2.5	5	BS-409
No.30 (600µm)	2.5	5	BS-410
No.25 (710µm)	2.5	5	BS-411
No.20 (850µm)	3.0	5	BS-412
No.18 (1.00mm)	7.0	5	BS-413
No.16 (1.18mm)	10.0	5	BS-414
No.14 (1.40mm)	15.0	5	BS-415
No.12 (1.70mm)	15.0	5	BS-416
No.10 (2.00mm)	20.0	5	BS-417
No.8 (2.36mm)	20.0	5	BS-418
No.7 (2.80mm)	25.0	5	BS-419
No.6 (3.35mm)	25.0	5	BS-420

NIST Glass Beads

NIST REFERENCE MATERIALS

Gilson stocks a number of Standard Reference Materials, (SRM's) issued by the US National Institute of Standards and Technology (NIST) for calibration of sieves, sedimentation instruments, particle counters, and other instruments.

BS-5, BS-10, BS-20, BS-30A and BS-40B are calibrated glass beads for determining effective sieve opening. (NOT for determining conformity to specifications.) They are also useful for calibration of electroformed sieves. The entire sample is placed on clean sieves and shaken in the manner that tests will be made on test samples. Percent of glass beads retained on each sieve is calculated, and effective opening of each of the sieves is determined from calibration data on the supplied NIST Certificate.

BS-42 is a set of three 150g bottles of different sands for use in sieving. Material A is the coarsest for testing sieves from No.30—No.100. Material C is for No.70—No.200 sieves and Material D is for finer sieves, No.100—No.325.

BS-50 Portland Cement No.114 is twenty units, each in a sealed pouch. This is used for Wagner Turbidimeter (ASTM C115; AASHTO T 98), Blaine fineness apparatus (ASTM C204; AASHTO T 153), the 2in diameter No.325 sieve used in fineness tests (ASTM C430; AASHTO T 192), and others.

NIST Reference Materials

Material	Model	Range	Quantity
NIST Glass Beads	BS-5	No.10—No.20 (2450—750µm)	200g
	BS-10	No.25—No.60 (750—220µm)	87g
	BS-20	No.45—No.140 (400—100µm)	70g
	BS-30A	No.120—No.270 (125—53µm)	43g
	BS-40B	No.400—No.635 (38—20µm)	28g
NIST Sand	BS-42	No.30—No.325 (600—45µm)	3 bottles
NIST No.114 Portland Cement	BS-50	—	20 units

helpfulhint

Gilson Sieve Verification and Reverification Services ensure your sieves meet ASTM E11 or ISO 565 Inspection and Calibration Grade requirements. Now available for Testing Screen Trays as well.

UB-1 shown with 8in Sieves

UB-15

UB-18 shown with 8in Sieves

ULTRASONIC SIEVE CLEANERS

Gilson Ultrasonic Sieve Cleaners are ideal for safe and efficient cleaning of fine-mesh sieves from 3 to 12in (75 to 305mm) diameters, including fragile electroformed cloth sieves. Ultrasonic energy waves create rapid cavitation, agitating and freeing lodged particles. Most meshes are completely cleaned in one to five minutes.

Ultrasonic Sieve Cleaners				
Description	Model	Tank Capacity, qt (L)	Tank Dimensions, DxWxH, in (mm)	External Dimensions, DxWxH, in (mm)
Ultrasonic 8in Sieve Cleaner is sized for full immersion cleaning of up to four 8in (203mm) full-height sieves. Generating unit is housed separately from the stainless steel liquid tank for safe and convenient use. Threaded inlet and outlet drain connections are provided. Generator has On/Off push button. Ultrasonic frequency is 80kHz. A UBA-1 Sieve Holder Rack is included. Extra Racks can be ordered separately to increase productivity.		16 (15.1)	9x10x12 (229x254x305)	13x13x15 (330x330x381)
Ultrasonic 8in Sieve Cleaner 115V, 50/60Hz	UB-1			
Ultrasonic 8in Sieve Cleaner 220V, 50/60Hz	UB-1A			
Sieve Holder Rack for 8in Sieves	UBA-1			
Ultrasonic 12in Sieve Cleaner has identical performance features to UB-1, but the tank is sized for full-immersion of two 12in (305mm) diameter full-height sieves.		55 (52)	14x12x20 (356x305x508)	20.5x14x22 (521x356x559)
Ultrasonic 12in Sieve Cleaner 115V, 50/60Hz	UB-5			
Ultrasonic 12in Sieve Cleaner 220V, 50/60Hz	UB-5A			
Ultrasonic 3in Sieve Cleaner is ideal for full-immersion cleaning of 3in (76mm) diameter sieves, including electroformed meshes as fine as 5µm. It is recommended for Gilson 3in Acrylic Frame Sieves. The 320 Watt output generator features microprocessor circuitry, and 0 to 30min timer. Stainless steel tank is equipped with drain valve. 115V, 50/60Hz, 1 amp. UBA-100 stainless steel Sieve Holder is purchased separately.		3.4 (3.2)	4x5.4x9.4 (102x137x239)	9x8.1x12.5 (229x206x318)
Ultrasonic 3in Sieve Cleaner 120V, 50/60Hz	UB-15			
Sieve Holder rack for 3in Sieves	UBA-100			
Ultrasonic Multi-Sieve Cleaner can perform full immersion cleaning of four full-height, or six half-height 8in (203mm) sieves, or partial-immersion cleaning of two full or intermediate height or three half height 12in (305mm) sieves. 1,500 Watt output, microprocessor circuitry, 0 to 30min timer and cooling fan. Vinyl clad stainless steel tank is equipped with drain valve. Sieve Rack is included.		40 (37.9)	10x16x14 (254x406x356)	19x17x20 (406x330x381)
Ultrasonic Multi-Sieve Cleaner 120V, 50/60Hz	UB-18			
Ultrasonic Multi-Sieve Cleaner 220V, 50/60Hz	UB-18A			
Ultrasonic Multi-Sieve Cleaner 240V, 50/60Hz	UB-18B			
Special Detergent Concentrate liquid expedites cleaning for all sizes of sieves. A small amount in each tank cleans quickly and effectively, and is safe for all meshes. The one gallon (3.8L) bottle of concentrate yields 16 gallons (60.6L) of cleaning solution.	UBA-4	-	-	-

TSA-168 TSA-170 TSA-179 TSA-173

TSA-172

TSA-171

TSA-174 TSA-176

WT-6

TSA-177 & TSA-178 TSA-182 & TSA-183

TSA-184, TSA-186 & TSA-188 TSA-198 TSA-205, 207 and 208

Brushes

Description	Model
Small Fine Sieve Cleaning Brush has soft, 100% China bristles tapered for use with fine mesh sieves in round 0.75in (19mm) ferrule. Especially handy for 3in diameter test sieves or Precision Electroformed sieves. Overall length is 5in (127mm) with wood handle.	TSA-168
Fine Sieve Cleaning Brush is ideal for cleaning No.16 and finer sieves. Soft bristles, nickeled steel ferrule, lacquered wood handle, 1.25in diameter and 5.75in long.	TSA-170
Nylon Sieve Cleaning Brush is a hardwood block brush with nylon bristles, optimal for cleaning No. 120 mesh and finer sieves. 1.875in diameter and 0.875in thick with 3.75in straight wood handle. Overall brush length is 5.88in.	TSA-179
Wire Loop Brush is a 1.25in wide fan type brush with 1.625in long metal bristles and a wire loop handle. The 4.75in long brush is designed for use on #16 and coarser wire cloth.	TSA-173
Coarse Sieve Cleaning Brush has an 8.5in curved plastic handle with 1.5in x 1.75in of slanted brass wire bristles—perfect for No.30 and coarser wire cloth in round sieves.	TSA-172
Coarse Screen Tray Brush is recommended for No.30 and coarser wire cloth in screen trays. The 13in curved wooden handle has 5.5in x 0.75in of fine (0.005) brass wire bristles, which slant toward the tip for cleaning corners of screen trays. Also useful for cleaning molds.	TSA-171
Table Brush has 9x3in of horsehair bristles. This 14in long brush comes with a plastic or wood handle, depending on availability. A general purpose brush suitable for clean up of lab equipment.	TSA-174
Wire Scratch Brush has flat wire bristles that are grouped in 5x10 rows. Sturdy wood block handle is 7.75in long x 2.625in wide. The TSA-176, with 2in bristles, may be used on soil-cement specimens to meet ASTM D559, D560, AASHTO T 135, and T 136. The TSA-176A is the same brush with 1.25in bristles.	
Wire Scratch Brush, 2in Bristles	TSA-176
Wire Scratch Brush, 1.25in Bristles	TSA-176A
Scrub Brushes are available in 20in (508mm) long-handled, or 8in (203mm) short-handled versions, and stand up to heavy everyday use in the field. Both feature durable, solid plastic handles and sturdy, acid-resistant synthetic fibers.	
Short Scrub Brush, 8in (203mm)	TSA-232
Long Scrub Brush, 20in (508mm)	TSA-233
Camel Hair Brush Set for delicate sieve meshes includes two flat-tip and two round-tip brushes.	WT-6

TSA-232

TSA-233

Scoops

Type	Model	Capacity oz (L)	Bottom Type	Bowl LxW, in	Overall Length in (mm)
Plastic	TSA-177	32 (0.95)	Flat	6.5 x 5.0	11.5 (292)
	TSA-178	82 (2.4)	Flat	9.0 x 6.0	14.5 (368)
Aluminum	TSA-182	38 (1.12)	Flat	8.8 x 5.3	14.0 (355)
	TSA-183	3.5 (0.10)	Flat	4.8 x 2.8	8.5 (216)
	TSA-193	2 (0.05)	Round	4.5 x 2.0	7.8 (198)
	TSA-184	5 (0.15)	Round	4.8 x 2.5	7.3 (185)
	TSA-185	12 (0.36)	Round	5.8 x 3.3	8.8 (223)
	TSA-186	24 (0.71)	Round	7.0 x 3.8	10.5 (267)
	TSA-187	85 (2.37)	Round	11.8 x 6.3	16.0 (406)
	TSA-188	38 (1.12)	Round	8.8 x 4.6	12.3 (312)
	TSA-189	58 (1.71)	Round	10.0 x 5.3	14.3 (363)
Stainless Steel	TSA-198	4 (0.11)	Round	3.0 x 5.0	9.0 (229)
	TSA-205	12 (0.36)	Flat	5.5 x 3.0	9.0 (229)
	TSA-206	24 (0.71)	Flat	7.0 x 4.5	12.0 (305)
	TSA-207	45 (1.33)	Flat	8.0 x 5.5	13.5 (343)
	TSA-208	63 (1.86)	Flat	10 x 7.0	15.0 (381)

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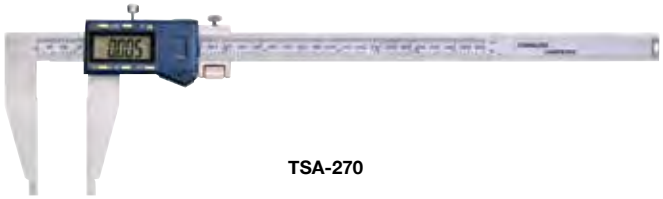
TSA-271



TSA-270

SSA-58

TSA-175

TSA-265

SP-90

WT-7

WT-5

WT-3

WT-13S

WT-4

BK-447R

Sieving Accessories

Description	Model
Digital Caliper accurately measures inside, outside, and depth in inches or mm over a range of 0-6in or 0-150mm. Readability is 0.0005in or 0.01mm on LCD display. Stainless steel caliper has smooth-moving head with locking knob, zero calibration and On/Off switch. Battery is easily replaceable. Supplied with protective carrying case. **Product Dimensions:** 9.5x3in (241x76mm), WxH.	TSA-271
12in Digital Caliper is stainless steel and accurately measures inside and outside dimensions in inches or mm from 0-12in or 0-300mm. Resolution of 0.0005in or 0.01mm on LCD display is accurate for precise dimensional checks of most asphalt, concrete and soil specimens up to 6x12in (152x305mm) Dia.xL. Large 3.5in (89mm) jaw depth easily reaches center of 6in diameter specimens. Includes protective carrying case. **Product Dimensions:** 14.5x4.1 (368x104mm) LxW.	TSA-270
Sieving Aid is a very fine (5—7µm), high purity silicon dioxide powder. When mixed with fine samples (2% by weight is typical), Sieving Aid keeps material free-flowing and prevents agglomeration from static attraction or high humidity. It also acts as a dehydrating agent for samples. Addition does not affect sieving results because of its extremely low bulk density of 7lb/ft^3 (112kg/m^3). 1L is sufficient for over 100 sieving tests. Typical dry purity is 99.6% SiO_2. Available as individual 1 liter bottles or convenient and economical 5-packs. **Product Dimensions:** 3x3.5x8in (76x89x203mm), WxDxH. Sieving Aid, 1L Bottle Sieving Aid, 5-Pack of 1L Bottles	 SSA-58 SSA-58C
Pocket Magnifier is ten-power (10x), and useful for examination of wire cloth for damage or for appropriate mesh size. Not for acceptance testing or verification. Viewing area is 0.5x0.5in (12.7x12.7mm). Size is 1.25x1-.375x0.375in (32x35x22mm) open; folds flat to 0.375in (9.5mm) thickness.	TSA-175
Screen Opening Gauge is a useful tool when examining test sieves and screen trays as a quick check for wire cloth opening sizes. Marked from 0.125 to 1.125in on one side and 3 to 28mm on the other, the gauge is simply placed in an opening and read where the mesh contacts the side. Durable 22ga stainless steel body has laser-engraved graduations. Not for acceptance or verification. **Product Dimensions:** 1.5x5.5in (38x140mm), WxH.	TSA-265
Automagnet Separator simple spring plunger has hold-and-release action, and permits extraction of magnetic material dry or partially immersed in liquids. Powerful Sealed Alnico V-six Pole Permanent magnet in lightweight aluminum case. **Product Dimensions:** 2.5inx6.5in (64x165mm), Dia.xH.	SP-90
Spray Fitting attaches to standard lab faucet with threaded fitting. Adapter for small, unthreaded faucets is included. Superfine conical spray pattern brass fitting is rated at 2gal (7.6L) per minute.	WT-7
Spray Bottle has a 32oz (946ml) capacity and an adjustable nozzle.	WT-5
Sieve Pan with drain is available in 8in (203mm) diameter by 2-5/8in (67mm) or 3in (76mm) diameter by 1-3/4in (44mm) height, with 3/8in barbed fitting for vinyl tubing. 8in (203mm) Brass 8in (203mm) Stainless Steel 3in (76mm) Brass 3in (76mm) Stainless Steel	 WT-3 WT-3S WT-13 WT-13S
Sieve Seal Gaskets seal between stacked Test Sieves or pan to prevent loss of fines (pkg. 6). 3in (76mm) 8in (203mm) 12in (305mm)	 SSA-14 SSA-10 SSA-11
Vinyl Tubing is quality material for Sieve Pans with Drains and useful for other lab applications. 3/8in ID fits drains for 8in diameter pans, 1/4in ID tubing fits 3in diameter pan drains. Priced per foot or in bulk 100ft (30.5M) rolls. 3/8in ID, priced per foot 3/8in ID, 100ft Roll 1/4in ID, per foot 1/4in ID, 100ft Roll	 WT-4 WT-4R WT-8 WT-8R
ASTM Manual On Test Sieving Methods new 5th edition ASTM publication supplements current ASTM sieving standards. Subject matter covers sieve types, sampling methods, sieving procedures, calculation and graphing. Appendices include reference tables and charts. 66 pp. soft cover. **Product Dimensions:** 6x9in (152x229mm)	BK-447R

SIEVE SHAKER SELECTION

Matching a sieve shaker to material characteristics saves time and effort, and ensures superior accuracy and repeatability.

Circular Sieve Shakers use a simple motion on a flat, oscillating plane. Particles are evenly distributed around most of the sieve surfaces, and randomly fall through openings. These units are adequate for coarser free-flowing materials between No.4 (4.75mm) and No.100 (150µm).

Orbital Sieve Shakers mimic the motion of hand sieving, and are an economical choice for free-flowing materials. The particles are essentially rolled around on the mesh surface until they fall through an opening. A bumping action is sometimes introduced as the sieve stack oscillates. Orbital shakers work well for most materials between No.4 (4.75mm) and No.200 (75µm).

Tapping is a performance enhancing feature included on premium sieve shakers with vibratory, circular, orbital, or other primary actions. Repetitive tapping of the sieve stack by mechanical means reorients particles, aids passage, and prevents blinding. Tapping sieve shakers improve the passage of fines for nearly any material.

Vibratory Sieve Shakers use electromagnetic energy to agitate particles. An ideal setting creates a fluid bed of material on the mesh. This optimizes the number of openings tried by the sample material. Adjustments for vibration amplitude and frequency on some shakers allow optimization for a wider range of materials. Vibratory Shakers perform well on most materials between No.10 (2mm) to No.635 (20µm).

Pause is a function on better quality Vibratory Shakers with an effect similar to Tapping. Programming a pause into the test cycle causes particles to briefly stop, and then reorient themselves when agitation resumes.

Sonic Sieve Shakers use up to 3,600 sonic energy pulses per minute to oscillate an air column enclosed within the sieve stack. This continuous agitation excites the particles and continuously reorients particles to the mesh surface. Programmable horizontal and vertical tapping clears the sieves and allows accurate separations down to 5µm.

SS-8R shown with Sieves

SS-20

SS-15 shown with Sieves

SS-3 shown with Sieves

SS-30 shown with Sieves

SS-12R shown with Sieves

Sieve Shaker Selection

ASTM Sieve Sizes	2in (50mm)	1in (25mm)	0.5in (12.5mm)	No.4 (4.75mm)	No.10 (2mm)	No.100 (150µm)	No.200 (75µm)	No.635 (20µm)	3µm
Circular									
Orbital									
Tapping									
Vibratory									
Sonic									
Millimeters	100		10		1	0.1		0.01	0.001
Micrometers					1000	100		10	1

Find Estimated Ship Weights for all our products in the Ship Weight Index

SS-15 shown with Sieves

SS-14D shown with Sieves

GILSON SIEVE SHAKERS

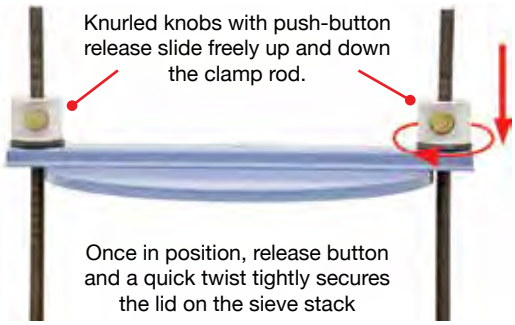
Gilson portable Sieve Shakers outperform comparably priced sieving equipment. These cost effective 1/4hp units are widely accepted by state transportation departments for highway materials testing. Both units feature a back-and-forth lateral motion combined with up/down and tilting actions. The test specimen travels in an orbit on the sieve surfaces, assuring full use of sieve mesh area. These Sieve Shakers are recommended primarily for No.4 to No.200 (4.75mm to 75µm) size range, but may be used with larger material sizes when specifications for sieve loading and sample quantities permit.

Both models feature Gilson's exclusive EZ-Clamp system to quickly and securely lock in sieves for testing. The easy to operate clamping system with integral sieve cover slides freely up and down the clamp rods with the push of a button. Once in position, a quick twist secures the stack. When the test is complete, raise just enough to remove the stack and the clamps stay in place, ready for the next test without readjustment. The "D" digital models control test times with Gilson's exclusive digital countdown timer. The large LED display shows precisely timed operation up to 99 minutes at ±1 second. A pause function and user-selectable modes offer greater versatility. Settings are saved between cycles for precise repeatability and easy, one-button operation. Standard models use a classic 15-minute mechanical-electrical timer with manually adjustable knob-stop for improved repeatability and a "Hold" feature for continuous running.

All mechanical and electrical parts are enclosed in a rugged painted steel case with rubber feet. Free-standing operation is normal, but they may be securely mounted via holes provided in bottom end flanges.

SS-14 Gilson 8in/12in Sieve Shakers accept ASTM or ISO sieves in 8in, 12in, 200mm or 300mm diameters for maximum versatility. Extended stack height al-

SSA-807



Close-up EZ-Clamp

Close-up of Digital Timer; available with both shakers

SSA-802 shown with sieve

OBA-15R shown with sieve

lows more sieves in a single stack for efficient processing. Sieve capacity ranges from six 12in full-height to twenty-one 8in half-height sieves plus pan. **Product Dimensions:** 26x20x40in (660x508x1016mm) WxDxH.

SS-15 Gilson 8in Sieve Shakers have a stack capacity of six full-height sieves with pan or twelve half-height sieves with pan, and also accept ISO 200mm sieves. The SSA-806 EZ Clamp Upgrade kit is available to update older SS-15 shakers for more efficient performance and easier operation. **Product Dimensions:** 17x11x30in (432x279x762mm), WxDxH.

SSA-802 and OBA-15R Clean-N-Stor units are fast and efficient for collection, cleaning and weighing operations when sieving.

Gilson Sieve Shakers	
Gilson 8in Sieve Shaker, Mechanical Timer, 115V/60Hz	SS-15
230V/50Hz	SS-15F
Gilson 8in Sieve Shaker, Digital Timer, 115V/60Hz	SS-15D
230V/50Hz	SS-15DF
Gilson 8in/12in Sieve Shaker, Mechanical Timer, 115V/60Hz	SS-14
230V/50Hz	SS-14F
Gilson 8in/12in Sieve Shaker, Digital Timer, 115V/60Hz	SS-14D
230V/50Hz	SS-14DF
Accessories	
EZ-Clamp Upgrade Kit for SS-15	SSA-806
Stand Alone Clean-N-Stor	SSA-802
Adjustable Height Clean-N-Stor	OBA-15R

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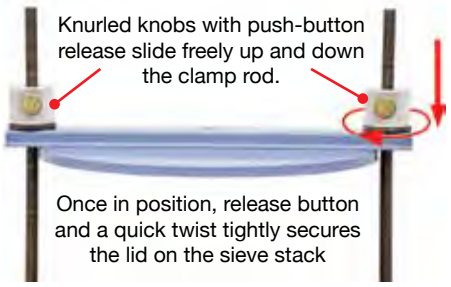
SS-8R shown with Sieves



Close-up of Digital Timer

SS-12R shown with Sieves

GILSON TAPPING SIEVE SHAKERS

- **Two-way tapping.**
- **Gilson exclusive EZ-Clamp System.**
- **No permanent mounting required.**
- **Precision digital controller.**
- **Capacities of up to twenty sieves.**

: Product spotlight :

SIEVE CAPACITIES (PLUS PAN)

Sieve Type	SS-8R	SS-12R
8in Full-Height	10	10
8in Half-Height	20	20
12in Full-Height	—	6
12in Intermediate Height	—	10
12in Half-Height	—	13

Research-based sieving action of Gilson SS-8R and SS-12R Tapping Sieve Shakers produces sharp, repeatable separations quickly over a broad range of particle sizes and material types. The Gilson-engineered sieving action results from perfect circular rotation of the sieve stack plus vertical two-way tapping at 48 taps per minute. Superior circular rotation prevents "dead spots" on the sieve surfaces that prevent complete separation. Particles roll in all directions relative to the pattern of woven sieve mesh. "Up" taps mix, reorient, and redistribute particles to present new orientations to sieve surfaces. "Down" taps assist in passing near-size particles to clear the mesh. These high-capacity shakers can hold as many as twenty sieves, depending on model and sieve frame dimensions.

Gilson's exclusive digital controller provides precise test times for exact repeatability up to 99 minutes, at ±1 second. Settings are saved between cycles for easy, one-button operation. A pause function allows the cycle to be suspended and resumed with no loss of test time, and a five-second audible alarm sounds at completion of the interval. The controller is simple to program and the large, bright 0.5in (12.6mm) LED display is easy to read.

Easy to operate new EZ-Clamp system with integral sieve cover slides freely up and down the clamp rods with the push of a button. Once in position, simply release, then a quick twist secures the cover on the sieve stack. Once the test is complete, raise just enough to remove the stack. The clamps stay in place, ready for the next test without readjustment. The EZ-Clamp system is also available as an accessory to retrofit older SS-8R and SS-12R shakers.

Gilson's internal counterbalance system promotes stability during operation without the need for permanent mounting. The unit can easily be relocated, using the adjustable footpads for leveling. Gilson Sieve Shakers are housed in sturdy painted steel cases and powered by 1/3hp electric motors. Sieves and accessories are ordered separately. **Product Dimensions:** 22.5x13x41in (572x330x1.041mm), WxDxH.

SSA-807

SSA-809 shown on SS-12R with Sieves

SSA-805R shown with SS-12R & Sieves

SSA-801 shown with Sieves on SS-8R

SSA-802 shown with Sieve

Gilson SSA-805R Sound Enclosure accessory controls noise and dust associated with Sieve Shakers and other lab equipment. Sturdy painted steel case with full-width hinged doors is lined with 1in (25.4mm) of sound-attenuating foam. **Product Dimensions:** 31x19x46in (800x500x1,200mm), WxDxH.

Clean-N-Stor accessories streamline collection, cleaning, and weighing functions for sieving operations. Inverting an 8in or 200mm sieve on the stainless-steel funnel empties contents into a receiving scoop or pan. A scoop and soft-bristle brush are included with all models. SSA-801 attaches to the top of the SS-8R case. SSA-802 is a stand-alone model that can be positioned directly over an electronic balance. OBA-15R features adjustable height to fit over taller balances. **Product Dimensions:** OBA-15R 8.4x11x6.8in (213x279x173mm), SSA-801 8.5x11.6x5.5in (216x295x140mm), SSA-802 8.5x11.6x5.5in (216x295x140mm).

Gilson Tapping Sieve Shakers	
Gilson Tapping Sieve Shaker 8in, 115V/60Hz	SS-8R
230V/50Hz	SS-8RF
Gilson Tapping Sieve Shaker 12in, 115V/60Hz	SS-12R
230V/50Hz	SS-12RF
Accessories	
EZ-Clamp Upgrade Kit for SS-8R	SSA-807
EZ-Clamp Upgrade Kit for SS-12R	SSA-809
Gilson Sound Enclosure	SSA-805R
Clean-N-Stor Attachment for SS-8R	SSA-801
Stand-Alone Clean-N-Stor	SSA-802
Adjustable-Height Clean-N-Stor	OBA-15R

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SS-20

SS-20 Inside View shown with Sieves

SS-21

GILSON ROTARY SIFTERS

- **Built by Gilson, backed by Gilson.**
- **Accurate results.**
- **Simple and efficient.**
- **New Silent Sifter® and Silent Sifter® II: "The quietest in the industry."**

Gilson has revamped the classic rotary sifter design and added our own innovations to introduce three new models. This proven sieving method preferred by many DOT's is now available with Gilson-guaranteed quality and reliability.

Gilson's progressive designs carry forward the best features of traditional rotary sifters and add upgrades drawn from our expertise in particle separation technology. Faster conversion from 8 to 12in or 200 to 300mm diameter sieves, easier set up, and much quieter operation all reflect the time devoted to improved design and materials. Sieve stack capacity ranges from six 12in diameter full-height sieves with pan, or up to twenty 8in diameter half-height sieves with pan.

The totally enclosed cabinet allows safe, dust-free operation. Assembled sieve stacks are simply placed inside and the cabinet is rotated back against the stops, no clamping is required. An ergonomic side knob allows easy rotation of the cabinet between the loading and testing positions. A drive roller system continuously rotates the sieve stack with particle separation assisted by tapping against the stack. The digital countdown timer with large LED display precisely times operation up to 99 minutes at ±1 second. A pause function and user-selectable modes offer greater versatility. Settings are saved between cycles for precise repeatability and easy, one-button operation.

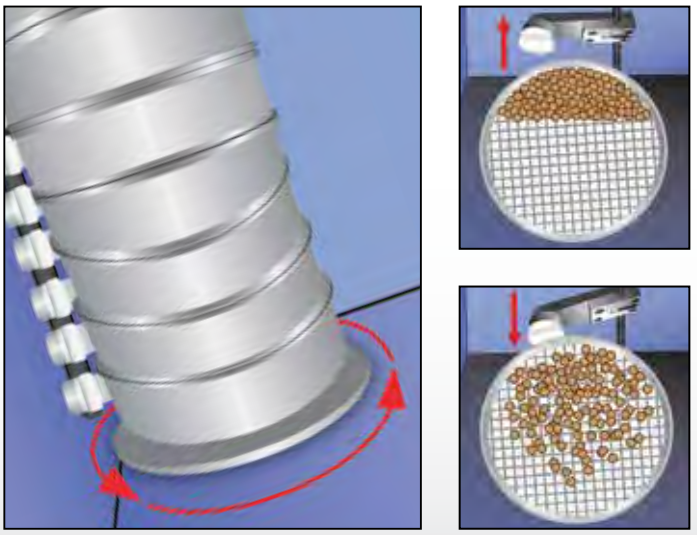
Hammer assemblies are 6061 aluminum alloy with Ultra High Molecular Weight (UHMW) Polyethylene heads. Rugged painted case is CNC machined for precise, dust-proof fit using dense, impact-resistant MDF board, mounted on a sturdy, powder-coated ASTM A513 heavy steel tubing stand. Full-width door swings completely out of the way on heavy-duty commercial grade hinges. The system is driven by a dependable 1/4hp continuous-duty motor. **Product Dimensions:** 19x24x58in (483x610x1,473mm), WxDxH.

SS-20 Rotary Sifter offers classic design and efficient operation in an economic package. Design advances, upgraded materials and efficient operation put the SS-20 a step above other sifters, while maintaining compliance with specification requirements. For ease of mobility, SSA-77 4in hard rubber Locking Swivel Casters may be purchased separately for installation on the SS-20 Floor Stand.

SS-21 Silent Sifter® matches the performance of the SS-20 Rotary Sifter

SS-22

GILSON ROTARY SIFTERS



As the sieve stack rotates, hammers tap the sieves to re-orient and redistribute particles across the sieve surface.

Close-up of hammers

Close-up of handle

while significantly reducing operational noise levels. Design modifications made using Gilson's proprietary silencing technology have resulted in a unit with noise levels 7—10dB lower than any other rotary sifter. The floor stand of the SS-21 includes SSA-77 4in diameter hard rubber Locking Swivel Casters for easy mobility in the lab. The Silent Sifter makes a significant contribution to the reduction of noise levels in your lab.

SS-22 Silent Sifter® II is the newest and most quiet member of the Gilson Rotary Sifter family. Specially engineered with advanced soundproofing materials and techniques, this sifter is 16—18dB quieter than standard rotary sifters, and 8—10dB quieter than even our SS-21 Silent Sifter®. A heavy-duty, over-center lever latch pulls the door tightly against the case gasket, insuring a tight, dust-proof seal that enhances noise control. This is your first choice for enhanced worker protection and reduction of nuisance noise levels. The floor stand of the Silent Sifter® II includes 4in hard rubber locking casters. Performance and features match those of our other two sifter models.

Users of traditional Rotary Sifters can still take advantage of Gilson's advances in design, along with better pricing and availability by upgrading commonly replaced parts with Gilson components. Gilson Hammer Assemblies, Hammer Heads, and Timers fit all current rotary sifter brands and are designed for efficient operation and long service life. Inquire for other quality replacement components.

Gilson Rotary Sifters	
Gilson Rotary Sifter, 115V/60Hz	SS-20
230V/50Hz	SS-20F
Gilson Silent Sifter®, 115V/60Hz	SS-21
230V/50Hz	SS-21F
Gilson Silent Sifter® II, 115V/60Hz	SS-22
230V/50Hz	SS-22F
Accessories	
Rotary Sifter Hammer Assembly	SSA-72
Rotary Sifter Hammer Head	SSA-74
Rotary Sifter Timer/Controller	SSA-76
Rotary Sifter 4in Locking Swivel Casters	SSA-77

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SS-31 shown with SSA-320A, SSA-325 & Sieves

VIDEO ONLINE

SS-30 shown with Sieves

SS-33 shown with Sieves

W.S. TYLER® RO-TAP® SIEVE SHAKERS

W.S. Tyler® Ro-Tap® Sieve Shakers have 278 oscillations and 150 taps per minute as specified in some ASTM and other sieving applications. Horizontal, circular action combined with vertical tapping assures accurate and consistent results.

These shakers are designed for heavy-duty use and bolt easily to a solid table or sturdy bench top. All models feature an adjustable-plate sieve support and built-in 99 minute x 0.1 second digital timer. Powerful 1/4hp motors provide plenty of action for efficient separations. For models operating on 230V/60Hz power, add "S" to the model number. Sieves are ordered separately and a sieve cover is required.

SS-30 8in W.S. Tyler® Ro-Tap® Sieve Shaker holds up to six full-height 8in (203mm) sieves with a full-height pan, or thirteen half-height sieves with a half-height pan. Recommended particle size range is No.4 (4.75mm) to No.635 (20µm). Add "K" to model number to specify our Lab Kit, which includes the Sieve Shaker, SSA-320A Sound Enclosure, and SSA-325 Test Stand. **Product Dimensions:** 28x21x25in (711x533x635mm), WxDxH.

SS-31 12in W.S. Tyler® Ro-Tap® Sieve Shaker holds up to four 12in (305mm) full-height sieves and pan, six intermediate height and pan, or eight half-height sieves and pan. Recommended particle size range is 1/2in (12.5mm) to No.500 (25µm). Add "K" to model number to specify our Lab Kit, which includes the Sieve Shaker, SSA-320A Sound Enclosure, and SSA-325 Test Stand. **Product Dimensions:** 28x21x25in (711x533x635mm), WxDxH.

SS-33 8in W.S. Tyler® Ro-Tap® II Sieve Shaker performs two 8in (203mm) sieve tests simultaneously with exactly the same action as the single-stack models. Recommended particle size range is from No.4 to No.635. **Product Dimensions:** 30x27x26in (762x686x660mm), WxDxH.

SSA-320A Sound Enclosure for SS-30 or SS-31 W.S. Tyler® Ro-Tap® Sieve Shakers has a steel cabinet lined with 1in (25.4mm) thick acoustic foam. Two front doors and a top-opening panel allow easy access. A small access port is built-in to the rear of each unit. **Product Dimensions:** 35x24x29in (889x610x737mm), WxDxH.

SSA-321 Sound Enclosure has all of the same features as the SSA-320A, but it is dimensioned to fit the larger SS-33 W.S. Tyler® Ro-Tap® II Sieve Shaker. **Product Dimensions:** 34x33x31in (864x838x787mm), WxDxH.

SSA-325 Test Stand for SS-30 and SS-31 can be used with or without the SSA-320A. The sturdy aluminum frame includes hardware for assembly and floor anchoring. **Product Dimensions:** 20x32x28in (508x813x711mm), WxDxH.

W.S. Tyler® Ro-Tap® Sieve Shakers	
W.S. Tyler® Ro-Tap® 8in Sieve Shaker, 115V/60Hz	SS-30
230V/50Hz	SS-30F
W.S. Tyler® Ro-Tap® 12in Sieve Shaker, 115V/60Hz	SS-31
230V/50Hz	SS-31F
W.S. Tyler® Ro-Tap® II 8in Sieve Shaker, 115V/60Hz	SS-33
230V/50Hz	SS-33F
Accessories	
Sound Enclosure for SS-30 & SS-31	SSA-320A
Test Stand for SS-30 & SS-31	SSA-325
Sound Enclosure for SS-33	SSA-321

W.S. Tyler® and Ro-Tap® are registered trademarks of Haver Tyler Corporation.

SS-25 shown with Sieves

SS-82 shown with Sieves

"MARY ANN®" SIFTER

The original "Mary Ann®" Sifter has been popular in testing labs for many years. Sieve stacks up to 26in (660mm) in height are set into place, with no clamping required. Enclosed cabinet door has the option where it can be mounted to open from either the right or left. The SS-25 accommodates either 8in (203mm) or 12in (305mm) diameter testing sieves. Testing cycles are controlled to ±1 second with a 99 minute digital timer. Sieve stack angled at 45 degrees and allows rotation of sieves. This rotation, aided by tapping from hardwood faced cast aluminum hammers, promotes many orientations of particle to mesh. The support stand also doubles as a sieve storage rack. Assembled Sifter requires 18x40in (457x1,016mm) of floor space. **Product Dimensions:** 18x26x58in (457x660x1,473mm), WxDxH.

"Mary Ann®" Sifter	
"Mary Ann®" 8/12in Sifter, 115V/60Hz	SS-25

W.S. TYLER® COARSE SIEVE SHAKER

Designed for materials in the No.4 to No.100 size range, this rugged W.S. Tyler® sieve shaker is portable enough for field applications. An effective circular sifting motion is imparted to sieves via the 1/4hp motor. Built-in digital timer with 99 minute range is accurate to 0.1 second.

SS-82 accommodates both 8in (203mm) and 12in (305mm) sieves with included adapter. Shaker will accept from 6—13 eight inch sieves and from 4—8 twelve inch sieves, dependant upon use of full, intermediate or half-height sieve frames. Mounting holes are provided in the frame for securing the unit to a table or bench-top. **Product Dimensions:** 28x22x34in (711x559x864mm), WxDxH.

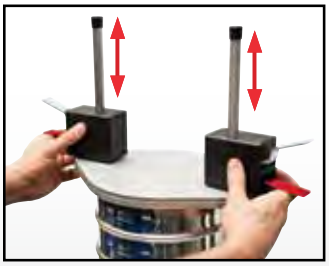
W.S. Tyler® Coarse Sieve Shaker	
W.S. Tyler® Coarse Sieve Shaker, 115V/60Hz	SS-82
220V/50Hz	SS-82F

W.S. Tyler® is a trademark of Haver Tyler Corporation.

Find Estimated Ship Weights for all our products in the Ship Weight Index

SS-10 shown with Sieves

SS-10 CLAMPING SYSTEM



Apply light upward pressure on both bottom levers to move sieve cover up or down.

Press downward on both top levers several times for a tight clamp on sieves.

SS-10
Touch Screen

1-TOUCH VIBRATORY SIEVE SHAKER

- **Quiet, efficient operation with a compact bench-top footprint.**
- **Three-dimensional agitation for maximum efficiency.**
- **Menu-guided touch-screen controls are easy to set up.**
- **Wide range of control settings for performance customized to materials.**
- **Fast, accurate separations for materials from No. 10 to No. 635 (2.00mm to 20µm).**

Gilson's 1-Touch Vibratory Shaker for 8in and 200mm sieves combines the latest in electronic control with proven separation technology for fast, accurate separations of materials 2mm and finer. The touch-screen programmable controller allows selection of vibration level, time, and pauses. Once operating parameters are set, just tap "Start" on the display screen to begin each new test. Up to 99 testing profiles can be stored in non-volatile memory to insure exact repeatability. Quiet, compact bench-top unit offers complete control of multi-directional agitation for optimum performance based on material type.

The wide range of user-controlled performance options means the SS-10 is suitable for a variety of materials. Pharmaceuticals, powders and many other granular materials are efficiently sized on this programmable sieving system. The three-dimensional sieving action evenly distributes the specimen across sieve surfaces and continuously reorients particles to insure the maximum number of passing opportunities. Optimal size range is dependant on material type, but typically, particles between No.10 and No.635 sieve sizes are easily processed. GAA-19 Clear Acrylic Spacer for 8in sieves can be used in place of one sieve to visually observe specimen action when optimizing vibration settings. The 5.6in (142.2mm) diagonally measured screen offers a bright, clear view of controls and operating information. Fast acting stack clamps adjust quickly, hold their position, and tighten with little effort. Sieves are securely locked down, assuring efficient transfer of vibration energy during operation.

The shaker accepts eight full-height, or sixteen half-height 8in (203mm) diameter sieves plus pan. 200mm sieves can also be used. Times can be set up to 99 minutes, 59 seconds. Ten levels of vibration power are selectable for optimum separation efficiency with different materials.

The sturdy housing is powder coated steel and has adjustable leveling feet with non-skid rubber pads. Electrical requirements are 115V/60Hz. **Product Dimensions:** 12x16.5x28in (305x419x711mm), WxDxH.

1-Touch Vibratory Sieve Shaker	
1-Touch Vibratory Sieve Shaker	SS-10
Accessories	
Clear Acrylic Sieve Spacer	GAA-19

SS-3 shown with Stainless Steel Sieves

SS-3 control panel

EZ-Clamp knob

SSA-15

PERFORMER III 3IN SIEVE SHAKER

- **Quiet, electromagnetic vibratory action.**
- **0—100% amplitude control.**
- **Switchable tapping action.**
- **Exclusive Gilson EZ-Clamp System quickly secures sieves.**
- **Precise digital timing.**

The Gilson Performer III's compact size, small footprint, and quiet operation make it a very efficient instrument for dry powder separations of small samples. 3in (76mm) Sieve Shaker is designed for chemicals, minerals, pharmaceuticals, powdered metals, cosmetics, abrasives, ores, foods, and other fine powders. Effective size range is No.4—No.635 (4.75mm—20µm) with woven wire sieves. Extended sizes are possible with some materials.

High frequency 3,600vpm electromagnetic vibratory action with 0—100% amplitude control is ideal for fine particle separations. In-line solenoid actuated tapping action (60 taps/min) works during dry sieving to redistribute the sample on the sieves, and breaks static blinding, helping to clear undersize particles rapidly. Tapping can also be used independently for tap-settling and tap-density functions.

The SS-3 can hold either seven full-height 3in (76mm) metal sieves plus pan or fourteen acrylic frame sieves and pan. The unique Gilson EZ-Clamp sieve clamping mechanism makes insertion and removal of the sieve stack simple and convenient, yet holds the sieves snugly during operation. The captive knobs on the clamping mechanism allow it to be released with a quick twist. The mechanism remains at this height until the knobs are twisted in the opposite direction, clamping the sieves in place.

SS-3 features include a rugged coated steel case, variable control for vibration and a manual/timed mode switch. A sieve cover is included. The digital count-down timer controls operation to 99 min., 59 sec. and has pause feature. Stackable acrylic 3in (76mm) see-through cylinder is helpful for observing sample action while leveling platform or for setting vibration. SSA-17 clear acrylic Adapter allows 3in acrylic sieves to be used with 3in stainless steel pan. Power requirements are 115V/50-60Hz. For 230V operation, order TR-502 Transformer. **Product Dimensions:** 8x11x22in (203x279x559mm), WxDxH.

Performer III 3in Sieve Shaker	
Performer III 3in Sieve Shaker	SS-3
Accessories	
Adapter for Acrylic Sieves to Stainless Steel Pan	SSA-17
Acrylic Spacer for Metal Sieves	SSA-15
Acrylic Spacer for Acrylic Sieves	GAA-88

Find Estimated Ship Weights for all our products in the Ship Weight Index

VIDEO ONLINE

WET/DRY SIEVE VIBRATOR

The vibration energy of the SS-23 is transferred directly to the sieve frames, promoting passage of finer particles from wet or dry material. The powder-coated steel frame is designed for use with a notched plastic bucket to collect fines.

SS-34 shown with Sieves

SS-23 shown with SSA-20 & Sieves

SS-23 shown with sieve

W.S. TYLER® RO-TAP® E SIEVE SHAKERS

W.S. Tyler® Ro-Tap® E Sieve Shakers for 8in (203 mm) or 12in (305mm) test sieves are for light to medium duty applications in the size range of No.10 (2mm) to No.635 (20µm). Electromagnetic vibration produces constant amplitude and three-dimensional sieving action to insure complete separations. Controls allow customized settings for analyses of fine or coarse materials. Digital controls, quick-release clamping, quiet operation and a see-through cover are featured on both models. Heavy construction and cast iron parts assure a long service life.

SS-34 8in W.S. Tyler® Ro-Tap® E is compact and requires minimal counter space. The shaker will accept eight full-height or sixteen half-height sieves, plus pan. Units automatically adjust to 110V/60Hz or 220V/50Hz power supplies. **Product Dimensions:** 18x18x30in (460x460x760mm), WxDxH.

SS-36 12in W.S. Tyler® Ro-Tap® E is a larger floor unit. The digital control panel can be remotely mounted. Sieve capacity is seven full-height, ten intermediate height or fourteen half-height sieves. Units operate on 110V/60Hz or 220V/50Hz power supplies. **Product Dimensions:** 15x17x38in (380x430x960mm), WxDxH.

W.S. Tyler® Ro-Tap® E Sieve Shakers	
8in W.S. Tyler® Ro-Tap® E Sieve Shaker, 110V/60Hz or 220V/50Hz	SS-34
12in W.S. Tyler® Ro-Tap® E Sieve Shaker, 110V/60Hz or 220V/50Hz	SS-36

W.S. Tyler® and Ro-Tap® are registered trademarks of Haver Tyler Corporation.

WET/DRY SIEVE VIBRATOR

Inexpensive electric sieve vibrator is helpful for fast separations of wet or dry materials using one or two 8in diameter, full-height sieves.

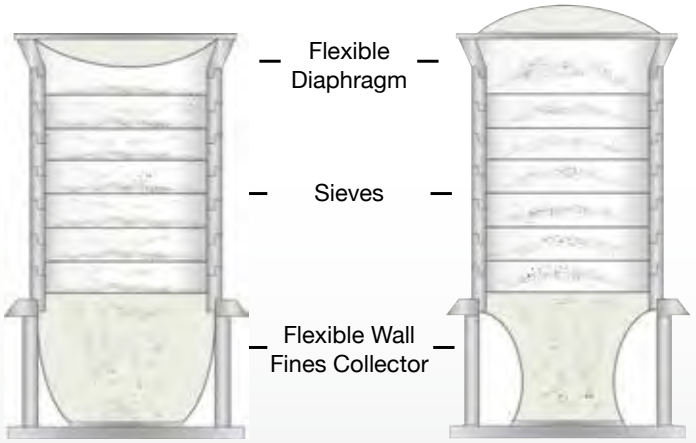
For wet samples, WT-7 Spray Fitting, WT-5 Spray Mist Dispenser, or other wet sieving accessories can be used to assist processing. Use SSA-20 Notched Bucket or one sieve and an extended-rim sieve pan to catch undersize material.

Vibrating unit is mounted on a durable, powder-coated steel frame. Includes 3-wire cord and plug for 115V, 50/60Hz operation. **Product Dimensions:** 13.5x12x10in (343x305x254mm), WxDxH.

Wet/Dry Sieve Vibrator	
Wet/Dry Sieve Vibrator, 115V, 50/60Hz	SS-23
Accessories	
Notched Bucket	SSA-20

GA-6 shown with Sieves

GA-6 SONIC SIEVING ACTION



The diagram represents one pulse. The GA-6 generates 3,600 sonic pulses per minute.

Tapping is controlled by the user and can be set for horizontal and vertical, vertical only, or turned off completely.

GILSONIC AUTOSIEVER SONIC SIFTER

- **Fast, efficient, and proven dry separations of fine powders.**
- **Size range from 850µm (No.20) to 5µm.**
- **Programmable vertical and horizontal tapping clears sieve openings and reduces clumping.**
- **3in (76mm) acrylic-frame sieves are available in standard woven wire or precision electroformed mesh.**

The GilSonic AutoSiever is the most accurate and reliable sieve shaker available for particle sizing of dry powders and fine granular materials. Testing profiles are fully customizable, assuring consistent, repeatable values for even the most difficult materials. Only minimal training is required for proper operation.

3,600 sonic energy pulses per minute oscillate the air column enclosed within the sieve stack. This agitation continuously excites and reorients the particles to the mesh surface. Programmable tapping clears the sieves and prevents lumps from forming in the materials. Controls for intensity, ramp and dwell, and total test time assure fully customizable profiles for many different material types. Up to ten profiles can be saved in non-volatile memory, assuring repeatability for similar materials. The AutoSiever is designed and manufactured in the USA to meet CE requirements.

Test times vary depending on material type and particle size. Five minutes is typical, but some samples may be complete in as little as thirty seconds. Operating time can be set for up to 99.9 minutes. Sieving intensity (amplitude) is selected with a proportional power controller. Ramping function automatically increases power at a programmed rate for optimum separation of difficult materials. Programmable tapping is built into each unit and can be programmed for horizontal and vertical, vertical only, or turned off completely.

Sample capacity is a function of particle size and material type. Larger particle samples may range up to 20g or about 7cc. Samples with maximum particle sizes of 38µm (No.400) should be about 10g or 4cc. For precision sieving with electroformed sieves down to 5µm, some samples may be as small as 1g. The 3in (76mm) diameter clear acrylic-framed sieves are available with ASTM E11 woven-wire cloth or ASTM E161 precision electroformed mesh. The AutoSiever holds seven woven-wire or three precision electroformed sieves in the fixed-height stack assembly. Clear acrylic spacers are available if fewer sieves are desired.

Fines are retained in a flexible-walled latex fines collector. A latex diaphragm on top of the stack seals the air column and confines the sample during testing. The complete stack assembly is held together with a column lock, inserted into the backlit testing chamber and quickly secured in place for testing.

The cabinet is powder coated steel with a sliding acrylic door. The AutoSiever is supplied with one GAA-2 stack assembly, consisting of seven clear acrylic spacers, a fines collector with collector holder, top cone, diaphragm, and column lock. Sieves are purchased separately. Operates on 115/230V, 50 or 60Hz (selectable) power supplies, 40 Watts maximum. **Product Dimensions:** 10x10x20in (254x254x508mm), WxDxH.

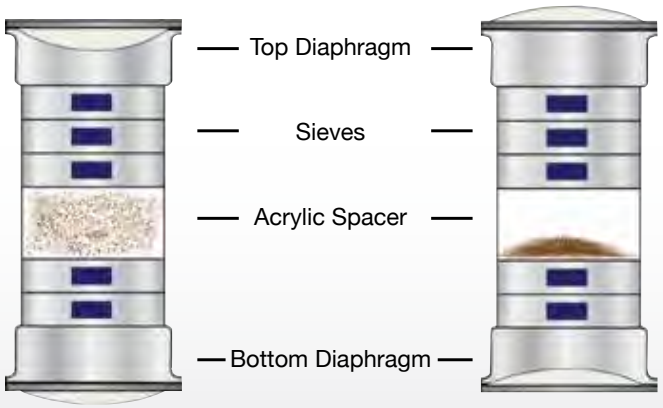
GilSonic AutoSiever Sonic Sifter	
GilSonic AutoSiever Sonic Sifter	GA-6
Accessories	
Stack Assembly	GAA-2
Replacement Diaphragm	GAA-3
Replacement Fines Collector	GAA-4
Standard Acrylic Spacer	GAA-88

alsoavailable

See the separate listing for 3in Acrylic Frame Test Sieves.

GA-8 shown with Sieves

GA-8 SONIC SIEVING ACTION



The diagram represents one pulse. The GA-8 generates 3,600 sonic pulses per minute.

GAA-5 shown with Sieves

GAA-19

GAA-10

GILSONIC ULTRASIEVER® SONIC SIFTER

- **Sonic sieving for samples up to 100g.**
- **Uses up to Seven Full-Height 8in or 200mm diameter sieves.**
- **Fully programmable time, amplitude and vertical or horizontal tapping sequences.**

The GilSonic UltraSiever® sample capacity is more than seven times that of our GA-6 AutoSiever, and it accepts up to seven 8in (203mm) diameter full-height test sieves. ASTM E11 woven wire sieves from 1/4in to No.635 (6.3mm to 20µm) or ASTM E161 sieves with unsupported precision electroformed mesh from 150 to 5µm with tolerances of ±2µm can be used. ISO 565-3310 200mm sieves can also be used when paired with the GAA-10 adapter set. Sample size for materials up to 1/4in (6.3mm) may be 100g or more. 10g or less is typical when using precision electroformed sieves below 20µm.

Sieving action is created by 3,600 sonic pulses per minute oscillating inside the sieve stack and agitating each particle. Sieving intensity (amplitude) is set through a proportional controller, based on observation of particles during agitation. A programmable Ramping function incrementally increases amplitude to the maximum rate and holds it, then steps it back down for optimum separation. There are additional controls for selectable horizontal and vertical tappers. The horizontal tappers can be positioned to tap on selected sieves. Four vertical tappers can be operated as one pair for most materials or two pairs for difficult samples. Up to ten programs with specific amplitude, ramping, tapping, and test duration settings for specific materials can be stored in the memory. Test times vary depending on material type and particle size. Typical sieving time is 1 to 5 minutes, but operating time can be set for up to 99.9 minutes.

The powder-coated steel case has vertically-hinged Lexan™ doors enclosing the sieve chamber. Sample material is contained by flexible top and bottom diaphragms. The stack is sealed when the upper enclosure is lowered. Upon test completion, fines are recovered from the bottom diaphragm. Acrylic spacers are required when using less than seven sieves or for viewing sieving action.

The GA-8 UltraSiever includes top and bottom sieve stack adapters, four diaphragms for top or bottom use, two acrylic spacers, one double-height acrylic sieve spacer, and twelve polyurethane sieve Seal Gaskets. The GAA-5 Extra Sieve Stack Assembly includes top and bottom sieve adapters, handle plate, bottom diaphragm, and sieve seal gaskets to assemble a second sieve stack for faster processing. Sieves are ordered separately. Operates on 115/230V, 50 or 60Hz (selectable) power supplies, 100 Watts maximum. **Product Dimensions:** 19x23x45in (483x584x1,143mm), WxDxH.

GilSonic UltraSiever® Sonic Sifter	
GilSonic UltraSiever® Sonic Sifter, 115/230V, 50/60Hz	GA-8
Accessories	
Replacement Top/Bottom Diaphragm	GAA-15
8in Sieve Seal Gasket	SSA-10
Diaphragm Seal Gasket	GAA-18
Spacer, 8in	GAA-19
Double-Height Spacer	GAA-16
Assembly for Sieve Stack	GAA-5
Adapter Set for 200mm Sieves	GAA-10
Spacer, 200mm	GAA-19M
Double-Height Spacer, 200mm	GAA-16M

AJ-103 shown with AJA-4 and AJA-8

AJ-103 screen

AJA-8

SSA-9 shown with 8in Test Sieve

MIKRO AIR JET SIEVE™

The redesigned Mikro Air Jet Sieve™ is an accurate and reliable single-sieve system made in the USA for 10 to 100g samples of dry powders from 4.75mm to 20µm (No. 4 to No. 635). A rotating slotted nozzle supplies positive air pressure to gently fluidize the sample in a covered 200mm or 8in (203mm) diameter sieve. Exiting air is drawn downward with an external vacuum system, creating a negative pressure that carries undersize particles to a collection canister. Air Jet sieving action is gentle, effective, and especially useful for fragile or low specific gravity materials. Operation is clean, quiet, and takes up minimal space. Test times and vacuum/pressure settings are controlled through the integrated computer with touch screen controls and display. The controller has memory for up to nine preset test times to insure easy operation and test-to-test repeatability.

The new Air Jet design now accommodates both 200mm test sieves and conventional 8in (203mm) ASTM Test Sieves with use of an O-ring for sealing. Sieves are constructed with stainless steel frames and mesh, and are ordered separately by mesh sizes required. Low-Profile O-rings adapt Gilson 8in ASTM E11 Test Sieves for use with the Mikro Air Jet, and are available separately as SSA-9. Multiple particle sizes can be determined by transferring retained sample on a fine sieve to the next larger sieve. Inquire for special 83mm diameter sieves and adapter plate for small or fragile samples that allow three sieves to be used at once.

The AJ-103 Basic Mikro Air Jet Sieve™ consists of the base unit with a clear acrylic sieve cover, slotted brass air nozzle, electronic controls with integrated computer and touch screen display. The 15 Watt bevel-gear motor has lifetime lubricated bearings. The cast aluminum Instrument housing features a built-in pressure differential gauge and has an attractive baked enamel finish. An integral electrical outlet provides a convenient connection for the vacuum system, purchased separately. Vacuum is monitored at the housing outlet and has a control valve for adjustment.

You can take advantage of the features of the Advanced Air Jet Sieve by ordering the AJ-105 model directly, or by purchasing a simple upgrade procedure to unlock all of the features on an existing Basic model. The Advanced version includes everything that the AJ-103 Basic model has, and uses Windows-compatible software to interface with an electronic balance for automatic collection of sieve and fraction weights, and to the user's computer for networking and printing functions. Test results can be reported in a variety of graphs and tabular formats, and can be saved directly to the computer. A serial interface cable is included. The AJ-105 model or upgrade requires an AJA-135 Electronic Balance, purchased separately. The Balance has a capacity of 4,200g with a readability of 0.01g, and is supplied with an interface cable. **Product Dimensions:** 16.5x10.5x7.5in (419x267x191mm) WxDxH.

A Vacuum system is required for operation, and is purchased separately. The AJA-134 Vacuum System is recommended for best performance over a wide range of materials, including very fine and conductive specimens. Three-stage filtration system includes a Dacron pre-filter bag, a disposable paper filter bag and a drop-in, pleated HEPA Filter Assembly with a minimum efficiency rating of 99.91% at 0.3µm. The powder-coated 5gal (19L) collection canister is equipped with casters and a carrying handle for easy portability. The 1hp air-cooled motor is available in 110 or 220V versions, and operates on 50-60Hz power supplies. Sound level is 85 to 88 dBa. The unit is equipped with a 10ft (3M) anti-static suction hose and 25ft (7.6M) power cord. AJA-133 Standard Vacuum System has a low-noise 1,000 Watt motor and low-profile epoxy-lined steel filter canister with 4gal (15L) capacity. Note that the Standard Vacuum System is not designed for conductive materials or materials with high fines content. The AJA-4 Cyclone Collector, used in conjunction with the vacuum systems, assures greatest recovery of sub-micron fines. Undersize sieve fractions are directed through an anti-static vacuum hose through the cyclone, and collected in a threaded glass receiving bottle. **Product Dimensions:** 16.5x10.5x7.5in (419x267x191mm) WxDxH.

Mikro Air Jet Sieve™	
Mikro Air Jet Sieve™ Basic, 90-240V/50-60Hz	AJ-103
Mikro Air Jet Sieve™ Advanced, 90-240V/50-60Hz	AJ-105
Accessories	
Advanced Upgrade for AJ-103	AJ-111
Vacuum System w/HEPA Filter, 110V/50-60Hz	AJA-134
Standard Vacuum System, 110V/50-60Hz	AJA-133
High-Efficiency Cyclone Collector	AJA-4
Low Profile O-Rings for 8in Sieves	SSA-9
Electronic Balance with Serial Cable, 4,200 x 0.01g, 110 or 220V/50-60Hz	AJA-135
Replacement 200mm Clear Acrylic Cover	AJA-8
Non-Woven Bag for AJA-134	AJA-141
Dacron HEPA Pre-Filter Bag	AJA-142
HEPA Filter Assembly w/Gasket	AJA-143
Primary Bag Filter (Disposable)	AJA-144
Disposable Paper Bags for AJA-133 Vacuum, pkg. of 10	AJA-139
HEPA Replacement Cartridge for AJA-133 Vacuum	AJA-140

TS-2 shown with Screen Trays

TS-1 shown with Screen Trays

TS-3 shown with Screen Trays

GILSON TESTING SCREENS

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 in as little as three to five minutes, depending on material type. Vibration and amplitude characteristics are fixed at optimum for mineral aggregates in the 4in (101mm) to No.4 (4.75mm) size range, but Testing Screens can process material down to No.200 (75µm) with some loss in separation efficiency. Several models are available with different features and Screen Tray capacities, but all have the same performance specifications.

Removable Screen Trays to fit both Testing Screen and Test-Master models are purchased separately in a wide range of opening sizes with ASTM E11, ISO 565 specification cloth or punched steel plate. Each tray features a generous 14.75x22.75in (375x578mm), 2.33ft2 (0.22m2) clear screen area. Screen cloth is replaceable, insuring long life and inexpensive maintenance of trays. Available Screen Trays, Dustpans and Replacement Mesh sizes are listed in the accompanying selection guide. Dustpans are available in configurations for increased capacity, reduced dust output, or dispensing of fines directly into outside bag or container.

Standard vibration characteristics are designed to separate coarse mineral aggregates. Separation of fine, sensitive or low-density materials such as wood chips, coal or coke can be improved by adding optional Vibration Speed Variation accessory or an optional factory-installed Low-Amplitude Drive Shaft. These options reduce degradation of material and allow the user to optimize screening profiles for specific materials. Accessories such as Clean-N-Weigh and Tray Racks enhance overall efficiency, and other accessories facilitate sample handling, dust and noise control and separation performance.

Gilson Testing Screens are proven economical performers, designed for mounting to a solid, rigid floor system. Securing with anchor bolts to a concrete floor is recommended. Models are available with clamping activated by a manual hydraulic pump or by threaded cranks. Top-mounted drive mechanisms are enclosed for safety and operated by powerful 1/2hp capacitor-type motors with built in overload protection. Simple on/off switching controls operation, but accuracy, repeatability and convenience can be improved by connecting the optional TSA-169R Digital Timer/Controller. Dustpans are normally placed in the bottom tray slot of the Testing Screens, but can be temporarily placed on the bottom shelf, freeing up a slot for an additional screen tray. Units operate on 115V/60Hz electrical supplies. Add “F” suffix to model number to specify 230V/50Hz models.

- TS-1 Gilson Testing Screen has a quick-acting hydraulic pump system to clamp the screen trays in place. Trays are quickly released using the same handle. This more efficient model is recommended for labs with a steady workload of particle size testing. A total of six tray slots hold five Screen Trays plus a Dust Pan. **Product Dimensions:** 23x31x43in (584x787x1,092mm) WxDxH.

- TS-2 Gilson Testing Screen uses manually operated threaded clamping handles to secure the screen trays. This model is more economical, but also more labor-intensive for continuous use. A total of six tray slots hold five Screen Trays plus a Dust Pan. TSA-155 or TSA-159 Hydraulic Clamping Conversion Kits are available to convert existing TS-2 models to hydraulic clamping TS-1 units. **Product Dimensions:** 23x31x43in (584x787x1,092mm) WxDxH.

- TS-3 Gilson Testing Screen is our newest model and features an additional tray slot for samples requiring additional fractions. Hydraulic clamping system is the same as TS-1 with a reinforced top frame for the increased screen tray loads. Seven tray slots hold six Screen Trays plus a Dust Pan. **Product Dimensions:** 23.4x31.4x47.4in (594x798x1,204mm) WxDxH.

Test-Master® Testing Screens feature a counter-balanced drive assembly with internal rotating counterweights to equalize the vertical screening action and assure smooth, quiet operation. The Test-Master® can be placed anywhere with no need for permanent bolting to the floor. Sample vibration characteristics are identical to our TS-1 and TS-2 models.

TM-6 shown with doors closed

VIDEO ONLINE

Foot-operated Tray Clamping

Feed Hopper

TM-5 shown with Screen Trays. Doors open & Hopper elevated

Test-Master models have a full enclosure covering all moving parts to minimize exposure to nuisance dust and reduce noise. The panel doors open flat across the front and feature a safety interlock switch to prevent operation when open. A 1.6ft³ (45.3L) integrated hopper allows incremental introduction of sample material during operation. The hopper is hinged at the rear and has a panel to block dust when closed. A built-in electronic LED digital controller displays time remaining and sounds an audible tone at the end of the test cycle. Test cycles lasting up to 99 minutes, 59 seconds may be programmed and cycles can be interrupted without loss of test time. An ergonomic foot-pedal easily operates the hydraulic clamping and pressure release system for the screen trays. Both operate with powerful, capacitor-start 1/3hp motor. Units operate on 115V/60Hz electrical supplies. Add "F" suffix to model number to specify 230V/50Hz models. **Product Dimensions:** 28x35x50in (711x889x1,270mm).

- TM-5 Test-Master has a capacity of six Screen Trays plus a Dust Pan. The wider tray spacing of the TM-5 allows more efficient separation of samples with higher fractions of coarse aggregates.
- TM-6 Test-Master holds up to seven Screen Trays plus Dust Pan. An extra tray increases efficiency when separating samples into multiple size fractions.

Gilson Testing Screens	
Gilson Testing Screen, Hydraulic Clamping, 115V/60Hz	TS-1
Gilson Testing Screen, Manual Clamping, 115V/60Hz	TS-2
Gilson Testing Screen, 7-Tray Capacity, Hydraulic Clamping, 115V/60Hz	TS-3
Test-Master®, 6-Tray Capacity, 115V/60Hz	TM-5
Test-Master®, 7-Tray Capacity, 115V/60Hz	TM-6
Accessories	
Sound Enclosure	TSA-180
Clean-N-Weigh	TSA-167
Screen Tray Rack	TSA-156
Digital Timer/Controller for TS-1, TS-2 & TS-3	TSA-169R
Door Enclosure for TS-1, TS-2 & TS-3	TSA-157
Speed Variation Accessory for Test-Master, 115V/60Hz	TSA-153
Speed Variation Accessory for TS-1 & TS-2, 115V/60Hz	TSA-154R
Low-Amplitude Drive Shaft for Test-Master (factory-installed)	TSA-201
Low-Amplitude Drive Shaft for TS-1 & TS-2 (factory-installed)	TSA-200
Hydraulic Clamping Conversion for TS-2; s/n 13824 and Lower	TSA-155
Hydraulic Clamping Conversion for TS-2; s/n 13825 and Higher	TSA-159

technote

Tray Capacity of Gilson TS-1, TS-2, and TS-3 Testing Screens can be temporarily increased by placing the Dust Pan for fines collection on the bottom shelf instead of in the bottom tray slot.

@contactus

Contact a Gilson Technical Support Specialist to discuss optimizing Testing Screen Performance for special materials.

Find Estimated Ship Weights for all our products in the Ship Weight Index

PS-4 shown with Screen Trays

VIDEO ONLINE

PSA-367

PSA-312 on PS-3

PSA-356 shown with Screen Trays

Foot-Tab Leveling

GILSON PORTA-SCREEN®

- **Counterbalanced mechanisms for smooth operation.**
- **Portable for mobile applications.**
- **Smaller screens are easier to handle.**

Gilson's Porta-Screen® has long been the accepted standard portable screen for quality control of construction aggregates at asphalt and ready-mix plants. Porta-Screen® models are designed for performance durability, yet are light enough to be portable. Designed for best separation in the 2in (50.8mm) to No.16 (1.18mm) range, it is often used to sieve materials to No.200 (75µm). Porta-Screens are also useful for separations of many other materials. Capacity depends on test material characteristics but may range up to 60lb (27.3kg) per test. PS-3 holds five screen trays and pan. PS-4 holds seven screen trays and pan to permit two added mesh sizes per test. Both the PS-3 and PS-4 fit inside the TSA-180 sound enclosure. Vibration of both models is mechanically counterbalanced for smooth, stable operation; no mounting is required. A built-in electronic digital timer has LED display of remaining test time and issues a 5 second audible alarm at zero. Timer resets to repeat times which can be programmed up to 99 minutes, 59 seconds. A feature allows interruptions without loss of test time. **PS-3 Product Dimensions:** 21x15x42in (533x381x1,219mm), WxDxH. **PS-4 Product Dimensions:** 21x15x48in (533x381x1,067mm), WxDxH.

Screen Trays and Dustpans for the Porta-Screen® units are ordered separately. Trays have 14x14in (356x356mm) screen area and are quickly secured for operation by dual hand clamp levers. When levers are released, trays are individually-removable for convenient emptying, cleaning, and weighing operations. Mesh sizes No.4 and larger have metal shields around edges to cover partial openings for accuracy of separations. Trays with wire cloth in the No.16 to No.80 (1mm to 180µm) range have three added support ribs. No.100 (150µm) and finer trays are supplied with backup cloth support. Replaceable mesh is available in all sizes. Cloth No.4 and larger is steel; fine mesh is stainless steel. **Tray Dimensions:** 16x16.5x3in (406x419x76mm), WxDxH.

The vibrating assembly is mounted on hardened guide pins. The 1/3hp motor, drive shaft, and connecting rod are synchronized with rotating weight counterbalance system. All are enclosed by the enameled steel case. The machine is quickly leveled by foot tab adjustment of the three support legs while watching an indicator bubble on the top frame.

PSA-114 Porta Wheels can be attached for added mobility. Ball-bearing wheel assemblies with rubber tires are predrilled for quick attachment to frame of Porta-Screen®.

PSA-312 Porta Cover bolts to the top flange to enclose the sample chamber. It has a latch, and is hinged to open for introduction of samples.

PSA-367 Porta Sample Pan is helpful in emptying and cleaning trays and in weighing operations. This chute-end pan fits inverted trays and holds entire samples for cumulative weighing. Handling is easy with the top swing-away handle and end handle grip. **Product Dimensions:** 17x30x4in (432x762x102mm), WxLxD.

PSA-356 Porta-Screen® Tray Rack organizes up to eight Porta-Screen trays for storage and to protect frames and wire cloth from possible damage. Sturdy painted steel sections can be bolted together for stacking. Assembly required. **Product Dimensions:** 18.9x17.4x30.2in (480x442x767mm) WxDxH.

Gilson Porta-Screen®	
Gilson Porta-Screen®, 5 Trays + Pan, 115V/60Hz	PS-3
230V/50Hz	PS-3F
Gilson Porta-Screen®, 7 Trays + Pan, 115V/60Hz	PS-4
230V/50Hz	PS-4F
Accessories	
Porta Wheels	PSA-114
Porta Cover	PSA-312
Porta Sample Pan	PSA-367
Porta-Screen® Tray Rack	PSA-356

Testing Screen & Test-Master® Trays

Porta-Screen® Trays

ASTM SCREEN TRAYS
ASTM E11, E323

ASTM Screen Trays for Gilson Testing Screen, Test-Master®, and Porta-Screen® units have stainless steel cloth and meet relevant wire cloth specifications of ASTM E11. Non-ASTM sizes of 1/8in and 1/16in are available as TSA-101 and TSA-126A or PSA-301 and PSA-326A for Porta-Screen®.

Testing Screen and Test-Master Trays with No.16 (1.18mm) and finer wire cloth have metal ribs installed to support mesh. No.4 stainless steel backing cloth reinforcement is included in Testing Screen Trays with No. 230 and finer cloth, and may be added to other trays with or without support ribs. Backing Cloth is exclusively for use as reinforcement, and features flat-rolled surfaces to prevent abrasion of finer cloth. Porta-Screen trays with cloth from No.16 to No.100 use metal support ribs, and No.4 stainless steel backing cloth is included on these trays with mesh from No.100 to No.400 opening sizes.

Blank trays (with no wire cloth) for Testing Screen and Test-Master models are available as TSA-136 to accept No.4 and coarser mesh, and TSA-137 for cloth No.5 and finer. For Porta-Screen models, order PSA-336 Blank Tray. Round Hole Punched-Plate Sizes for Testing Screen and Test-Master machines are punched openings in steel plate as used for coal testing and other special materials, and meet ASTM D4749 and E323. Verification services to ASTM E11 Inspection or Calibration Grades are available for Screen Trays. For details, see listing for Test Sieve Verification Services.

technote

Wire cloth in sizes 4.25in and larger or 112mm and larger is welded rather than woven, so does not strictly meet ASTM E11 or ISO 656/3310-1specifications.

ASTM E11 Screen Trays

Screen Designation		Testing Screen & Test-Master®		Porta-Screen	
Alternate	Standard	Full Tray	Cloth Only	Full Tray	Cloth Only
-	125.0mm	TSA-99 5"	TSA-124 5"	n/a	n/a
-	106.0mm	TSA-110 4.24"	TSA-132 4.24"	n/a	n/a
-	100.0mm	TSA-100 4"	TSA-125 4"	n/a	n/a
3-1/2in	90.0mm	TSA-100 3-1/2"	TSA-125 3-1/2"	n/a	n/a
3in	75.0mm	TSA-100 3"	TSA-125 3"	Inquire	Inquire
2-1/2in	63.0mm	TSA-100 2-1/2"	TSA-125 2-1/2"	Inquire	Inquire
2.12in	53.0mm	TSA-110 2.12"	TSA-132 2.12"	Inquire	Inquire
2in	50.0mm	TSA-100 2"	TSA-125 2"	PSA-300 2"	PSA-325 2"
1-3/4in	45.0mm	TSA-100 1-3/4"	TSA-125 1-3/4"	PSA-300 1-3/4"	PSA-325 1-3/4"
1-1/2in	37.5mm	TSA-100 1-1/2"	TSA-125 1-1/2"	PSA-300 1-1/2"	PSA-325 1-1/2"
1-1/4in	31.5mm	TSA-100 1-1/4"	TSA-125 1-1/4"	PSA-300 1-1/4"	PSA-325 1-1/4"
1.06in	26.5mm	TSA-110 1.06"	TSA-132 1.06"	PSA-299 1.06"	PSA-324 1.06"
1in	25.0mm	TSA-100 1"	TSA-125 1"	PSA-300 1"	PSA-325 1"
7/8in	22.4mm	TSA-100 7/8"	TSA-125 7/8"	PSA-300 7/8"	PSA-325 7/8"
3/4in	19.0mm	TSA-100 3/4"	TSA-125 3/4"	PSA-300 3/4"	PSA-325 3/4"
5/8in	16.0mm	TSA-100 5/8"	TSA-125 5/8"	PSA-300 5/8"	PSA-325 5/8"
.530in	13.2mm	TSA-110 .530"	TSA-132 .530"	PSA-299 .530"	PSA-324 .530"
1/2in	12.5mm	TSA-100 1/2"	TSA-125 1/2"	PSA-300 1/2"	PSA-325 1/2"
7/16in	11.2mm	TSA-100 7/16"	TSA-125 7/16"	PSA-300 7/16"	PSA-325 7/16"
3/8in	9.5mm	TSA-100 3/8"	TSA-125 3/8"	PSA-300 3/8"	PSA-325 3/8"
5/16in	8.0mm	TSA-100 5/16"	TSA-125 5/16"	PSA-300 5/16"	PSA-325 5/16"
.265in	6.7mm	TSA-110 .265"	TSA-132 .265"	PSA-299 .265"	PSA-324 .265"
1/4in	6.3mm	TSA-100 1/4"	TSA-125 1/4"	PSA-300 1/4"	PSA-325 1/4"
No.3-1/2	5.6mm	TSA-110 #3-1/2	TSA-132 #3-1/2	PSA-299 #3-1/2	PSA-324 #3-1/2
No.4	4.75mm	TSA-100 #4	TSA-125 #4	PSA-300 #4	PSA-325 #4
No.5	4.00mm	TSA-101 #5	TSA-126A #5	PSA-301 #5	PSA-326A #5
No.6	3.35mm	TSA-101 #6	TSA-126A #6	PSA-301 #6	PSA-326A #6
No.7	2.80mm	TSA-101 #7	TSA-126A #7	PSA-301 #7	PSA-326A #7
No.8	2.36mm	TSA-101 #8	TSA-126A #8	PSA-301 #8	PSA-326A #8
No.10	2.00mm	TSA-101 #10	TSA-126A #10	PSA-301 #10	PSA-326A #10
No.12	1.70mm	TSA-101 #12	TSA-126A #12	PSA-301 #12	PSA-326A #12
No.14	1.40mm	TSA-101 #14	TSA-126A #14	PSA-301 #14	PSA-326A #14
No.16	1.18mm	TSA-102 #16	TSA-126B #16	PSA-302 #16	PSA-326B #16
No.18	1.00mm	TSA-102 #18	TSA-126B #18	PSA-302 #18	PSA-326B #18
No.20	850µm	TSA-102 #20	TSA-126B #20	PSA-302 #20	PSA-326B #20
No.25	710µm	TSA-102 #25	TSA-126B #25	PSA-302 #25	PSA-326B #25
No.30	600µm	TSA-102 #30	TSA-126B #30	PSA-302 #30	PSA-326B #30
No.35	500µm	TSA-102 #35	TSA-126B #35	PSA-302 #35	PSA-326B #35
No.40	425µm	TSA-102 #40	TSA-126B #40	PSA-302 #40	PSA-326B #40
No.45	355µm	TSA-102 #45	TSA-126B #45	PSA-302 #45	PSA-326B #45
No.50	300µm	TSA-102 #50	TSA-126B #50	PSA-302 #50	PSA-326B #50
No.60	250µm	TSA-102 #60	TSA-126B #60	PSA-302 #60	PSA-326B #60
No.70	212µm	TSA-102 #70	TSA-126B #70	PSA-302 #70	PSA-326B #70
No.80	180µm	TSA-102 #80	TSA-126B #80	PSA-302 #80	PSA-326B #80
No.100	150µm	TSA-102 #100	TSA-126B #100	PSA-302 #100	PSA-326B #100
No.120	125µm	TSA-103 #120	TSA-140 #120	PSA-303 #120	PSA-328 #120
No.140	106µm	TSA-103 #140	TSA-140 #140	PSA-303 #140	PSA-328 #140
No.170	90µm	TSA-103 #170	TSA-140 #170	PSA-303 #170	PSA-328 #170
No.200	75µm	TSA-103 #200	TSA-140 #200	PSA-303 #200	PSA-328 #200
No.230	63µm	TSA-103 #230	TSA-140 #230	PSA-303 #230	PSA-328 #230
No.270	53µm	TSA-103 #270	TSA-140 #270	PSA-303 #270	PSA-328 #270
No.325	45µm	TSA-103 #325	TSA-140 #325	PSA-303 #325	PSA-328 #325
No.400	38µm	TSA-103 #400	TSA-140 #400	PSA-303 #400	PSA-328 #400
No.4 Backing Cloth		-	TSA-135	-	PSA-335
Blank Tray, No.4 & Coarser		TSA-136	-	PSA-336	-
Blank Tray, No.5 & Finer		TSA-137	-	PSA-336	-
Dust Pan		TSA-112	-	PSA-310	-

ASTM E323 Round-Hole Plate Trays

Screen Designation		Testing Screen & Test-Master®	
Alternate	Standard	Full Tray	Plate Only
4.0in	101.6mm	TSA-115 4"	TSA-130 4"
3.5in	88.9mm	TSA-115 3-1/2"	TSA-130 3-1/2"
3.0in	76.2mm	TSA-115 3"	TSA-130 3"
2.5in	63.5mm	TSA-115 2-1/2"	TSA-130 2-1/2"
2.25in	57.2mm	TSA-115 2-1/4"	TSA-130 2-1/4"
2.0in	50.8mm	TSA-115 2"	TSA-130 2"
1.75in	44.5mm	TSA-115 1-3/4"	TSA-130 1-3/4"
1.5in	38.1mm	TSA-115 1-1/2"	TSA-130 1-1/2"
1.375in	34.9mm	TSA-115 1-3/8"	TSA-130 1-3/8"
1.25in	31.8mm	TSA-115 1-1/4"	TSA-130 1-1/4"
1.0in	25.4mm	TSA-115 1"	TSA-130 1"
.875in	22.2mm	TSA-115 7/8"	TSA-130 7/8"
.75in	19.1mm	TSA-115 3/4"	TSA-130 3/4"
.625in	15.9mm	TSA-115 5/8"	TSA-130 5/8"
.5in	12.7mm	TSA-115 1-2"	TSA-130 1-2"
.375in	9.5mm	TSA-115 3/8"	TSA-130 3/8"
.312in	8.0mm	TSA-115 5/16"	TSA-130 5/16"
.25in	6.4mm	TSA-115 1/4"	TSA-130 1/4"
.187in	4.75mm	TSA-115 #4	TSA-130 #4
.125in	3.2mm	TSA-115 1/8"	TSA-130 1/8"

Find Estimated Ship Weights for all our products in the Ship Weight Index

ISO SCREEN TRAYS
ISO 565, 3310-1

ISO Screen Trays for Gilson Testing Screen, Test-Master®, and Porta-Screen® units are fitted with ISO series stainless steel screen cloth.

Testing Screen and Test-Master Trays with cloth 1.18mm and finer have metal support ribs under the mesh. No.4 stainless steel backing cloth reinforces Testing Screen Trays with cloth openings of 63µm and finer, and can be added to other trays with or without support ribs as an option. The specially built Backing Cloth features flat-rolled surfaces to prevent the abrasion of fine mesh. Porta-Screen trays with 1.18mm to 150µm openings use metal support ribs, and No.4 stainless steel backing cloth is included on these trays with mesh from 150µm to 38µm opening sizes. **Product Dimensions for Testing Screen and Test-Master® cloth only:** 16x24in (406x609). **Product Dimensions for Porta-Screen® cloth only:** 15x15in (381x381mm).

Blank trays (with no cloth) for Testing Screen and Test-Master models are available as TSA-136 for 4.75mm and coarser mesh, and TSA-137 for 4.00mm and finer. For Porta-Screen models, order PSA-336 Blank Tray.

helpfulhint

Gilson Screen Trays can be verified to ASTM E11 or ISO 565 and 3310-1 Inspection or Calibration grades, just like our Gilson Verified Test Sieves.

- Inspection Screen Tray Verification, ASTM E11 GV-61
- Calibration Screen Tray Verification, ASTM E11 GV-66
- Inspection Screen Tray Verification, ISO 565 and 3310-1 GV-64
- Calibration Screen Tray Verification, ISO 565 and 3310-1 GV-67

See our separate listing for Test Sieve and Screen Tray Verification and Services.

See Gilson Test Sieves Reference Page for ASTM/ISO equivalent sizes.

technote

Wire cloth in sizes 4.25in and larger or 112mm and larger is welded rather than woven, so does not strictly meet ASTM E11 or ISO 656/3310-1specifications.

ISO Screen Trays

Screen Designation	Testing Screen & Test-Master®		Porta-Screen®	
	Full Tray	Cloth Only	Full Tray	Cloth Only
125mm	TSA-103 125M	TSA-140 125M	-	-
106mm	TSA-100 106M	TSA-125 106M	-	-
100mm	TSA-100 100M	TSA-125 100M	-	-
90.0mm	TSA-100 90M	TSA-125 90M	-	-
75.0mm	TSA-100 75M	TSA-125 75M	-	-
63.0mm	TSA-100 63M	TSA-125 63M	Inquire	Inquire
56.0mm	TSA-100 56M	TSA-125 56M	Inquire	Inquire
53.0mm	TSA-100 53M	TSA-125 53M	Inquire	Inquire
50.0mm	TSA-100 50M	TSA-125 50M	PSA-300 50M	PSA-325 50M
45.0mm	TSA-100 45M	TSA-125 45M	PSA-300 45M	PSA-325 45M
40.0mm	TSA-100 40M	TSA-125 40M	PSA-300 40M	PSA-325 40M
37.5mm	TSA-100 37.5M	TSA-125 37.5M	PSA-300 37.5M	PSA-325 37.5M
35.5mm	TSA-100 35.5M	TSA-125 35.5M	PSA-300 35.5M	PSA-325 35.5M
31.5mm	TSA-100 31.5M	TSA-125 31.5M	PSA-300 31.5M	PSA-325 31.5M
28.0mm	TSA-100 28M	TSA-125 28M	PSA-300 28M	PSA-325 28M
26.5mm	TSA-100 26.5M	TSA-125 26.5M	PSA-300 26.5M	PSA-325 26.5M
25.0mm	TSA-100 25M	TSA-125 25M	PSA-300 25M	PSA-325 25M
22.4mm	TSA-100 22.4M	TSA-125 22.4M	PSA-300 22.4M	PSA-325 22.4M
20.0mm	TSA-100 20M	TSA-125 20M	PSA-300 20M	PSA-325 20M
19.0mm	TSA-100 19M	TSA-125 19M	PSA-300 19M	PSA-325 19M
18.0mm	TSA-100 18M	TSA-125 18M	PSA-300 18M	PSA-325 18M
16.0mm	TSA-100 16M	TSA-125 16M	PSA-300 16M	PSA-325 16M
14.0mm	TSA-100 14M	TSA-125 14M	PSA-300 14M	PSA-325 14M
13.2mm	TSA-100 13.2M	TSA-125 13.2M	PSA-300 13.2M	PSA-325 13.2M
12.5mm	TSA-100 12.5M	TSA-132 12.5M	PSA-300 12.5M	PSA-325 12.5M
11.2mm	TSA-100 11.2M	TSA-125 11.2M	PSA-300 11.2M	PSA-325 11.2M
10.0mm	TSA-100 10M	TSA-125 10M	PSA-300 10M	PSA-325 10M
9.5mm	TSA-100 9.5M	TSA-125 9.5M	PSA-300 9.5M	PSA-325 9.5M
9.0mm	TSA-100 9M	TSA-125 9M	PSA-300 9M	PSA-325 9M
8.0mm	TSA-100 8M	TSA-125 8M	PSA-300 8M	PSA-325 8M
7.1mm	TSA-100 7.1M	TSA-125 7.1M	PSA-300 7.1M	PSA-325 7.1M
6.7mm	TSA-100 6.7M	TSA-125 6.7M	PSA-300 6.7M	PSA-325 6.7M
6.3mm	TSA-100 6.3M	TSA-125 6.3M	PSA-300 6.3M	PSA-325 6.3M
5.6mm	TSA-100 5.6M	TSA-125 5.6M	PSA-300 5.6M	PSA-325 5.6M
5.0mm	TSA-100 5M	TSA-125 5M	PSA-300 5M	PSA-325 5M
4.75mm	TSA-100 4.75M	TSA-125 4.75M	PSA-300 4.75M	PSA-325 4.75M
4.50mm	TSA-100 4.5M	TSA-125 4.5M	PSA-300 4.5M	PSA-325 4.5M
4.00mm	TSA-101 4M	TSA-126A 4M	PSA-301 4M	PSA-326A 4M
3.55mm	TSA-101 3.55M	TSA-126A 3.55M	PSA-301 3.55M	PSA-326A 3.55M
3.35mm	TSA-101 3.35M	TSA-126A 3.35M	PSA-301 3.35M	PSA-326A 3.35M
3.15mm	TSA-101 3.15M	TSA-126A 3.15M	PSA-301 3.15M	PSA-326A 3.15M
2.80mm	TSA-101 2.8M	TSA-126A 2.8M	PSA-301 2.8M	PSA-326A 2.8M
2.50mm	TSA-101 2.5M	TSA-126A 2.5M	PSA-301 2.5M	PSA-326A 2.5M
2.36mm	TSA-101 2.36M	TSA-126A 2.36M	PSA-301 2.36M	PSA-326A 2.36M
2.00mm	TSA-101 2M	TSA-126A 2M	PSA-301 2M	PSA-326A 2M
1.80mm	TSA-101 1.8M	TSA-126A 1.8M	PSA-301 1.8M	PSA-326A 1.8M
1.70mm	TSA-101 1.7M	TSA-126A 1.7M	PSA-301 1.7M	PSA-326A 1.7M
1.60mm	TSA-101 1.6M	TSA-126A 1.6M	PSA-301 1.6M	PSA-326A 1.6M
1.40mm	TSA-101 1.4M	TSA-126A 1.4M	PSA-301 1.4M	PSA-326A 1.4M
1.25mm	TSA-101 1.25M	TSA-126A 1.25M	PSA-301 1.25M	PSA-326A 1.25M
1.18mm	TSA-102 1.18M	TSA-126B 1.18M	PSA-302 1.18M	PSA-326B 1.18M
1.12mm	TSA-102 1.12M	TSA-126B 1.12M	PSA-302 1.12M	PSA-326B 1.12M
1.00mm	TSA-102 1M	TSA-126B 1M	PSA-302 1M	PSA-326B 1M
900µm	TSA-102 900U	TSA-126B 900U	PSA-302 900U	PSA-326B 900U
850µm	TSA-102 850U	TSA-126B 850U	PSA-302 850U	PSA-326B 850U
800µm	TSA-102 800U	TSA-126B 800U	PSA-302 800U	PSA-326B 800U
710µm	TSA-102 710U	TSA-126B 710U	PSA-302 710U	PSA-326B 710U
630µm	TSA-102 630U	TSA-126B 630U	PSA-302 630U	PSA-326B 630U
600µm	TSA-102 600U	TSA-126B 600U	PSA-302 600U	PSA-326B 600U
560µm	TSA-102 560U	TSA-126B 560U	PSA-302 560U	PSA-326B 560U
500µm	TSA-102 500U	TSA-126B 500U	PSA-302 500U	PSA-326B 500U
450µm	TSA-102 450U	TSA-126B 450U	PSA-302 450U	PSA-326B 450U
425µm	TSA-102 425U	TSA-126B 425U	PSA-302 425U	PSA-326B 425U
400µm	TSA-102 400U	TSA-126B 400U	PSA-302 400U	PSA-326B 400U
355µm	TSA-102 355U	TSA-126B 355U	PSA-302 355U	PSA-326B 355U
315µm	TSA-102 315U	TSA-126B 315U	PSA-302 315U	PSA-326B 315U
300µm	TSA-102 300U	TSA-126B 300U	PSA-302 300U	PSA-326B 300U
280µm	TSA-102 280U	TSA-126B 280U	PSA-302 280U	PSA-326B 280U
250µm	TSA-102 250U	TSA-126B 250U	PSA-302 250U	PSA-326B 250U
224µm	TSA-102 224U	TSA-126B 224U	PSA-302 224U	PSA-326B 224U
212µm	TSA-102 212U	TSA-126B 212U	PSA-302 212U	PSA-326B 212U
200µm	TSA-102 200U	TSA-126B 200U	PSA-302 200U	PSA-326B 200U
180µm	TSA-102 180U	TSA-126B 180U	PSA-302 180U	PSA-326B 180U
160µm	TSA-102 160U	TSA-126B 160U	PSA-302 160U	PSA-326B 160U
150µm	TSA-102 150U	TSA-126B 150U	PSA-302 150U	PSA-326B 150U
140µm	TSA-102 140U	TSA-126B 140U	PSA-302 140U	PSA-326B 140U
125µm	TSA-103 125U	TSA-140 125U	PSA-303 125U	PSA-328 125U
112µm	TSA-103 112U	TSA-140 112U	PSA-303 112U	PSA-328 112U
106µm	TSA-103 106U	TSA-140 106U	PSA-303 106U	PSA-328 106U
100µm	TSA-103 100U	TSA-140 100U	PSA-303 100U	PSA-328 100U
90µm	TSA-103 90U	TSA-140 90U	PSA-303 90U	PSA-328 90U
80µm	TSA-103 80U	TSA-140 80U	PSA-303 80U	PSA-328 80U
75µm	TSA-103 75U	TSA-140 75U	PSA-303 75U	PSA-328 75U
71µm	TSA-103 71U	TSA-140 71U	PSA-303 71U	PSA-328 71U
63µm	TSA-103 63U	TSA-140 63U	PSA-303 63U	PSA-328 63U
56µm	TSA-103 56U	TSA-140 56U	PSA-303 56U	PSA-328 56U
53µm	TSA-103 53U	TSA-140 53U	PSA-303 53U	PSA-328 53U
50µm	TSA-103 50U	TSA-140 50U	PSA-303 50U	PSA-328 50U
45µm	TSA-103 45U	TSA-140 45U	PSA-303 45U	PSA-328 45U
40µm	TSA-103 40U	TSA-140 40U	PSA-303 40U	PSA-328 40U
38µm	TSA-103 38U	TSA-140 38U	PSA-303 38U	PSA-328 38U

TSA-157

Testing Screen & Test-Master® Accessories

Description	Model
Low-Amplitude Drive Shaft is a factory-installed option often used in conjunction with the Speed Variation Accessory for gentle separations of fragile, sensitive, or lightweight materials. The special drive shaft has a shorter stroke than the original design. For Testing Screen or Continuous-Flow Screen models order TSA-200, and for Test-Master® order TSA-201.	TSA-200 TSA-201
Door Enclosure is a lightweight, easily removable door panel for TS-1 and TS-2 Testing Screens, designed to minimize dust and noise. Sturdy fiberboard door has a full-width hinge and sound-deadening liner to cover the top and front openings. It is held in place with permanent magnets. Specify Testing Screen serial number when ordering to insure proper fit.	TSA-157
Sound Enclosure is a sturdy, painted-steel cabinet lined with 1in (25.4mm) thick sound attenuating foam. The enclosure is designed for use with Testing Screen and Test-Master® units, but can also be used with Porta-Screen and other laboratory equipment. Full-width doors and top are hinged for easy access to equipment. When used with TS-1 or TS-2 Testing Screens, use of the TSA-157 Door Enclosure is recommended. **Outside Product Dimensions:** 36.5x38.5x57in (927x978x1,448mm), WxDxH.	TSA-180
Clean-N-Weigh Accessory provides a fast, convenient method of cleaning and collecting contents of Testing Screen, Test-Master® or Porta-Screen screen trays for weighing of separated fractions. Loaded screen trays are inverted and cleaned on top of the unit and specimen is collected in the included TSA-162 Chute-End Handling Pan below. The pan can also be positioned on an electronic balance for instant display or data collection of cumulative weights. Sturdy, painted-steel construction, adjustable shelf and leveling feet. TSA-171 Coarse Screen Tray Brush is included. **Product Dimensions:** 30.5x19.5x30.5in (775x495x775mm), WxDxH.	TSA-167

TSA-180 shown with TS-1 and Screen Trays

TSA-167 shown with screen tray

CLEAN-N-WEIGH ACCESSORY

Step 1: Place the Chute-End Handling Pan under the hopper of the Clean-N-Weigh, then invert a Screen Tray on the hopper support bars.

Step 2: Brush all particles from the Screen Tray through the hopper.

Step 3: Weigh the sample fraction in either the Chute-End Handling Pan or separate container.

Note: A high-capacity electronic balance can be positioned under the Handling Pan for immediate display of accumulated fraction weights or to transfer data to user's PC.

TSA-154R

TSA-169R

TSA-155

Testing Screen & Test-Master® Accessories

Description	Model
Speed Variation Accessory is factory-installed to allow precise control of vibration speed on Testing Screen and Test-Master® machines. Control of vibration speed assures reliable separations of materials with specific gravities different from common mineral aggregates or for materials finer than No.4 (4.75mm). The TSA-154R for Testing Screens and TSA-153 for Test-Master® both feature a remotely-mounted digital controller that displays stroke values between 240 and 635 strokes per minute. Please inquire for retrofitting existing units. **Controller Product Dimensions:** 6.1x4.3x7.5in (159x108x191mm), WxDxH.	
Speed Variation Accessory for Testing Screen	TSA-154R
Speed Variation Accessory for Test Master	TSA-153
Digital Lab Timer controls up to 1hp single phase motors or 20 amp loads. Bright 1/2in (12.6mm) LED display shows remaining time, stops machine at zero, then resets to programmed time for next use. Test times are set with tactile panel buttons. When stopped and restarted, countdown resumes from paused time. Timer operates in four modes with capacities of: 9,999 sec, 9,999 min, 99:59 min:sec or 99:59 hr/min. Electronics are mounted in a stainless steel case. The timer has a three-wire receptacle for timed devices operating on 115V/60Hz power. TSA-169RF has two 6ft (3m) three-wire cords without plugs for connection to mains and machine. **Overall Product Dimensions:** 4.5x5x5.5in (114x127x140mm), WxDxH.	
Digital Lab Timer with 3-Wire Receptacle	TSA-169R
Digital Lab Timer with no Plugs	TSA-169RF
Hydraulic Clamping Conversion converts the threaded manual clamping of the TS-2 to the fast-acting hydraulic system of the TS-1. Time and effort for each test cycle are reduced and clamping pressure is automatically equalized between the two sides. For serial numbers lower than 13825 order TSA-155 and higher than 13825 order TSA-159. Kit includes pump, cylinders, rods, bearings and other necessary parts, along with a drilling template and instructions.	
Hydraulic Clamping Conversion Kit, S/N 13825 and Lower	TSA-155
Hydraulic Clamping Conversion Kit, S/N 13826 and Higher	TSA-159
Screen Tray Rack provides organized storage for up to seven screen trays while protecting tray flanges and wire cloth from possible damage. Enameled steel sections fit on top of or below most lab bench tops and can be bolted together for stacking. Assembly required. **Product Dimensions:** 20.3x27.7x23.1in (516x704x587mm), WxDxH	TSA-156
Special Dustpans are available to fit TS or TM models for collecting and handling fines. 3in (76mm) deep TSA-114 and 4in (100mm) deep TSA-112S pans have extra capacity for samples with high fines fractions. The two piece TSA-116 Stationary Dustpan with Adapter, designed for use with TM models only, has a flexible sleeve, providing a dust seal to the stationary pan below. Nuisance dust generated by fines separation is reduced. TSA-117 Inclined Chute pan allows fines to be drawn off continuously into an external pan or bag. TSA-117 can not be used with TM-3, TM-4, TM-5 or TM-6 models. The TSA-114 can be used in Testing Screen without losing a tray space. The Test-Master® will lose one tray space. Other trays will reduce maximum screen tray capacity of machines by one.	
3in Deep Dustpan	TSA-114
4in Deep Dustpan	TSA-112S
Two-Piece Stationary Dustpan	TSA-116
Inclined Chute Pan	TSA-117

TSA-156 shown with screen trays

TSA-112S

TSA-114

TSA-116

TSA-117

CF-1

SS-35 shown with cloth squares

CFA-100

CONTINUOUS-FLOW SCREEN

Gilson's CF-1 Continuous-Flow Screen is extremely versatile, ideal for the laboratory where many different separation jobs are encountered. For small-scale scalping, mass separation and continuous-feed production applications with coarse sized materials CF-1 does the job practically and efficiently.

The unit can be used with one or two screen trays with screening area approximately 16x24in (406x610mm) per tray. The trays are vibrated in inclined position, with incline angle adjustable in a range of 4°—10°, and speed is digitally controlled up to 650 cycles per minute. Inclined Screen Trays are available with stainless steel wire cloth in ASTM E11 sizes 4in to No.100, or may be specified with round openings, slotted openings, or other special wire cloth.

Discharge pans are provided in two styles, for either front or bottom discharge. The trays and pan are secured by clamp rods readily accessible on top of the unit. The CF-1 is powered by a 1/2hp, fan cooled, totally enclosed motor. **Screen Product Dimensions:** 34x22x28in (864x559x711mm), LxWxH. Length with trays is 41in (1041mm).

The vertical-throw action of the CF-1 is designed primarily for coarse materials (2in to No.4), but adjustable incline and frequency allow use with a wide range of materials. A special low amplitude drive shaft may also be specified to improve separations in sizes finer than No.4.

Continuous-flow screening is not recommended for testing applications. The versatile CF-1 may be adapted for some testing work by setting at lowest incline angle and replacing Inclined Screen Trays and pan with trays and pan Models TSA-100 to TSA-112 described elsewhere for use with the Model TS-1 Testing Screen. **Product Dimensions:** 26x34x31in (660x864x787mm), WxDxH.

ROCKER SCREEN SET

Set consists of a 12in square steel frame designed for interchangeable wire cloth and bottom pan. Stainless Steel Wire Cloth squares are held in place by two bolted side clamps with wing nuts. Order required squares separately in mesh sizes desired. When not in use, all squares can be clamped into the frame for carrying or storing. Frame and rocker bottom have handles for rocking and carrying. Frame height above cloth is 5in (13cm). Not recommended for use with sizes below No.20. **Product Dimensions:** 15x12x10in (39x31x25cm).

Rocker Screen Set	
Rocker Screen Set	SS-35
Accessories	
No.7 & Coarser Wire Cloth Squares	SSA-351
No.8—No.20 Wire Cloth Squares	SSA-355

Continuous-Flow Screen	
Continuous-Flow Screen, 110V/60Hz	CF-1
230V/50Hz	CF-1F
Accessories	
Inclined Screen Tray 4in—No.4	CFA-100
Inclined Screen Tray No.5—No.14	CFA-101
Inclined Screen Tray No.16—No.100	CFA-102
Discharge Pan Inclined (for front discharge)	CFA-112
Discharge Pan Chute (for bottom discharge)	CFA-113
Replacement Cloth only 4in—No.4	TSA-125
Replacement Cloth only No.5—No.14	TSA-126A
Replacement Cloth only No.16—No.100	TSA-126B
Special Low Amplitude Drive Shaft Option	TSA-200

Find Estimated Ship Weights for all our products in the Ship Weight Index

GILSO-MATIC® SCREENING ASSEMBLIES

- **Automated in-plant quality control.**
- **Research and pilot plant production.**
- **Samples up to 10.5ft³ (0.5m³).**
- **Particle size to 4in (102mm).**

Effective quality control of coarse aggregate production requires testing large-volume samples. Gilso-Matic® Screening Assemblies equipped with Hopper/Feeders can test total sample volumes up to 10.5ft³ (0.3m³) (152mm), in batch sizes from 1—3ft³ (0.03—0.08m³). Operating principles are similar to our proven Testing Screen and Test Master laboratory models. The mechanism of the screening assembly is internally counter-balanced for smooth operation and to minimize transfer of vibration. Capacities are considerably greater and automated material handling features have been added. These are powerful, reliable units designed for integration into an automated, total quality control system.

For greatest accuracy, these large samples are screened in smaller batches, and weights are added together for total fractions. The 18ft³ (0.5m³) Hopper/Feeder assembly can dispense samples to the Gilso-Matic® in successive cycles of feeding, screening and discharge. After each batch is screened, air-actuated cylinders tilt the screen decks and fines collection pan to discharge fractions into individual collection chutes. Screen decks and pan remain mounted in the machine during testing and discharge operations, but can be unbolted and dismounted for cleaning and maintenance. At completion of the batch-testing cycles, contents of each chute can be discharged directly to a platform scale for cumulative analysis. Electronic scales, purchased separately, can be connected to a PC to allow automated data collection, analysis and reporting. Sized fractions can also be collected individually in pans and dollies and moved away for further processing.

Holding capacity of each collection chute is about 1.5ft³ (0.04m³) for a total capacity of 10.5ft³ (0.3m³) from the six screen decks and the fines collection pan. Each chute has an individually powered gate for controlled release of accumulated material. Replaceable ASTM E11 stainless steel wire cloth units are 24in (610mm) square and mounted in metal frames for clamping in screen decks. Six GXA-99 or GXA-100 wire cloth units are required and must be ordered separately.

Gilso-Matic® Screening Assemblies have 4in (102mm) topsize capacity. Inquire for models to process materials up to 6in (152mm). Minimum recommended material size is No.8 (2.36mm). The basic Gilso-Matic® unit is supplied with a 3hp electric motor, air-actuated cylinders, collection chutes, a control box and mounting rails. Models can also be ordered with 18ft³ (0.5m³) Hopper-Feeder included. Special factory-installed low-amplitude vibration and speed variation accessories are available to optimize performance and match characteristics of different materials.

Gilso-Matic® Screening Assemblies[1]	
Gilso-Matic®, 230 or 460V/60Hz	GX-4A2
230 or 460V/50Hz	GX-4A2F
Gilso-Matic® with 18ft³ Hopper, 230 or 460V/60Hz	GX-4A1
230 or 460V/50Hz	GX-4A1F
Accessories	
Wire Cloth Units, Larger than 4in	GXA-99
Wire Cloth Units, 4in—No.4	GXA-100
Wire Cloth Units, No.5—No.14	GXA-101
Speed Variation Accessory	GXA-153
Low-Amplitude Vibration Option	GXA-200

[1] Specify electrical configuration when ordering.

GX-4A1 (Safety guards removed)

An additional 9in (230mm) of vertical clearance is required for tilt-discharge operation. An additional 60in (1.52m) of horizontal clearance is required in front of the unit for maintenance and repair. The Gilso-Matic® requires a 230 or 460V, three phase electrical supply and a minimum air supply of 80psi (533kPa). **Product Dimensions:** 86x48x85in (2.18x1.22x2.16m), LxWxH. **Dimensions with Hopper-Feeder Assembly:** 107x48x106in (2.72x1.22x2.69m).

helpfulhint

Gilso-Matic® Screening Assemblies in combination with Split-O-Matic Splitters can be a major part of an in-plant quality control system for automated production monitoring. Automated sampling devices can sample directly from the production stream. Electronic scales and data collection software allows real-time analysis of output for on-the-spot changes.

Inquire for assistance developing a custom-designed system.

VIDEO ONLINE

SP-52 shown with SC-20

SP-50 shown with SPA-51

GILSON HEAVY-DUTY 1/16 SAMPLE REDUCER
ISO 13503-2-2006; API RP19C

The Heavy Duty 1/16 Sample Reducer by Gilson has up to four times more bulk sample capacity than traditional 1/16th sample reducer models. Suitable for any free-flowing granular material with particle sizes up to 0.5in (12.7mm), the SP-52 is especially useful in sample preparation and dividing of frac sand proppant materials for hydraulic fracturing operations. Final yield is a 1/16th representative specimen of the bulk sample in a single pass.

The Reducer quickly adjusts to either 45° or 60° dividing positions using a spring-loaded positive-locking knob. The fully-adjustable sliding gate of the large 1.0ft³ (28L) capacity hopper allows precise control of flow rate, or can be locked fully open for continuous flow-through of large samples. The fixed-height integral frame/floor stand is optimal for ergonomic loading and operation. A sturdy welded steel pan is included to collect the waste fraction, and the divided specimen can be collected in the optional SC-20 12qt Polyethylene Container with Lid, or in a container supplied by the user. An additional SPA-115 Steel Waste Pan can be ordered for greater efficiency in sample processing.

The Sample Reducer features sturdy painted-steel welded construction, and the flow table is designed to leave minimal sample residue behind after use. **Product Dimensions:** 22x28.5x41in (559x724x1041mm) WxDxH.

Gilson Heavy Duty 1/16 Sample Reducer	
Gilson Heavy Duty 1/16 Sample Reducer	SP-52
Accessories	
Additional Waste Pan	SPA-115
Polyethylene Container w/lid, 12qt	SC-20

1/16 SAMPLE REDUCER

The Sample Reducer cuts a representative 1/16 fraction from feed material by systematically rejecting segments of material flowing down the adjustable 45° or 60° cast aluminum incline. Adjustable 0.25ft³ (7.1L) hopper can be used batch-wise or locked in open position for pouring larger samples. Use for up to 0.5in (12.7mm) particle sizes.

Reducer adjusts about 10in (254mm) vertically on removable legs. Main components are aluminum. **Product Dimensions:** 27x18x36in (686x457x914mm), WxDxH.

SP-50 is supplied without pans, but SPA-51 Pan Set can be ordered separately. The Pan Set includes heavy painted steel reject pan 22x13x11in (559x330x279mm), LxWxH and lightweight 12qt (11L) polyethylene sample container, 10in dia. x 11.5in H (254x292mm) with lid.

1/16 Sample Reducer	
1/16 Sample Reducer	SP-50
Accessories	
Pan Set	SPA-51
Polyethylene Container w/lid, 12qt	SC-20

VIDEO ONLINE

SP-1

VIDEO ONLINE

SP-0

SP-1 Close-Up

GILSON UNIVERSAL SPLITTERS
ASTM C702, C778; AASHTO T 27, T 248

- **Adjustable-width chutes.**
- **Lever-release hoppers.**
- **Five capacities for up to 5in topsize.**

Gilson's family of Universal Splitters features our exclusive adjustable chute system and lever-release hoppers, assuring top accuracy when reducing bulk materials. Each of these agile workhorses takes the place of two or more conventional splitters with just a few quick adjustments. Selecting the optimum chute width for each material yields accurate representative sample splits without bridging. The lever-release hoppers allow level placement of the bulk sample for even, consistent flow over the chutes as the gate is opened. The largest SP-0 and SP-1 models feature sample volume and particle size capacities not available anywhere else.

Universal Splitter chutes are formed by a series of aluminum bars pivoting on a rod through their lower ends. The operator arranges the precision-ground bars equally on alternate sides, creating V-shaped chutes of the desired width. Once set, the bars are drawn together by tightening wing nuts on threaded ends of the rod. Chutes for SP-1 and SP-2 are sloped at 45°. Other models have standard 60° chute slopes to improve material flow of lighter and finer materials, and to meet certain coal or coke testing specifications. All splitters supplied with two pans (four pans for SP-0). Additional pans are available for faster, more efficient processing.

SP-0 is built for large-volume bulk aggregate or raw coal samples. Each split is evenly distributed to four pans on each side. All four pans are included. The SPA-450 Lift Cart is recommended for handling fully loaded pans. **Product Dimensions:** 56x26x41in (1,422x660x1,041mm) WxDxH.

SP-1 is a rugged, large-capacity floor model for laboratory or field use with materials with particle sizes up to 2in (51mm). The convenient size and a wide range of available accessories make the SP-1 our most versatile splitter. The SPA-114 Fixed Chute Accessory converts the SP-1 into a SP-1C fixed-chute splitter with ten 2.25in wide chutes. The SPA-102 Chute Attachment replaces one pan to permit direct loading of material into a bag or container. PSA-114 Porta Wheels bolt easily to the splitter for added mobility. **Product Dimensions:** 29x19x39in (737x483x990mm) WxDxH.

SP-2 is compact and more durable than conventional portable splitters. Lightweight with ample hopper capacity for materials up to 1.5in (38mm), the SP-2 is convenient for use from floor or bench-top positions. This splitter provides accurate and representative samples for a wide range of materials. **Product Dimensions:** 22x14.5x20.5in (559x368x521mm), WxDxH.

SP-2.5 for sizes up to 1in (25mm) is widely used for fine aggregates, and is rugged enough for field or laboratory use. The frame is painted steel, and most contact parts are stainless steel except for the anodized aluminum chute bars. The SPA-109 Dust Enclosure Accessory installs easily and has hinged flaps for pan access that hold in open position. **Product Dimensions:** 15.5x12.5x17.5in (394x318x445mm), WxDxH.

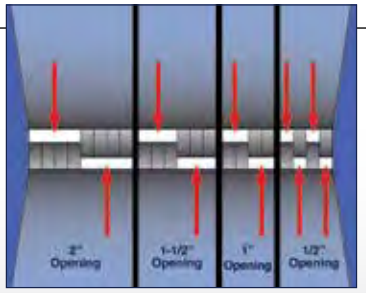
alsoavailable

Gilson Mini-Universal Splitters provide versatility and precision for materials 0.25in (6.4mm) and below.

GILSON UNIVERSAL SPLITTERS

Gilson's adjustable chute bars make the Universal Splitter Series the most versatile splitters available. All of these unique splitters have a row of precision-machined aluminum bars, easily positioned by the operator to direct material into one of two sample pans. Using the adjustable bars, chute opening size is quickly adjusted to the optimum width of 3 times the largest particle size. One splitter does the work of several!

Our proprietary gated hopper holds the entire sample in place, allowing proper level placement and even distribution prior to splitting. One pull of the lever releases the material to flow freely across the entire width of the chute openings, not just a portion. This method results in the most accurate and precise sample reduction possible using traditional splitters or rifflers.



SP-1 Chute bars can be positioned to create 0.5" to 4" chute openings.

Material released from the gated Universal Splitter Hopper flows evenly across the entire width of the chutes.

SP-2

VIDEO ONLINE

SP-2.5

technote

ASTM C702 requires the chute opening widths of mechanical splitters to be at least 50% larger than the maximum nominal particle size of the aggregate sample being divided. A minimum of eight openings for coarse aggregate, and twelve openings for fine aggregate samples is also specified. To assure accurate splits with best performance and minimal opportunities for "bridging", or blockages, Gilson recommends chute widths 2 to 3 times larger than maximum particle size.

Gilson Universal Splitters

Model	Recommended Maximum Particle Size in (mm)	Hopper Capacity ft³ (L)	Chute Bar Size in (mm)	Chute Slope
SP-0	4 (102)	3.5 (99.1)	1 (25)	60°
SP-1	2 (51)	1.0 (28.3)	0.5 (13)	45°
SP-2	1.5 (38)	0.55 (15.6)	0.5 (13)	45°
SP-2.5	1 (25)	0.28 (7.9)	0.25 (6)	60°

Accessories	
Lift Cart Accessory for SP-0	SPA-450
Fixed-Chute Accessory for SP-1	SPA-114
Chute Attachment for SP-1	SPA-102
Porta Wheels for SP-1	PSA-114
Enclosure Adapter Set for SP-1	SPA-7
Dust Enclosure Kit for SP-2.5	SPA-109
Dust Enclosure Kit for SP-3 and SP-33	SPA-302
SP-0 Sample Pan, Painted Steel	SPA-400
SP-1 Sample Pan, Painted Steel	SPA-100
SP-2 Sample Pan, Painted Steel	SPA-101
SP-2.5 Sample Pan, Stainless Steel	SPA-108

Universal Splitter Chute Width & Opening

Model	SP-2.5	SP-2	SP-1	SP-0
Hopper/Pans Capacity, ft³	0.28	0.55	1.0	3.5
(liters)	(7.9)	(15.6)	(28.3)	(99.1)
Chute Slope	60°	45°	45°	60°
Chute Bar Width, in	0.25	0.5	0.5	1
No. of Chute Bars	48	36	48	48
Chute Width Setting, in (mm)	**Number of Chutes**			
1/4 (6.4)	48	—	—	—
1/2 (12.7)	24	36	48	—
3/4 (19.1)	16	—	—	—
1 (25.4)	12	18	24	48
1-1/2 (38.1)	8	12	16	—
2 (51)	6	—	12	24
3 (76)	4	6	8	16
4 (102)	—	—	6	12
6 (152)	—	—	4	8
8 (203)	—	—	—	6
12 (305)	—	—	—	4

SP-1C

SP-12CA

GILSON FIXED-CHUTE SPLITTER
ASTM C702; AASHTO T 248; CALIFORNIA 201

The Fixed-Chute Splitter is based on our original SP-1 Universal Splitter design, featuring ten fixed-width chutes, each 2.25in (57.2mm) wide and a gated material hopper for equal sample distribution. The original Gilson-designed lever-release hopper with 1ft³ (28.3L) capacity assists in rapid and accurate splitting and mixing of granular materials up to 1.125in (28.6mm) topsize.

This steel frame, floor model splitter has a painted and baked finish. Two Collection Pans are included. Extra SPA-100 Sample Pans may be ordered for more efficient sample processing. The SP-1C uses many of the same accessories as the SP-1, the SPA-102 Chute Attachment replaces one pan to direct loading of material into a bag or container. PSA-114 Porta-Wheels bolt to the splitter for added mobility. SPA-7 converts this splitter into a totally enclosed sample splitter similar to the SP-10 for control of nuisance dust in the lab. SPA-114 fixed chute adapter set is available to convert an existing SP-1 Adjustable Chute Splitter to the SP-1C Fixed Chute model. **Product Dimensions:** 29x19x-39in (737x483x991mm).

Gilson Fixed-Chute Splitter	
Gilson Fixed-Chute Splitter	SP-1C
Accessories	
Sample Pan	SPA-100
Chute Attachment	SPA-102
Porta-Wheels, set of 2	PSA-114
Enclosure Adapter Set	SPA-7
Fixed-Chute Adapter for SP-1	SPA-114

GILSON CALIFORNIA SPLITTER
ASTM C702; AASHTO T 248; CalifORNIA 201

Designed by and constructed for the California Department of Transportation, the SP-12CA Splitter meets CalTrans 201 requirements for coarse aggregate splitters. Large capacity 1.9ft³ (53.8L) gate release hopper assures accuracy when mixing and dividing bulk aggregate into representative samples. Ten 2.25in (57.2mm) fixed chutes process particle sizes up to 1.125in (28.6mm). Sturdy, heavy-gauge steel frame with painted, baked finish is built for extended service life with heavy use. Swivel casters permit mobility and easy storage.

SP-12CA includes two 1.2ft³ (34L) capacity, welded steel sample pans. SP-12CG includes same size sample pans, but fabricated of light-weight aluminum. Reinforced pans have sturdy handles for convenient handling of heavy samples. Order extra Steel Sample Pans as SPA-120. SPA-122 lightweight aluminum pans are also available as replacements. **Product Dimensions:** 29x28x46in (737x711x1,169mm), WxDxH.

Gilson California Splitter	
Gilson California Splitter with Steel Pans	SP-12CA
Gilson California Splitter with Aluminum Pans	SP-12CG
Accessories	
Steel Sample Pan	SPA-120
Aluminum Sample Pan	SPA-122

SP-10

SP-6 Tilt-feeding Mechanism at loading position

VIDEO ONLINE

SP-6

GILSON TOTALLY-ENCLOSED SPLITTER
ASTM C702, C778; AASHTO T 248

Gilson's Totally-Enclosed Splitter can be loaded and operated through a complete splitting cycle without releasing dust into the room or losing sample material. Dust-tight hinged panels enclose the hopper and pans during operation and are easily opened at completion to retrieve divided sample material.

The SP-10 is an adaptation of the top-selling SP-1 Universal Splitter, but designed so that all in-lab sample handling operations are done inside the splitter. Samples in an SPA-100 pan are placed in a slot inside the top of the splitter through a hinged door. After closing the door, the pan is dumped into the hopper by external lever. When internal dust settles, the door may be opened momentarily to level the sample material in the hopper before using a second lever to release sample through the adjustable chutes and into two lower pans enclosed by spring-held covers. To continue splitting sample into smaller fractions, the bottom pan is switched with the feed pan, covers closed, and the process repeated until the desired sample fraction is obtained in the bottom pan. **Product Dimensions:** 33x21x51.3in (838x533x1303mm) WxDxH.

Gilson Totally-Enclosed Splitter	
Gilson Totally-Enclosed Splitter	SP-10
Accessories	
Sample Pan	SPA-100
Porta-Wheels, set of 2	PSA-114
Fixed-Chute Adapter	SPA-114

GILSON QUADRI-SPLITTER
ASTM C702, D346, D2013, E276, E389, E877

The Gilson Quadri-Splitter yields four equal samples of up to 0.4ft³ (11.3L) each for total sample capacity of 1.6ft³ (45.3L). Unit is totally enclosed including feed inlet and sample outlets. Fully enclosed construction controls nuisance dust and prevents moisture loss during operation. Gilson's unique tilt-feeding mechanism lifts and rotates the removable feed pan to the hopper opening using the feed lever. The pan seals to the hopper inlet as the material is dumped, preventing the release of dust into the room and avoiding sample loss. Sample pans seal to splitter body, yet easily slide out using pan handles. Body has hinge-mounted doors on both sides for 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.

The Quadri-Splitter can be used to divide any free-flowing material and is ideally suited to coal and coke since dust and moisture loss are minimized by fewer passes and less handling. Two passes yields a 1/16th split and three passes yields a 1/64th split each with a set of four representative samples.

The SP-6 Quadri-Splitter has stainless steel contact parts (chutes and pans); other parts fabricated from galvanized steel, spot welded, riveted, and painted for long life and durability. It includes four Sample Pans of 0.4ft³ (11.3L) and one Feed Pan of 0.7ft³ (19.8L). Both pans fit tilt mechanism and seal feed inlet after dumping. **Product Dimensions:** 24x34x55in (610x864x1,398mm), WxDxH.

Gilson Quadri-Splitter	
Gilson Quadri-Splitter	SP-6
Accessories	
Sample Pan	SPA-100
Feed Pan	SPA-111

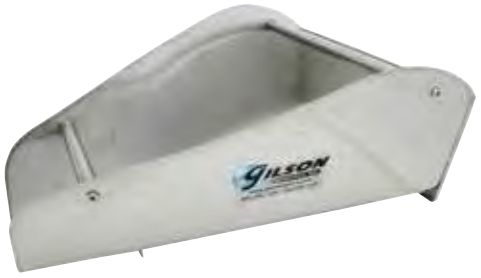
Find Estimated Ship Weights for all our products in the Ship Weight Index

VIDEO ONLINE

SP-55

SPA-22 shown with SPA-23 and SPA-24

SPA-21



HMA-68

GILSON QUARTERMASTER ASPHALT SAMPLE DIVIDER

ASTM D979; AASHTO R 47

- **Quickly and safely divides bulk asphalt and aggregate samples for testing.**
- **Rugged construction stands up to field use.**
- **Bucket-Liner sample bags streamline sample handling.**
- **Proven history of accurate performance.**

Gilson's patented SP-55 Quartermaster quickly and accurately divides the large bulk samples required in Superpave® specifications for quality control analysis. Hot-mix asphalt samples of 120lb (55kg) or more are easily reduced, ensuring representative samples for consistent laboratory results. The large hopper reduces handling of hot material during preparation of laboratory specimens. The Quartermaster has a proven history of significantly reducing bias in sample reduction.

Once a bulk hot-mix asphalt sample is loaded evenly into the hopper, the handle is released and the sample falls through the divider, and is distributed into the four included galvanized steel buckets. SPA-22 Bucket-Liner Sample Bags simplify collection and handling of divided specimens and eliminate cleaning of the sample buckets. One person can easily collect and secure samples. Fabric and thread of the sturdy cotton Bucket-Liner bags are temperature-rated to 400°F (204°C). Double loop Wire Ties and Wire Tie Twister allows bag openings to be quickly and securely closed. Only occasional clean-up is required to prevent buildup on the exposed splitting surfaces.

Rugged two-part steel construction stands up to field conditions and allows portability between jobsites. The SPA-21 Quick-Funnel Insert (purchased separately), drops into the top of the Quartermaster to significantly reduce hopper volume and allow accurate reduction of smaller samples. Four Galvanized Steel Sample Buckets and four Bucket-Liner Sample Bags are included. Additional buckets can be ordered to increase efficiency. Liner bags in quantities of 10, 100 or 1,000 are available. SPA-23 8in Double-Loop 16 gauge Wire Ties securely close bag openings when used with the SPA-24 Wire Twister. HMA-68 Material Handling Chute allows fast and easy loading of hopper. **Product Dimensions:** 14x17x48in (356x432x1,219mm), WxDxH.

Gilson Quartermaster Asphalt Sample Divider	
Gilson Quartermaster Asphalt Sample Divider	SP-55
Accessories	
Quick-Funnel Insert	SPA-21
Bucket-Liner Sample Bags, qty. of 10	SPA-22
Bucket-Liner Sample Bags, qty. of 100	SPA-22C
Bucket-Liner Sample Bags, qty. of 1,000	SPA-22K
8in Double-Loop Wire Ties, qty. of 50	SPA-23
Wire Tie Twister	SPA-24
Galvanized Steel Sample Buckets	MA-950
Material Handling Chute	HMA-68

VIDEO ONLINE

SP-3

SP-33

SP-306

SP-302

GILSON UNIVERSAL MINI-SPLITTERS
ASTM B215, C702; AASHTO T 248

The Mini-Splitters are the smallest of Gilson's exclusive Universal Splitter design, and are suited for powders and granular materials with top sizes less than 0.25in (6.4mm). The portable benchtop models are identical in size and design and can easily be positioned anywhere. Both feature 48 adjustable 0.125in (3mm) wide chute bars for maximum versatility and are built with stainless steel hoppers and frames. 60° chute angles insure fast, accurate splitting of powders and lightweight materials. The spring-loaded gate release hoppers allow proper placement of bulk sample and controlled, even release of material over the chutes for accurate, repeatable splits. Hopper capacity is 0.06ft³ (1.7L). Two sample pans are included for proper operation and additional pans are available for more efficient sample processing.

SP-3 Gilson Universal Mini-Splitter has stainless steel hopper and frame, with adjustable chute bars and sample pans fabricated from economical anodized aluminum. **Product Dimensions:** 9.5x8.5x13.5in (241x216x343mm), WxDxH.

SP-33 Gilson Universal All Stainless Steel Mini-Splitter is constructed of quality stainless steel throughout, including chute bars and sample pans. The 100% stainless steel construction enhances durability and reduces the risk of sample contamination. This model is a good choice for sensitive materials, food-grade samples, or abrasives. **Product Dimensions:** 9.5x8.5x13.5in (241x216x343mm), WxDxH.

The optional SPA-302 Dust Enclosure Kit controls nuisance dust during operation and prevents the loss of fines. The kit consists of two stainless steel panels that secure via spring attachment to either Mini-Splitter model. The panels slide up for easy access to the pans, and quickly detach when not in use.

Gilson Universal Mini-Splitters	
Gilson Universal Mini-Splitter	SP-3
Gilson Universal All Stainless Steel Mini-Splitter	SP-33
Accessories	
Sample Pan for SP-3, Aluminum	SPA-301
Dust Enclosure Kit	SPA-302
Sample Pan for SP-33, Stainless Steel	SPA-303

GILSON PRECISION SPLITTERS
ASTM B215, C702; AASHTO T 248

Gilson Precision Splitters quickly divide granular materials and fine powders. These riffle-type splitters feature precision fixed-width chutes and a gate-controlled hopper to produce greater accuracy. Completely constructed of heavy-gauge, type 304 stainless steel to avoid potential sample contamination, corrosion, and stand up to rugged daily use. The easy-flip gate hopper control allows the sample to be loaded completely and distributed evenly before opening. Side panels control dust, reducing the loss of fines during processing. The unit quickly and easily disassembles for cleaning, and all parts are autoclavable. Two 304 stainless steel sample pans are included. Additional sample pans can be ordered separately.

SP-300 Gilson Precision Splitter hopper capacity is 132in³ (2.2L) and the sixteen 0.5in (12.7mm) chutes have a discharge angle of 45°. Suitable top size is 4 to 5mm. **Product Dimensions:** 11.5x9x12in (292x228x305mm), WxDxH.

SP-302 Gilson Precision Splitter has a hopper capacity of 61in³ (1L), and the discharge angle from the sixteen 0.25in (6.3mm) fixed chutes is 45°. The SP-302 is suitable for materials finer than 2.2mm top size. **Product Dimensions:** 8.8x7.4x12in (223x188x305mm), WxDxH.

SP-304 Gilson Precision Splitter has a hopper capacity of 61in³ (1L), and the thirty 0.125in (3.2mm) fixed chutes have a discharge angle of 45°. Suitable for materials finer than 1mm top size. **Product Dimensions:** 8.8x7.4x12in (223x188x305mm), WxDxH.

SP-306 Gilson Precision Splitter is more compact for smaller samples of fine powders. Hopper capacity is 8.8in³ (0.14L). The thirty fixed chutes are 0.0625in (1.6mm) wide and have a 60° discharge angle. Suitable for materials up to 0.6mm top size. **Product Dimensions:** 5.3x5.3x7in (135x135x178mm), WxDxH.

Gilson Precision Splitters					
Model	Description	Chute Opening in (mm)	Number of Chutes	Hopper in³ (L)	Extra Pan
SP-300	Gilson Precision Splitter	0.5 (12.7)	16	132 (2.2)	SPA-129
SP-302	Gilson Precision Splitter	0.25 (6.4)	16	61 (1)	SPA-130
SP-304	Gilson Precision Splitter	0.125 (3.2)	30	61 (1)	SPA-130
SP-306	Gilson Precision Splitter	0.0625 (1.6)	30	8.8 (0.14)	SPA-132

Find Estimated Ship Weights for all our products in the Ship Weight Index

SP-171X

SP-177

SP-1015FX

SP-1070

MICRO & PRECISION SPLITTERS
ASTM B215, C702; AASHTO T 248

Micro Splitters are ruggedly constructed for long service life. The stainless steel feeder guides material directly past fixed-width chutes and into two sample pans. SP-171 chutes and pans are both made of hardened aluminum. The 0.125in (3.2mm) chutes are designed for materials with 1.0 to 1.5mm top size. Four standard pans are included, and have an extended back to prevent spillage. SPA-242 0.5L High-Volume Pans are available for handling larger samples volumes. Special SP-171X model features all stainless steel contact parts to avoid sample contamination and includes three stainless steel pans.

Precision Splitters are similar in design and quality to Micro Splitters, but feature larger capacities and gated hoppers that hold material until released. The gated hopper permits easy mixing and distribution of samples prior to splitting, and requires only the two included pans for processing. Frames and hoppers are stainless steel, while riffle plates and pans are hardened aluminum. Pans for SP-174 are stainless steel. Models with 0.25, 0.375, or 0.5in (6.4, 9.5, or 12.7mm) chute openings are offered.

SP-171 Product Dimensions: 4.25x2.25x6.5in (108x57x165mm) WxDxH.
SP-171X Product Dimensions: 4x2.25x6.5in (102x57x165mm), WxDxH.
SP-173 & 177 Product Dimensions: 11.5x11x12.5in (292x279x318mm), WxDxH.
SP-174 Product Dimensions: 20.5x11x12.75in (521x279x324mm), WxDxH.
SP-175 Product Dimensions: 12x11x12.5in (305x279x318mm), WxDxH.

Micro & Precision Splitters

Model	Description	Hopper Capacity in^3 (L)	No. of Chutes	Extra Pan
SP-171	0.125in Chute Microsplitter	-	14	SPA-241
		-		SPA-242
SP-171X	0.125in SS Chute Microsplitter	-	14	SPA-240X
SP-173	0.25in Chute Precision Splitter	160 (2.6)	32	SPA-244
SP-174	0.25in Chute Precision Splitter	325 (5.3)	64	SPA-245X
SP-175	0.375in Chute Precision Splitter	100 (2.6)	22	SPA-244
SP-177	0.5in Chute Precision Splitter	150 (2.5)	16	SPA-244

HOLMES ENCLOSED SAMPLE SPLITTERS
ASTM B215, C702, D346, D2013; AASHTO T 248

Enclosed splitters are suggested for samples of fine, dusty powders, or where moisture retention is important. Holmes splitters have 60° chute slopes, feed hopper-guide, and enclosure, as preferred for coal and coke applications to meet ASTM D2013 and D346.

Small Enclosed FX Series Splitters have twenty-four chutes, 0.375in (9.5mm), 0.5in (12mm) or 0.75in (19mm) wide, depending on model. SP-1017FX and SP-1018FX models have built-in hopper-guide to introduce sample evenly across chutes through an open vertical slot. Model SP-1015FX has no hopper-guide, and sample is poured directly into chutes. Riffle chutes, sample drawers, and hopper-guide are stainless steel.

Large Enclosed SP-1050, SP-1060 and SP-1070 Splitters are manufactured with fixed chute widths of 0.5in (12mm), 0.75in (19mm) or 1in (25mm), all with built-in hopper-guide. Lugs on drawer top-ends fit slotted brackets on hopper-guide for pour feeding. Models with stainless steel contact surfaces are designated with an "X" suffix on the model number. Other models have galvanized surfaces. Dolly accessory SPA-502 has four 2.25in (63mm) diameter casters on mounting base for mobility in the lab.

All enclosed splitters have enameled steel enclosure. Two sample drawers are included; extras are suggested for pouring to hopper-guide for repetitive splits.

Holmes Enclosed Sample Splitters

Model	Chute Width in (mm)	No.	Capacity ft^3 (L)	WxDxH, in	Extra Pan
SP-1015FX	0.375 (9.5)	24	0.24 (6.8)	11x15x22	SPA-151
SP-1017FX	0.5 (12.7)	24	0.36 (10.2)	15x15x22	SPA-171
SP-1018FX	0.75 (19.1)	24	0.48 (13.6)	21x15x22	SPA-181
SP-1060	0.5 (12.7)	28	1.40 (39.6)	17x31x34	SPA-501
SP-1070	0.75 (19.1)	18	1.40 (39.6)	17x31x34	SPA-501
SP-1050	1 (25.4)	14	1.40 (39.6)	17x31x34	SPA-501
SP-1060X	0.5 (12.7)	28	1.40 (39.6)	17x31x34	SPA-501X
SP-1070X	0.75 (19.1)	18	1.40 (39.6)	17x31x34	SPA-501X
SP-1050X	1 (25.4)	14	1.40 (39.6)	17x31x34	SPA-501X
Accessories					
Dolly					SPA-502

SP-230

SPA-260

SPA-261

SPA-262

SPA-267

SPA-268

SPA-264

GILSON SPINNING RIFFLER
ASTM B215

Representative sample splitting by spinning riffler is the method of choice for sampling accuracy and reliability of the highest order with dry materials. Gilson's expertise in sampling and analyses of powders and granular material is utilized to produce this next-generation Spinning Riffler. The SP-230 features a custom designed touch-screen controller/display, minimal moving parts and an outer case designed for easy clean-up and maintenance. Operation is quieter and safer thanks to an isolated motor and vibrator, automatic belt-drive system and sample vessel enclosure. Both rotation speed and vibration level are displayed on and precisely controlled from the touch screen.

A built-in vibratory feeder provides a constant flow of material from a stainless steel hopper with 1L capacity. A durable urethane-based resin dividing head sharply separates flowing material into as many as sixteen 60ml glass sample vessels. Standard Tube vessels may be used, or vials with screw-top caps in different sizes of amber or clear glass are available. The vials enable freshly divided samples to be capped and stored immediately, with minimal handling and little chance for contamination. Either type of vessel is contained within the drum during operation to minimize exposure of moving parts and contain spillage. The number of final fractions can be controlled by simply leaving tubes or vials out of the drum. Excess material will then flow directly into the drum. Rotation speed is continuously variable between 0—20rpm and the vibration amplitude of the feeder is variable as well. All adjustments are controlled and displayed on the touch screen. The unique, digitally controlled stepper motor turns a toothed belt and cogged drive wheel for accurate speed control with no slippage. A digitally controlled variable amplitude feeder ensures a constant and steady feed rate. A "sleep" mode conserves power when the unit is not operating. Main power supply voltage is automatically sensed, allowing any AC input from 85—264V, and 47—63Hz single phase. A power cord is supplied for use with standard North-American outlet configurations. Power cords for other configurations are readily available locally.

The SP-230 includes a sixteen-port Dividing Head, a set of sixteen Standard Tube Sample Vessels, a Sample Drum to contain the vessels and a Holder Plate for positioning the vessels in the drum. All are listed below as separate accessories for more efficient sample processing or as replacements. Threaded Glass Sample Vials with plastic cap are available by the dozen. **Product Dimensions:** 13x20.5x23in (330x521x584mm), WxDxH.

technote

The Gilson Spinning Riffler virtually eliminates operator error and bias associated with other types of sample dividing. The accuracy of spin riffling has been demonstrated in the 1968 M.Sc. thesis of A. A. Khan, Bradford University. Sampling tests based on a 60/40% mixture of coarse and fine sands produced the following comparisons:

COMPARISON OF SAMPLE DIVIDING METHODS

Method	Std. Dev. of Samples (%) σ	Var. (P_n)	Est. Max. Sample Error (%) E
Cone & Quartering	6.81	46.4	22.7
Scoop Sampling	5.14	26.4	17.1
Table Sampling	2.09	4.37	7.0
Chute Riffling	1.01	1.02	3.4
Spinning Riffling	0.125	0.016	0.42
Random Variation	0.076	0.0058	0.25

Gilson Spinning Riffler	
Gilson Spinning Riffler, 85-264V, 47-63Hz	SP-230
Accessories	
Standard Test Tube, qty. 12	SPA-260
60ml, Clear Sample Vials with Screw Caps, qty. 12	SPA-261
40ml, Clear Sample Vials with Screw Caps, qty. 12	SPA-267
40ml, Amber Sample Vials with Screw Caps, qty. 12	SPA-268
20ml, Clear Sample Vials with Screw Caps, qty. 12	SPA-265
20ml, Amber Sample Vials with Screw Caps, qty. 12	SPA-266
Sample Vessel Holder Plate	SPA-262
Sample Drum	SPA-263
Dividing Head	SPA-264

Find Estimated Ship Weights for all our products in the Ship Weight Index

SP-245

GILSON ACCU-MAX SPINNING RIFFLER
ASTM D2013

Gilson's Accu-Max Spinning Riffler scales up precision dividing and sample preparation for large bulk samples. Aggregates, coal, or ores with particle topsize to 2in (50.8mm) are quickly and accurately split to 1/8 or 1/4 fractions with less handling and risk of sample loss. The unit works equally well for finer granular materials or powders with large volumes. Samples that do not flow well through fixed-chute gravity splitters process more effectively with the Accu-Max vibratory feeder. High power vibratory feeder enhances accuracy and efficiency, as well as improved sampling accuracy. All contact parts are of quality stainless steel for long service life and low contamination.

Total capacity of the hopper is 1.8ft³ (51L). Feed rate through the 6.5in (165mm) wide hopper discharge is controlled by a sliding gate that adjusts for openings from 0—4in (0—102mm), and by power settings of the variable-amplitude vibratory feeder. Adjustable angle of the vibratory feeder and feed trough assembly assures a constant, controlled flow of material. Eight precise sample fractions are divided into special stainless steel collection pans rotating at a constant 14rpm (12rpm at 50Hz) on the turntable. A precision 1/3hp gearmotor assembly drives the turntable, and the 0.32ft³ (9L) collection pans lock together with unique overlapping cutting edges to prevent loss of fines. Lifting bars in the pans are positioned for easy and convenient handling.

Working components are mounted in a durable, painted steel frame. Eight Collection Pans for 1/8 fractions are included. Additional pans are available as SPA-30 for 1/8 fractions or SPA-31 double-sized pans for 1/4 fractions. **Product Dimensions:** 50x35x58in (1,270x890x1,473mm), WxDxH.

Gilson Accu-Max Spinning Riffler	
Accu-Max Spinning Riffler, 115V/60Hz	SP-245
230V/50Hz	SP-245F
Accessories	
Collection Pan, 1/8 Fraction	SPA-30
Collection Pan, 1/4 Fraction	SPA-31

technote

The Gilson Spinning Riffler virtually eliminates operator error and bias associated with other types of sample dividing. The accuracy of spin riffling has been demonstrated in the 1968 M.Sc. thesis of A. A. Khan, Bradford University. Sampling tests based on a 60/40% mixture of coarse and fine sands produced the following comparisons:

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Chute Riffling	1.01	1.02	3.4
Spinning Riffling	0.125	0.016	0.42
Random Variation	0.076	0.0058	0.25

SP-48R shown with SC-108 Sample Jars

GILSON MIXING WHEEL
ASTM D2013

Proper sample preparation for materials such as coal or ores requires careful and thorough mixing to assure consistent and accurate results. Gilson offers floor-mounted Mixing Wheels for a wide range of sample quantities.

SP-48R Floor Mount Mixing Wheel has ten sample stations to mount large 0.5gal (2L) sample containers at a 45° angle. Rotation speed is variable from 0—25rpm. Numbered sample stations secure sample jars with spring-loaded clamping. SC-108 Wide-mouth polyethylene sample containers with screw-top lids are 4.7x9.4in (119x239mm), dia.xH, and ordered separately in cases of 12. The wheel is mounted on a rugged, welded steel heavy-duty painted floor stand. When permissible, SPA-64 metallic Jack Rocks may be added to speed the mixing process. **Product Dimensions:** 48x40x50in (1,220x1,020x1,270mm), WxDxH.

Gilson Mixing Wheel	
Floor Mount Mixing Wheel, 115V/60Hz	SP-48R
230V/50Hz	SP-48RF
Accessories	
Sample Jar for SP-48R, 0.5gal (2L), case/12	SC-108
Jack Rocks, case/500	SPA-64

LABORATORY SPLIT-O-MATIC® SPLITTERS
ASTM C702, C778; AASHTO T 248

- **1/2, 1/4 or 1/8 fractions in a single pass.**
- **High-capacity hoppers with gate-release.**
- **Fixed-width chutes.**
- **Particle topsize up to 2in.**

Laboratory Split-O-Matic® Splitters are the best choice for large samples that must be quickly and accurately reduced. With a single pass, these higher-capacity units process bulk samples of granular materials into small fractions for efficient preparation of test specimens. Exclusive Gilson three-stage design allows the user to select sample fractions of 1/2, 1/4, or 1/8 of bulk sample. A selection lever sets internal sample fraction positions, directing selected fraction to the sample pan and the balance to the reject pan. V-bottom chutes precisely align material flow for more accurate divisions. Laboratory Splitters are well-suited for aggregates, sand, gravel, ores, coal and coke or other free-flowing granular materials up to 2in (51mm) topsize.

Laboratory Splitters have heavy, welded-steel construction with painted and baked finish. Sample hoppers have a gate-release mechanism for greater control of sample dividing. Front panel doors latch shut for superior dust control, and open wide for easy cleaning. Sample pans are included, and are size-matched to hopper capacity. Bottom flange is suitable for anchored or freestanding lab use. Standard models feature three stages of 45° chute slopes, suitable for most materials. Steeper 60° chute slope models are recommended for low specific gravity materials such as coal or coke, or materials with a large fraction of fines. The 60° Laboratory Splitters are approximately 20% taller, slightly heavier, and are ordered by adding a "C" suffix to model numbers.

For best results, choose a splitter with chute width at least twice that of the material's topsize to avoid bridging over chute openings. For coal or coke, or for materials with oblong pieces, 3 to 4 times topsize is recommended. Any Laboratory Splitter can be custom-ordered with special larger hopper and sample pans if needed. Custom models may also be ordered with four or more chute stages for sample fractions smaller than 1/8.

technote

ASTM C702 requires the chute opening widths of mechanical splitters to be at least 50% larger than the maximum nominal particle size of the aggregate sample being divided. A minimum of eight openings for coarse aggregate, and twelve openings for fine aggregate samples is also specified. To assure accurate splits with best performance and minimal opportunities for "bridging", or blockages, Gilson recommends chute widths 2 to 3 times larger than maximum particle size.

VIDEO ONLINE

SM-4L

Laboratory Split-O-Matic® Splitters

Model	Chutes per Stage	Sample Fractions	Chute Width in (mm)	Chute Angle	Maximum Particle Size in (mm)	Dimensions without Hopper WxDxH, in (mm)	Hopper Capacity ft³ (L)
SM-3L	8	1/2, 1/4, 1/8	4 (102)	45°	2 (51)	42x25x79 (1,067x635x2,007)	3.0 (85)
SM-4L	8	1/2, 1/4, 1/8	2 (51)	45°	1 (25)	25x16x53 (635x406x1,346)	1.6 (45)
SM-4XL	12	1/2, 1/4, 1/8	2 (51)	45°	1 (25)	34x16x53 (864x406x1,346)	2.4 (68)
SM-5L	24	1/2, 1/4, 1/8	1 (25)	45°	0.5 (13)	32x17x47 (813x432x1,194)	1.8 (51)
SM-6L	36	1/2, 1/4, 1/8	0.5 (13)	45°	0.25 (6)	33x13x40 (838x330x1,016)	1.6 (45)
SM-6SL	18	1/2, 1/4, 1/8	0.5 (13)	45°	0.25 (6)	22x13x40 (559x330x1,016)	0.8 (23)
SM-3LC	8	1/2, 1/4, 1/8	4 (102)	60°	2 (51)	42x25x99 (1,067x635x2,515)	3.0 (85)
SM-4LC	8	1/2, 1/4, 1/8	2 (51)	60°	1 (25)	25x16x67 (635x406x1,702)	1.6 (45)
SM-4XLC	12	1/2, 1/4, 1/8	2 (51)	60°	1 (25)	34x16x67 (864x406x1,702)	2.4 (68)
SM-5LC	24	1/2, 1/4, 1/8	1 (25)	60°	0.5 (13)	32x17x60 (813x432x1,524)	1.8 (51)
SM-6LC	36	1/2, 1/4, 1/8	0.5 (13)	60°	0.25 (6)	33x13x49 (838x330x1,245)	1.6 (45)
SM-6SLC	18	1/2, 1/4, 1/8	0.5 (13)	60°	0.25 (6)	22x13x49 (559x330x1,245)	0.8 (23)

Find Estimated Ship Weights for all our products in the Ship Weight Index

SM-5 and MH-5 shown with Pneumatic Release Option

helpfulhint

Gilson can design and manufacture complete automated sample splitting and screening systems. We can also work as part of a design team to integrate quality control ideas and products into an existing system.

Contact us for help at any level with your quality control program.

PRODUCTION SPLIT-O-MATIC® SPLITTERS

Production Split-O-Matic® Splitters accurately divide large amounts of material through multiple stages in a single pass. The Production series allows this unique Gilson design to be adapted to different applications and sampling environments. These units frequently feature custom design or special fabrication for installation in production or pilot-plant facilities. Our most popular Production Split-O-Matic® configurations are listed in the accompanying chart.

Production Split-O-Matics can be configured with three to six stages of riffles and chute widths from 0.5—12in (13—305mm). Standard chutes are sloped at 45°. Three-position fraction control gates allow a choice of three final sample fractions, ranging from 1/2 to 1/32. Non-adjustable, single-fraction models are also available. V-bottom chutes precisely align material flow for more accurate divisions. Rugged, heavy steel construction throughout assures long service life.

Custom options include chutes with 60° slopes for low-density materials, fabrication with all stainless steel contact parts, specially-sized material hoppers, pneumatic operation for hopper gates and/or fraction gates, fixed-fraction models, mounting or positioning fixtures, and special collection pans.

Material Hoppers and sample plans are sold separately for design flexibility. Bulk material is accumulated in hoppers before distribution through the chutes, assuring even divisions. Capacities from 1.6—12ft³ (45—340L) are available. Recommended standard hopper sizes for the Split-O-Matic® assemblies are indicated in the chart.

Production Split-O-Matics have a useful range for material particle sizes from 5in (127mm) to fine sand. Chute widths should be specified at more than twice as wide as the largest particle to avoid bridging over chute openings. For oblong shapes, or low density materials such as coal or coke, three to four times topsize is recommended.

Contact Gilson to discuss custom design requirements best suited for your application.

Production Split-O-Matic® Splitters[1]

Model	Chutes per Stage	Number of Stages	Sample Fractions	Chute Width in (mm)	Dimensions without Hopper WxDxH, in (mm)	Recommended Material Hopper Model	Hopper Capacity ft³ (L)
SM-1	4		1/2, 1/4, 1/8	12 (305)	68x60x112 (1,727x1,524x2,845)	MH-1	12.0 (340)
SM-2	6		1/2, 1/4, 1/8	8 (203)	64x49x82 (1,626x1,245x2,082)	MH-2	8.0 (227)
SM-3	8		1/2, 1/4, 1/8	4 (102)	42x25x47 (1,067x635x1,194)	MH-3	3.0 (85)
SM-4	8	3	1/2, 1/4, 1/8	2 (51)	25x16x26 (635x406x660)	MH-4	1.6 (45)
SM-4X	12		1/2, 1/4, 1/8	2 (51)	34x16x26 (864x406x660)	MH-4X	2.4 (68)
SM-5	24		1/2, 1/4, 1/8	1 (25)	32x17x24 (813x432x610)	MH-5	1.8 (51)
SM-6	36		1/2, 1/4, 1/8	0.5 (13)	33x10x18 (838x254x457)	MH-6	1.6 (45)
SM-31	8		1/32	4 (102)	45x22x63 (1,143x559x1,600)	MH-3	3.0 (85)
SM-41	12	5	1/32	2 (51)	31x15x38 (787x381x965)	MH-4X	2.4 (68)
SM-51	24		1/32	1 (25)	32x16x35 (813x406x889)	MH-5	1.8 (51)
SM-61	36		1/32	0.5 (13)	27x9x21 (686x229x533)	MH-6	1.6 (45)

[1]Most popular basic models shown. Contact Gilson to discuss specific requirements.

VIDEO ONLINE

HM-275

SPA-400

TSA-162

HMA-68

QUARTERING CLOTH KIT
ASTM C702; AASHTO T 248

The HM-275 Quartering Cloth Kit includes required cloth, broom, and shovel specified in the standard procedures for sampling and splitting aggregates and asphalt mixes.

HMA-591 Quartering Cloth is a 6x8ft, heavy-duty, finished canvas. The HMA-592 Square-point Shovel has a 9.75x12in (248x305mm) blade and a 30in (762mm) D-handle. The HMA-593 Broom is a 16in (406mm) wide Prolene plastic brush head and a 4ft (1.2m) long wooden handle.

Quartering Cloth Kit	
Quartering Cloth Kit	HM-275
Accessories	
Quartering Cloth, 6x8	HMA-591
Square-point Shovel	HMA-592
Prolene Broom	HMA-593

helpfulhint

AASHTO accepted SP-55 Quartermaster Asphalt Sample Divider is ideal for quartering asphalt or other difficult to handle materials.

MULTI-PURPOSE SAMPLE PANS

These rugged pans handle heavy loads in lab and field conditions, and are suitable for use in drying ovens. They are durable heavy gauge steel, welded and painted for long service life.

Material Handling Pans have a swinging handle mounted at the balance point and a flanged end for safe, easy lifting. The chute end allows efficient emptying and distribution. Handling Pans can be cross-stacked for storage.

Sample Pans have lifting flanges at both ends, and will nest together for storage.

Multi-Purpose Sample Pans			
Type	Model	Size, WxDxH in (mm)	Capacity qt (L)
Material Handling Pans	TSA-162	15x30x4 (381x762x102)	39 (37)
	TSA-163	12x20.5x4 (305x521x102)	17 (16)
Sample Pans	SPA-105	29x12x9 (737x305x229)	48 (45)
	SPA-104	22x13x11 (559x330x279)	49 (46)
	SPA-400	25x9x8 (635x229x203)	31 (29)
	SPA-100	29x9x6 (660x229x152)	24 (23)
	SPA-101	20x7x6 (508x178x152)	14 (13)

MATERIAL HANDLING CHUTE

- **Makes handling of HMA samples safe and efficient.**
- **Fills large Gyratory compaction molds in a single lift.**
- **Works well for aggregate and soil samples.**
- **Useful as a weighing scoop.**

HMA-68 Material Handling Chute is an all-purpose chute that allows loading, filling, and handling of any bulk material, including Asphalt, Aggregates, and Soils. It quickly and uniformly fills Gyratory, Marshall, Proctor, CBR, Relative Density molds, Quartermaster™ or Universal splitters. The Handling Chute conforms to mold loading procedures in ASTM D4013 and AASHTO T 312.

The flat bottom and integral feet make weighing convenient. The two sturdy aluminum bar handles reinforce the unit and enable balanced handling for easy and accurate placement of sample materials. Material Handling Chute is constructed of 24-gauge stainless steel with rolled edges. The open end is formed with a 2in (51mm) radius to fit most mold openings. The unit stands horizontally or vertically. **Product Dimensions:** 22x11.5x10.5 (559x292x267mm).

Material Handling Chute	
Material Handling Chute	HMA-68

alsoavailable

See our Pans, Tools & Glassware section for a complete selection of Material Pans.

GP-12 GP-6

GPA-11

GP-82 GP-8 GP-118 GP-112

Sampling Probes

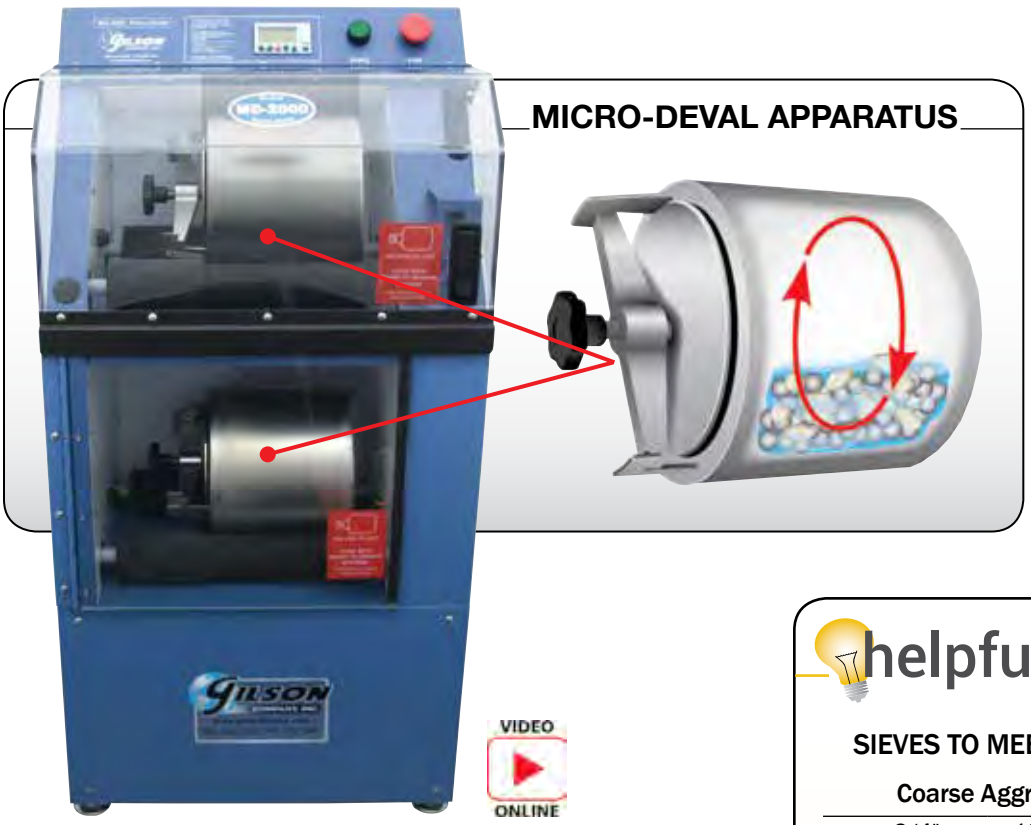
Description	Model	Length in (mm)	O.D. in	Material	Openings/ Partitions
Double-Tube Probes are seamless construction with durable points. Inner tube is rotated to open/close sampling holes. Probes with partitions between holes have closed-end handle, and pockets are emptied individually. Those without partitions have open-ended handle for convenience of emptying total sample. Partition type is USDA approved for grain sampling. GP-16 meets ASTM C183 and AASHTO T 127 for bulk sampling of hydraulic cement. GP-25 Spiral Probe has offset inner tube openings that open in sequence from bottom to top as the probe is rotated. Smaller diameters may be used for in-bag sampling. Use stainless steel probe for foods, pharmaceuticals, fertilizers.	GP-12 GP-14 GP-16 GP-22 GP-24 GP-25 GP-29 GP-29A GP-68A GP-70A GP-4 GP-5 GP-6 GP-6S	40 (1,020) 50 (1,270) 63 (1,600) 63 (1,600) 63 (1,600) 62 (1,575) 72 (1,829) 72 (1,829) 96 (2,438) 120 (3,048) 18 (457) 30 (762) 39 (991) 39 (991)	1.375 1.375 1.375 1.375 1.375 1.375 1.375 1.375 1.375 1.375 0.5 0.5 0.875 0.875	Extruded Brass with Cast Bronze Point Chrome- Plated Brass Stainless	6/No 8/No 10/No 10/Yes 11/Yes 10/No 12/Yes 12/No 16/No 20/No 5/No 9/No 6/No 6/No
Sampling Probe T-Handle accessory grips the outside of 1.375in (35mm) diameter Double-Tube Probes for better leverage and control during sampling operations. Handle is detachable. Each end has a handle grip for comfortable use. **Product Dimensions:** 21x15x11in (533x381x279mm)	GPA-11	-	-	-	-
Single-Tube, Single-Slot Probes are useful for fertilizers, foods, pharmaceuticals, etc. GP-80 for flour and similar materials has solid wooden handle, and the outside diameter tapers from 1.7in (24.5—17.5mm) at the end. Slot width is 0.5in (12.7mm). GP-82 fertilizer tube has an open-end handle with score marks at 28 and 31in (711 and 787mm) from the tip.	GP-80 GP-82	22 (559)	0.7 0.875	Stainless Stainless	1/No 1/No
Triple-Zone Sampler has three partitioned cells to collect 9cc samples of powders, pellets, and other bulk granular materials from drums, bags, bins, or stockpiles. The sampler is inserted and the "T" handle is rotated one-half turn to collect samples through the 3x0.4in (76x10mm) openings. After closing the ports, samples representing three separate zones are easily recovered for inspection. Made of anodized aluminum with sharp stainless steel point.	GP-8	22 (559)	0.75	Aluminum & Stainless	3/Yes
Keystone Carbon Sampling Probe is designed especially to sample fine powders that tend to compact. Ideal for powdered metals and chemicals. Double-tube construction, 1in O.D.x39in (25.4x991mm). Thirteen openings with partitions; inner tube rotates to close openings for removal. An auger vane on bottom 13in (330mm) of outer tube, and a "T" handle on top aids augering.	GP-118	42.5 (1,080)	1	Chrome-Plated Steel	13/Yes
Bag Triers are nickel-plated steel, tapered to a point with a single large opening for sampling granular material through bags. Sample can be poured through hollow handle.	GP-106 GP-112	6 (152) 12 (305)	0.5 1	Nickel Plated Steel	1/No 1/No

VIDEO ONLINE

Watch video tutorials for our products online at **www.globalgilson.com!**

NEW! Ship Weight Index

The Estimated Ship Weight for every product is easy to find in the NEW Ship Weight Index!



MD-2000

HMA-920 shown with HMA-922

helpfulhint

SIEVES TO MEET ASTM & AASHTO SPECIFICATIONS*

Coarse Aggregate		Fine Aggregate	
3/4"	19.0mm	No.4	4.75mm
5/8"	16.0mm	No.8	2.36mm
.530"	13.2mm	No.16	1.18mm
3/8"	9.5mm	No.30	600mm
.265"	6.7mm	No.100	150mm
No.4	4.75mm	No.200	75mm
No.16	1.18mm		

*Order required sieves separately in 8in, 12in, 200mm, or 300mm diameters. See separate listing for wet sieving accessories, useful for washing sample at completion of abrasion cycle.

MICRO-DEVAL APPARATUS

ASTM D6928, D7428; AASHTO T 327; TxDOT: 845-49-40; Ontario LS-618

- **Multi-function electronic controller tracks time, speed, and total revolutions.**
- **Easier, safer, and less expensive to operate.**
- **Lexan doors with safety interlocks enclose moving parts.**

The increasingly popular 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. Smaller equipment size, lower sample quantities and a simpler procedure make the method easier and less costly to perform than other tests methods.

The MD-2000 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. Gilson's MD-2000 Micro-Deval Apparatus is a second generation, state-of-the-art machine. 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.

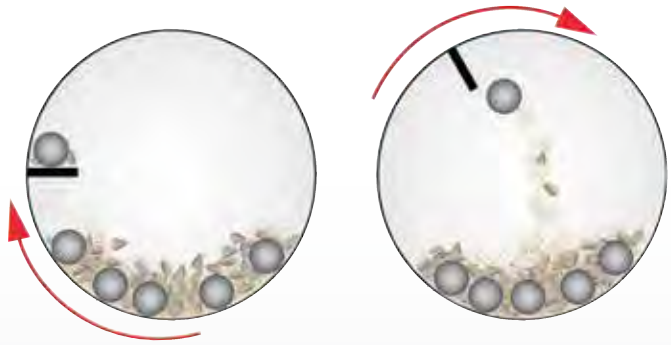
The jars revolve behind Lexan™ doors with safety interlocks. No moving parts are exposed during operation. Other manufacturers use separate timers to control test duration, which does not permit tracking of jar revolutions or speed and allows variations up to ±6% of the optimum number of revolutions. In addition, other machines rotate the jars on unguarded open rollers, creating a potentially hazardous situation.

The Micro-Deval machine is a two-tier unit with sturdy steel frame. Each tier carries one stainless steel 5L jar, 194mm ID, 170mm internal height with locking cover. Power to the rubber-covered rollers is supplied by a 3/4hp, electric motor through a gear transmission and chain drive. The unit is supplied with two jars and two sets of 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, order additional Jars HMA-920 and Abrasive Charge HMA-922. Electrical: operates on 115V/60Hz. Add "F" to model number for operation on 230V/50Hz power supply. MD-2000C model is equipped with thermally protected motor to meet stricter requirements in some areas. **Product Dimensions:** 20.5x13.5x38in (521x343x965mm).

Micro-Deval Apparatus	
Micro-Deval Apparatus, 115V/60Hz	MD-2000
115V/60Hz	MD-2000C
230V/50Hz	MD-2000F
Accessories	
Stainless Steel Micro-Deval Jar with Locking Cover	HMA-920
Abrasive Charge	HMA-922
Magnet	HMA-924

HM-70A

LOS ANGELES ABRASION MACHINE



The Los Angeles Abrasion machine rotates at 30-33rpm. The shelf plate catches and drops the aggregate sample and abrasive charge to the other side of the drum, creating an impact-crushing effect. Aggregate sample and abrasive charge then roll within the drum creating additional abrasion and grinding actions. Degradation is determined as a percent loss of mass after 500 revolutions.

LOS ANGELES ABRASION MACHINE
ASTM C131, C535; AASHTO T 96

- **Electronic safety interlocks allow operation only with doors secured.**
- **Powerful 1hp motor rotates drum through slip-clutch protected chain drive.**
- **Enclosure lined with sound attenuating foam.**

The Los Angeles Abrasion test is widely used as an indicator of relative quality of aggregates. Test measures degradation of standard gradings of aggregates when subjected to abrasion and impact, in a rotating steel drum containing an abrasive charge of steel balls. Up to twelve balls are used, depending on gradation of test sample.

Gilson's design has built-in safety features with user controls on the outside of the integral sound enclosure. An electrical interlock allows the machine to operate only when the double-hinged lid is closed and a safety key is inserted. Drum is positioned for loading and unloading using a jog button while watching through a viewing window in the enclosure. Sound is absorbed by the heavy, painted steel enclosure with sound attenuating foam and membrane lining.

The 0.5in (12.7mm) thick welded steel drum has 28in (711mm) ID and 20in (508mm) inside width, and is mounted on a rigid welded steel support frame. The 6in (152mm) wide opening for introducing and discharging sample has a bolted cover which fits flush with inside contour of drum when tightened securely with a dust-tight gasket. A 3.5in (89mm) wide steel shelf, per ASTM's "preferred design", extends the full length of the drum interior. The shelf thickness is 1in (25mm) and is attached securely to the drum using fine 0.75in (19mm) x 1.5in (37.5mm) long bolts, providing a firm and rigid shelf that is also easily removed for replacement or maintenance.

A 1hp electronically controlled gear-motor rotates the drum at 30—33rpm via enclosed chain drive. Drum assembly rotates in flanged ball bearings with dust seals and grease fittings. Controller console with overload protection has large JOG and On/Off push button controls, and automatic counter stops rotation after a preset number of revolutions. Abrasive charge of twelve hardened steel balls 1.81-1.88in (46-48mm) in diameter and 390-445 grams are included. Heavy-duty catch pan measures 24x26x2.5in (610x660x63mm), WxDxH. **Product Dimensions:** 38x40x46.5in (965x1,016x1,181mm), WxDxH.

Los Angeles Abrasion Machine	
Los Angeles Abrasion Machine, 220V/60Hz, 1 phase	HM-70A
230V/50Hz, 1 phase	HM-70AF
Accessories	
Los Angeles Abrasive Charge, set of 12 Balls	HMA-130
Catch-Pan	HMA-131
Replacement Steel Shelf	HMA-132
Replacement Wear-Resistant Steel Shelf	HMA-132WR

SULFATE SOUNDNESS TEST

ASTM C88; AASHTO T 104; CALIFORNIA 214; PENNDOT 510

The Sulfate Soundness test subjects aggregate samples to alternate cycles of immersion in sodium or magnesium sulfate solution and oven drying. Aggregates are placed in the sample sieves, stacked in the sieve holder, and lowered into the sulfate solution buckets. The solution buckets are placed inside the water bath tank, which is used to maintain the specified 70 degree temperature.

HM-447 shown with sieves

HM-444

HM-452

MA-168 & MA-169

HM-442

MA-76

MA-246

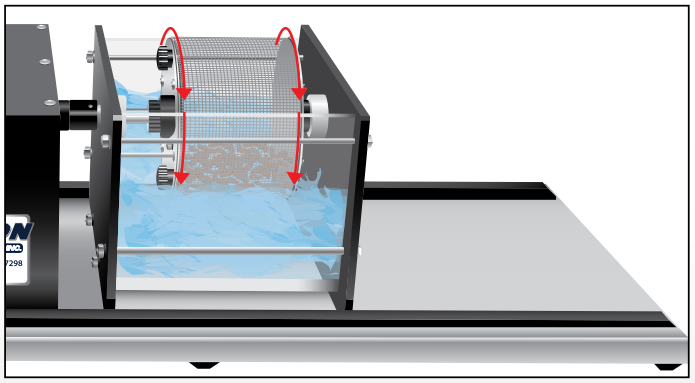
Sulfate Soundness Test

Description	Model
Aggregate Sample Sieves hold sample materials for immersion in sulfate solution. Sieves for coarse aggregate are 8in (203mm) diameter, full-height stainless steel No.5 or No.10. Blank frame sieves are full height, 8in (203mm) diameter sieve frames with no mesh and extend the overall height for coarse aggregate samples when stacked. Fine Aggregate Sieves are Full or Half-Height, 8in stainless steel No. 70 sieves.	
8in Full-Height, No.5	V8SF #5
8in Full-Height, No.10	V8SF #10
8in Full Height, No. 70	V8SF #70
8in Half-height, No. 70	V8SH #70
8in Full-Height Blank Frame	SV-800
8in Sample Sieve Holders hold up to seven stacked Sample Sieves, depending on sieve height. Stainless steel frames allow optimum fluid circulation. Handles lock upright, but fold for easy loading into drying ovens. **Product Dimensions:** 8x9x11in (203x229x279mm), WxDxH.	HM-447
Solution Buckets hold sulfate solution for immersion of samples. One Bucket is required for each Sieve Holder. 6gal. (22L) Buckets are thick-wall, high-density polyethylene with bail handles. **Product Dimensions:** 11.5x11.5x16.5in (292x292x419mm), WxDxH.	HM-452
Washing Buckets are used to rinse sulfates out of specimens after immersion cycles. Water flows in through bottom and out through top overflow. 0.25in (6.4mm) thick, white polyethylene. Each Washing Bucket holds one Sieve Holder. **Interior Product Dimensions:** 12x12x18in (305x305x457mm), LxWxH.	HM-444
Solution Hydrometers measure specific gravity of sulfate solutions to ±0.001 SG. Choose hydrometer for use in Sodium Sulfate or Magnesium Sulfate solutions. **MA-168 Product Dimensions:** 1x14x1in (25x356x25mm), WxDxH. **MA-169 Product Dimensions:** 1x13.5x1in (25x343x25mm), WxDxH.	
Sodium Sulfate Hydrometer, 1.120—1.190	MA-168
Magnesium Sulfate Hydrometer, 1.240—1.310	MA-169
Heating/Cooling Circulator is used when temperature of sulfate solution cannot be maintained at required 70°F (21°C). This unit circulates water only to the Water Bath Tank (purchased separately), where Solution Buckets are immersed. Up to 5gal (20L) per minute of water is heated or cooled to the specified temperature. Advanced digital controller has temperature read out accuracy of 0.25°C, stability of 0.01°C and allows temperature control between 14°—212°F (-10°—100°C). Unit has 7L reservoir, 1,000 Watt heating and 600 Watt cooling at 110V/60Hz. **Product Dimensions:** 17x9x24in (430x229x610mm), WxDxH.	MA-76
Water Bath Tank is connected to the Heating/Cooling Circulator for use when additional temperature regulation is required. The Tank holds plain water and accepts up to four Solution Buckets. A lid is supplied to reduce evaporation loss and reduce temperature fluctuations. Thermometer for monitoring Bath temperature is purchased separately. The tank is 0.25in (6.4mm) thick white polyethylene and includes circulation and drain fittings. **Interior Product Dimensions:** 36x24x18in (914x610x457mm), LxWxH.	HM-442
Platinum RTD Datalogging Thermometer is highly accurate and allows direct transfer of recorded data (CSV files) to PC or Mac using a USB flash drive (not included) - no need for additional software. Temperature range is –130° to 221°F (–90° to 105°C) with 0.01° resolution and accuracy of ±0.2°C across the entire range. Rolling datalogging memory captures temperatures at user-defined intervals from 1 minute to 24 hours with capacity for a year of recorded data using 1-minute intervals. Smart-Alarm™ visual and audible indicators signal continuously until acknowledged. Up to ten alarm events are stored and time-stamped in memory. Also features max/min, difference, and average functions. This two-channel unit is available supplied with one or two 316 stainless steel factory-calibrated Probes, for connection to high-impact, chemical-resistant ABS plastic case with 10ft (3M) leads. Replacement probes must be factory-installed and calibrated. Each CE marked thermometer features NIST Traceable calibration from an A2LA lab and has a unique ID for identification. Includes AAA batteries, AC adaptor, built in stand and wall-mount accessories. Product Dimensions: 2.75 x 0.75 x 4.25in (70x19x108mm) WxDxH.	
Platinum RTD Datalogging Thermometer, w/1 Probe	MA-246
Platinum RTD Datalogging Thermometer, w/2 Probes	MA-247
ASTM S63F Thermometer can be used for checking temperatures while mixing solution, and for periodic checks of water bath temperatures. Total immersion, 18°—89°F range, 0.2°F readability. Blue spirit-filled, white-backed glass with permanent graduations.	MA-531F

Find Estimated Ship Weights for all our products in the Ship Weight Index

SS-18 shown with SSA-22

SLAKE DURABILITY INDEX



A pre-weighed sample is placed in a partially submerged wire mesh drum, tumbled for 10 minutes, then oven dried and weighed. Retained mass is calculated and recorded for each of two cycles.

SA-80

DURABILITY INDEX AGITATOR

ASTM D3744; AASHTO T 210;
CALIFORNIA 227, 229

Durability Index measures the relative resistance of aggregates to producing clay-like fines when mechanically agitated in a special washing vessel. Resulting fines material is evaluated using sand equivalent apparatus (SEA-100) listed separately. The versatile Gilson SS-18 Agitator runs at 285cpm, and may also be used as a sieve shaker for up to six full-height 8in or 200mm diameter sieves and pan.

Holes are provided in case flanges for securing to floor or bench. Switch, cord, and plug are provided. Gilson TSA-169R Digital timer can be purchased separately to precisely control test times. Order Wash Vessel separately. **Product Dimensions:** 16x14x30in (406x356x762mm), WxDxH.

SSA-22 Stainless Steel Wash Vessel is approximately 8in (203mm) diameter x 9.5in (241mm) high and is complete with lid, gasket, and clamps.

Durability Index Agitator	
Durability Index Apparatus, 115V/60Hz	SS-18
230V/50Hz	SS-18F
Accessories	
Stainless Steel Washing Vessel	SSA-22
Gilson Digital Timer	TSA-169R

SLAKE DURABILITY DEVICE

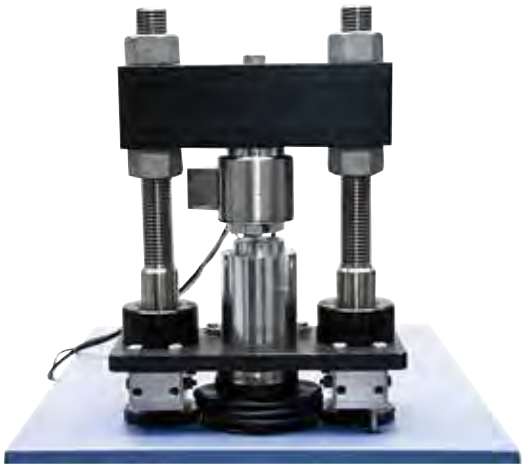
ASTM D4644

Slake durability is a simulated weathering test to determine abrasion resistance during wetting and drying cycles of shale and similar soft rocks. Samples are alternately tumbled in mesh drums through a water medium and oven-dried for two cycles. The percent loss of mass is referred to as the slake durability index.

The SA-80 apparatus consists of a base-mounted, double-ended motor drive unit which rotates two 140mm dia. x 100mm (5.5x3.9in) sturdy wire mesh drums at twenty revolutions per minute included water tanks. The water tanks have built-in, quick-release drive units. Corrosion resistant drums are constructed of 2mm opening mesh with solid end plates. The unit is capable of turning four drums simultaneously at 20 rpm, and is mounted on a 4ft (1,219mm) long base suited to the addition of the added drums in series with the first two. An additional set of two mesh drums and two water tanks are available as SAA-30. To facilitate sample preparation, order additional mesh drums as SAA-31. **Product Dimensions:** 48x14x9.25in (1,219x355x235mm), WxDxH.

Slake Durability Device	
Slake Durability Device, 115V/60Hz	SA-80
230V/50Hz	SA-80F
Accessories	
Water Tank Assembly, qty. 2	SAA-30
Wire Mesh Drums, qty. 2	SAA-31

PR-10 shown with PRA-14



PR-10 Load Frame shown with PRA-14

PRA-14

PROPPANT CRUSH TEST SYSTEM

API RP 19C; ISO 13503-2

Sand and engineered ceramic particles (proppants) used for hydraulic fracturing operations in oil and gas production are subjected to tremendous pressures thousands of feet beneath the Earth's surface. To assure top performance in the harshest of conditions, tests are performed to determine resistance to crushing and degradation of the materials.

Collaborative efforts between Gilson and Karol-Warner combined over a century of knowledge and experience to produce our new Proppant Crush Test Load Frame. This sophisticated and efficient unit is compact and has a total rated capacity of 25,000lbf (111kN). A unique hybrid motor system is used to drive pressures over 7,000psi (48.3mPa), using the included 2in inside diameter Crush Cell. This equipment meets the newest API requirements as well as proposed ISO standards.

Front panel controls allow settings for Crush Cell diameter, load rate, maximum load and hold time through the menu-driven four-line, backlit LCD display. Tare and Peak hold buttons are provided, and status is displayed during testing. A jog switch provides rapid positioning of the loading platform, and a large emergency stop button improves operator safety and protects the system from damage. LED indicators are provided for maximum travel limit and home position of the platform. Travel distance is 1.5in (38mm), and tracked by the LVDT flow sensor. Solid steel crosshead adjusts easily for a total daylight opening of up to 4.5x8.5in (114x216mm) WxH. A precision machined 3in (76mm) diameter Crush Cell with piston dimensions of 2.0x3.5in (50.8x89mm) dia.xL is included; inquire for other sizes. Additional Proppant Crush Cell assemblies are available separately to facilitate sample preparation. Adjustable centering cams on the loading platform allow precise and repeatable positioning of Crush Cells with outside diameters up to 3.5in (89mm).

Default loading rate is set at 2000psi (13.8mPa) per minute, and is adjustable up to 4000psi (27.6mPa) per minute. Load hold time is pre-set at two minutes, but is adjustable for up to five minutes. There is an automatic rapid release of the load at completion of the hold time. Load, rate, and time values are displayed in real time and documented through the custom software installed on the included laptop computer. A serial port connection is provided. Enclosure is rugged painted steel. The Crush Test Frame is mounted on a sturdy rolling cart for optimum positioning in the lab. Operates on 120V/60Hz electrical supplies. **Product Dimensions:** 22x27x54in (559x686x1.372mm) WxDxH.

Proppant Crush Test System	
Proppant Crush Test System, 120V/60Hz	PR-10
Accessories	
Proppant Crush Cell	PRA-14

technote

A Crush Test System with a 50,000lbf (222kN) capacity for testing high-strength proppants is currently under development. Inquire for details.

HM-602W

HM-614

PENDULUM SKID TESTER

ASTM D3319, E303; AASHTO T 278, T 279; BS 812-114; BS EN 1097-8, 13036

The Pendulum Skid Tester measures skid resistance when a rubber slider on a 20in (508mm) pendulum arm contacts a test surface. A drag pointer on a 0—150 scale measures friction. The unit quantifies the potential of automotive tire skidding and also evaluates skid resistance of surfaces and polishing tendencies of aggregates. A supplementary 0—10 scale is provided for work using smaller sliders. Adjustments to the arm position and base maintain a true circular path when operated on sloping road surfaces. Sliders are made with a graded rubber strip bonded to an aluminum backing plate.

Gilson supplies both large and small rubber sliders mounted to aluminum plates or as unmounted replacement pads. Order 3in (76mm) wide Large Sliders for testing road surfaces or 1.25in (32mm) wide Small Sliders for testing polishing wheel specimens.

The Tester includes a setting gauge, three wrenches, water bottle, instrument case, traceable calibration certificate, and instructions. Large or Small Sliders are ordered separately. When evaluating specimens from Accelerated Polishing Machines, order Laboratory Base Plate HMA-204W and HMA-207 Small Sliders separately. Base Plate is 25x19x2in (635x480x50mm), LxWxH, including a specimen mounting block. Order HMA-208 6x24in (152x610mm) No.60 grade silicon carbide Slider Conditioning Cloth in packs of ten to condition sliders per ASTM E303. Molds to form Accelerated Polishing Machine specimens are also available. **Product Dimensions:** 28.3x28.7x8.7in (720x730x220), WxDxH.

Pendulum Skid Tester	
Pendulum Skid Tester	HM-602W
Accessories	
Slider Conditioning Cloth, pkg 10	HMA-208P
Laboratory Base Plate	HMA-204W
Large Pad, Unmounted	HMA-228
Small Slider, Mounted	HMA-207
Small Pad, Unmounted	HMA-229
Accelerated Polishing Specimen Mold	HMA-258
Mold Plate	HMA-259

ACCELERATED POLISHING MACHINE

ASTM D3319; AASHTO T 279

The Accelerated Polishing Machine determines aggregate wear through action of vehicle tires. 0.375—0.5in (9.5—12.7mm) pieces of aggregate are bonded in molds to form fourteen curved segments. Segments are clamped to the "road wheel" to form a continuous aggregate surface 1.75in (44.5mm) wide and 16in (406mm) in diameter. In testing, the road wheel is driven at 320 ±5rpm in loaded contact with an 8in (203mm) diameter rubber-tired wheel while abrasive is fed to the contact area. Friction values are determined after polishing by use of a Pendulum Skid Tester.

The HM-614 is designated for ASTM/AASHTO test method and consists of a welded steel frame on adjustable pads. This unit maintains an 88lbf (391N) load on the road wheel and utilizes silicon carbide grit abrasive with a special grit feeder and Goodyear pneumatic-tired wheel assembly. The road wheel is driven by TEFC motor via an adjustable timing belt. Tests are automatically terminated by a preset revolution counter. Water is gravity fed from a tank through a calibrated flow meter, and is collected with used abrasive in a removable tray. Tire loadings to the road wheel are controlled by a mechanical lifting device. Units are supplied with two specimen molds, two mold plates, required feeders, wheel assemblies, wrenches, mounting pads, and operating instructions. Order abrasives separately. Each ASTM/AASHTO test requires about 10lb (4.5kg) of silicon carbide grit. Inquire for a version of this machine meeting BS812/EN 1097-8, available as HM-615. **Product Dimensions:** 32x31x48in (810x790x1,230mm), WxDxH.

Accelerated Polishing Machine	
Accelerated Polishing Machine, 115V/60Hz	HM-614
230V/50Hz	HM-614F
Accessories	
Abrasive Silicon Carbide Grit, 50lb (23kg) box	HMA-240
Tired Wheel Assembly ASTM (for Silicon Carbide)	HMA-250
Replacement Tire (Pneumatic) with Tube	HMA-251
Accelerated Polishing Specimen Mold	HMA-258
Mold Plate	HMA-259

VIDEO ONLINE

SEA-100

SAND EQUIVALENT TESTING

ASTM D2419, D3744; AASHTO T 176, T 210; CALIFORNIA 217, 229

Sand Equivalent Testing	
Description	**Model**
Sand Equivalent Test Set includes four Clear Plastic Graduated Cylinders, a Siphon Assembly, Irrigator Tube, Weighted Foot, Funnel, Measuring Tin, Solid Stopper and 8oz of Stock Solution. All items are packed in a convenient, plastic case with foam lining with carrying handle and latch. **Product Dimensions:** 22x5x13in (559x127x330mm), WxDxH.	SEA-100
Basic Sand Equivalent Test Set includes all components of the SEA-100 Standard Set, but is supplied without the carrying case.	SEA-99
Plastic Graduated Cylinder is transparent acrylic, 17x1.25in (432x31.8mm), HxID, with 0.1in graduations from bottom of cylinder to 15in height.	SEA-101
Stock Solution is a calcium chloride solution available in 8oz (237ml) or 1gal (3.8L) containers. Stock solution is diluted to prepare working solution for testing and has a limited shelf life of 3 months after opened. Stock Solution, 8oz Stock Solution, 1gal	 SEA-102 SEA-103
Weighted Foot Assembly consists of a steel weight, brass foot and sand reading indicator mounted on a brass rod. The assembly weighs 1,000g	SEA-100A
Siphon Assembly includes a siphon tube, blow tube and stopper is used to transfer the working calcium chloride solution into the graduated cylinder. The Irrigation Tube is purchased separately. Siphon Assembly Irrigation Tube	 SEA-100B SEA-100G
Sand Equivalent Funnel has wide mouth and is used to transfer test specimens into the Graduated Cylinder.	SEA-100C
Sand Equivalent Carrying Case is a plastic case with foam lining with handle and latch, and holds all required accessories.	SEA-100E
Solid Stopper is a #7 rubber stopper, seals the graduated cylinder during agitation.	SEA-100F
Measuring Tin is used to measure Stock Solution when preparing working solution, as well as for sampling and measuring specimen material. Round metal, approximately 2.25in (57mm) diameter with 85ml (3oz) capacity.	SC-500-1

SEA-100E

SEA-101

SEA-102

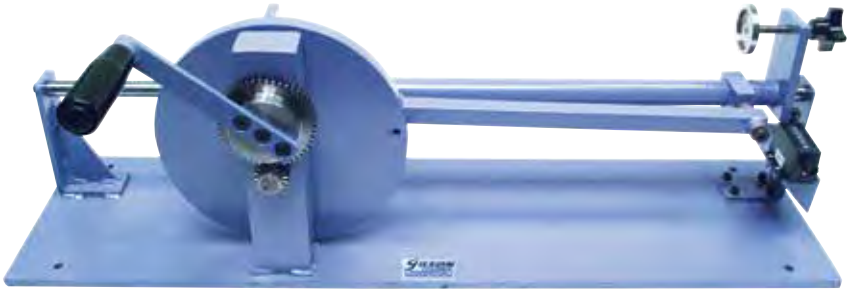
SEA-100A

SEA-100B

SEA-100C

SEA-100F

Find Estimated Ship Weights for all our products in the Ship Weight Index



SE-6

SE-2B shown with SEA-101

SE-5

SAND EQUIVALENT SHAKERS

ASTM D2419, D3774; AASHTO T 176, T 210; CALIFORNIA 217, 229

The Sand Equivalent Test indicates the portion of undesirable clay-like fines in granular soils and fine aggregates. It is also used in the Durability Index Test, measuring the resistance of aggregates to producing clay-like fines when subjected to degradation. The sample is placed in a clear plastic cylinder with sand equivalent solution, consisting of calcium chloride, formaldehyde, and glycerine. After agitating the cylinder, it is allowed to stand for a sedimentation period. Readings are taken for the clay suspension, and for the sand level. "Sand Equivalent" is the sand reading divided by the clay reading x 100.

SE-2B Motorized Sand Equivalent Shaker is recommended for labs performing sand equivalent tests on a regular basis. Positive DC drive assures precise speed and stroke and eliminates errors. A selection switch gives options of precise fixed times of 45 seconds and 10 minutes. The 8in (203mm) throw at 175cpm is smooth, quiet, and efficient. The 1/8hp DC sealed gear motor is housed in a sturdy metal case. The hinged safety cover with top viewing windows must be closed to operate the shaker. Test cylinder is held securely by base pin and spring-loaded holder on stoppered end. **Product Dimensions:** 35x14x20in (889x356x508mm), WxDxH; allow 10in (254mm) additional height for opening of safety cover.

SE-6 Hand-Crank Sand Equivalent Shaker has 3 cycles per revolution of crank. Operator cranks at one turn per second until the digital counter reaches 131 cycles. Cylinder mounts to fixed-travel guide rod by base pin and threaded clamp holder on stoppered end. Base has holes for mounting. **Product Dimensions:** 30x14x10in (762x356x254mm), LxWxH.

SE-5 Hand-Operated Spring Sand Equivalent Shaker conforms to ASTM, AASHTO and California 217 test methods. Unit has cylinder mounting bracket suspended by two steel straps. Operator manually oscillates cylinder to a preset mark on the case at proper rate. Digital counter records stroke counts. Components are mounted in a vinyl-covered, plywood case with reinforced corners, removable front and a top handle. **Product Dimensions:** 24x6x25in (610x152x635mm), WxDxH.

Sand Equivalent Shakers	
Motorized Sand Equivalent Shaker, 115V/60Hz	SE-2B
230V/50Hz	SE-2BF
Hand-Operated Spring Sand Equivalent Shaker	SE-5
Hand-Crank Sand Equivalent Shaker	SE-6

HM-137

HM-58R

ORGANIC IMPURITIES TEST SET
ASTM C40; AASHTO T 21

This simple test is widely used to detect the presence of organic compounds in fine aggregates. Samples are shaken in a special graduated bottle with a 3% sodium hydroxide solution, then allowed to stand for 24 hours. If the resulting color of the liquid above the test sample is darker than a reference standard color, organic compounds may be present and further testing should be done before approval.

Gilson offers a complete HM-137 Organic Impurities Test Set or individual set components. The set includes six HM-817 graduated 240ml (8oz) colorless glass Impurities Test Bottles, a 1lb (454g) bottle of Sodium Hydroxide (NaOH) Pellets (HM-816), and an HM-815 Color Reference Chart. The sodium hydroxide pellets make enough 3% solution to perform over 150 tests. For strict compliance to ASTM and AASHTO Standards, order HM-818 Reagent Grade Sodium Hydroxide Pellets. The Color Reference Chart has been upgraded to meet the latest ASTM revisions, and has five permanent reference colors mounted in a durable protective plastic case. For areas with shipping restrictions, the HM-137F includes all items listed except the sodium hydroxide reagent. The HM-817 Test Bottles are graduated in oz and ml and have watertight screw-on caps.

Organic Impurities Test Set	
Organic Impurities Test Set	HM-137
Organic Impurities Test Set w/o NaOH	HM-137F
Accessories	
Color Reference Chart	HM-815
Sodium Hydroxide Pellets, 1lb	HM-816
Sodium Hydroxide Pellets, Reagent Grade, 1lb	HM-818
Impurities Test Bottle	HM-817

METHYLENE BLUE VALUE SET
ASTM C837; AASHTO T 330

The Methylene Blue Value (MBV) of fine aggregate is a measure of the amount of potentially harmful fine material present such as clay and organic material. Material passing the No.200 (75µm) sieve is maintained in dispersion with distilled water by mixing with a magnetic stirrer. Methylene Blue solution is titrated into the stirred dispersion in increments until a drop of the mixture on filter paper shows a blue ring indicating that the sample can absorb no more reagent. The MBV is simply a measure of the amount of reagent absorbed, and is proportional to the amount of clay or organic material present.

Methylene Blue Reagent solution is light sensitive. The solution shelf life is 4-6 months maximum, when stored in a dark cabinet in foil-wrapped amber bottles. The HM-58R Set includes 25g of methylene blue reagent in stable powder form, a 50 x 0.1ml special amber glass burette, a burette clamp and stand, two amber 500ml solution storage bottles, three glass 600ml beakers, two glass dropping rods, a 1L volumetric flask, and a 100 sheet pack of 24cm diameter filter paper. Instructions for preparation and storage of solution are provided along with details of the test procedure. The 25g of powder reagent provided in the set is sufficient to prepare solution for over 500 tests. Other required accessories should be ordered if not available in the lab.

Methylene Blue Value Set	
Methylene Blue Value Set	HM-58R
Accessories	
Powder Reagent, 25g	HMA-78
Filter Paper, pkg. 100	HMA-79

SG-40 shown with HMA-11A & SC-74

SG-42

FINE AGGREGATE ANGULARITY APPARATUS
ASTM C1252; AASHTO T 304

This Apparatus determines the uncompacted void content of a fine aggregate sample to indicate angularity and sphericity properties thta affect workability of mix designs. Each sample is mixed with a spatula until it is homogeneous. After filling the hopper, the sample is allowed to flow into the 100ml copper cylindrical measure. The measure has a hole to fit a locating pin on the Funnel Stand to ensure each sample is tested with precision and repeatability. Once the user strikes off excess material, mass is determined and void content is computed. Gilson recommends SC-74 Stainless Steel Pan as a sample retainer.

Included with the SG-40 is a 100ml copper Cylindrical Measure, Funnel with specified hopper, Funnel Stand and a Glass Plate for calibration. **Product Dimensions:** 8x8x14.5in (203x203x368mm), WxDxH.

Fine Aggregate Angularity Apparatus	
Fine Aggregate Angularity Apparatus	SG-40
Accessories	
Glass Plate	SGA-91
100ml Measure	SGA-92
Pan, Stainless Steel 12.5x2in, Dia.xH	SC-74
Spatula	HMA-11A

COARSE AGGREGATE ANGULARITY APPARATUS
AASHTO T 326

The SG-42 apparatus measures uncompacted void content of coarse aggregate. Gradation and void content data provide an indication of angularity, sphericity, and surface texture. NCAT research correlates, test results to permanent deformation and fatigue cracking of asphalt, and the test has been recommended for evaluation of aggregates for hot-mix asphalt pavement.

Aggregate is allowed to free fall from the hopper into a cylindrical measure. Excess heaped aggregate is struck off using the included bar, the mass is measured, and void content is computed.

The hopper, stand and measure are stainless steel. The apparatus also includes glass plate for calibration of the measure. A locator pin and circle on the bottom plate of the stand assure centering the measure below the hopper. SC-181 lightweight fiberglass reinforced plastic pan is 21.2x15.6x6in (538x396x152mm), LxWxH and recommended for containment of particles during testing. The TSA-163 Chute-end Aggregate Handling Pan is useful for weighing and loading of aggregate test material. **Product Dimensions:** 10x10x27in (254x254x686mm), WxDxH.

Coarse Aggregate Angularity Apparatus	
Coarse Aggregate Angularity Apparatus	SG-42
Accessories	
Overflow Pan	SC-181
Chute-end Aggregate Handling Pan	TSA-163
Glass Plate	SGA-94
Stainless Steel Measure	SGA-95

HM-38R

HM-38B

HM-925

HM-926

AGGREGATE SHAPE
ASTM D4791; BS 812-105

Particle Shape		
Description	**Model**	**Test Method**
Proportional Calipers are used for rapid determination of percentages of flat and elongated particles in coarse aggregate fractions of 0.375in (9.5mm) or larger. Both units are constructed of durable plated steel, precision tooled for accuracy. Flat particles are identified by setting the width at the large end of the caliper, then checking thickness of the same aggregate at the smaller end. The aggregate is considered flat if it fits within the smaller gap. Tests for elongated aggregates are performed in a similar manner, comparing length. Both calipers consist of a base plate with fixed posts and a 13in (330mm) pivoting arm with posts at each end to measure opening ratios of 1:2, 1:3, 1:4, and 1:5. **HM-38R Budget Caliper** adjusts by securing a pivot arm screw at one of four threaded positions to provide end opening ratios one at a time. **Product Dimensions:** 16x6x3in (406x173x76mm) WxDxH. **HM-38B Four Station Caliper** is similar, but provides openings for all four ratios simultaneously, without the need to reposition the pivot screw. Posts are easily removed and replaced as necessary. **Product Dimensions:** 16x8x3in (406x203x76mm), WxDxH Budget Proportional Caliper Four-Station Proportional Caliper	 HM-38R HM-38B	ASTM D4791
Thickness Gauge has seven labeled slots for rapid manual determinations of the Flakiness Index of aggregates. Aggregates from each of the seven sieve cuts from 2.5 to 0.25in (63 to 6.3mm) are tried to the openings. Aggregates not passing are identified as flaky, and their percent of the total sample by weight is the flakiness index. Thickness Gauge is enameled sheet metal with clearly marked sieve fraction ranges for each slot. **Product Dimensions:** 15x6x0.375in (381x152x9mm) WxDxH	HM-925	BS 812-105
Length Gauge has six labeled openings between pairs of metal pins for measuring length of aggregate from each of the six sieve cuts from 2 to 0.25in (50 to 6.3mm). The aggregate is elongated when its longest dimension is more than 1.8 times the midsize of the sieve fraction. The mass of all elongated aggregates as percent of the total sample is the elongation index. The Length Gauge has stainless pins set in an anodized brushed aluminum base, stamped with sieve fraction ranges between pins. **Product Dimensions:** 12.75x2x2.5 (324x51x64mm) WxDxH	HM-926	BS 812-105

AUTOMATIC AGGREGATE WASHERS

Gilson Aggregate Washers efficiently wash away fines from aggregate or soil materials. Both Aggregate Washers connect to a standard water line or faucet with user supplied adapter. Water continuously flows into the revolving drum and washes the aggregate sample. The aggregate and water mixture overflows from the wash drum and over a sieve with desired mesh size.

HM-57R

VIDEO ONLINE

HM-52

AUTOMATIC AGGREGATE WASHERS
ASTM C117, D1140; AASHTO T 11

Two Aggregate Washer models automatically wash soil and aggregate samples, removing fines passing the No.200 sieve. Inconsistencies and high cost of manual methods are eliminated. Water is continuously fed into the revolving, inclined stainless steel drum via a permanent regulated connection, and the sample is gently agitated until overflow is clear. Overflow water is directed onto sieves to prevent loss of oversize material. Waste water is then directed to a nearby drain. Select sieves with appropriate opening sizes from our extensive line of Wet-Washing Sieves. Both models are equipped with totally enclosed gear motors for drum rotation and 6ft (1.8M) power cords with GFCI plugs.

HM-57R Full-Size Aggregate Washer allows processing of large aggregate samples up to 15lb (7kg). Drum size is 11in diameter x 13in high (279x330mm), extra drums can be ordered as HMA-261 to improve sample processing efficiency. **Product Dimensions:** 24x20x27in (610x508x686mm), LxWxH.

HM-52 Table Top Aggregate Washer is portable and convenient for placement on a counter top adjacent to a sink. This model is useful for washing geotechnical or small aggregate samples of up to 6—8lb (2.7—3.6kg). The fixed-angle removable drum can be used as a weighing container. Gooseneck water tube swivels aside to allow drum removal. Order extra drums as HMA-260 to improve sample processing efficiency. Stainless steel drum is 9in diameter x 10.75in high (229x273mm). **Product Dimensions:** 19x16x22in (482x406x559mm), LxWxH.

HMA-262 Vacuum Lid can be purchased separately for the HM-52 Aggregate Washer, allowing the wash drum to function both as a deaerator and vacuum pycnometer for asphalt Rice Test or other specific gravity specimens. The unique action of the rotating drum allows the sample to tumble under water during the vacuum process, removing entrapped air. The Lid is made from clear acrylic and fitted with a rotating vacuum seal, a port for connection to a vacuum source and locking tabs. **Product Dimensions:** 13x13x3in (330x330x76mm) WxDxH.

Other recommended accessories for both models include 8in (203mm) and 12in (305mm) brass sieve pans with drains. Vinyl tubing may be used to connect pan to drain, if desired.

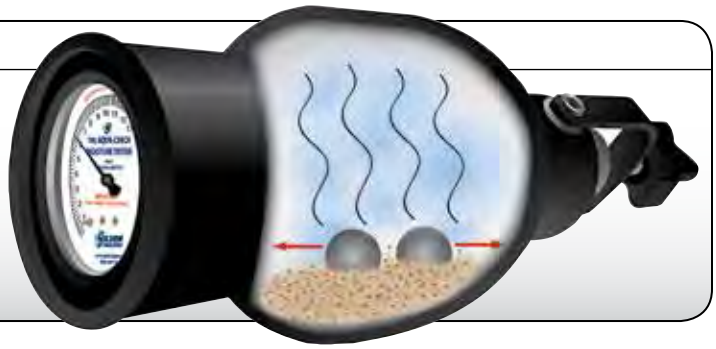
Automatic Aggregate Washers	
Large Aggregate Washer, 115V/60Hz	HM-57R
230V/50Hz	HM-57RF
Small Aggregate Washer, 115V/60Hz	HM-52
230V/50Hz	HM-52F
Accessories	
Wash Drum for HM-52	HMA-260
Wash Drum for HM-57R	HMA-261
Vacuum Lid for HM-52	HMA-262
8in Pan with Drain	WT-3
12in Pan with Drain	WT-10
Vinyl Tubing, 1/4in ID, per foot	WT-8
Hose Clamp	MA-198

alsoavailable

NEW! Wet-wash sieves are used for fines content determinations, or to wash away excessive fines when preparing specimens for particle size testing.

AQUA-CHECK MOISTURE TESTER

The gas-pressure method for moisture determination has long been in use and is widely accepted for accurate field testing of soils, aggregates, coal, abrasives and other materials. These devices are essentially pressure vessels and depend on the formation of gas when the calcium carbide reacts with moisture in the sample. A precision gauge in the sealed chamber measures pressure for relative readings, and results are easily correlated to laboratory results for enhanced accuracy.



MA-26X

MAA-45

MA-26X additional views

GILSON AQUA-CHECK MOISTURE TESTER
ASTM D4944; AASHTO T 217; FLORIDA FM 5-507

Gilson Aqua-Check is made in the USA, and an affordable choice for rapid, accurate, and reliable moisture tests on sand, aggregates, ores, coal, soils, and other materials with particle size up to 20mm (0.8in). Samples can be quickly tested on-site, eliminating risk of moisture loss during transport. Portable units are easy to use, and meet ASTM, AASHTO and Florida DOT requirements. The Gilson Aqua-Check was evaluated by the Florida DOT and verified to meet FM5-507 DOT requirements.

A pre-weighed 20g sample is placed in the test chamber, along with a measured quantity of calcium carbide reagent. When the chamber is sealed and agitated for one to three minutes, free moisture in the test sample reacts with the reagent to produce acetylene gas. The integral pressure gauge registers 0—20% moisture by weight in 0.2% graduations. Moisture range can be doubled by halving the pre-weighed sample weight.

MA-26X Aqua-Check has a rugged, die-cast aluminum body with a tough, wear-resistant coating and includes a 0—20x0.2% pressure gauge, with certificate of calibration. Also included; electronic digital balance, two 1.25in (32mm) dia. steel pulverizing balls, reagent measuring scoop, brush, and instructions in a heavy-duty, waterproof plastic case. Approximate pressure chamber dimensions: 14x5.5in (356x140mm), LxDia. Recalibration of existing Aqua-Check gauges is available as MAA-53. Calcium Carbide Reagent is available separately in 10lb (4.5kg) cans as MAA-44. These bulk containers can be used to refill smaller containers for field use. The pressure gauge and all accessories are compatible with both Aqua-Check and Speedy-brand Moisture Testers.

MAA-45 Aqua-Check 0—20% Replacement Pressure Gauge includes a certificate of calibration, and is also compatible with Speedy-brand MA-21A and MA-25 Moisture Testers. Due to shipping restrictions, additional reagent is sold in 10lb (4.5kg) cans only. Reagent from these larger cans can be used to replenish smaller containers, MAA-43 or SC-116, for field use. **Product Dimensions:** 20x17x9in (508x431x228mm), WxDxH.

Gilson Aqua-Check Moisture Tester	
Gilson Aqua-Check Moisture Tester, without Reagent	MA-26X
Accessories	
Calcium Carbide Reagent, 10lb can	MAA-44
Empty 1lb Metal Can for Reagent	MAA-43
Aqua-Check 0—20% Pressure Gauge	MAA-45
Recalibration of MAA-45 Pressure Gauge	MAA-53
Electronic Balance, 200 x 0.1g	OB-205
1.25in (32mm) Steel Balls, pkg. 2	MAA-47
Sample Cup	MAA-52
Long-Handle Reagent Scoop	MAA-48
Large, Coarse Clean-Out Brush	MAA-51
Small, Fine-Bristle Brush	MAA-50
Heavy-Duty Waterproof Plastic Case	MAA-46
Round Plastic Sample Jars, pkg 12	SC-116

technote

Gilson Company, Inc. now offers a repair service for the MA-26X Aqua-Check Moisture Tester. Please call **800.444.1508** for pricing or to schedule repairs.

RICE TEST SET-UP

Rice tests require removal of free and entrapped air from the asphalt sample. In the typical set-up shown, the vacuum pump removes the free air, while the SGA-5R agitates the pycnometer to remove the entrapped air. The MA-170 measures vacuum applied to the sample and the SG-70 Air/Gas Dryer Tube with indicating drierite prevents water from entering the vacuum pump.

VIDEO ONLINE

SGA-5R shown with SG-16A

Close up of EZ Clamp

MA-170

SGA-5R shown with GW-76 & SGA-8

RICE SHAKER

ASTM C128, D854, D2041, D4867; AASHTO T 84, T 100, T 209; TxDOT Tex-227-F

- **Consistent, repeatable agitation for Asphalt Rice Test and other specific gravity determinations.**
- **Variable vibration control allows for setting optimum agitation.**
- **Automatic operation minimizes operator error and frees technician from hand agitation.**

The Gilson Rice Shaker performs consistent, automatic agitation of Asphalt Rice Test vacuum pycnometers, freeing lab technicians for other duties. It is also a useful deairing device for specific gravity tests of fine aggregates (ASTM C128) and soils (ASTM D854), as well as sample preconditioning per ASTM D4867 and AASHTO T 209.

The Rice Shaker features built-in 0—99 min. digital timer with 1 second accuracy, a vibration speed controller, and a three position switch for manual or timed operation—all front panel mounted for easy use. Variable speed settings closely control agitation to avoid stripping of asphalt. Gilson's exclusive EZ Clamp system quickly secures the pycnometers. Push the buttons, slide into place, and a quick twist secures the container. The painted steel case has non-slip rubber feet so no mounting is required.

The SGA-5R includes fitted top and bottom plates for exact fit with SG-16A or SG-18A Aluminum Pycnometers. Order SGA-7 Adapter Set for use with high-capacity plastic SG-15 Pycnometer. SGA-8 Adapter Set is required for use with GW-75 or GW-76 filter Flasks, SG-500 Volumetric Flasks, SG-24 LeChatelier Flask, or SG-2 Mason Jar Pycnometer. Inquire for fitting other containers. MA-170 Digital Residual Pressure Manometer precisely measures applied vacuum during testing. NIST certified model is available as MA-170C. SGA-5RT has modified vibration characteristics to meet Texas DOT requirements. **Product Dimensions:** 13x14x19in (330x356x483mm), WxDxH.

Rice Shaker	
Rice Shaker, 115V, 50/60Hz	SGA-5R
Rice Shaker, Texas, 115V, 50/60Hz	SGA-5RT
Accessories	
Adapter Set for SG-15	SGA-7
Adapter Set for GW-75 or GW-76	SGA-8
Digital Residual Pressure Manometer, 115v/60Hz	MA-170
230v/50Hz	MA-170F
Digital Residual Pressure Manometer, NIST Calibrated, 115v/60Hz	MA-170C

RICE TEST WITH AUTORICE™ CONTROLLER SYSTEM SET-UP

The Rice Test to measure theoretical maximum specific gravity of asphalt specimens, requires removal of free and entrapped air from the immersed sample. The procedure has been hands-on and time consuming in the past, but the new AutoRice™ Controller System allows precise control of vacuum pressure and time while monitoring SGA-5R Rice Shaker vibration energy. Accuracy and repeatability is increased, while decreasing the need for constant attention to the procedure.

SG-35 Controller

SG-35 Controller shown with PumpSaver™

AUTORICE™ DIGITAL MANOMETER & CONTROLLER SYSTEM

ASTM D2041; AASHTO T 209, T 283

The AutoRice™ Digital Manometer and Controller precisely measures vacuum and regulates the vacuum pressure setting and time. The device can also be equipped to monitor shaker vibration energy during theoretical maximum specific gravity testing (Rice Test) of hot-mix asphalt samples. Careful control of these three important factors can mean dramatic improvements in inter-laboratory repeatability and accuracy. Variations in acceleration and frequency energy produced by rice shakers can create repeatability issues as well as cause stripping of the sample. Actual shaker energy profiles have not been monitored up until now, and accurate measurements helps establish parameters for adjustment of settings between different shakers.

With the push of a button, the AutoRice™ Controller starts the vacuum pump, regulates vacuum pressure, controls vacuum time and displays vacuum pressure. The optional SGA-126 Shaker Sensor is purchased separately, attaches to the pycnometer and is connected to the controller's USB port to measure vibration acceleration and frequency. Data from the sensor can be used to calculate a "shaker factor" to establish proper vibration levels. The Controller is easy to setup with menu driven software and replaces traditional analog or digital manometers. Sample weights can be entered and the system calculates maximum specific gravity results. Data from each test cycle can be downloaded to a PC via the USB port for review to assure adherence to test specifications. Documented test data can be stored and shared or emailed. The Controller and Shake Sensor work well with Gilson's SGA-5R Rice Shaker and are compatible with glass, metal or plastic pycnometers. Compact design allows benchtop placement or easy wall-mounting of the controller. The SG-35 also automates the saturation process for AASHTO T 283 Moisture-Induced Damage specimens. The Controller is equipped with a 3/8in (10mm) hose barb connection and controls vacuum pumps up to 3/4hp to ±0.4mm at 27.5mmHg. Controller Module dimensions are 12x4x9in (305x102x229mm) WxDxH.

Gilson recommends use of the SGA-128 PumpSaver™ when operating the SG-35 AutoRice™ device. PumpSaver™ is an air drier to protect vacuum pumps and optimize efficiency. The high-performance thermoelectric (Peltier) chamber chills incoming air, condensing moisture and removing it before it reaches the vacuum pump, eliminating the need for elaborate moisture traps and desiccant cartridges. It also reduces resistance to air flow, maximizing pump efficiency and increasing service life. Your pump reaches the desired vacuum immediately, enhancing accuracy and repeatability. The unit has one inlet and one outlet port for connection between the vacuum pump and pycnometer, using 3/8, 7/16 or 1/2in (10, 11, or 13.5mm) ID tubing, purchased separately. The AutoRice™ and PumpSaver™ devices can be purchased together as model SG-36. PumpSaver dimensions are 11x8x8in (280x203x203mm) WxDxH. Both models operate on nominal 120 to 240V/ 50 or 60Hz electrical supplies.

AutoRice™ Digital Manometer and Controller System	
AutoRice™ Digital Manometer and Controller System, 120 to 240V/50 or 60Hz	SG-35
AutoRice™ Digital Manometer and Controller w/ PumpSaver™, 120 to 240V/50 or 60Hz	SG-36
Accessories	
Shake Sensor	SGA-126
PumpSaver™ Air Drier, 120 to 240V/50 or 60Hz	SGA-128
3/8in ID Reinforced Vinyl Tubing, per foot	WT-4B

Find Estimated Ship Weights for all our products in the Ship Weight Index

SG-16A

SG-15

GW-76

SG-28

SG-70

SGA-105

WT-4B

MA-198

Specific Gravity Pycnometers

Description	Model	Test Method
2,000g Aluminum Pycnometer is 7.5x6in (191x152mm) Dia.xD and tests a maximum 2,000g sample with aggregates up to 0.75in (19.1mm). A transparent vacuum lid and a second tapered aluminum lid with capillary bore are included to allow use as a volumeter for specific gravity of compacted mixes. Vacuum hose, quick-disconnect, and a 3/8in (9.5mm) threaded aspirator vacuum source are included. **Product Dimensions:** 8.125x6.375in (206x162mm) DiaxH.	SG-16A	ASTM D2041 AASHTO T 209
4,000g Aluminum Pycnometer with higher capacity is 7.5x9in (191x229mm) Dia.xD with enough volume for specimens up to 4,000g. Included transparent acrylic Vacuum Lid and Aluminum Lid with capillary bore are identical to SG-16A lids for use in specific gravity of compacted mixtures. Vacuum hose, quick-disconnect, and a 3/8in (9.5mm) threaded aspirator vacuum source are also included. **Product Dimensions:** 8.125x9.375in (206x238mm) DiaxH.	SG-18A	ASTM D2041 AASHTO T 209
6,000g Pycnometer has large, 10L capacity for mixes with aggregates up to 2in (51mm). High strength plastic vessel with O-ring seal is 9.38in (238mm) I.D. An adjustable valve controls water level, and a perforated plastic shelf is included. The shelf supports three 4in (102mm) dia. specimens. Vacuum hose, quick-disconnect, and a 3/8in (9.5mm) threaded aspirator vacuum source are included. **Product Dimensions:** 10.75x13.3in (273x338mm), Dia.xHt.	SG-15	ASTM D2041 AASHTO T 209
Heavy Wall Filter Flask meets ASTM and AASHTO requirements for use as a vacuum pycnometer for weighing in air only. The 4L glass flask must be fitted with GWA-3 Stopper, purchased separately, with a 0.375in (9.5mm) hole for vacuum use.	GW-76	ASTM D2041 AASHTO T 209
Phunque Flasks are fast and reliable to determine specific gravity/absorption of fine, coarse, or blended fine and coarse aggregate. Simple procedures are ideal for tracking values without the complexity and delay of traditional lab tests. SG-26 for fine aggregate has 2,500ml capacity and 1in (25mm) diameter neck. **Product Dimensions:** 7x39in (178x991mm) Dia.xHt. SG-27 for coarse, and blended fine and coarse aggregate has 5,000ml overall capacity. a 2in (51mm) diameter neck. **Product Dimensions:** 8.5x48in (216x1,219mm) Dia.xHt. Scale on both are readable to 0.1 grams. Both Flasks can be purchased together as SG-28 Set. Quality laboratory-grade glassware includes Excel calculation sheet and a swabbing utensil. Phunque Flask for Fine Aggregate Phunque Flask for Coarse or Blended Aggregate Phunque Flask Set, for Fine & Coarse Aggregate	 SG-26 SG-27 SG-28	ASTM PENDING; AASHTO T 354
Laboratory Air/Gas Dryer protects vacuum pumps from harmful moisture while deairing specific gravity specimens and works in vacuum or pressure applications. Water capacity is 50 grams. Molded polycarbonate column has a threaded cap, and stainless steel springs hold the included Indicating Drierite Granules between two felt filters. Hose barbs accept 1/4in (6.4mm) or 3/8in (9.5mm) ID tubing. Recommended Flow Rate: 0.1scfm (200lph) at 90psi (6.2bar). **Product Dimensions:** 2.6x11.4in (67x289mm) Dia.xL.	SG-70	
Indicating Drierite Granules rapidly absorb water vapor from air and gases. Blue desiccant crystals turn pink when exhausted and can be regenerated in an oven for longer life, or replaced as needed. Use #8 size for SG-70 Laboratory Air/Gas Dryer, and #4 size in GW-74 Filter Flasks. #4 Indicating Drierite Granules, 5lb (2.3kg) Jar #8 Indicating Drierite Granules, 5lb (2.3kg) Jar	 SGA-105 SGA-106	
Accessories for asphalt specific gravity determinations includes 3/8in Reinforced Vinyl Tubing priced per foot, Tubing Clamp, and #12 Rubber Stopper with 0.375in (9.5mm) hole for GW-76 Flask. 3/8in ID Reinforced Vinyl Tubing, per foot Tubing Clamp #12 Rubber Stopper	 WT-4B MA-198 GWA-3	

MA-23

MA-24

MA-27A

MA-28

MA-29

MA-32

MA-31

MA-33

VACUUM PUMPS

ASTM C830, D2041, D2172, D4867; AASHTO T 100, T 164, T 209

MA-23 Vacuum Pump is a large oilless pump that allows multiple specific gravity tests to be performed simultaneously. This heavy-duty unit combines large capacity with maintenance free operation. The 1/3hp motor pulls 29.6in Hg (759.46mm), with free air displacement up to 99L/min (3.5cfm), and ultimate pressure of 5.0Torr, and includes a NEMA guarded switch and grounded electric cord. **Product Dimensions:** 11.1x9.2x11.0in (282x234x279mm).

MA-24 Vacuum Pump offers the same vacuum capacity as some oil systems in an economical oilless pump package. The 1/3hp motor pulls a vacuum to 29.6in Hg (759.46mm), with free-air displacement up to 45L/min (1.6cfm) and ultimate pressure of 5.0Torr, and includes a NEMA guarded switch and grounded electric cord. **Product Dimensions:** 11.7x7.2x9.5in (296x183x240mm).

MA-27A Vacuum Pump has a two-stage, direct drive, rotary vane pump that provides good performance to cost ratio. This lightweight 1/2hp pump features 0.001Torr ultimate vacuum pressure and 3.0cfm free air capacity. The compact design reduces space requirements and a 2.5in (64mm) diameter Bourdon-style 0—30in (0—762mm) vacuum gauge is mounted on the intake side. A gas ballast valve permits purging of water vapor. The handy plastic grip handle allows easy portability. **Product Dimensions:** 14x5.25x11in (355x133x279mm), WxDxH.

MA-28 Vacuum Pump has a two-stage, belt drive, rotary vane pump that has fast recovery time and good durability. This quiet, reliable pump has standard 0.375in intake fittings for quick connection or adaptation to other equipment. It also features a drain cock and sight glass for easy maintenance and monitoring of oil levels, an approved belt guard and On/Off switch. A one-year manufacturer parts and labor guarantee is standard. The exhaust dome and baffle condense oil spray for cleaner operation. **Product Dimensions:** 18.5x10x10.75in (470x254x273mm), WxDxH.

MA-29 Vacuum Pump has a two-stage, belt drive, rotary vane pump that has high vacuum capacity and good free air capacity for higher volume applications. The heavy-duty unit features cast-iron construction, quiet operation and long service life. Pump is supplied with motor, pulley and belt with guard mounted on a sturdy steel base. An oil sight gauge, drain cock, and standard 0.875in intake fitting are also included. The initial fill and an extra quart of oil are provided. A gas ballast valve is fitted for purging water vapor and other condensates. Pump recovers from atmospheric exposure to guaranteed 0.0001Torr in one to three minutes. **Product Dimensions:** 17.3x11.5x13in (438x292x330mm), WxDxH.

MA-31 Economy Chemical Resistant Vacuum Pump is a smaller, affordable, oiless pump optimized for ultimate protection against corrosive solvents. This quiet model exhibits noise levels as low as 54dB and is optimized for vacuum filtration and degassing applications. The low-maintenance MA-31 is equipped with a 1/7hp motor that pulls a vacuum to 22in Hg (559mm), with free air displacement up to 20L/min (0.7cfm) and ultimate pressure of 203.2 Torr. The pump includes a regulator gauge to adjust and monitor vacuum levels, and the inlet catch-pot protects from accidental intake of fluids and particulates. **Product Dimensions:** 6.8x7.3x8.3in (173x185x211mm), LxWxH.

MA-32 Vacuum Pump is a budget oil-less diaphragm pump that is ideal for use with light-to-medium duty lab applications. This popular unit comes complete with gauges, connections, and relief valves for vacuum and pressure applications and has built-in On/Off switch and carrying handle. Pump has free air capacity of 1.1cfm (31.2L/min), and can produce vacuum to 25.5in Hg (648mm), or up to 60psi (414kPa) pressure as a compressor. It is quiet, portable, and maintenance free. The pump has 1/8hp, 115V, 60Hz shaded pole motor with thermal protection and is UL listed and CSA approved. **Product Dimensions:** 5.3x7.6x10.5in (133x194x267mm), WxDxH.

MA-33 Chemical Resistant Vacuum Pump is a durable, corrosion and bleach-resistant pump ideal for mid-range vacuum applications, and safe for use with cell culture contamination protocols. The included liquid inlet trap and vacuum regulator are suitable for organic aqueous solvents and light acid/base solutions. The 1/5hp motor pulls a 24in Hg (607mm) vacuum, with free air displacement up to 37L/min (1.3cfm), and ultimate pressure of 152.4 Torr. The unit is supplied with an electrical line cord, plug and power switch. **Product Dimensions:** 8.75x5x8.75in (222x147x222mm), LxWxH.

Vacuum Pumps

Model	Electrical	hp (kW)	Ultimate Vacuum Torr	Free Air Capacity cfm (L/min)	Intake Nipple OD in (mm)
MA-23 MA-23F	115V/60Hz 230V/50Hz	1/3 (0.25) 1/3 (0.25)	5.0 5.0	3.5 (99) 3.5 (99)	0.375 (9.5) 0.375 (9.5)
MA-24 MA-24F	115V/60Hz 230V/50Hz	1/3 (0.25) 1/3 (0.25)	5.0 5.0	1.6 (45) 1.6 (45)	0.375 (9.5) 0.375 (9.5)
MA-27A MA-27AF	115V/60Hz 230V/50Hz	1/2 (0.37) 1/2 (0.37)	0.001 0.001	3.0 (85) 3.0 (85)	0.375 (9.5) 0.375 (9.5)
MA-28 MA-28F	115V/60Hz 230V/50Hz	1/3 (0.25) 1/3 (0.25)	0.0003 0.0003	0.35 (10) 0.35 (10)	0.375 (9.5) 0.375 (9.5)
MA-29 MA-29F	115V/60Hz 230V/50Hz	1/2 (0.37) 1/2 (0.37)	0.0001 0.0001	2.79 (79) 2.79 (79)	0.875 (22) 0.875 (22)
MA-31	115V/60Hz	1/7 (0.14)	203.2	0.7 (20)	0.25 (6.3)
MA-32	115V/60Hz	1/8 (0.10)	152	1.1 (32)	0.25 (6.3)
MA-33 MA-33F	115V/60Hz 230V/50Hz	1/5 (0.20) 1/5 (0.20)	152.4 152.4	1.3 (37) 1.3 (37)	0.25 (6.3) 0.25 (6.3)

Find Estimated Ship Weights for all our products in the Ship Weight Index

VIDEO ONLINE

SG-20 shown with SGA-120, OBX-512 & SG-7A

MA-170

SPECIFIC GRAVITY BENCH

ASTM C20, C127, C642, C830, D1188, D2041, D2726; AASHTO T 85, T 166, T 209, T 275

The SG-20 Specific Gravity Bench allows easy weighing of suspended samples in water for relative density determinations of aggregates, hardened concrete, bituminous mixtures, refractory brick, and similar materials. Bench is sturdy painted steel and features three 2in (51mm) diameter holes in the top for suspension of samples and thermometer. The lower support doubles as a shelf that can be adjusted to fit Gilson 30gal (114L) or 44gal (170L) Plastic Water Tanks. Requires assembly. **Product Dimensions:** 31x25x46in (787x635x1,168mm).

Heavy-duty polyethylene water tanks are ordered separately. Both 0.25in (6.4mm) thick molded tanks are seamless and translucent for water level visibility, and equipped with drain and overflow outlets. Maximum operating temperature is 140°F (60°C). SGA-120 has 30gal (114L) capacity with dimensions of 24x18x18in (610x457x457mm) LxWxD. SGA-122 has 44gal (170L) capacity and 24x18x24in (610x457x610mm) LxWxD, and is preferred for ASTM D2041, AASHTO T 209 and similar tests.

HM-651 Heater and HM-655 Circulator or alternate HM-649 Portable Heater/Circulator accessories for temperature control are ordered separately. Use SGA-130 Locking Caster Set for portability of the bench. Stainless Steel SGA-125 Large Density Weighing Cradle allows for samples to tilt backward to prevent specimen loss. SGA-119 Small Density Weighing Cradle, shaped from heavy stainless steel wire, is useful for weighing odd-shaped specimens. Additional accessories and scales are described elsewhere. SGA-125 and SGA-119 dimensions are 4x4x6.5in (102x102x165mm) and 10x6x2in (254x152x655mm) respectively.

Specific Gravity Bench	
Specific Gravity Bench & Tank Shelf (without Tank), 115V/60Hz	SG-20
Accessories	
Water Tank 30 gallon, 18in deep	SGA-120
Water Tank 44 gallon, 24in deep	SGA-122
Small Density Weighing Cradle	SGA-119
Large Density Weighing Cradle	SGA-125
Tank Heater	HM-651
Tank Circulator	HM-655
EZ Mount Heater/Circulator	HM-649
Locking Caster Set	SGA-130
Wire Basket for ASTM C127	SG-7A

DIGITAL RESIDUAL PRESSURE MANOMETERS

ASTM D2041; AASHTO T 209

MA-170 Digital Manometer is a safe, accurate and environmentally friendly alternative for precise measurement of vacuum levels. The mercury-free gauge uses an absolute pressure transducer for instant digital display of applied vacuum from 0—1,000mm Hg. Resolution is 0.1mm. A 0.25in hose barb connection with a needle valve is supplied for vacuum tubing.

The MA-170C version is supplied with a certificate of NIST calibration to meet requirements of AASHTO T 209. This model undergoes multi-point calibration at 25, 30 and 35mm Hg on NIST traceable equipment. The same NIST calibration or recalibration is available for existing MA-170 Digital Manometers by ordering MAA-25 and sending the units in. Contact Gilson customer service for shipping instructions.

Both models are powered by a 9V battery or included AC adapter. Automatic shut-off saves power in battery mode. Adapter included with MA-170F and MA-170FC operates on 230V/50Hz. **Product Dimensions:** 3.1x6.5x1.18in (78.7x165.1x30mm), WxDxH.

Digital Residual Pressure Manometers		
Digital Manometer, 115V/60Hz		MA-170
	230V/50Hz	MA-170F
Digital Manometer, NIST Calibration, 115V/60Hz		MA-170C
	230V/50Hz	MA-170FC
Digital Manometer Recalibration		MAA-25

BK-36

SG-1

SG-6

SG-450 SG-24 SG-250

SG-30 SG-62 SG-63

Specific Gravity Accessories

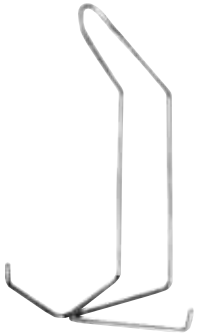
Description	Model	Test Method
THE AGGREGATES HANDBOOK This compilation of articles creates a comprehensive reference for anyone dealing with aggregates. Discusses basic properties, aggregate as a component of Portland cement and asphalt concrete, sampling and testing principles and more. New second edition features expanded coverage of many industry topics	BK-36	–
Specific Gravity & Absorption of Fine Aggregate Set includes pycnometer with conical mold and tamper. Pycnometer is 1qt (0.95L) threaded glass jar with a rubber gasketed brass top tapered to 0.125in (10mm) hole at top. Mold is 40mm ID at top, 90mm at bottom, 75mm H. The 340g tamper has 25mm diameter face. Complete Set Jar & Top Mold & Tamper Mold Only Tamper Only	 SG-1 SG-2 SG-3 SGA-15 SGA-16	ASTM C128 AASHTO T 84
Specific Gravity & Absorption of Coarse Aggregate Set includes Stainless Steel Wire Mesh Basket with handle and polyethylene 24qt Water Container for weighing coarse aggregate samples while suspended in water. Wire Basket is No.8 stainless steel mesh, 8x8in (203x203mm), Dia.xH. Inquire for baskets with No.4, No.6, No.12 or No.16 mesh sizes. 14qt Galvanized Pail is available as a container. #8 Wire Mesh Basket and Polyethylene Container Set #8 Wire Mesh Basket Polyethylene Container 14qt Galvanized Pail	 SG-6 SG-7A SG-8 MA-950	ASTM C127 AASHTO T 85
Chapman Specific Gravity Flask is used to determine approximate percentage of surface moisture and voids in fine aggregates. Upper and lower bulbs contain 175ml and 200ml, respectively. Stem is graduated above the bulbs from 375 to 450ml.	SG-450	ASTM C70
LeChatelier Specific Gravity Flask is used to obtain specific gravity of hydraulic cement, dust, sand, and other fine materials. Body holds about 250ml, bulb in neck holds 17ml. Below the bulb are graduations from 0 to 1ml. Above the bulb, the neck is graduated from 18 to 24ml. Complete with stopper. Inquire for Gay-Lussac type SG bottles.	SG-24	ASTM C188 AASHTO T 133
Volumetric Flasks are calibrated to contain indicated capacity at 20°C when filled to mark. Supplied with plastic snap cap. Volumetric Flask 100ml Volumetric Flask 250ml Volumetric Flask 500ml Volumetric Flask, 1,000ml	 SG-100 SG-250 SG-500 SG-1000	ASTM D854 AASHTO T 100
Volumeters are precision machined cast aluminum and meet Pennsylvania PTM 715 and 716 for determining specific gravity of compacted bituminous mixtures. Treated for corrosion resistance and available in three sizes. Each has matching volumetric lid and is guaranteed for weight repeatability of ±0.2g at 77°F (25°C). Dimensions listed are inside dia. x depth, in (mm). Volumeter, 7.5x6 (191x152) Volumeter, 7.5x4 (191x102) Volumeter, 5.375x3.5 (137x89)	 SG-30 SG-32 SG-33	PTM 715, 716
Hubbard & Hubbard-Carmick Specific Gravity Bottles determine specific gravity of semi-solid bituminous materials, asphalt cements and soft tar pitches. Included stopper is concave on lower surface and has 1.6mm center hole for air evacuation. Hubbard bottle is 1.06x2.75in (27x70mm) Dia.xH with 24ml capacity. Conical Hubbard-Carmick bottle is 1.54x1.7in (39x43mm), Dia. (at bottom) xH (without stopper) with 25ml capacity. Hubbard Specific Gravity Bottle Hubbard-Carmick Specific Gravity Bottle	 SG-62 SG-63	ASTM D70 AASHTO T 43

VIDEO ONLINE

SS-28 shown with SG-2

GW-76, GW-75 & GW-74 shown with Stopper Fittings

HM-649



SGA-125

SGA-119

SG-70

SGA-105

WT-4B

MA-198

Specific Gravity Accessories

Description	Model	Test Method
Vibra Pad assists with agitation of specific gravity specimens during deairing operations and is specified by the Kentucky Transportation Cabinet for fine aggregate specific gravity testing. The plastic coated 5.25in (133mm) square platform has two wing nut fasteners and corner pillars with springs for holding flasks and pycnometers up to 6in (152mm) diameter in place. **Product Dimensions:** 6x7x6.5in (152x178x165mm), WxDxH.		KM 64-605
Vibra Pad, 115V, 50/60Hz	SS-28	
Vibra Pad, 230V, 50/60Hz	SS-28F	
Filter Flasks are thick-walled glass with side tubulations for 3/8in (9.5mm) ID vacuum tubing. 2L and 4L sizes are often used as pycnometers, and GW-76 4L Flask meets ASTM and AASHTO specifications for use as a vacuum container for weighing in air only. 1L flasks can be used in line with SGA-105 #4 Drierite granules as a moisture trap for vacuum pump protection. Neoprene stoppers have 3/8in (9.5mm) hole.		ASTM D2041 AASHTO T 209, T 283
1L Heavy-Wall Flask	GW-74	
2L Heavy-Wall Flask	GW-75	
4L Heavy-Wall Flask	GW-76	
#8 Stopper for GW-74 Flask	GWA-1	
#9 Stopper for GW-75 Flask	GWA-2	
#12 Stopper for GW-76 Flask	GWA-3	
EZ Mount Heater/Circulator for laboratory water bath tanks combines circulation and temperature functionality into a compact and portable unit. mounts securely to straight or curved tank walls with an adjustable clamp, and dismounts quickly for use on other tanks. Compact Design features convenient sliding control to adjust flow rate and easy to read 3.25" LCD backlit display with onscreen prompts. Tough plastic protective housing is easy to keep clean. Over temperature and low-liquid level shut-offs are set manually to assure safe operation. HM-649 has 1,100-Watt heat output and adjustable pump flow up to 3.4gpm (12.8Lpm) to heat and maintain water in SGA-120 and SGA-122 tanks to the required temperature ranges. Smaller tanks up to 7.4gal (28L), temperatures are controlled to ±0.13° from ambient + 20° to 275°F (±0.07° from ambient + 10° to 135°C). Maximum flow rate for model HM-649F is 2.8gpm (10.6Lpm). Suitable for tanks with a working depth of 7.25in (18.4 cm) or more, using tap or distilled water only. Two-year manufacturer's warranty. Supplied with a 5ft power cord with grounded plug. **Product Dimensions:** 4.3x3.8x14.1in (109x97x358mm), WxDxH.		
EZ Mount Heater/Circulator, 115V/60Hz	HM-649	
EZ Mount Heater/Circulator230V/50Hz	HM-649F	
Density Weighing Cradles are fabricated of heavy stainless steel rod to hold various size samples and containers for suspension weighing. **SGA-135 Mega Weighing Cradle** for large specimens and pycnometers accepts the HMA-260 Small Aggra-Washer Drum when used with the HMA-262 Vacuum Lid for Rice tests, the SG-18A Vacuum Pycnometer, and other large samples. Vertical clearance is 12.5in (318mm). **Product Dimensions:** 10x6x17in (254x152x432mm) WxDxH. **SGA-125 Large Cradle** accepts SG-16A Vacuum Pycnometer Canisters, Aggregate Density Baskets, Marshall or Gyratory Compaction Specimens, cores up to 6in (152mm) and other large samples. The Cradle tilts back when loaded to prevent specimen loss. **Product Dimensions:** 10x6x12.5in (254x152x318mm) WxDxH. **SGA-119 Small Weighing Cradle** holds various Marshall, Gyratory, or other material specimens for suspension weighing. **Product Dimensions:** 4x4x6.5in (102x102x165mm), WxDxH.		ASTM C20, C127, D1188, D2041 AASHTO T 85, T 166, T 209, T 275
Mega Weighing Cradle	SGA-135	
Large Density Weighing Cradle	SGA-125	
Small Density Weighing Cradle	SGA-119	
Laboratory Air/Gas Dryer protects vacuum pumps from harmful moisture while deairing specific gravity specimens and works in vacuum or pressure applications. Water capacity 50 grams. Molded polycarbonate column has a threaded cap, and stainless steel springs hold the included Indicated Drierite Granules between two felt filters. Hose barbs accept 1/4in (6.4mm) or 3/8in (9.5mm) ID tubing. Recommended Flow Rate: 0.1scfm (200lph) at 90psi (6.2bar). **Product Dimensions:** 2.6x11.4in (67x289mm) Dia.xL.	SG-70	
Indicating Drierite Granules rapidly absorb water vapor from air and gases. Blue desiccant crystals turn pink when exhausted and can be regenerated in an oven for longer life, or replaced as needed. Use #8 size for SG-70 Laboratory Air/Gas Dryer, and #4 size in GW-74 Filter Flasks.		
#4 Indicating Drierite Granules, 5lb (2.3kg) Jar	SGA-105	
#8 Indicating Drierite Granules, 5lb (2.3kg) Jar	SGA-106	
Reinforced Vinyl Tubing has 3/8in (9.5mm) ID and will not collapse under vacuum. Priced per foot.	WT-4B	
Adjustable Hose Clamp has adjustment screw for vacuum regulation in vinyl tubing. Nickle-plated brass with pivoting lower jaw.	MA-198	

HM-685

HMA-624

HMA-619

technote

Superpave™ Gyratory Compactor Specifications

Number of Gyrations	0 to 999
Speed of Gyrations	30 gpm
Compaction Force	200 to 999kPa
Angle of Gyration	0.00 to 1.50° (Selectable internal or external)
Mold Dimensions	150x250mm, Dia. x Ht 100x250mm, Dia. x Ht
Specimen Ht.	0.00mm to 200mm
Dimensions	34.5x35.5x54in (876x902x1,372mm) WxDxH
Power Requirements HM-685 HM-685F HM-685S HM-685SF	 115V/60Hz, 12 A, 1ph 230V/50-60Hz, 6 A, 1ph 115V/60Hz, 12 A, 1ph 230V/50-60Hz, 6 A, 1ph

SUPERPAVE™ GYRATORY COMPACTOR
ASTM D6925, D7229; AASHTO T 312

The Superpave™ Gyratory Compactor is made in the USA by Pine Instruments and meets all Superpave requirements for preparation of hot mix asphalt specimens. User-controlled variable settings for compaction pressure, angle adjustment, gyrations, and adaptability for different size molds make this reliable unit versatile to test a wide range of materials and applications. An integrated computer with two USB ports and an Ethernet jack controls settings through a simple menu interface, and a four-button control panel simplifies machine operation. The computer also controls the angle of gyration and allows the user to switch between internal and external angle settings with little effort. The control system is network compatible for complete data management. Number and angle of gyrations, specimen height, and consolidation pressure can be sent through an Ethernet cable to a network or to a stand-alone PC, stored on a flash drive, or printed directly with the optional HMA-626 PCL Laser Printer.

Operation modes can be set to a specified number of gyrations, specified sample height, or a locking point, all at a selected internal or external angle. Total gyrations can be selected from 0 to 999 at 30 ±0.5 gyrations per minute and 0° to 1.50° internal or external angle, with compaction pressure selectable from 200 to 999kPa. Final specimen height is user-controlled to 210mm. A built-in specimen extruder and a completely enclosed compacting chamber are convenience and safety features, minimizing lifting of hot, heavy molds, and shielding moving parts.

The HM-685 is equipped for 150mm diameter specimen sizes, but can be configured to use 100mm or 4.0in molds with the optional Conversion Kit. Precision machined steel Mold Assemblies are ordered separately in 150mm, 100mm, and 4.0in (101.6mm) inside diameters. Order extra molds for more efficient sample preparation and processing. Overall mold height is 250mm for all diameters and compacted specimen height is 200mm. A bottom platen is supplied with each mold. A Mold Funnel and Specimen Lift handle are optional accessories for each machine. Internal angle of gyration and gyratory shear force measurement are confirmed using the self-contained HMA-621 Rapid Angle Measurement Device, purchased separately. A 5,000lbf (22.2kN) Load Ring and Gage Blocks are available to verify force and spacing requirements. Both are certified and NIST traceable. An optional HMA-629 Cooling Door for the compaction chamber reduces waiting times for specimen cooling and extrusion for asphalt mixtures containing rubber. A specimen squaring function resists specimen expansion issues when testing hot mix asphalt with ground tire rubber content. Power requirements are 115V/50-60Hz, or 230V/50-60Hz for the HM-685F. Inquire for other electrical configurations. Machine weight is approximately 880lb (400kg). **Product Dimensions:** 34.5 x35.5x54in (875x900x1,375mm) WxDxH.

The HM-685S is an identical Superpave™ Gyratory Compactor, which has been factory-equipped to measure and graph gyratory shear, the force required to gyrate the specimen. The data can be depicted as gyratory shear force vs. gyrations or as shear force vs. percent air-voids. This information provides insight into the workability and compactability of a mix.

Superpave™ Gyratory Compactor	
Superpave™ Gyratory Compactor, 115V/60Hz	HM-685
230V/50-60Hz	HM-685F
Superpave™ Gyratory Compactor w/Shear Measurement, 115V/60Hz	HM-685S
230V/50-60Hz	HM-685SF
Accessories	
150mm Gyratory Compactor Mold Assembly	HMA-615
100mm Gyratory Compactor Mold Assembly	HMA-616
4.0in Gyratory Compactor Mold Assembly	HMA-617
Gyratory Compaction Mold Funnel, 150mm	HMA-618
Conversion Kit for 100mm and 4.0in Molds	HMA-619
Specimen Cooling Door	HMA-629
Specimen Lift Handles, 150mm	HMA-624
Specimen Lift Handles, 100mm and 4.0in	HMA-630
External Angle Measurement Jig	HMA-628
Laser Printer	hma-626
Rapid Angle Measurement Device	hma-621

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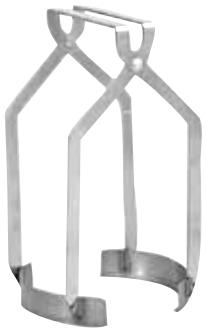
HM-687

HMA-696

HMA-694



HMA-697

BROVOLD SUPERPAVE™ GYRATORY COMPACTOR

ASTM D6925, D7229; AASHTO T 312

The rugged and proven Brovold Gyratory Compactor is unmatched for portability and ease of use when compacting hot mix asphalt specimens. This reliable self-contained model is built by Pine Instruments and is ideal for both mix design and QC/QA applications. The self-contained unit weighs only 304lb (138kg) and is easily transported to remote sites or mobile labs in the bed of a pickup truck. An integrated industrial computer controls the entire specimen compaction cycle. After compaction parameters are entered through the simple, menu-driven controller, and the prepared mold is set in place, just secure the gyratory head and press start. The system automatically applies consolidation pressure, induces the angle, and gyrates the mold to the specified settings. At completion, the specimen is extruded with the same hydraulic ram used for compaction, eliminating handling of hot, heavy molds. Rigid tubular frame design and patented gyratory mechanism assure accurate, repeatable results.

The HM-687 Brovold Gyratory includes integrated data logging functionality designed by Pine to save or export data to a portable USB flash drive, or output directly to an optional PCL Laser Printer. Up to ten completed tests are stored in the compactor's internal memory, and data is also output to the two USB ports for flash drive and printer as well as a RS232 serial port. Test data can also be viewed in real time on the four-line digital display. Default settings of the HM-687 control compaction of specimens to the height, number of gyrations, compaction force and speed required by the standard test method. All of these parameters can be reset by the user for special applications and different materials. Default internal angle of gyration is 1.16° and 1.25° external. The angle can also be factory set to 0.82° internal if specified when ordering.

Compaction forces are supplied through a hydraulic/electro-mechanical system. Precision machined steel 150mm Mold Assemblies for the HM-687 are ordered separately. Each mold is 280mm overall height for maximum specimen heights of 200mm, and include both top and bottom platens. Preparation, processing and handling efficiencies are improved by having extra molds on hand. A Mold Funnel Cap is included for proper placement of sample material in the mold. The user can select a specimen squaring function to specify the amount of time pressure is applied to a specimen after squaring, from 0 to 16 seconds in 2-second intervals. A magnet for lifting mold plates, Specimen Lifting Handle for 150mm specimens, Mold Tongs for handling 150mm molds are all included.

Electrical requirements are 115V/60Hz for the HM-687 and 230V/50-60Hz for the HM-687F. **Product Dimensions:** 30x21.3x55.4in (760x540x1,410mm) WxDxH.

Brovold Superpave™ Gyratory Compactor	
Brovold Superpave™ Gyratory Compactor, 115V/60Hz	HM-687
230V/50-60Hz	HM-687F
Accessories	
150mm Gyratory Compactor Mold Assembly	HMA-694
Specimen Lift Handles, 150mm	HMA-697
Complete Calibration Kit	HMA-696

technote

Brovold Superpave™ Gyratory Compactor Specifications

Number of Gyrations	0 to 299
Speed of Gyrations	20-40 gpm (Default is 30±0.5)
Compaction Force	300 to 630kPa (Default is 600±18.0kPa)
Angle of Gyration[1]	1.16° Internal, 1.25° External
Specimen Squaring	0 to 16 seconds, 2 second intervals
Mold Dimensions	150x280mm, ID Dia. x Ht.
Specimen Ht.	10 to 200mm
Dimensions	30x21.3x55.4in (760x540x1,410mm) WxDxH
Power Requirements HM-687 HM-687F	 115V/60Hz, 15 A, 1ph 230V/50-60Hz, 10A, 1ph

[1]Can be factory set to 0.82° if specified at time of order.

HMA-621

MSA-120

MSA-121

HMA-622

HMA-623

SUPERPAVE™ GYRATORY COMPACTOR ACCESSORIES
ASTM D6925, D7229; AASHTO T 312, T 344

Superpave™ Gyratory Compactor Accessories	
Description	**Model**
Rapid Angle Measurement (RAM) Device is used to verify and calibrate the internal and external angles on the HM-685 and HM-687. The device safely and efficiently measures the internal angle of gyration on Superpave gyratory compactors and can be used in any 150mm diameter gyratory mold meeting Superpave specifications. It takes only a few minutes to complete the measurements required by AASHTO T312 and T 344. Measurements are taken at room temperature avoiding the handling of hot molds. The instrument is self-contained with push-button controls and an LED display. No computer interface is required, simply operate the compactor with the device inside the mold. Remove it and read the result on the display. No asphalt mix is required and no test data is stored. A NIST traceable certified calibration tube is included with the RAM. Certification is valid for one year. Contact Gilson for Recertification. **Product Dimensions:** 0.875x6in (22x152mm), WxH.	
Rapid Angle Measurement (RAM) Device	HMA-621
Circular Paper Discs are strong and tear-resistant, with smooth edges. Choose between the MSA-120 designed for both 4in and 100mm or the MSA-121 for all 6in and 150mm Marshall and Gyratory Molds.	
4in/100mm Paper Discs	MSA-120
6in/150mm Paper Discs	MSA-121
Load Ring 5,000lbf (22.2kN) with dial gauge and **Gage Blocks** are certified and NIST traceable for verifying applied loads and height measurements for both the HM-685 and HM-687 Gyratory Compactors. Gage Blocks are supplied individually, a total of 4 is required. The Gyratory should be verified semi-annually. **HMA-622 Product Dimensions:** 10.25x7.25in (260x184mm), WxH. **HMA-623 Product Dimensions:** 3x1in (76x25mm), WxH.	
Certified 5,000lbf Load Ring	HMA-622
Certified Gage Block, 1ea	HMA-623
Laser Printer with USB port is a wide format using Printer Command Language (PCL). Data will automatically be printed during a test if a printer is connected and turned on. Data can also be printed from saved test data files. Type A-B USB cable in 10ft (3M) length is included. **Product Dimensions:** 14.25x7in (362x178mm), WxH.	
PCL Laser Printer	HMA-626

Find Estimated Ship Weights for all our products in the Ship Weight Index

MARSHALL STABILITY SYSTEMS
ASTM D4867, D5581, D6927;
AASHTO R 68, T 245, T 283

Manufactured in cooperation with Karol•Warner

The Pro-Loader II and Marshall Stability Load Frames are designed to be outfitted with selected components to create a custom system for your application. A complete selection of components is available to install on the motorized load frames for measuring, displaying, and recording load and flow of asphalt specimens. Systems can be configured for Marshall or Lottman testing of 4in (102mm) or 6in (152mm) samples. Data collection options range from manual recording using load rings and mechanical dial gauges to automatic recording from load cells, displacement transducers and a digital readout box connected to a user-supplied computer for load and flow data acquisition.

Both heavy-duty load frames have 10,000lbf (44.5kN) capacities and are housed in 14-gauge steel cabinets with a durable enamel finish. An 8in (203mm) diameter lower platen is included. Crosshead heights are quickly and accurately changed using the self-centering adjusting nuts. The 1.25in (31.8mm) diameter vertical threaded rods are plated for corrosion resistance. Flexible boots protect the precision loading screws from dust and dirt. Component sets for load and flow measurements are ordered separately.

MS-398 Pro-Loader II Load Frame is designed for versatility in multi-disciplined labs. Variable speed ranges from 0.02—2.0in (0.508—50.8mm) per minute allow running Marshall, Lottman, CBR, unconfined compression, soil-cement, and basic triaxial tests, all on a single unit. The 3/4hp DC motor and controller precisely control strain rates to ±1% of set point. Strain rates or loading rates are easily set with the three segment thumbwheel selector. Travel limit switches with indicating lights protect the unit from damage due to platen travel outside of its 3in (76mm) range. Daylight Opening: 11.9x17.3in (302x439mm), WxH. Platen diameter: 8in (203mm). **Product Dimensions:** 18x29x54.5in (457x737x1,384mm), WxDxH.

MS-86 Marshall Stability Load Frame has similar design and construction features, but loading rate is fixed at the 2in (50.8mm) per minute, as specified for Marshall testing. The loading rate is maintained at ±1% by the 3/4hp DC motor and controller. Daylight Opening: 11.9x37.3in (302x947mm), WxH. Platen diameter: 8in (203mm). **Product Dimensions:** 18x29x54.5in (457x737x1,384mm), WxDxH.

MSA-860 Marshall Stability Standard Component Set includes HM-430 10,000lbf Load Ring, MA-334 1x0.001in Dial Indicator, and HMA-339 0.5in Bracket for Dial Indicator.

MSA-860D Marshall Stability Digital Component Set includes HM-430D 10,000lbf Load Cell, HM-740 2in Digital Displacement Transducer, HM-418 Two-Channel Digital Readout to display both load and flow measurements, and HMA-401 0.75in Bracket for Dial Indicator or Displacement Transducer. The Digital Component Set transfers ASC11 file formatted data and must be connected to a user-supplied PC.

MS-398 shown with MSA-860 and MS-26

MS-86 shown with MSA-860D, MS-26 and HMA-94

HMA-94 Rolling Load Frame Cart is sturdy bolted steel construction and positions load frames at the proper working height. Rugged casters allow convenient placement. **Product Dimensions:** 25x21.4x24.5in (635x543x622mm), WxDxH.

A complete selection of 4in (102mm) and 6in (152mm) Marshall and Lottman Breaking Heads, and a Tack Bond Shear Apparatus compatible with these load frames and stability component sets are available and ordered separately.

alsoavailable

Components for CBR, Soil-Cement, Unconfined and Triaxial testing are available to increase the versatility of your MS-398 Pro-Loader II Load Frame. See listing in our Soils section.

Pro-Loader & Marshall Stability Systems	
Pro-Loader II Load Frame, 115V/60Hz	MS-398
230V/50Hz	MS-398F
Marshall Stability Load Frame, 115V/60Hz	MS-86
230V/50Hz	MS-86F
Accessories	
Marshall Stability Standard Component Set	MSA-860
Marshall Stability Digital Component Set	MSA-860D
4in Marshall Breaking Head	MS-26
6in Marshall Breaking Head	MS-29
4in Lottman Breaking Head	MS-35
6in Lottman Breaking Head	MS-36
4in/6in Asphalt Tack Bond Shear Apparatus	MS-43
100mm/150mm Asphalt Tack Bond Shear Apparatus	MS-43F
Rolling Load Frame Cart	HMA-94

MS-26

MS-29

MS-35

MS-36

MS-43

MS-25

MS-45

MS-48

Marshall Load Frame Accessories

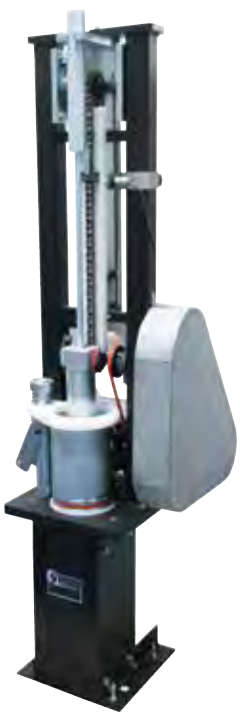
Description	Model	Size, in (mm)	ASTM/ AASHTO
Marshall Breaking Heads Fixtures have machined upper/lower segments to accommodate 4in (102mm) or 6in (152mm) asphalt specimens. Segments are connected by two vertical guide rods with precisely machined sleeves to reduce friction and assure nonbinding movement. **MS-29** **Product Dimensions:** 8x8x10in (203x203x254mm), WxDxH.	MS-26 MS-29	4 (102) 6 (152)	D5581 D6927/ R 68 T 245
Lottman Breaking Head (Indirect Tensile IDT) These fixtures are used with conventional Marshall load frames to determine Indirect Tensile (IDT), (also known as Lottman) values of asphalt mixes. Each fixture consists of a base with upright guide rods and top with mating guide sleeves. The upper and lower stainless steel loading strips have concave contact surfaces. Available for 4in (102mm) or 6in (152mm) specimens.	MS-35 MS-36	4 (102) 6 (152)	D4867 D6931/ T 283
Asphalt Tack Bond Shear Strength Apparatus This fixture is used in a Marshall Test Load Frame to measure shear strength of tack coat material between two asphalt layers. The heavy steel frame holds a fixed and a moveable shear plate. The moveable plate is centered over the shear plane, and features roller bearings to minimize drag. Lateral load on the specimen is controlled by a calibrated spring, and a dial indicator displays force. The shear plane gap is 0.5 inches (12.5mm), and maximum shear travel is also 0.5 inches (12.5 mm). Adapters are included for testing either 4in (102mm) or 6in (152mm) diameter cores. A version for 100mm or 150mm specimens is available as MS-43F. The Tack Bond Shear Strength Apparatus is compatible with MS-86, MS-398 and HM-398 Gilson load frames and most Marshall Load Frames with daylight openings of at least 10in (254mm). **Product Dimensions:** 9x22x9.5in (229x559x241mm).			-
Tack Bond Shear Strength Apparatus, 4in and 6in Tack Bond Shear Strength Apparatus, 100 and 150mm	MS-43 MS-43F	4/6 (102/152) 100/150	
Dial Flow Meters For manual measurement of flow in Marshall load frames. Dial indicator with maximum position brake is attached to a sleeve for hand holding over guide rod of the Breaking Head during testing.			D5581 D6927/ R 68 T 245
Graduated 1in x 0.001in Graduated 25mm x 0.01mm	MS-25 MS-25F	- -	
Semi-Circular Bend (SCB) Test Fixture This fixture determines low-temperature fracture energy and toughness of asphalt mixtures with a maximum aggregate size of 19mm. Semicircular samples are cut from Superpave™ Gyratory compacted cylinders or 150mm field cores. The Fixture consists of a 0.5in (12.7mm) thick steel base plate, two L-shaped roller support steel blocks, two steel rollers, and a U-shaped frame. The test fixture is mounted in a Marshall Stability Load Frame such as the MS-86 or MS-398 for loading. A specimen is positioned with the flat side on two rollers with Polytetrafluoroethylene strips to minimize friction, and a load is applied along the vertical diameter of the specimen. Load and displacement are measured to calculate test results. Initial roller position is maintained by springs and backstops that establish the test span dimension. **Product Dimensions:** 6.25x5x8.4in (159x127x215mm), WxDxH.	MS-45	6 (150)	D8044/ TP-105
Sample Preparation Saw for SCB samples features a custom spring clamp fixture to quickly secure the specimen for required notch cuts without adjusting the saw blade. Simply change out the spacer blocks to switch between specimen types and notch depths. The saw can also be used for Disk-Shaped Compact Tension Test (DCT) samples. The included 10in (254mm) diameter blade is 0.05in (1.27mm) thick and meets cut-width requirements for the test method. A precision machined alignment block is included to quickly check saw alignment. **Product Dimensions:** 21.5x35x48in (546x889x1219mm).	MS-48	-	D8044, D7313/ TP-105

Find Estimated Ship Weights for all our products in the Ship Weight Index

MS-10

MS-1

MS-2



MS-6

MARSHALL COMPACTORS

ASTM D5581, D6926; AASHTO R 68, T 245; PENN DOT 705

The Marshall System is widely used for design and control of asphalt paving mixtures. The resistance to plastic flow of compacted Marshall specimens is measured in terms of maximum load before failure. Normally, 4in (102mm) diameter specimens are suitable for mixes containing aggregates up to 1in (25.4mm), and 6in (152mm) diameter specimens are preferred for maximum aggregate sizes up to 1.5in (38.1mm). All automatic models operate on 115V/60Hz power supplies. Add "F" suffix to specify models for 230V/50Hz operation.

Marshall Compactors

Description	Model
Manual Marshall Compactor allows manual compaction of a single 4in (102mm) Marshall asphalt specimen in a stationary mold. Included is an oak pedestal, hammer support and guide rod, 10lb (4.5kg) flat-face hammer, a MSA-100 4in (102mm) mold, base and collar assembly, and a mold holder. **Product Dimensions:** 12x12x64in (305x305x1,626mm).	
Manual Marshall Compactor	MS-10
4in Mold, Base & Collar Assembly	MSA-100
Automatic Standard-Duty 4in (102mm) Compactor compacts Marshall specimens in a stationary 4in (102mm) mold. Automatic counter is set to the specified number of blows and stops at completion. The unit includes a painted oak pedestal with steel plate, a 10lb (4.5kg) flat-face hammer, and a MSA-100 4in (102mm) mold, base and collar assembly. **Product Dimensions:** 20x66x12in (508x1676x305mm), LxHxW.	
Automatic Standard Duty 4in Compactor	MS-1
Additional Hammer Assembly	MSA-111
4in Mold, Base & Collar Assembly	MSA-100
Double or Triple Automatic Standard-Duty 4in (102mm) Indexing Compactors compact two or three Marshall asphalt specimens simultaneously in indexing molds. The bevel-face hammers and indexing base plates produce a consistent kneading action during compaction. Larger painted oak pedestals with steel plates accommodate compacting of multiple specimens. A single motor and counter controls the number of blows on multiple specimens and shuts off at completion. 10lb (4.54kg) bevel-face hammers and MSA-101 4in (102mm) mold, base, and collar assemblies are included. **MS-2 Product Dimensions:** 20x66x17in (508x1676x432mm), LxHxW. **MS-3 Product Dimensions:** 20x66x20in (508x1676x508mm), LxHxW.	
Double Automatic Standard-Duty 4in Indexing Compactor	MS-2
Triple Automatic Standard-Duty 4in Indexing Compactor	MS-3
Additional Hammer Assembly	MSA-112
4in Mold, Base & Collar Assembly	MSA-101
Automatic Heavy-Duty Indexing 4in (102mm) Compactor compacts one 4in (102mm) Marshall specimen in an indexing mold. Heavy-duty frames reduce structural and mechanical wear and tear during operation. The bevel-face hammer and indexing base plate produce a consistent kneading action during compaction. Molds are secured with a cam-action lever assembly. An automatic counter shuts off the unit at completion of the compaction process. Painted oak pedestal with steel plate, 10lb (4.5kg) bevel-face hammer, and MSA-101 4in (102mm) mold, base and collar assembly are included. The MS-5 Automatic Compactor converts to compact 6in (152mm) Marshall specimens by adding the MSA-113 22.5lb (10.2kg) bevel-face hammer and MSA-106 6in (152mm) mold. **Product Dimensions:** 20x66x12in (508x1,676x305mm), LxHxW.	
Automatic Heavy-Duty Indexing 4in Compactor	MS-5
Additional 4in Hammer Assembly	MSA-114
4in Mold, Base & Collar Assembly	MSA-101
Hammer Assembly for 6in Conversion	MSA-113
6in Mold, Base & Collar Assembly	MSA-106
Automatic Heavy-Duty Indexing 6in (152mm) Compactor compacts one 6in (152mm) Marshall specimen in an indexing mold. Heavy-duty frame reduces structural and mechanical wear and tear during operation. The bevel-face hammer and indexing base plate produce a consistent kneading action during compaction. Molds are secured with a cam-action lever assembly. An automatic counter shuts off the unit at completion of the compaction process. Painted oak pedestal with steel plate, 22.5lb (10.2kg) bevel-face hammer, and MSA-106 6in (152mm) mold, base and collar assembly are included. The MS-6 Automatic Compactor converts to compact 4in (102mm) specimens by adding the MSA-114 10lb (4.54 kg) bevel-face hammer and MSA-101 4in (102mm) mold. **Product Dimensions:** 24x21x65in (609x533x1651mm), WxDxH.	
Automatic Heavy-Duty Indexing 6in Compactor	MS-6
Additional 6in Hammer Assembly	MSA-113
6in Mold, Base & Collar Assembly	MSA-106
Hammer Assembly for 4in Conversion	MSA-114
4in Mold, Base & Collar Assembly	MSA-101

MSA-100

MSA-106

MSA-100M

MSA-106M

MSA-101B

MSA-120

HM-514

MS-27

Marshall Compaction Accessories

Description	Model	Size, in (mm)	ASTM/ AASHTO
Compaction Mold Assemblies Complete Marshall Stability Compaction Molds are three-part assemblies consisting of mold, base plate, and collar constructed of sturdy, rust-resistant plated steel. 4in (102mm) or 6in (152mm) I.D. diameter molds are available for stationary or indexing Marshall Compactors as noted. Stationary molds are used with the MS-1 and MS-10 Marshall Compactors. Indexing molds are used with the MS-2, MS-3, MS-5 and MS-6 Marshall Compactors.			D5581 D6926/ R 68 T 245
4in Stationary Mold Assembly, Complete	MSA-100	4 (102)	
4in Indexing Mold Assembly, Complete	MSA-101	4 (102)	
6in Indexing Mold Assembly, Complete	MSA-106	6 (152)	
Compaction Mold Components Individual components for 4in (102mm) or 6in (152mm) Marshall Stability Molds are available separately for more efficient sample processing or as economical replacements. Sturdy, rust-resistant plated steel. Mold, Collar, and Base components of 4in (102mm) diameter molds fit stationary or indexing Marshall Compactors as noted.			D5581 D6926/ R 68 T 245
4in Stationary Mold Only	MSA-100M	4 (102)	
4in Stationary Base Only	MSA-100B	4 (102)	
4in Indexing Mold Only	MSA-101M	4 (102)	
4in Indexing Base Only	MSA-101B	4 (102)	
4in Collar only, fits Stationary or Indexing Molds	MSA-100C	4 (102)	
6in Indexing Mold Only	MSA-106M	6 (152)	
6in Indexing Base Only	MSA-106B	6 (152)	
6in Collar only	MSA-106C	6 (152)	
Circular Paper Discs Gilson Paper Discs are strong and tear-resistant, with smooth edges. Choose between the MSA-120 designed for both 4in and 100mm or the MSA-121 for 6in and 150mm Marshall and Gyratory Molds. The Discs are 0.0007-0.008in thick and made of 100lb paper stock.		3.875in for use with 4 (100/102) 5.875in for use with 6 (150/152)	D5581 D6925 D6926/ T 245 T 312
pkg. 1,000	MSA-120		
pkg. 500	MSA-121		
Sample Ejectors HM-514 Ejector extracts specimens from 4in (102mm) asphalt or soil molds. HM-516 Combination Ejector extrudes either 4in or 6in (102 and 152mm) asphalt or soil samples. Adapter sets are purchased separately for 2, 2.5 or 3in (51, 64, or 76mm) diameter molds. These ejectors are 12,000lbf (53.4kN) manually-operated hydraulic jack frames.			D5581 D6926/ R 68 T 245
Sample Ejector, 4in	HM-514		
Sample Ejector, Combination 4in & 6in	HM-516	-	
Adapter Set, 2in	HMA-219	-	
Adapter Set, 2.5in	HMA-220	-	
Adapter Set, 3in	HMA-221	-	
Budget Sample Ejector The MS-27 is a 3.95in (100mm) dia. x 0.5in (12.7mm) thick disc with a pedestal for specimen removal using a separate laboratory load frame.			D5581 D6926/ R 68 T 245
Budget Sample Ejector, 4in	MS-27	-	

helpfulhint

For accuracy, reliability and convenience, the new generation of digital dial indicators, displacement transducers, load cells, and displays are hard to beat. They are easy to set-up and use, and their data output options simplify documentation in the lab.

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MSA-130

MSA-131

MSA-125

MARSHALL WATER BATHS

ASTM D5581, D6927; AASHTO R 68, T 245, T 283

Marshall Water Baths			
Description	Model	Capacity	Tank Dimensions, in (mm), LxWxD
Marshall Water Baths accept five 6in (152mm) or twelve 4in (102mm) diameter specimens. Precision electronic temperature controls regulate fluid temperatures from ambient to 350°F (177°C) to within ±1% of set point using Type K thermocouples. Digital display shows temperatures in °F or °C. Built-in variable speed magnetic stirrer assures even heat distribution and uniformity. The fully insulated baths include a perforated 14-gauge bottom support shelf to maintain 2in (51mm) water below specimens. Sturdy, all-stainless steel construction with 14-gauge tanks and covers with 20-gauge cases and also includes external drain valve. MSA-130S version is fitted with a gas strut-assisted cover and drip shield. **Product Dimensions:** 24.5x16.5x15in (622x419x381mm) WxDxH.		8.3gal (31.4L)	20x12x8in (508x305x203mm)
Marshall Water Bath, 120V/60Hz	MSA-130		
Marshall Water Bath, 220V/50-60Hz	MSA-130F		
Marshall Water Bath with Gas Strut Assist, 120V/60Hz	MSA-130S		
Marshall Water Bath with Gas Strut Assist, 220V/50-60Hz	MSA-130SF		
Large Marshall Water Bath holds nine 6in (152mm) or sixteen 4in (102mm) diameter specimens. Precision electronic controls regulate water bath temperature to 140°F (60°C) to ±1% of set-point, well within specified Marshall water bath tolerances. Higher water temperatures can be achieved up to 212°F (100°C). A built-in variable speed magnetic stirrer assures even heat distribution and uniformity. Long-lasting all-stainless steel construction features 14-gauge tank and cover and fully insulated 20-gauge cases with external drain valve. The perforated 14-gauge bottom support shelf assures 2in (51mm) water level below specimens. The cover has a built-in drip shield and operates on gas-assist struts for easy lifting. **Product Dimensions:** 24.5x24.5x17in (622x622x432mm), WxDxH.		17.3gal (65.5L)	20x20x10in (508x508x254mm)
Large Marshall Water Bath, 120V/60Hz	MSA-131		
Large Marshall Water Bath, 220V/50-60Hz	MSA-131F		
Budget Water Bath is an efficient, economical 1,440 Watt unit with 4.5gal (17L) capacity. An automatic thermostat controls temperature from 200°—500°F (93°—260°C). Specimens are supported above the bottom on a perforated stainless steel bottom shelf to permit circulation. This model does not strictly meet ASTM/AASHTO guidelines, but is often used in this application for non-specification testing. **Product Dimensions:** 23.5x15.5x13in (597x394x330mm), WxDxH.		4.5gal (17L)	17x12x4.8in (432x305x122mm)
Budget Water Bath, 115V/60Hz	MSA-125		
Budget Water Bath, 230V/50Hz	MSA-125F		

THERMOLYNE® NCAT ASPHALT CONTENT FURNACE
ASTM D6307; AASHTO T 308

Asphalt binder ignition testing is an environmentally friendly and cost effective test to determine asphalt content of paving mixtures, and reduces testing time compared to solvent extraction. A 1,200—1,800g sample of asphalt can be tested in 30—45 minutes with the NCAT Furnace. The unit can accommodate samples up to 5,000g at extended testing times. The method also eliminates the cost of solvent, solvent disposal and safety concerns when handling solvent in the lab.

The NCAT Asphalt Furnace automatically monitors sample weight throughout the ignition process, saving valuable technician time and increasing productivity in the lab. Simply enter the sample weight and calibration factor, place the sample in the furnace chamber and press "start." The system automatically ends the test and prints the results. A "beep" alerts the technician that the test has ended. Pressing "stop" unlocks the chamber door and the sample can be removed and allowed to cool for gradation analysis.

The NCAT Furnace features automatic or manual test modes. In the automatic mode, the software ends the test when the endpoint is detected, and prints out the results. In the manual mode, the unit beeps when the endpoint is detected, but continues to test until "stop" is pressed, unlocking the door and printing the results. Positive or negative correction factors can be entered and weight change due to sample and basket assembly temperature change is automatically compensated. The automatically detected endpoint of the test cycle is reached when weight loss from the sample is less than a user-established setpoint between 0.01% and 0.5% for three consecutive readings. Test results are computed as asphalt content per total weight of HMA sample or bitumen ratio per weight of dry aggregate to an accuracy of ±0.11%.

The furnace is pre-heated to a setpoint temperature within the range of 450°—650°C (842°—1,202°F). The default setting is 538°C (1,000°F). The hot-mix asphalt sample is weighed and divided into two screened baskets on a tray assembly and placed in the furnace chamber. Once the door is closed and the test initiated, the door remains locked until completion. During the test, volatiles are oxidized in a high-temperature afterburner. This system has been shown to reduce process emissions by up to 95%.

The 24 hour/7 day timing function can be programmed to preheat the furnace to any time set by the operator. The modular, refractory embedded heating elements provide extended service life and easy, inexpensive replacement. An RS-232 port provides data interface with a personal computer for graphical data analysis.

The optional APA-40 Retriever™ automatically collects and stores up to 1,000 tests from any NCAT Asphalt Furnace model and stores on a USB flash drive. The system mounts on the side of the furnace and connects directly to the electronics. Installation is quick and easy and the Retriever can be used along with or in place of the existing printer. Complete and secure test data can now be cataloged, saved on a separate server, or easily emailed to clients or agencies. The included EZ Retrieve™ PC software is required to open files and allows on-screen viewing and printing. The encrypted data cannot be altered by the operator.

AP-20 shown with APA-31

Included with the NCAT furnace are the Electronic Balance, Hearth Tray, six replacement Fuses and an operation manual. Purchased separately, the APA-25 Starter Kit is required and includes two Sample Basket Assemblies, Transport Handle, Aluminum Cool Down Plate, Cool Down Safety Cage, four rolls of Printer Paper, Basket Brush, and Motor Lubricant. For increased safety, the kit includes Head Gear with Face Shield, and Heat Resistant Gloves. Order additional APA-31 Sample Basket Assemblies, for quicker sample preparation and more sample throughput.

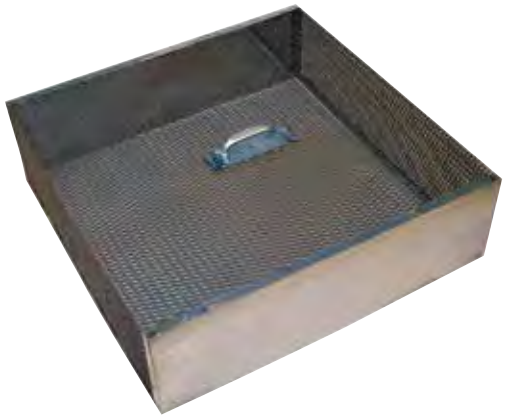
Chamber Dimensions: 14x14x14in (35.5x35.5x35.5mm), WxDxH. NCAT Furnaces are not supplied with power cords and must be hard-wired directly to a suitable electrical supply or supplied with a cord and plug by the user. **Product Dimensions:** 25.75x21.75x36.75in (65.4x55.2x99.3mm), WxDxH.

Thermolyne® NCAT Asphalt Content Furnace	
NCAT Asphalt Content Furnace, 240V/60Hz, 1 phase, 20/27 amp	AP-20
NCAT Asphalt Content Furnace, 208V/60Hz, 1 phase, 28 amp	AP-20L
NCAT Asphalt Content Furnace CE-Marked, 220-240V/50-60Hz, 1 phase, 20/27 amp	AP-20F
Accessories	
NCAT Furnace Starter Kit (Required)	APA-25
Retriever™ Data Collector	APA-40
Sample Basket Assemblies	APA-31
Transport Handle	APA-32
Cooldown Plate	APA-33
Cooldown Safety Cage	APA-34
Printer Paper, Case of 25 Rolls	APA-35
Printer Paper, Pkg of 5 Rolls	APA-37
Galvanized Steel Flexible Exhaust Tubing, 3in x 10ft (76mm x 3m)	APA-36
Heat Resistant Gloves	SE-31

Find Estimated Ship Weights for all our products in the Ship Weight Index

HM-378

HMA-69



HMA-813

GILSON ASPHALT CONTENT FURNACE
ASTM D6307; AASHTO T 308

Gilson's Asphalt Content Furnace meets ASTM and AASHTO standards, and features accurate, simple operation. Extensive testing has shown that process times and accuracy are comparable to automatic-weighing units. Standard 1,200—1,800g samples are processed in as little as 30—45 minutes. Larger samples up to 3,000g or more require longer test times.

During a test, an asphalt sample is heated until the binder ignites. Temperature in the main chamber rises above setpoint, peaks, then returns to setpoint as coke-type products are burned off. This decoking period is based on user experience with similar mixes or specification requirements. When determining the decoking period to program for a new mix, the sample is merely returned to the furnace for additional 5—10 minute periods until completion is confirmed by stable total weight.

As the asphalt burns, volatile components are carried into the high-temperature afterburner chamber, where they are completely oxidized. Large amounts of room temperature air are drawn in to quickly cool the exhaust for safe discharge to the outside. Any remaining particulate matter is captured in the disposable in-line filter. The Furnace remains locked during operation until a safe temperature is reached during the cool-down period.

The easy to operate controller features a large, bright display showing operating temperatures, times, setpoints, and menu functions. Up to ten timed programs with chamber and afterburner time and temperature setpoints can be stored. A pre-set function allows starting of the furnace at a specific time of day, so there is no lost time waiting for warm-up. The controller can also be used for custom programs with multiple ramps and dwells for glassware cleaning or other applications. The stainless steel case has a drop door to serve as a shelf for ease of sample tray handling. Heating elements are quality Kanthal A-1 and easily accessible for inexpensive replacement as necessary.

The Asphalt Content Furnace includes two Sample Baskets, a Basket Cover, Sample Tray and Tray-Handling fork, two-piece ceramic Hearth Plate, Exhaust Filter and Filter Holder for more efficient sample processing. Extra sets of sample tray, basket and cover may be ordered as HMA-69. SE-31 Heat Resistant Gloves are purchased separately and are highly recommended for users' safety. The HMA-810 all-steel Furnace Support Stand allows safe positioning of the furnace in the lab. Available HMA-813 Sample Cooling Cage protects personnel from hot surfaces as sample is cooling. HMA-814 Exhaust Vent Kit is easy to install for routing warm exhaust gases to the outside. A reliable bench scale of 12kg capacity or more, readable to 0.1g is required; Gilson recommends our AD-12KA, listed separately.

The furnace ships configured to operate on 240V/60Hz, single phase power supplies, and a NEMA 6-50 Cord Set is supplied. It is easily converted during installation to operate on a number of different single or three phase electrical supplies, from 208—380V at 50 or 60Hz, with current draw ranging from 16—45 amps. **Chamber Dimensions:** 21x21x9in (533x533x229mm). **Product Dimensions:** 43x30x43in (1,092x762x1,092mm), WxDxH.

Gilson Asphalt Content Furnace	
Gilson Asphalt Content Furnace	HM-378
Accessories	
Replacement Filters, box of 12	HMA-812
Sample Tray, Screen & Lid Set	HMA-69
Furnace Support Stand	HMA-810
Sample Cooling Cage	HMA-813
Exhaust Vent Kit	HMA-814
Heat Resistant Gloves	SE-31
Recommended Scale (12kg x 0.1g)	AD-12KA

Product spotlight

GILSON ASPHALT CONTENT FURNACE

Optional Wiring Configurations:

Electrical	kW	(amps)
240V, 1 phase, 50/60Hz	10.8	(45)
208V, 1 phase, 50/60Hz	8.1	(39)
240V, 3 phase, 50/60Hz	10.8	(34.6)
208V, 3 phase, 50/60Hz	8.1	(29.9)
380V, 3 phase, 50/60Hz	7.5	(16)

HM-807

HM-750R

GILSON CENTRIFUGE EXTRACTORS
ASTM D2172; AASHTO T 164

- **Electrical braking system.**
- **1,500 or 3,000g sample capacities.**
- **Explosion-Proof motors available.**

Gilson's popular Centrifuge Extractors provide efficient and reliable quantitative determinations of bitumen content in hot-mix asphalt specimens. Models conforming to explosion-proof requirements are available with 1,500 or 3,000g capacities. A standard version with 1,500g capacity is also offered. All models offer safe, simple operation and long service life.

For each model, the precision machined and balanced inner aluminum bowl assembly quickly lifts out of the sealed housing for efficient specimen handling. Rotation speeds up to 3,600rpm are easily set using the speed control knob. The built-in electric brake stops the centrifuge in seconds when extraction is complete. The heavy cast aluminum outer cover latches securely in place and features an integral solvent dispensing cup. Paper filter rings prevent loss of fines during processing.

All models are powered by a reliable 1/8hp DC motor equipped with an electrical braking system. Extra centrifuge bowl assemblies may be ordered for faster sample processing. HMA-263 1,500g capacity Bowls may also be used on HM-807 3,000g Extractors. Twenty-five paper Filter Rings are included. 1,500g models use rings 9.75in diameter with 2.5in center holes. 3,000g model rings are 11.63in diameter with 2.5in diameter holes. **Product Dimensions for 1,500g units:** 12x20x22in (305x508x559mm), WxDxH. **Product Dimensions for 3,000g units:** 14x20x22in (356x508x559mm), WxDxH.

Gilson Centrifuge Extractors	
1,500g Standard Extractor, 120V/60Hz	HM-808
230V/50Hz	HM-808F
1,500g Explosion-Proof Extractor, 120V/60Hz	HM-806
230V/50Hz	HM-806F
3,000g Explosion-Proof Extractor, 120V/60Hz	HM-807
230V/50Hz	HM-807F
Accessories	
Bowl for 1,500g Models	HMA-263
Bowl for 3,000g Models	HMA-264
Filter Rings for 1,500g Models, pkg. 100, 9.75 x 2.5in	HMA-265
Filter Rings for 3,000g Models, pkg. 100, 11.63 x 2.5in	HMA-266

FILTERLESS CENTRIFUGE
ASTM D1856, D2172; AASHTO R 59, T 164

The American made Continuous-Flow Filterless Centrifuge is effective for recovery of mineral filler fines from bitumen-laden nonflammable solvents from asphalt mix extraction tests. Analysis is simplified and accuracy is improved by eliminating the filter. Solvent suspension is fed through a top funnel into a special 526ml, 7x2.5in (178x64mm) HxI.D. aluminum beaker (included) rotating at 11,000rpm. Under high centrifugal force, the liquid moves up the beaker wall and out through the overflow tubing while solids remain for easy removal. Continuous feeding is possible until the solids-retaining capacity of the beaker is reached.

No.18 (1mm) and No.200 (75µm) stainless steel full height sieves are included for fitting to the top of the inlet funnel. A No.230 (63µm) sieve may be substituted for the No.200; please specify. When using the sieves, the extraction process can be run by pre-dissolving the mix sample with solvent, then pouring into the sieves.

Rotating spindle and electric motor of the centrifuge are enclosed in a sturdy cast aluminum case. Two aluminum beakers are included with each unit. **Product Dimensions:** 20x15x33in (508x380x840mm), WxDxH.

Filterless Centrifuge	
Filterless Centrifuge, 115V/60Hz	HM-750R
230V/50Hz	HM-750RF
Accessories	
Aluminum Beaker	HMA-308R

HM-8

HMA-54

HMA-56

HM-15

VACUUM EXTRACTOR
ASTM D2172; AASHTO T 164

Gilson HM-8 Vacuum Extractor with 3,000g capacity has superior design features for quantitative determination of bitumen in hot-mixed paving mixtures using the vacuum method. Extractor base is a 16in (407mm) dia. x 8in (203mm) high painted aluminum extract collection tank with carrying handles, a gauge-fitted vacuum source connection, and an extract drain valve. Two sight-glass gauges are provided to monitor solvent level and color of extract during extraction. A 12.25x4.5in (311x114mm), IDxH removable funnel ring clamps filter paper and a perforated aluminum support plate to base with a Viton O-Ring seal. Sample and solvent are placed on paper inside the ring.

Improved design features anodized aluminum funnel ring for protection from corrosive solvents. Quick-action wing bolt fasteners between ring and base have no exposed threads to damage. Filter paper support plate has disc spacers to prevent collapse under vacuum.

HM-8 Vacuum Extractor includes Vacuum Gauge, 25 Filter Papers, Filter Support, O-Ring Seal, 4ft (1.2m) Vacuum Hose Connection, and instructions. For best results Gilson recommends using biodegradable terpene-based solvents and HMA-54-2 filter papers. Both the HMA-54 and HMA-54-2 are sold in packages of 100. Vacuum source is required; order vacuum pumps separately. The HMA-56, 4lb carton of Diatomaceous Silica Filtering Aid for slow filtering samples is sufficient for 36 tests.

Vacuum Extractor	
Vacuum Extractor	HM-8
Accessories	
Filter Paper, Grade 613	HMA-54
Filter Paper Terpene Solvents, Grade 627	HMA-54-2
Viton O-Ring Seal	HMA-55V
Diatomaceous Silica Filter, 4lb carton	HMA-56
Diatomaceous Silica Filter, 50lb bag	HMA-56B

BASIC VACUUM EXTRACTOR
ASTM D2172; AASHTO T 164

Basic Vacuum Extractor has a 12.25x4.5in (311x114mm), IDxH aluminum funnel ring, perforated stainless steel filter support, and an O-Ring seal, supported by three legs. Instead of a solvent collection tank, the assembly uses a vacuum filter flask such as GW-76. The Hose and Stopper Assembly has a 6ft (1.8m) rubber vacuum hose to fit to the 3/8in (9.5mm) OD drain connection, and a No.12 neoprene stopper with glass tubing to fit GW-76. Order Filter Flask, Hose and Stopper Assembly, Diatomaceous Silica Filter Aid, Filter Paper, and Vacuum Pump separately. Side tubulation on GW-76 flask is 3/8in (10mm), OD.

Basic Vacuum Extractor	
Basic Vacuum Extractor	HM-15
Accessories	
4L Filter Flask	GW-76
Hose & Stopper Assembly	HMA-58
Filter Paper, Grade 613	HMA-54
Filter Paper Terpene Solvents, Grade 627	HMA-54-2
Viton O-Ring Seal	HMA-55V
Diatomaceous Silica Filter, 4lb carton	HMA-56
Diatomaceous Silica Filter, 50lb bag	HMA-56B

technote

FILTER PAPER SELECTION GUIDE

Model	Outside Dia. in (cm)	Hole Dia. in (cm)	Grade	Flow Rate ml/min	Filter Speed	Micron Retention
HMA-265	9.75 (24.8)	2.5 (6.4)	923	200	Fast	20
HMA-266	11.75 (29.8)	2.5 (6.4)	923	200	Fast	20
HMA-34	10 (25.4)	5 (12.7)	627	85	Medium	4
HMA-44	12.25 (31.1)	5 (12.7)	627	85	Medium	4
HMA-44B	12.25 (31.1)	5 (12.7)	904	70	Medium	2
HMA-54-2	13 (33)	-	627	85	Medium	4
HMA-54-5	13 (33)	-	633	435	Fast	31
HMA-64-1	15.7 (40)	-	617	360	Fast	6
HMA-54	13 (33)	-	613	60	Medium	6

HM-124E

HM-6

HM-5

HM-56

ASPHALT EXTRACTION SOLVENTS

Gilson asphalt extraction solvents are available in 5gal (18.9L) Pails with Est. Ship Wt. of 40lb (18kg), or 55gal (208L) Drums with Est. Ship Wt. of 440lb (200kg).

Excel Clean HD and Hisol Plus both contain 100% natural orange and citrus terpenes. They are nontoxic, biodegradable, ozone-friendly, and rinse freely with no clumping. Not for use with reflux or other heated methods, but ideal for use in vacuum extractors or centrifuges for gradations. Flash point is 125°F for Excel Clean HD and 145°F for Hisol Plus.

Power-Solv contains citrus terpenes and petroleum solvent, is non-rinsable, and can be used in vacuum extractors or centrifuges for gradations only. Flash point is 115°F.

Asphalt Extraction Solvents

Description	Flash Point	Model
Excel Clean HD, 5gal Pail	125°F	HM-124E
Excel Clean HD, 55gal Drum	125°F	HM-125E
Hisol Plus, 5gal Pail	145°F	HM-124H
Hisol Plus, 55gal Drum	145°F	HM-125H
Power-Solv, 5gal Pail	115°F	HM-124P
Power-Solv, 55gal Drum	115°F	HM-125P

REFLUX EXTRACTORS
ASTM D2172; AASHTO T 164

Reflux extraction is the least expensive method for determining asphalt content in bituminous paving mixtures. Solvent vapor generated by hot plate passes around and through sample contained in two wire mesh cones lined with filter paper. Reflux solvent from the water-cooled condenser percolates through the sample repeatedly until the bitumen is extracted.

Extractors are offered in nominal capacities of 1,000g and 2,000g. Models HM-5 and HM-6 include Hot Plate, Extraction Jar, two interlocking wire mesh Cones with bail handles, copper Condenser with water inlet/outlet tubes, Filter Paper, and instructions. Model HM-5 has 6in (152mm) diameter jar and 6in (152mm) hot plate; Model HM-6 has 8.75in (222mm) diameter jar and 9in (228mm) hot plate. Both jars are 18in (457mm) high with ground tops for tight condenser fit. Included insulating pad is used for protection next to hot plate surface. HMA-54 and HMA-64 Grade 613 Filter Papers are supplied in packages of 100.

Reflux Extractors

1,000g Reflux Extractor, 115V, 50/60Hz	HM-5
230V, 50/60Hz	HM-5F
2,000g Reflux Extractor, 115V, 50/60Hz	HM-6
230V, 50/60Hz	HM-6F
Accessories	
Extraction Jar for HM-5	HMA-51
Extraction Jar for HM-6	HMA-61
Wire Mesh Cone Set for HM-5	HMA-52
Wire Mesh Cone Set for HM-6	HMA-62
Condenser for HM-5	HMA-53
Condenser for HM-6	HMA-63
1,000g Filter Paper for HM-5, pkg 100	HMA-54
2,000g Filter Paper for HM-6, pkg 50	HMA-64-1
Insulating Pad	HM-5-1

DRAINDOWN BASKETS
ASTM D6390; AASHTO T 305

The draindown test for uncompacted bituminous mixes measures the amount of asphalt binder that separates from a sample held at the elevated temperatures encountered in production, transport and placement. The test is particularly applicable to stone matrix asphalt (SMA) or open-graded porous asphalt mixtures. The sample is placed in the special Draindown Basket in a forced-air oven on a pre-weighed paper plate for one hour. The amount of draindown is measured as that portion that separates itself from the sample and is deposited onto the plate outside the basket. Paper plates should be obtained locally.

ASTM E11 quality stainless steel mesh is used for HM-56 1/4in (6.3mm), HM-56A No.8 (2.36mm), and No.16 (1.18mm) baskets. Each measure 4.25x5.5in (108x140mm), Dia.xH and have a 1in (25mm) bottom skirt. A convenient bail-type handle is provided.

Draindown Baskets

Draindown Basket, 1/4in Mesh	HM-56
Draindown Basket, No.8 Mesh	HM-56A
Draindown Basket, No.16 Mesh	HM-56B

ASPHALT PAVEMENT ANALYZER (APA)
AASHTO T 324, T 340; TEX 242-F

The Asphalt Pavement Analyzer (APA) by Pavement Technology is a three-wheel, multi-function Loaded Wheel Tester (LWT) for evaluating rutting, fatigue cracking and moisture susceptibility of both hot and cold asphalt mixes. Samples can be tested in dry or submerged conditions in the environmentally controlled chamber. An exclusive High Pressure Feature can perform rut testing at high contact pressures of 250psi or more on mix designs for airport runways and taxiways. The APA performs AASHTO methods T 324 Hamburg Test with solid steel wheels, and T 340 APA Rut Test with concave wheels loading high-pressure rubber hoses.

This versatile model has a unique drive system allowing multiple speeds and load rates to be applied simultaneously to separate samples. Samples can be from Gyratory, Marshall, or vibratory beam specimens molded in the laboratory, or from field cores cut from existing pavement. Three rectangular slab or beam specimens or six cylindrical specimens can be tested at the same time. A built-in Chiller for Low Temperature Fatigue Testing on Beam Specimens is included. Optional equipment for studded wheel and fatigue testing at temperatures to -5°C includes Cold Plate, Molds, Studded Wheels and Software and is available as HMA-826. Optional equipment to perform Microsurfacing/Slurry Seal Testing includes Molds, Rubber Wheels and Software, and is available as HMA-828.

Operation is controlled through a PLC-based system with New Gen 5 Software, and data is collected on a PC. Measurements are plotted and data is displayed in numeric and graphical format. In a single pass, five or more measurements can be collected on a beam specimen and three or more on a cylindrical specimen. This extremely accurate system calculates the data to 0.00001mm. The drive system operates the wheel tracking assembly from 0 to 60 cycles (120 passes) per minute. Both speed and stroke are adjustable for Hamburg Testing. Wheel loading is applied with controlled contact pressure on beam or cylindrical samples for rutting, fatigue and moisture damage testing. Independent pneumatic cylinders generate adjustable loads to each of the three wheels applying contact pressure on the specimens.

The Sample Holding Assembly locates the sample molds properly under the loading wheels for testing. A sliding tray makes it easy to load and position the samples and is locked against the frame by two toggle clamps. Temperature control of the main chamber from 5° to 80°C ±1.5°C (41° to 176°F) is accomplished by a series of heating strips and a cooling unit, regulated by a microprocessor-based controller. The 30gal reservoir can be raised with a pneumatic cylinder and flooded to a constant water level over the top of the test specimen for submerged testing. A weir valve allows water to drain back to the 35gal stainless steel storage tank where water temperature is maintained from ambient to 80°C (176°F). Sample Pre-Conditioning Shelves are located in the base of the APA to bring three beam or six cylindrical specimens up to desired test temperature.

The Asphalt Pavement Analyzer is supplied fully equipped to run a variety of loaded wheel tests. Concave wheels to perform rut and moisture testing, solid wheels for fatigue and Hamburg testing are all included in sets of three each. Wheels are stainless steel and comply with requirements for each test. Four sets of High Density Polyethylene Molds, 300x125x75mm LxWxH for rut testing, 150x75mm dia.xH for rut and moisture testing, 300x125x75mm LxWxH for fatigue testing and 300x150x62mm LxWxH for Hamburg tests are also included, each as a set of three. Three 3/4in (19mm) high-pressure rubber hoses are used in conjunction with Concave Wheels for the AASHTO T 340 Rut Test and with the high pressure loading feature for airport runway and taxiway design. A source of clean, dry compressed air at 120psi (8.3bar) and 8CFM (226LPM) is required. Electrical Requirements are 208V/60HZ, 40A Single Phase. Unit weight is approximately 3,000lb (1357kg). **Product Dimensions:** 35x70x80in (889x1778x2032mm) WxDxH.

HM-459

HMA-815

Asphalt Pavement Analyzer (APA)	
Asphalt Pavement Analyzer (APA), 208V/1ph/60Hz	HM-459
Accessories	
Low-Temperature Studded Wheel Testing Kit	HMA-826
Microsurfacing/Slurry Seal Testing Kit	HMA-828
Wheel Tracker Sample Trimming Jig	HMA-815

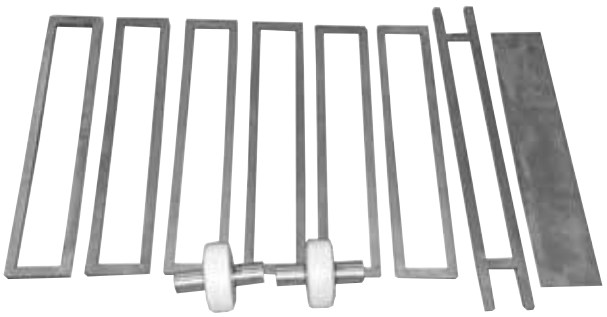
WHEEL TRACKER SAMPLE TRIMMING JIG
AASHTO T 324

The Wheel Tracker Sample Trimming Jig secures a cylindrical asphalt specimen or core in a sample saw to allow a single straight cut. The cut ends of two specimens are fitted together in the sample fixture of a Loaded Wheel Tracker (LWT) for rut and moisture susceptibility testing. This Jig can be used with most popular sample saws and mounts quickly with slotted holes, bolts and nuts. Sample stops assure rapid, repeatable cuts. Sturdy aluminum construction. **Product Dimensions:** 8x9x3.6in (203x229x91mm) WxDxH.

Wheel Tracker Sample Trimming Jig	
Wheel Tracker Sample Trimming Jig	HMA-815

HM-457

Inside view of HM-457



HMA-821

ASPHALT PAVEMENT ANALYZER JUNIOR (APA JR.)

AASHTO T 324, T 340; TEX 242-F

The APA Jr. is a multi-functional two-wheel Loaded Wheel Tester (LWT) to determine rutting, fatigue cracking and moisture susceptibility of hot or cold asphalt paving mixes in dry or submerged conditions. This versatile CE Approved model from Pavement Technology has a small footprint and meets all requirements for the AASHTO T324 Hamburg Wheel Tracking Test and AASHTO T340 Rut Test. The HM-457 can also be equipped to perform a variety of other tests including high contact pressure testing for airport runways and taxiways, microsurfacing/slurry seal testing, and low-temperature fatigue and studded wheel tests with the optional Chiller. The unique frequency drive of the APA Jr. allows mixes to be tested at multiple speeds and multiple rates of loading.

A sample holding assembly positions the specimens in molds under the wheels for testing. Heating and cooling of the main chamber is accomplished by a series of heating elements and the optional HMA-820 Chiller. With the Chiller, temperature can be controlled from -9° to 80°C (15° to 176°F). A 15gal (57L) stainless steel water tank circulates temperature controlled water to the reservoir, which maintains water levels about 0.5in over specimens during the test. Temperature can be maintained up to 80°C (176°F) Vertical measurements are determined using linear position transducers and rut depth is monitored with transducers mounted inside the pneumatic cylinders.

The APA Jr. is equipped with a PLC based control system, operated through the user's laptop PC. All calibration and operation is performed through the laptop computer. Data is plotted and displayed in numeric and graphical format. Five or more measurements on a beam and three or more on a cylindrical specimen are collected in each pass and the data is calculated to 0.00001mm. The wheel tracking assembly operates from 0 to 60 cycles (120 passes) per minute, with stroke and speed adjustable for Hamburg Testing. Wheel loading is applied through independent pneumatic cylinders.

Four cylindrical molds of ultra-high molecular weight (UHMW) plastic are provided with the APA Jr., two 150x62mm Dia.xH for Hamburg Tests and two 150x75mm Dia.xH for Rut and Moisture Damage Tests. The molds can accommodate Gyratory, Marshall, Hveem or core specimens. Two Hamburg-type solid wheels and two APA concave wheels with high-pressure hoses are also included. Both are solid stainless steel construction. Additional beam-type molds and wheels for studded wheel, slurry seal and fatigue tests are also available. Equipment for microsurfacing/slurry seal testing is an optional set that includes Molds, Rubber Wheels and Software, and is available as HMA-821. An optional equipment set for studded wheel and fatigue testing at temperatures to -5°C includes Cold Plate, Molds, Studded Wheels and Software and is available as HMA-822. A source of clean, dry compressed air at 120psi (8.3bar) and 8CFM (226LPM) is required. Electrical Requirements are 208 or 230V/50-60HZ, 40A Single Phase. Unit weight is approximately 1,300lb (590kg). **Product Dimensions:** 327x45x61in (69x114x591mm) WxDxH.

Asphalt Pavement Analyzer Junior (APA Jr.)	
Asphalt Pavement Analyzer Junior (APA Jr.), 208 or 230V/1ph/50-60Hz	HM-457
Accessories	
Low-Temperature Studded Wheel Testing Kit	HMA-822
Microsurfacing/Slurry Seal Testing Kit	HMA-821
Chiller for APA Jr., 208V/50-60Hz	HMA-820
Wheel Tracker Sample Trimming Jig	HMA-815

HVEEM-N-BEAM TESTER

ASTM C78, C109, C293, D1560, D1561, D2844; AASHTO T 97, T 106, T 177, T 190, T 246, T 247; CALIFORNIA 301, 366

- **Designed for Hveem testing of asphalt samples, R-Value testing of soil samples, and flexural testing of concrete beams.**
- **Useful for a variety of mid-range compression testing.**
- **Digital controller has memory for 1,000 tests and downloads to printer or PC.**
- **60,000lbf capacity.**

Gilson's versatile mid-range 60,000lbf (267kN) digital compression tester is suited for a variety of tests, but it is specially designed for Hveem asphalt stability testing, R-Value testing of soil samples, or (with attachments) recorded flexural testing of 6x6in (152x152mm) concrete beams. A test set for 2in (51mm) cube testing is also available, and sets for other applications can be offered on request.

The display shows live load, peak load, peak stress, and load rate with 0.5% accuracy from 1%—100% of capacity in 0.44in digits. Load may be displayed in lbf, N, or kgf, and memory is provided for up to 1,000 tests. USB interface allows transfer of data to PC. The 2.5in (64mm) working stroke hydraulic ram has control positions for rapid advance, metered advance at constant loading rate, hold, and retract. The two-stage hydraulic system is powered by a 1/2hp motor, and safety features limit pressure within load frame capacity, protect against piston overextension, and guard against flying specimen fragments. The rigid one-piece solid steel load frame is supplied with an 8in (203mm) diameter 1in (25mm) thick hardened steel lower platen and a 6.5in (165mm) diameter spherically-seated upper platen. Both are plated and scribed with concentric circles. A support stand is included.

The MC-60 is set up for Hveem and R-Value testing as supplied. Upper platen shim locks are included to eliminate swivel for mold compaction. The unit has a special Hveem valve that is manually activated to drop to 1,000lbf and automatically hold there within ±20lbf as necessary in the test procedure. The 14in (356mm) wide and 21.5in (546mm) high (16in high with platens) daylight openings and included support stand are designed to permit easy placement and use of the Hveem stabilometer. HMA-118 R-Value Molds are plated steel and meet specification requirements with prescribed 25 micron rough inside finish. HMA-118S R-Value Molds are stainless steel and meet dimensional requirements but are machined smooth as frequently requested.

The MCA-4 Flexural Attachment and MCA-15 Spacer are required for testing 6x6in (152x152mm) beams of 12—30in (305—762mm) span in either center or third-point loading. MCA-22 software allows plotting of Modulus of Rupture (MOR) in lbf/in^2 vs. time. Data Collection Reporting Software installs on user's PC connected to MC-60. Data and reports can be printed by user's printer. The plot is automatically scaled to fit 8.5x11in plain paper, and the peak MOR is printed on the plot to ±0.5% machine accuracy along with specimen and operator IDs, test date, and time.

MCA-4

HMA-118

MC-60

The versatile MC-60 can be adapted to suit a variety of other mid-range test procedures. A 2in (51mm) Cube Test Set is available as MCA-6. Inquire for other possible applications including compressive strength of 6x12in soil cement cylinders, 3x6in grout or concrete cylinders, and for molding and strength of 2in, 3in, or 4in diameter bituminous concrete specimens. **Product Dimensions:** 31.8x17x61in (806x432x1549mm), WxDxH.

Hveem-N-Beam Tester	
Hveem-N-Beam Tester, 115V, 50/60Hz	MC-60
230V, 50/60Hz	MC-60F
Accessories	
Concrete Beam Flexural Attachment[1]	MCA-4
2in Cube Test Set	MCA-6
Spacer, 4in (102mm) thick	MCA-14
Spacer, 4in (102mm) thick, for use with MCA-4	MCA-15
Data Collection and Reporting Software	MCA-22
R-Value Mold, 4in x 5in (Dia. x H) with 25µm micron finish (rough)	HMA-118
R-Value Mold, 4in x 5in (Dia. x H) with smooth finish	HMA-118S

[1] MCA-15 required for use with MC-60

helpfulhint

Gilson's exclusive Hveem-N-Beam Tester is designed for multiple applications in laboratories that routinely test both asphalt and concrete products.

Accuracy is 0.5% from 600—60,000lbf. (2.7—267kN), making the MC-60 a versatile machine for many types of tests.

SG-4

AP-16

APA-166

ASPHALT BULK SPECIFIC GRAVITY DEVICE
AASHTO TP 82

Gilson's SG-4 Asphalt Bulk Specific Gravity Device is the quickest and most accurate method for bulk specific gravity determinations of 4in (102mm) and 6in (151mm) asphalt cores and gyratory specimens. The SG-4 uses a precision computer-controlled system (patent pending) to measure water displacement with superior resolution and accuracy. This improved method uses no consumable products, allows the user to perform more than twice as many tests in the same time, and greatly improves repeatability between operators. The AASHTO TP 82 Provisional Specification provides guidance for operation of the SG-4.

The SG-4 is easy to use, and operator error is significantly reduced from other methods. Enter the sample information and weight of the dry asphalt specimen into the proprietary software program (preloaded in the included computer) and lower the sample into the water-filled measuring chamber. The system is capable of accurately measuring water displacement with 0.5cc resolution and repeatability of ±1cc. Within seconds, the bulk specific gravity is displayed directly on the computer screen, saving time, improving accuracy, and eliminating potential inconsistencies created by the subjective SSD drying process in other methods. Test Data is saved in a format suitable for export to a spreadsheet or printer.

Primary components insulated with the SG-4 are the Measuring Chamber, Computer, Specimen Holder and Calibration Specimen. **Product Dimensions:** 6.1x9x11in (156x229x279mm), WxDxH.

Asphalt Bulk Specific Gravity Device	
Asphalt Bulk Specific Gravity Device, 120-240V, 50/60Hz	SG-4

LABORATORY ASPHALT PERMEAMETERS
FLORIDA FM 5-565

Laboratory Asphalt Permeameters utilize the falling head method to determine hydraulic conductivity of saturated 4in (102mm) and 6in (152mm) diameter asphalt cores or laboratory compacted specimens.

This simple, easy-to-use Permeameter design is based on test procedures developed at Florida DOT. The asphalt sample is placed inside a metal cylinder and held in place by expanding discs. A replaceable rubber membrane inside the rubber membrane lined metal cylinder is pressurized to fill voids and eliminate flow down the outside of the core. Permeability of the prepared specimen is determined by timing flow from the included 500cc Manometer through the sample. Both models include a self-contained hand pump which provides vacuum to hold the membrane out against the metal cylinder during assembly as well as confining pressure to push the membrane against the core during testing. A dial gauge displays pressure applied by the hand pump. Included with each Permeameter are two APA-144 4in (102mm) or two APA-166 6in (152mm) Rubber Membranes. Replacement 500cc Manometers are available as APA-105. 2,000cc capacity Manometers are available as APA-120 for more permeable samples. **Product Dimensions:** 8x13x45in (203x330x1,143mm), WxDxH.

Laboratory Asphalt Permeameters	
Permeameter for 4in (102mm) dia.	AP-14
Permeameter for 6in (152mm) dia.	AP-16
Accessories	
Replacement 500cc Manometer	APA-105
Large Capacity 2,000cc Manometer	APA-120
4in (102mm) Rubber Membranes	APA-144
6in (152mm) Rubber Membranes	APA-166

SP-55

SPA-22 shown with SPA-23 and SPA-24

SPA-21

HMA-68

GILSON QUARTERMASTER ASPHALT SAMPLE DIVIDER

ASTM D979; AASHTO R 47

- **Quickly and safely divides bulk asphalt and aggregate samples for testing.**
- **Rugged construction stands up to field use.**
- **New Bucket-Liner sample bags streamline sample handling.**
- **Proven history of accurate performance.**

Gilson's patented SP-55 Quartermaster quickly and accurately divides the large bulk samples required in Superpave® specifications for quality control analysis. Hot-mix asphalt samples of 120lb (55kg) or more are easily reduced, ensuring representative samples for consistent laboratory results. The large hopper reduces handling of hot material during preparation of laboratory specimens. Quartermaster has a proven history of significantly reducing bias in sample reduction.

Once a bulk hot-mix asphalt sample is loaded evenly into the hopper, the handle is released and the sample falls through the divider, and is distributed into the four included galvanized steel buckets. SPA-22 Bucket-Liner Sample Bags simplify collection and handling of divided specimens and eliminate cleaning of the sample buckets. One person can easily collect and secure samples. Fabric and thread of the sturdy cotton Bucket-Liner bags are temperature-rated to 400°F (204°C). Double loop Wire Ties and Wire Tie Twister allows bag openings to be quickly and securely closed. Only occasional clean-up is required to prevent buildup on the exposed splitting surfaces.

Rugged two-part steel construction stands up to field conditions and allows portability between jobsites. The SPA-21 Quick-Funnel Hopper Insert (purchased separately), drops into the top of the Quartermaster to significantly reduce hopper volume and allow accurate reduction of smaller samples. Four Galvanized Steel Sample Buckets are included. Extras can be ordered to increase sampling efficiency. Four Bucket-Liner Sample Bags are also included. Order additional liner bags in quantities of 10, 100 or 1,000. SPA-23 8in Double-Loop 16 gauge Wire Ties securely close bag openings when used with the SPA-24 Wire Twister. HMA-68 Material Handling Chute allows fast and easy loading of hopper. **Product Dimensions:** 14x17x48in (356x432x1,219mm), WxDxH.

Gilson Quartermaster Asphalt Sample Divider	
Gilson Quartermaster Asphalt Sample Divider	SP-55
Accessories	
Quick-Funnel Insert	SPA-21
Bucket-Liner Sample Bags, qty. of 10	SPA-22
Bucket-Liner Sample Bags, qty. of 100	SPA-22C
Bucket-Liner Sample Bags, qty. of 1,000	SPA-22K
8in Double-Loop Wire Ties, qty. of 50	SPA-23
Wire Tie Twister w/Plastic Grip	SPA-24
Galvanized Steel Sample Buckets	MA-950
Material Handling Chute	HMA-68

MATERIAL HANDLING CHUTE

- **Fills large Gyratory compaction molds in a single lift.**
- **Makes handling of hot-mix asphalt samples safe and efficient.**
- **Works equally well for aggregate and soil samples.**
- **Stable for use as a weighing scoop.**

HMA-68 Material Handling Chute is an all-purpose chute that allows loading, filling, and handling of any bulk material, including Asphalt, Aggregates, and Soils. It quickly and uniformly fills Gyratory, Marshall, Proctor, CBR, Relative Density molds, Quartermaster or Universal splitters. The Handling Chute conforms to mold loading procedures in ASTM D4013 and AASHTO T 312.

The flat bottom and integral feet make weighing convenient. The two sturdy aluminum bar handles reinforce the unit and enable balanced handling for easy and accurate placment of sample materials. Material Handling Chute is constructed of 24-gauge stainless steel with rolled edges. The open end is formed with a 2in (51mm) radius to fit most mold openings. The unit stands horizontally or vertically. **Product Dimensions:** 22x11.5x10.5 (559x292x267mm).

Material Handling Chute	
Material Handling Chute	HMA-68

helpfulhint

Gilson's Material Handling Chute is the easiest way to handle bulk samples of aggregate, asphalt or soils.

MA-66

MA-67

MA-52

PORTABLE MIXERS

The portable Asphalt/Concrete Mixers are ideal for sample or small batch mixing in just about any setting. The enameled-steel mixer holds a utility bucket securely in place. As the bucket rotates at 60rpm, a stationary Mixing Paddle scrapes sides and bottom of the bucket to ensure thorough mixing. All 115V/60Hz mixers are supplied with a 1/2hp motor, On/Off switch, fuse protection, and an 8ft cord with three-prong plug. For 230V/50Hz mixer, add "F" to model number suffix. The 10 gallon "F" model is supplied with a 1hp motor.

MA-66 Light-Duty Stationary Mixer includes a removable 5gal Utility Bucket and Standard Mixing Paddle. A Deluxe Mixing Paddle with extra fins is available for heavy loads. MA-66 is powered by a constant speed motor and belt pulley. Other heavy-duty models are recommended for asphalt mixes. **Product Dimensions:** 12x18x24in (305x457x610mm), WxDxH.

MA-67 and MA-68 Heavy-Duty Portable Mixers use 5gal and 10gal Utility Buckets, respectively, and are equipped with 8in wheels for maximum mobility. By using a direct drive motor more power is generated for mixing. Mixing paddles not included. Gilson recommends MA-67 Mixer with either MAA-146 Paddle for asphalt or MAA-148 Paddle for concrete applications. The 5gal bucket can be preheated in ovens if necessary. Inquire for other available paddles. **Product Dimensions:** 24x21x35in (610x533x889mm), WxDxH.

Portable Mixers	
Light-Duty Stationary Mixer, 5gal	MA-66
Heavy-Duty Portable Mixer, 5gal	MA-67
Heavy-Duty Portable Mixer, 10gal	MA-68
Accessories	
Bucket & Cover for MA-66, 5 gal	MAA-141
Replacement Paddle for MA-66	MAA-142
Deluxe Paddle for MA-66	MAA-143
Utility Bucket for MA-67, 5gal	MAA-144
Utility Bucket for MA-68, 10gal	MAA-145
Asphalt Paddle for MA-67, 5gal	MAA-146
Asphalt Paddle for MA-68, 10gal	MAA-147
Concrete Paddle for MA-67, 5gal	MAA-148
Concrete Paddle for MA-68, 10gal	MAA-149

LABORATORY MIXERS
ASTM C109, C227, C305; AASHTO T 106, T 162

Industrial-grade Laboratory Mixers have planetary action for thorough mixing, and blending of materials. Direct gear drives and heavy-duty motors assure constant mixing speeds under load. Locking hand-lever raises and lowers bowl. All mixers are supplied with stainless steel bowl, wire whip, dough hook, and aluminum flat beater. MA-52 and MA-52X include an MAA-266 stainless steel flat beater. MA-52X includes modifications to meet ASTM and AASHTO specifications. Add “F” suffix to any mixer or heating adapter model number for similar unit that operates on 230V/50Hz power supply.

MA-52 Laboratory Mixer has 5qt (4.7L) capacity and a 1/6hp motor with selectable operating speeds of 139, 285 and 591rpm. Additional heavy-duty Stainless Steel Flat Beater is included, as well as a 6ft (1.8m) power cord. The MAA-30A Clearance Adjustment Bracket can be purchased separately to meet requirements of ASTM C305, C227 and C109. MAA-31 Acrylic Bowl Lid is also available for all 5qt (4.7L) bowls. **Product Dimensions:** 10.5x15x17in (267x381x432mm).

MA-52X Laboratory Mixer has the same specifications as MA-52, but has been modified with a MAA-30A Clearance Bracket to meet the requirements of ASTM C305, C227 and C109 (AASHTO T 162 and T 106) and certain other tests for mortar and cement. **Product Dimensions:** 10.5x15x17in (267x381x432mm).

MA-54A Laboratory Mixer is a 12qt (11.4L) capacity benchtop mixer for larger batch requirements. This unit is supplied with a 1/2hp motor for selectable mixing speeds of 107, 198 and 365rpm. A 6ft (1.8m) power cord is included. **Product Dimensions:** 19x23x29in (483x580x750mm), WxDxH.

Heating Adapter Kits maintain elevated temperatures when preparing hot-mix asphalt specimens in Laboratory Mixers. Heating mantles mount under mixing bowls with hook and loop fasteners. Electronic proportional controller with built-in circuit breaker attaches with a twist-lock connector on 4ft (1.2m) cable.

Laboratory Mixers	
5qt Laboratory Mixer, 115V/60Hz	MA-52
5qt Laboratory Mixer for ASTM C 305 and C 109, 115V/60Hz	MA-52X
12qt Laboratory Mixer, 115V/60Hz	MA-54A
Accessories	
Wire Whip for MA-52	MAA-260
Heavy-Duty Stainless Steel Flat Beater for MA-52	MAA-266
Bowl for MA-52	MAA-32
Bowl for MA-54A	MAA-34A
Clearance Adjustment Bracket for MA-52	MAA-30A
Heating Adapter for MA-52, 250 Watts	MAA-28[1]
Heating Adapter for MA-54A, 600 Watts	MAA-64[1]

[1]Add "F" to model number to order Mixers or Heating Adapters to operate on 230V/50Hz electrical supplies.

Find Estimated Ship Weights for all our products in the Ship Weight Index

CD-1 shown with CDA-141

CD-6 shown with CDA-141

CDA-50

CDA-142

CDA-243

CORE DRILLING MACHINES
ASTM C42; AASHTO T 24

Gasoline or electric-powered core drilling machines offer easy set up, fast drilling, and low bit wear to give low cost per core. The drills have bit capacities up to 8in (203mm) diameter. Inquire for larger, trailer-mounted rigs for bits up to 16in (406mm). Quick disconnect fittings for water supply are provided. Diamond coring bits are ordered separately.

CD-1 Gasoline-Powered Core Drill is designed for vertical coring of pavements and slabs. Stable platform with leveling screws, a heavy-duty column and smooth, precision-feed system combine to make this model the ideal choice for large projects. Gasoline-powered drill allows the operator to operate independently of power supplies, and have minimal set up time and faster drilling. The unit easily adapts to mount to a pickup truck and has a 6.5hp four-cycle manual start engine. Carriage travel is 24in (610mm).

CD-6 Electric Core Drill adapts to a wide range of drilling jobs in addition to pavement coring. The column rotates 180° horizontally, allowing precise placement of drill bit. The super-duty two-speed (450/900rpm) 3.5hp motor and carriage can be removed or reattached without changing location for ease in snapping cores and adding extension rods. The 10in (254mm) wide wheeled base has a vacuum anchor to solidly grip smooth pavement or floors. Unit includes oilless vacuum pump, filter, hose, and quick connections.

Accessories for the Core Drilling Machines are purchased separately. CDA-20 is a 4gal (15L) manually-pressurized portable water tank, and CDA-22 is a trap-ring and electric pump to recirculate drilling water. CDA-24 9in (229mm) extension allows drilling to extended depth, and CDA-26 18in (457mm) strap wrench is for attaching and removing coring bits without damage. CDA-32 is a replacement gasket with mastic for the CD-6 vacuum base. **CD-1 Product Dimensions:** 14x32x46in (356x813x1168mm), WxDxH. **CD-6 Product Dimensions:** 12x34x36in (305x864x914mm), WxDxH.

Core Drilling Machines	
Gasoline-Powered Core Drill	CD-1
Electric Core Drill, 115V/60Hz	CD-6
230V/50-60Hz	CD-6F
Accessories	
Pressurized Water Tank, 4gal (15L)	CDA-20
Water Recirculator	CDA-22
Extension Rod, 9in (229mm)	CDA-24
Strap Wrench, 18in (457mm)	CDA-26
Replacement Vacuum Gasket	CDA-32
Long-Handle Core Retrieval Tongs, 4in Cores	CDA-15
Long-Handle Core Retrieval Tongs, 6in Cores	CDA-16
Core Extractors, 4in Cores	CDA-18
Core Extractors, 6in Cores	CDA-19

DIAMOND CORING BITS
ASTM C42; AASHTO T 24

Open-Head Coring Bits require Expander Sets listed for attachment to drills. These bits are slightly less expensive, and the expander sets can be reused many times as the core barrels wear out and are replaced. They are an economical choice for high-output and heavy use applications.

Closed-Head Coring Bits are one piece construction for convenience and easy, direct attachment to drills. There are no extra parts to buy or lose. These are best suited for light to medium duty, or for occasional use.

Both bit styles are available in designs optimized for asphalt pavements, or for reinforced concrete and other hard materials. All bits are constructed for wet use, and are fast-cutting when used according to design applications. Standard length is 14in (356mm) for cutting cores up to 12in long. Our most popular bit sizes are listed here. Please inquire for sizes not shown. All bits may be refurbished when worn.

Diamond Coring Bits					
Nominal Bit Size OD, in (mm)	Open-Head Bits			Closed-Head Bits	
	Concrete	Asphalt	Expander Sets	Concrete	Asphalt
2 (50.8)	CDA-120	CDA-220	CDA-40	CDA-121	CDA-221
2-1/4 (57.2)	CDA-122	CDA-222	CDA-41	CDA-123	CDA-223
3 (76.2)	CDA-130	CDA-230	CDA-43	CDA-131	CDA-231
3-1/4 (82.6)	CDA-132	CDA-232	CDA-55	CDA-133	CDA-233
4 (101.6)	CDA-140	CDA-240	CDA-45	CDA-141	CDA-241
4-1/4 (108)	CDA-142	CDA-242	CDA-46	CDA-143	CDA-243
6 (152.4)	CDA-160	CDA-260	CDA-50	CDA-161	CDA-261
6-1/4 (158.8)	CDA-162	CDA-262	CDA-51	CDA-163	CDA-263

CDA-18 and CDA-19

HM-60 shown with HMA-226

HM-62 shown with HMA-234

CORE EXTRACTORS

Gilson Core Extractors are efficient and easy-to-use for the removal of drilled cores from asphalt or concrete pavements. To operate, simply insert the curved blades into the cut area around the core. Adjust the top screw, enabling the blades to grasp the core, and lock the device into place by squeezing the handles. Push sharply to break off the core bottom and lift the specimen out. Release lever to free the core.

The lock feature protects cores from damage during extraction and assures laboratory acceptance for testing without repeat drilling. Models for 4in (102mm) or 6in (152mm) core sizes have identical features and operation. Extractors are welded, painted steel with sturdy handle grips. **Product Dimensions:** 12x10x10in (305x254 x254mm) WxDxH.

Core Retrieval Extractors	
Long-Handle Core Extractors, for 4in Cores	CDA-18
Long-Handle Core Extractors, for 6in Cores	CDA-19

CDA-15

LONG-HANDLE CORE RETRIEVAL TONGS

Fast, easy-to-use patented Core Retrieval Tongs remove cores from asphalt or concrete surfaces. Simply insert blades into space from core drill bit, grasp the core with the tongs, and lift. Recovered cores are free of damage that may occur from use of improper tools. Laboratory acceptance for testing is assured without repeat drilling. Models are available for 4in (102mm) or 6in (152mm) core sizes. Tongs are welded, painted steel with plastic handle grips. **Product Dimensions:** 3x4.5x35in (76x114x889mm).

Long-Handle Core Retrieval Tongs	
Long-Handle Core Retrieval Tongs, for 4in Cores	CDA-15
Long-Handle Core Retrieval Tongs, for 6in Cores	CDA-16

HUSQVARNA® MASONRY SAWS

Masonry Saws from Husqvarna® are ideal for trimming concrete, asphalt and masonry specimens to size for testing. Models include a lightweight 1.5hp Portable unit and a larger 5hp Heavy-duty version for high-production applications. Both include reliable high-torque motors and heavy-duty shafts mounted on quality ball bearings. Water distribution by submersible pumps permits wet cutting.

HM-60 Portable Masonry Saw has 2,330 blade rpm from the 1.5hp electric motor. The HM-60 uses 14in (356mm) diameter blades for up to 5in (127mm) cut depth. This saw features a unique, patented water distribution system designed to keep both the work piece and the work area cleaner and drier. The optional HMA-226 Portable Rolling Stand is quickly set up, easily relocated by one person, and has fast adjustment for proper height. The stand folds flat for easy portability. Lightweight, economical HMA-224 Fixed-Leg Stand is also available. A 14in (356mm) Vari-Cut™ blade is included with the saw. **Product Dimensions:** 27.5x39.8x27.5in (699x1,011x699mm), WxDxH. Height with Fixed leg stand is approximately 54in (1372mm).

HM-62 Heavy-Duty Masonry Saw is equipped with a powerful 3hp high-torque motor with 2,350 blade rpm to assure high-production performance. A convenient crank on the foot pedal sets table height and the patented Sta-level® blade guard controls blade orientation to assure the most accurate cuts possible. The painted integral rigid steel support stand resists flexing. The 20in (508mm) blade capacity permits cutting of 6in (152mm) cylinders or 8in (203mm) blocks in a single pass. Blades are purchased separately. **Product Dimensions:** 22x47.8x57.5in (559x1213x1461mm), WxDxH.

High-quality Diamond Blades are ordered separately. Premium grade blades for medium-sized jobs feature fast cutting and long life. Super Premium Blades allow maximum production for the largest jobs, and have the lowest cost per cut. All blades listed below can be used wet or dry and cost less in quantities of five.

Husqvarna® Masonry Saws	
Portable Masonry Saw, including blade, 1.5hp, 115V/60Hz	HM-60
Heavy-Duty Masonry Saw, without blade, 3hp, 208-230V/60Hz	HM-62
Accessories	
Portable Rolling Stand for HM-60	HMA-226
Fixed-Leg Stand for HM-60	HMA-224
14in Super Premium Blade	HMA-234
14in Super Premium Blade, price each for qty. 5 or more	HMA-234D
20in Premium Blade	HMA-232
20in Premium Blade, price each for qty. 5 or more	HMA-232D
20in Super Premium Blade	HMA-236
20in Super Premium Blade, price each for qty. 5 or more	HMA-236D

Find Estimated Ship Weights for all our products in the Ship Weight Index

VIDEO ONLINE

MA-771

VIDEO ONLINE

MA-774

FLIR® INFRARED THERMAL IMAGING CAMERAS

Thermal Imaging Cameras by FLIR® were selected by Gilson as the best values for instant detection of temperature gradients in many different materials. The color LCD displays highlight problem areas fast, something that can't be done with standard infrared thermometers. Paving operations, bridge deck and floor slab inspections, location of delaminations, cavities, and moisture problems in concrete and masonry prism walls, are just a few of the applications for these sophisticated instruments.

FLIR® Cameras are light and compact, with focus-free lenses and simple navigation for easy one-handed operation, yet are tough enough for rugged field conditions and rated to withstand shock values to 25g. Rechargeable Lithium-Ion batteries yield two to four hours or more of operating time, and are quickly charged on the included AC charger. The unmatched manufacturer's warranty offers 10-year coverage on the detector, and 2 years parts and labor.

Exclusive MSX® thermal image enhancement on most models adds key details from the visible spectrum camera to the entire infrared image on the color LCD display. Text becomes clearly visible, making it easy to read a label or identifier in the image. The all-in-one image shows accurate thermal gradients along with visible details. Higher-end models feature enhanced infrared resolution, selectable measurement modes, and picture-in-picture displays, which superimpose a thermal image over a visible spectrum photo.

FLIR® Infrared Thermal Imaging Cameras

Description	Model	Temperature Range F° (C°)	Accuracy	Thermal Sensitivity C°	IR Sensor Resolution (Pixels)	Field of View
FLIR® C2 Thermal Imaging System This pocket-sized, full-featured thermal camera is the first designed for construction applications. The C2 saves thermal, visible, and MSX®-enhanced JPEG still images, as well as non-radiometric streaming thermal video. Fully radiometric images allow measurement at any point during on-screen analysis and the included FLIR® Tools software for PC or Mac allows easy reporting and analysis down to the pixel level. The large, 3in (76mm) LCD intuitive touch screen display features auto-orientation and wide field of view. Internal memory stores at least 500 images in standard JPEG format. A built-in digital camera captures visible images. Also included are a lanyard, USB Memory Stick, and USB cable with Micro-B connector for data transfer to and from PC, iOS, and Android devices. **Product Dimensions:** 3.1x1x4.9in (80x24x125mm) WxDxH.	MA-771	14°—302° (-10°—150°)	±2°C or 2%	<0.10	80x60 (4,800)	41°x31°
E4 Thermal Imaging Camera is economical and features infrared, visual, and MSX image modes on 3in (76mm) color display. Sensor operates only in center-spot measurement mode. Comes with FLIR Tools software and a sturdy plastic case. **Product Dimensions:** 3.1x1x4.9in (80x24x125mm) WxDxH.	MA-774	-4°—482° (20°—250°)	±2°C or 2%	<0.15	80x60 (4,800)	45°x34°

MA-775

MA-776

MA-778

MA-769

FLIR® Infrared Thermal Imaging Cameras

Description	Model	Temperature Range F° (C°)	Accuracy	Thermal Sensitivity C°	IR Sensor Resolution (Pixels)	Field of View
E5 Thermal Imaging Camera measurement modes include center-spot or area box. Automatic hot/cold detection marks maximum and minimum temperatures within the 3in (76mm) color display. Image modes are infrared, visual, and MSX. A plastic carrying case and FLIR® Tools software are included. **Product Dimensions:** 3.1x1x4.9in (80x24x125mm) WxDxH.	MA-775	-4°—482° (20°—250°)	±2°C or 2%	<0.10	120x90 (10,800)	45°x34°
E6 Thermal Imaging Camera with higher Infrared resolution and thermal sensitivity rating of less than 0.06°C. Measurement modes include center-spot or area box. Automatic hot/cold detection marks maximum and minimum temperatures within the display area. Image modes are infrared, visual, MSX, and picture-in-picture mode on the 3in (76mm) color display. FLIR® Tools analytical software and a plastic case are included. **Product Dimensions:** 3.1x1x4.9in (80x24x125mm) WxDxH.	MA-776	-4°—482° (20°—250°)	±2°C or 2%	<0.06	160x120 (19,200)	45°x34°
E8 Thermal Imaging Camera features full, sharp 76,800 Infrared pixel resolution with thermal sensitivity rating of less than 0.06°C. Measurement modes include center-spot or area box. Automatic hot/cold detection marks maximum and minimum temperatures within the display area. Image modes are infrared, visual, MSX, and picture-in-picture on the 3in (76mm) color display. A plastic case and FLIR® Tools software for analysis are included. **Product Dimensions:** 3.1x1x4.9in (80x24x125mm) WxDxH.	MA-778	-4°—482° (20°—250°)	±2°C or 2%	<0.06	320x240 (76,800)	45°x34°
FLIR® Imaging IR Thermometer The affordable new Imaging IR Thermometer bridges the gap between ordinary infrared thermometers and FLIR® infrared Thermal Imaging Cameras. The MA-769 lets you easily visualize heat patterns instead of relying on spot temperatures. Accurate surface temperatures and images are saved to an included 8Gb Micro SD card or to a PC over a USB connection. The measurement field is framed by dual-laser pointers and has a 24:1 spot ratio for accurate measurements at a safe distance. The 2in (50mm) display has gray-scale or hot iron color palettes and adjustable auto power-off. A lanyard, USB Cable, and international AC charger are included. Analysis Software is not included. Protective Vinyl Case and a convenient Belt Holster are available as options. **Product Dimensions:** 2.2x3.7x7.3in (55x94x186mm) WxDxH.		-13°—716° (-25°—380°)	±2°C or 2%	<0.15	80x60 (4,800)	50°x39°
FLIR® Imaging IR Thermometer Protective Vinyl Case	MA-769 MAA-14					

Find Estimated Ship Weights for all our products in the Ship Weight Index

AP-1B

NCAT ASPHALT FIELD PERMEAMETER

The NCAT Field Permeameter 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. Studies show that some Superpave mixes can be permeable to water even when compacted to an acceptable air void ratio. Field testing permits on the spot, accurate estimation of permeability, eliminating the need for coring, patching and laboratory testing. Corrections to mix and placement procedures can be implemented right away. Testing and subsequent calculations can usually be completed in 10—15 minutes by one technician. The simple procedure means no extensive training is required.

The APA-11B Permeameter is a 4-tiered, graduated standpipe supplied in two sections and constructed of rugged plastic. A sealing material is placed on the base plate. The unit is then positioned on the test site and seated against the pavement using gentle foot pressure and included base weights. After filling with water, outflow is observed against the clearly marked graduations and timed. The smallest, uppermost tier allows rapid determinations in low-porosity pavements. The larger diameter tiers permit enough time to accurately read flow on more porous pavements. An alternate top section is included 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 AP-1B Kit includes the 4-tiered graduated Permeameter, Alternate top section, Filling Tube, 5lb (2.3kg) tub of Moldable Sealant material, Whisk Broom for test site preparation, and four 5lb (2.3kg) Base Weights. Kit is packaged in a durable carrying case, with wheels for easy transporting. **Permeameter Product Dimensions:** 3x3x12.5in (76x76x318mm), WxDxH.

NCAT Asphalt Field Permeameter	
NCAT Asphalt Field Permeameter Kit	AP-1B
Accessories	
Permeameter	APA-11B
Standard Top Tier, Replacement	APA-17
Alternate Top Tier, Replacement	APA-18
Moldable Sealant, 5lb (2.3kg)	APA-22

HM-574

MA-366

MA-334

HM-591

BENKELMAN BEAM

ASTM D4695; AASHTO T 256

The Benkelman Beam is a simple lever arm device which measures deflection of flexible pavements under the action of moving wheel loads. A probe beam is supported by a rigid reference beam such that deflections in its 2.44m (8ft) probe end are measured by a dial indicator 1.22m (4ft) on the other side of the fulcrum. Deflections measured on a dial indicator are therefore doubled to obtain pavement deflection.

The probe beam is placed between the tires of a test vehicle, and deflection is measured as the vehicle passes over the test area to beyond the end of the probe beam. The reference beam has a leveling adjustment to zero the dial indicator. A switchable battery-operated vibrator serves as a personnel alert and assures free movement of beam parts during measurements.

The three-piece, anodized, lightweight aluminum beam is 33lb (15kg) net weight for easy portability, and the longest piece is 6.5ft (1.99m). Mechanical Dial Indicator MA-334 or Digital Dial Indicator MA-366 must be ordered separately.

Benkelman Beam	
Benkelman Beam	HM-574
Accessories	
Mechanical Dial Indicator	MA-334
Digital Dial Indicator	MA-366

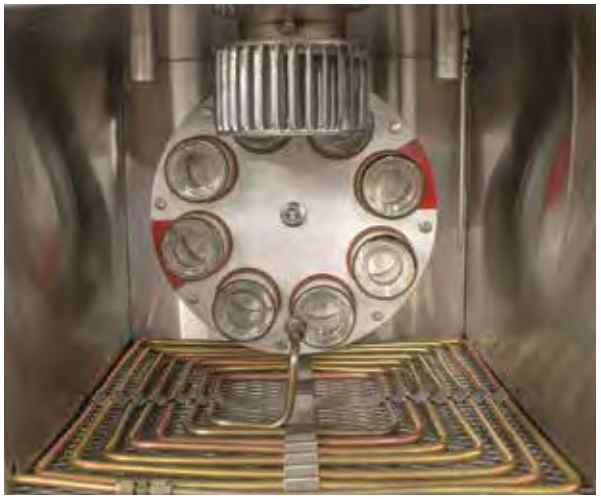
ASPHALT DEPTH GAUGE

The Asphalt Depth Gauge makes accurate thickness determinations quickly and easily. Depth measurements up to 11.75in (298mm) in 0.25in increments may be made from back of paver or from curbside with no need to step directly on hot asphalt. Depth rod will not pull on asphalt when retracted and leaves a small hole easily closed by roller. Storage bracket may be mounted directly to paver or pickup truck bed and holds the gauge securely in place with a spring clamp and PVC cup.

Gauge body is all-aluminum construction with 38in (965mm) total length, 1.25in (32mm) dia. anodized barrel is 25in (635mm) long. 3in (76mm) diameter foot insures steady, accurate measurements. Depth probe is 0.25in (6.3mm) steel. Hole for lubricating oil is in barrel. Gauge weight is 2lb (1kg).

Asphalt Depth Gauge	
Asphalt Depth Gague	HM-591

MO-36



Inside of MO-36

MOA-6

GILSON ROLLING THIN FILM OVEN
ASTM D2872; AASHTO T 240; CALIFORNIA 346

- **Quick 5-8 minute temperature recovery time after loading samples, exceeds ASTM and AASHTO requirements.**
- **Easy to remove bottom tray allows for quick change of elements or spill clean-up.**
- **High-temperature silicone compression fit gaskets securely grip RTFO Bottles.**
- **Double-walled stainless steel oven maintains temperature to 200^{0}C ± 1^{0}C (392^{0}F ± 1.8^{0}F).**
- **Platinum Resistance Temperature Detector (RTD) ±0.1^{0}C from 0^0-215^{0}C (±0.18^{0}F from 0^0-419^{0}F).**

The Gilson Rolling Thin Film Oven by ATS features advanced design, solid construction and reliable accuracy. Precision components are paired with basic controls to insure accurate, repeatable results and straightforward operation. Set-up and operational procedures are fast and easy with minimal training required. A built-in timer controls test times. Precision temperature control is easily programmed for test temperature of 163°C (325°F), with maximum temperature rated up to 200°C (392°F). The exclusive Gilson MO-36 is made in the USA, meeting all test method specifications and exceeding requirements for recovery time, a requirement other manufacturers have been unable to meet.

Temperature is precisely controlled to ±0.1°C with a built-in NIST Traceable Platinum RTD temperature sensor, assuring an overall temperature uniformity of ±1°C, and safe, mercury-free operation. Time from ambient to 163°C (325°F) set point is 20 minutes, and full heat recovery is 5 to 8 minutes after loading of specimens. A thermal shutdown switch provides over-temperature protection at 215°C (419°F). Operating airflow of 0-5,000 mL/m is indicated on the included flow meter with a range of 200 to 14,000 ml per minute. A source of clean, dry compressed air at 100psi (6.9 bar) is required for operation. Soft, high-temperature silicone compression gaskets in the rotating carousel grip RTFO Bottles securely, yet allow quick and easy insertion and removal with no scratching. Cleaning and access for maintenance of the elements is easy with the removable tray at the bottom of the case.

The rugged double-wall stainless steel case features leveling legs for convenient bench-top operation. A set of eight serial numbered RTFO Sample Bottles is included. Additional Gilson serial-numbered bottles are ordered as MOA-6. The MOA-5 Bottle Scraper is optionally available, and is shaped to fit RTFO bottles for quickly removing testing residue. Other optional accessories include special stainless steel MOA-3 Bottle Tongs with synthetic gripper pads for handling of hot bottles, and the stainless steel MOA-10 Cooling Rack, constructed to meet ASTM requirements holds nine specimen bottles. Electrical requirements: 230V-50/60 Hz, single phase, 15 amps, 3500 watts. **Product Dimensions:** 37.25x28.75x36in (946x730x914mm) WxDxH.

Gilson Rolling Thin Film Oven	
Gilson Rolling Thin Film Oven, 230V-50/60Hz	MO-36
Accessories	
RTFO Sample Bottle, Serial-Numbered	MOA-6
RTFO Bottle Cooling Rack	MOA-10
RTFO Bottle Scraper	MOA-5
RTFO Bottle Tongs	MOA-3

alsoavailable

MO-38 Touch Screen RTFO by ATS is also available. See the complete listing at www.globalgilson.com.

HM-923

VDO TOUCH VACUUM DEGASSING OVEN
ASTM D6521; AASHTO R 28; BS EN 14769

Vacuum Degassing Ovens (VDO) remove entrapped air bubbles from asphalt specimens aged in a Pressure Aging Vessel. The VDO Touch by ATS is a completely automated tabletop degassing oven with a self-contained vacuum system to rapidly evacuate the chamber to the required 15 ±1.0kPa (25.5Hg). The network-ready 7in (178mm) industrial grade touch-screen controller features easy menu-driven operation in multiple language options for fast programming of vacuum, temperature values and soak times. When connected to a network via the Ethernet connection, the VDO Touch can be operated remotely using widely available remote access applications on smart phones, tablets, or PC's. USB Ports allow easy software upgrades. The controller display indicates time, temperature, and current process stage. Audible and visual alarms alert the user at end of each process.

Temperatures in the VDO Touch vacuum chamber are measured by a platinum RTD probe from ambient to 200°C with accuracy to ±5°C. Soak time 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 observation during the vacuum degassing process. The chamber accommodates eight 4oz (118ml) or four 8oz (236ml) sample containers. The HM-923 includes four 8oz (236ml) sample tins, and a specimen removal tool for easy loading and unloading of samples. Additional Sample Tins are available. The VDO Verification Kit is purchased separately and used periodically to confirm that the oven is producing specified temperature and vacuum values. The kit includes a 201° to 1,210°C digital thermometer with accuracy of ± 0.03°C, an insulated vessel cap and temperature calibration block for temperature verification, and a 0 to 30in Hg digital vacuum gauge with 0.01 resolution. The kit is also available with NIST Certification. HM-923 Electrical Requirements: 115V/60Hz, 10A, or 230V/50-60Hz. **Product Dimensions:** 24x16x12in (610x406x304mm), WxDxH.

VDO Touch Vaccum Degassing Oven	
VDO Touch Vacuum Degassing Oven, 115V/60Hz	HM-923
230V/50-60Hz	HM-923F
Accessories	
VDO Verification Kit	HMA-674
VDO Verification Kit w/NIST Certification	HMA-674C
Sample Tins, 4oz, pkg of 12	SC-502
Sample Tins, 8oz, pkg of 12	SC-506

HM-74

ATS PRESSURE AGING VESSEL (PAV3)
ASTM D6521; AASHTO R 28; BS EN 14769

Pressure Aging Vessels (PAV's) use heated, pressurized air to simulate long-term oxidative aging of asphalt binders. PAV's consist of an ASME-code and CE certified stainless steel pressure vessel, stainless steel cabinet with encased band heaters, and integral pressure measurement control.

The state of the art PAV3 meets ASTM, AASHTO, and EN 14769 requirements and includes a platinum RTD device to insure accurate temperature resolution and uniformity. A pressure relief valve and high-temperature thermal shut-down are included as standard safety features. A USB port located on the front of the unit allows the user to easily store test data and upgrade software if necessary. The system now includes remote operation capabilities, and allows the user to completely control the PAV3 system using an app compatible with most smart phones and tablets.

The HM-74 ATS Pressure Aging Vessel (PAV3) uses an industrial grade touch-screen controller for complete control and monitoring of all test processes. The system has an operating pressure of 2.1mPa (304psi) and temperature range programmable from 50°—150°C, with resolution of 0.1°C. This easy-to-use system completes a test in three easy steps: press the heat button, insert specimens when prompted, and press the age button. The stainless steel cabinet measures 28x18x30in (710x460x760mm), WxDxH. The ATS PAV includes a set of ten stainless steel Specimen Pans, an anodized aluminum sample holder with lifting handle, and a Specimen Handling Tool. The included MOA-2 Specimen TFOT Pans are the type formerly used in the Thin Film Oven Test (TFOT) procedure. Additional TFOT Pans can be ordered as single units or complete sets as required. Bottled compressed air with a pressure of at least 340psi (2.34mPa) is required. Model is supplied with a regulator; compressed air is user-supplied.

ATS Pressure Aging Vessel (PAV3)	
ATS Pressure Aging Vessel (PAV3), 230V, 50/60Hz	HM-74
Accessories	
Stainless Steel Specimen TFOT Pan	MOA-2
Stainless Steel Specimen TFOT Pans, pkg. 10	MOA-2C

Find Estimated Ship Weights for all our products in the Ship Weight Index

HM-59

HM-73

ATS BENDING BEAM RHEOMETERS
ASTM D6648; AASHTO T 313

Bending Beam Rheometers measure the flexural creep stiffness of asphalt binder at cold temperatures (ambient to -40°C) to predict low-temperature thermal cracking of asphalt pavements. Special molds are used to form small asphalt beam samples for testing. The three point bend apparatus is easily removed and reinstalled in the base unit for convenient sample preparation and loading. Deflection of the beam specimen is measured and recorded as a constant load is applied. Load, displacement, and bath temperature are displayed in tabular and graphic form in real time. The stiffness value is calculated at the lowest temperature anticipated for the region. A fluid bath controls the temperature of the Ethylene Glycol/Water/Methanol mixture down to -40°C (-40°F). Process temperature is controlled and monitored by two independent platinum RTD temperature transducers to maintain temperature stability. Both BBR models fully comply with ASTM/AASHTO requirements. A source of clean, dry, compressed air at 50 PSIG minimum must be provided by the user.

HM-59 ATS Bending Beam Rheometer is a proven and reliable model constructed of stainless steel and durable, high-strength polymer components. The unit uses an air bearing system to assure reliable loading with accurate and repeatable results. A linear variable displacement transducer (LVDT) with a range of 6.35mm and accuracy to ±2µm measures deflection. The temperature-compensating 500g load cell with mechanical overload protection ensures accurate load results. Safe, rapid cooling of the test fluid is provided by the mechanical refrigeration system.

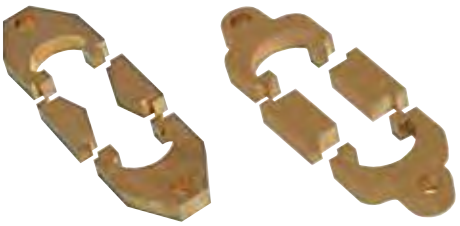
The HM-59 includes a Computer with pre-loaded control, acquisition, and analysis software, five aluminum specimen Molds with mylar strips, a Calibration Kit with required weights, and Confidence Beam. Calibrated test weights and a certified LVDT NIST-traceable standard are provided with each system. The easy-to-use software allows daily verification and periodic calibration of load cell, LVDT, and RTD transducers. **Product Dimensions:** 49x49x41in (1,245x1,245x1,040mm), LxWxH.

HM-73 ATS BBR3 Touch Screen incorporates state of the art design features but retains all of the accuracy, quality, and performance characteristics of the HM-59. Its built-in computer makes test set up and operation easier than ever. The industrial grade touch-screen controller also has intuitive step through menus for guidance. This model can also be started, stopped and monitored remotely using an App installed on a smartphone, iPad, or tablet.

The HM-73 is ruggedly built with integral stainless steel construction. The unit uses an air bearing system to assure reliable loading with accurate and repeatable results. A linear variable displacement transducer (LVDT) with a range of 6.35mm and accuracy to ±2µm measures deflection. The temperature-compensating 500g load cell with mechanical overload protection ensures accurate load results. The complete system consists of a fluid bath base unit with removable three-point bend test apparatus, a cooling unit with temperature controller, 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 standard. The easy-to-use control, acquisition, and analysis software is preloaded on the internal computer, and allows daily verification and periodic calibration of load cell, LVDT, and RTD transducers. A USB port is located on the front of the unit for software upgrades and data storage. **Product Dimensions:** 49x49x41in (1,245x1,245x1,041mm), LxWxH.

ATS Bending Beam Rheometers	
Bending Beam Rheometer, 115V/60Hz	HM-59
230V/50Hz	HM-59F
BBR3 Touch Screen, 115V/60Hz	HM-73
230V/50Hz	HM-73F
Accessories	
Aluminum Beam Molds, set of 5	HMA-348R

LP-10



LPA-20 LPA-21

LPA-24

LPA-30

DUCTILITY TESTER

ASTM D113, D6084; AASHTO T 51, T 300, T 301

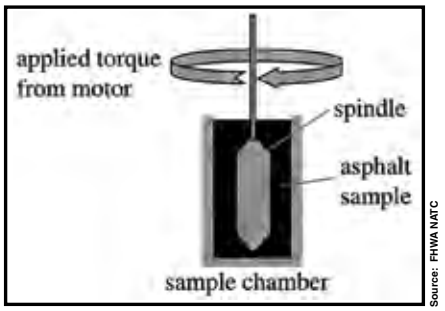
Ductility tests of bituminous materials measure elongation of a binder specimen before failure. The ends of a molded specimen are pulled apart in a liquid-filled trough at specified speed and temperature. The Ductility Tester features a heating and cooling circulator for complete temperature control. Tensile strength and ductility of specimens can be measured concurrently with addition of the Force Ductility Kits.

Ductility Tester

Description	Model
Temperature Controlled Ductility Tester is mounted in a stainless steel water bath to precisely control test temperatures, and can test three standard ductility specimens simultaneously. The heating/cooling fluid circulation system uses an immersion heater and refrigerating unit to digitally regulate temperatures from 5° to 25°C ±0.5° (41° to 77°F ±0.9°). Temperature set points are programmed through the digital controller/display. Dual safety thermostats prevent temperature over-runs. Operation is vibration-free with a maximum stroke of 1,500mm and constant travel speed of 50mm per minute maintained via a direct-drive motor. Maximum force is 300 ±0.1N (67 ±0.02lbf) A traveling pointer indicates exact position of the carriage on a fixed scale. LPA-20 Standard Ductility Molds and LPA-24 Standard Base Plates are purchased separately. Painted enamel outer steel case, and fiberglass insulated interior stainless steel walls. **Product Dimensions:** 74x14x27in (1880x360x680mm) LxWxH. The unit also accommodates components to conduct force ductility testing.	
Temperature-Controlled Ductility Tester, 115V/60Hz	LP-10
230V/50Hz	LP-10F
LPA-20 Standard Ductility Mold meets ASTM D113 requirements and is precision-machined brass consisting of two side pieces and two end clips with mounting holes. LPA-24 Base Plate is purchased separately for each mold. LPA-26 Large Base Plate is 5x8x0.1in (127x203x3mm), and allows placing three molds on same base. LPA-21 Force Ductility Molds are also machined brass, include two end clips and two sides designed to meet AASHTO T 300 Force Ductility, ASTM D6084, and AASHTO T 301 Elastic Recovery requirements. Order additional molds and base plates to save set-up time with high-volume testing.	
Standard Ductility Mold	LPA-20
Standard Base Plate	LPA-24
Large Base Plate	LPA-26
Force Ductility Mold	LPA-21
Force Ductility Kit adapts most standard ductility machines for single-specimen force measurement. Components fit easily without tools or modifications. The kit consists of a load measuring adapter, 0.01lbf two-channel digital display, RS-232 interface, cables, and software. Three pairs of straight-side mold pieces are also provided to convert standard ductility molds to force ductility molds. A calibration stand, weight hanger assembly, and six weights (30lb total) for calibration in English or metric units are also included. For testing two force measurement specimens simultaneously, order an additional LPA-31 Load Measuring Adapter. Single-channel Chart Recorder is a multiple-range flatbed unit for 200mm (7.9in) paper that accepts analog data input.	
Force Ductility Kit	LPA-30
Load Measuring Adapter	LPA-31
Chart Recorder	LPA-182

LP-22

Close-up of L-22 Touch Screen



Source: FHWA NATC

Principle of Operation

LP-23

AMETEK BROOKFIELD ROTATIONAL VISCOMETER AND RHEOMETER

ASTM D4402; AASHTO T 316

Brookfield Rotational Viscometers and Rheometers provide rapid, reproducible, high-temperature viscosity measurements correlating closely with the time consuming AASHTO T 201 glass capillary method. Asphalt binder products are characterized, and temperature/viscosity charts developed to estimate mixing and compaction temperatures in hot-mix design. Torque required to rotate a spindle immersed in the specimen is measured and yields a dynamic viscosity value.

Gilson offers two Brookfield systems to measure viscosities from 100cP to 40 million cP. Both are accurate to ±1% and reproducible to ±0.2%. The units measure at sample temperatures from 9°—260°C (40°—500°F) and are compatible with a variety of spindles. Viscosity in cP or mPa/s, temperature in °C or °F, shear rate and shear stress in dynes/cm², percent torque, spindle number and speed, and step program status are displayed during operation on the color touch-screen displays. Stand-alone programming of test parameters can be performed directly on the screen, and built-in RTD probes accurately monitor sample temperature. Auto range feature shows maximum viscosity measured with any spindle/speed combination. The new user interface provides enhanced security with customizable user levels, date/time stamp files, and password access. User instructions with multi-step test protocols can be created using the new PG Flash Software and uploaded to the Viscometer through a USB Flash Drive (both included with instrument). USB PC interface provides computer control and automatic data gathering capability using Rheocalc T software, purchased separately. Each instrument can save all test data internally, or to a flash drive in Excel format. Data can then be exported, further analyzed, graphed and reported in Excel. Three USB ports are provided. Standard models operate on 115V, 60Hz power supplies. Other voltage configurations are available, Inquire. Contact Gilson about Brookfield Viscometers and Rheometers for other applications.

LP-22 DV2T Viscometer features a 5-inch touch screen display that supports multiple languages to guide users through test creation and data collection. The LP-22 also offers powerful new programming capabilities and results analysis, including data averaging and QC limits with alarms. Built-In options include timed tests, data averaging, programmable QC limits/alarms, customizable speed/spindle lists, and on screen data comparison. Test Data can be sent directly on a local printer or transferred to Excel on a PC, using the flash drive. A lab stand, RTD temperature probe, spindle guard leg, PG Flash software, flash drive, and a carrying case are included. **Product Dimensions:** 10x10x6in (254x254x152mm), WxDxH.

LP-23 DV3T Rheometer with a 7-inch touch screen, features real-time graphing of data that can be captured in stand-alone mode, sent to a printer, or saved on the flash drive in Excel format and opened on a PC for further analysis and reporting. The display supports multiple languages and displays all test parameters and measured values for yield stress, viscosity and temperature. Built-in math models provide rapid data analyses for flow index, yield stress, flow curves, leveling, and recovery. Other functions included are yield tests, timed tests, data averaging, programmable limits and alarms, customizable speed and spindle lists, and on screen data comparison. Fast, straight-forward, single-point viscosity is also easily accomplished with the LP-23, making it the ideal "all-in-one" instrument for both busy QC labs and demanding R&D applications modeling comprehensive flow behavior. Inquire for Integrated temperature control with connection to other Brookfield accessories. A lab stand, RTD temperature probe, spindle guard leg, PG Flash software, flash drive, and a carrying case are included. **Product Dimensions:** 10x10x6in (254x254x152mm), WxDxH.

LPA-52 Programmable Thermosel Set is required with both LP-22 and LP-23

LPA-52

LPA-55

LPA-158

LPA-127

LPA-121

LPA-10, 11 and 12

helpfulhint

Recommended products for ASTM D4402 and AASHTO T 316

Rotational Viscometer	LP-22
Programmable Thermosel	LPA-52
Platinum RTD	MA-270

systems for compliance with AASHTO T 316 and ASTM D4402 specifications. The Thermosel set allows measurement of accurate viscosities at elevated temperatures, and consists of a programmable temperature controller, reusable stainless steel sample chamber, five disposable aluminum sample chambers, extracting tools, one SC4-27 stainless steel Spindle and a manual. The LPA-52 can be synchronized with the LP-23 Rheometer to provide viscosity data as a function of temperature over any time interval with up to twenty five temperature set points and hold times.

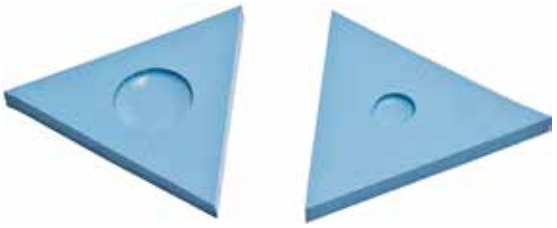
LPA-62 RHEOCALC T Software automates data collection for both models and allows complete computer control. The user can collect and analyze data, run math models for yield stress calculations and plastic index, and perform time-saving routines. Rheocalc software requires user-supplied Windows® PC or Gilson HMA-354 Computer System and LPA-63 cable, purchased separately. **Product Dimensions:** 8x8x7in (203x203x178mm), WxDxH.

Thermosel Spindles are designated from SC4-21 (lower viscosity) to SC4-29 (higher viscosity). Order extra Spindles for wider viscosity range. One SC4-27 Spindle is supplied with Thermosel systems. Extra LPA-55 stainless steel Thermosel Chambers are recommended for labs running multiple samples. Cleaning time can be eliminated by using aluminum LPA-56 Disposable Thermosel Sample Chambers and Disposable Thermosel Spindles, both sold in packages of 100. The Chuck Closure Assembly is required for use with disposable spindles, and must be ordered separately. High-temperature Silicone Viscosity Standard Fluids verify performance of Brookfield Thermosel Systems. Inquire for LPA-65 Two-Pen Recorder to provide hard copy records of temperature and torque for each test, essential for most labs.

Brookfield Rotational Viscometer/Rheometer	
DV2T Viscometer, 115V/60Hz	LP-22
DV3T Rheometer, 115V/60Hz	LP-23
Programmable Thermosel, 115V/60Hz	LPA-52
Accessories	
Thermosel Chamber	LPA-55
Disposable Thermosel Chambers	LPA-56
SC4-21 Thermosel Spindle	LPA-121
SC4-27 Thermosel Spindle[1]	LPA-127
SC4-28 Thermosel Spindle	LPA-128
SC4-29 Thermosel Spindle	LPA-129
Disposable SC4-27 Thermosel Spindles	LPA-127D
Replacement Spindle Extension Link	LPA-118
Chuck Closure Assembly[2]	LPA-58
Standard Fluid; 4,500—30,000cP	LPA-10
Standard Fluid; 9,000—60,000cP	LPA-11
Standard Fluid; 15,000—100,000cP	LPA-12
Rheocalc T Software	LPA-62
Cable for Rheocalc Software	LPA-63
Computer System[3], 115V/60Hz	HMA-354

[1] One included with Thermosel Set. [2] Required when using Disposable Spindles. [3] Inquire for computer specifications.

HM-87



HMA-356

HMA-355

KINEXUS DYNAMIC SHEAR RHEOMETERS

ASTM D7175, D7405, D7654; AASHTO M 230, M 332, R 29, T 315, T 350

Rheological characterization of asphalt binders by Dynamic Shear Rheometers (DSR) provides a broad range of information about asphalt performance properties over time and under different loads and environmental conditions. This data is important in the classification of performance-graded binders designed for resistance to rutting, aging, thermal damage and fatigue cracking. In simple terms, a disc-shaped specimen of asphalt binder is confined between parallel plates, and one of the plates is oscillated at a known torque as rotational shear is measured.

Kinexus DSR's by Malvern feature advanced modular design, allowing configuration of models specifically meeting current ASTM and AASHTO requirements. Standard operating modes of the DSR include direct strain control, shear rate control and shear stress control with operation in steady, dynamic, and transient loading modes. The Active Hood cartridge used with both models is a plug-and-play environmental controller providing precise temperature control and easy to operate integrated calibration. Peltier elements dynamically control thermal gradients within the sample quickly and accurately. The cartridge controls and monitors temperatures to ASTM, AASHTO, and EN requirements.

Upper and lower sample fixtures with 4, 8, and 25mm diameter plates for asphalt binder specimens are provided. Automatic recognition of sample fixtures and configuration of specimen size through the software minimizes errors. Alerts are generated if incorrect plates for the selected procedure are used. rSpace software provides step-by-step user guidance and continuous feedback. The software can be set up to perform standard test protocols or fully customized sequences, and retains a complete sample history from loading to unloading. The report functionality features auto print or PDF generation. The DSR models Operate on 110V/60Hz or 220V/50Hz power supplies. **Product Dimensions:** 19x19.3x26.8in (485x490x680mm) WxDxH.

HM-87 DSR-III is designed to meet the needs of most QC/QA laboratories. Torque range for viscometry and oscillation is 100nNm to 150mNm, and normal force range is 0.01N to 20N. Temperature range controlled by the Active Hood cartridge is 0° to 150°C with 0.005° resolution (32° to 302°F with 0.009° resolution). Stability is ±0.03°C (0.05°F).

HM-88 DSR-E features wider torque and temperature capabilities and greater measurement sensitivity. It is also equipped with fixtures and capability to perform testing of rectangular or cylindrical solids such as asphalt cores, making it suitable for advanced research facilities. Torque range for viscometry and oscillation is10nNm to 200mNm, and normal force range is 0.01N to 50N. Active Hood temperature range is -40° to 200°C with 0.0005° resolution (-40 to 392°F with 0.0009° resolution). Stability is ±0.01°C (0.018°F).

Silicone Rubber Specimen Molds are purchased separately. Molds for 4mm, 8mm and 25mm diameter specimens have actual dimensions that may vary from specified sample sizes, to allow for proper placement and trimming between the plates. Flexible, tear-resistant silicon molds are manufactured by the Asphalt Institute, and a set containing one each of the 8mm and 25mm sizes is available. HMA-355 2.7 million centipoise Viscosity Standard fluid in 55ml bottles is NIST traceable and designed specifically for the DSR.

Kinexus Dynamic Shear Rheometers	
Kinexus DSR-III Dynamic Shear Rheometer, 110/220V, 50/60Hz	HM-87
Kinexus DSR-E Dynamic Shear Rheometer, 110/220V, 50/60Hz	HM-88
Accessories	
Silicon Specimen Mold, 25mm	HMA-356A
Silicon Specimen Mold, 8mm	HMA-356B
Silicon Specimen Mold, 4mm	HMA-356C
Silicon Specimen Mold, Set of one each, 25 and 8mm Molds	HMA-356
Viscosity Standard Fluid, 55ml	HMA-355

HM-91

ANTON PAAR DYNAMIC SHEAR RHEOMETERS
ASTM D7175, D7405; AASHTO T 315, T 350

Dynamic Shear Rheometers (DSR) classify asphalt binders based on their resistance to damage from age, temperature, and mechanical forces over a wide temperature range. DSR's are particularly important in characterizations of polymer-modified, performance graded (PG) binders used in modern Superpave™ mix designs. A disc-shaped binder sample is confined between two parallel plates and subjected to horizontal oscillation to determine dynamic shear properties. Anton Paar SmartPave 92 Dynamic Shear Rheometers are configured to meet the demands of everyday quality control testing of 8mm and 25mm samples in asphalt production facilities. These models are ideal for classification of SHRP/ SuperPave PG binders.

The synchronous, brushless DC motor drives a rotor mounted on a frictionless air bearing to allow the most precise movement and sensitive measurements. Maximum torque is 125 mNm (milliNewtons-meter) and minimum oscillation torque is 1µNm. Speed range is from 10-3 to 1,500rpm. A clean, dry, and oil-free supply of compressed air is required for operation. Operating air pressures are from 58 to 101psi (4 to 7bar) with optimum pressure of 87psi (6bar). User-friendly RheoCompass™ software is included and designed specifically for the needs of the asphalt industry. Intuitive, step-by-step instructions guide user through predefined standard test procedures, and temperature calibration and verification routines are fully automated. Simplified data retrieval and report generation make the software easy to use. Toolmaster™ automatic tool recognition and configuration instantly recognizes testing components and temperature control units, eliminating the need to enter data manually when changing components. Quick-Connect coupling allows one-handed connection of key components and ensures fast, convenient changes. TruRay LED lighting feature provides a clear view of the sample and measurement surface for easy set up and precise filling of the measuring gap. A sliding rail design allows easy access to the sample during trimming and set up operations. HM-90 and HM-91 DSR's operate on 120 and 230V, 50 or 60Hz power supplies. Installation and training costs will be quoted separately by the manufacturer. **Product Dimensions:** 15x21x26in (380x530x660mm) WxDxH.

HM-90 SmartPave I DSR is designed for cost effective QC testing, and is supplied without the Peltier temperature controlled hood. Upper and lower measuring plates and fittings for 8mm and 25mm samples are included. The Peltier system in the base provides temperature control for the lower plate.

HM-91 SmartPave II DSR is also configured for routine QC testing, but fully complies with current ASTM and AASHTO requirements for temperature control of the testing environment. The patented active Peltier temperature hood controls temperatures both above and below the sample, eliminating temperature gradients and making heating and cooling rates much faster. Test times are reduced, while reproducibility is improved. With no water flow around the sample, set up and testing takes place in a completely dry environment. Temperature range is -5° to 200°C, with temperature gradients less than 0.1°C.

Silicone Rubber Specimen Molds are purchased separately. Molds for 4mm, 8mm and 25mm diameter specimens have actual dimensions that may vary from specified sample sizes, to allow for proper placement and trimming between the plates. Flexible, tear-resistant silicon molds are manufactured by the Asphalt Institute, and a set containing one each of the 8mm and 25mm sizes is available. HMA-355 2.7 million centipoise Viscosity Standard fluid in 55ml bottles is NIST traceable and designed specifically for the DSR.

Anton Paar Dynamic Shear Rheometers	
SmartPave I DSR, 115 or 230V/50 or 60Hz	HM-90
SmartPave II DSR, 115 or 230V/50 or 60Hz	HM-91
Accessories	
Silicon Specimen Mold, 25mm	HMA-356A
Silicon Specimen Mold, 8mm	HMA-356B
Silicon Specimen Mold, 4mm	HMA-356C
Silicon Specimen Mold, Set of one each, 25 and 8mm Molds	HMA-356
Viscosity Standard Fluid, 55ml	HMA-355

PT-82

SAYBOLT VISCOMETER
ASTM D88, D7496; AASHTO T 72

The Saybolt Viscometer determines viscosity of petroleum liquids at temperatures from ambient to 464°F (240°C). PID controller maintains ±0.05°F (±0.03°C) temperature uniformity throughout operating range and provides quick temperature stabilization with protection of an over-temperature control. Set-point temperatures are displayed in °F/°C. Circulate tap water or refrigerated coolant through the built-in cooling coil for operation at near-ambient temperatures.

The enameled steel cabinet has specimen-area backlighting, leveling feet and sliding draft shields. Insulated stainless steel bath with 5gal (19L) capacity has overflow pipe and drain valve to simplify filling to required level. Flasks for the 60ml samples are easily centered on the removable, chemical-resistant alignment plate. The unit comes with four thermometer supports, four chained corks, withdrawal tube, tube nut and orifice wrenches, two port closures and four port covers, and oil strainer. Saybolt tubes, flasks, orifices, and withdrawal pipettes must be selected based on specimen properties.

Order Regular Bath Oil separately for use up to 275°F (135°C), or Hi-Temperature Silicone Fluid with 620°F (327°C) flash point. **Product Dimensions:** 29x25x34in (737x635x864mm), WxDxH.

Saybolt Viscometer	
Saybolt Viscometer, 115V, 50/60Hz	PT-82
220/240V, 50/60Hz	PT-82F
Accessories	
Brass Saybolt Tube	PTA-176
Stainless Steel Saybolt Tube	PTA-177
Universal Orifice	PTA-178
Furol Orifice	PTA-179
Road Oil Orifice	PTA-180
Wrench for Universal & Furol Orifices	PTA-162
Wrench for Road Oil Orifices	PTA-163
Socket Wrench	PTA-166
Bath Oil, Regular, 1gal	PTA-164
Bath Oil Hi-Temperature Silicone, 1gal	PTA-165
Saybolt 60ml Receiving Flask	PTA-168
Saybolt 60ml Withdrawal Pipette	PTA-169

PT-103

PT-114

ZEITFUCHS® CROSS-ARM VISCOMETERS
ASTM D445, D446, D2170; AASHTO T 201; ISO 3104, 3105

These viscometers measure kinematic viscosity of bitumens and road oils at 140°F (60°C) and asphalt cements at 275°F (135°C). Precision is ±0.2%. Using only a 1—3ml charge, the viscometer can be filled and cleaned while immersed in a constant temperature bath. Instrument requires a liquid depth of 9in (230mm). Each unit is supplied with permanently attached 2in (51mm) round metal holder and certificate of calibration. Viscometers with rectangular metal holders or without holder are also available. **Product Dimensions:** 12x2x2in (305x51x51mm), WxDxH.

Zeitfuchs® Cross-Arm Viscometers			
Size	Viscosity Range Centistokes	Approx. Constant, cSt/s	Model
1	0.6—3	0.003	PT-101
2	2—10	0.01	PT-102
3	6—30	0.03	PT-103
4	20—100	0.1	PT-104
5	60—300	0.3	PT-105
6	200—1,000	1.0	PT-106
7	600—3,000	3.0	PT-107
8	2,000—10,000	10	PT-108
9	6,000—30,000	30	PT-109
10	20,000—100,000	100	PT-110

ASPHALT INSTITUTE VACUUM VISCOMETERS
ASTM D2171; AASHTO T 202

Gilson offers five sizes of Asphalt Institute Viscometers to determine viscosity of highly viscous materials such as bitumen at 140°F (60°C). The user measures elapsed time for a fixed volume of liquid to be drawn by vacuum through the graduated capillary tube. Time is multiplied by the viscometer constant to obtain absolute viscosity. Measurement requires a minimum sample size of 3ml and a bath depth of 7in (180mm). Certificate of calibration is supplied with each viscometer. Neoprene rubber holders to fit a 2in (51mm) diameter hole are ordered separately as PTA-100. Inquire if fixed metal holders preferred. **PT-111, 114 & 115 Product Dimensions:** 12x2x2in (305x51x51mm), WxDxH. **PT-112 & 113 Product Dimensions:** 10.25x1.625in (260x41mm), WxH.

Asphalt Institute Vacuum Viscometers		
Size	Viscosity Range, Poise	Model
25	42—800	PT-111
50	108—3,200	PT-112
100	600—12,800	PT-113
200	2,400—52,000	PT-114
400	9,600—200,000	PT-115

PT-62

VACUUM REGULATORS
ASTM D 2171; AASHTO T 202

Solid state mercury-free digital regulators are designed for precise measurement and control for a range of laboratory vacuum applications. They are preset to control at 300mm below atmospheric pressure as needed for viscous asphalt testing with Asphalt Institute, Cannon-Manning, and Modified Koppers vacuum viscometers, but may also be user reset to control anywhere in the range from 1—410mm below atmospheric pressure. An LCD screen displays vacuum in mm Hg or any of nine other units. The vertical configuration is designed for convenient display and keypad access while minimal counter space is used.

Two models are available. Model PT-61 100 Watt is for regulation of user's existing vacuum system. Model PT-62 175 Watt is equipped with an internal vacuum pump and requires no external vacuum source. Both have housings of enameled steel supported with rubber feet. **Product Dimensions:** 6.75x18x18.5in (172x458x470mm), WxDxH.

Vacuum Regulators	
Vacuum Regulator, 115V, 50/60Hz	PT-61
230V, 50/60Hz	PT-61F
Vacuum Regulator, 115V, 50/60Hz	PT-62
230V, 50/60Hz	PT-62F

PT-53

CONSTANT TEMPERATURE VISCOSITY BATH
ASTM D445, D2170, D2171; AASHTO T 201, T 202

The Constant Temperature Viscosity Bath is designed for use with capillary viscometers, but is well-suited for general laboratory work requiring precise temperature control. The Bath uses 12x12in (305x305mm), DxH Pyrex bath jars for easy visibility.

The PT-53 Viscosity Bath conforms to ASTM D445 temperature stability requirements and has selectable temperature presets and a variable control to set temperature at any point within their ranges. Temperature can be adjusted precisely within hundredths of a degree. A stainless steel encased thermistor in the baths senses temperature. Bath Covers have seven 2in (51mm) diameter holes for viscometers and two 0.375in (10mm) holes for ASTM thermometers. A white-coated stainless steel baffle plate aids viewing of viscometers. Lighting is by fluorescent lamps. The circuitry is in base platform drawer on ball-bearing glides for easy access. Temperature range is 20°—100°C. Control is proportional ±0.01°C. Mixing features a motor-driven stirrer. Unit has several over-temperature protection standards, two heating elements and is 900 Watts. PT-53 also boasts a baffle background for viewing. **Product Dimensions:** 16x14.25x24in (406x362x610mm), WxDxH.

The Viscosity Bath includes three safety features: A second thermistor provides fault protection for over-temperature condition, and shuts off until user resets limit circuit. Heater power is shut off if control thermistor is disconnected. Power is shut off if bath liquid falls below safe operating level. PTA-70 Drawer fits under unit for storing viscometers and accessories.

PTA-61 Bath Oil is recommended when testing to 100°C (212°F). Bath jars hold about 5gal (19L).

Order viscometers and thermometers separately. See separate listing for Pressure Regulators. ASTM 9C Pensky Martens and Tag Closed High Thermometer has range of -5° to 110°C with 0.5°C divisions, and is ordered separately.

Constant Temperature Viscosity Baths	
Viscosity Bath, 115V, 50/60Hz	PT-53
230V, 50/60Hz	PT-53F
Accessories	
Drawer Unit	PTA-70
Bath Oil, 5gal	PTA-61
ASTM 9C Thermometer	MA-210C
ASTM Equivalent S9C Non-Mercury Thermometer	MA-510C

PT-6A

CLEVELAND FLASH TESTER
ASTM D92; AASHTO T 48

The Cleveland Flash Point Tester is used in the Cleveland Open Cup method to measure flash and fire points for petroleum products igniting above 175°F (79°C). The variable control 10 amp, 1250 watt nickel-chromium heater assures accurate rate-of-rise temperature settings. A separate gas supply is required to connect to the pivoting test-flame burner. The thermometer positioning bracket is adjustable and can be raised for clearance to remove and install the included flash cup. A rugged stainless steel housing with cooling vents encloses the heater and the open flash cup rests on an insulated platform. An ASTM 11C Thermometer is required and is ordered separately as MA-212C. **Product Dimensions:** 12x5x4in (305x127x102mm), WxDxH.

Cleveland Flash Tester	
Cleveland Flash Tester, 115V/60Hz	PT-6A
230V, 50/60Hz	PT-6AF

HM-320

HM-322

HM-322D

HMA-180

HMA-183

HMA-188

UNIVERSAL PENETROMETERS

ASTM D5, D217, D937, D1168, D1321, D1403, D1831, D2884, D5329; AASHTO T 49

Universal Penetrometers test a wide variety of materials by penetration of weighted needles or cones. Main applications are for bituminous materials, but waxes, greases, foods, and pharmaceuticals are among other products tested. Penetration is read from a 5in (127mm) diameter indicator dial of 400 divisions, each representing 0.1mm of penetration, or digital display. Gilson offers heavy-duty units for manual and automatic use, and a lighter portable model for field work or users with a limited work load or budget. All meet ASTM and AASHTO standards when fitted with proper needle or cone.

HM-320 Manual Penetrometer is ruggedly constructed for accurate, sensitive measurements. The aluminum base has a machined, grooved table with leveling screws and rubber inserts to protect tips of needles and cones. Two stainless steel rods act as support guides for a cast aluminum head with coarse/fine adjustments and a calibrated friction-free plunger mechanism. Indicator dial has instant zero reset. Any needle or cone with standard 0.125in (3mm) diameter stem may be mounted to the 47.5g plunger assembly. A standard 2.5g ASTM D5 Needle (HMA-180) and two additional loading Weights (50g and 100g) are included. Order needles or cones for other tests separately as needed. **Product Dimensions:** 10.5x13x22in (267x330x559mm), WxDxH.

HM-322 Automatic Penetrometer is the same as the HM-320, but has a button release mechanism with digital timer to automatically stop the plunger when the preset time from 0.1—9.9 seconds expires. **Product Dimensions:** 10.5x13x22in (267x330x559mm), WxDxH.

HM-322D Digital Automatic Penetrometer is based on the HM-320 and HM-322 Penetrometers but uses a digital penetration gauge for precise readings. This model will also start the test with a single button push and stop it after a preset duration. **Product Dimensions:** 10.5x13x22in (267x330x559mm), WxDxH.

HMA-180 Penetration Needle for bituminous materials is smooth, hardened, tempered stainless steel with brass ferrule and weighs 2.5g to give 50g total when mounted with plunger assembly. Stainless steel wax penetration needle HMA-181 is also 2.5g but has truncated cone-shaped tip with approximately 4mm maximum diameter tapered to 0.15mm diameter end. Several types of grease cones detailed in ASTM D217 have polished 90° cone with 30° removable hardened steel tip. Other types of Needles and Cones are available. Transfer Dish HMA-188 is clear plastic, 3.75in diameter x 3.25in deep (95x82mm), suitable for holding 3oz or 6oz sample boxes for transferring samples from bath to penetration testing. Flat bottom of dish has metal centering lugs and a magnet cemented to the bottom to secure sample boxes.

Universal Penetrometers	
Manual Universal Penetrometer	HM-320
Automatic Universal Penetrometer, 110V/60Hz	HM-322
220V/50-60Hz	HM-322F
Digital Automatic Universal Penetrometer, 110V/60Hz	HM-322D
220V/50-60Hz	HM-322DF
Accessories	
Bituminous Materials Needle[1]	HMA-180
Bituminous Materials Needle with Certification	HMA-180C
Wax Penetration Needle	HMA-181
Wax Penetration Needle with NIST Certifications	HMA-181C
Standard Grease Penetration Cone, Solid Magnesium	HMA-182
Grease Penetration Cone, Hollow Brass	HMA-183
Grease Penetration Cone, Hollow Stainless	HMA-183S
Transfer Dish	HMA-188
Tinned Sample Boxes, 3oz, 55 x 35mm dia. x ht., carton of 12	SC-500
Tinned Sample Boxes, 6oz, 70 x 45mm dia. x ht., carton of 12	SC-504

[1] Inquire for other needles and cones.

LP-16

MS-66

MS-62

SOFTENING POINT RING & BALL APPARATUS

ASTM D36; AASHTO T 53

Ring and Ball Apparatus is used for determining the softening point of asphalt, coal tar pitch, and other viscoelastic bitumens in the range of 30°—157°C (86°—315°F). Steel balls are placed on top of bitumen specimen discs in test rings in a bath. Temperature of the bath is increased gradually until the specimens soften and fall under the ball weight to the shelf 1in (25.4mm) below. The assembly provides for simultaneous testing of two specimens as suggested in standard test procedures, and includes two square-shouldered brass test rings, two 0.375in (9.5mm) steel balls, two brass ball-centering guide rings, an 800ml heat-resistant beaker (bath), and a brass ring holder suspension assembly with cover and shelf to fit beaker. ASTM Softening Point Thermometers, and a Beaker Stand Assembly should also be purchased. The Beaker Stand Assembly includes metal support stand, ring clamp, wire gauze, and thermometer clamp. **Product Dimensions:** 4x4x6in (102x102x152mm), WxDxH.

Softening Point Ring & Ball Apparatus	
Softening Point Assembly	LP-16
Accessories	
Beaker Stand Assembly	LP-18
800ml Beaker	LPA-43
Steel Balls, set of 15	SSA-44

also available

For ASTM Bituminous Softening Point Thermometers, see our Thermometers and Timers section.

STAINLESS STEEL MELTING POTS

Stainless Steel Melting Pots are designed for performance in harsh lab environments and include precise long-lasting digital controllers. Increasingly popular in asphalt labs, these units can also be used for dispensing of other materials like waxes or adhesives. The rugged melting pots are fitted with heated, no-drip ball dispenser valves to aid material flow and prevent clogs. Sturdy powder-coated steel stands are included and have adjustable height. Stands bolt securely to the bench-top, raising the pots up to 16in (406mm) over bench.

The Electronic digital controller regulates independent temperature settings for pot and dispenser valve. The menu-driven controller is easy to set up and has pass code-actuated lockout settings to guard against accidental changes. The controller can be field calibrated by user if needed. Readout is selectable for °F or °C display. The 18-gauge crucible is housed in a 20-gauge stainless steel shell and insulated with 3in (76mm) of fiberglass. The multi-circuit blanket heater assures uniform temperatures. Maximum operating temperature is 350°F (177°C). The loose aluminum cover has a heat resistant knob. The pots are supplied with a 6ft (1.8m) power cord.

MS-66 Stainless Steel Melting Pot has 4qt (3.8L) capacity and crucible is 6.75x7.25in (171x184mm), Dia.xH. **Product Dimensions:** 10.375x12in (264x305mm), Dia.xH. Heating Element is 600 Watts.

MS-67 Stainless Steel Melting Pot has 12qt (11.4L) capacity and crucible is 10.9x9.75in (277x248mm), Dia.xH. **Product Dimensions:** 15x17in (381x482mm), Dia.xH. Heating Element is 1,200 Watts.

Stainless Steel Melting Pots	
4qt Melting Pot, 110V/60Hz	MS-66
220V/50Hz	MS-66F
12qt Melting Pot, 110V/60Hz	MS-67
220V/50Hz	MS-67F

DISPENSING MELTING POTS

Timesaving melting pots simplify dispensing of asphalt binder for laboratory testing and mix-design applications. Pots are available in 4qt or 10qt (3.8L or 9.5L) capacities and are also useful for dispensing waxes, adhesives, and other compounds. A heavy pipe single-column support mounts easily to a bench top. Height and angle are quickly adjusted with set screws on the sliding boss attached to the column. A Manual dispensing lever operates a needle valve that is adjusted to obtain desired flow rate. The dial thermostat controls heating range from 150°—550°F (66°—288°C).

The heavy painted-steel housing is insulated from the cast-aluminum inner pot by thick thermal insulation. Blanket-type heating element uniformly heats the pot across the bottom and for 75% of the wall height. An aluminum cover is provided to retain heat and control fumes.

MS-62 Dispensing Melting Pot has 4qt (3.8L) capacity and 880 Watt heating element. Footprint is 10x15in (254x381mm) and maximum height is 18in (457mm). Maximum clearance below dispensing valve is about 7in (178mm).

MS-64 Dispensing Melting Pot has 10qt (9.5L) capacity and 1,540 Watt heating element. Footprint is 14x19in (356x483mm) and maximum height is 19in (483mm). Maximum clearance below dispensing valve is about 7in (178mm).

Dispensing Melting Pots	
4qt Melting Pot, 120V/60Hz	MS-62
240V/50Hz	MS-62F
10qt Melting Pot, 120V/60Hz	MS-64
240V/50Hz	MS-64F

Find Estimated Ship Weights for all our products in the Ship Weight Index

CONCRETE COMPRESSION TESTING MACHINES

ASTM C39, C78, C109, C293, E 4; AASHTO T 22; BS 1610, 1881

VIDEO ONLINE

MC-250P

Gilson makes it easy to build the machine that best fits your application. Select a load frame from our 250, 300, 400 or 500 Series with capacities from 250,000—500,000lbf (1,112—2,224kN), and equip it with a state-of-the-art electronic controller. Our Pro and Pro-Plus Controllers cover application needs from basic to sophisticated. We will also help you design a custom machine with capacity up to 1,000,000lbf (4,448kN) for testing a wide range of sample types and sizes.

With solid steel cross-heads from 3—6in (76—152mm) thick on our standard frames, Gilson compression machines are among the few meeting the stringent ACI 363 rigidity recommendations. Standard frames are equipped for testing 6x12in (152x302mm) cylinders, but may be outfitted with accessories to accommodate testing of many different sized cubes, cores, beams and cylinders. The 400P Series frames accommodate two-block masonry prisms. Load Frame Mounting Stands are included with 400 series and higher. Mounting stands place the lower platen at the correct height for safe, efficient handling of specimens. All frames include latchable steel Fragment Guard Doors, and side mounted controller.

Bottom mounted hydraulic rams apply compression force upward, except for 250 Series, which are mounted in the top crosshead. Precision ground pistons with O-Ring sealing and Teflon back-up rings rest in a polished steel cylinder. Spherically-seated upper platen assemblies are ground, hardened, nickel plated and scribed with concentric circles. Lower platens for 250 Series are 6.5in (165mm) diameter, and other series have oversized rectangular compression tables. Locking stems hold upper platen assemblies securely in place, yet allow for quick substitution of accessory components.

Two-stage, oil-immersed pumps drive hydraulic systems on all frames. The first high volume, low-pressure stage rapidly advances the piston. The pump automatically switches at 135psi of pressure to the second stage of low volume, high pressure flow used during testing to maintain a continuous rate of loading from 2,000—200,000lbf per minute with the value set in its Metered Advance Position. Hold feature pauses pressure advance indefinitely and Retract feature releases pressure to allow return of piston to starting position. A high-pressure hydraulic safety valve prevents use beyond maximum machine capacity. A pressure bleed hole in the piston helps avoid overextension of the ram. Our unique 1/2hp system on the 250 and 300 Series runs cooler, offers better load control and is the quietest available. The 400 and 500 Series use a more powerful 3/4hp motor. Both systems operate on 115V/60Hz power supply. Specify 230V/50Hz operation by adding an "F" suffix to the model number.

Pro Controllers have practical designs with high-end features. These units simultaneously display both live load and rate of load during testing. Peak load and average rate of load are displayed automatically at test conclusion and held until reset. Up to 600 tests can be stored in memory with date and time, sample I.D., peak load, and average rate of load data.

A high sampling rate and digital filtering result in smooth, uniform control of load pacing. Accuracy is generally better than ±0.5% of indicated load from 1% through full capacity, exceeding ASTM C39 and E 4 requirements. The 5.3in (135mm) wide backlit VGA liquid crystal screen has a 240x64 pixel display area and adjustable contrast settings. Test data is displayed in user-selectable engineering units of lbs, kN, kg, or N, and rate of load is shown in force units per second. MCA-29 Able Cable® allows direct transfer of test data in memory to user's computer via a USB port. The Pro Controller can also be configured to output data from memory to a serial printer.

The Pro Controller is made in the USA, features a two-year manufacturer's warranty, and is housed in a sturdy stainless steel, NEMA-4 rated moisture and dust-proof enclosure to resist the harshest environments. The Pro is UL, CUL, CE, and Measurement Canada listed. Inquire for Pro Controller as a field-installed retrofit package on your existing compression machine. **Product Dimensions:** 10.5x3.3x7.3in (267x84x184mm), WxDxH.

Pro-Plus Controllers offer the most accurate and advanced system available today for the testing and documentation of concrete strengths. Ease of operation and dependability are two important features of this new system. All information is clearly displayed on the 4.6x3.4in (116x86mm), WxH back-lit VGA graphic panel. The large 320x240 pixel screen with large alphanumeric characters has adjustable contrast to make it easily readable under any lighting conditions.

Soft-key menus allow fast and easy set up. A sample type menu lists six common specimen and test types: cylinder, cube, third-point and center-point beams, cylinder-split and cross-sectional area. Test results are automatically stored for hard-copy documentation. In case of accidental data loss, a calibration restore feature allows the original factory calibration to be uploaded to the controller via a communication port. The original calibration data file is maintained at the factory.

During a test cycle, load, stress and rate of load in the time units selected are displayed simultaneously. At test completion, peak stress, load, and if activated, the average loading rate during the test, are automatically displayed. Selectable display units include Force: lb, kN, kg and N; Stress: psi, mPa, kg/cm², and kPa; Size: in, mm, and cm; and Time in seconds or minutes.

The controller automatically stores test results to memory for later downloading to a computer. Up to 500 tests can be stored to memory and printed in a

MC-300P

MC-400PR

spreadsheet format listing test date and time, sample ID number, sample type, specimen area and length, peak load and peak stress. Data includes average rate of load, C39 cylinder correction factor, break type, cylinder cap type, sample age, weight, and operator ID number. Spanish or English language menus can be toggled in the settings. Inquire for other options to store and download test data.

The Pro-Plus has a two-year warranty and is built for harsh laboratory environments and features a stainless steel NEMA-4 enclosure that is both moisture and dust proof. Heavy-duty tactile keys are tested to over five million actuations. Accuracy is achieved through a five-point linear calibration program to exceed ASTM C39 and E 4 requirements and in general, is better than ±0.5% of indicated load from 1% to machine capacity. The Pro-Plus Controller is also UL, CUL, CE, and Measurement Canada listed. **Product Dimensions:** 10.5x4.5x8.5in (267x114x216mm), WxDxH.

helpfulhint

Gilson offers custom compression machines with capacity up to 1,000,000lbf (4448kN), multiple load cells, specially-sized frames, and console-mounted controllers and displays.

Concrete Compression Testing Machines

Controller	Model[2]	Total Capacity Mlbf (kN)	Maximum psi, 6x12in Cylinder	Overall Size with Stand WxDxH, in	Opening with Platens WxH, in	Lower Platen Dimensions, in
Pro	MC-250P	250 (1,112)	7,000	27 x 14 x 58	9.3 x 13.4	6.5 dia. x 1.9
	MC-300P	300 (1,335)	8,500	29 x 16 x 60	9.5 x 14.4	9 x 11 x 1.9
	MC-400P	400 (1,780)	11,300	39 x 20 x 61	13.3 x 14.3	12 x 18 x 2
	MC-500P	500 (2,224)	14,100	31 x 24 x 61	14 x 14.3	13 x 18 x 2
Pro-Plus	MC-250PR	250 (1,112)	7,000	27 x 17 x 57	9.3 x 13.4	6.5 dia. x 1.9
	MC-300PR	300 (1,335)	8,500	32 x 17 x 59	9.5 x 14.4	9 x 11 x 1.9
	MC-400PR	400 (1,780)	11,300	39 x 20 x 61	13.3 x 14.3	12 x 18 x 2
	MC-400PRP[1]	400 (1,780)	11,300	39 x 20 x 70	13.3 x 22.3	12 x 18 x 2
	MC-500PR	500 (2,224)	14,100	31 x 24 x 61	14 x 14.3	13 x 18 x 2

[1] Frames configured for 2-Block masonry prisms. [2] Specify 230V/50Hz operation by adding an "F" suffix to the model number.

Find Estimated Ship Weights for all our products in the Ship Weight Index

VIDEO ONLINE

Pro Controller

Pro-Plus Controller

Concrete Compression Machine Controller Comparison

	Pro Controller	Pro-Plus Controller
Accuracy	Exceeds ASTM C-39 and E-4 requirements through a calibration program with seven linearization points. Accuracy is better than ±.5% of indicated load from 1% to full machine capacity	Exceeds ASTM C-39 and E-4 requirements through a calibration program with five linearization points. Accuracy is better than ±.5% of indicated load from 1% to full machine capacity
Features	➤ Simultaneously displays both live load and rate of load during a test ➤ Automatically displays peak load and average rate of load at the end of a test ➤ Available as a field-installed retrofit package for an existing compression machine	➤ Simultaneously displays live load, rate of load, sample stress, sample size and type during a test ➤ Menu selection for six common specimen types; cylinder, cube, beam third point, beam center point, cylinder split tensile and cross-sectional area. ➤ English or Spanish language menus ➤ Calibration restore feature allows uploading of factory calibration in case of accidental data loss ➤ Automatically calculates and displays peak stress at the end of a test ➤ Can be used with multiple transducer/load cell combinations with one or more load frames ➤ Available as a field-installed retrofit package for an existing compression machine
Display	5.3in (135 mm) wide, 240 x 64 pixel backlit VGA liquid crystal display with adjustable contrast settings	4.6x3.4in (116x86 mm) back-lit VGA graphic panel display with 320 x 240 pixel screen and adjustable contrast settings
Test Documentation	Transfer data from memory to a computer using the optional MCA-29 USB Able Cable, or print tests stored in memory to the optional MCA-28 serial printer.	Tests stored in memory can be downloaded to a computer using optional MCA-29 Able Cable, or printed to optional MCA-28 Serial Printer. Load and time data can be sent directly to a PC during a test using the Able Cable for later analysis on a spreadsheet and X-Y plotting of load vs. time.
Memory	600 tests with test date and time, sample ID number, peak load and average rate of load.	500 tests with test date and time, sample ID, sample type, sample area and length, peak load, peak stress, average rate of load in lbs and psi, cylinder correction factor, cylinder break type, cylinder cap type, sample age and weight, and operator ID number.
Engineering Units	lbs, kN, kg and N	lbs, kN, kg and N, psi, MPa, kg/cm² and Kpa
Housing	Stainless steel NEMA-4 rated housing is dust and moisture proof	Stainless steel NEMA-4 rated housing is dust and moisture proof
Housing Size, without Bracket	10.5x3.3x7.3in (267x84x184mm) WxDxH	10.5x4.5x8.5in (267x114x216mm) WxDxH
Ratings	UL, CUL, CE, and Measurement Canada listed	UL, CUL, CE, and Measurement Canada listed
Power Requirements	115/230V, 50/60Hz	115V, 60Hz or 230V, 50Hz

MCA-4

MCA-7

MCA-11

MCA-13R

MCA-24

HM-130

HM-131D

MAA-83

ATTACHMENTS & ACCESSORIES FOR CONCRETE COMPRESSION MACHINES

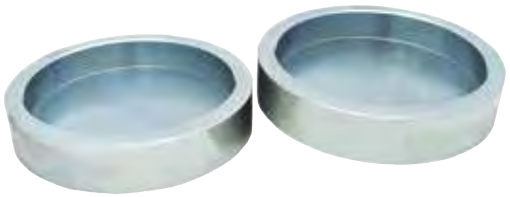
Attachments are compatible with 500, 400, 300, and 250 concrete compression machine series models, and comply with test standards indicated. Upper components are attached to machines by a locking stem system. Additional spacers for special testing are available.

Attachments & Accessories for Concrete Compression Machines

Item	250 Mlbf Frame	300 Mlbf Frame	400/500 Mlbf Frame	Standards ASTM	Standards AASHTO
Universal Flexural Set for 6x6in beams, 12—30in span for center or third point loading.	MCA-4	MCA-34	MCA-4	C78 C293	T 97 T 177
Cube Test Set 2in includes pedestal and upper platen assembly.[1]	MCA-6	MCA-5	MCA-7	C109	T 106M T 106
Cube Test Set 6in includes upper platen and spacer. (Also lower platen for 250/300 series)	MCA-8	MCA-3	MCA-9	—	—
Cylinder Splitting Set includes 2x12in, WxL bearing bar head. (Also lower platen for 250/300 series)	MCA-10	MCA-30	MCA-11	C496	T 198
Masonry Test Set includes upper platen assembly. 400/500 Series tests up to 12in wide block; 250/300 Series includes lower platen and tests 8in block.	MCA-12R	MCA-32	MCA-13R	C1314	—
4in Spacer for testing 4x8in cylinders is painted steel.	MCA-14	MCA-19	MCA-15	C39	T 22
3x6in Cylinder Test Set includes upper platen and spacer.[1]	MCA-16	MCA-18	MCA-17	C39	T 22
Load Frame Mounting Stand serves to position compression platens at optimal loading height and is included on all 400 Series and above frames. Mounting stands are recommended for all compression machines.	MCA-24	MCA-27	Included	—	—
Serial Printer to print data from controller memory.	MCA-28	MCA-28	MCA-28	—	—
USB Able Cable for data transfer to computer.	MCA-29	MCA-29	MCA-29	—	—
Compressometers measure deformation and strain of concrete cylinders during compression for determination of modulus of elasticity. The units consist of two yokes mounted around the specimen. The bottom is rigidly attached, and the upper yoke is hinged to permit pivoting. A fixed rod connects the two. Yokes are aluminum alloy; other parts are cadmium plated steel. A mechanical dial or digital indicator measures specimen deformation. Indicators have 0.2in (5.08mm) range and 0.0001in (.0025mm) divisions. Models with either mechanical dial or digital indicators fit standard 4in (102mm) or 6in (152mm) concrete cylinders.				C469	—
4x8in Compressometer with Dial	HM-203	HM-203	HM-203		
4x8in Compressometer with Digital	HM-203D	HM-203D	HM-203D		
6x12in Compressometer with Dial	HM-130	HM-130	HM-130		
6x12in Compressometer with Digital	HM-130D	HM-130D	HM-130D		
Compressometer/Extensometers are similar to compressometers, but a third center yoke attaches to the specimen to measure horizontal extension. This allows a combined determination of both modulus of elasticity and Poisson's ratio. A second indicator between yoke segments measures the transverse deformation simultaneously. Models are available with either mechanical dial or digital indicators to fit standard 4in (102mm) or 6in (152mm) concrete cylinders.				C469	—
4x8in Compressometer/Extensometer with Dial	HM-207	HM-207	HM-207		
4x8in Compressometer/Extensometer with Digital	HM-207D	HM-207D	HM-207D		
6x12in Compressometer/Extensometer with Dial	HM-131	HM-131	HM-131		
6x12in Compressometer/Extensometer with Digital	HM-131D	HM-131D	HM-131D		
Single-Gauge USB Cable & Software collects data from one Digital Dial Indicator and routes to a computer. Data can be saved as a .csv file for later conversion to ASCII spreadsheet.	MAA-83	MAA-83	MAA-83	—	—

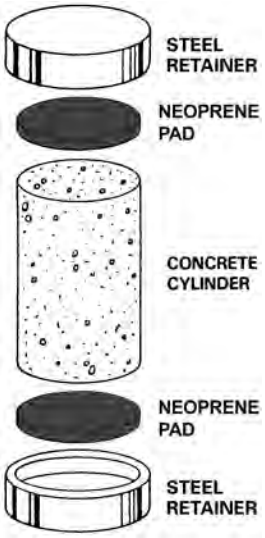
[1]*The same Upper Platen assembly is used for Cube Test and 3x6in Cylinder sets.*

MCA-44



HM-180

Neoprene Pads



Unbonded Capping Set

PERPENDICULARITY VERIFICATION DEVICES (PVD)
ASTM C39

The Perpendicularity Verification Device (PVD) is a new tool to verify proper perpendicular alignment of concrete cylinders during compressive strength testing. Latest revisions to ASTM C39 require verification that alignment is within ±0.5° of vertical for each specimen tested when using Unbonded Caps. After loading has commenced, but before reaching 10% of total load, the PVD is held on the bottom machine platen and manually positioned against the cylinder. The included MCA-41 Gap Measurement Tool is used to check the gap between the device and cylinder. If the Tool will not pass through the gap, alignment is within specified tolerances.

The PVD's feature unique designs for use with 4x8in (102x203mm) or 6x12in (152x305mm) cylinders and are simple, lightweight and easy to use. A recess cut at the bottom eliminates interference from Retaining Rings and spacers during use. Sturdy machined aluminum construction.

MCA-44 PVD is used for 4x8in (102x203mm) specimens in compression machines where 4in (102mm) high spacer blocks are used for proper positioning of the cylinder. **Product Dimensions:** 4.75x11.5in (121x292mm).

MCA-44N PVD is designed for use with 4x8in cylinders in compression machines where no spacer block is in use. **Product Dimensions:** 4.75x9.5in (121x241mm) WxH.

MCA-46 PVD fits 6x12 concrete cylinders in all compression machines. **Product Dimensions:** 4.5x11.75 (121x298mm) WxH.

Perpendicularity Verification Devices (PVD)	
Perpendicularity Verification Device for 4x8in Cylinders & Spacer	MCA-44
Perpendicularity Verification Device for 4x8in Cylinders	MCA-44N
Perpendicularity Verification Device for 6x12in Cylinders	MCA-46
Replacement Gap Measurement Tool, 4in, Pkg of 5	MCA-41
Replacement Gap Measurement Tool, 6in, Pkg of 5	MCA-42

UNBONDED CAPPING SETS & PADS
ASTM C1231; AASHTO T 22

Unbonded capping and pad caps for concrete cylinders save time, labor, and expense for compression testing. Choose capping sets and pads for 6in, 4in, 3in, and 2in diameter cylinders. 2in retainers and pads for specimens are also suitable for use on 2.125in diameter rock cores.

A steel retainer ring holding a tough 0.5in, (12.7mm) thick neoprene pad is placed at each end of the cylindrical specimen. Retainers last for years with proper care, and Neoprene Pads are reusable for up to 100 tests. Retainers and Pads are ordered separately.

Steel Retainers are alloy steel, precisely machined to specified dimensions, and plated inside and out to resist corrosion. All bearing surfaces are plane to within 0.002in (0.05mm). The 6in Retainers meet acceptable configuration of AASHTO T 22 and do not require acceptance testing. Retainers are sold in sets of two.

Neoprene pads flow during compression to fill irregularities in cylinder ends and assure load uniformity. Pads comply with the latest version of ASTM C1231.

- 50 Durometer Pads meet tensile strength and durometer requirements of AASHTO T 22 and are appropriate for compressive strengths from 1,500—6,000psi (10—40mPa).
- 60 Durometer Pads are used for strengths from 2,500—7,000psi (17—50mPa).
- 70 Durometer Pads are used for strengths from 4,000—7,000psi (28—50mPa).

These pads may be used for concrete strengths up to 12,000 psi (80mPa) with additional qualification testing by owner. Neoprene Pads are sold individually. Two are required for compression testing of concrete cylinders. Add "CS" to model numbers of 4in and 6in Neoprene Pads to specify case quantities of 12 pads.

Unbonded Capping Sets & Pads				
Diameter	Steel Retainers (Sets of 2)	Neoprene Pads (Sold Individually)		
		50 Durometer	60 Durometer	70 Durometer
6in	HM-180	HM-363	HM-364	HM-365
4in	HM-181	HM-360	HM-361	HM-362
3in	HM-182	HM-366	HM-367	HM-368
2in	HM-183	HM-369	—	HM-370

HM-186

GILSON GRAY IRON 9000 CAPPING COMPOUND
ASTM C287, C617; AASHTO T 231

Gilson Gray Iron 9000 is a new and improved sulfur mortar capping compound blended especially for concrete strength testing. Ultra-thin flakes are carefully formulated from sulfur and mineral filler for guaranteed consistency and faster melting times. Gray Iron melts quickly at 230° to 240°F (110° to 115°C), with a wide optimum pouring range of 265° to 290°F (129° to 143°C) and low odor. Set time is about one minute, and shrinkage is minimal. If accidental overheating occurs, the compound remains usable after cooling, and solidified material can be remelted with no loss of properties. Compressive strength exceeds 8,000psi at two hours for ASTM C617 tests of 2in cubes, and bond strength is 150psi or more. Strength and bond properties of capped specimens does not degrade over time, even when stored in humid condtions. Special plasticizer additives ensure even load distribution during testing. Gray Iron can be used for testing of much higher strength concretes with additional aging. Gray Iron 9000 is supplied in 50lb moisture-resistant bags. Order 40 or more bags for best pricing at pallet shipping quantity.

Gilson Gray Iron 9000 Capping Compound	
Gilson Gray Iron 9000, 1—39 bags	HM-186
Gilson Gray Iron 9000, 40—399 bags	HM-187

HM-239

PORTABLE BEAM TESTER

Portable Beam Tester transports and sets up easily for rapid field checks of 6x6in (152x152mm) concrete beam specimens with minimum length of 20in (508mm). Conversion between third-point and center-point flexural loading configurations is quick and easy. The hydraulically loaded unit does not strictly comply with ASTM/AASHTO requirements, but test results compare favorably with load frames with fixed attachments meeting the standards.

Upper bearing assemblies are provided for both center-point and third-point loading. Third-point assembly bearing points are 6in (152mm) center-to-center. Elastic bands hold the assemblies in raised position for easier specimen placement. Lower bearing points on the load frame are 18in (457mm) on-center and pivot as the test beam deflects. The manually-operated pump assembly with 6in (152mm) diameter gauge is attached by a 4ft (1.2m) quick-disconnect hose to the hydraulic cylinder and load frame. The high-quality, direct-reading gauge features ±0.25% accuracy, and is graduated from 0-1500 psi. **Product Dimensions:** 22x8x14in (559x203x356mm) WxDxH.

Portable Beam Tester	
Portable Beam Tester	HM-239

HM-189

VITROBOND INGOT CAPPING COMPOUND
ASTM C287, C617; AASHTO T 231

Vitrobond Ingot Capping Compound is sometimes preferred for ease of storage and handling. Dark grey compound is carbon filled, sulfur based and melts and pours smoothly, for consistent results. Compressive strength exceeds 5,000psi (34.4kPa) at two hours and increases to 7,000psi (48.3kPa) at 7 days. Ingots come in 50lb (23kg) cartons, each with ten 5lb ingots. Pieces break easily for melting to pouring temperature of 280°—300°F (138°—140°C). Physical strength ratings are 600psi tensile strength and 1,300psi modulus of rupture by ASTM C307 methods. The compound must not be heated above 320°F (160°C). Using excessive release oil may affect cap strength.

Vitrobond Ingot Capping Compound	
Vitrobond Ingot Capping Compound, 1—4 cartons	HM-189
Vitrobond Ingot Capping Compound, 5 or more cartons	HM-190

HM-166

VERTICAL CYLINDER CAPPERS
ASTM C617; AASHTO T 231

Popular vertical design for capping concrete test cylinders assures smooth, right-angle end surfaces. Cylinder is placed into mold against upright guide after filling recess with molten capping compound.

Capper bottom plate is 1in (25.4mm) thick steel and ground to 0.002in (0.05mm) planeness with separate ring to form recess. Ring and vertical guide are removable to permit regrinding to proper planeness after extended use. Corner mounting holes are provided. HM-166 has a spring-loaded hand cam lever that tilts cylinder forward to release it from capper. HM-164 and HM-163 for smaller cylinders are similar to HM-166, but do not have the lever release. **HM-166 Product Dimensions:** 8x9.5x15in (203x241x381mm), WxDxH. **HM-163 & 164 Product Dimensions:** 8x6x5in (203x152x127mm), WxDxH.

Vertical Cylinder Cappers	
6x12in Cylinder Capper	HM-166
4x8in Cylinder Capper	HM-164
3x6in Cylinder Capper	HM-163
Accessories	
Replacement Ring for HM-166	HMA-21

HM-200

HM-202

NEW PRODUCT

HM-204

HM-205

HM-678

MELTING POTS

ASTM C617; AASHTO T 231

Melting pots are useful for preparing capping compounds, wax, tars, asphalt, and other materials in the lab. Each has precision temperature control for 38°—160°C (100°—320°F) range that holds to set point. A high limit control turns pots off at 182°C (360°F). The cast aluminum inner liner is contacted from top to bottom by a unique helically wound element to give even heat distribution. Durable polished stainless steel outer case assures long, dependable service. Molten capping compound is placed into capping fixture with 8oz (237ml) stainless steel HM-210 Ladle.

Melting Pots

Model	Capacity qt (L)	Dimensions IDxDepth, in (mm)	Electrical V/Hz	Electrical amps
HM-200 HM-200F	4 (3.8)	7.5 x 7 (191 x 178)	115/60 230/50-60	6 3
HM-201 HM-201F	8 (7.6)	10 x 6 (254 x 152)	115/60 230/50-60	10 5
HM-202 HM-202F	12 (11.4)	10 x 9 (254 x 229)	115/60 230/50-60	11 5.5
HM-205 HM-205F	20 (18.9)	14 x 7 (356 x 178)	115/60 230/50-60	13 6.5
HM-206 HM-206F	24 (22.7)	14 x 9 (356 x 229)	115/60 230/50-60	14 7
HM-204 HM-204F	28 (26.5)	14 x 11 (356 x 279)	115/60 230/50-60	15 7.5

Accessories

Ladle, 0.25qt (0.24L)	HM-210

MASONRY BLOCK CAPS

Masonry Block Caps offer a unique unbonded capping method for the compressive strength testing of masonry units. This cost-effective alternative to sulfur capping reduces time, labor, expense and equipment such as ladles and melting pots. The fibrous composite is laminated to the tough plastic sheeting, providing rigidity, proper load distribution, and protection of the machine platens. Composite material flows during compression to fill the irregularities of the concrete masonry unit, distributing test loads uniformly.

This method is comparable in accuracy to capping with hydrocal gypsum but is not accepted in the ASTM C140 method. Block Caps are ideal for internal QC testing applications and eliminate the need for mixing, cutting or measuring. Sizes available for 8x16in and 12x16in masonry block. Each set of caps is designed for a single use. Each carton contains ten sets of caps.

Masonry Block Caps

Masonry Block Caps, 8in x 16in (203 x 406mm)	HM-678
Masonry Block Caps, 12in x 16in (305 x 406mm)	HM-679

HM-716A

HMA-1054

CONCRETE CYLINDER END GRINDERS
ASTM C39; CSA A23.1-04, A23.2-04

- **Four to six specimens can be prepared at once; as many as 100 per day.**
- **Preferred end preparation for high-strength concrete.**
- **Eliminates qualification testing of capping materials.**
- **Reduces health and safety concerns and is much less labor intensive.**

The Concrete Cylinder End Grinder is an essential tool for modern concrete laboratories. This multi-sample preparation unit eliminates the need for qualification testing or documentation of common capping methods, especially when testing design strengths exceeding 7,000psi (48.3mPa). It eliminates time consuming and labor intensive sulfur-capping and reduces health hazards and safety concerns. It can also "save" samples with damaged or poorly finished ends that would otherwise be unusable for testing. Large laboratories with heavy sample volumes will find this machine cost-effective for processing their regular concrete samples on a daily basis. 100 or more cylinders can be processed in a typical workday, and can be tested immediately. No plumbing or drains are required and dust hazards are eliminated. Technicians are free to perform other duties during grinding cycles.

Once the cylinders are mounted in the carousel and the grinding cycle is started, the operation is entirely automated until a preset 4mm of material has been removed from each sample. The machine then polishes the cylinder ends and automatically shuts down. The included water tank and pump circulate water to the diamond grinding head for cooling and flushing of cuttings. Replacement Diamond Grinding Heads are available as HMA-1050. Other accessories include HMA-1051 Mobile Cart for Water Tank, HMA-1052 Tool Set for measuring planeness of sample ends, and HMA-1053 Inspection Jig for checking perpendicularity and alignment. The Cylinder End Grinders require 30A power supply at 208-220V/60Hz single phase. Inquire for units wired for 50Hz power supply. **Product Dimensions:** 48x48x60in (1,219x1,219x1,524mm), WxDxH.

HM-714A Concrete Cylinder End Grinder is designed for 4in (102mm) cylinders and is equipped to handle up to six 4in (102mm) samples in each cycle.

HM-716A Concrete Cylinder End Grinder accommodates four 6in (152mm) diameter test cylinders, and includes adaptors to accept four 4in (102mm) cylinders. The unit is capable of grinding one size cylinder at a time, and is recommended in labs where both 4in (102mm) and 6in (152mm) sample sizes are to be tested. The HMA-1054 Carousel can be fitted to this unit to allow grinding of six 4in diameter cylinders only.

Concrete Cylinder End Grinders	
Concrete Cylinder End Grinder, for Six 4in Cylinders	HM-714A
Concrete Cylinder End Grinder, for Four 4in or 6in Cylinders	HM-716A
Accessories	
Replacement Grinding Head	HMA-1050
Water Tank Cart with Wheels	HMA-1051
Planeness Tool Set	HMA-1052
Alignment Inspection Jig	HMA-1053
Carousel for Six 4in Cylinders	HMA-1054

TSA-270

12IN DIGITAL CALIPER

Large stainless steel Digital Caliper accurately measures exact length and diameter dimensions on concrete cylinders, core and cube specimens. Clear LCD digital display shows inch or metric measurements with resolution of 0.0005in or 0.01mm from 0-12in or 0-300mm. Ideal for precise dimensional checks of most asphalt, concrete and soil specimens up to 6x12in (152x305mm) Dia.xL. Large 3.5in (89mm) depth jaws easily reach center of 6in diameter specimens and have inside diameter function. Includes battery and protective carrying case. **Product Dimensions:** 14.5x4.1 (368x104mm) LxW .

12in Digital Caliper	
12in Digital Caliper	TSA-270

HM-162

DIAMETER MEASURING TAPE

The Pi Tape brand diameter measuring tape quickly gives a direct reading of average diameter with micrometer accuracy simply by placing tape around circumference of the specimen. Use for round or out-of-round specimens of concrete, soils, and asphalt. The 0.10in (2.5mm) thick spring steel tape has graduations and numerals engraved and acid-etched on a ground surface. Vernier scale permits readings to .001in (.025mm) diameter; accuracy to ±.001in, furnished with certificate of calibration traceable to NIST. The tape is graduated in English units, suitable for measuring diameters from 2—12in. Metric Pi Tape reads from 50 to 300mm to 0.01mm accuracy.

Diameter Measuring Tape	
Diameter Measuring Tape, Inches	HM-162
Diameter Measuring Tape, Metric	HM-162M

HM-40

HM-403

HM-401

SLUMP TEST SETS

ASTM C143/143M; AASHTO T 119, T 119M; BS 1881

Concrete slump is a basic test of fresh concrete to measure workability and indirectly indicate water/cement ratio. The slump test is often used for acceptance. Gilson Slump Test Sets combine all the required components into convenient field kits. Individual components are also available separately.

Slump Test Sets	
Slump Test Set includes a heavy-gauge spun steel Slump Cone, cast aluminum Base Plate, and 5/8x24in (16x610mm) stainless steel Tamping Rod. Clamps on the base swivel to hold foot tabs of slump cone securely. The Carrying Handle can be rotated over the specimen as a measuring reference. Test Set components assemble compactly for easy transport.	HM-40
EZ-Clean Slump Cone, Base and Rod Set includes a Slump Cone, a high-density polyethylene Base Plate, and 5/8x24in (16x610mm) steel Tamping Rod. HM-403 set features our heavy-gauge spun steel Slump Cone, and HM-403P is supplied with the easy to clean Plastic Slump Cone. Adjustable clamps secure Slump Cone and spring-loaded rod clamps allow easy transport of set components. Concrete is easily cleaned off of plastic base plate.	
EZ-Clean Slump Cone, Base and Rod Set, Steel Slump Cone	HM-403
EZ-Clean Slump Cone, Base and Rod Set, Plastic Slump Cone	HM-403P
Deluxe Slump Test Set includes all components from HM-40 Set, plus a 58oz (1,715ml) capacity polished aluminum Round-Bowl Scoop, aluminum Filling Funnel, a 12ft (3.6m) measuring tape and a sturdy, acid-resistant scrub brush with 10in (254mm) handle.	HM-401
Deluxe EZ-Clean Slump Test Set includes all HM-403 components, plus a 58oz (1,715ml) capacity polished aluminum Round-Bowl Scoop, aluminum Filling Funnel, a 12ft (3.6m) measuring tape and a sturdy, acid-resistant scrub brush with 10in (254mm) handle. The plastic base plate is easy to clean-up after use and will not corrode. Components meet specification requirements. Choose from sets with steel or Plastic Slump Cones.	
Deluxe EZ-Clean Slump Test Set, Steel Slump Cone	HM-410
Deluxe EZ-Clean Slump Test Set, Plastic Slump Cone	HM-410P

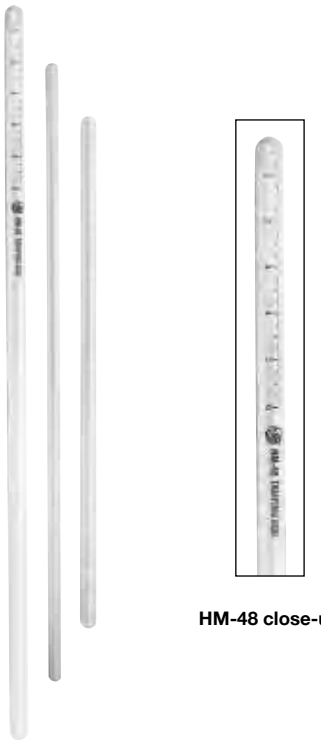
HM-410

VIDEO ONLINE

HM-45

VIDEO ONLINE

HM-39



HM-48, HM-63 & HM-47

HM-48 close-up

SLUMP CONES, RODS, AND BASES

ASTM C143/143M; AASHTO T 119, T 119M; BS 1881

Spun steel or molded plastic concrete slump cones meet all specification requirements. Convenient Slump Bases provide a clean, stable testing surface for slump testing anywhere. Tamping Rods are required for manual consolidation for slump, air content, and molding of strength specimens.

Slump Cones, Rods and Bases	
Steel Slump Cones are seamless, heavy-gauge spun steel, plated for rust resistance with welded foot tabs and handles. Steel Slump Cones are available to meet inch (4x8x12in) or metric (100x200x300mm) dimensional requirements.	
Steel Slump Cone, Inch	HM-45
Steel Slump Cone, Metric	HM-45M
Plastic Slump Cones are constructed of durable, high-density material and comply with current ASTM and AASHTO specifications. These economical inch or metric models are dimensionally stable, easy to clean, and will not dent or rust. Plastic Slump Cones are available to meet inch (4x8x12in) or metric (100x200x300mm) dimensional requirements.	
Plastic Slump Cone, Inch	HM-39
Plastic Slump Cone, Metric	HM-39F
Cast Aluminum Slump Base has swivel clamps to secure foot tabs and a carrying handle that rotates up to use as a measuring reference. Use with either steel or plastic slump cones. Rod and cone attach to the base for convenient carrying. **Product Dimensions:** 15x17in (381x432mm).	HM-68
EZ -Clean Slump Base is High-Density Polyethylene, and acceptable for use in the specifications. Adjustable clamps secure slump cone and spring-loaded rod clamps allow easy transport. Base cleans easily and will not corrode. Rod and slump cone purchased separately. Base is 18x18in (457x457mm).	HM-31
5/8in Tamping Rod is stainless steel with hemispherical tips on both ends. HM-48 has engraved measuring scale in 1/4in increments. HM-48A is plain with no markings. 5/8x24in (610x16mm) Dia.xL, size is specified for 6x12in concrete cylinders, air content, and slump tests.	
5/8x24in Tamping Rod, Engraved Measuring Scale	HM-48
5/8x24in (610x16mm) Tamping Rod, Plain	HM-48A
3/8in Small Tamping Rod is stainless steel and is required for molding of 4x8in concrete cylinder specimens, and is 3/8x12in (10mmx305mm) Dia.xL	HM-47
3/8in Long Tamping Rod is stainless steel and meets both Canadian and ASTM standards for consolidation of 4x8in (102x203mm) concrete cylinders. The rod is 3/8x18in (10x457mm) Dia.xL.	HM-63

HM-68

NEW PRODUCT

HM-31

Find Estimated Ship Weights for all our products in the Ship Weight Index

TSA-188

TSA-189

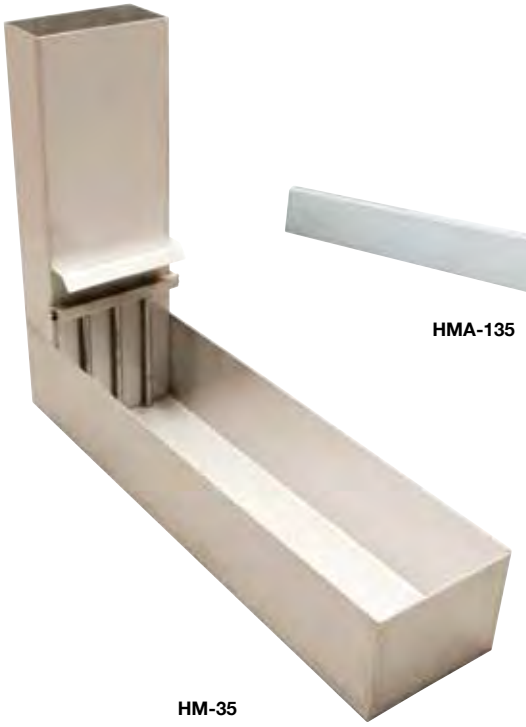
TSA-233

TSA-275

HMA-306

HM-53

VIDEO ONLINE



HM-35

HMA-135

SLUMP TEST ACCESSORIES
ASTM C143/143M; AASHTO T 119, T 119M; BS 1881

Slump Test Accessories	
Round Bowl Scoops are die-cast and polished aluminum with integral handles for filling slump cones, air meters or cylinder molds.	
Round Bowl Scoop, 38oz (1,124ml) Capacity	TSA-188
Round Bowl Scoop, 58oz (1,715ml) Capacity	TSA-189
Scrub Brushes are available in 21.5in (546mm) long-handled, or 10in (254mm) short-handled versions, and stand up to heavy everyday field use. Both feature durable, solid plastic handles and sturdy, acid-resistant synthetic fibers.	
Scrub Brush, 10in (254mm) Handle	TSA-232
Scrub Brush, 21.5in (546mm) Handle	TSA-233
Mortar Trowel has wooden handle and flat steel blade. **Product Dimensions:** 4.5x3in (114x76mm).	HMA-306
Measuring Tapes have retractable blades in sturdy cases, belt clips, and offer a choice of measuring scales in feet and inches or millimeters. Tapes have 0.75in (19mm) blade widths.	
16ft/5m Measuring Tape in Inches and Millimeters	TSA-275
12ft Measuring Tape in Feet and Inches	TSA-279
Slump Cone Filling Funnel is a convenient accessory for fast and easy filling of slump cones.	HM-53

L-BOX FOR SELF-CONSOLIDATING CONCRETE

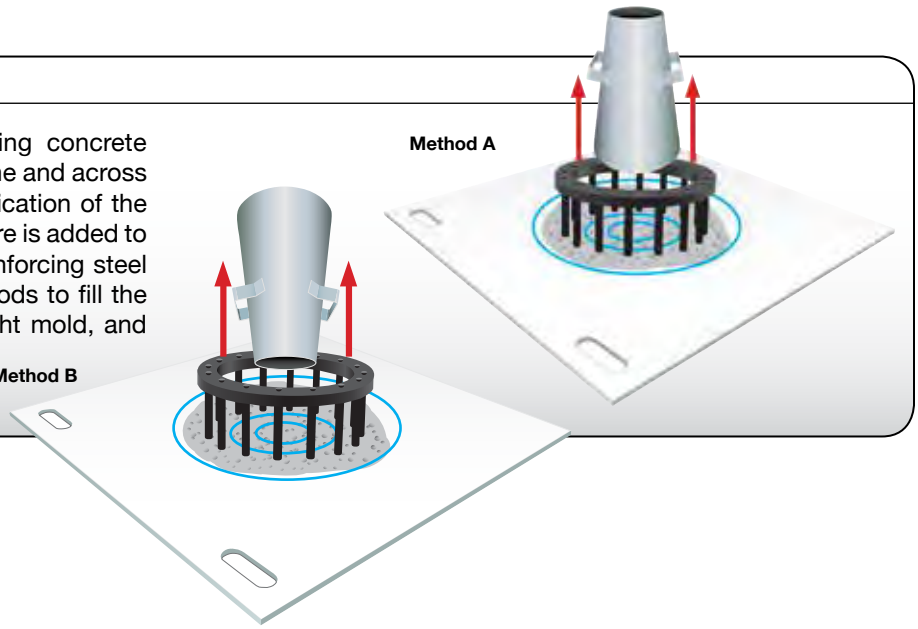
The L-Box offers an alternate method of determining flow and passing ability of self-consolidating concrete (SCC) mixes. This method is in use in Europe, and some DOT's in the United States have adopted the procedure or are examining it. An ASTM procedure is still pending.

The HM-35 is constructed of stainless steel with welded joints and consists of a vertical hopper with a sliding gate at the bottom. There are three bars representing reinforcing steel and a horizontal trough in front of the gate. Fresh concrete is placed in the vertical hopper without consolidating. Lifting the slide gate allows the concrete to flow past the bars into the horizontal trough. Final depth of the concrete at the gate and at the end of the trough is measured and the proportional difference expressed as a blocking ratio. Some versions of this procedure require timing the flow with a stopwatch. The HMA-135 11.8x1.6in (300x40mm) Stainless Steel Straightedge is a suggested accessory for striking-off the concrete surface. **Product Dimensions:** 8x24x32.5in (203x610x826mm), WxDxH.

L-Box for Self-Consolidating Concrete	
L-Box for Self-Consolidating Concrete	HM-35
Accessories	
Stainless Steel Straightedge, 11.8x1.6in	HMA-135

SCC PASSING ABILITY SET (J-RING)

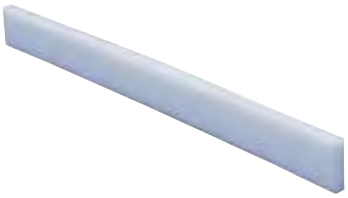
For ASTM C1611 stump field test, self-consolidating concrete (SCC) flows out of the bottom of a modified slump cone and across the baseplate. It's final measured diameter is an indication of the concrete's slump flow. In ASTM C1621, the j-ring fixture is added to the test to measure passability of the mix around reinforcing steel and other obstructions. Each test provides two methods to fill the modified slump cone mold. Method A uses an upright mold, and Method B uses an inverted mold.



VIDEO ONLINE

HM-55

HM-42



HMA-145

HM-43

SCC PASSING ABILITY SET (J-RING)
ASTM C1611, C1621; AASHTO T 345, T 347

Structures designed with congested reinforcing steel often require self-consolidating concrete (SCC) mix designs to prevent voids and honeycombing. The J-Ring test, in conjunction with the Slump-Flow test, determines the passing ability of SCC, defined as the ability of the concrete to flow under its own weight.

Depending upon the procedure selected, a modified slump cone is positioned either inverted or upright in the middle of the J-Ring and filled with concrete. The cone is then lifted straight up and the diameter of the resulting circular flow of concrete is measured. A similar test is then run without the J-Ring in place and the difference in the flow diameters is recorded as the passing ability. Additional measurements or visual classifications may also be determined at the conclusion of the test.

Gilson offers this equipment as a set or as individual components. The complete HM-55 set includes the J-Ring assembly, Modified Slump Cone, high-density polyethylene Strike-Off Bar and a plastic Base Plate with convenient cut-out carrying handles. The Base Plate is 36x36x0.5in (914x914x12mm), and is inscribed with concentric circles for use when performing the slump flow procedure described in ASTM C1611. **J-Ring Dimensions:** 5x12.75in (127x324mm), HxDia, with sixteen 0.625in (16mm) bars around 12in (305mm) circumference of the ring.

SCC Passing Ability Set (J-Ring)	
SCC Passing Ability Set	HM-55
Accessories	
J-Ring	HM-42
Modified Slump Cone	HM-43
Base Plate	HM-54
Strike-Off Bar	HMA-145

HM-30 shown with case and accessories

HMA-108

HMA-108S

HM-30

GILSON CONCRETE PRESSURE METER
ASTM C231; AASHTO T 152

- **High-quality, accurate and easy to use.**
- **New *Gorilla Gauge* features rugged plastic housing and safety glass.**
- **Sturdy plastic carrying case is fitted to carry all required components.**

Gilson's high-quality Type B Pressure Meters measure concrete air content and include many value-added improvements. Our standard model HM-30 now features the exclusive Gilson Gorilla Gauge, and a new, more affordable model HM-30S offers an American-made stainless steel gauge. Other features of the two units are identical. Long-lasting, easy-operating stainless steel clamps adjust quickly and are less expensive to replace. The Gilson Air Pump with large, easy-grip handle builds pressure quickly and is shielded to keep dirt and water out of the piston area. Quality check-valve lasts longer for fewer maintenance issues. Brass petcocks use stainless steel ball valves for accuracy and durability. Petcock handles are vinyl coated for more comfortable operation.

Dimensions and accuracy of the Gilson meters meet ASTM requirements. Calibration Vessel, Calibration Tubes, 24in (610mm) Tamping Rod, Aluminum Straightedge, Syringe for water, Carrying Case and operating instructions are all included. Cast aluminum chamber volume is 1/4ft³ and can also be used for unit weight and yield determinations. Sturdy plastic carrying case holds meter with all accessories securely in die-cut foam padding. **Case Dimensions:** 27x14x14in (686x356x356mm), WxDxH.

HM-30 Concrete Pressure Meter features our exclusive Gorilla Gauge, a rugged German-engineered gauge with precision jeweled movement and a high-strength Polymid B molded housing that is waterproof and rustproof. Micro-Adjustable calibration screws ensure superior accuracy and save time during calibration and maintenance procedures. The Gorilla Gauge is ANSI rated B40 Grade 2A with accuracy ±1/2% of full scale. The dual-layer safety glass lens is sealed behind a threaded bezel with O-ring.

technote

Calibration and repair services are available from Gilson for the HM-30 Concrete Pressure Meter. Please call **800.444.1508** for pricing and scheduling.

HM-30S Concrete Pressure Meter uses a dependable and accurate American-made gauge with stainless steel housing. The sturdy industrial rack and pinion mechanism is accurate to ±1% of full scale. A threaded bezel with gasket seals the safety glass lens.

The Gorilla Gauge, Stainless Steel Gauge, and Gilson Air Pump are all available separately as replacement parts or upgraded retrofit parts for Gilson and other popular brand Type B concrete pressure meters.

Gilson Concrete Pressure Meters	
Gilson Pressure Meter w/*Gorilla Gauge*	HM-30
Gilson Pressure Meter w/Stainless Steel Gauge	HM-30S
Accessories	
Gilson Gorilla Gauge	HMA-108
Gilson Stainless Steel Gauge	HMA-108S
Gilson Air Meter Pump	HMA-107R

HMA-108

HMA-108S

HM-24

HM-27

HMA-107R

HM-25

CONCRETE AIR METER REPLACEMENT GAUGES

Replacement Gauges from Gilson fit most Type B Concrete Pressure Meters on the market today. Rugged precision gauges are a step up in quality and help restore accuracy and dependability to used Air Meters.

HMA-108 Gilson *Gorilla Gauge* is a durable, accurate, and long-lasting upgrade for most popular Type B Concrete Air Meters. Features not found on lower quality gauges include a wide-profile phosphor bronze Bourdon tube and a rugged German-engineered precision mechanism for dependable accuracy. Fine adjustment screws on the dial face are micro-adjustable for easy "tweaks" during calibration, saving time and making calibration and maintenance easier. Accuracy is ±1/2% of full scale.

The High-strength Polymid B housing is waterproof, rustproof, and resists impact forces. Threaded bezel has O-ring gasket, sealing the gauge from moisture and dust. Durable dual-layer safety glass lens resists scratches and breakage, and is easily replaceable. 1/4in NPT brass threads fit most concrete air meters. **Product Dimensions:** 4.25 x 2in (108x51mm) Dia.xH, with a 3.5in (89mm) dial face.

HMA-108S Stainless Steel Gauge is a dependable and accurate replacement gauge. This American-made gauge has a stainless steel housing and sturdy industrial grade rack and pinion mechanism. Accuracy is ±1% at full scale. The acrylic lens is break-resistant and sealed behind the gasketed bezel to protect from moisture and dust. 1/4in NPT brass threads fit most concrete air meters. **Product Dimensions:** 4x1.5in (102x38mm) Dia.xH, with a 3.5in (89mm) dial face.

Concrete Air Meter Replacement Gauges	
Gorilla Gauge Concrete Air Meter Replacement Gauge	HMA-108
Stainless Steel Concrete Air Meter Replacement Gauge	HMA-108S

GILSON AIR METER PUMP

Gilson Air Meter Pump is the same pump supplied on our popular Pressure Meters, and fits most other popular brands of Type B Concrete Air Meters as an upgraded replacement part. Sturdy brass construction uses quality components throughout for dependability and long service life. Large rubber ball-shaped handle is easier to grip and the smooth operation is less tiring to use. The long, effortless stroke pressurizes faster for more efficient testing. A built-in protective shield around the shaft keeps dirt out and a reliable, long-lasting check valve means fewer maintenance issues.

Gilson Air Meter Pump	
Gilson Air Meter Pump	HMA-107R

PRESSURE METER CALIBRATORS
ASTM C231; AASHTO T 152

Calibrators quickly field-check accuracy of concrete pressure meters. With a calibrator in the water-filled base, air meter gauge should read 5% air. Two calibrators are used in a 0.25ft³ meter for a 10% air reading.

HM-24 Brass Calibrator is of precisely machined brass. 7.5x2.125in (191x54mm), HxDia. with 0.5in (13mm) thick base.

HM-25 Plastic Calibrator is rugged plastic with metal weighted ring. 3.75x4in (95x102mm), HxDia.

HM-27 Lightweight Aluminum Calibrator is accurately machined to exact dimensions. They are sturdier than plastic, less expensive than brass models. 5.63x3.25in (143x83mm), HxDia.

Pressure Meter Calibrators	
Brass Calibrator	HM-24
Plastic Calibrator	HM-25
Lightweight Aluminum Calibrator	HM-27

Find Estimated Ship Weights for all our products in the Ship Weight Index

HM-345 shown with case and accessories

HM-345

HMA-482

SUPER AIR METER
ASTM C231; AASHTO T 152, TP 118

The HM-345 Super Air Meter (SAM) determines both total air content and the spacing factor of air voids in fresh concrete specimens. The test takes less than 10 minutes to run and the meter provides both the conventional air content as noted in ASTM C231/AASHTO T 152, and a new value called the SAM number that correlates with the air void spacing. Overall quality of the air void system is built on the presence of small and well dispersed bubbles. Spacing of the voids has proven to be a better indicator of freeze-thaw durability than total air content alone, and SAM measurements make durability much easier to predict. This rapid test can be performed in the field at the point of placement of the fresh concrete, eliminating the need to wait weeks for results of traditional tests on hardened concrete.

The Super Air Meter is a modified version of a conventional Type B Concrete Pressure Meter as described in ASTM C231. For the SAM procedure, two sequential pressurizations are applied to the concrete sample. For each sequence, increments of 14.5, 30, and 45psi (1, 2.1, and 3.1bar) are applied to the concrete and a deformation value is obtained. The SAM number is the difference between these values and correlates to the average spacing between air voids. A higher SAM number indicates increased susceptibility to freeze-thaw deterioration. Extensive research during development shows that a SAM value of 0.20 indicates 90% certainty that the spacing meets ACI durability recommendations. Optimum spacing of air voids can also reduce the overall air content required for the concrete to resist freeze-thaw damage. The meter is currently being used in twenty-two US States and one Canadian Province. AASHTO TP 118 Provisional Standard for this test has been approved, and the test is specified in Michigan and Oklahoma.

The optional CAPE Tank accessory can be pre-filled with compressed air to reduce the effort required to pressurize the SAM to higher testing pressures. Three attached inflation chucks with regulators are easily attached to the pressurization valve of the SAM. The HM-345 Super Air Meter is constructed of rugged cast aluminum and features a 1/4ft³ (7.1L) chamber and reinforced cover with six stainless steel clamps. The unique electronic digital gauge is highly accurate and pre-programmed to prompt the user through the required steps. Also included are a 5/8x16in (16x400mm) Dia.x L Tamping Rod, Brass Calibration Vessel, 12x12in (305x305mm) chemical resistant Plastic Strike-Off Plate, 16oz (454g) Rubber Mallet, and water syringe. All components are packed in a heavy duty water-tight molded resin case with fitted foam insert. The case features secure latches, built-in wheels and telescoping handle. **Case Dimensions:** 27x14x14in (686x356x356mm) WxDxH.

Super Air Meter	
Super Air Meter	HM-345
Accessories	
CAPE Tank	HMA-482

HM-32L

HM-33

LIGHTWEIGHT ROLL-A-METER
ASTM C173; AASHTO T 196, T 196M

- **Volumetric Air Meters can test any concrete mix, but are required for lightweight mixes.**
- **Anodized aluminum model is less than half the weight of original bronze unit.**

The new lightweight version of the popular Roll-A-Meter is a simple and accurate device for measuring air content of concrete mixes containing lightweight aggregates. The anodized aluminum version is less than half the weight of earlier bronze models. Hard-anodized aluminum bowl and neck are highly scratch and wear resistant.

The base and top are fastened with quick acting stainless steel clamps after concrete sample is placed in base. Water and isopropyl alcohol are added to zero mark on neck, and meter is inverted, rolled, and rocked until air is removed for concrete. Percent of air is read directly from liquid level on scale.

HM-32L Lightweight Roll-A-Meter may also be used as a pycnometer for determining specific gravity of sand, gravel, and cement. Unit is supplied in foam-lined plastic carrying case with Straight Edge, Tamping Rod, Syringe, Baffle-Bottom Funnel, and instructions. Volume of base is 130in³ (2,130ml). Overall height: 22in (559mm); Maximum diameter: 8in (203mm).

Lightweight Roll-A-Meter	
Lightweight Roll-A-Meter	HM-32L

VIDEO ONLINE Watch video tutorials for our products online at **www.globalgilson.com!**

VOLUMETAIR AIR METER
ASTM C173; AASHTO T 196, T 196M

- **Lightest Volumetric Air Meter.**
- **Best for occasional use.**

Volumetair Volumetric Air Meter accurately and economically measures air content in any type of concrete, including lightweight aggregate concrete mixes. The unit weighs only 5.5lb (2.5kg) and is made of dimensionally stable PVC and fiberglass-reinforced plastic. The Volumetair is much lighter than brass or aluminum units.

Base and top housing fit together with a leakproof O-Ring seal and stainless steel over-center clamp assembly. Parts clean up easily with water. Base volume is 134in³ (2,200ml), and sight tube is graduated from 0 to 9.5in 0.25% increments. The meter comes complete with Funnel, Syringe, Tamper, Strike-Off Bar, Calibrated Cup, and Mallet in a plastic Case. **Product Dimensions:** 27x7.25in (686x184mm) HxDia.

Volumetair Air Meter	
Volumetair Air Meter	HM-33

also available

Compact Field Scales for determining concrete unit weight and yield are listed in this section and our Ovens & Balances section.

Find Estimated Ship Weights for all our products in the Ship Weight Index

VIDEO ONLINE

HM-34

HMA-1A

CHACE AIR INDICATOR KIT

The inexpensive Chace Air Indicator is used for quick estimations of air content in fresh concrete. Method is ideal for rapid field checks to supplement air meter tests. A sample of cement paste and fine aggregate is placed in the measuring cup, then inserted into the glass tube, and the tube is filled with isopropyl alcohol. Percent air is determined by number of lines the alcohol drops in the stem of the vial after agitation. Kit includes Vial, Rubber Stopper, Cup, Cleaning Brush, Alcohol Squeeze Bottle, instructions and Plastic Case. **Product Dimensions:** 6.25x1.125in (159x29mm), LxDia.

Chace Air Indicator Kit	
Chace Air Indicator Kit	HM-34
Accessories	
Glass Vial, Brass Cup with Stopper	HMA-1A
Glass Vial	HMA-2

HMA-295

HM-80

HM-78

CONCRETE PENETROMETERS

Concrete Penetrometers are used to estimate initial set of concrete mixes. Concrete that has reached initial set can no longer be effectively consolidated, and is nearly ready for final finishing operations. ASTM defines the initial set of concrete mortar as when 500psi (3.4mPa) of force is required to embed a penetration probe to a depth of 1in. Both penetrometer models are equipped with 1/20in² (32.3mm²) penetration plungers, which are simply pushed into fresh concrete at a constant rate to the mark scribed at 1in (25mm). Both can also be used in evaluations of mortars for unit masonry when equipped with the 2.7in (68.58mm) diameter HMA-295 Adaptor Foot.

HM-80 Concrete Pocket Penetrometer is a rugged, lightweight unit using a calibrated reaction spring for resistance. Plated steel construction resists rust and stands up under harsh field conditions. 0 to 700psi scale is etched into barrel of piston. A snug-fitting indicator band slides on the piston to register maximum readings. **Product Dimensions:** 7x0.75in (178x19mm), LxD.

HM-78 Concrete Dial Penetrometer is a compact instrument fitted with an easy to read 2.25in (57mm) diameter dial gauge. Dual scales of 0 to 700psi and 0 to 50kg/cm² indicate resistance. Maximum readings are locked in until released by push button. The instrument can be calibrated using an ordinary platform balance and adding or removing the register plates provided. Plastic case, factory certification and instructions are included. Overall length is 6in (152mm).

Concrete Penetrometers	
Concrete Pocket Penetrometer	HM-80
Concrete Dial Penetrometer	HM-78
Accessories	
Concrete Penetrometer Adaptor Foot	HMA-295

HM-65

"K-SLUMP" TESTER

Approximate concrete slump and workability readings can be determined prior to or after placement with the "K-SLUMP" Tester in just 60 seconds.

The hollow-tube probe has two groups of side openings through which wet concrete enters to raise a floating plunger to give an estimate of concrete slump. Workability is indicated by an additional simple up-and-down motion of the probe. Readings are reliable when 6in (152mm) or more of concrete surrounds the tester. Instructions and correlation chart included. **Product Dimensions:** 12x0.75in diameter (305x19mm)

"K-SLUMP" Tester	
"K-SLUMP" Tester	HM-65

CP-75 shown with
HM-30 Air Meter Base (Not Included)

COMPACT FIELD SCALES
ASTM C29, C138; AASHTO T 19, T 19M, T 121

The Gilson Compact Field Scale is the portable and affordable solution for weighing concrete, soil and asphalt samples in remote locations. With capacities ranging from 6—200kg (13—440lb), these units enable fast, accurate weight determinations in an easily transportable package. A special hold function feature allows the user to press the hold button and keep weight reading on the display. All models meet ASTM C29, C138 and AASHTO T 19, T 121 concrete specifications when paired with the cast aluminum unit weight containers or air meter base, each purchased seperately.

The large stainless steel platform adds stability when weighing large containers and is easy to keep clean. Base is sturdy steel. Remote mountable indicator comes with a wall bracket and has gross, net, zero and stable functions displayed in 1in (25.4mm) high LCD characters. Weighing units are selectable between lb, kg, oz, lb:oz and all models feature full capacity tare range. Includes a standard RS-232 interface to connect to PC or printer and an aluminum carrying case with fitted foam interior with AC adapter. Scale can also be operated with six AA batteries. **Base Dimensions:** 11.8x11.8x2in (300x300x50mm), WxDxH. **Indicator:** 8.7x3.7x1.7in (220x95x43mm), WxDxH. Gross weight is 10.6lb (4.8kg).

Compact Field Scales

Model	Range x Readability kg (lb)	Precision (Std. Dev.), g
CP-6	6x0.002 (13x0.005)	±2.0
CP-15	15x0.005 (33x0.01)	±5.0
CP-35	35x0.01 (75x0.02)	±10.0
CP-75	75x0.02 (165x0.05)	±20.0
CP-150A	150x0.05 (330x0.1)	±50.0
CP-200	200x0.05 (440x0.1)	±50.0

technote

ASTM C31 now requires a unit weight determination (C138) for each set of concrete strength test specimens.

HM-12

HM-28

HMA-491

UNIT WEIGHT MEASURES
ASTM C29, C138; AASHTO T 19, T 19M, T 121, T 121M

Cylindrical measures are used for determining unit weight of concrete or aggregates. Measures can also be used to determine void content of aggregates. All measures are watertight with top and bottom true and even, and constructed to retain shape under rough usage.

Cast Aluminum Measures meet ASTM C29, C138, AASHTO T 19, T 121 specifications, and are machined for superior accuracy. Integral handles are formed into the castings. The measures resist corrosion from cement paste and are preferred in unit weight and yield testing of fresh concrete.

Steel Measures with bail handles are roll-formed, seam-welded, and painted. They are suitable for non-specification checks for unit weight and void content of aggregates when calibrated for volume by end-user.

Square Strike-Off Plates are rugged 0.25in (6.4mm) thick corrosion-proof aluminum and useful for various volume and mass determinations in aggregate and concrete testing. ASTM and AASHTO standards typically require dimensions 2in (50.8mm) greater than diameters of unit weight measures. Model HMA-491 is popular for use with concrete pressure meter buckets. HM-48 Tamping Rod meets requirements for consolidation of concrete with slump greater than 3in.

Unit Weight Measures

Model	Description	Inside Dimensions Ht. x Dia., in (mm)	Capacity ft^3 (L)	Aluminum Strike-Off Plate
HM-10	Cast Aluminum	11.2x14 (284x356)	1 (28.3)	HMA-493
HM-11		11x10 (279x254)	1/2 (14.2)	HMA-492
HM-12		11.5x8 (292x203)	1/3 (9.4)	HMA-491
HM-29		8.8x8 (224x203)	1/4 (7.1)	HMA-491
HM-13		6.1x6 (155x152)	1/10 (2.8)	HMA-490
HM-20	Steel	11.2x14 (284x356)	1 (28.3)	HMA-493
HM-21		11x10 (279x254)	1/2 (14.2)	HMA-492
HM-22		11.5x8 (292x203)	1/3 (9.4)	HMA-491
HM-28		8.8x8 (224x203)	1/4 (7.1)	HMA-491
HM-23		6.1x6 (155x152)	1/10 (2.8)	HMA-490

Strike-Off Plates

Model	Fits Unit Weight Measures	Size in (mm)
HMA-490	HM-13, HM-23	8x8 (203x203)
HMA-491	HM-12, HM-28, HM-29, HM-30[1]	10x10 (254x254)
HMA-492	HM-11, HM-21	12x12 (305x305)
HMA-493	HM-10, HM-20	16x16 (406x406)

[1] *HM-30 Gilson Concrete Pressure Meter*

Find Estimated Ship Weights for all our products in the Ship Weight Index

CONCRETE CYLINDER MOLDS

ASTM C31, C192, C470; AASHTO M 205, M 205M, R 39, T 23

VIDEO ONLINE

HM-151, HM-152, HM-153 and HM-154

HM-157

HM-141 shown with 6in cylinder mold

HM-146, HMA-190 and HMA-191

HM-160

Concrete Cylinder Molds		
Description	**Model**	**Qty. per Case**
Biodegradable Plastic Cylinder Molds for single-use applications are non-absorptive and molded as single piece units for dimensional uniformity. Rugged molds have unlimited shelf life and are weather-resistant, but contain a unique additive that allows microbes present in landfills and composting facilities to break down plastic. Molds are unaffected by heat, light or cement paste. Built-in lip helps retain round specimen shape. Writable surface allows recording of data. Tight-fitting Plastic Lids are purchased separately. For quantities of 25 cases or more of 4x8in or 6x12in molds, add "D" suffix to model number. These models have price savings and lower per-case shipping charges in 25+ case quantities. Dimensions shown are Diameter x Height in inches.		
Plastic Cylinder Molds, 6x12in	HM-151	20
Plastic Cylinder Molds, 4x8in	HM-152	36
Plastic Cylinder Molds, 3x6in	HM-153	80
Plastic Cylinder Molds, 2x4in	HM-154	520
Domed Biodegradable Plastic Cylinder Mold Lids are purchased separately to fit Gilson Biodegradable Plastic Cylinder Molds. Slight dome shape with internal ridge snaps tightly over lip of molds. Use of tight-fitting lids assures moisture retention.		
Plastic Cylinder Mold Lids, 6in	HM-156	250
Plastic Cylinder Mold Lids, 4in	HM-157	300
Plastic Cylinder Mold Lids, 3in	HM-158	100
Plastic Cylinder Mold Lids, 2in	HM-159	200
Reusable Cylinder Molds are 0.25in (6.3mm) heavy-wall plastic for extended use and significant cost savings over single-use molds. With proper care, these 4x8in (102x152mm) molds can be used dozens of times. Inexpensive multi-use Cylinder Saver Liners and Disc Inserts allow easy removal of molded cylinders, often by just sliding them out. If necessary, a small, user-supplied hand-held air pump will quickly release specimens. The molds meet the requirements of ASTM C470 and produce exceptionally consistent specimens. Supplied in packages of four, each with a domed Plastic Lid, Liner, and Insert. Replacement Liners and Disc Inserts are available as accessories.		
Reusable 4in Plastic Cylinder Molds	HM-146	4
Cylinder Saver Liners	HMA-190	36
Disc Inserts	HMA-191	36
Plastic Concrete Cylinder Carrier fits 6in (152mm) diameter plastic cylinder mold with a wide lip and can be used with lids in place. Flexible plastic ring slides onto mold from bottom and is held in place by top lip. When ready to transport, carrier handles are turned up and snap together in the middle. Carriers are packaged in cartons of 50.	HM-141	—
Cylinder Stripping Tool Cylinder Stripping Tool is an easy to use and inexpensive device for removing single-use cylinder molds from all sizes of concrete cylinders.	HM-160	—

HM-142 and HM-143

HM-144

HM-149 and HM-169

CONCRETE CYLINDER MOLDS

ASTM C31, C192, C470, C1090; AASHTO M 205, M 205M, R 39, T 23, T 126

Concrete Cylinder Molds

Description	Model
Steel Concrete Cylinder Molds are heavy-duty and reusable many times over. 0.25in (6.4mm) thick walls are split longitudinally to allow easy specimen removal. When clamps are released, the mold springs apart slightly. Detachable base plate is tight-fitting. All parts are plated for rust resistance and are non-reactive to cement constituents. Steel molds give uniform results and are dimensionally stable under severe use. HM-144 6x12in Mold has a built-in handle for easier handling of specimens. Available in 6x12in (152x305mm) or 4x8in (102x203mm) sizes.	
Steel Concrete Cylinder Mold with Handle, 6x12in	HM-144
Steel Concrete Cylinder Mold, 6x12in	HM-142
Steel Concrete Cylinder Mold, 4x8in	HM-143
Cast-Iron Concrete Cylinder Molds are heavy castings, machined to exact dimensions and serial numbered for long-term repeated use. Sidewalls are approximately 0.25in (6.4mm) thick with molded-in 0.5in (12.7mm) reinforcing ribs to resist any deformation under rough use. Mold is assembled using toggle bolts with large wing nuts to securely fasten pieces. Joints are closely fitted and can be coated with grease for completely waterproof seal. Fast disassembly for stripping and cleaning. Base is 0.75in thick (19mm). **Product Dimensions:** of HM-149 Mold for 4x8in (101.6x203.2mm) specimens are 6.5x6.5x8.75in (165x165x222mm), HM-169 molds for 6x12in (152.4x304.8mm) specimens are 9x9x13in (229x229x330mm) WxDxH.	
4x8in Cast-Iron Concrete Cylinder Mold	HM-149
6x12in Cast-Iron Concrete Cylinder Mold	HM-169
Concrete Cube Molds, 6x6in (152x152mm) ASTM C403; AASHTO T 197, T 197M Steel molds produce specimens for strength testing, or serve as a container for mortar penetration and set-time tests. Sturdy unit construction with sides hinged to base and ends hinged to sides. Wing-nut fasteners for quick assembly and easy de-molding.	HM-290
Concrete Cube Molds, 150x150mm (5.9x5.9in) ASTM C403; AASHTO T 197, EN 12390-1 Rugged one-piece molded plastic molds for consistent concrete cube specimens. Specimens are removed by injecting compressed air into the base.	HM-291
Economy Single-Cube Mold for concrete compressive strength cube specimens and mortar penetration tests is durable one-piece plastic with reinforcing ribs. A hole in the base with included plug permits quick demolding using a compressed air source. Internal dimensions are 150x150x150mm (5.9x5.9x5.9in).	HM-292
Cylinder Wraps Canvas-nylon Cylinder Wraps for 4in and 6in diameter concrete test cylinders prevent damage to the cylinder in transit and minimize shattering when a cylinder is broken in compression tests. Especially useful with unbonded capping systems. Wraps are secured by velcro strips.	
4in Cylinder Wrap	HM-178
6in Cylinder Wrap	HM-179

HM-290

HM-291

HM-292

HM-179 & HM-178

VIDEO ONLINE

HM-279

HM-280

HM-287

HM-331

HM-288

CONCRETE BEAM MOLDS

ASTM C31, C78, C192, C403; AASHTO TR 39, T 23, T 97

Concrete Beam Molds		
Description	Model	Sample Size in (mm)
Hinge-Free Steel Molds are lightweight and collapse into individual parts for easy stripping and cleaning. They are compact when broken down and assemble quickly with plated bolts, wing nuts, and stainless steel U-bolt carrying handles.	HM-279 HM-281	6x6x20 (152x152x508) 6x6x21 (152x152x533)
1-Piece Hinged Steel Molds are fabricated with the side plates hinged to both the base and end plates. Wing nuts fasten sides and ends. Wide selection of sample lengths available.	HM-280 HM-282 HM-284 HM-286	6x6x21 (152x152x533) 6x6x24 (152x152x610) 6x6x30 (152x152x762) 6x6x36 (152x152x914)
Heavy-Gauge Steel Mold casts 4x4in (102x102mm) specimens. Simple wing nuts secure the sides for ease of stripping, cleaning and assembly. The unique design requires no tools.	HM-287	4x4x14 (101x101x355)
Plastic Interlocking Mold is durable copolymer plastic, one-quarter the weight of steel and easier to strip and clean. Ribbed interlocking parts hold dimensions and shape securely. Assembled with thumb screws for easy stripping, cleaning and set-up. Inside surfaces are smooth and watertight to eliminate need to grease or seal joints.	HM-331	6x6x21 (152x152x533)
One-Piece Plastic Mold produces lighter and easier to handle 4x4in (102x102mm) beam samples and does not require assembly. Lightweight, durable mold is constructed from heavy-duty plastic and engineered with reinforcing ribs. Specimen removal is simple, fast and easy. Remove the plug from the hole in the bottom of the mold and apply compressed air.	HM-288	4x4x15 (102x102x381)

HM-140

HM-133

VIBRATING TABLE

ASTM C192; AASHTO R 39, T 23

Vibrating Table consolidates fresh concrete in cylinder and beam molds. Large platform is 20x20x10in (508x508x254mm). Included separate control box has On/Off switch and rheostat knob to adjust amplitude of 3,600 VPM vibration. Power cable supplied by user. Load capacity is up to 300lb (136kg). **Product Dimensions:** 20x20x10in (508x508x254mm)

Vibrating Table		
Vibrating Table, 115V/60Hz		HM-140
	230V/50Hz	HM-140F

CONCRETE VIBRATOR

ASTM C31, C138, C 192; AASHTO R 39, T 23, T 121, T 121M

Concrete Vibrator consolidates fresh concrete specimens in the lab or field. The 1-1/4hp, 9 amp power unit delivers high-amplitude 10,000+ vibration per minute via a 3ft (0.9m) flexible shaft connected to a 0.75in (19.1mm) diameter x 12in (305mm) long vibrating head. The lightweight aluminum power unit housing and waterproof switch are protected by a wraparound chrome plated tubular frame. The HM-133 has UL and CSA approval and comes with a heavy-duty grounded cord. **Product Dimensions:** 12x6x6in (305x152x152mm), LxWxH.

Concrete Vibrator		
Concrete Vibrator, 115V, 50/60Hz		HM-133
	230V, 50/60Hz	HM-133F

HM-114

HM-116

Concrete Sample Handling & Transport

Description	Model
4in Cylinder Transport Rack holds eight 4x8in (102x203mm) concrete cylinders with or without molds for curing and transport. Durable plastic rack resists moisture damage and allows easier handling of multiple cylinder specimens. Two HM-114 Racks will fit in the HM-112 Field Storage Chest. **Product Dimensions:** 19x9.5x5.4in (483x241x138mm), WxDxH.	HM-114
6in Cylinder Transport Rack holds nine 6x12in (152x305mm) concrete cylinders with or without molds for initial curing and transport. This sturdy molded plastic rack is lightweight and waterproof. Fits inside the HM-112 Storage Chest. **Product Dimensions:** 24x24x8in (610x610x203mm), WxDxH.	HM-116
Field Curing Chest is collapsible and easily fits behind a truck seat or in a car trunk until needed. Lightweight folding zippered chest protects concrete specimens from harsh weather conditions and eliminates the time and expense of fabricating wooden curing boxes at each job site. Rigid floor maintains a flat and level surface for specimens and doubles as a slump test base. Holds nine 6x12in (152x305mm) or sixteen 4x8in (102x203mm) concrete cylinders, and has 0.5in (12.7mm) of polymer foam insulation. **Product Dimensions:** 24x24x14in (610x610x356mm), WxDxH.	HM-112
Ring Concrete Cylinder Carrier is handy for moving heavy 6x12in (152x305mm) concrete cylinders and loading/unloading curing tanks. Sliding ring lifts to allow easy placement of bottom pad under cylinder, then slides down until locked in position by a locating pin. Fits cylinders in plastic molds with lids or bare cylinders. Constructed of stainless steel with rubber hand grip. **Product Dimensions:** 7.5x8x16in (191x203x406mm), WxDxH.	HM-161
Gripper Concrete Cylinder Carriers Concrete cylinders are held by a hand-grip pincer action for secure carrying and handling. For 6in (152mm) diameter cylinders. **Product Dimensions:** For 6in Carriers:16x8.5in (406x216mm) LxW. For 4in Carriers: **Product Dimensions:** 14x6in (356x152mm) LxW.	
6in Gripper Cylinder Carriers	HM-188
4in Gripper Cylinder Carriers	HM-192

HM-112

HM-161 shown with 6in concrete cylinder

HM-188

VIDEO ONLINE

NEW PRODUCT

HM-491

HM-49

PERFA-CURE CONCRETE CURING BOXES
ASTM C31; AASHTO T 23

Lightweight Perfa-Cure Curing Boxes offer storage and protection of concrete test specimens on the jobsite to meet required initial curing temperature conditions. Users can simply plug in the units and turn the thermostat dial to the desired temperature in degrees Fahrenheit. Models are available with heating or with heating and cooling. A heating panel wired to a thermostat uses a safe, aluminum base to radiate heat. Models with cooling functionality feature 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. Models are compliant with current ASTM C31 and AASHTO T 23 specifications for initial curing of concrete test specimens in the field in most ambient conditions. Sturdy lifting handles on each end make it easy to transport units when not loaded. Drain plugs are readily accessible when curing stage is complete and the Heater Pad 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. Perfa-Cure boxes operate on 110V/60Hz electrical supply.

HM-491 Perfa-Cure provides heat-only and accommodates up to twelve 6x12in cylinders or thirty-three 4x8in cylinders. Empty weight is approximately 40lb (18kg). **Product Dimensions:** 42x18x20in (1067x457x508mm) WxDxH; **Inside Dimensions:** 33x14x15in (838x356x381mm) WxDxH.

HM-493 Perfa-Cure Mini is heat-only and holds four 6x12in cylinders or twelve 4x8in cylinders. Weight empty is 30lb (13.6kg). **Product Dimensions:** 30x18x20in (762x457x508mm) WxDxH; **Inside Dimensions:** 24x12x14in (610x305x356mm) WxDxH.

HM-495 Perfa-Cure Plus Curing Box features both heating and cooling functionality and accepts ten 6x12in or thirty-two 4x8in concrete cylinders. Empty weight is approximately 40lb (18kg). **Product Dimensions:** 42x18x20in (1067x457x508mm) WxDxH; **Inside Dimensions:** 33x14x15in (838x356x381mm) WxDxH.

Perfa-Cure Concrete Curing Boxes	
Perfa-Cure Concrete Curing Box, 110V/60Hz	HM-491
Perfa-Cure Concrete Curing Box Mini, 110V/60Hz	HM-493
Perfa-Cure Concrete Curing Box Plus, 110V/60Hz	HM-495

THERMOCURE PORTABLE CURING BOXES
ASTM C31, C192, C511; AASHTO M 201, R 39, T 23

For true field portability and on-the-job convenience, lightweight Thermocure models are unbeatable for storing concrete test specimens within standard humidity/temperature conditions. Up to 22 test specimens of 6x12in (152x302mm) cylinders can be stored at 73° ±3°F (23° ±2°C) over an ambient range of -10°—100°F (-23°—37.8°C).

HM-49 Deluxe Curing Box has a recirculating heating and cooling temperature control unit for easy use, especially in high ambient temperature applications. Controls for this model include temperature set buttons, digital water temperature readout (°F or °C) and indicator lights to show when heating or cooling modes are on. **Product Dimensions:** 75x25x21in (1,905x635x533mm) WxDxH.

HM-50 Economy Curing Box has a 1,500 Watt heater (cooling is accomplished by fresh water circulation only), an adjustable temperature control, and a 3in (76mm) dial thermometer. **Product Dimensions:** 68x25x21in (1,727x635x533mm) WxDxH.

Both models have the same tough, insulated plastic rustproof box with removable galvanized rack. The cover has a gasket, stainless steel hinges and plated buckles with padlock loops. Lifting handles are provided on each end of the box for transport. Shipped via motor freight only. **Interior Dimensions for Both Models:** 54x18x17in (1,372x457x432mm), WxDxH.

Thermocure Portable Curing Boxes	
Deluxe Curing Box, 115V/60Hz	HM-49
Economy Curing Box, 115V/60Hz	HM-50

HM-651

HM-655

HM-648

HEATER/CIRCULATOR
ASTM C192, C511; AASHTO M 201, T 23

The versatile clamp-on Heater/Circulator has 1,100 Watt heating capacity and provides accurate temperature control for water tanks and baths up to 7.4gal (28L) from ambient + 9° to 302° ±0.09°F (ambient + 5° to 150° ±0.05C). Temperature range and stability is dependent upon tank volume, surface area and insulation. Capacity is sufficient to control most tanks to specified temperature levels. The PID microprocessor controller features a digital LED display that reads out in °C or °F, adjustable over-temperature protection and low-liquid level cut-off. The two-speed pump switches from 2.4 to 4gpm per minute (9 to 15L) to adapt to a wide range of tank sizes and types. All contact parts are stainless steel. An adjustable flow director accepts 1/2in ID tubing for external circulation. The long heating element is designed for immersion from 3—7in (76—178mm) and mounting clamp fits tank walls up to 1.2in (30.2mm) thick. Two-year manufacturer's warranty. Supplied with a 6ft power cord with grounded plug. **Product Dimensions:** 5.8x4.6x12.3in (146x12x32mm) WxDxH.

Heater/Circulator	
Heater/Circulator, 120V/60Hz	HM-648
240V/50Hz	HM-648F

CURING TANK HEATERS & CIRCULATORS
ASTM C192, C511; AASHTO M 201, T 23

Heaters and Circulators maintain curing temperature at required 73.4°F ±3°F (23°C ±1.7°C) in curing tanks. Number needed will depend on tank size, ambient air temperature, and specimen loading. One HM-651 heater will normally supply sufficient heat to control up to 350gal at 53°F (12°C) or higher ambient temperatures. Two or more HM-655 Circulators are recommended for larger tanks.

HM-651 Curing Tank Heater has dial-type thermostat. The 1,000 Watt, 10 amp Incoloy shielded element is attached to a sealed stainless housing. The unit is equipped with a three-prong grounded plug, fuse, run light, and mounting bracket. An instruction decal describes easy operation. **Product Dimensions:** 7.5x4.5x 23in (191x114x584mm).

HM-655 Curing Tank Circulator, is a 1/125hp (36 Watt) submersion pump with 3 GPM (11.4L/min.) rating. Steady, gentle circulation from the 1/4in (6.4mm) MNPT discharge may be aimed by placing the housing on any of four sides. Epoxy-encapsulated parts in the glass-filled nylon housing and a 6ft (1.8m) grounded cord. 230V "F" suffix model has a 1/60hp with 2/3 of flow of the 1/125hp pump. **Product Dimensions:** 4x4x3in (102x102x76mm).

Curing Tank Heaters & Circulators	
Curing Tank Heater, 115V, 50/60Hz[1]	HM-651
Curing Tank Circulator, 115V/60Hz	HM-655
230V, 50/60Hz	HM-655F

[1] For 230V operation of Heater, order TR-3002 transformer.

HM-621

HM-623

CONCRETE CURING TANKS
ASTM C192, C511; AASHTO M 201, T 23

Gilson offers steel and plastic tanks for lab or field curing of concrete cylinders, beams, and other concrete specimens. Curing Tanks filled with lime-saturated water and maintained to proper temperatures meet all field and laboratory curing requirements specified in ASTM and AASHTO with less expense and greater adaptability than full-scale moist curing rooms. Straight sides with round ends make most efficient use of floor space. Curing Tanks are oversized and must be shipped via motor freight.

Steel Tanks have straight sides and a pipe-reinforced top for strength. Sturdy rolled seam with enclosed sealant prevents leaks. Side panels are 22-gauge, zinc-coated galvanized steel with corrugations for additional strength. Bottom is 20-gauge, zinc-coated galvanized steel. All tanks have drain plug.

Plastic Tanks are heavy, seamless construction and formed from recycled materials. Tough and flexible tanks are impact and UV resistant, rustproof, leakproof, and chemically neutral. Sides are sloped, allowing partial nesting for storage or during transport. Smaller HM-623 is a great solution for 4x8in or smaller cylinders and for cores or mortar and grout samples. All except HM-623 feature a built-in drain plug.

Concrete Curing Tanks			
Model	Material	Dimensions, WxLxH in (mm)	Capacity gal (L)
HM-620	Galvanized Steel	24x48x24 (610x1,220x610)	95 (360)
HM-621	Galvanized Steel	24x72x24 (610x1,829x610)	142 (538)
HM-622	Galvanized Steel	30x96x24 (762x2,438x610)	252 (954)
HM-626	Galvanized Steel	36x96x24 (914x2,438x610)	300 (1,136)
HM-623	Heavy Recycled Plastic	38x27x13 (965x686x330)	40 (151)
HM-624	Heavy Recycled Plastic	53x36x20 (1,346x914x508)	110 (416)
HM-625	Heavy Recycled Plastic	58x40x24 (1,473x1,016x610)	180 (681)

HM-630

HM-632

technote

ASTM C511 notes that the proper humidity level in a moist room for curing concrete samples occurs when the surfaces of all specimens both look and feel moist. Proper humidity levels can be influenced by room size and shape, operation of heating and cooling systems, outside temperature and humidity, window and door openings and other factors. Gilson Technical Support staff can help you evaluate your lab environment to choose the most efficient and effective curing system.

MOISTURE ROOM CONTROL PANEL
ASTM C192, C511; AASHTO M 201, T 23

This wall-mounted Control Panel automatically blends hot and cold water supplies to keep your concrete specimen curing environment at 73.4 ± 3°F (23 ± 1.7°C) and approximately 100% humidity. The system is a stand-alone device to be used with HMA-298 Atomizing Spray Heads. The panel system does not integrate with other foggers, misting devices, compressed air, or HVAC units. A dedicated hot water tank is recommended to assure constant temperatures.

The easy to read digital controller display allows easy input of temperature set points for automated control. A manual bypass system assures continuous maintenance of specified temperature and humidity levels if power is interrupted. The panel has space for a temperature chart recorder or data logger. Quick-connect water line fittings are fast and easy to install. Inquire for custom design of a closed-loop layout with atomizing spray head pattern for your cure room based on room dimensions, and water temperatures and pressures. One-pass water chillers also available as required. **Product Dimensions:** 30x8x20in (762x203x508mm) WxDxH.

Moisture Room Control Panel	
Moisture Room Control Panel, 115V/60Hz	HM-630
Accessories	
Atomizing Spray Head	HMA-298

AQUAFOG® TURBO XE FOGGING FANS
ASTM C511; AASHTO M 201, T 23

Aquafog® Fogging Fans humidify concrete curing rooms up to 35ft (12m) long. The self-flushing system forces water through the fan blades, atomizing as the liquid exits the blades. High-speed centrifugal force and powerful air flow produce a high quality fog with uniform distribution. The Foggers operate on ordinary water supplies with 10 to 100psi pressures, even well water, without the risk of clogging. Specialized pumps and filtering equipment are not needed.

Aquafog Fans are engineered for extreme conditions of 100% RH in corrosive environments. Units are constructed with stainless steel hardware, polyethylene enclosures, and anodized aluminum. NEMA-4 connections are standard and the units are powered by continuous-duty wash-down rated motors. Turbo XE models are supplied to operate at 115V/60Hz, but can be configured operate on 230V/60Hz power supplies. The new GT 500 has separate models that operate on 115V/60Hz or 230V/60Hz power. "F" models all operate on 230V/50Hz.

Each unit is equipped with an adjustable bracket, 12ft (3.7m) heavy-duty power cord, 20ft (6m) water line, 16ft (4.9m) drain line, and a Visual Flowmeter Panel. Rooms wider than about 24ft (6m) will have more uniform humidification with use of the HMA-402 Oscillator, adjustable for up to 360° rotation. All Aqua Fog models can be supplied with higher capacity flowmeters for increased fog output in larger rooms. A fogger with too much output may saturate wall surfaces while humidification remains inadequate. Proper humidification can also be affected by heating and ventilation systems, room air exchange rate and other factors. Contact Gilson for advice on correct sizing for your application.

HM-631 Aquafog® Small Turbo XE is for rooms from 400 to 700ft² (37 to 65m²). Fan is rated at 1,760cfm (50cmm) with 5gal (19L) per hour fog output. 50Hz "F" model has 1,870cfm (53cmm) and 7gal (265L) per hour output. **Product Dimensions:** 20.5x17x22.5in (521x432x572mm), WxDxH.

HM-632 Aquafog® Large Turbo XE is for larger rooms from 750 to 1,150ft2 (70 to 107m²). Fan is rated at 2,160cfm (61cmm) with fog output of 11gal (42L) per hour. 50Hz "F" model has 2,580cfm (73cmm) output at 14gal (53L) per hour. **Product Dimensions:** 20.5x17x22.5in (521x432x572mm), WxDxH.

HM-633 Aquafog® GT 500 is the newest model, and is designed for rooms up to 680ft² (63m²) with fog output of 5gal per hour. Quiet and energy-efficient fogger uses 1/4hp continuous duty, washdown-rated motor, and fan output is 2,000cfm (57cmm). **Product Dimensions:** 20.5x17x22.5in (521x432x572mm), WxDxH.

Aquafog® Turbo XE Fogging Fans	
Aquafog® Small Turbo XE, 115-230V/60Hz	HM-631
230V/50Hz	HM-631F
Aquafog® Large Turbo XE, 115-230V/60Hz	HM-632
230V/50Hz	HM-632F
Aquafog® GT 500, 115V/60Hz	HM-633
230V/60Hz	HM-633V
230V/50Hz	HM-633F
Accessories	
Oscillator, 115V/50-60Hz	HMA-402
230V/50-60Hz	HMA-402F

@contactus

Call our technical support staff to find the right equipment for your application. **800.444.1508!**

HM-71

HM-75

HM-76B

HM-117A

CONCRETE TEST HAMMERS
ASTM C805; BS 1881-202

Concrete Test Hammers are ideal for quick, inexpensive, nondestructive estimations of in-place concrete strength. Hammer tests can help determine where test cores should be taken and locate damage from freezing or fire. Useful range covers concrete strengths from approximately 1,400—8,000psi (10—55mPa). The plunger rod is pressed against a concrete surface until a spring-loaded mass is released, causing an impact on the concrete. Rebound of the mass is registered on the hammer as the "rebound number". Included calibration curves provide estimated strength from rebound number, but accuracy is greatly improved by user-produced laboratory correlations with compression tests on the same type of concrete being evaluated.

HM-71 Gilson Concrete Test Hammer is an economical alternative meeting the same published specifications as the original Schmidt. The quality Made-in-America hammer gives consistent results and reliable operation. A durable nylon carrying case with loop handle, carborundum stone for surface preparation, instructions and charts are included with the HM-71. **Product Dimensions:** 2.1x14in (53x356mm), Dia.xH.

HM-75 Schmidt Concrete Test Hammer is manufactured by the original producer of these instruments. It is supplied with a plastic carrying case, charts, instructions, and carborundum stone for surface preparation. **Product Dimensions:** 2.1x14in (53x356mm), Dia.xH.

HM-101 Schmidt Recording Concrete Test Hammer automatically records rebound numbers as a bar chart on a paper strip. Each strip chart will log up to 4,000 impacts. HM-101 is supplied with a carrying case, paper charts and grinding stone. **Product Dimensions:** 11.6x12.8x4.1in (295x325x105mm), WxDxH.

HM-76B Concrete Test Hammer Calibration Anvil can be used to check the calibration of concrete test hammers after every 1,000—2,000 impacts. The HM-76B has a solid steel 6in (152mm) diameter anvil with a hammer guide and hardened alloy steel rebound plate. A hardness certification to ASTM E18 requirements is provided. A wire brush for cleaning is included. **Product Dimensions:** 6x8.5in (152x216mm), Dia.xH.

Concrete Test Hammers	
Gilson Concrete Test Hammer	HM-71
Schmidt Concrete Test Hammer	HM-75
Schmidt Recording Concrete Test Hammer	HM-101
Accessories	
Concrete Test Hammer Calibration Anvil	HM-76B

ELECTRONIC METAL DETECTOR

The HM-117A finds location and approximate depth of rebar, metal pipe, conduit and metal framing through concrete and most nonmetallic construction materials at depths up to 6in (150mm). This economical device is well suited for occasional use or for preliminary scanning of large areas. When compared to precision rebar locators, this unit is less accurate and bar sizes are more difficult to determine.

The HM-117A is fast and easy-to-use with comfortable hand grip and one-touch operation. The sturdy plastic case is shock and splash resistant. The large LCD display quickly indicates both location and depth of embedded metal objects. Differentiates between magnetic and nonmagnetic metals based on their magnetic properties. Location accuracy for rebar is approximately ±1in (25mm), dependant upon size and depth of the bar. **Product Dimensions:** 9x2.5x2in (229x64x51mm), WxDxH.

Powered by a 9V alkaline battery (not included).

Electronic Metal Detector	
Electronic Metal Detector	HM-117A

technote

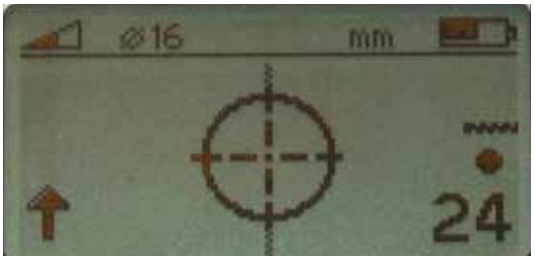
Gilson Company, Inc. now offers a calibration and repair service for the HM-71 and HM-75 Concrete Test Hammers. Please call **800.444.1508** for pricing or to schedule calibration or repairs.

NEW! Ship Weight Index

The Estimated Ship Weight for every product is easy to find in the NEW Ship Weight Index!

Find Estimated Ship Weights for all our products in the Ship Weight Index

HM-196



Close-up of HM-196 screen

HM-196 in use

PROFOSCOPE REBAR LOCATORS AND COVERMETERS
BS 1881-204

The Profoscope and Profoscope+ by Proceq are versatile, fully-integrated rebar detectors and cover meters with detection capabilities to a maximum depth of 7in (180mm). A single #5 reinforcing bar can be located to a depth of 5.5in (140mm). Both models are designed for one-handed operation and feature rebar-proximity indicators with visual and acoustic locating aids for location and minimum cover alert. The detector can identify the mid-point between bars as well as their orientation. Rebar diameter can also be estimated within the specified testing range. These unique features and Proceq's intuitive user interface make the task of locating reinforcing steel simple and efficient. The Profoscope+ adds the ability to manually or automatically record measurements for up to 500 objects, and upload to a PC with included ProfoLink software for later analysis.

The icon-based menu system on the display shows all setting, detection, and navigation information. A simple crosshair icon shows relative location of strongest signal beneath the meter. All values are easily switched between metric and imperial units of measure. The display itself has a switchable backlight for low-light environments. 30 second sleep mode and 120 second auto shut-down features extend battery life. A start-up test kit consists of two short lengths of rebar in a cardboard box with a lid. The kit allows simple user orientation and training for all functions in a comfortable environment, before use on a job site. A canvas carrying bag, carrying strap, batteries and marking chalk are also included. The Profoscope+ also includes a memory card and the ProfoLink software. The Profoscope units are powered by two AA batteries, and have a battery life of up to 50 hours with the display backlight off. **Product Dimensions:** 8x3.6x1.6in (205x92x41mm) WxDxH.

Profoscope Rebar Locators and Covermeters	
Profoscope Rebar Locator and Covermeter	HM-196
Profoscope+ Rebar Locator and Covermeter	HM-197

CT-160

CT-165

CT-163

PROFOMETER® 6 COVER METERS

BS 1881-204

Profometer® 6 Cover Meters by Proceq are the sixth generation in over forty years of quality instruments designed for location and measurement of concrete reinforcing steel. These models offer greater flexibility, productivity and advanced technology than ever, with high-resolution color touchscreen operation, Internal 8GB flash memory, dual-core processors and instant model upgrades through purchase of an activation key.

Profometer models have superior detection range and accuracy. Bar location can be detected and concrete cover measured up to 7.3in (185mm) deep, with cover accuracy of less than ±0.16in (4mm). Shallower depths can produce diameter accuracy of ±1mm. Diameters of #12 (40mm) bars can be identified at depths up to 2.5in (63mm) with accuracy of ±1mm. Detection and measurement limits and accuracy are affected by cover depth and bar diameter. 7in (178mm) IP54 rated color touchscreen display is 800x480 pixels.

All models feature a color touchscreen in a ruggedized housing for harsh field conditions, a universal probe with integrated spot probe and detachable wheeled scanning cart, a 5ft (1.5m) probe cable, power supply, carrying strap and carrying case. Profometer Link software is also included and allows downloading of data and creation of customized reports with detailed charts and graphs. Optional CTA-85 Extension Handle makes data collection on floors or overhead areas more efficient and less tiring. All Profometer 6 units share the same hardware and basic electronics, differing only in available software features. Upgrade Kits are available separately, and consist of activation keys to unlock features converting the CT-160 to CT-163, and the CT-163 to CT-165. Each model can also be converted directly to the CT-170 Profometer Corrosion meter (listed separately) with purchase of the CTA-91 Conversion Kit and desired Corrosion Electrode. 3.6V internal battery is rated for up to 8-hour use in standard mode.
Product Dimensions: 9.8x6.4x2.4in (250x162x62mm) WxDxH

CT-160 Profometer 600 precisely locates reinforcing steel and provides accurate assessments of cover depths. It is ideal for avoiding damage to the reinforcement matrix when drilling, coring or cutting concrete, as well as determining adequate concrete cover over steel in large areas or for spot checks.

Operation in locate mode detects rebar location and direction, while measuring bar diameter and cover depth. On-screen visual prompts offer control over signal strength and speed, and integral spot probe features increased definition in corners or areas of congested reinforcement. Settings are directly accessible on the measurement screen. Inclined rebars are automatically detected.

Snapshot and statistics views display a comprehensive graphic of measured data on the screen. Cover and diameter for each rebar is shown in snapshot, while statistics view presents a graphical display of cover depth distribution. Measured values are easily assessed directly on the screen. Simply reopen stored files to continue measurements. Stored data is easily exported to a PC through the USB port using the Profometer-Link software.

CT-163 Profometer 630 AI features enhanced functionality over the CT-160 by adding Single-Line, Multi-Line and Area Scan Modes and advanced statistical capabilities. Single-line and multi-line scans allow continuous recorded measurements of cover over long distances with or without bar diameter measurements. Colors indicating cover and bar diameter parameters can be assigned to quickly highlight areas of concern. The area scan feature produces a simplified view of cover data over a large area. This makes it easy to assess conformity of slabs and structural walls to required codes for corrosion protection and fire resistance.

CT-165 Profometer 650 AI offers the full reporting features of the CT-163, and adds Proceq's unique Cross-Line Scan measuring mode and analysis functions. The 2D Cross-Line Scan feature adds the ability to combine linear scans in the X and Y axis into a single representation of first and second layers of reinforcing bars. Details of cover, bar diameter and signal strength are all displayed. Adjustments to signal strength gain and offset can be made to define specific features, for instance; allowing display of only the first layer of rebars.

Profometer® 6 Cover Meters	
Profometer® 600 Cover Meter	CT-160
Profometer® 630 AI Cover Meter	CT-163
Profometer® 650 AI Cover Meter	CT-165
Accessories	
Upgrade Kit, CT-160 to CT-163	CTA-81
Upgrade Kit, CT-163 to CT-165	CTA-82
Telescopic Extension Rod w/Cable, 5.6ft (1.7M)	CTA-85
Conversion Kit converts to Profometer® Corrosion Meter	CTA-91

HM-680

MA-324

HM-134

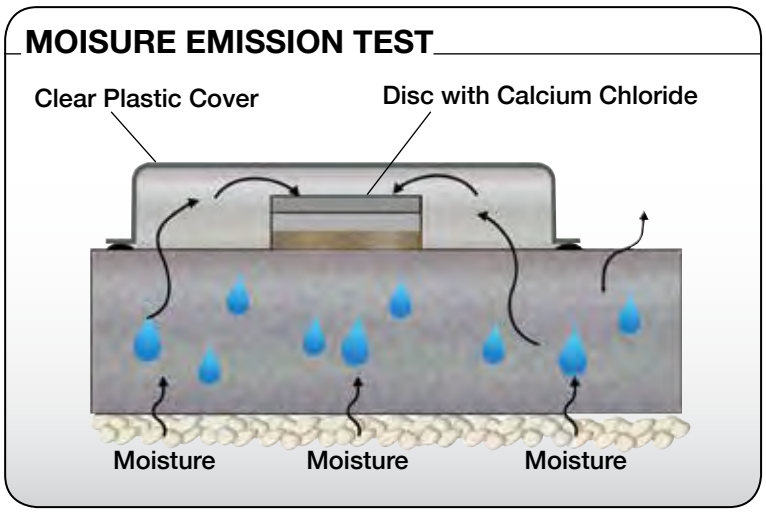
CONCRETE MATURITY METERS

ASTM C918, C1074; AASHTO T 276, T 325

Concrete maturity provides a simple method of estimating the strength of concrete in place, based on its age and temperature history. Accurate strength prediction is valuable for scheduling form removal and reshoring, or prestressing and post-tensioning operations. The heat signature of a specific mix enables strength prediction using mathematical equations to compare a maturity index to previous physical tests of the same mix design. These widely practiced and accepted methods have been in use for over thirty years. Easy-to use datalogging meters continuously collect time-stamped temperatures from pre-placed probes, and maturity numbers can be calculated over time from a few hours to a few months.

Concrete Maturity Meters

Description	Model
COMMAND Center™ Concrete Maturity Systems use self-powered sensors to collect, store and upload time and temperature data to a Windows device for concrete maturity calculations or simple monitoring of temperatures. Sensor/loggers are embedded in fresh concrete, leaving only exposed wire connectors for later collection of information. The HM-680 Pocket COMMAND Center Kit includes a Trimble® Nomad® 1050 handheld computer with pre-installed software, fifty 4ft (1.2m) sensors, desktop software, and required accessories. The rugged, IP68 rated Nomad device features a dedicated DB9 serial port, 15-hour battery life, and wi-fi connectivity to allow direct emailing of data files. This kit includes everything required to collect data on the handheld device and transfer it to a Windows-based PC to viewing, data analysis and reporting. The HM-681 Desktop COMMAND Center Kit functions directly with Windows-based tablets, laptops or desktop computers. It includes COMMAND Center Software, fifty 4ft (1.2m) sensors and required accessories. Software provides a graphical display and output of temperatures, maturity index and estimated strength using either the Nurse-Saul or Arrhenius maturity equations. Data collection intervals for the sensors are factory-configured for any user-specified time from 1 to 255 minutes when ordered. 30 minutes is typical for maturity applications as required in most standard test methods, and 60 minutes is common for temperature monitoring. Preprogrammed sensors are ready to install and begin retrieving data right out of the box; no activation required. Capacity for data stored in the sensors varies with frequency of the readings. At 30-minute intervals, data will be logged continuously for 42 days and 16 hours. For longer periods, just periodically download sensor data to the COMMAND Center software. Standard Sensors are supplied with 4ft (1.2m) leads. Sensors with 8ft (2.4m) and 15ft (4.6m) leads are also available. Inquire for custom sensors in lengths up to 100ft (30.5m). Sensor accuracy is ±1°C (1.8°F). **Product Dimensions:** 3x5x1in (76x127x25mm), WxDxH.	
Pocket COMMAND Center Kit	HM-680
Desktop COMMAND Center Kit	HM-681
Sensor w/ 4ft (1.2m) cable	HMA-700
Sensor w/ 8ft (2.4m) cable	HMA-701
Sensor w/15ft (4.6m) cable	HMA-702
4-Channel Data Logging Thermometer displays data from four probes simultaneously on a backlit LCD screen in °C or °F, using standard Type K thermocouples and stores up to 16,000 time-temperature data prints. Features include automatic shut-off, auto ranging, Max/Min, and hold functions. Accuracy is ±0.5% of reading +1°C or 2°F, full-scale. Time and temperature data points can be exported to an ASCII format spreadsheet with included USB cable and free downloadable software for calculation. Software supplied does not calculate maturity values but time and temperature data can be used within Excel to do so. Includes foam-lined case, two beaded-wire probes, and 9V battery. An AC adapter is optional. **Product Dimensions:** 2.5x1.25x7.25in (64x30x184mm), WxDxH.	
4-Channel Data Logging Thermometer	MA-324
Type K Thermocouple Wire, 100ft (30m)	HMA-324
Type K Male Connector	HMA-323
USB Cable	MAA-231
AC Adapter, 115V/60Hz	MAA-227
Four-Channel Concrete Maturity Meters have internal memory for over ten months of continuous recording of half-hour interval readings. Datum temperature and activation energy are user programmable. One to four locations can be monitored at once, and all data is accessed via membrane keyboard and alphanumeric display. Maturity can be checked directly from the meter at any time. Standard meter is operated by included 9V lithium battery for three weeks or more. Rechargeable meter has a NiCad battery and charger for more battery life or operation directly from 115V AC. Both meters include Type T thermocouple wire, four connectors, RS-232 cable for downloading to a PC, and a plastic carrying case. **Product Dimensions:** 7.4x4.7x2.9in (198x119x74mm), WxDxH.	
Maturity Meter, 4-Channel Standard	HM-136
Maturity Meter, 4-Channel Rechargeable	HM-134
Type T Thermocouple Wire, 100ft Roll	HMA-20
Serial Printer Cable	HMA-82



HM-674D

MOISTURE EMISSION TEST KITS
ASTM F1869

Gilson's Concrete Moisture Emission Test Kits are the most recognized method to determine moisture emission through concrete floor slabs. Millions of dollars in damage to coatings and flooring systems occurs every year as a result of moisture migration through concrete slabs and structures. Electronic moisture meters indicate the existing degree of saturation but not the rate of moisture emission.

A container of moisture-absorbing calcium chloride is weighed and placed under a plastic "dome" that is sealed to the concrete surface with a self adhereing gasket. At the conclusion of the 60—72 hour test cycle, the plastic is cut open and the dish of calcium chloride is removed, and immediately weighed. The weight gain and exposure time values are used to compute the test result, expressed in pounds of moisture emitted per 1,000 square feet in 24 hours. Recommended test frequency is three for the first 500 square feet and one test for each additional 500 square feet of total area.

Each test kit consists of a sealed calcium chloride dish and a plastic dome with a pre-installed butyl rubber gasket. Three pH test strips with color chart are also included. Test kits are supplied in 3 or 12 packs. For a complete evaluation of the concrete floor surface, see moisture meters and pH meters listed elsewhere in the catalog. AD-25 Balance is recommended for quick evaulations in the field. **Product Dimensions:** 10x10x2in (254x254x51mm), WxDxH.

Moisture Emission Test Kits	
Moisture Emission Test Kit, 3 pack	HM-674D
Moisture Emission Test Kit, 12 pack	HM-674B
Accessories	
Electronic Balance, 200 x 0.1g	AD-25

HM-668A

CONCRETE MOISTURE METER
ASTM F2659

Nondestructive Concrete Moisture Meters measure moisture content instantly on concrete floor surfaces prior to the application of floor coverings. Designed and calibrated specifically for concrete, they can also determine comparative readings on stone, lightweight concrete, gypsum floor screeds, ceramic tiles and other masonry type materials. The meter is simply pressed firmly onto a clean concrete surface and impedance measurements are obtained by electrodes located on the base of the meter. No drilling is required. Both meters are housed in rugged, ABS Plastic cases, and are supplied with batteries.

HMA-661 Calibration Check Plate is used to monitor proper operation of HM-668A meter. Adjustments or recalibration must be performed by the factory.

HM-668A Concrete Moisture Encounter 4 has an analog dial to show readings of 0—6% moisture in concrete or 0—10% moisture in gypsum, with a "Hold" button to freeze the display. The unit is user calibrated at the start of each use for accurate repeatable readings. The meter has a low battery LED indicator. **Product Dimensions:** 3x6x1.5in (76x152x38mm), WxDxH.

Concrete Moisture Meter	
Concrete Moisture Encounter 4	HM-668A
Accessories	
Calibration Check Plate	HMA-661

CT-51

CT-50B

CT-51B

CONCRETE HUMIDITY MEASUREMENT KITS
ASTM F2170, F2659

Measurement of relative humidity in concrete floors can prevent mold growth and future moisture damage to expensive floor coverings and coatings. Relative Humidity (RH) measurement provides a complete profile of moisture content throughout the depth of the concrete slab, not just the surface.

A 0.625in (16mm) borehole is drilled in the concrete to the specified depth and lined with a plastic sleeve. After the boreholes are allowed to reach temperature and moisture equilibrium, a probe is inserted and connected to an electronic meter for periodic measurement of humidity levels. Probes are installed below the floor surface and covered with a cap between readings, so do not interfere with normal construction activities. Systems meet the requirements of ASTM F2170.

Concrete Humidity Measurement Kits by Lignomat meet ASTM F2170 requirements and provide a complete set of equipment for Relative Humidity testing. NIST certified RH BluePeg Probes are easily recovered at completion of testing for reuse. Each kit includes a Relative Humidity Meter with cable, one BluePeg RH Probe for insertion in the borehole, and ten plastic sleeves with caps. An RH Adaptor is provided to connect the probe directly to the meter for ambient temperature and humidity readings. Components are packed in a foam-lined, hard plastic carrying case. Optional accessories are purchased separately and include additional Probes and Sleeves for increased efficiency when testing larger areas, Calibration Check Solutions for checking performance, and brush and vacuum attachments for borehole cleaning and preparation. **Product Dimensions:** 12x8x3.5in (306x203x89mm) WxDxH.

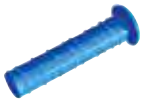
CT-50 Concrete Humidity Measurement Kit is equipped with the Tec RH meter to read the RH BluePeg Probes using the provided cable or adaptor. The meter features a large LCD display that indicates relative humidity, temperature, dew point and GPP (weight in grains of water per pound of air) with 0.1 resolution for all ranges. Relative humidity accuracy for probe and meter system is ±2% for 10-90%, and ±3% for 0-10% or greater than 90%. Temperature accuracy is ±0.5° for 32° to 120°F, plus ±1° from 5° to 32°F and from 120°F to 160°F. The meter also functions independently as a thermo-hygrometer to measure ambient conditions, and is available separately as CT-50B with an adaptor and one BluePeg Probe.

CT-51 Concrete Humidity Measurement Kit features the versatile DuoTec BW meter to read the RH BluePeg probes as required for ASTM F2170 tests, but doubles as a non-invasive moisture meter to measure near-surface moisture levels on a relative scale when held on a flat surface. The meter has selectable measuring depths of 0.25 and 0.75in (6 and 19mm) for concrete, gypsum, and wood materials and meets ASTM F2659. A large LCD display indicates relative humidity, temperature, dew point and GPP (weight in grains of water per pound of air) with 0.1 resolution for all ranges. Relative humidity accuracy for the probe and meter system is ±2% for 10-90%, and ±3% for 0-10% or greater than 90%. Temperature accuracy is ±0.5° for 32° to 120°F, plus ±1° from 5° to 32°F and from 120°F to 160°F. The meter also functions independently as a thermo-hygrometer to measure ambient conditions by using the RH BluePeg Probe and Adaptor from the kit. The DuoTec BW Meter alone is available separately as CT-51B.

Concrete Humidity Measurement Kits	
Concrete Humidity Measurement Kit w/ Tec RH Meter	CT-50
Tec RH Meter w/RH BluePeg Probe & Adaptor	CT-50B
Concrete Humidity Measurement Kit w/DuoTec BW Meter	CT-51
DuoTec BW Meter Alone	CT-51B

CTA-22

CTA-19



CTA-20

CTA-21

CTA-27

CTA-29

CTA-32

CTA-34

Concrete Humidity Measurement Kit Accessories

Description	Model
RH BluePeg Probes are made for in-situ concrete relative humidity testing with CT-50 and CT-51 measurement kits. Precision RH Probes have 3.5mm connectors and fit Plastic Hole Liner Sleeves. When connected to kit meters, Probes have relative humidity accuracy of±2% for 10-90%, and ±3% for 0-10% or greater than 90%. Temperature accuracy is ±0.5° for 32° to 120°F, plus ±1° from 5° to 32°F and from 120°F to 160°F. Available as single units or in packages of 3, 5, or 10. Additional probes minimize acclimatization time when multiple readings are required over large areas, and probes can be left inside Sleeves between readings for even better efficiency. Probes are easily recovered after testing and are reusable.	
RH BluePeg Probe, Single Unit	CTA-22
RH BluePeg Probes, pkg of 3	CTA-24
RH BluePeg Probes, pkg of 5	CTA-26
RH BluePeg Probes, pkg of 10	CTA-28
Plastic Hole Liner Sleeves w/Caps are inserted into 0.625in (16mm) boreholes in concrete floor slabs for concrete humidity measurements. 1.8in (45.7mm) length of Standard Sleeves is designed to position probes properly in conventional 4in (101.6mm) thick floor slabs. Top-Extenders are required when testing at shallow depths and probes stick up above concrete surface. The Extender fits into the lip of the Standard Sleeve for a moisture-tight seal. Extra Long Sleeves are 3in (76mm) long for thicker slabs. Either model can be cut to length as required. Included low-profile caps seal the openings. Ten Standard Sleeves are included with the testing kits.	
Standard Plastic Hole Liner Sleeves w/Caps, pkg. of 20	CTA-18
Liner Sleeve Top Extender, pkg of 5	CTA-19
Extra Long Plastic Hole Liner Sleeves w/Caps, pkg. of 10	CTA-20
RH Adapter is a double-ended 3.5mm male connector plug that allows the probes to be connected directly to Tec RH or DuoTec BW Meters for use as hand-held thermo-hygrometers. One Adaptor is included in each kit.	CTA-21
RH Depth Adapter is a 3.5mm male/female connector that adds 2in (51mm) to the length of a probe. This allows easy cable connection in holes over 2.4in (61mm) when CTA-20 Extra Long Sleeves are used.	CTA-25
Cleaning Accessories prepare the boreholes for testing by removing cuttings, dust, and other debris before inserting the Liner Sleeves. Brush with total length of 7.5in (191mm) has rounded tip and sturdy bristles. Vacuum Attachment fits standard shop-vac style hoses and can reach approximately 3.5in (89mm) deep.	
Clean-Out Brush	CTA-27
Vacuum Attachment	CTA-29
RH Concrete Cable connects RH BluePeg probes to a RH moisture meter. A seal on the 6ft (1.8m) cable is pushed onto the Sleeve Liner during measurement, sealing the borehole to prevent moisture loss. The seal also allows disconnecting the cable without removing the probe. One cable is included in each kit.	CTA-32
Calibration Check Salt Solution in 75% concentration is used to check RH BluePeg Probes for proper operation. Includes a connection cable with sealing plug.	CTA-34

HM-723

HMA-283

HMA-287

HMA-284

HMA-278

HMA-286

HMA-279

HMA-299

RAPID CHLORIDE PERMEABILITY TESTER
ASTM C1202; AASHTO T 277

Chloride permeability characteristics of concrete can be reliably determined with the Proove'it system by Germann Instruments. The simple Rapid Chloride Permeability Test (RCPT) is performed on concrete specimens taken from cores or test cylinders. Electrical current flow is measured across a 4x2in (102x51mm) dia.xH specimen positioned in a test cell with fluid reservoirs at each end. The negative end is immersed in a 3% sodium chloride solution, and the positive end in a 0.3N sodium hydroxide solution. The specimen is subjected to a 60V DC potential across the ends for six hours. The more permeable the concrete, the higher the total charge or Coulombs passed across the specimen will be.

The HM-723 Rapid Chloride Permeability Tester includes a microprocessor power supply module that distributes precisely controlled voltage to as many as eight RCPT specimens simultaneously. Windows®-based software installed on the user's PC controls test parameters, stores test data, and prepares professional quality reports that can be customized with a company logo. Electrical current readings are updated every 5 seconds, and a predicted 6-hour Coulomb value is generated every 5 minutes. Test results can be exported to Excel for comprehensive statistical analyses of the results. Software, power cord, serial cable, and manual are included. Testing time and parameters are programmable as required. The system can also be adapted for ASTM C1760 Bulk Electrical Conductivity Testing (inquire), and to determine Chloride Migration Coefficient as described in NordTest Build 492. Voltage settings can be adjusted from 5 to 60V in 5V increments.

HMA-278 Specimen Cells are purchased separately and are ready to use with sealing rings for 4in (102mm) diameter specimens, connecting cables and temperature probe. Each cell consists of two plexiglass end-caps with embedded conductive mesh and required electrical connections. HMA-279 Sealing Rings adapt Specimen Cells for use with 100mm (3.9in) specimens. Inquire for a special cell with cooling fins for testing highly permeable concrete or for tests requiring constant temperatures. For efficient sample conditioning, the HMA-283 Vacuum Chamber saturates 4 to 6 samples at a time. The user can operate with their own vacuum pump, or the HMA-284 Vacuum Pump is available as an option. Larger HMA-286 Vacuum Chamber has capacity for up to 20 specimens, user supplied vacuum pump or the HMA-287 Vacuum Pump is available for use with it. The HMA-299 Verification Unit verifies output from the Proove'it Controller. Each channel of the Controller is set up for a selected voltage and connected to the Verification Unit. Actual current is displayed on the computer screen.

Rapid Chloride Permeability Tester	
Rapid Chloride Permeability Tester, 115V/60Hz	HM-723
230V/50Hz	HM-723F
Accessories	
Rapid Chloride Permeability Measuring Cell for 4in Specimens	HMA-278
Sealing Ring for 100mm Specimens	HMA-279
Verification Unit	HMA-299
Standard Vacuum Chamber (4 to 6 Specimens)	HMA-283
Standard Vacuum Pump	HMA-284
Large Vacuum Chamber (Up to 20 Specimens)	HMA-286
Large Vacuum Pump	HMA-287

HM-271 shown with HMA-104

HMA-113

HMA-115

GILSON CONCRETE CTE SYSTEM
AASHTO T 336

Coefficient of Thermal Expansion (CTE) determinations predict thermally induced expansion and contraction movements in concrete pavement. CTE values help in developing concrete pavement mix designs that maximize service life. The NCHRP 1-37A research program found that these thermal movements have a significant impact on concrete pavement performance, and integrated the use of CTE values into the Mechanistic-Empirical Pavement Design Guide (MEPDG). AASHTO T 336 is the standard test method for determination of CTE values, and other agencies are evaluating its development.

Once the saturated 4x7in (101.6x177.8mm) Dia.xL concrete specimen is mounted in the measuring frame and immersed in the water bath, the test is initiated simply by pressing the start button. Precise length change measurements of the specimen are recorded at specified controlled temperatures over a range of 10°—50°C (50°—122°F). At completion, the CTE value is computed and reported.

Gilson CTE System components all work together to achieve significant improvements in accuracy, repeatability, and versatility over currently available systems. Pre-loaded software on the included laptop computer completely automates measuring, recording and calculating of final CTE values in accordance with AASHTO T-336. The portable bench-top stainless steel water bath has capacity for testing two samples simultaneously. A water circulation unit uses a thermistor with 0.01°C resolution and ±0.05°C accuracy to control and record bath temperatures. Water is recirculated every twenty seconds, insuring uniform temperature levels. The effects of evaporative loss are eliminated by a water level control device that precisely maintains a constant water level throughout the test. The heavy-duty adjustable specimen measuring frame is constructed of Type 304 stainless steel, assuring uniform expansion characteristics. An LVDT securely mounted to the measuring frame has 1.27mm of travel with a resolution of 3.1x10-8mm, assuring extremely precise length change measurements. **Product Dimensions:** 4x7in (101.6x177.8mm), WxDxH.

The HM-271 CTE System includes a laptop computer pre-loaded with CTE software, and required computer interfaces, a bench-top stainless steel water bath with 20L (5gal) capacity and dimensions of 25x15x13in (635x381x330mm) WxDxH, one stainless steel measuring frame with LVDT, a stand-alone water circulating unit with thermistor temperature probe, and a water level control device. **Product Dimensions:** 17x26x21in (432x660x533mm), WxDxH.

Calibration and Verification Specimens are purchased separately. HMA-104 Calibration Specimen is 304 Stainless Steel, and HMA-115 Verification Specimen is 410 Stainless Steel. Grade 5 Titanium Steel and Nickel Calibration Specimens are available and can be certified to ASTM E228 by an ISO 9001 facility for additional confidence, inquire.

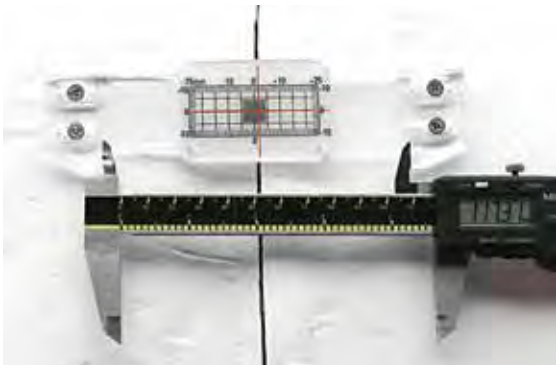
An additional HMA-114 CTE Measuring Frame with LVDT, purchased separately, allows testing of two specimens simultaneously for greater sample efficiency. The frames are supplied ready to connect the LVDT directly to the USB port of the computer. HMA-113 LVDT Calibrator with Digital Micrometer can be purchased separately to verify performance of the LVDT.

Gilson Concrete CTE System	
Concrete CTE System, 110V/60Hz	HM-271
230V/50Hz	HM-271F
Accessories	
Calibration Specimen, 304 Stainless Steel	HMA-104
Verification Specimen, 410 Stainless Steel	HMA-115
CTE Measuring Frame, 304 Stainless Steel	HMA-114
LVDT Calibrator with Digital Micrometer	HMA-113

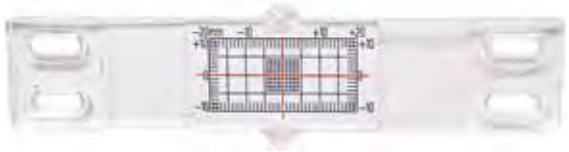
VIDEO ONLINE

CONCRETE CRACK MONITORS

Monitoring of crack width and movement in concrete roads and structures is easy and reliable with Gilson Concrete Crack Monitors. Opening, closing and differential movement can be continuously monitored and recorded. Monitors are affixed with available screws or two-part epoxy adhesive.



HM-634 shown with TSA-271 calipers



HM-637

HM-635

HM-638

Concrete Crack Monitors

Description	Model
Crack Monitor Plus consists of two overlapping polycarbonate plates. The white bottom plate has a grid graduated in millimeters, and the transparent top plate is marked with a crosshair. Movement range is 25mm horizontally and 10mm vertically. The monitor can be installed using user-supplied screws or HMA-804 Rapid Set Epoxy, purchased separately. Temporary pegs are removed after placement so plates move independently. Integral raised points on both plates enable exact measurement to 0.01mm using TSA-271 Caliper, sold separately. A second Crack Monitor may be positioned for monitoring in three dimensions. **Product Dimensions:** 1x3in (25x76mm), WxH.	HM-634
Standard Crack Monitor has a simpler design with white bottom plate graduations of 20mm horizontally and 10mm vertically. There are no integral raised points for use with calipers. Readability is 1mm. **Product Dimensions:** 2x6in (51x152mm), WxH.	HM-637
Corner Adapter enables Plus or Standard series Crack Monitors to be positioned in internal or external corners with angles from 70° to 180°. **Product Dimensions:** 1x6in (25x152mm), WxH.	HM-635
Displacement Monitor measures differential movement across a crack, such as settling of a floor slab. It also measures opening and closing of the crack itself. White plastic with easy to read divisions. Displacement range is 110mm. Horizontal range is -10—50mm. **Product Dimensions:** 1x7.5in (25x191mm), WxH.	HM-638
Crack Monitoring Kit assembles components necessary to establish a crack monitoring program. Five HM-634 Crack Monitor Plus units, two Corner Crack Monitors, and a HM-636 Crack Width Gauge to determine initial crack widths are included. The complete kit also provides seven packs of 4-each fixing screws, and a HMA-804 dispenser tube of rapid-set epoxy adhesive. All is packaged in a sturdy carrying bag with shoulder strap with an illustrated instruction booklet and recording sheets. All the components are available as separate items. **Product Dimensions:** 17.7x12.6x4.3in (450x320x110mm) WxDxH.	HM-644
Digital Monitoring Essentials Kit provides basic instrumentation for monitoring of cracks where precise determinations are called for. The TSA-271 Digital Caliper measures movement between established measuring points up to 6in (152mm) with resolution of ±0.0005in or 0.01mm. The Kit contains the Caliper, a HM-640 pack of 100 Stainless Steel Discs, HMA-804 Rapid-Set Epoxy and a HM-636 Crack Width Gauge. Kit contents are packed in a carrying bag with shoulder strap with full instructions and field recording sheets. **Product Dimensions:** 17.7x12.6x4.3in (450x320x110mm) WxDxH.	HM-645
Digital Monitoring Professional Kit includes all the contents of the Essential Kit, plus a pair of Corner Discs for monitoring corner cracks, and a HM-641 100 pack of Plastic Measuring Pegs. All is packed in a sturdy carry bag with shoulder strap with instructions and recording sheets. **Product Dimensions:** 17.7x12.6x4.3in (450x320x110mm) WxDxH.	HM-646

HM-644

HM-645

HM-646

TSA-271

HM-636

HM-639

HM-642 shown with HM-643

Concrete Crack Monitors

Description	Model
Digital Caliper accurately measures inside, outside, and depth in inches or mm over a range of 0-6in or 0-152mm. Readability is 0.0005in or 0.01mm on LCD display. Stainless steel caliper has smooth-moving head with locking knob, zero calibration and On/Off switch. Battery is easily replaceable. Supplied with protective carrying case. **Product Dimensions:** 9.5x3in (241x76mm), WxH.	TSA-271
Crack Width Gauge assists those who survey and report on damaged buildings. This durable acrylic Gauge has graduations for direct comparison to cracks from 0.1 to 7mm on one edge and a scale of 0 to 165x1mm on the other. The Gauge is very useful for preliminary measurements prior to ongoing monitoring, and for quick field measurements. **Product Dimensions:** 7x2in (178x51mm), WxH.	HM-636
Economy Crack Comparator is a handy, credit card-sized field reference that slips easily into your pocket or wallet. Clear plastic card is marked with inch and metric scales as well as a range of crack widths from 0.1—7.0mm. **Product Dimensions:** 2x4in (51x102mm), WxH.	HM-639
Scratch-A-Track Motion Monitor is mounted over a crack or joint to provide continuous tracking of relative movement. The Recording Pad is coated with a white film and is bonded to one surface using HMA-804 Rapid-Set Epoxy (purchased separately). The spring steel Finger assembly is mounted on the opposing surface. A thumb screw adjusts pressure on the Finger so the stainless steel Scriber leaves a thin, well-defined black scratch on the pad for a permanent visual record. The unit is lightweight, inexpensive and weather resistant. The Pad has space for written data such as date, location, etc. The Recording Pads are single-use, but the Finger and Scriber assembly can be used repeatedly. **Product Dimensions:** 1x5.5x1in (25x140x25mm), WxDxH. Scratch-A-Track Motion Monitor Recording Pads, pkg. 10	 HM-642 HM-643
Rapid-Set Epoxy is a quick and convenient method of affixing Crack Monitors, Plastic Measuring Pegs, and Stainless Steel Monitor Discs. The two-part epoxy adhesive bonds to almost any surface and eliminates the need to drill holes. Handy 0.85oz (25ml) double-tube pack dispenses and mixes at the same time. Working time is about 5 minutes. **Product Dimensions:** 2.8x8.8in (71x224mm), WxH.	HMA-804
Plastic Measuring Pegs provide solid reference points for consistent and accurate measurements. They are quickly and easily affixed to most surfaces on either side of a crack using HMA-804 Rapid-Set Epoxy adhesive. Polycarbonate pegs are supplied in packages of 100. **Product Dimensions:** 0.4x0.3in (10x7mm) Dia.xH	HM-641
Stainless Steel Crack Monitor Discs are easily attached with HMA-804 Epoxy Adhesive to any flat surface on either side of a crack. Small cavities in the center of each disc precisely locate jaws of TSA-271 Digital Calipers for accurate and reliable monitoring measurements. Package of 100 Discs. **Product Dimensions:** 0.265x0.046in (6.7x1.2mm) Diameter x Thickness. Stainless Steel Crack Monitor Discs Digital Caliper	 HM-640 TSA-271

HMA-804

HM-641

HM-640

Find Estimated Ship Weights for all our products in the Ship Weight Index

CT-170

CTA-95

CTA-96

CTA-97

PROFOMETER® CORROSION METER
ASTM C876; BS 1881

The Profometer® Corrosion Meter uses half-cell electrical measurement technology for detection and mapping of steel reinforcing corrosion in reinforced concrete. A cable is connected to the rebar grid and electrical potential is measured through fluid-saturated copper/copper sulfate electrode probes. Data is collected in the ruggedized touchscreen controller and processed for mapping and reporting with the included Profometer Link software. Extent of active corrosion activity is easily measured and documented, and corrosion hot-spots are quickly isolated.

This advanced instrument features a 7in (178mm) 800x480 pixel color touchscreen display with an intuitive user interface, illustrative display and assisted workflow. The dual-core processor and 8GB flash memory for efficient post processing of measured data and storage for later download to user's PC. Customizable graphic screen views and a pre-defined, ASTM compliant layout enable fast, on-site data interpretation. Measurement range is from -1000 to +1000mV with 1mV resolution. Sampling rate is 900Hz and impedance is 100MΩ. The Profometer Corrosion Meter can also be configured to use third-party silver/silver chloride electrodes.

The CT-170 includes the Profometer Touchscreen, interface box, charger, 82ft (25M) cable with clamp, USB cable, software, carrying case and strap. The unit requires a Corrosion Electrode Probes, purchased separately, for operation. The conventional Electrode Rod probe is used for single readings or on a manually-defined grid pattern. Available Single-Wheel and Four-Wheel Electrodes improve data collection accuracy and maximize productivity for assessing large areas. Both wheeled electrodes include a 5.6ft (1.7M) telescopic handle, encoder, and required cables.

The Corrosion Meter is designed to be an all-in-one instrument, and shares hardware and electronics with the Profometer® 6 series of Covermeters. The CTA-92 Conversion Kit converts the CT-170 Corrosion Meter to a CT-160 Profometer Cover Meter, complete with a universal probe (see separate listing). **Product Dimensions:** 9.8x6.4x2.4in (250x162x62mm) WxDxH.

Profometer® 6 Cover Meters	
Profometer® 600 Corrosion Meter	CT-170
Accessories	
Rod Corrosion Electrode	CTA-95
Single-Wheel Corrosion Electrode	CTA-96
Four-Wheel Corrosion Electrode	CTA-97
Conversion Kit to CT-160 Cover Meter	CTA-92

HM-246

HM-952

CONCRETE CORROSION MAPPING SYSTEM

ASTM C876; BS 1881

The Corrosion Mapping System rapidly scans concrete surfaces for the presence of or tendency for chloride-induced corrosion in reinforcing steel. Operating on the half-cell potential method, this instrument is used for assessment of bridge decks, pavement, walls, and other structures.

Steel buried in concrete is normally passive to corrosion until chlorides from the environment permeate the concrete and create anodic and cathodic areas, starting the flow of corrosion currents. Half-cell measurements are an indicator of corrosion activity. The half-cell probe electrically connects to the concrete through a water-saturated foam sponge. A separate cable from the meter is attached to a rebar in the structure, completing the electrical circuit. The resulting potential reading can be correlated to corrosion activity of the steel in the vicinity of the probe. Readings can be plotted on paper or on the structure itself to provide an easy to interpret graphic assessment of the structure. Probable corrosion areas and the total area of the structure subject to corrosion can be determined.

The System includes a specialized voltmeter in a protective pouch, copper/copper sulfate electrode with surfactant reservoir and dispensing sponge, a separate electrode for overhead readings, two 15in (381mm) extensions, reel with 250ft (76M) of wire, surfactant solution, copper sulfate crystals, operating manual, all in a sturdy plastic case. The probe can attach to a long handle for ceilings. A rebar locator is also recommended to reference bar position. **Product Dimensions:** 19.75x15.75x7.5in (502x400x191mm), WxDxH.

Concrete Corrosion Mapping System	
Concrete Corrosion Mapping System	HM-246
Accessories	
Surfactant Reservoir with $CuSO_4$ Electrode	HMA-385
Concrete Surfactant Solution	HMA-386
Replacement Dispensing Sponge	HMA-387

RESIPOD CONCRETE RESISTIVITY METER

AASHTO T 358; ASTM Pending

Electrical resistivity of concrete surfaces correlates directly to permeability, the likelihood and rate of reinforcing steel corrosion, as well as chloride diffusion rate. The Resipod meter by Proceq features a four-probe Wenner array fully integrated into an electronic meter with digital display, ready to use for laboratory or field resistivity applications. This simple new test method is based on resistivity readings from standard concrete test cylinders and is a fast, accurate, and economical alternative to ASTM C1202 Rapid Chloride Permeability. The same cylinder can be used for compressive strength testing, and structural elements in the field can be checked with the same meter for comparative values. Specific mix designs can be evaluated in the lab, and areas within an existing structure can be quickly mapped for their susceptibility to chloride induced corrosion of reinforcing steel.

The Resipod meter is available in two versions, one with probe spacing fixed at 38mm (1.5in) as required in AASHTO T 358, and one with 50mm (1.97in) probe spacing. The wider spacing allows a greater sampling size, but is still narrow enough to avoid interference from reinforcing steel in most cases. Resistance is measured from 1 to 1000 kΩcm and current is supplied at a variable 10 to 50µA or a full 200µA. The non-volatile memory stores up to 500 measured values for transfer to a PC using the included Resipod Link software.

The one-piece, hand-held Resipod provides instantaneous and reliable readings on the large, 3.5-digit LCD display, and is housed in a rugged, IP67 rated waterproof enclosure. Each contact point of the probe array carries a small water reservoir to assure reliable electrical contact with the specimen surface. The optional Resipod Geometric accessory is a four-probe Wenner array attachment with probe spacing variable from 40 to 70mm (1.57 to 2.76in) for testing of a wide range of concrete sample types and mix designs. The Bulk Resistivity Accessory for resistivity measurements on 4x8in concrete cylinders is purchased separately and includes measurement plates with conductive foam inserts and an instrument stand with cable connections. Both accessories connect to the Resipod Meter for operation. The Resipod meter kit includes a test strip, foam contact pads, a charger with USB cable, ResipodlLink software, carrying strap, documentation and case. ResipodLink Windows-based software is used to download all measurements from the device to PC for analysis and reporting. User-defined correction factors can also be defined in the software and uploaded to the device. The charger connects to standard USB ports on computers and laptops. **Product Dimensions:** 7.1x2.1x2.7in (197x53x69.7mm) LxWxH.

Resipod Concrete Resistivity Meter	
Resipod Concrete Resistivity Meter, 38mm Probe Spacing	HM-952
Resipod Concrete Resistivity Meter, 50mm Probe Spacing	HM-954
Accessories	
Geometric Accessory	HMA-844
Bulk Resistivity Accessory	HMA-843
Replacement Foam Contact Pads, pkg of 20	HMA-846
Resipod Test Strip	HMA-847
Bulk Resistivity Contact Pads, pkg of 10	HMA-848

CD-1 shown with CDA-141

CD-6 shown with CDA-141

CDA-50

CDA-142

CDA-243

CORE DRILLING MACHINES
ASTM C42; AASHTO T 24

Gasoline or electric-powered core drilling machines offer easy set up, fast drilling, and low bit wear to give low cost per core. The drills have bit capacities up to 8in (203mm) diameter. Inquire for larger, trailer-mounted rigs for bits up to 16in (406mm). Quick disconnect fittings for water supply are provided. Diamond coring bits are ordered separately.

CD-1 Gasoline-Powered Core Drill is designed for vertical coring of pavements and slabs. Stable platform with leveling screws, a heavy-duty column and smooth, precision-feed system combine to make this model the ideal choice for large projects. Gasoline-powered drill allows the operator to operate independently of power supplies, and have minimal set up time and faster drilling. The unit easily adapts to mount to a pickup truck and has a 6.5hp four-cycle manual start engine. Carriage travel is 24in (610mm).

CD-6 Electric Core Drill adapts to a wide range of drilling jobs in addition to pavement coring. The column rotates 180° horizontally, allowing precise placement of drill bit. The super-duty two-speed (450/900rpm) 3.5hp motor and carriage can be removed or reattached without changing location for ease in snapping cores and adding extension rods. The 10in (254mm) wide wheeled base has a vacuum anchor to solidly grip smooth pavement or floors. Unit includes oilless vacuum pump, filter, hose, and quick connections.

Accessories for the Core Drilling Machines are purchased separately. CDA-20 is a 4gal (15L) manually-pressurized portable water tank, and CDA-22 is a trap-ring and electric pump to recirculate drilling water. CDA-24 9in (229mm) extension allows drilling to extended depth, and CDA-26 18in (457mm) strap wrench is for attaching and removing coring bits without damage. CDA-32 is a replacement gasket with mastic for the CD-6 vacuum base. **CD-1 Product Dimensions:** 14x32x46in (356x813x1168mm), WxDxH. **CD-6 Product Dimensions:** 12x34x36in (305x864x914mm), WxDxH.

Core Drilling Machines	
Gasoline-Powered Core Drill	CD-1
Electric Core Drill, 115V/60Hz	CD-6
230V/50-60Hz	CD-6F
Accessories	
Pressurized Water Tank, 4gal (15L)	CDA-20
Water Recirculator	CDA-22
Extension Rod, 9in (229mm)	CDA-24
Strap Wrench, 18in (457mm)	CDA-26
Replacement Vacuum Gasket	CDA-32
Long-Handle Core Retrieval Tongs, 4in Cores	CDA-15
Long-Handle Core Retrieval Tongs, 6in Cores	CDA-16
Core Extractors, 4in Cores	CDA-18
Core Extractors, 6in Cores	CDA-19

DIAMOND CORING BITS
ASTM C42; AASHTO T 24M, T 24

Open-Head Coring Bits require Expander Sets listed for attachment to drills. These bits are slightly less expensive, and the expander sets can be reused many times as the core barrels wear out and are replaced. They are an economical choice for high-output and heavy use applications.

Closed-Head Coring Bits are one piece construction for convenience and easy, direct attachment to drills. There are no extra parts to buy or lose. These are best suited for light to medium duty, or for occasional use.

Both bit styles are available in designs optimized for asphalt pavements, or for reinforced concrete and other hard materials. All bits are constructed for wet use, and are fast-cutting when used according to design applications. Standard length is 14in (356mm) for cutting cores up to 12in long. Our most popular bit sizes are listed here. Please inquire for sizes not shown. All bits may be refurbished when worn.

Diamond Coring Bits					
Nominal Bit Size OD, in (mm)	Open-Head Bits			Closed-Head Bits	
	Concrete	Asphalt	Expander Sets	Concrete	Asphalt
2 (50.8)	CDA-120	CDA-220	CDA-40	CDA-121	CDA-221
2-1/4 (57.2)	CDA-122	CDA-222	CDA-41	CDA-123	CDA-223
3 (76.2)	CDA-130	CDA-230	CDA-43	CDA-131	CDA-231
3-1/4 (82.6)	CDA-132	CDA-232	CDA-55	CDA-133	CDA-233
4 (101.6)	CDA-140	CDA-240	CDA-45	CDA-141	CDA-241
4-1/4 (108)	CDA-142	CDA-242	CDA-46	CDA-143	CDA-243
6 (152.4)	CDA-160	CDA-260	CDA-50	CDA-161	CDA-261
6-1/4 (158.8)	CDA-162	CDA-262	CDA-51	CDA-163	CDA-263

CDA-18 and CDA-19

HM-60 shown with HMA-234 & HMA-224

HM-62 shown with HMA-234

CORE EXTRACTORS

Gilson Core Extractors are efficient and easy-to-use for the removal of drilled cores from asphalt or concrete pavements. To operate, simply insert the curved blades into the cut area around the core. Adjust the top screw, enabling the blades to grasp the core, and lock the device into place by squeezing the handles. Push sharply to break off the core bottom and lift the specimen out. Release lever to free the core.

The lock feature protects cores from damage during extraction and assures laboratory acceptance for testing without repeat drilling. Models for 4in (102mm) or 6in (152mm) core sizes have identical features and operation. Models are available for 4in (102mm) or 6in (152mm) core sizes. Extractors are welded, painted steel with sturdy handle grips. **Product Dimensions:** 12x10x10in (305x254 x254mm) WxDxH.

Core Retrieval Extractors	
Core Extractors, for 4in Cores	CDA-18
Core Extractors, for 6in Cores	CDA-19

CDA-15

CORE RETRIEVAL TONGS

Fast, easy-to-use patented Core Retrieval Tongs remove cores from asphalt or concrete surfaces. Simply insert blades into space from core drill bit, grasp the core with the tongs, and lift. Recovered cores are free of damage that may occur from use of improper tools. Laboratory acceptance for testing is assured without repeat drilling. Models are available for 4in (102mm) or 6in (152mm) core sizes. Tongs are welded, painted steel with plastic handle grips. **Product Dimensions:** 3x4.5x35in (76x114x889mm).

Core Retrieval Tongs	
Core Retrieval Tongs, for 4in Cores	CDA-15
Core Retrieval Tongs, for 6in Cores	CDA-16

HUSQVARNA® MASONRY SAWS

Masonry Saws from Husqvarna® are ideal for trimming concrete, asphalt and masonry specimens to size for testing. Models include a lightweight 1.5hp Portable unit and a larger 5hp Heavy-duty version for high-production applications. Both include reliable high-torque motors and heavy-duty shafts mounted on quality ball bearings. Water distribution by submersible pumps permits wet cutting.

HM-60 Portable Masonry Saw has 2,330 blade rpm from the 1.5hp electric motor. The HM-60 uses 14in (356mm) diameter blades for up to 5in (127mm) cut depth. This saw features a unique, patented water distribution system designed to keep both the work piece and the work area cleaner and drier. The optional HMA-226 Portable Rolling Stand is quickly set up, easily relocated by one person, and has fast adjustment for proper height. The stand folds flat for easy portability. Lightweight, economical HMA-224 Fixed-Leg Stand is also available. A 14in (356mm) Vari-Cut™ blade is included with the saw. **Product Dimensions:** 27.5x39.8x27.5in (699x1,011x699mm), WxDxH. Height with Fixed leg stand is approximately 54in (1372mm).

HM-62 Heavy-Duty Masonry Saw is equipped with a powerful 5hp high-torque motor with 2,350 blade rpm to assure high-production performance. A convenient crank on the foot pedal sets table height and the patented Sta-level® blade guard controls blade orientation to assure the most accurate cuts possible. The painted integral rigid steel support stand resists flexing. The 20in (508mm) blade capacity permits cutting of 6in (152mm) cylinders or 8in (203mm) blocks in a single pass. Blades are purchased separately. **Product Dimensions:** 22x47.8x57.5in (559x1213x1461mm), WxDxH.

High-quality Diamond Blades are ordered separately. Premium grade blades for medium-sized jobs feature fast cutting and long life. Super Premium Blades allow maximum production for the largest jobs, and have the lowest cost per cut. All blades listed below can be used wet or dry and cost less in quantities of five.

Husqvarna® Masonry Saws	
Portable Masonry Saw, including blade, 1.5hp, 115V/60Hz	HM-60
Heavy-Duty Masonry Saw, without blade, 5hp, 208-230V/60Hz	HM-62
Accessories	
Portable Rolling Stand for HM-60	HMA-226
Fixed-Leg Stand for HM-60	HMA-224
14in Super Premium Blade	HMA-234
14in Super Premium Blade, price each for qty. 5 or more	HMA-234D
20in Premium Blade	HMA-232
20in Premium Blade, price each for qty. 5 or more	HMA-232D
20in Super Premium Blade	HMA-236
20in Super Premium Blade, price each for qty. 5 or more	HMA-236D

Find Estimated Ship Weights for all our products in the Ship Weight Index

CUBE & PRISM MOLDS

Gilson offers a wide selection of cube and prism molds for use with cement, mortar, grout, concrete, and capping compound. Metal molds meet ASTM and AASHTO specifications. Lighter, easy to clean, plastic molds are economical for internal QC programs. All molds are 3-gang except for single specimen, 6in (152mm), 150mm single specimen cube molds, and grout sample boxes.

HM-294C

HM-294

HM-296

HM-297

HM-335

HM-340

HM-298

Cube & Prism Molds

Description	Model	Specimen Size	ASTM/ AASHTO
Bronze Cube Mold with Cover Plate has machined alignment guides top and bottom for easy, accurate positioning of included 0.25in (6.4mm) thick brass base and cover plates. This mold is ideal for casting expansive grout samples as well as for conventional grouts and mortars, and is easily flipped over to compensate for worn top surfaces. The forged bronze casting is precision machined to produce three 2in (51mm) cubes diagonally. Wing-nuts and studs secure mold halves together and clamp base and cover to the mold body. Specially machined extra cover plates are available as HM-307C. **Product Dimensions:** 11x4.5x2.5in (279x114x64mm), WxDxH.			C87, C91, C109, C141, C311, C472, C579, C942 / T 106M
Bronze Cube Mold w/Cover Plate, 2in	HM-294C	2x2in	
Extra Cover Plate for HM-294C	HM-307C	-	
Bronze Cube Molds feature the same rugged quality construction as HM-294C, and are available in 2in or 50mm sizes, but do not include Cover Plates. Cover Plates can be purchased separately and options include: HM-307 Brass Cover Plate, HM-309 0.5in thick Plastic Cover Plate and HM-299 Brass Cover Plate with Holes for casting sulfur mortar capping compound cubes. **HM-294 Dimensions:** 11x4.5x2.5in (279x114x64mm), WxDxH.			C87, C91, C109, C141, C311, C472, C579, C942 / T 106M
Bronze Cube Mold, 2in	HM-294	2x2in	C109M/T 106M
Bronze Cube Mold, 50mm	HM-294M	50x50mm	
Brass Cover Plate	HM-307	-	C617 T 231
Brass Cover Plate w/Holes	HM-299	-	-
Plastic Cover Plate	HM-309	-	-
Stainless Steel Cube Molds are accurately machined for casting 2in (51mm) and 50mm cubes in diagonal position. Stainless steel material resists corrosion, is easier to clean and stands up to rough handling. Wing nuts secure the mold halves to the detachable base plate. **Product Dimensions:** 11x4.5x2.5in (279x114x64mm), WxDxH.			C87, C91, C109, C141, C311, C472, C579, C942/T 106M
Stainless Steel Cube Mold, 2in	HM-296	2x2in	C109M/T 106M
Stainless Steel Cube Mold, 50mm	HM-296M	50x50mm	
Econ-O-Cube Molds are three-piece plastic molds. These units meet size tolerances only for ASTM C109. The molds are held together by self-aligning thumb screws. Include HM-298 Hard Rubber Tamper. **Product Dimensions:** 11x4.5x3.5in (279x114x89mm), WxDxH.			
Econ-O-Cube Molds	HM-297	2x2in	—
Plastic Cover for HM-297	HMA-143	—	—
HDP Plastic Cube Molds are machined of high-density polyethylene strips that assemble easily, and are held together with heavy rubber straps. Corrosion-proof and easy to clean and store. The set includes a tamper and mold cover. **Product Dimensions:** 9x4x3in (229x102x76mm), WxDxH.	HM-335	2x2in	—
Cube Maker System utilizes disposable polypropylene mold liners in a three-gang stainless steel frame. Cured cubes are lifted out of the frame and the liners are stripped away. The reusable frame never needs cleanup. The system includes 27 Poly Liners, four polyurethane unbonded caps and two stainless steel retainers. Two red caps are for strengths up to 4,000psi (27.6mPa) and two amber caps for strengths exceeding 4,000psi. The caps may be re-used up to 300 times. This inexpensive, timesaving system is reliable for in-house quality control and other non-specification applications. Liners, pads, and extra mold frames are available as accessories. **Product Dimensions:** 2x2in (51x51mm), WxH.			
Cube Maker System	HM-340	2x2in	—
Frame for HM-340	HMA-139	—	—
Poly Liners for HM-340, case of 196	HMA-140	—	—
Polyurethane Caps for HM-340, pkg. 4	HMA-141	—	—
Hard Rubber Tamper is required by specification for consolidating mortar or grout specimens into molds.	HM-298	6x1x0.5in	C87, C91, C109, C141, C311, C472, C579, C942/T 106M

Cube & Prism Molds

Description	Model	Size	ASTM/ AASHTO
Steel Single Cube Mold is all-steel and collapsible 6x6in (152x152mm) mold that produces concrete specimens for compression testing or serves as a container for mortar penetration tests. Sides are hinged to the base, and ends are hinged to the sides. Wing nut fasteners secure the assembly in place.	HM-290	6x6in	C403/T 197M T 197
Premium Single-Cube Mold is a rugged one-piece plastic 150x150x150mm (5.9x5.9x5.9in) mold for concrete compressive strength specimens and can be used as a container for mortar penetration tests. Reinforced plastic construction is 0.75 to 1.25in (19 to 32mm) thick for added rigidity and long service life. Cured specimens are easily de-molded using compressed air injected through the base.	HM-291	150mm	C403/T 197M T 197
Economy Single-Cube Mold for concrete compressive strength cube specimens and mortar penetration tests is durable one-piece plastic with reinforcing ribs. A hole in the base with included plug permits quick demolding using a compressed air source. Internal dimensions are 150x150x150mm (5.9x5.9x5.9in).	HM-292	150mm	C403/T 197M T 197
Grout Sample Box (GSB) meets requirements of ASTM C1019 and UBC 21-18. Field samples are efficiently molded, protected and shipped, all in one container. Cardboard material duplicates absorption characteristics of concrete masonry units and compressive strength values are comparable to traditional molding methods, as well as much more consistent and repeatable. Single-use cardboard boxes ship and store flat, taking only seconds to set up for molding. Each box yields four 3.125x3.125x6.25in (79x79x159mm) mortar samples. 25 boxes per carton. Optional Grout Sample Box Fixture reinforces the sidewalls of the cardboard GSB to maintain square shape, assuring more consistent specimens. Sturdy ventilated steel construction allows excess moisture to escape. Grout Sample Box, pkg 25 Grout Sample Box Fixture, Ea.	 HM-295 HMA-349	 3.125x3.125x6.25in —	 — C1019
Grout Prism Capping Stand allows easy and accurate end preparation for masonry grout samples up to 3.5in (89mm) square. Designed for capping of specimens molded with HM-295 Grout Sample Box for compressive strength testing. Vertical guides insure samples are perpendicular when capping with sulfur mortar compound. The capping plate and recess with beveled sides meet ASTM requirements for hardness and depth to produce caps that properly distribute loads for accurate strength results. Solid steel construction. Grout Prism Capping Stand	 HMA-359	 12x10x12in	 C1019
ASTM Trowel has straight sides as specified for proper consolidation and strike off of mortar and grout specimens. Regular Trowel is convenient for mixing and handling of samples. ASTM Trowel Trowel	 HMA-307 HMA-306		C109/T 106

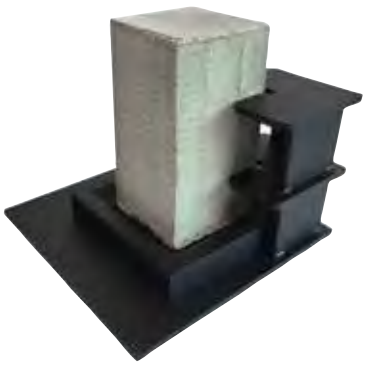
HM-290

HM-291

HM-292

HM-295

HMA-349



HMA-359

HMA-307

Find Estimated Ship Weights for all our products in the Ship Weight Index

HM-300

HMA-290

HMA-296

HM-310

HM-570

PENETROMETERS FOR CEMENT, MORTAR AND GROUT

Vicat, Gillmore Needle, and Mortar Penetrometers determine consistency, set times, and false set of hydraulic cement, mortar, and grout.

Penetrometers for Cement, Mortar and Grout		
Description	**Model**	**ASTM/AASHTO**
Standard Vicat has a reversible 300g stainless steel rod with a 10mm plunger on one end and a 1mm double-threaded needle at the other. The adjustable indicator on the rod may be set to indicate in either orientation on a 0-50 x 1mm scale. A conical plastic mold, 60/70mm top/base ID x 40mm high, and glass plate are included. Threaded Adapter Weight modifies the HM-300 to a HM-302 Modified Vicat. **Product Dimensions:** 12x5x4in (305x127x102mm), WxDxH.		C91, C141, C187, C191, C308, C451/ T 129, T 131, T 186
Standard Vicat Apparatus	HM-300	
Additional Conical Plastic Mold, 60/70mm top/base ID x 40mm high	HMA-290	
Additional 1mm SS Needle with reversible, threaded end for HM-300	HMA-292	
Threaded Adapter Weight, modifies HM-300 to HM-302	HMA-293	
Modified Vicat for False Set is used for false set (early stiffening) determination of Portland cement mortar, this unit has a 400g plunger assembly. A conical plastic mold, 60/70mm top/base ID x 40mm high, and glass plate are included. **Product Dimensions:** 12x5x4in (305x127x102mm), WxDxH.		C359/T 185
Modified Vicat Apparatus	HM-302	
False-Set Container, 50x50x150mm	HMA-296	
400ml Cylindrical Unit Measure	HMA-136	
Additional Conical Plastic Mold, 60/70mm top/base ID x 40mm high	HMA-290	
Gillmore Needle Apparatus determines initial and final set times of portland cement, masonry cement, hydraulic hydrated lime, and certain mortars. The adjustable support has horizontal arms guiding two weighted needles with flat-end cylindrical stainless steel tips. The initial-set needle is 1/4lb (113.4g) and 1/12in (2.12mm) diameter; final-set needle is 1lb (453.6g) and 1/24in (1.06mm) diameter. Base has ample flat shelf for positioning specimens. **Product Dimensions:** 6x3.5x4in (152x89x102mm), WxDxH.	HM-310	C266, C414/ T 154
Acme Penetrometer measures penetration resistance to determine set times of concrete mixes, mortars , and grouts. A 200lb (890N) capacity load cell displays loads on a dial gauge in 1lb divisions. **Product Dimensions:** 10x13x31in (250x330x787mm), WxDxH.	HM-570	C403/T 197M
Manual Mortar Penetrometer is operated with a downward force to penetrate 1in (25mm) into a sample. Pressure is indicated on a scale located on the handle stem with a sliding ring indicator. Unit comes with convenient carrying case and includes six stainless steel penetration needles with 1, 1/2, 1/4, 1/10, 1/20, 1/40 in^2 (645, 323, 161, 65, 32, and 16mm^2) bearing areas. Replacement needles available on request. **Product Dimensions:** 24x9x3in (610x229x76mm), WxDxH.	HM-571	C403/T 197M

HM-571

HM-252

HM-250D

HM-250

HM-256

HM-257

HM-259

HM-268

HM-254

HM-270

LENGTH CHANGE APPARATUS

ASTM C151, C227, C490, C1260; AASHTO R 70, T 107M/T 107

Length Change Apparatus measures changes in length of cast prisms due to alkali-silica reactivity (ASR), autoclave curing, alkali reactivity, and other causes not related to applied load. Methods are applicable to testing of hardened Portland cement paste, mortar, concrete, or evaluation of hydraulic hydrated lime for structural purposes.

Length Change Apparatus

Description	Model	ASTM/AASHTO
Cement Autoclave provides accelerated curing to estimate expansion of hydraulic cement caused by hydration. Test Bars are cured in controlled steam pressure and constant temperature. Vessel is capable of pressures from 60—350psi (0.4—2.4mPa) and includes pressure regulator, gauge (0—600 x 5psi), air vent valve, a Safety Pop Valve set at 350psi, ASTM 2F thermometer, wrench, and package of five gaskets. Replacement gaskets and Pop Valves are available as accessories. Autoclave chamber is 6.1x16in (156x407mm) Dia.xH. 115V/50-60Hz/1,800 Watts. For use with 230V service, order TR-3002 transformer. **Product Dimensions:** 17x48x28in (432x1220x711mm) WxDxH.		C151/ T 107M
Cement Autoclave, 115V/50-60Hz	HM-252	
Gaskets, pkg. 100	HMA-85	
Safety Pop Valve	HMA-86	
ASTM 2F Thermometer, 20°—580°F	MA-421F	
ASTM 2C Thermometer, -5°—300°C	MA-421C	
Length Comparators with 0.0001in (0.0025mm) divisions determine precise length changes in 10in (254mm) specimens. Recommended HM-250D has a quick-reading 0.5in (12.5mm) range LCD digital indicator with in/mm switch, RS-232 port, and replaceable 200 hour battery. Analog HM-250 has a 0.4in dial indicator. Comparators include a heat treated, hardened Invar Reference Bar for periodic calibration. Sturdy upright metal support is attached to a solid base. Specimens up to 4x4x10in (102x102x254mm) may be tested, but 1x1x10in (25x25x254mm) prisms are normal. Inquire for special adapter and shorter Invar Reference Bar if 5in (127mm) long prism samples are tested. **Product Dimensions:** 11x11.5x17in (279x292x432mm), WxDxH.		C151, C227, C490, C1260/ R 70, T 107M
Digital Length Comparator	HM-250D	
Length Comparator	HM-250	
Prism Molds are corrosion-resistant steel (HM-258 is stainless) with base plate, removable partitions and end plates, to provide required length of 10in (254mm) between ends of HM-268 Gage Studs cast in ends of bars. Dimensions from outside ends of Gage Studs are 11.625in (296mm); specimens are 11.25in (286mm) long. Select molds for specimen cross sections of 1x1in, 2x2in, or 3x3in. Inquire for 5in (127mm) length specimen molds.		C151, C227, C490, C1260/ R 70, T 107M
Prism Mold 1x1x10in (25x25x254mm), Single	HM-256	
Prism Mold 1x1x10in (25x25x254mm), 2-Gang	HM-257	
Stainless Steel Prism Mold 1x1x10in (25x25x254mm), 2-Gang	HM-258	
Prism Mold 2x2x10in (51x51x254mm), 2-Gang	HM-255	
Prism Mold 3x3x10in (76x76x254mm), Single	HM-259	
Gage Studs are knurled stainless steel and threaded to be cast into specimen ends. Gage ends precisely fit contact points in the bottom and top anvils of the Length Comparators. **Product Dimensions:** 0.25x0.8125in (6.35x20.64mm) Dia. x L.	HM-268	C151, C227, C490, C1260/ R 270, T 107M
Test Bar Holder holds up to eight 1x1in (25x25mm) 10in (254mm) bars for suspension inside the Autoclave. Bars are held vertically above water level to expose all specimens to Autoclave steam. Package of 10. **Product Dimensions:** 5.75x5.75x11.75in (146.1x146.1x298.5mm), WxDxH.	HM-254	C151/ T 107M
Mortar Bar Container is stainless steel with wicking liner and tight fitting cover to seal in water vapor. Vertically supports up to 36 mortar bars in container with lower end above water surface. **Product Dimensions:** 9x11x15.5in (229x279x394mm), WxDxH.	HM-270	C227

HM-273

FLOW TABLES

ASTM C87, C109, C110, C185, C230, C348, C593, C860; AASHTO M 152M, T 71, T 106M, T 137

Flow tables are used for determining consistency (flow) and for preparing mortars of standard consistency for testing. Flow is determined as percent increase in diameter of a conically-molded mortar. The sample is subjected to a required number of cam-actuated 0.5in (12.5mm) table drops at a fixed 100rpm rate.

All flow tables have the 10in (254mm) diameter rigid cast bronze table supported in a cast iron frame. Base and special drive motor bracket are mounted to a concrete pedestal provided by user. A Flow Mold is included with all tables; extras are available as HMA-133. Mold is cast bronze, 2.75/4in (70/102mm) top/bottom ID with collar. The HMA-134 Percent Flow Caliper has special scale to give the average flow directly by adding four readings. The 11.8in (300mm) long Stainless Steel Straightedge (HMA-135) for striking off specimens in containers, measures or molds is 1.57in wide x 0.125in thick (40x3mm) and has one beveled edge.

HM-272 and HM-273 Motorized Flow Tables have rates controlled precisely in accordance with ASTM and AASHTO standards. **HM-272 Product Dimensions:** 18x15x20in (457x381x508mm), WxDxH. **HM-273 Product Dimensions:** 19x22x24in (483x559x610mm), WxDxH.

HM-274 Manual Flow Table gives reliable results and is recommended for applications where strict adherence to standards is not essential. **Product Dimensions:** 14x14x14in (356x356x356mm), WxDxH.

Flow Tables	
Motorized Flow Table w/Counter, 115V/60Hz	HM-272
230V/50Hz	HM-272F
Motorized Flow Table, w/o Counter, 115V/60Hz	HM-273
230V/50Hz	HM-273F
Manual Flow Table w/Hand Wheel & Flow Mold	HM-274
Accessories	
Flow Mold	HMA-133
Percent Flow Caliper	HMA-134
Stainless Steel Straightedge, 11.8x1.57x0.125in	HMA-135
Rubber Tamper, 0.5x1x6in	HM-298

VIDEO ONLINE

HM-372 shown with MA-48

GROUT FLOW CONE SETS

ASTM C939

Grout Flow Cones measure the flowability of hydraulic grout used in preplaced aggregate concrete. Flowability is measured by time of discharge of a 1.725L sample of grout through the 0.5in (12.7mm) ID discharge tube orifice from the cone. The cast aluminum Flow Cone has 7in (178mm) top ID and comes with an adjustable point gauge assembly to indicate initial sample level. **Product Dimensions of Flow Cone:** 7x12in (178x305mm) IDxH

HM-372 Grout Flow Cone Set is supplied as a Flow Cone with replaceable 0.5in (12.5mm) Orifice, a 3-legged Steel Stand, and a 2L (2.1qt) Stainless Steel Beaker receiving container.

HM-373 Grout Flow Cone Set is similar to the HM-372, but the Flow Cone is fitted with a special 0.75in (19mm) Orifice for less flowable grouts.

Flow Cones, Orifices and other set components can be purchased separately. Flow Cone models include the point gauge measurement assembly and are available with or without 0.5in or 0.75in Orifices. Both Orifice sizes are replaceable and available separately. The sturdy painted Steel Stand is 20.5in (414mm) high. The 2qt (1.9L) Stainless Steel Beaker is sized to receive grout from a single test, and graduated in oz and cc. The 6qt (5.7L) Beaker can collect grout from up to three tests.

Flow Cone Sets	
Flow Cone Set, w/0.5in Orifice and Stand	HM-372
Flow Cone Set, w/0.75in Orifice and Stand	HM-373
Accessories	
Flow Cone Only, No Orifice	HM-371
Flow Cone with 0.5in Orifice	HM-372B
Flow Cone with 0.75in Orifice	HM-373B
Flow Cone Stand Only	HM-372A
0.5in (12.7mm) Orifice Only	HMA-146
0.75in (19.0mm) Orifice Only	HMA-147
Stainless Steel Beaker, 2L	MA-42
Stainless Steel Beaker, 6L	MA-48

NEW PRODUCT

HM-677

MASONRY GROUT WINDOWS

Grout Windows enable debris cleanout while allowing monitoring and visual confirmation of grout placement in masonry structures to ensure block cores are properly filled. Simply open one cell in the bottom course of block to be filled and install the window using the specially designed anchor bolt. After grout placement, the Acrylic Window can be removed by twisting and breaking off the exposed portion of the engineered plastic bolt. Proper use and grout placement assures soundness of the block face and eliminates costly repairs resulting from blow outs. The Acrylic Windows are reusable while the bolt is abandoned in place. Acrylic Grout Windows are supplied in packs of 20 pieces. Bolt and Nut sets are purchased separately in packages of 18 sets. **Product Dimensions:** 5x8in (127x203mm) WXD.

Masonry Grout Windows	
Masonry Grout Windows, Pkg of 20	HM-677
Accessories	
Engineered Plastic Bolt and Nut, 18 sets	HMA-715

technote

Gilson's new flow cone design now allows for you to interchange the 0.5in (12.5mm) and 0.75in (19mm) with each other improving the versatility of your grout testing.

WT-1

WT-23ESB

BS-50

WT-62 shown with WTA-49

HM-106

HM-107

HM-108 shown with TSA-198

FINENESS TEST APPARATUS
ASTM C430, D1514; AASHTO T 98, T 192

Gilson Fineness Test Apparatus meets standard test methods for fineness of Portland, and other hydraulic cements, fly ash, natural pozzolan, masonry cement, and similar materials requiring constant-pressure wash apparatus.

WT-1 Spray Apparatus consists of valve, pressure gauge, piping, and spray nozzle. It is useful for any wet sieving application. Gauge is 4.5in (114mm) diameter, and graduated in psi to 30psi max. Red pointer indicates maximum reached.

WT-1A Connector Accessory is a 2ft flexible hose connector. Threaded end connects to valve of WT-1; other end fits standard garden hose outlet, and has screw-in fitting for attachment to sink faucet.

WT-23ESB Fineness Test Sieve has one-piece brass frame and No.325 stainless steel wire cloth. The frame is 2in (50.8mm) diameter, and 3in (76.2mm) deep from rim to cloth. To have the WT-23ESB Test Sieve verified to ASTM E11 Calibration or Inspection Grade, see separate listing for Test Sieve and Screen Tray Verification and Services. User calibration with NIST Standard Cement No. 114, available separately as BS-50, is required.

WT-62 Two-Piece Nickel Plated Sieve Frame may be used with WTA-49 No.325 Mesh Disc, purchased separately, to perform the fineness test as specified. The WT-62 frame is easily disassembled by removing three screws to replace the disc. To have the WTA-49 disc verified to ASTM E11 Calibration or Inspection Grade, see separate listing for Test Sieve and Screen Tray Verification and Services. User calibration with NIST Standard Cement No. 114, available separately as BS-50, is required. Inquire for replacement discs of ASTM E161 Precision Electroformed Cloth.

BS-50 NIST Standard Cement No.114 is available for calibration of fineness test sieves in accordance with ASTM C 430 and AASHTO T 192. Each package consists of twenty standard sample units in individual sealed vials and is supplied with a NIST certificate.

Fineness Test Apparatus	
Fineness Test Sprayer Assembly	WT-1
2 ft Hose Connector for WT-1	WT-1A
Brass Fineness Test Sieve	WT-23ESB
Two-Piece Nickel Plated Fineness Sieve Frame	WT-62
Mesh for WT-62	WTA-49
NIST Standard Cement No.114	BS-50

STANDARD TEST SANDS

Specially graded sands for ASTM tests are naturally rounded silica sands of nearly pure quartz, mined from the Ottawa, Illinois area. All meet ASTM and AASHTO standards indicated.

HM-106 Sand Cone Density Sand for testing of soils is clean, uniform, uncemented, and free-flowing. Meets ASTM D1556 and AASHTO T 191. Few particles pass No.200 (75µm) or are retained on No.10 (2.00mm) sieves. Uniformity coefficient less than 2.0, and less than 3% passes No.60 (250µm). Bulk density varies less than 1%. 50lb (22.7kg)

HM-107 20-30 Standard Tensile Test Sand is manufactured to pass No.20 (850µm) sieve and be retained on No.30 (600µm). Meets ASTM C778 requirements. HM-107 sand also met former ASTM C190, now a discontinued standard. 50lb (22.7kg)

HM-108 Graded Standard Cube Test Sand is graded between No.30 (600µm) and No.100 (150µm) sieves. Meets requirements for ASTM C109 and C778, as well as AASHTO T 106. 50lb (22.7kg)

Standard Test Sands	
Sand Cone Density Sand	HM-106
20-30 Standard Tensile Test Sand	HM-107
Graded Standard Cube Test Sand	HM-108

MA-66

MA-67

PORTABLE MIXERS

The portable Asphalt/Concrete Mixers are ideal for sample or small batch mixing in just about any setting. The enameled-steel mixer holds a utility bucket securely in place. As the bucket rotates at 60rpm, a stationary Mixing Paddle scrapes sides and bottom of the bucket to ensure thorough mixing. All 115V/60Hz mixers are supplied with a 1/2hp motor, On/Off switch, fuse protection, and an 8ft cord with three-prong plug. For 230V/50Hz mixer, add "F" to model number suffix. The 10 gallon "F" model is supplied with a 1hp motor.

MA-66 Light-Duty Stationary Mixer includes a removable 5gal Utility Bucket and Standard Mixing Paddle. A Deluxe Mixing Paddle with extra fins is available for heavy loads. MA-66 is powered by a constant speed motor and belt pulley. Other heavy-duty models are recommended for asphalt mixes. **Product Dimensions:** 12x18x24in (305x457x610mm), WxDxH.

MA-67 and MA-68 Heavy-Duty Portable Mixers use 5gal and 10gal Utility Buckets, respectively, and are equipped with 8in wheels for maximum mobility. By using a direct drive motor more power is generated for mixing. Mixing paddles not included. Gilson recommends MA-67 Mixer with either MAA-146 Paddle for asphalt or MAA-148 Paddle for concrete applications. The 5gal bucket can be preheated in ovens if necessary. Inquire for other available paddles. **Product Dimensions:** 24x21x35in (610x533x889mm), WxDxH.

Portable Mixers	
Light-Duty Stationary Mixer, 5gal	MA-66
Heavy-Duty Portable Mixer, 5gal	MA-67
Heavy-Duty Portable Mixer, 10gal	MA-68
Accessories	
Bucket & Cover for MA-66, 5 gal	MAA-141
Replacement Paddle for MA-66	MAA-142
Deluxe Paddle for MA-66	MAA-143
Utility Bucket for MA-67, 5gal	MAA-144
Utility Bucket for MA-68, 10gal	MAA-145
Asphalt Paddle for MA-67, 5gal	MAA-146
Asphalt Paddle for MA-68, 10gal	MAA-147
Concrete Paddle for MA-67, 5gal	MAA-148
Concrete Paddle for MA-68, 10gal	MAA-149

MA-52

LABORATORY MIXERS

ASTM C109, C227, C305; AASHTO T 106, T 162

Industrial-grade Laboratory Mixers have planetary action for thorough mixing, and blending of materials. Direct gear drives and heavy-duty motors assure constant mixing speeds under load. Locking hand-lever raises and lowers bowl. All mixers are supplied with stainless steel bowl, wire whip, dough hook, and aluminum flat beater. MA-52 and MA-52X include an MAA-266 stainless steel flat beater. MA-52X includes modifications to meet ASTM and AASHTO specifications. Add “F” suffix to any mixer or heating adapter model number for similar unit that operates on 230V/50Hz power supply.

MA-52 Laboratory Mixer has 5qt (4.7L) capacity and a 1/6hp motor with selectable operating speeds of 139, 285 and 591rpm. Additional heavy-duty Stainless Steel Flat Beater is included, as well as a 6ft (1.8m) power cord. The MAA-30A Clearance Adjustment Bracket can be purchased separately to meet requirements of ASTM C305, C227 and C109. MAA-31 Acrylic Bowl Lid is also available for all 5qt (4.7L) bowls. **Product Dimensions:** 10.5x15x17in (267x381x432mm).

MA-52X Laboratory Mixer has the same specifications as MA-52, but has been modified with a MAA-30A Clearance Bracket to meet the requirements of ASTM C305, C227 and C109 (AASHTO T 162 and T 106) and certain other tests for mortar and cement. **Product Dimensions:** 10.5x15x17in (267x381x432mm).

MA-54A Laboratory Mixer is a 12qt (11.4L) capacity benchtop mixer for larger batch requirements. This unit is supplied with a 1/2hp motor for selectable mixing speeds of 107, 198 and 365rpm. A 6ft (1.8m) power cord is included. **Product Dimensions:** 19x23x29in (483x580x750mm), WxDxH.

Heating Adapter Kits maintain elevated temperatures when preparing hot-mix asphalt specimens in Laboratory Mixers. Heating mantles mount under mixing bowls with hook and loop fasteners. Electronic proportional controller with built-in circuit breaker attaches with a twist-lock connector on 4ft (1.2m) cable.

Laboratory Mixers	
5qt Laboratory Mixer, 115V/60Hz	MA-52
5qt Laboratory Mixer for ASTM C 305 and C 109, 115V/60Hz	MA-52X
12qt Laboratory Mixer, 115V/60Hz	MA-54A
Accessories	
Wire Whip for MA-52	MAA-260
Heavy-Duty Stainless Steel Flat Beater for MA-52	MAA-266
Bowl for MA-52	MAA-32
Bowl for MA-54A	MAA-34A
Clearance Adjustment Bracket for MA-52	MAA-30A
Heating Adapter for MA-52, 250 Watts	MAA-28[1]
Heating Adapter for MA-54A, 600 Watts	MAA-64[1]
Stainless Steel Whire Whip for 12qt Laboratory Mixers	MAA-261A
Aluminum Beater for 12qt Laboratory Mixers	MAA-267A

[1]Add "F" to model number to order Mixers or Heating Adapters to operate on 230V/50Hz electrical supplies.

HM-220

HM-221

MA-10

PORTABLE CONCRETE MIXERS
ASTM C192; AASHTO R 39

Gilson Concrete Mixers have 3ft³ (85L) batch capacity and are powered by electric motors. Mixers have rugged construction for long life and a lightweight design for easy portability. Heavy-gauge steel drums with reinforced rims feature replaceable mixing blades to give four mixing actions with each drum revolution. One-piece cast iron ring on drums, and tapered roller bearings on drive and drum shafts assure smooth, efficient operation. Drum diameter is 26in (660mm), opening size is 15.25in (387mm) and discharge height is 20in (508mm). Total drum volume is 5.5ft³ (156L). The mixers are equipped with a five position drum lock and tilt bar for discharging mix, and predrilled base plates for permanent mounting if desired. Powerful 115V/60Hz, 1/3hp electric motor.

HM-220 Portable Concrete Mixer has handles and wheels for easy manual positioning in the lab or on the jobsite. 10in (254mm) wheels with pneumatic tires are mounted on tapered roller bearings. **Product Dimensions:** 30x46x48in (762x1168x1219mm), WxDxH.

HM-221 Portable Concrete Mixer has a telescoping tow bar and larger tires suitable for high-speed towing behind a vehicle with a 2in hitch ball. Wheel (rim) diameter is 12in (305mm). **Product Dimensions:** 30x46x-48in (762x1168x1219mm), WxDxH.

HM-223 Stationary Concrete Mixer has similar specifications to Portable Mixers, but is designed for permanent mounting. This newer model also features a replaceable polyethylene Drum Liner (included) for fast, non-stick clean up and extended life for the steel drum. Pre-drilled steel base can be anchored to the floor. **Product Dimensions:** 30x42x46in (762x1067x1168mm), WxDxH.

Portable Concrete Mixers	
Portable Concrete Mixer, Hand Tow	HM-220
Portable Concrete Mixer, Hi-Speed Tow	HM-221
Stationary Concrete Mixer	HM-223
Accessories	
Replacement Poly Drum Liner for HM-223	HMA-155

BLAINE AIR PERMEABILITY
ASTM C204; AASHTO T 153

Blaine Air Permeability Apparatus measures the specific surface area of fine materials in square centimeters per gram of test sample. A quantity of air is drawn through a bed of definite porosity. The pore volume in the bed is a function of the size of particles, and determines the rate of air flow.

The apparatus is supplied complete with stainless steel test cell, plunger, perforated disc, calibrated U-tube manometer, rubber aspirator and bulb, all mounted on a sturdy wooden panel and base. An 8oz bottle of red spirit manometer fluid, package of filter paper, and a wood block for holding cell during filling are included. For calibration, order BS-50, NIST Portland Cement standard reference material (20 units). Order additional 12.7mm, grade 597 Filter Paper discs in quantities of 1,000 as MA-11. **Product Dimensions:** 16x16x6in (406x406x152mm), WxDxH.

Blaine Air Permeability	
Blaine Air Permeability Apparatus	MA-10
Accessories	
Filter Paper, qty. 1,000	MA-11
Replacement U-Tube	MA-12
Manometer Fluid, 8oz	MA-13
NIST Calibration Cement, qty. 20	BS-50

Manufactured in cooperation with
Karol•Warner

HM-397 shown with HMA-685 and BRA-60

HM-398 shown with HMA-685D, BRA-60 and HMA-94

HM-396

CALIFORNIA BEARING RATIO (CBR) LABORATORY TEST SYSTEMS

ASTM D1883; AASHTO T 193

The California Bearing Ratio (CBR) test yields relative strength of laboratory-compacted or in–situ soils and base course materials. This laboratory test is based on penetration resistance of a soil to a standard-sized piston.

Karol-Warner Pro-Loader Load Frames are ideal for Laboratory CBR testing, and a quick change of test components converts them to perform other soil testing applications. Pro-Loader frames feature 10,000lbf (44.5kN) capacity with 11.9x37.3in (302x947mm) WxH frame openings. 3/4hp DC motors and controllers precisely regulate strain rates to ±1% of set point, and the frames have sturdy 14-gauge painted steel enclosures. Adjusting nuts on the 1.25in (32mm) coarse-threaded vertical rods allow technicians to quickly change the horizontal cross-head height. Platen Diameter is 8in (203mm). Units operate on 115V/60Hz power supplies. Rolling Cart for Pro Loader Frames is sturdy steel and makes positioning of Load frames easy. Add "F" suffix to model numbers to order units operating on 230V/50Hz. **Product Dimensions:** 18x29x54.5in (457x737x1,384mm) WxDxH.

HM-396 Pro-Loader Load Frame features a high-speed platen advance to rapidly position the platen for faster set-up. Strain Rate is 0.001—0.1in/min (0.0254—2.54mm/min).

HM-397 Pro-Loader Load Frame has a wider range of strain rates. The micro-stepping drive controller also allows more precise control of loading rates. Strain Rate is 0.0001—0.3in/min (0.00254—7.62mm/min).

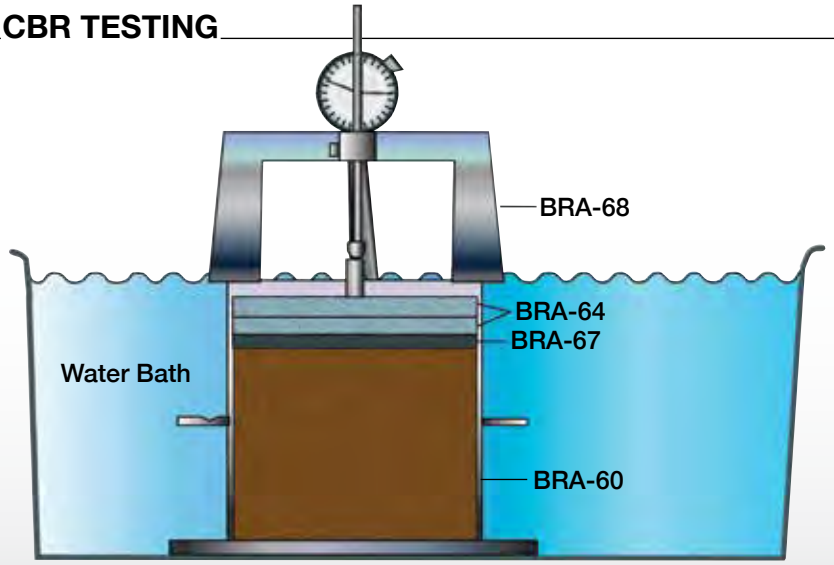
HM-397B Pro-Loader Load Frame has the greatest strain rate sensitivity of any of our 10,000lbf (44.5kN) load frames. It can be used for the full range of soils laboratory applications and is ideal for ASTM D4767 consolidated/undrained triaxial tests on sensitive soils. The HM-397B features a strain rate range from 0.00001 to 0.29999in/min (0.000254 to 7.62mm/min).

HM-398 Pro-Loader II Load Frame has a higher overall strain rate that allows use for a wider range of test methods. Strain Rate is 0.02—2.0in/min (0.508—50.8mm/min).

HM-399 Pro-Loader Load Frame is Gilson's newest and features 20,000lbf (89kN) capacity, plus enhanced strain rate sensitivity over the HM-397. This versatile model is ideal for ASTM D4767 consolidated/undrained triaxial tests on sensitive soils. Micro-Stepping motor and controller offer the highest degree of precision strain rate control. 0.00001 to 0.29999in/min (0.000254 to 7.62mm/min)

BR-10 Economy Manual CBR Press has separate crankshafts for platen positioning and testing operation. The 10,000lbf (44.5kN) capacity press meets specifications when cranked at required speed. Load Ring, Dial Indicator, and

CBR TESTING



Compacted specimens in the mold are immersed in water for soaking. Surcharge weights are placed on top and the molded specimen is monitored to determine swell.

BR-10

HMA-685D

HMA-685

Penetration Piston are included; this model does not require purchase of a separate Component Set. **Product Dimensions:** 18x13x40in (457x330x1,016mm), WxDxH.

Component Sets for CBR testing with the Pro-Loader Frames feature high-quality instrumentation required to perform the laboratory CBR tests and quickly install on the Load Frames. Fixtures and brackets are included for direct mounting to the frames.

HMA-685 Analog CBR Component Set has a 10,000lbf capacity Load Ring, CBR Penetration Piston, a 1x0.001in Dial Indicator, and Indicator Clamp.

HMA-685D Digital CBR Component Set includes a CBR Penetration Piston, 10,000lbf Load Cell and 2in travel Displacement Transducer with clamp that connects to the included HM-418 two-channel Digital Readout. The self-contained HM-418 transfers load and displacement data via the mini USB port to common spreadsheet applications on user's computer with included software. Data can be used to create printable graphs. The software is compatible with Windows® XP and newer operating systems. The Readout shows real-time data on the large, bright vacuum fluorescent display. The front panel keys allow instant taring of either channel peak reading on the selected channel and entry of calibration factors during set up.

HMA-94 Rolling Load Frame Cart is sturdy bolted steel construction and positions load frames at the proper working height. Rugged casters allow convenient placement. **Product Dimensions:** 25x21.4x24.5in (635x543x622mm), WxDxH.

California Bearing Ratio (CBR) Test Systems	
Pro-Loader Load Frame, 115V/60Hz	HM-396
Pro-Loader Load Frame, 115V/60Hz	HM-397
Pro-Loader Load Frame, 115V/60Hz	HM-397B
Pro-Loader Load Frame, 20,000lbf	HM-399
Pro-Loader II Load Frame, 115V/60Hz	HM-398
Economy Manual CBR Press	BR-10
Accessories	
Analog CBR Component Set, 10,000 lbf capacity	HMA-685
Digital CBR Component Set, 10,000 lbf capacity	HMA-685D
Rolling Load Frame Cart	HMA-94

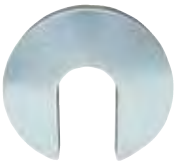
BRA-59

BRA-60

BRA-61

BRA-31

BRA-63



BRA-64

BRA-67

BRA-68

BRA-70

BRA-76

BRA-55

CALIFORNIA BEARING RATIO (CBR) EQUIPMENT
ASTM D1883; AASHTO T 193

California Bearing Ratio (CBR) Equipment	
Description	**Model**
CBR Molds and Spacer Discs CBR Compaction Molds are 6x7in (152x178mm) IDxH with 2in (51mm) collar and perforated base. CBR Spacer Disc is 5.94x2.416in (151x61mm), Dia.xH with threaded opening for insertion and removal. Both are rugged and rust-resistant plated steel.	
CBR Mold	BRA-60
CBR Spacer Disc	BRA-61
LBR Molds and Spacer Discs LBR Compaction Mold (FM 5-515 Florida Limerock Bearing Ratio test) is 6x6in (152x152mm), IDxH with 2.375in (60.3mm) collar. Spacer Disc for LBR is 5.94x1.41in (151x36mm), Dia.xH with threaded opening. Plated steel construction.	
LBR Mold	BRA-59
LBR Spacer Disc	BRA-62
Penetration Pistons CBR Penetration Piston is 7.5x1.954in (191x49.6mm) LxDiam. and fits standard fixtures for use in testing. Choose models with threaded male connectors of 1/2in (12.7mm) for 200 to 2,500lbf load cells or rings, or 3/4in (19mm) diameters for load cells or rings with 5,000lbf capacity and higher.	
CBR Penetration Piston, 3/4in Threaded Male Connector	BRA-30
CBR Penetration Piston, 1/2in Threaded Male Connector	BRA-31
Surcharge Weights Annular type has 2.125in (54mm) center hole. Slotted type has 2.125in (54mm) radius slot. Both are 5.875in (149mm) diameter plated steel and weigh 5lb (2.27kg).	
Annular Surcharge Weight	BRA-63
Slotted Surcharge Weight	BRA-64
Swell Plate Perforated Swell Plate is 5.875in (149mm) diameter and has threaded stem for insertion and removal.	BRA-67
Swell Tripod with Dial Indicator Tripod to measure specimen swell includes MA-334 1x0.001in dial indicator. Metric version includes MA-346 25x0.01mm dial indicator.	
Swell Tripod	BRA-68
Metric Swell Tripod	BRA-68F
Filters Stainless steel woven-wire mesh Filter with No.100 (150µm) openings is 5.94in (151mm) diameter. Coarse Filter Paper is same diameter and comes in a package of one hundred pieces.	
No.100 Stainless Steel Mesh Filter	BRA-75
Coarse Filter Paper, pkg. 100	BRA-76
Cutting Edge 6x2in (152x51mm) plated steel cutting edge fits on end of BRA-60 mold for field-sampling of in-place soils.	BRA-70
CBR Accessory Set Convenient CBR Accessory Set includes four each of BRA-60 Molds, BRA-63 Surcharge Weights, BRA-64 Surcharge Weights, BRA-67 Swell Plates, and BRA-75 Filter Screens. One each BRA-61 Spacer Disc and BRA-68 Swell Tripod are also included for typical CBR lab operation.	BRA-55

BR-2

BRA-31, BRA-33, BRA-40, BRA-41 & BRA-42

BRA-32

MA-334

HM-428

CALIFORNIA BEARING RATIO (CBR) FIELD EQUIPMENT

ASTM D1883, D4429 ; COE MIL-STD-621A; CRD-C654-95

The California Bearing Ratio (CBR) field test yields in–situ strength of soils and some base course materials. The field procedure uses a loading jack to force a piston into the soil, noting the piston load and depth of penetration. The jack is loaded against dead weights or a heavy piece of equipment such as a loaded dump truck. Gilson CBR equipment can be ordered as complete sets or separately as individual components.

California Bearing Ratio (CBR) Field Equipment

Description	Model
California Bearing Ratio Field Sets include all the components required to perform Field CBR tests using either a two-speed or three-speed jack with a manual crank. The two-speed jack has 10,000lbf (44.5kN) capacity with 3.5in (89mm) total travel. The three-speed Jack is similar, with 2in (51mm) of travel. Other components include 2,000lbf and 5,000lbf Load Rings with dial gauges, Swivel Bases for the Jacks, a Penetration Piston with Connector and Extension Sets, two 10lb and two 20lb Surcharge weights, a 10lb, 10in diameter Surcharge Plate, Support Bridge, and Dial Indicator with magnetic holder.	
California Bearing Ratio Field Set, Two-Speed Jack	BR-12
California Bearing Ratio Field Set, Three-Speed Jack	BR-13
Two Speed Field CBR Jack has 10,000lbf (45kN) capacity with 3.5in (89mm) lift. **Three Speed Field CBR Jack** is similar and has 2in (51mm) maximum lift. Both jacks are supplied with a swivel base and manual crank handle.	
Two-Speed Field Jack with Swivel Base	BR-2
Three-Speed Field Jack with Swivel Base	BR-3
Penetration Piston is 7.5x1.954in (191x49.6mm) LxDia. It meets requirements for ASTM or COE methods. The Piston Extension Set and Connector Set are required for proper set up and use of the Field Jack, Load Ring, and Piston assembly.	
CBR Penetration Piston, 3/4in Threaded Male Connector	BRA-30
CBR Penetration Piston, 1/2in Threaded Male Connector	BRA-31
Field Piston Extension Set	BRA-32
Field Connector Set	BRA-33
Field Surcharge Plate with circular opening, and Surcharge Masses with u-shaped openings simulate loads from base course or pavement which will overlie the test material. U-shaped openings allow addition or removal of masses with penetration piston in place. Additional Surcharge Masses may be needed to simulate large pavement loads.	
10lb Field Surcharge Plate, 10in dia.	BRA-40
10lb Field Surcharge Mass, 8.5in dia.	BRA-41
20lb Field Surcharge Mass, 8.5in dia.	BRA-42
Penetration Dial Gauges are available with inch or metric analog dial faces. The 8ft (2.4m) Dial Support Bridge and Magnetic Gauge Holder position the Penetration Dial Gauges for measuring penetration strain.	
Dial Support Bridge	BRA-45
Penetration Dial Gauge, 1in x 0.001in	MA-334
Penetration Dial Gauge, 25mm x 0.01mm	MA-346
Magnetic Gauge Holder	HMA-338
Load Rings are machined from high strength aluminum alloy plate and designed for compression measurement. Loads are measured to ±0.5% on the included mechanical dial indicator (0.0001in resolution). Measurements are plotted on a calibration chart prior to shipment. Ring dimensions are 6.25in high x 1.0in thick. Mounting holes are 1/2in-20 threads per inch.	
Load Ring, 2,000lbf x 1lbf	HM-425
Load Ring, 5,000lbf x 5lbf	HM-427

BRA-45

TRIAXIAL/PERMEABILITY TYPICAL SETUP

Master and Auxiliary Control Panels monitor and regulate Test Cell and sample pressures, and operations such as filling, draining, and saturation. They are the central point for connections from pressure, vacuum and water sources, and output to the Cells. A Master Panel controls a single Test Cell, and can also be connected to and control (2) Auxiliary Panels allowing for control of up to (3) Test Cells.

Test Cells act as a pressure chamber to place confining pressures on the samples. Connections between the Cells and Control Panels allow measurement and control of these pressures. Pore Pressure monitors can also be connected to the Cells when required.

A Deairing Tank for water and a vacuum pump connect to the panels, and are available from Gilson. A source of clean, dry compressed air is also required.

technote

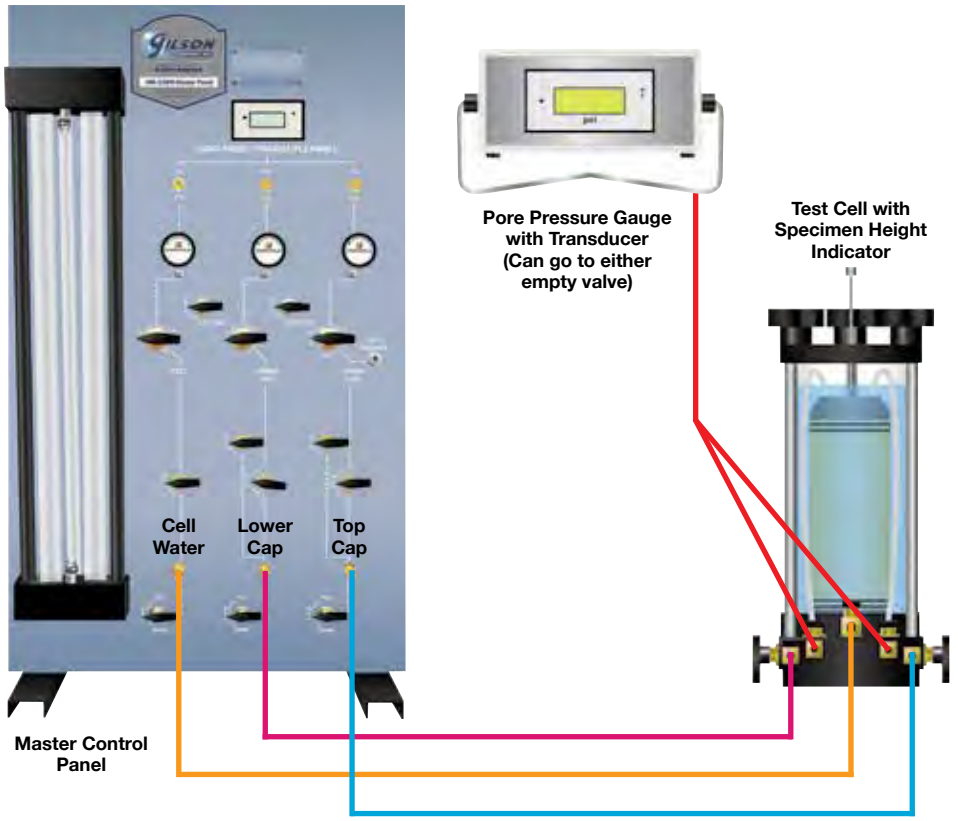
For Triaxial Testing, the Test Cell is mounted in a Load Frame for axial loading of the soil specimen. Either a Digital or Analog Component Set must be purchased separately to properly measure load and displacement forces.

VIDEO ONLINE

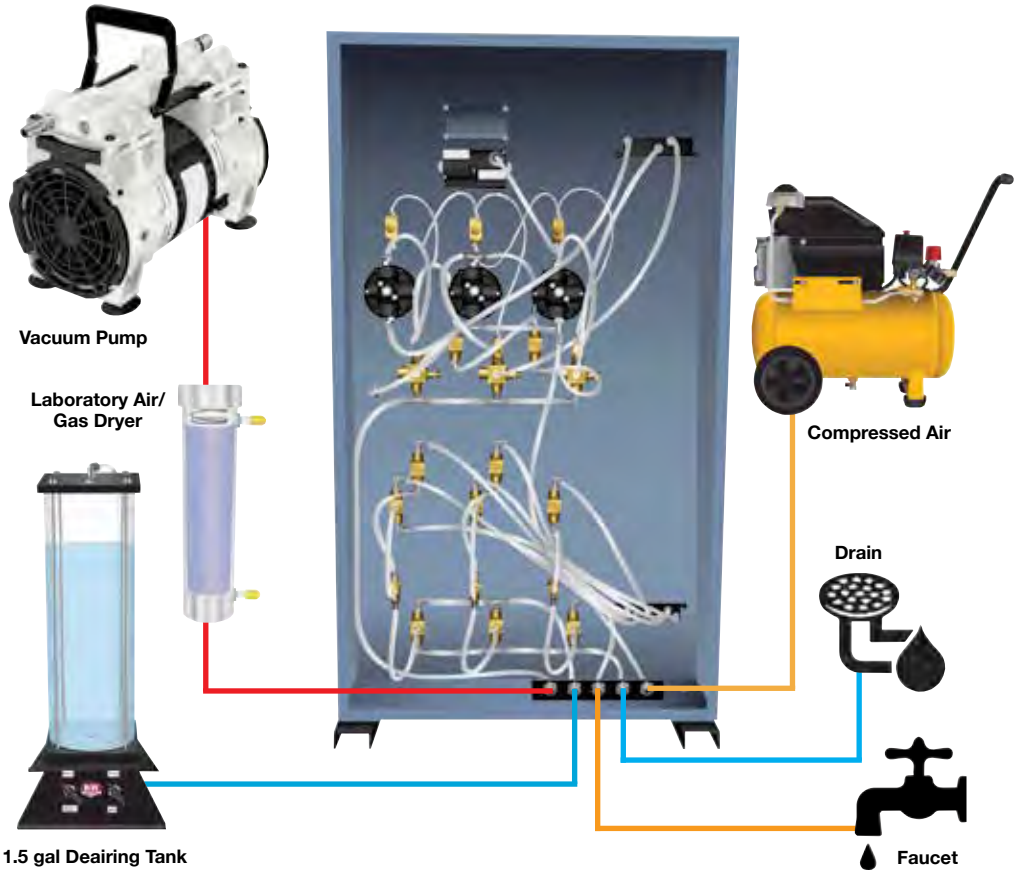
Watch video tutorials for our products online at **www.globalgilson.com!**

TRIAXIAL/PERMEABILITY TYPICAL SETUP

(Front Panel View)



(Back Panel View)



VIDEO ONLINE

HM-350M

HMA-521

HMA-520

TRIAXIAL CONTROL PANELS

ASTM D2850, D4767; AASHTO T 296, T 297

Control Panels for triaxial shear testing use a system of burettes, valves and regulators to precisely regulate air and fluid pressures in Testing Cells. They provide a central point for supply connections of air, water, and drains with a logical layout and are built with quality components.

Cell and burette pressures are individually adjustable and monitored by a single digital pressure gauge in the Master Panel. Precision regulators and zero-displacement ball valves allow accurate setting of critical pressures during saturation, consolidation and testing phases. Effective cell pressure and cell and sample back-pressure are controlled through a single regulator. A bias control feature allows the user to set the effective cell pressure and increase both cell and sample back pressure using only one regulator. This minimizes air consumption during saturation and causes no change in effective stress. Two 50cc burettes with 0.1cc graduations for flow measurement, and two 4cc pipettes with 0.008cc graduations are included. These are located inside two storage cells which have additional capacity of 400cc each. Cell-water interface utilizes a 20cc burette. The panel and cells are conveniently filled and drained using the front connections. The same Panels are also used for ASTM D5084 hydraulic conductivity/flexible wall permeability testing.

The Control Panels feature sturdy cabinet-grade construction, laid out with controls for air pressure located on the upper half and controls for water pressure on the lower half. All connections for the Test Cell are conveniently located on the front of the panel, with air, water, vacuum and drain connections located in the rear. The optional HMA-520 Deairing Tank prepares water for use in the testing cells. An air compressor is required to generate confining pressures, but not included. Test Cells and other accessories are ordered separately. To measure soil pore pressure, the optional HMA-511 Pore Pressure Readout can be factory-installed. The same readout, housed in a stand-alone portable case, can be purchased as HMA-521.

HM-350M Master Control Panel is required for connection to a single Triaxial or Flex-Wall Permeability Test Cell and is fitted with a digital readout for setting Test Cell and burette pressures. **Product Dimensions:** 21x6.25x37.25in (533x159x946mm) WxDxH.

HM-350A Auxiliary Control Panel is ideal for adding an additional test cell to the Master Control Panel for simultaneous testing. Once connected to the Master Panel, the Auxiliary Panel uses the Master Panel's digital pressure readout to display confining and cell pressures. Two HMA-350A Auxiliary Panels can be connected to each HMA-350M, allowing three samples to be tested simultaneously. **Product Dimensions:** 21x6.25x37.25in (533x159x946mm) WxDxH.

Triaxial Control Panels	
Master Control Panel	HM-350M
Auxiliary Control Panel	HM-350A
Accessories	
Deairing Tank, 1.5gal (5.7L) capacity	HMA-520
Panel-Mounted Pore Pressure Display (Factory-Installed)	HMA-511
Portable Pore Pressure Display	HMA-521

HM-397 shown with HMA-517, HMA-686 and HMA-521

Manufactured in cooperation with Karol•Warner

HM-398 shown with HMA-517 and HM-413

HMA-686

HM-413

TRIAXIAL LOAD FRAMES

ASTM D2850, D4767; AASHTO T 296, T 297

Pro-Loader Series Load Frames by Karol-Warner perform ASTM D2850 unconsolidated/undrained triaxial testing when outfitted with selected Triaxial Loading Component sets. HM-397 and HM-399 models can also test consolidated/undrained or consolidated-drained specimens to ASTM D4767 requirements. All models are designed to perform other soil testing applications just by switching component sets. Pro-Loader Load Frames have 10,000lbf (44.5kN) capacity, except the new HM-399, which has 20,000lbf (89kN) capacity.

Pro-Loaders have 3/4hp DC motors and precision controllers to regulate strain rates to ±1% of set point, and feature frame openings of 11.9x37.3in (302x947mm) WxH. Horizontal cross member height is quickly set using adjusting nuts. Coarse-threaded, 1.25in (32mm) high-strength vertical rods are plated for corrosion resistance. Cabinets are sturdy 14-gauge painted steel. An optional sturdy steel Rolling Cart is available to increase portability in the lab. Units operate on 115V/60Hz power supplies. To order units operating on 230V/50Hz, add "F" suffix to model numbers. **Product Dimensions:** 18x29x54.5in (457x737x1,384mm) WxDxH.

HM-396 Pro-Loader Load Frame features a high-speed platen advance for rapid positioning of the platen. Strain Rate is 0.001—0.1in/min (0.0254—2.54mm/min).

HM-397 Pro-Loader Load Frame has a wider range of strain rates, and the micro-stepping drive allows precise control of loading rates. Strain Rate is 0.0001—0.3in/ min (0.00254—7.62mm/min).

HM-397B Pro-Loader Load Frame has the greatest strain rate sensitivity of any of our 10,000lbf (44.5kN) load frames. It can be used for the full range of soils laboratory applications and is ideal for ASTM D4767 consolidated/undrained triaxial tests on sensitive soils. The HM-397B features a strain rate range from 0.00001 to 0.29999in/min (0.000254 to 7.62mm/min).

HM-398 Pro-Loader II Load Frame has the highest overall strain rate that allows use for a wider range of test methods. Strain Rate is 0.02—2.0in/min (0.508—50.8mm/min).

HM-399 Pro-Loader Load Frame is Gilson's newest and features 20,000lbf (89kN) capacity, plus enhanced strain rate sensitivity over the HM-397. This versatile model is ideal for ASTM D4767 consolidated/undrained triaxial tests on sensitive soils. Micro-Stepping motor and controller offer the highest degree of precision strain rate control. 0.00001 to 0.29999in/min (0.000254 to 7.62mm/min).

Triaxial Component Sets equip any Pro-Loader Frame to perform accurate and reliable triaxial shear testing. The sets are complete and feature high-quality instrumentation ready for easy installation and mounting on Pro-Loader Load Frames.

HMA-686 Analog Triaxial Loading Component Set includes a 1,000lbf capacity Load Ring, and a 1x0.001in Dial Indicator. Load Ring is machined from high-strength aluminum alloy plate for repeatable compression measurements, and is supplied with a calibration graph.

HM-413 Digital Load and Displacement Kit has our HM-418 two-channel Digital Readout connected to a 1,000lbf Load Cell and a 2in travel Displacement Transducer. The self-contained Digital Readout shows real-time numerical data on the large, bright vacuum fluorescent display. Front panel keys allow instant taring of either channel, peak reading on the selected channel, and entry of calibration factors during set up. The Readout transfers load and displacement data via the mini USB port to common spreadsheet applications on user's computer with included software. Data can be used to create printable graphs. The software is compatible with Windows® XP and newer operating systems.

Triaxial Load Frames	
Pro-Loader Load Frame, 0.001—0.1in/min Strain Rate	HM-396
Pro-Loader Load Frame, 0.0001—0.3in/min Strain Rate	HM-397
Pro-Loader Load Frame, 0.00001—0.29999in/min Strain Rate	HM-397B
Pro-Loader II Load Frame, 0.02—2.0in/min Strain Rate	HM-398
Pro-Loader Load Frame, 20,000lbf, 0.00001 to 0.29999in/min Strain Rate	HM-399
Accessories	
Analog Triaxial Loading Component Set	HMA-686
Digital Load and Displacement Kit	HM-413
Rolling Load Frame Cart	HMA-94

HMA-517, HMA-518 and HMA-519
(Sample pedestal not included)

HMA-584

HMA-589A

TRIAXIAL TEST CELLS

ASTM D2850, D4767, D5084; AASHTO T 296, T 297

Gilson Triaxial Test Cells are designed for optimum performance with Gilson Pro-Loader Frames and Master or Auxiliary Control Panels, but also fit other systems. The Test Cells are constructed with heavy-wall clear acrylic chambers and solid, machined aluminum bases designed for heavy loading. The precision-ground and polished stainless steel load piston features internally lubed and sealed linear ball bearings for very low friction. Cells are fitted with precision zero-volume change ball valves and rugged quality brass fittings. Models equipped with stainless steel valves and fittings to resist corrosion and harsh permeant fluids can be ordered by adding "S" to the model number. Maximum operating pressure is 150psi (10.3bar) for models HMA-517 and HMA-518 and 100psi (6.9bar) for HMA-519. Inquire for units built for higher test pressures.

HMA-517 and HMA-518 Triaxial Test Cells test a range of sample sizes, but must be equipped with Triaxial Test Cell Kits, purchased separately, for specific specimen sizes. HMA-519 and HMA-519S Test Cells test only 6in diameter samples, and must be equipped with HMA-586A Test Cell Kit. Kits contain individual components of a single specimen size required to test a soil sample.

Triaxial Test Cells		
Model	Inside Chamber Dimensions Dia.xH, in (mm)	Maximum Specimen Size in (mm)
HMA-517	4.75x10.75 (121x273)	3.0 (76.2)
HMA-518	5.0x12.125 (127x308)	4.0 (101.6)
HMA-519[1]	9.625x18 (244.5x457)	6.0 (152.4)

[1]HMA-519 tests only 6in diameter samples.

Each kit includes an anodized aluminum specimen cap and pedestal, two Porous Stones, two Latex Membranes and four O-Rings. The anodized aluminum caps have two drain ports and are grooved for O-Rings. Keyed pedestals with flow-through lines prevent pinching of tubing during set up. Other accessories include the HMA-506 Specimen Height Indicator to track sample deformation and the HMA-521 Digital Pore Pressure Gauge to precisely measure soil pore pressure. Triaxial Test Cells can also be used for ASTM D5084 Flexible Wall Permeability testing.

Triaxial Test Cell Kits / Cell Compatibility				
Triaxial Cell Kit		Triaxial Cell		
Sample Diameter in (mm)	Model	HMA-517	HMA-518	HMA-519
1.4 (35.6)	HMA-587	X	X	—
1.5 (38.1)	HMA-587A	X	X	—
1.87 (47.5)	HMA-587B	X	X	—
2.0 (50.8)	HMA-588	X	X	—
2.36 (59.9)	HMA-588A	X	X	—
2.42 (61.5)	HMA-588B	X	X	—
2.5 (63.5)	HMA-589	X	X	—
2.8 (71.1)	HMA-589A	X	X	—
3.0 (76.2)	HMA-583	X	X	—
4.0 (101.6)	HMA-584	—	X	—
6.0 (152.4)	HMA-586A	—	—	X

TRIAXIAL TEST CELL ACCESSORIES
ASTM D2850, D4767, D5084; AASHTO T 296, T 297

Triaxial Test Cell Accessories

Description	Sample Diameter, in (mm)										
	1.4 (35.6)	1.5 (38.1)	1.87 (47.5)	2.0 (50.8)	2.36 (60)	2.42 (61.5)	2.5 (63.5)	2.8 (71.1)	3.0 (76.2)	4.0 (101.6)	6.0 (152.4)
Test Cell Kits must be used to outfit Test Cells for specific sample sizes. Kits contain all components of a single size required to perform a test. Each kit includes an anodized aluminum specimen cap and pedestal, two Porous Stones, two Latex Membranes and four O-Rings. The anodized aluminum caps have two drain ports and are grooved for O-Rings. Keyed pedestals with flow-through lines prevent pinching of tubing during set up.	HMA-587	HMA-587A	HMA-587B	HMA-588	HMA-588A	HMA-588B	HMA-589	HMA-589A	HMA-583	HMA-584	HMA-586A
Cap & Pedestal Sets include only the anodized aluminum fixtures for the top and bottom of samples. Other accessories are purchased separately.	HMA-947	HMA-947A	HMA-947B	HMA-948	HMA-948A	HMA-948B	HMA-949	HMA-949A	HMA-943	HMA-944	HMA-946A
Latex Membranes fit tightly around prepared soil specimens and provide a barrier against chamber fluids during testing. Supplied in packages of 12. Standard Latex Membranes are 0.012in thick, and Premium Membranes are 0.025in (0.6mm) thick.											
Standard 0.012in Latex Membranes	HMA-527C	HMA-527D	HMA-527E	HMA-528C	HMA-528D	HMA-528E	HMA-529C	HMA-529D	HMA-523C	HMA-524C	HMA-526C
Premium 0.025in Latex Membranes	HMA-527	HMA-527A	HMA-527B	HMA-528	HMA-528A	HMA-528B	HMA-529	HMA-529A	HMA-523	HMA-524	HMA-526
Membrane Stretchers are slightly larger than specimen diameters and use vacuum applied through a tubular fitting to expand the membranes for easy placement. Aluminum construction.	HMA-557	HMA-557A	HMA-557B	HMA-558	HMA-558A HMA-558B	HMA-558A	HMA-559	HMA-559A	HMA-553	HMA-544	HMA-556
O-Rings made of neoprene material seal the Latex Membranes tightly around the Specimen Caps and Pedestals to protect specimen from chamber fluid.	HMA-567	HMA-567A	HMA-567B	HMA-568	HMA-568A	HMA-568B	HMA-569	HMA-569A	HMA-573	HMA-574	HMA-576
O-Ring Placing Tool is a simple design for easy placement of O-Rings without disturbing the sample.	HMA-577	HMA-577A	HMA-577B	HMA-578	HMA-578A	HMA-578B	HMA-579	HMA-579A	HMA-573	HMA-574	HMA-576
Porous Stones provide solid support at sample ends, while allowing two-way passage of water or permeant. Quality aluminum oxide stones have a permeability range of 15 to 18ft³ of air per minute, per square foot and average pore size of 179µm.	GSA-201	GSA-202	GSA-203	GSA-211	GSA-214	GSA-215	GSA-220	GSA-223	GSA-229	GSA-234	GSA-237
Two-Part Compaction Molds are used to prepare compacted specimens for triaxial or permeability testing. Granular soils are compacted in a Mold with a latex membrane held in place by a vacuum source. Cohesive specimens are compacted in molds with no vacuum capability and later fitted in Latex Membranes. Molds for cohesive soils are available as complete assemblies, or as molds only for increased efficiency in sample preparation.											
Two-Part Compaction Mold w/Vacuum for Granular Soils	HMA-957	HMA-957A	HMA-957B	HMA-958	HMA-958A	HMA-958B	HMA-959	HMA-959A	HMA-953	HMA-954	HMA-956
Two-Part Compaction Mold Assembly for Cohesive Soils	HMA-987	HMA-987A	HMA-987B	HMA-988	HMA-988A	HMA-988B	HMA-989	HMA-989A	HMA-983	HMA-984	HMA-986
Two-Part Compaction Mold only for Cohesive Soils	HMA-967	HMA-967A	HMA-967B	HMA-968	HMA-968A	HMA-968B	HMA-969	HMA-969A	HMA-963	HMA-964	HMA-966
Two-Part Miter Boxes are used to trim soil samples to precise lengths for triaxial, permeability, unconfined compression, shear and other tests.	HMA-977	HM-977A	HMA-977B	HMA-978	HMA-978A	HMA-978B	HMA-979	HMA-979A	HMA-973	HMA-974	HMA-976

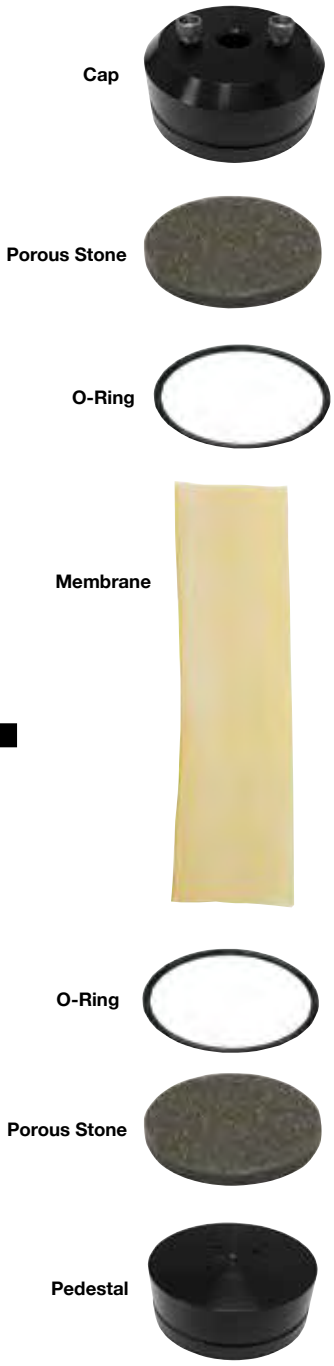
TRIAXIAL & FLEXIBLE WALL PERMEABILITY TEST CELL ACCESSORIES

Test Cell

1.4in—6in Specimens

**Triaxial Cells can be used in both triaxial and flex-wall permeability tests.*

Test Cell Components



Sample Preparation

technote

Gilson Test Cells have similar construction, but are available in two unique designs to perform triaxial or flexible-wall permeability testing on soil samples. Triaxial Test Cells are equipped to mount in a Load Frame for application of axial loads, but may also be used in flex-wall permeability testing. Permeability Cells are not designed for axial loading. Each Cell accommodates a range of soil sample sizes, and components to outfit the Test Cells for specific sample sizes are purchased separately. Sample Preparation accessories aid in preparing soil samples for mounting in a Test Cell.

VIDEO ONLINE

HM-350M

HM-350A

FLEXIBLE-WALL PERMEABILITY CONTROL PANELS
ASTM D5084

Control Panels for flexible-wall permeability testing use a system of burettes, valves and regulators to precisely regulate air and fluid pressures in Testing Cells. They provide a central point for supply connections of air, water, and drains with a logical layout and are built with quality components.

Cell and burette pressures are individually adjustable and monitored by a single digital pressure gauge in the Master Panel. Precision regulators and zero-displacement ball valves allow accurate setting of critical pressures during saturation, consolidation and testing phases. Effective cell pressure and cell and sample back-pressure are controlled through a single regulator. A bias control feature allows the user to set the effective cell pressure and increase both cell and sample back pressure using only one regulator. This minimizes air consumption during saturation and causes no change in effective stress. Two 50cc burettes with 0.1cc graduations for flow measurement, and two 4cc pipettes with 0.008cc graduations are included. These are located inside two storage cells which have additional capacity of 400cc each. Cell-water interface utilizes a 20cc burette. The panel and cells are conveniently filled and drained using the front connections. The same Panels are also used for ASTM D2850 and D4767 triaxial shear test methods.

The Control Panels feature sturdy cabinet-grade construction, laid out with controls for air pressure located on the upper half and controls for water pressure on the lower half. All connections for the Test Cell are conveniently located on the front of the panel, with air, water, vacuum and drain connections located in the rear. The optional HMA-520 Deairing Tank prepares water for use in the testing cells. An air compressor is required to generate confining pressures, but not included. Test Cells and other accessories are ordered separately. To measure soil pore pressure, the optional HMA-511 Pore Pressure Readout can be factory-installed. The same readout, housed in a stand-alone portable case, can be purchased as HMA-521.

HM-350M Master Control Panel is required for connection to a single Triaxial or Flex-Wall Permeability Test Cell and is fitted with a digital readout for setting Test Cell and burette pressures. **Product Dimensions:** 21x6.25x37.25in (533x159x946mm) WxDxH.

HM-350A Auxiliary Control Panel is ideal for adding an additional test cell to the Master Control Panel for simultaneous testing. Once connected to the Master Panel, the Auxiliary Panel uses the Master Panel's digital pressure readout to display confining and cell pressures. Two HMA-350A Auxiliary Panels can be connected to each HMA-350M, allowing three samples to be tested simultaneously. **Product Dimensions:** 21x6.25x37.25in (533x159x946mm) WxDxH.

Flexible-Wall Permeability Control Panels	
Master Control Panel	HM-350M
Auxiliary Control Panel	HM-350A
Accessories	
Deairing Tank, 1.5gal (5.7L) capacity	HMA-520
Panel-Mounted Pore Pressure Display (Factory-Installed)	HMA-511
Portable Pore Pressure Display	HMA-521

HMA-514

HMA-516

HM-914

HM-916

FLEXIBLE-WALL PERMEABILITY TEST CELLS

ASTM D5084

Gilson Flexible-Wall Permeability Test Cells are designed for optimum performance with Master and Auxiliary Control Panels, but also fit other systems. The Test Cells are constructed with heavy-wall clear acrylic chambers and solid, machined aluminum bases. Cells are fitted with precision zero-volume change ball valves and rugged quality brass fittings. Models equipped with stainless steel valves and fittings to resist corrosion from harsh permeant fluids can be ordered by adding "S" to the model number. Maximum operating pressure is 150psi (10.3bar). Inquire for units built for higher test pressures.

Permeability Test Cells can test a range of sizes, but must be equipped with Flexible-Wall Permeability Test Cell Kits, purchased separately, for specific specimen sizes. Kits contain individual components of a single specimen size required to test a soil sample. Each kit includes an anodized aluminum specimen cap and pedestal, two Porous Stones, two Latex Membranes and four O-Rings. The anodized aluminum caps have two drain ports and are grooved for O-Rings. Keyed pedestals with flow-through lines prevent pinching of tubing during set up. Optional accessories include the HMA-506 Specimen Height Indicator to track sample deformation and the HMA-521 Digital Pore Pressure Gauge to precisely measure soil pore pressure.

Flexible-Wall Permeability Test Cells		
Model	Inside Chamber Dimensions, Dia.xH, in (mm)	Maximum Specimen Size, in (mm)
HMA-514	4.75x8.25 (121x273)	4.0 (101.6)
HMA-516	7.5x10.125 (191x343)	6.0 (152.4)
Accessories		
Specimen Height Indicator		HMA-506
Digital Pore Pressure Gauge		HMA-521

Flexible-Wall Permeability Test Cell Kits / Cell Compatibility			
Permeability Test Cell Kit		Permeability Cell	
Sample Diameter, in (mm)	Model	HMA-514	HMA-516
1.4 (35.6)	HMA-587	X	X
1.5 (38.1)	HMA-587A	X	X
1.87 (47.5)	HMA-587B	X	X
2.0 (50.8)	HMA-588	X	X
2.36 (59.9)	HMA-588A	X	X
2.42 (61.5)	HMA-588B	X	X
2.5 (63.5)	HMA-589	X	X
2.8 (71.1)	HMA-589A	X	X
3.0 (76.2)	HMA-583	X	X
4.0 (101.6)	HMA-584	X	X
6.0 (152.4)	HMA-586	—	X

TOXIC INTERFACE UNITS

Toxic Interface Units allow safe flexible-wall permeability testing by providing a barrier against toxic or corrosive chemicals in contaminated samples. Two chambers are required between the Control Panel and Permeability Test Chamber to prevent chemicals from entering the panel and venting to the atmosphere. Contaminants are isolated to the sample and the lower half of each interface chamber. The lower section of the chamber consists of a base, a stainless steel tube, and a zero-volume change ball valve. The tube and base are sealed with a Viton O-Ring, and a Viton diaphragm separates the chemical from the water within the test cell. The position of the diaphragm can be viewed through the clear polycarbonate top section. Models are available with 180cc or 500cc capacity. **Product Dimensions for HM-914:** 5.9x6.3x10.1 (150x160x257mm). **Product Dimensions for HM-916:** 6.5x7.25x10.1in (165x184x257mm) WxDxH.

Toxic Interface Units	
Toxic Interface Unit, 180cc	HM-914
Toxic Interface Unit, 500cc	HM-916

FLEXIBLE-WALL PERMEABILITY TEST CELL ACCESSORIES
ASTM D5084

Flexible-Wall Permeability Test Cell Accessories

Description	Sample Diameter, in (mm)										
	1.4 (35.6)	1.5 (38.1)	1.87 (47.5)	2.0 (50.8)	2.36 (59.9)	2.42 (61.5)	2.5 (63.5)	2.8 (71.1)	3.0 (76.2)	4.0 (101.6)	6.0 (152.4)
Test Cell Kits must be used to outfit Test Cells for specific sample sizes. Kits contain all components of a single size required to perform a test. Each kit includes an anodized aluminum specimen cap and pedestal, two Porous Stones, two Latex Membranes and four O-Rings. The anodized aluminum caps have two drain ports and are grooved for O-Rings. Keyed pedestals with flow-through lines prevent pinching of tubing during set up.	HMA-587	HMA-587A	HMA-587B	HMA-588	HMA-588A	HMA-588B	HMA-589	HMA-589A	HMA-583	HMA-584	HMA-586
Cap & Pedestal Sets include only the anodized aluminum fixtures for the top and bottom of samples. Other accessories are purchased separately.	HMA-947	HMA-947A	HMA-947B	HMA-948	HMA-948A	HMA-948B	HMA-949	HMA-949A	HMA-943	HMA-944	HMA-946
Latex Membranes fit tightly around prepared soil specimens and provide a barrier against chamber fluids during testing. Supplied in packages of 12. Standard Latex Membranes are 0.012in thick, and Premium Membranes are 0.025in (0.6mm) thick.											
Standard 0.012in Latex Membranes	HMA-527C	HMA-527D	HMA-527E	HMA-528C	HMA-528D	HMA-528E	HMA-529C	HMA-529D	HMA-523C	HMA-524C	HMA-526C
Premium 0.025in Latex Membranes	HMA-527	HMA-527A	HMA-527B	HMA-528	HMA-528A	HMA-528B	HMA-529	HMA-529A	HMA-523	HMA-524	HMA-526
Membrane Stretchers are slightly larger than specimen diameters and use vacuum applied through a tubular fitting to expand the membranes for easy placement. Aluminum construction.	HMA-557	HMA-557A	HMA-557B	HMA-558	HMA-558A	HMA-558A HMA-558B	HMA-559	HMA-559A	HMA-553	HMA-544	HMA-556
O-Rings made of neoprene material seal the Latex Membranes tightly around the Specimen Caps and Pedestals to protect specimen from chamber fluid.	HMA-567	HMA-567A	HMA-567B	HMA-568	HMA-568A	HMA-568B	HMA-569	HMA-569A	HMA-573	HMA-574	HMA-576
O-Ring Placing Tool is a simple design for easy placement of O-Rings without disturbing the sample.	HMA-577	HMA-577A	HMA-577B	HMA-578	HMA-578A	HMA-578B	HMA-579	HMA-579A	HMA-573	HMA-574	HMA-576
Porous Stones provide solid support at sample ends, while allowing two-way passage of water or permeant. Quality aluminum oxide stones have a permeability range of 15 to 18ft³ of air per minute, per square foot and average pore size of 179µm.	GSA-201	GSA-202	GSA-203	GSA-211	GSA-214	GSA-215	GSA-220	GSA-223	GSA-229	GSA-234	GSA-237
Two-Part Compaction Molds are used to prepare compacted specimens for triaxial or permeability testing. Granular soils are compacted in a Mold with a latex membrane held in place by a vacuum source. Cohesive specimens are compacted in molds with no vacuum capability and later fitted in Latex Membranes. Molds for cohesive soils are available as complete assemblies, or as molds only for increased efficiency in sample preparation.											
Two-Part Compaction Mold w/Vacuum for Granular Soils	HMA-957	HMA-957A	HMA-957B	HMA-958	HMA-958A	HMA-958B	HMA-959	HMA-959A	HMA-953	HMA-954	HMA-956
Two-Part Compaction Mold Assembly for Cohesive Soils	HMA-987	HMA-987A	HMA-987B	HMA-988	HMA-988A	HMA-988B	HMA-989	HMA-989A	HMA-983	HMA-984	HMA-986
Two-Part Compaction Mold only for Cohesive Soils	HMA-967	HMA-967A	HMA-967B	HMA-968	HMA-968A	HMA-968B	HMA-969	HMA-969A	HMA-963	HMA-964	HMA-966
Two-Part Miter Boxes are used to trim soil samples to precise lengths for triaxial, permeability, unconfined compression, shear and other tests.	HMA-977	HM-977A	HMA-977B	HMA-978	HMA-978A	HMA-978B	HMA-979	HMA-979A	HMA-973	HMA-974	HMA-976

HM-524

HM-231 shown with HMA-851 & HMA-855

HM-232 shown with HMA-855

HMA-855

HM-266

HM-267

Soil Sample Preparation

Description	Model	Dimensions, WxDxH
Hydraulic Sample Extruder ejects undisturbed soil samples from thin-walled Shelby Tubes with up to 5,600lbf (24.9kN) of force Smooth extrusion action in one continuous stroke prevents damage to sensitive soils, and makes it easier to divide and preserve small sections for Consolidation, Triaxial, Direct Shear, and other tests. The extruder is set up for 3in (76mm) diameter tubes of 30in or 36in (762mm or 914mm) length, but easily processes 2in (51mm) diameter tubes using the HMA-282 adapter, purchased separately. A sample receiving trough (not shown) is included to support the entire length of the specimen during extrusion. Samples are easily logged, cut to length, and prepared for testing in one step. Powerful 1hp electric motor, 1.7gpm (6.4lpm) hydraulic pump, and 2.5gal (47L) hydraulic oil reservoir are mounted to a rugged solid steel frame, with the horizontally mounted piston. The Extruder can be bolted to a benchtop, or mounted on the optional Extruder Stand to position at a convenient working height. The Stand is rugged bolted steel construction with casters.		
Hydraulic Sample Extruder, 115V/60Hz	HM-524	84x23x18
230V/50Hz	HM-524F	84x23x18
2in Tube Adapter	HMA-282	—
Extruder Stand	HMA-289	84.8x18x34.5
Adjustable Soil Trimmers are vertical soil lathes, and guide preparation of cylindrical soil samples to desired diameter from 1 to 4in (25.4 to 101.6mm). Top and bottom platens turn freely on low-friction sealed cartridge bearings with no side play, assuring precise dimensioning. The platens feature short pins to grip the specimen and interchangeable Top Platens are mounted to a height-adjustable steel rod. Top Platens are purchased separately for finished diameters desired. Rigid vertical metal frames are mounted on 6in (150mm) square aluminum bases with non-skid rubber feet, and an adjustable trimming guide accurately controls diameter. Cost effective HM-231 Adjustable Soil Trimmer covers the most common soil sample sizes from 1 to 3in (25.4 to 76.2mm) diameter and up to 7.5in (190mm) in length. HM-232 Adjustable Soil Trimmer for larger specimens prepares samples up to 4in (101.6mm) diameter and 9.75in (247.7mm) long.		
1in to 3in Adjustable Soil Trimmer	HM-231	6x6x14
1in to 4in Adjustable Soil Trimmer	HM-232	6x6x16
Top Platens are interchangeable to fit either Soil Trimmer model for precise control of specimen sizes. Units feature sealed cartridge bearings and can be quickly changed out.		
Top Platen, 1.0in (25.4mm) dia.	HMA-850	—
Top Platen, 1.4in (35.6mm) dia.	HMA-851	—
Top Platen, 1.875in (47.6mm) dia.	HMA-852	—
Top Platen, 2.0in (50.8mm) dia.	HMA-853	—
Top Platen, 2.5in (63.5mm) dia.	HMA-854	—
Top Platen, 2.8in (71.1mm) dia.	HMA-855	—
Top Platen, 3.0in (76.2mm) dia.	HMA-856	—
Top Platen, 4.0in (101.6mm) dia.	HMA-857	—
Wire Saws with fine-wire blades are the best choice for trimming fine-grained cohesive samples on Adjustable Soil Trimmers. Standard Saw has a sturdy steel handle and tension adjustment. Open End Wire Saw has a deeper throat, for increased cut sizes on larger samples. The blade mounts in a steel frame that connects to the handle.		
Standard Wire Saw	HM-266	0.375x3x13.5
Open-End Wire Saw	HM-267	1.5x7.5x13.75

HM-891 with HMA-840

HM-831 thru 835

GRANULAR SOIL PERMEAMETERS
ASTM D2434; AASHTO T 215

Permeameters for granular soils are available in versions meeting ASTM/AASHTO constant head requirements, or combination models for use with either constant head or falling-head methods. Both versions feature anodized aluminum end caps and clear acrylic chambers.

ASTM/AASHTO Permeameters determine permeability by constant head method of granular soil samples. Gilson offers permeameters in sizes from 2.5—9.0in (63.5—228.6mm) diameter, which allows the customer to determine permeability of granular soils with a wide range of particle top sizes.

Clear acrylic sample chambers allow easy viewing during test procedure. Two manometer ports are vertically spaced at a distance equal to the chamber diameter. Stainless steel No.100 mesh screen at each port prevents migration of material into the manometer. Porous stones are included with the smaller chambers, while the 6 and 9in (152.4 and 228.6mm) diameter chambers are supplied with brass mesh screens. A compression spring in the top cap applies 5—10lb (2.3—4.5kg) of force to prevent changes in sample density during the test. Anodized aluminum end caps have valves and ports for vacuum and water sources. Tubing is included. Either the HMA-838 Free Standing or HMA-839 Wall Mounted double-tube Manometer is required and must be purchased separately. Both feature a 100cm graduated scale and valves. The HMA-836 2in (50.8mm) diameter sliding weight Permeability Compaction Hammer, and HMA-837 Acrylic 1000cc Constant head reservoir with mounting brackets are available as accessories.

Combination Permeameters are more economical and allow granular samples to be tested by either the constant-head or falling-head methods, but do not strictly meet ASTM and AASHTO requirements. Chamber sizes are similar to the ASTM/AASHTO Permeameters, but they are not equipped with sidewall manometer ports. Constant-head reservoir free standing single tube manometer with scale and all necessary tubing are included.

Granular Soil Permeameters	
ASTM/AASHTO Permeameter, 2.5in dia.	HM-831
ASTM/AASHTO Permeameter, 3.0in dia.	HM-832
ASTM/AASHTO Permeameter, 4.5in dia.	HM-833
ASTM/AASHTO Permeameter, 6.0in dia.	HM-834
ASTM/AASHTO Permeameter, 9.0in dia.	HM-835
Combination Permeameter, 2.5in dia.	HM-891
Combination Permeameter, 3.0in dia.	HM-892
Combination Permeameter, 4.5in dia.	HM-893
Combination Permeameter, 6.0in dia.	HM-894
Combination Permeameter, 9.0in dia.	HM-895
Accessories	
Permeability Compaction Hammer	HMA-836
Constant Head Reservoir	HMA-837
Free Standing Manometer, Double Tube	HMA-838
Wall Mounted Manometer, Double Tube	HMA-839
Free Standing Manometer, Single Tube, included with combination permeameters	HMA-840

HM-81

HMA-840

HM-36

HM-37

SHELBY TUBE PERMEAMETER

The Shelby Tube Permeameter allows tests to be performed on undisturbed soil samples in sections of 3in (76mm) diameter Shelby sampling tubes. Supplied apparatus consists of corrosion-resistant top and bottom plates, valves, two porous stones, two stainless steel screens, and three threaded tie rods with tilt nuts for quick repositioning. Inside of top plate is concave for de-airing.

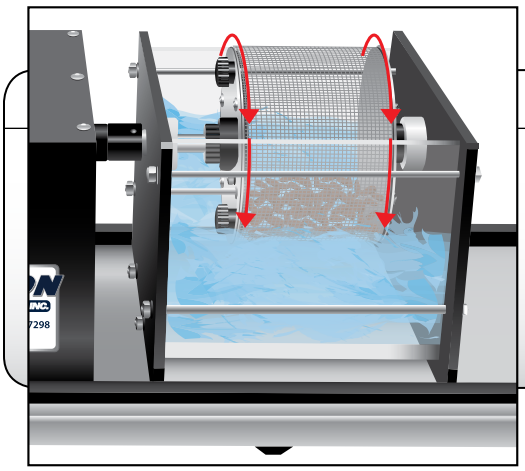
Tie rods extend to permit testing in Shelby tubes up to 6in (152mm) long under constant or falling head conditions. Order HMA-8 to single-tube manometer to measure head pressure during permeability testing. Features a 1,000mm graduated scale and necessary valves. HMA-49 Filter paper is useful for keeping fines from blinding porous stones. Paper is 2.95in (70mm) dia. and comes a pack of one hundred. **Product Dimensions:** 8x6x9.75in (203x152x248mm), WxDxH.

Shelby Tube Permeameter	
Shelby Tube Permeameter	HM-81
Accessories	
Filter Paper, pkg. 100	HMA-49
Single-Tube Manometer	HMA-840

COMPACTION PERMEAMETERS

Compaction Permeameters measure constant or falling-head properties of compacted soils. The 4in and 6in Permeameters are constructed of plated steel for wear resistance and long life. Mold dimensions are 4x4.584in (101.6x116.4mm) and 6x7in (152.4x177.8mm), not including collars. These molds are dimensionally identical to Proctor and CBR molds, however the upper and lower plates have inlet/outlet connectors to allow the flow of water through the compacted sample. The overflow valve on the top plate is designed for air removal during the test. A porous stone filter is also provided. HMA-8 to single-tube manometer is purchased separately and is required to measure head pressures during permeability testing. Both feature a 100mm graduated scale and necessary valves. **HM-36 Product Dimensions:** 7.5x8x10in (191x203x254mm), WxDxH.
HM-37 Product Dimensions: 9.5x9x10.5in (241x229x267mm), WxDxH.

Compaction Permeameters	
4in Compaction Permeameter	HM-36
6in Compaction Permeameter	HM-37
Accessories	
Single-Tube Manometer	HMA-840



SLAKE DURABILITY INDEX

A pre-weighed sample is placed in a partially submerged wire mesh drum, tumbled for 10 minutes, then oven dried and weighed. Retained mass is calculated and recorded for each of two cycles.

SA-80

HM-534

SLAKE DURABILITY DEVICE
ASTM D4644

Slake durability is a simulated weathering test to determine durability resistance during wetting and drying cycles of shale and similar soft rocks used in embankments and other construction-related applications. Samples are alternately tumbled in mesh drums through a water medium and oven-dried for two cycles. The percent loss of mass is referred to as the slake durability index.

The SA-80 apparatus consists of a base-mounted, double-ended motor drive unit which rotates two 140mm dia. x 100mm (5.5x3.9in) sturdy wire mesh drums at twenty revolutions per minute in included water tanks. The water tanks have built-in, quick-release drive units. The 4ft (1,219mm) long base allows the addition of two added drums in series with the first two. An additional set of two mesh drums and two water tanks are available as SAA-30. To facilitate sample preparation, order additional mesh drums as SAA-31. **Product Dimensions:** 48x14x9.25in (1,219x355x235mm), LxWxH.

Slake Durability Device	
Slake Durability Device, 115V/60Hz	SA-80
230V/50Hz	SA-80F
Accessories	
Water Tank Assembly with Drums	SAA-30
Wire Mesh Drums, qty. 2	SAA-31

PIN HOLE DISPERSION DEVICE
ASTM D4647

The pinhole test identifies the dispersive characteristics of clay soils used in construction of earth embankments and dams by modeling the action of flowing water along a crack in a soil mass. Failures of earthen structures have been attributed to colloidal erosion along cracks or other flow channels formed in dispersive clays. This test evaluates clay soils by directing water through a small hole drilled through the compacted specimen.

An evaluation of effluent cloudiness and final size of the pinhole is used to qualitatively classify soils into categories of dispersiveness. Additional computations of water flow rate may also be required. Comparison of results with other tests indicates that the pinhole test has the best correlation with the actual erosion characteristics of clay soils.

The stainless steel mold is held to the base with a unique clamping ring while the specimen is compacted. Chamber and end-caps, screens, base stand, a constant-head reservoir, tubing, pipet, and a tool for drilling the pinhole are included. The end cap has a pilot hole for drilling the 1.0 mm (.040in) hole through the sample. All aluminum parts are anodized for corrosion resistance. **Product Dimensions:** 3.5x3x5.75in (89x76x146mm), WxDxH (cell); 6.5x9.5x47.5in (165x241x1,207mm), WxDxH (funnel w/stand).

Pin Hole Dispersion Device	
Pin Hole Dispersion Device	HM-534

HM-396

HM-398 shown with HM-430D and HM-418

HMA-94

UNCONFINED COMPRESSIVE STRENGTH TEST SYSTEMS

ASTM D2166; AASHTO T 208

Unconfined compression tests quickly provide approximate strength values of cohesive soils. This test can be performed on intact, remolded, or reconstituted soil specimens using strain-controlled application of axial loads. A wide selection of reliable Karol-Warner Load Frames, components and accessories offer versatility to select a system meeting your specific needs.

Karol-Warner Load Frames are a good choice for unconfined compression testing and can perform other soil testing applications with just a quick change of components. All models feature 10,000lbf (44.5kN) total capacity and frame openings of 11.9x37.3in (302x947mm) WxH. The frames have sturdy 14-gauge painted steel cabinets, and 3/4hp DC motors with controllers to precisely regulate strain rates to ±1% of set point. Horizontal cross-head heights are quickly changed using adjusting nuts. Coarse-threaded 1.25in (32mm) high strength vertical rods are plated for corrosion resistance. Platen diameter is 8in (203mm). Units operate on 115V/60Hz power supplies. HMA-94 sturdy steel Rolling Cart offers portability and correct positioning height of the Load Frame. Add "F" suffix to model numbers to order units operating on 230V/50Hz. **Product Dimensions:** 18x29x54.5in (457x737x1,384mm) WxDxH.

HM-396 Pro-Loader Load Frame features a high-speed platen advance to rapidly position the platen for faster set-up. Strain Rate is 0.001—0.1in/min (0.0254—2.54mm/min).

HM-397 Pro-Loader Load Frame has a wider range of strain rates. The micro-stepping drive controller also allows more precise control of loading rates. Strain Rate is 0.0001—0.3in/min (0.00254—7.62mm/min).

HM-397B Pro-Loader Load Frame has the greatest strain rate sensitivity of any of our 10,000lbf (44.5kN) load frames. It can be used for the full range of soils laboratory applications and is ideal for ASTM D4767 consolidated/undrained triaxial tests on sensitive soils. The HM-397B features a strain rate range from 0.00001 to 0.29999in/min (0.000254 to 7.62mm/min).

HM-398 Pro-Loader II Load Frame has the highest overall strain rate that allows use for a wider range of test methods. Strain Rate is 0.02—2.0in/min (0.508—50.8mm/min).

HM-399 Pro-Loader Load Frame is Gilson's newest and features 20,000lbf (89kN) capacity, plus enhanced strain rate sensitivity over the HM-397. This versatile model is ideal for ASTM D4767 consolidated/undrained triaxial tests on sensitive soils. Micro-Stepping motor and controller offer the highest degree of precision strain rate control. 0.00001 to 0.29999 (0.000254 to 7.62)

Unconfined Compression Component Sets feature high-quality instrumentation needed to perform unconfined compression tests and are ready for easy installation on Pro-Loader Load Frames. Fixtures and brackets are included for direct mounting to the frames.

HMA-683 Analog Unconfined Compression Component Set includes a 1,000lbf capacity Load Ring, a 1x0.001in Dial Indicator, Indicator Bracket, and two 2.8x0.25in Plastic Discs.

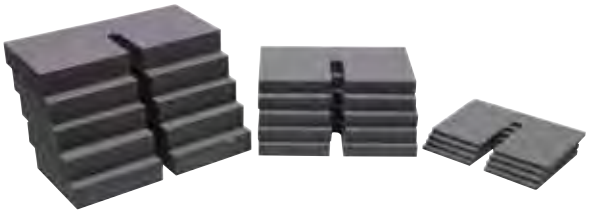
HMA-683D Digital Unconfined Compression Component Set has a 1,000lbf Load Cell and 2in travel Displacement Transducer that connect to the included HM-418 two-channel Digital Readout. A Transducer Bracket and 2.8x0.25in Plastic Discs are also included. The self-contained HM-418 transfers load and displacement data via the mini USB port to common spreadsheet applications on user's computer with included software. Data can be used to create printable graphs. The software is compatible with Windows® XP and newer operating systems. The Readout shows real-time data on the large, bright vacuum fluorescent display. The front panel keys allow instant taring of either channel peak reading on the selected channel and entry of calibration factors during set up.

Unconfined Compressive Strength Test Systems	
Pro-Loader Load Frame, 0.001—0.1in/min Strain Rate	HM-396
Pro-Loader Load Frame, 0.0001—0.3in/min Strain Rate	HM-397
Pro-Loader Load Frame, 0.00001—0.29999in/min Strain Rate	HM-397B
Pro-Loader Load Frame, 20,000lbf, 0.00001—0.29999in/min Strain Rate	HM-399
Pro-Loader II Load Frame, 0.02—2.0in/min Strain Rate	HM-398
Accessories	
Analog Unconfined Compression Component Set	HMA-683
Digital Unconfined Compression Component Set	HMA-683D
Rolling Load Frame Cart	HMA-94

Find Estimated Ship Weights for all our products in the Ship Weight Index

HM-353 shown with HMA-83E

MA-333



HMA-725

HMA-727

HMA-89

DEAD-WEIGHT CONSOLIDATION LOAD FRAME

ASTM D2435, D4546; AASHTO T 216

The Dead-Weight Consolidation Load Frame from Karol-Warner is a compact table top unit with 48tsf (4597kPa) capacity for application of loads in stress-controlled consolidation testing of soil specimens. The Load Frame is simple and efficient to use and the advanced design allows instantaneous loading with minimal impact. A counterbalanced beam assembly allows 9:1, 10:1 or 11:1 beam ratios for wider selection of loads with weight sets. Locating pins on the top platform precisely center the consolidometer for loading. The loading platform has vertical x horizontal clearance of 5.25x6.38in (133x161mm) and accepts Consolidometers for specimen sizes up to 3in (76.2mm).

Rugged anodized aluminum plate is used for corrosion resistance in harsh laboratory environments. Vertical rods and beam support rods are made from stainless steel. Weight Sets are purchased separately in pound or kilogram versions. The Pound Weight Set is configured for convenient loading in tons/ft² (tsf) for a 2.5in (63.5mm) specimen when a 10:1 beam ratio is used. Consolidometers and Analog or Digital Dial Indicators are purchased separately. Order HMA-89 Load Frame Stand if a free-standing unit is desired. **Product Dimensions:** 8x32x20in (203x812x508mm), WxDxH.

Dead-Weight Consolidation Load Frame	
Dead-Weight Consolidation Load Frame	HM-353
Accessories	
Load Frame Stand for HM-353	HMA-89
Dial Indicator, 0.5in x 0.0001in	MA-333
Digital Dial Indicator, 0.6in x 0.0001in	MA-363

Kilogram Weight Sets

Model	Total Mass	Total Load at 10:1 Beam Ratio	Included Weights		
			1kg	4kg	8kg
HMA-730	32kg	320kg	4	3	2
HMA-725	64kg	640kg	4	5	5
HMA-731	88kg	880kg	4	5	8

Pound Weight Sets

Model	Total Mass	Total Load at 10:1 Beam Ratio[1]	Included Weights					
			0.852lb (1/8tsf)	1.704lb (1/4tsf)	3.409lb (1/2tsf)	6.818lb (1tsf)	13.635lb (2tsf)	27.270lb (4tsf)
HMA-727	54.5lb	545lbf (8tsf)	2	1	1	1	1	1
HMA-732	109.1lb	1,091lbf (16tsf)	2	1	1	1	1	3
HMA-729	218.2lb	2,182lbf (32tsf)	2	1	1	1	1	7

[1]tsf values indicate force applied to a 2.50in diameter specimen using a 10:1 beam ratio.

VIDEO ONLINE

HM-354 shown with HMA-83E & MA-333

GILSON COMPANY, INC.

Manufactured in cooperation with
Karol•Warner

MA-333

MA-363

CONBEL™ CONSOLIDATION LOAD FRAMES
ASTM D2435, D4546; AASHTO T 216

One-dimensional consolidation testing of soils provides information for geotechnical engineers to calculate expected settlement of structures and pavements. Karol-Warner's exclusive CONBEL™ Consolidation Frames with pneumatic loading meet the most stringent demands of soil testing labs.

CONBEL™ Load Frames are available in three different load capacities. All instantaneously apply and maintain loads for precision consolidation testing and feature low-load functionality for precision application of small confining loads. Loads are applied pneumatically and maintained by a precision pressure regulator. Small cabinet footprint saves valuable bench space. These self-contained devices display applied loads through digital displays and use precision pressure regulators and pressure transducers with a linearity of ±0.1%.

The 1in (25.4mm) thick aluminum platforms have adjustable centering pads and are designed to hold any consolidation ring up to 7.25in (184mm) diameter. Platform clearance is 8.25x7.75in (210x197mm), WxH. Stainless steel vertical rods support the cross-head and dial gauge. Sturdy, enamel-coated steel cabinets protect the unit. One HMA-81 Loading Ball is included with each load frame. Fixed or Floating-Ring Consolidometers and a Dial Indicator are required and purchased separately. An air compressor is required for operation, and must be supplied by the user. **Product Dimensions:** 20x14.5x20.5in (508x368x521) WxDxH.

HM-356 CONBEL™ Pneumatic Consolidation Load Frame has capacity to 16tsf (1,532kPa) and requires a minimum of 62psi (4.3bar) of compressed air.

HM-354 CONBEL™ Pneumatic Consolidation Load Frame has capacity to 32tsf (3,064.3kPa) and requires a minimum of 123psi (8.5bar) of compressed air.

HM-355 CONBEL™ Pneumatic Consolidation Load Frame has capacity to 64tsf (6,128.7kPa) and requires a minimum of 188psi (13bar) of compressed air.

CONBEL™ Consolidation Load Frames	
CONBEL™ Pneumatic Consolidation Load Frame 16tsf, 110V/60Hz	HM-356
220V/50Hz	HM-356F
CONBEL™ Pneumatic Consolidation Load Frame 32tsf, 110V/60Hz	HM-354
220V/50Hz	HM-354F
CONBEL™ Pneumatic Consolidation Load Frame 64tsf, 110V/60Hz	HM-355
220V/50Hz	HM-355F
Accessories	
Dial Indicator, 0.5in x 0.0001in	MA-333
Digital Dial Indicator, 0.6in x 0.0001in	MA-363

Find Estimated Ship Weights for all our products in the Ship Weight Index

HMA-83E

HMA-84E

HMA-83E components

HMA-84E components

Consolidometers & Accessories

Description	Consolidometer	Cutting Sample Rings	Calibration Disc	Top Porous Stone	Bottom Porous Stone
Fixed-Ring Consolidometers by Karol Warner load the specimen from the top with the base of the sample ring fixed in place. An acrylic inundation ring is attached to a stainless steel base. Stainless steel sample rings have built-in cutting edges for efficient sample preparation. Cutting rings are 1in (25.4mm) high, except 50mm and 2in diameter units with 0.75in (19mm) height. Clamping rings are fitted with lifting knobs for easy removal after the test. Cutting sample ring, loading pad, attached acrylic inundation ring, top and bottom porous stones and load-bearing ball are included. Components and accessories are also available separately. These Consolidometers fit Karol Warner Consolidation Load Frames as well as most other manufacturer's units.					
50.0mm (1.969in) Fixed-Ring Consolidometer	HMA-83A	HMA-90A	HMA-88A	GSA-207	GSA-230
2.0in (50.8mm) Fixed-Ring Consolidometer	HMA-83B	HMA-90B	HMA-88B	GSA-210	GSA-230
60.0mm (2.36in) Fixed-Ring Consolidometer	HMA-83C	HMA-90C	HMA-88C	GSA-212	GSA-230
2.42in (61.5mm) Fixed-Ring Consolidometer	HMA-83D	HMA-90D	HMA-88D	GSA-216	GSA-230
2.5in (63.5mm) Fixed-Ring Consolidometer	HMA-83E	HMA-90E	HMA-88E	GSA-219	GSA-230
70.0mm (2.756in) Fixed-Ring Consolidometer	HMA-83F	HMA-90F	HMA-88F	GSA-222	GSA-230
75.0mm (2.95in) Fixed-Ring Consolidometer	HMA-83G	HMA-90G	HMA-88G	GSA-226	GSA-230
3.0in (76.2mm) Fixed-Ring Consolidometer	HMA-83H	HMA-90H	HMA-88H	GSA-228	GSA-230
100.0mm (3.94in) Fixed-Ring Consolidometer	HMA-83L[1]	HMA-90L	HMA-88L	GSA-231	GSA-231
4.0in (101.6mm) Fixed-Ring Consolidometer	HMA-83J[1]	HMA-90J	HMA-88J	GSA-232	GSA-232
Floating-Ring Consolidometers by Karol Warner transfer force to the specimen through both the top and bottom. The sample ring is not attached to the base, but supported by the friction of the specimen. Consolidometers have a stainless steel base with attached acrylic see-through inundation ring. The units include a stainless steel sample ring with cutting edge, load pad, load bearing ball, and top and bottom porous stones. Models are designed to fit most manufacturer's testing units					
50.0mm (1.97in) Floating Ring Consolidometer	HMA-84A	HMA-90A	HMA-88A	GSA-207	GSA-207
2.0in (50.8mm) Floating Ring Consolidometer	HMA-84B	HMA-90B	HMA-88B	GSA-210	GSA-210
2.42in (61.47mm) Floating Ring Consolidometer	HMA-84D	HMA-90D	HMA-88D	GSA-216	GSA-216
2.50in (63.5mm) Floating Ring Consolidometer	HMA-84E	HMA-90E	HMA-88E	GSA-219	GSA-219
70.0mm (2.76in) Floating Ring Consolidometer	HMA-84F	HMA-90F	HMA-88F	GSA-222	GSA-222

[1]100.0mm and 4.0in Consolidometers are compatible only with Karol-Warner CONBEL™ HM-354, HM-355, and HM-356 Consolidation Load Frames

HM-564

HM-567

HM-562 shown with MA-333

BASIC SWELL CONSOLIDOMETERS

Self-contained Basic Swell Consolidometers are used for swell and expansion tests on soil specimens of 2.44 or 2.50in (62 or 63.5mm) diameters. The simple method provides rapid results to predict swell potential for soils with no need for a separate loading frame. Specimens are prepared by compacting soil into a stainless steel compaction ring. The ring with specimen is placed in the Consolidometer between two porous stones and loaded to 100psft (4.79kPa) with the Loading Weight. A dial indicator is set to the initial sample height and the Consolidometer is filled with water to begin the test.

The compact, all-in-one design includes the stainless steel base, a Compaction Specimen Ring and Loading Weight, Porous Stones, an acrylic ring to contain the water, and an adjustable dial indicator holder. Loading weights and Porous Stones are also available separately as replacements. A dial indicator is required and purchased separately. Additional stainless steel Compaction Rings can be purchased to enhance sample preparation efficiency. The HMA-836 Permeability Compaction Hammer is used to compact soil samples into a Compaction Ring secured in a Compaction Base and Collar assembly. The drop-hammer is supplied with 100g (0.22lb) and 1kg (2.2lb) sliding weights and a 2in (51mm) diameter tamping foot. Drop Height is adjustable from 4 to 8in (102 to 203mm). Compaction Base and Collar for each specimen size and the Compaction Hammer are all purchased separately for sample preparation. **Product Dimensions:** 5x2.5in (127x63.5mm) Dia.xH.

Basic Swell Consolidometer	
Basic Swell Consolidometer, 2.44in	HM-564
Basic Swell Consolidometer, 2.50in	HM-565
Accessories	
Dial Indicator, 0.5inx0.0001in	MA-333
Compaction Base & Collar for 2.44in Dia. Samples	HMA-834D
Compaction Base & Collar for 2.50in Dia. Samples	HMA-834E
100psf Loading Weight, 2.44in Diameter	HMA-835D
100psf Loading Weight, 2.50in Diameter	HMA-835E
Compaction Ring, 2.44x1.0in Dia.xH	HMA-841
Compaction Ring, 2.50x1.0in Dia.xH	HMA-842
Permeabilty Compaction Hammer	HMA-836
Top Porous Stone for HM-564, 2.405x0.25in	GSA-217
Top Porous Stone for HM-565, 2.485x0.25in	GSA-219
Bottom Porous Stone for HM-564 or HM-565	GSA-230

BACK PRESSURE CONSOLIDOMETER
ASTM D2435; AASHTO T 216

The Back Pressure Consolidometer allows back pressure saturation and pore pressure measurements of soil specimens during one-dimensional consolidation testing. The Consolidometer is mounted in a conventional consolidation device, such as the Karol-Warner CONBEL™ pneumatic Load Frame for loading, and connected to an HM-350M Master Control Panel for regulation of cell pressures. Permeability values can also be determined. The HMA-521 Digital Pore Pressure Gauge is used to determine real-time specimen pore pressure values.

The HM-567 Consolidometer transfers loads to the specimen via a stainless steel piston that passes through a top cap with sealed, low-friction linear bearings. Ports with connectors allow for application of confining pressures up to 200 psi, and a bottom port monitors pressure and flow rate. The unit tests 2.50x1.0in (63.5x25.4mm) specimens and includes a sample ring with built-in cutting edge for efficient sample preparation. Also included are two Porous Stones, flexible tubing, and connectors for pressure and pore pressure lines. Sample Rings and Porous Stones are also available separately for streamlined sample preparation. An optional stainless steel Calibration Disc is used to measure total system deflection under applied load. **Product Dimensions:** 5.5x6.7in (140x170mm) Dia.xH.

Back Pressure Consolidometer	
Back Pressure Consolidometer, 2.5in (63.5mm) Diameter	HM-567
Accessories	
Calibration Disc for 2.5in (63.5mm) Consolidometers	HMA-88E
Porous Stones, 2.485x0.25in (63.1x6.4mm)	GSA-219
Cutting Sample Ring, 2.5in (63.5mm) I.D.	HMA-90E

EXPANSION INDEX CONSOLIDOMETER
ASTM D4829

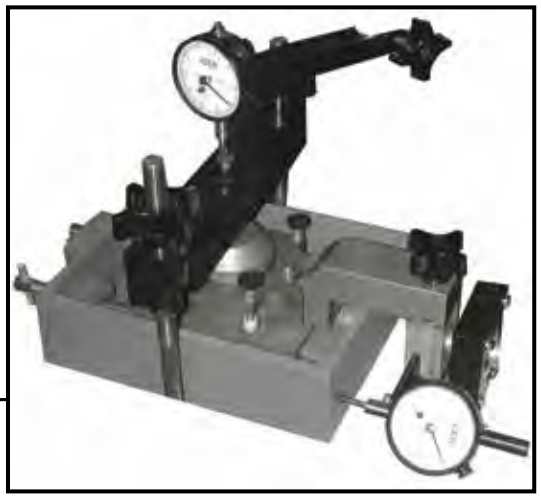
The Expansion Index test is a simple and effective method for predicting swelling potential of compacted soils. A soil specimen is moisture conditioned to 50% saturation, and compacted into a 4in (102mm) diameter mold. After a confining load is applied, the specimen is immersed in water, and volumetric swell is recorded for up to 24 hours. The expansion index, or EI, is calculated from these measurements. A high EI value indicates a need to design structures and pavements for expansive soils.

The unique, self-contained design does not require a separate consolidometer loading device to mount, load, and saturate the specimen for testing. After compaction into the 4x1in (101.6x25.4mm) IDxH stainless steel ring, the specimen is placed in the HM-562 Consolidometer with a closely fitting, air-dry porous stone at each end and loaded with the stainless steel weight. After consolidating for ten minutes, the assembly is immersed in distilled water to initiate the test.

All immersed parts are either stainless steel or anodized aluminum for durability and corrosion resistance. Included are an anodized aluminum base and collar with stainless steel hold-down rods, stainless steel specimen ring, 12.6lb (5.7kg) loading weight, and porous stones. MA-363 0.6inx0.0001in digital dial or MA-333 0.5in range x 0.0001in resolution mechanical dial indicator is required for the test (purchased separately). Additional Porous Stones, Stainless Steel Specimen Rings, and Loading Weights are purchased for more efficient sample preparation. **Product Dimensions:** 6x11in (152x279mm) Dia.xH.

Expansion Index Consolidometer	
Expansion Index Consolidometer	HM-562
Accessories	
0.5x0.0001in Dial Indicator	MA-333
Digital Dial Indicator, 0.6inx0.0001in	MA-363
Porous Stones, 3.99x0.5in Dia.xH	GSA-331A
Stainless Steel Specimen Ring	HMA-665
Stainless Steel Loading Weight	HMA-667

Manufactured in cooperation with
Karol•Warner



HM-381

PNEUMATIC DIRECT/RESIDUAL SHEAR MACHINES
ASTM D3080; AASHTO T 236

Gilson Pneumatic Direct/Residual Shear Machines are tabletop units manufactured Gilson Pneumatic Shear Machines are manufactured in cooperation with Karol-Warner and provide direct or direct/residual shear values for evaluating the strength and stability of soils. Soil specimens are carefully trimmed into a Direct Shear Box, which is horizontally divided, allowing independent movement of the upper and lower halves. A vertical confining load is applied to the specimen, and a horizontal shear force is applied to the lower half of the shear box, while the upper half remains stationary. After direct shear failure has been measured, selected models allow the force direction to be reversed to determine residual shear values.

Pneumatic Shear Machines use Karol-Warner's proven CONBEL™ loading system to apply vertical confining pressures to the specimen. Confining loads are applied pneumatically using a small, rolling diaphragm piston for light loads of 4—100lbf (0.018—0.44kN) and a larger diameter piston for loads up to 1,500lbf (6.67kN). This design increases the sensitivity and accuracy of the light load system. Loading is controlled using the precision regulator with included calibration chart. Load settings are displayed digitally and are accurate to ±0.25%. Both pneumatic shear machines are completely self-contained, and the need for loading weights is eliminated.

A stepper motor controls strain rates to ±1% from 0.0001—0.3in/min (0.0025—7.62mm/ min) and is easily set with digital thumb wheel controls. Total shear capacity is 1,500lbf (6.67kN). Drainage plates and a water chamber constructed of Teflon-coated, anodized aluminum for corrosion resistance are included. Round or Square Direct Shear Boxes are available in a variety of sizes and are purchased separately. HMA-739 Shear Box Counterbalance offsets top-half weight of Shear Boxes with specimen dimensions up to 2.5in (63.5mm) and is also purchased separately. Inquire for Counterbalances for larger sizes. An optional Rolling Cart for Pneumatic Shear Machines with sturdy all-steel construction offers easy portability in the lab. HM-739 horizontal and vertical Linear Variable Displacement Transducers with 1in (25.4mm) range and 0.0001in (0.0025mm) resolution are available separately to replace analog Dial Indicators if desired. **Product Dimensions:** 36x14.5x54in (914x368x1,372mm) WxDxH

HM-381 Standard Pneumatic Direct Shear Machine uses a S-Type Load Cell connected to a Two-Channel Digital Readout to measure and display load values. Consolidation and direct shear displacement are measured using analog dial indicators.

HM-382 Digital Pneumatic Direct/Residual Shear Machine also includes a S-Type Load Cell to measure shear load but adds Linear Variable Displacement Transducers (LVDT's) to measure horizontal and vertical displacement, and functionality to perform residual shear testing. A Four-Channel Digital Readout processes and displays measured values. Mini USB data output transfers data to user's computer in ASCII format.

Pneumatic Direct & Direct/Residual Shear Machines	
Standard Pneumatic Shear Machine, 110V/60Hz	HM-381
220V/50Hz	HM-381F
Digital Pneumatic Shear Machine, 110V/60Hz	HM-382
220V/50Hz	HM-382F
Accessories	
Rolling Cart for HM-381 and HM-382	HMA-95
Shear Box Counterbalance	HMA-739
1in Linear Digital Displacement Transducer	HM-739

HM-380R shown with HM-419 and HM-739

Manufactured in cooperation with
Karol•Warner

HMA-735, HMA-745 & HMA-765

DEAD-WEIGHT DIRECT & DIRECT/RESIDUAL SHEAR MACHINES

ASTM D3080; AASHTO T 236

- **Practical, self-contained design uses dead-weight loading.**
- **Simple operation and precise controls.**
- **Options for computerized data collection.**

Dead-Weight Direct and Direct/Residual Shear Machines by Karol-Warner are motorized units for direct and direct/residual shear testing of soil samples and use a 10:1 dead-weight beam loading system to apply vertical confining pressures. These compact, self-contained units have similar designs, but differ in instrumentation for data measurement and collection. Both are built for harsh laboratory environments and require little floor space.

Strain rate is precisely controlled from 0.0001—0.3in/min (0.0025—7.62mm/min) ±1% by an advanced stepper-motor drive system. Settings are easily adjusted using digital thumb wheel controls. Maximum shear displacement is 0.8in (20.3mm). Vertical load capacity is 1,411lb (640kg) and maximum horizontal shear force is 1,500lbf (6,672N). A solid 1.25in (32mm) base for the Shear Box assembly is mounted on a sturdy painted steel cabinet and stand with heavy-duty casters for easy mobility. Drainage plates, loading block, and a water chamber of Teflon coated anodized aluminum are included. Round or Square Direct Shear Boxes are available in a variety of sizes and are purchased separately. HMA-739 Shear Box Counterbalance offsets top-half weight of Shear Boxes with specimen dimensions up to 2.5in (63.5mm) and is also purchased separately. Inquire for Counterbalances for larger sizes. Weight Sets are purchased separately, and at least one US or Metric weight set is required for proper operation. **Product Dimensions:** 36x14.5x54in (914x368x137mm), WxDxH.

HM-380R Direct Shear Machine features a S-Type Load Cell with Digital Readout to display shear force, and Analog Dial Indicators to measure vertical and shear displacement. Options to upgrade the HM-380R for partial or complete electronic measurement and data collection include HM-739 Linear Variable Displacement Transducers (LVDT's) to measure horizontal and vertical displacement. The LVDT's have 1in (25.4mm) range with 0.0001in (0.0025mm) resolution and must be connected to HM-418 Two-Channel or HM-419 Four-Channel Digital Readouts. The Readouts show real-time values on a large vacuum fluorescent display and transfer load and displacement data via a mini USB port to a computer with Windows® XP or newer operating system. The HM-419 model provides an additional channel to route force measurements from the Load Cell to a computer. All are purchased separately.

HM-380D Direct/Residual Shear Machine performs both direct and residual shear measurements and is configured for complete electronic measurement and data collection. Vertical consolidation, shear force, and horizontal displacement values are all processed through a four-channel Digital Readout and routed to the user's Windows-based computer via a mini USB port. Data can be used for analysis and to create printable graphs. Software is included to plot test progress and import data to an Excel spreadsheet. The digital display shows current values on selected channels.

Dead-Weight Direct& Direct/Residual Shear Machine	
Direct/Residual Shear Machine, 115V/60Hz	HM-380R
230V/50Hz	HM-380RF
Direct/Residual Shear Machine, 115V/60Hz	HM-380D
230V/50Hz	HM-380DF
Accessories	
32kg Weight Set, Maximum Load 320kg	HMA-730
64kg Weight Set, Maximum Load 640kg	HMA-725
88kg Weight Set, Maximum Load 880kg	HMA-731
54.5lb Weight Set, Maximum Load 545lb	HMA-727
109.1lb Weight Set, Maximum Load 1,091lb	HMA-732
218.2lb Weight Set, Maximum Load 2,182lb	HMA-729
Shear Box Counterbalance	HMA-739
Linear Variable Displacement Transducer, 1in (25.4mm)	HM-739
Two-Channel Digital Readout	HM-418
Four-Channel Digital Readout	HM-419

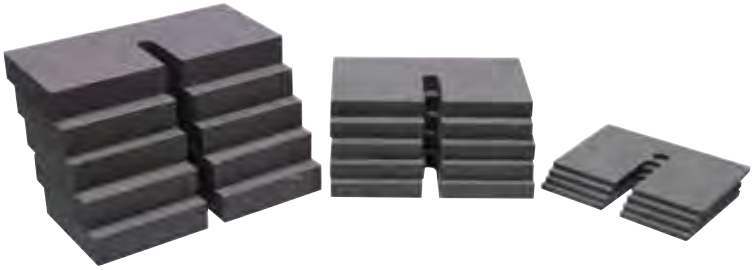
HMA-745

HMA-735

HMA-765

HMA-764S

GSA-219



HMA-725

HMA-727

DIRECT SHEAR BOXES & ACCESSORIES
ASTM D3080; AASHTO T 236

Direct Shear Boxes are designed for use in Karol-Warner and other dead-weight or pneumatic direct shear machines for determining direct shear values. Precision machined Shear Boxes are horizontally divided to allow opposing shear forces to be applied to soil specimens that have been carefully trimmed to fit. Models are available in a variety of sizes to test round or square specimens, and have fine adjustments to maintain required clearances. Shear Boxes are constructed of anodized aluminum with Teflon finish for corrosion resistance. Stainless steel Cutters with a built-in cutting edge are included to trim specimens to exact size for testing. Two Porous Stones are also included with each Shear Box. These components are also available separately for each size to enhance sample preparation efficiency. Extruders are purchased separately in each size for easy removal of tested samples.

Direct Shear Boxes & Accessories

Description	Shear Box	Cutters	Extruders	Porous Stones
Round Direct Shear Boxes				
50mm (1.97in) Diameter	HMA-733M	HMA-743M	HMA-763M	GSA-208
2.0in (50.8mm) Diameter	HMA-733	HMA-743	HMA-763	GSA-210
60mm (2.36in) Diameter	HMA-734M	HMA-744M	HMA-764M	GSA-213
2.42in (61.4mm) Diameter	HMA-734	HMA-744	HMA-764	GSA-217
2.5in (63.5mm) Diameter	HMA-735	HMA-745	HMA-765	GSA-219
100mm (3.94in) Diameter	HMA-737	HMA-747	HMA-767	GSA-231
4in (101.6mm) Diameter	HMA-736	HMA-746	HMA-766	GSA-232
Square Direct Shear Boxes				
50mm (1.97in) Square	HMA-733MS	HMA-743MS	HMA-763MS	GSA-208S
2.0in (50.8mm) Square	HMA-733S	HMA-743S	HMA-763S	GSA-210S
60mm (2.36in) Square	HMA-734MS	HMA-744MS	HMA-764MS	GSA-213S
2.42in (61.4mm) Square	HMA-734SA	HMA-744SA	HMA-764SA	GSA-217S
2.5in (63.5mm) Square	HMA-735S	HMA-745S	HMA-765S	GSA-219S
100mm (3.94in) Square	HMA-737S	HMA-747S	HMA-767S	GSA-231S
4in (101.6mm) Square	HMA-736S	HMA-746S	HMA-766S	GSA-232S

DIRECT SHEAR DEAD-WEIGHT SETS
ASTM D3080; AASHTO T 236

Weight Sets for the HM-380R Dead-Weight Direct Shear machine apply vertical loads to the specimen through a loading beam with 10:1 ratio, and are purchased separately in pound or kilogram versions. The Pound Weight Set is configured for convenient loading in tons/ft² (tsf) units for a 2.5in (63.5mm) specimen when a 10:1 beam ratio is used.

Direct Shear Dead-Weight Sets

Kilogram Weight Sets

Model	Total Mass	Total Load at 10:1 Beam Ratio	Included Weights		
			1kg	4kg	8kg
HMA-730	32kg	320kg	4	3	2
HMA-725	64kg	640kg	4	5	5
HMA-731	88kg	880kg	4	5	8

Direct Shear Dead-Weight Sets

Pound Weight Sets

Model	Total Mass	Maximum Load[1]	Included Weights					
			0.852lb (1/8tsf)	1.704lb (1/4tsf)	3.409lb (1/2tsf)	6.818lb (1tsf)	13.635lb (2tsf)	27.270lb (4tsf)
HMA-727	54.5lb	545lbf (8tsf)	2	1	1	1	1	1
HMA-732	109.1lb	1,091lbf (16tsf)	2	1	1	1	1	3
HMA-729	218.2lb	2,182lbf (32tsf)	2	1	1	1	1	7

[1]tsf values indicate applied load to a 2.50in diameter specimen at a 10:1 beam ratio.

HM-416

HM-430D

HM-740

Load & Displacement Indicators

Description	Type	Model
Load and Displacement Readout Kits include HM-418 Two-Channel Readout, Load Cell, and Linear Variable Displacement Transducer. HM-418 transfers load and displacement data via the mini USB port to common spreadsheet applications on user's computer with included software. Data can be used to create printable graphs. The software is compatible with Windows® XP and newer operating systems. The Readout shows real-time data on the large, bright vacuum fluorescent display. The front panel keys allow instant taring of either channel peak reading on the selected channel and entry of calibration factors during set up.	1,000lbf Load Cell and 2in Displacement Transducer Kit 2,000lbf Load Cell and 2in Displacement Transducer Kit 5,000lbf Load Cell and 2in Displacement Transducer Kit 10,000lbf Load Cell and 2in Displacement Transducer Kit	HM-413 HM-414 HM-415 HM-416
Load Cells are machined of stainless or nickel alloy plated steel and are designed to determine compression or tension measurements. Loads are measured to an accuracy of ±1.0% of full scale. The "S" type load cells are available in seven different capacities ranging from 500—20,000 lbf. Load cell dimensions range from 2.5x2.0in—7x5in (63.5x51mm—178x127mm), WxH depending on capacity of the load cell. Threaded mounting holes on top and bottom of the load cells vary in size; 500—2,000lbf = 1/2inx20tpi, 5,000—10,000lbf = 3/4inx16tpi, 20,000lbf = 1inx144pi.	**Load Capacity:** 500lbf 1,000lbf 1,500lbf 2,000lbf 5,000lbf 10,000lbf 20,000lbf	 HM-421D HM-422D HM-424D HM-425D HM-428D HM-430D HM-438D
Linear Variable Displacement Transducers are available in two different ranges, 1in and 2in. The linear variable displacement transducers are constructed using anodized aluminum housing, stainless steel actuating shaft with anti-rotation device and includes the industry proven double bearing system on both the actuator shaft and spring to reduce side load errors. Each transducer has a repeatability of 0.002mm, and includes two fixing clamps, screws and gauging head with hardened ball point.	**Range:** 1in 2in	 HM-739 HM-740
Digital Readouts are available with two or four channels. Both units are self-contained with large real-time, illuminated display and may be paired with load cells and digital transducers listed below. A separate analog to digital (A/D) converter for each channel produces simultaneous readings without time-delay errors. The included software exports data via mini USB port to Excel or similar programs for review, analysis and plotting of graphs. Compatible with Windows® XP and newer operating systems.	Two-Channel Digital Readout Four-Channel Digital Readout	HM-418 HM-419

HM-418

HM-419

MA-334

MA-366

MAA-83

HMA-338

HM-430

Load & Displacement Indicators

Description	Type		Model
Digital Dial Indicators are in/mm switchable and include a "hold" feature which allows the user to lock peak readings on the digital display. All are supplied with batteries designed to provide 250 hours of use. Order MAA-83 cable for digital output from dial indicator to allow data to be uploaded to computer. Order Extended Contact Points and Magnetic Gauge Holder separately. **Product Dimensions:** 2.5x2.25x5in (64x57x127mm) DiaxDxH.	**Range:** 0.25in 0.25in 0.6in 0.6in 1.0in 1.0in	**Resolution:** 0.0001in 0.00005in 0.0001in 0.00005in 0.0001in 0.00005in	 MA-360 MA-361 MA-363 MA-364 MA-366 MA-367
Single-Gauge USB Cable & Software collects output data from one Digital Dial Indicator and routes to a computer. Logging intervals and measuring units are selectable, and .csv files can be converted to Excel spread sheets for later analysis and reporting.	—	—	MAA-83
Mechanical Dial Indicators have 2.25in diameter, continuous clockwise dial with one hundred divisions per revolution and a revolution counter. Low friction mechanisms react instantly with contact pressure. Backs rotate 90° to adapt to horizontal and vertical mounting. "B" models feature brake to hold maximum position and are recommended for most applications. Order Extended Contact Points and Magnetic Gauge Holder separately. **Product Dimensions:** 2.25x2x5.5in (57x51x140mm) DiaxDxH.	**Range:** 0.2in 0.2in 1.0in 1.0in 25mm 25mm	**Resolution:** 0.0001in 0.0001in 0.001in 0.001in 0.01mm 0.01mm	 MA-330 MA-330B MA-334 MA-334B MA-346 MA-346B
Dial Indicator Accessories: Magnetic Gauge Holder uses a powerful Alnico magnetic base for secure fastening of dial indicators to round and flat surfaces. Thumb screw allows easy zeroing of indicators once positioned. Extended contact points adapt dial indicators to various configurations.	Magnetic Gauge Holder 0.5in Ext. Contact Points 1in Ext. Contact Points 1.5in Ext. Contact Points 2in Ext. Contact Points		HMA-338 MAA-70 MAA-72 MAA-74 MAA-76
Load Rings are machined from high strength aluminum alloy plate. Rings are designed for compression measurement only and allow for repeatable elastic deformation under varying loads. Loads are measured with an accuracy of ±0.5% using the included mechanical dial indicator (0.0001in resolution). Measurements are plotted on a calibration chart prior to shipment. The load rings are available in seven different capacities varying in capacity from 250—10,000lbf. Ring dimensions are 6.25in high x 1.0—2.0in thick depending on capacity of the ring. Mounting holes are 1/2in—20 threads per inch.	**Load Capacity:** 250lbf Load Ring 500lbf Load Ring 1,000lbf Load Ring 1,500lbf Load Ring 2,000lbf Load Ring 5,000lbf Load Ring 6,000lbf Load Ring 10,000lbf Load Ring		 HM-420 HM-421 HM-422 HM-424 HM-425 HM-427 HM-428 HM-430

helpfulhint

For accuracy, reliability and convenience, the new generation of digital dial indicators, displacement transducers, load cells, and displays are hard to beat. They are easy to set-up and use, and their data output options simplify documentation in the lab. MAA-83 Cable & Software package is easy to set up and use for logging measurement values from a single Digital Dial Indicator. Inquire for multiple gauge logging systems.

HM-384

GILSON COMPANY, INC

Manufactured in cooperation with
Karol•Warner

HM-384 shown with Compaction Table positioned to Load Specimen

HIGH CAPACITY GEOSYNTHETIC DIRECT SHEAR MACHINE
ASTM D5321, D6243

The High Capacity Direct Shear Machine is specifically designed to measure the total resistance to shear of large, 12in (305mm) square soil samples or within a soil/geosynthetic specimen. These devices feature the exclusive Karol-Warner CONBEL™ system for loading the large soil or soil/geosynthetic samples. The specimens are mounted in a two-piece shear box assembly, divided in half horizontally. The bottom half is held securely in place and a vertical confining force is applied. Horizontal force is then directed against the upper half of the box to shear the specimen.

Shear loads are applied using two pneumatic pistons. Initial loads are applied using a small diameter rolling diaphragm piston, for greater accuracy and sensitivity of lighter loads, up to 4.4kN (1,000lbf) of force. The larger piston generates loads up to 45kN (10,000lbf), or 90kN (20,000lbf) depending on unit selected. Horizontal shear rate from 0.0508—5.08mm (0.002—0.2in) per minute is easily set with thumbwheels on the control panel. Limit switches control the home position and limit total horizontal displacement to 102mm (4in). Vertical loading is controlled through a precision regulator, using the included calibration chart to set the required pressure. Loads are displayed to two decimal places on the digital readout, and are accurate to ±0.25%. Consolidation and shear displacement are measured by Linear Variable Displacement Transducers. Shear load is measured from a load cell attached to the water chamber. The four-channel readout displays all these values while directing data in ASCII format through the mini USB serial port to the user's computer. 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 box assembly to and from the water chamber is simplified using the Compaction Table. Pulling the loaded shear boxez 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.

HM-384 and HM-385 High Capacity Direct Shear Machines are capable of applying maximum piston loads of 45kN (10,000lbf), and 90kN (20,000lbf) respectively. Both are are ruggedly designed for harsh lab environments. All steel parts are powder-coated, and hard-coat anodized aluminum components resist corrosion. Casters on the machine and Compaction Table make for easy portability in the lab. Compaction Table and Top and bottom Shear Rings are included. Top ring is 12x12x4in (305x305x102mm), and bottom ring is 12x16x4in (305x406x102mm). Software and data cable is also included. A 120psi (827kPa) source of clean, dry, compressed air is required for operation. Inquire for customization options for specimen sizes and operating options. Operates on 110V/60Hz. For units operating on 220-240V/50Hz, add "F" suffix to model number. Weight is 840lb (381kg). **Product Dimensions:** 43x23x40in (1,090x584x1,020mm), WxDxH.

High Capacity Geosynthetic Direct Shear Machine	
High Capacity Geosynthetic Direct Shear Machine, 45kN, 110V/60Hz	HM-384
High Capacity Geosynthetic Direct Shear Machine, 90kN, 110V/60Hz	HM-385

Find Estimated Ship Weights for all our products in the Ship Weight Index

SOIL CEMENT TESTING SYSTEMS
ASTM D1632, D1633

Soil cement is a compacted mixture of soil, Portland cement, and water widely used as a cement-stabilized base for pavement applications. In the ASTM D1633 procedure, molded cylinders for compressive strength testing are prepared by method A, using common soil moisture-density (Proctor) equipment, or method B, using Gilson's HM-228 Dropping-Weight Compactor apparatus and 2.8in (71mm) diameter molds.

A Karol-Warner Pro-Loader Load Frame outfitted with an Analog or Digital Soil Cement Component Set is used for compressive strength determinations of method A or B specimens. The Component Sets measure applied load and sample deformation, and feature a 4in (101.6mm) diameter top swivel platen. For maximum versatility, all Pro-Loader Frames can be equipped with selected Component Sets to perform specific test methods. All Load Frames feature daylight openings of 11.9x37.3in (302x947mm) WxH. The frames have sturdy 14-gauge painted steel cabinets, and 3/4hp DC motors with controllers that precisely regulate strain rates to ±1% of set point. Horizontal cross-head heights are quickly changed using adjusting nuts. High-speed jog controls rapidly position the platen for efficient loading. Coarse-threaded 1.25in (32mm) high strength vertical rods are plated for corrosion resistance. Optional Rolling Cart for Load Frame is sturdy steel with casters and makes positioning easy. Platen diameter is 8in (32mm). Units operate on 115V/60Hz power supplies. Add "F" suffix to model numbers to order units operating on 230V/50Hz. **Product Dimensions:** 18x29x54.5in (457x737x1,384mm) WxDxH.

HM-396 Pro-Loader Load Frame features a of strain rate of 0.001—0.1in/min (0.0254—2.54mm/min). Capacity is 10,000lbf (44.5kN).

HM-397 Pro-Loader Load Frame has a wider range of strain rates. The micro-stepping drive controller also allows more precise control of loading rate. Strain Rate is 0.0001—0.3in/min (0.00254—7.62mm/min) with 10,000lbf (44.5kN) capacity.

HM-397B Pro-Loader Load Frame has the greatest strain rate sensitivity of any of our 10,000lbf (44.5kN) load frames. It can be used for the full range of soils laboratory applications and is ideal for ASTM D4767 consolidated/undrained triaxial tests on sensitive soils. The HM-397B features a strain rate range from 0.00001 to 0.29999in/min (0.000254 to 7.62mm/min).

HM-398 Pro-Loader II Load Frame has the highest overall strain rate to fit a wide range of test methods. Strain Rate is 0.02—2.0in/min (0.508—50.8mm/min) and capacity is 10,000lbf (44.5kN)

HM-399 Pro-Loader Load Frame is our highest-capacity Pro-Loader and features enhanced strain rate sensitivity. Micro-Stepping motor and controller offer the highest degree of precision for strain rate control. 0.00001 to 0.3in/min (0.000254 to 7.62mm/min). 20,000lbf (89kN) capacity.

Analog or Digital Soil Cement Component Sets feature high-quality instrumentation to measure load and deformation, and include the 4in (101.6mm) diameter swivel platen required for this test. Both sets are fully equipped for easy installation on Pro-Loader Load Frames. Fixtures and brackets are included for direct mounting to the frames.

Manufactured in cooperation with Karol•Warner

HM-397 shown with HM-430

HM-398 shown with HM-430D, HM-418 and HMA-94

HMA-687 Analog Soil Cement Component Set includes a 10,000lbf capacity Load Ring machined from high-strength aluminum alloy and supplied with a factory calibration chart. A 1x0.001in Mechanical Dial Indicator with low-friction mechanism, a steel Indicator Bracket, and 4in diameter Swivel Platen are also included.

HMA-687D Digital Soil Cement Component Set has a 10,000lbf Load Cell and 2in travel Displacement Transducer that connect to the included HM-418 two-channel Digital Readout. A Transducer Bracket and 4in diameter Swivel Platen are also included. The self-contained HM-418 with included software transfers data via the mini USB port to common spreadsheet applications on user's computer for analysis and creation of printable graphs. The software is compatible with Windows® XP or newer operating systems. The Readout shows real-time data on the large, bright vacuum fluorescent display. Front panel keys allow instant taring of either channel, peak reading on the selected channel, and entry of calibration factors during set up.

Soil Cement Testing Systems	
Pro-Loader Load Frame, 0.001—0.1in/min,115V/60Hz	HM-396
Pro-Loader Load Frame, 0.0001—0.3in/min, 115V/60Hz	HM-397
Pro-Loader Load Frame, 0.00001—0.29999in/min, 115V/60Hz	HM-397B
Pro-Loader II Load Frame, 0.02—2.0in/min, 115V/60Hz	HM-398
Pro-Loader Load Frame, 0.00001 to 0.3in/min, 115V/60Hz	HM-399
Accessories	
Analog Soil Cement Component Set, 10,000lbf capacity	HMA-687
Digital Soil Cement Component Set, 10,000lbf capacity	HMA-687D
Rolling Load Frame Cart	HMA-94

HM-228

HM-229

SOIL CEMENT COMPACTION APPARATUS
ASTM D1632, D1633

Soil Cement Compaction Apparatus prepares soil cement specimens for compressive strength testing using ASTM D1632 Method B. A pre-weighed sample of soil-cement mixture is consolidated into the mold assembly, first using a Tamping Rod, then a Dropping-Weight Compactor until the required length dimension is achieved.

HM-228 Dropping-Weight Compactor uses a 15lb (6.8kg) falling weight on a 0.75in (19mm) shaft guide to strike the top piston of the mold set. The Compactor base features a locating pin, assuring precise centering of the Test Mold Set. Drop height is controlled by a clip on the compactor shaft guide.

HM-229 Soil Cement Mold Set consists of a 2.8x9in (71x229mm) IDxH seamless steel mold, a 6in (152mm) mold extension collar, top and bottom pistons, a split spacer clip, and two aluminum 0.062in (1.54mm) separating discs. Additional HMA-122 Molds are recommended for more efficient specimen preparation and curing.

HMA-125 Tamping Rod is required for initial consolidation and sold separately. Rod dimensions: 20x0.5in (508x12.7mm) LxDia. HM-516 Gilson Sample Ejector is recommended for extraction of specimens from molds.

Soil Cement Apparatus	
Dropping-Weight Compactor	HM-228
Compression Test Mold Set	HM-229
Accessories	
2.8x9in Mold only	HMA-122
2.8x9in Mold w/ 6in Extension Collar	HMA-123
Top & Bottom Piston Set	HMA-124
Tamping Rod, 20in x 0.5in	HMA-125
Sample Ejector	HM-516

HM-530

HMA-410

HMA-110

HMA-120

HMA-111

MECHANICAL SOIL COMPACTORS

ASTM D558, D559, D560, D698, D1557, D1558; AASHTO T 99, T 134, T 135, T 136, T 180, T 220; CALIFORNIA 216

HM-530 Mechanical Soil Compactor automatically counts the number of hammer blows and shuts off when a preset number is reached. The Mechanical Soil Compactor brings big improvements in functional accuracy, ease of use, reliability, and safe operation to your laboratory. The HM-530 Compactor eliminates the repetitive operation of manual compaction hammers. Hammer blows are accurately counted and evenly distributed for each soil lift placed in the compaction mold. Automatic indexing of the turntable positions the mold for each new hammer drop. The simple and efficient chain-drive lift system employs a compensating mechanism to adjust hammer drop for soil thickness in the mold during compaction. Hammer mass is concentrated near the bottom for better transfer of energy to the soil specimen. This unit is a safe and efficient method for processing moisture-density samples, assuring uniform compaction and accurate, repeatable test results.

The Compactor can be used with the 4in (102mm) ID molds, 5.5lb (2.5kg) weight with 12in (305mm) drop. The HM-530 also accomodates the 6in (152mm) ID molds using either the standard 5.5lb (2.5kg) weight with 12in (305mm) drop or the modified 10lb (4.5kg) weight with 18in (457mm) drop. The standard 2in (51mm) hammer can be replaced by one of the same 3.14in^2 area, but with pie-shaped face to cover entire sample surface with 6in molds. The free-fall hammer adjusts easily from 5.5—10lb by addition of a surcharge weight.

The HM-530 includes a 2in (51mm) round, 5.5lb (2.5kg) hammer, a pie-faced hammer for use with 6in molds, and a surcharge weight to increase total hammer weight to 10lbs (4.5kg). 4in (102mm) and 6in (152mm) standard compaction molds, and a digital automatic counter with start/stop switching are also included. Electronic safety interlock automatically shuts down operation if the door is opened. **Product Dimensions:** 12.5x29.5x56in (318x749x1,422mm), WxDxH.

HMA-120 Calibration Kit is ordered separately to comply with ASTM D2168 Method B requirements and includes lead deformation apparatus, a micrometer, and fifty lead cylinders. Replacement lead cylinders are available as HMA-121.

HMA-410 Mold Safety Cage is ordered separately to fit new or existing machines. The cage offers additional protection from the rotating mold assembly during operation. To specify factory installation of the cage on a new compactor, order HMA-411.

Mechanical Soil Compactors	
Mechanical Compactor, 115V/60Hz	HM-530
230V, 50/60Hz	HM-530F
Accessories	
Compaction Mold, 4in (102mm) Std., 1/30ft^3	HMA-110
Compaction Mold, 4in (102mm) Split, 1/30ft^3	HMA-111
Compaction Mold, 6in (152mm) Std., 1/13ft^3	HMA-116
Compaction Mold, 6in (152mm) Split, 1/13ft^3	HMA-117
CBR Mold	BRA-60
LBR Mold	BRA-59
Stainless Steel Straightedge	HMA-135
Stainless Steel Straightedge, Graduated	HMA-135A
Calibration Kit	HMA-120
Lead Calibration Cylinders, pkg.100	HMA-121
Mold Safety Cage	HMA-410
Mold Safety Cage, Factory Installed	HMA-411

HM-550 HM-551

MANUAL COMPACTION HAMMERS

ASTM D558, D559, D560, D698, D1557, D1558; AASHTO T 99, T 134, T 135, T 136, T 180

These sliding drop hammers are used to compact soil samples for moisture-density relationship (Proctor) testing. Gilson Hammers feature 100% stainless steel construction for maximum corrosion resistance and long service life. Both models have a 2in (51mm) circular face. Hammer masses are enclosed in guide sleeves with vent holes to insure unrestricted free-fall. Knurled, hexagonal top allows a secure, comfortable grip and prevents rolling during storage.

HM-550 Standard Compaction Hammer has 5.5lb (2.5kg) mass with 12in (305mm) drop. **Product Dimensions:** 21x2.2in (533x55mm) LxDia.

HM-551 Modified Compaction Hammer has 10lb (4.5kg) mass and 18in (457mm) drop. **Product Dimensions:** 31x2.2in (787x55mm) LxDia.

Inquire for old-style U.S. Army Corps of Engineers compaction hammers.

Manual Compaction Hammers	
Standard Compaction Hammer, 5.5lb	HM-550
Modified Compaction Hammer, 10.0lb	HM-551

also available

Gilson's BRA-60 and BRA-59 CBR and LBR Molds are compatible with our HM-530 Mechanical Soil Compactor.

HMA-135

HMA-135A

STAINLESS STEEL STRAIGHTEDGES

ASTM C173, C185, C231, D558, D698, D1557; AASHTO T 99, T 137, T 180, T 326

Straightedges from Gilson are quality 304 stainless steel and used in many ASTM and AASHTO concrete and soil test methods for trimming and leveling specimens. Stainless steel material with electro-polished finish will not corrode and the precision-ground beveled edge remains straight and true after many uses. Unique HMA-135A model features laser engraved graduations at 0.5in intervals from 0 to 6in (0 to 152.4mm) for convenient measurement of approximate lift depths, mold dimensions and other references. Graduations are marked with inch and millimeter equivalents. Standard HM-135 model has no markings. **Product Dimensions:** 11.81x1.57x0.125in (300x40x3.2mm) LxWxD.

Stainless Steel Straightedges	
Stainless Steel Straightedge	HMA-135
Stainless Steel Straightedge with Graduations	HMA-135A

technote

Scales for remote concrete or soils applications must be accurate, rugged and portable. Gilson Compact Field Scales by Adam Equipment have large platforms for stability and include a durable, secure carrying case with fitted foam interior. These models feature digital accuracy with capacities from 13 to 440lb (6 to 200kg) and full-range taring. The indicator with selectable weighing units is wall mountable and has a standard RS-232 port for connection to PC or printer.

VIDEO ONLINE

HMA-110

HMA-111

HMA-116

BRA-60

BRA-59

SOIL DENSITY AND BEARING RATIO MOLDS

Gilson's rugged steel soil molds comply with numerous specifications and are plated for maximum rust resistance. The molds are available as complete assemblies with base, mold and collar, or as separate components.

Soil Density & Bearing Ratio Molds

Description	Model	Mold Size in (mm) Hxl.D.	ASTM/ AASHTO/ Other
Soil Density Molds are used for various methods of soil moisture-density relationship (Proctor) tests. Split molds partially separate longitudinally for easier sample removal. Solid molds require use of sample ejectors. Compaction molds are 4.584in (116.4mm) in height with detachable extension collar and base, and are clear-zinc plated for rust resistance. 4in diameter Molds have volume of 1/30ft³ (941cm³), and 6in diameter Molds are 1/13ft³ (2,124cm³) volume. Gilson Soil Density Molds fit our HM-530 Mechanical Soil Compactors, and can also be used with manual soil compaction hammers.			D558, D559, D560, D698, D1557, D1558 / T 99, T 134, T 135, T 136, T 180
4in Solid Soil Density Mold, Complete	HMA-110	4.584x4 (116.4x102)	
4in Split Soil Density Mold, Complete	HMA-111		
Mold Only, 4in Solid	HMA-110M		
Mold Only, 4in Split	HMA-111M		
Collar Only for 4in Molds	HMA-110C		
Base Only for 4in Molds	HMA-110B		
6in Solid Soil Density Mold , Complete	HMA-116	4.584x6 (116.4x152)	
6in Split Soil Density Mold, Complete	HMA-117		
Mold Only, 6in Solid	HMA-116M		
Mold Only, 6in Split	HMA-117M		
Collar Only for 6in Molds	HMA-116C		
Base Only for 6in Molds	HMA-116B		
California Bearing Ratio (CBR) Molds are 6x7in (152x178mm) clear-zinc plated steel molds with 2in (51mm) collar, and a base perforated with twenty eight 0.0625in (1.59mm) holes. See separate listing for a complete selection of CBR equipment. CBR Molds are designed to fit HM-530 Mechanical Soil Compactors.		7x6 (178x152)	D1883/ T 193
California Bearing Ratio Mold, Complete	BRA-60		
CBR Mold Only	BRA-60M		
Collar Only for 6in Molds	BRA-60C		
Base Only for CBR Molds	BRA-60B		
Limerock Bearing Ratio (LBR) Molds for Florida FM 5-515 test are 6x6in (152x152mm) clear-zinc plated steel molds with 2.375in (60mm) collar. Base is perforated with twenty eight 0.0625in (1.59mm) holes. See separate listing for a complete selection of LBR equipment. LBR Molds are designed to fit HM-530 Mechanical Soil Compactors.		6x6 (152x152)	T 220/ Florida FM 5-515
Limerock Bearing Ratio Mold, Complete	BRA-59		
LBR Mold Only	BRA-59M		
Collar Only for 6in Molds	BRA-60C		
Base Only for LBR Molds	BRA-59B		

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HM-560

PROCTOR PENETROMETER SET
ASTM D1558

The Penetrometer Set measures penetration resistance of fine grained soils. The penetrometer consists of a spring dynamometer with a scale on the stem of the handle graduated from 10—130lbf (45—580N) in increments of 2lbf (9N). A sliding ring on the stem gives shear strength obtained in the test. Model HM-560 basic set includes interchangeable threaded needles with areas square inches (square centimeters); 1 (6.45), 3/4 (4.84), 1/2 (3.23), 1/3 (2.15), 1/5 (1.29), 1/10 (0.65), 1/20 (0.32), 1/30 (0.22) and 1/40 (0.16). Replacement needles are available. Set comes in attractive foam-lined wooden box with carrying handle. **Product Dimensions:** 24x9x3in (610x229x76mm), WxDxH.

Proctor Penetrometer Set	
Proctor Penetrometer Set	HM-560

HM-514 HM-516

SAMPLE EJECTORS

Gilson Sample Ejectors quickly and easily extrude compacted soil or asphalt specimens from 4in and 6in (102mm and 152mm) soil-density or Marshall molds. Adapter ring accessories allow soil samples from short lengths of thin-walled (Shelby) tubes of 2, 2.5 or 3in (51, 64, or 76mm) diameter to also be extruded.

A 12,000lbf (53.4kN) capacity hydraulic jack with 5in (127mm) stroke is mounted in a robust three-column reaction frame constructed of plated steel. Molds are positioned vertically over the piston on a load platform that prevents the emptied mold from falling back over the jack. Daylight opening of the frame is adjustable for mold lengths up to 11.75in (279mm). Specimens longer than 5in are extracted by repositioning the Adapter Ring after maximum piston travel. The spring-loaded piston automatically returns to the start position when the stainless steel knob for the release valve is opened. Adapter Rings are quickly changed with just two wing-nuts, and Extruder Discs rest in place on top of the piston. Accessories for smaller-diameter specimens will fit either model. **Product Dimensions:** 9.5x10x24in (241x254x610mm), WxDxH.

HM-514 Sample Ejector is equipped to handle 4in (102mm) soil compaction or Marshall asphalt molds.

HM-516 Combination Sample Ejector extrudes either 4in (102mm) or 6in (152mm) soil or asphalt specimens.

Sample Ejectors	
Sample Ejector, 4in	HM-514
Combination Sample Ejector, 4in & 6in	HM-516
Accessories	
Adapter Ring & Extruder Disc, 2in dia.	HMA-219
Adapter Ring & Extruder Disc, 2.5in dia.	HMA-220
Adapter Ring & Extruder Disc, 3in dia.	HMA-221

HM-375

RELATIVE COMPACTION TEST SET
CALIFORNIA 216

Relative Compaction Test Set is used for determination of the maximum wet density of soils and aggregates by the California impact method. Relative compaction is the ratio of in-place wet density to test maximum wet density of the same soil or aggregate. In-place wet density is determined in the field using sand volume apparatus.

A 10lb (4.54kg) tamper is dropped from 18in (457mm) to compact samples to about 10—12in (254—305mm) in a 36in (914mm) long, 2.875in (73mm) diameter split mold. The special steel mold has a removable base and three hinged clamps for easy sample removal. Also included in the set are a metal leveling piston and a piston handling rod. Density is easily determined after compaction, based on a reading from the graduated scale on the shaft of the tamper. HM-375 is designed for manual use only.

Relative Compaction Test Set	
Relative Compaction Test Set	HM-375

HM-315

HMA-60

HM-317

RELATIVE DENSITY APPARATUS
ASTM D4253, D4254

Apparatus determines relative density of granular soils which do not respond well to Proctor moisture-density tests. Maximum density is determined by placing granular soil in 0.1 or 0.5ft^3 (2.83 and 14.2L) molds and densifying using a vibrating table and surcharge. Minimum index density is determined by loose placement in the molds using special pouring funnels, scoop, or shovel, depending on size of soil particles.

HM-315 Vibratory Table has a cushioned steel 30x30in (762x762mm) vibrating deck activated by electromagnetic vibrator with over 100lb (45.5kg) actuator. The table has 750lbs (341kg) load capacity and requires 800 Watts, 12 amps at 230V. Table height is 21in (533mm). Vibration rate is 3,600VPM (3,000 at 50Hz) and amplitude adjusts in accordance with ASTM requirements. The solid state circuitry allows precise amplitude control even with fluctuating voltage supplies. **Product Dimensions:** 30x30x21in (762x762x533mm), WxDxH.

HM-317 and **HM-318 Cylindrical Mold Sets** for 0.1 and 0.5ft^3 (2.83 and 14.2L) capacity have attached carrying handles and guide brackets for the Gauge Set. They come complete with detachable guide sleeve with clamp assembly, surcharge base plate with removable handle, and surcharge weight with handle. Mold included with HM-317 Set is 6in (152.4mm) ID x 6.112in (155.2mm) IH; surcharge weight plus base plate has 56.5 ±0.5lb (25.5 ±0.2kg) total weight. Larger mold with HM-318 Set is 11in (279.4mm) ID x 9.092in (230.9mm) IH with 190 ±2lb (86.2 ±0.9kg) total weight of base plate with surcharge weight.

HM-319 Gauge Set fits guide brackets of either Mold Set to measure distance from top of mold to top of base plate after densification (to compute volume change). Set includes a Dial Indicator, with 2in (50.8mm) travel and 0.001in (0.025mm) graduations, and a special holder to fit molds. A metal 3x12x1/8in (76x305x3.2mm) calibration bar is also included.

HMA-60 Accessory Pouring Funnel Set is required for loose placement of 3/8in (9.5mm) and finer soil in HM-317 mold set. Set includes two 6in (152mm) diameter x 12in (305mm) long metal cylinders, each with funnel and 6in (152mm) long delivery spout attached to one end. Spouts are 1in (25.4mm) and 1/2in (12.7mm) in diameter.

Relative Density Apparatus	
Vibrating Table, 230V/60Hz	HM-315
230V/50Hz	HM-315F
Mold Set, 0.1ft^3 (3L)	HM-317
Mold Set, 0.5ft^3 (14L)	HM-318
Gauge Set, Complete	HM-319
Pouring Funnel Set	HMA-60

SC-4, SC-1 , SC-5 & SC-3

SC-45

SC-74, SC-73, SC-78 and SC-77

SC-80 through 84

SC-270 & SC-272

Proctor/Density Accessories

Description	Model	Dimensions	Capacity
Galvanized Iron Pans have wire-bound and rolled top edges and two drop-handles. Often used for drying or mixing of laboratory samples of soils and aggregates. Pans SC-2, SC-4 and SC-5 have tapered sides for nesting. Others have straight sides. Can safely be used with maximum oven temperatures to 350°F (177°C).		**WxDxH, in**	**Qt.**
	SC-1	18x18x1.5H	8.0
	SC-2	18x18x3H	17.0
	SC-3	24x24x4H	40.0
	SC-4	24x24x3H	30.0
	SC-5	10x20x3H	10.0
Stainless Steel Pans feature top-quality seamless construction with rounded corners. Rectangular pans have straight sides. SC-45 thru SC-47 have handles, others have oversize flanges for handling. Round Pans have straight-tapered sides and will nest for storage. SC-77 is sized to contain 8in (200mm) sieves. Round Bowls SC-80 thru SC-84 have rounded sides and will also nest.	**Rectangular Pans**	**WxDxH, in**	**Qt.**
	SC-45	17.2x14.5x2.5	8.3
	SC-46	15.3x13x2.5	6.5
	SC-47	13.5x11.2x2.5	4.3
	SC-50	20.7x12.7x2.5	8.3
	SC-51	20.7x12.7x4	14.0
	SC-55	10.4x12.7x2.5	4.0
	SC-56	10.4x12.7x4	6.7
	SC-57	10.4x12.7x6	9.6
	SC-60	6.9x12.7x2.5	2.6
	SC-61	6.9x12.7x6	5.9
	SC-65	6.4x10.4x2.5	1.8
	SC-70	6.9x6.3x2.5	1.2
	Round Pans	**Diameter x Ht, in**	**Qt.**
	SC-73	10x1.9	0.7
	SC-74	14.2x1.9	1.3
	SC-77	11x3.5	5.0
	SC-78	13.5x5	7.5
	Round Bowls	**Diameter x Ht, in**	**Qt.**
	SC-80	7.7x2.7	1.5
	SC-81	9x3.2	3.0
	SC-82	11.3x3.6	5.0
	SC-83	13.3x4.4	8.0
	SC-84	17.5x5.2	16.0
Sample Cans are round, tinned metal with moisture-tight friction type lids and epoxy lacquered interiors. They are ideal for preparing, storing or transporting soil, aggregates, or other samples. Models SC-270 and SC-272 are sold in case quantities.		**Diameter x Ht, in**	**Qt.**
	SC-272, 6/Case	6.6x7.5	4
	SC-270, 12/Case	4.3x4.9	1
	MAA-43, Each	3.3x4.0	0.5
Plastic Graduated Cylinders are quality poly-methylpentene (PMP). PMP is highly transparent, rigid, resists impact, and handles temperatures of 200°C (180°C continuous). Not recommended for use with chlorinated solvents or strong oxidizing agents. Cylinders have pour-out, stable base, and molded-in graduations. Models with "P" suffix are sold in case quantities.			**Capacity x Graduations, ml**
	GW-40	-	10x0.2
	GW-40P, 10/Case	-	10x0.2
	GW-41	-	25x0.5
	GW-41P, 5/Case	-	25x0.5
	GW-42	-	50x1
	GW-42P, 5/Case	-	50x1
	GW-43	-	100x1
	GW-43P, 5/Case	-	100x1
	GW-44	-	250x2
	GW-45	-	500x5
	GW-46	-	1,000x10
	GW-47	-	2,000x20

GW-40 thru GW-47

SA-60

SA-61

SA-62

SAA-10P

SAA-8

SA-65

ATTERBERG LIMITS
ASTM D4318; AASHTO T 89, T 90

Liquid Limit is the water content at which soil changes from liquid to plastic state. It is arbitrarily defined as that point where two halves of a soil sample flow together when jarred 25 times in a specified manner using a Liquid Limit machine.

Gilson offers motorized or hand-crank operated machines with automatic impact counter, and a budget hand-crank model without counter. All models consist of a brass cup and carriage designed to control its drop exactly 1cm onto a hard rubber base. Height of drop is adjusted by a nut at the rear of the cup carriage using the gauge at one end of the plastic Casagrande grooving tool (SAA-10P) included. Order separate SAA-8 grooving tool for testing to AASHTO T 89. The cup attaches to the carriage by a pin allowing easy removal for cleaning and inspection. All mechanical parts are machined from solid brass. Rubber feet isolate base from work surface. One SAA-10P included with all Liquid Limit Machines. Additional SAA-10 and SAA-10P Casagrande metal grooving tools are available.

Motorized SA-60 with counter is most accurate with use of a special geared motor assuring proper operating speed of 1.9—2.1 drops per second. An on-off switch is provided. **SA-60 Product Dimensions:** 12x7.5x6in (305x191x152mm), LxWxH. Hand operated SA-61 is 6.5x6x5in (165x152x127mm), LxWxH; Hand operated SA-62 with counter is 6.5x7x5in (165x178x127mm), LxWxH.

Plastic Limit is defined as the water content at which a soil can no longer be deformed by hand rolling to 1/8in (3.2mm) diameter threads without crumbling. Main items needed for this test are SA-66 Glass Plate and SC-400 Aluminum Containers, both included in SA-65 Accessory Set, or available separately.

SA-65 Atterberg Limit Accessory Set provides items necessary to perform liquid and plastic limit tests in accordance with ASTM D4318, including MA-278 evaporating/mixing dish, SA-66 ground Glass Plate 12x12x3/8in (305x305x10mm) with seamed edges, 24 aluminum containers 2in dia. x 0.9in H (51x22mm) with snug-fitting lids, SC-77 wash pan, HMA-10 wooden-handled spatula with stainless steel blade 0.75in x4in (19x102mm), WxL, and a HMA-24 250ml polyethylene squeeze wash bottle.

Atterberg Limits	
Liquid Limit Machine Motorized, with Counter, 115V/60Hz	SA-60
230V/50Hz	SA-60F
Liquid Limit Machine Hand Operated	SA-61
Liquid Limit Machine Hand Operated, with Counter	SA-62
Accessories	
Grooving Tool, AASHTO	SAA-8
Grooving Tool metal, Casagrande ASTM	SAA-10
Grooving Tool plastic, Casagrande ASTM, pkg. 10	SAA-10P
Brass Cup with Mounting Holes	SAA-11
Brass Cup with Holder	SAA-12
Liquid & Plastic Limits Set	SA-65
Glass Plate	SA-66

SA-18

SA-19

SC-74

SAA-15

SA-56

PLASTIC LIMIT ROLLER
ASTM D4318; AASHTO T 90; TEXAS 105-E

Patented Plastic Limit Roller for soils is a unique time saving device designed to produce consistent results by an easily-repeatable manual technique.

Traditional methods call for repetitive rolling by hand between the palm or fingers and a glass plate while visually estimating the 1/8in (3.2mm) diameter stopping point. Results are highly dependent on technique and judgment of individual operators. The SA-18 Plastic Limit Roller device consists of top and bottom roller plates separated by 1/8in (3.2mm) side rails. Contact surfaces of the plates are covered with sheets of special adhesive-backed absorbent paper that adds no fiber to soil samples. Soil samples are rolled by moving the top plate over the fixed bottom plate. Soil thread diameters are reduced by back and forth action until the top plate contacts the 1/8in (3.2mm) side rails, preventing further thread size reduction.

SA-18 includes top plate with integral handle, bottom plate, 50-sheet pad of adhesive paper, and instructions. The bottom 0.1875in (4.8mm) and top 0.375in (9.5mm) acrylic plates measure 8x4.5x1.25in (203x114x32mm), LxWxH.

Plastic Limit Roller	
Plastic Limit Roller	SA-18
Accessories	
Adhesive Paper, pad of 50 sheets	SAA-9
Adhesive Paper, case of 20 pads	SAA-9C

SHRINKAGE LIMIT SET
ASTM D4943

The shrinkage limit of cohesive soils is defined as the water content at which further loss of moisture will not cause a decrease in volume. ASTM recommends this new method as an alternative to the original D427 test method, which was withdrawn due to its use of mercury for volume determinations. This procedure uses similar apparatus for preparation of a soil pat, but requires coating the pat in melted wax. Prior to immersion in water for mass determination.

Samples for shrinkage limit tests are usually taken from a larger sample prepared for liquid and plastic limit tests. A soil specimen with moisture content above the liquid limit is placed in the shrinkage dish and struck off with the straightedge. The sample is then oven dried. After coating in wax, volume of the soil pat is computed by weighing in water and noting the difference from its weight in air.

The SA-56 Shrinkage Limit Set includes a special Monel shrinkage dish, a 4.75x0.75in spatula used as a straightedge, fine thread to suspend the soil pat, a glass calibration plate and a tube of petroleum jelly, used when calibrating the dish. The SA-19 Wax Melting Pot is purchased separately. SAA-15 microcrystalline wax is available in 5lb (2.3kg) quantities. The Melting Pot has a 2qt (1.9L) capacity and a thermostat to control temperatures between 50°—250°F (10°—120°C). Electrical requirements are 600 Watts at 115V/60Hz. Other available accessories are the HMA-10 Spatula for mixing and handling and the SC-74 1.3qt Pan for use as a water bath for immersion weighing.

Shrinkage Limit Set	
Shrinkage Limit Set	SA-56
Accessories	
Wax Melting Pot	SA-19
Monel Shrinkage Dish	SA-55A
Microcrystalline Wax, qty. 5lb	SAA-15
Spatula, 4.75x0.75in Blade	HMA-10
Stainless Steel Pan, 1.3qt	SC-74

HMA-25 & HMA-24

HM-109

HM-111

HMA-10, HMA-11, HMA-11A & HMA-12

MA-278

MA-275

SC-400 thru SC-406

Atterberg Limits/Grain Size Accessories

Description	Model	Dimensions	Capacity
Wash Bottles, polyethylene, squeeze dispensing; adjust flow by cutting tip.			**ml**
Wash Bottle	HMA-24	-	250
Wash Bottle	HMA-25	-	500
Mortar & Pestles, heavy porcelain 5in dia. mortar has 320ml, glazed except for sample contact area (small porcelain pestle included). Use rubber tipped wooden pestle to break up agglomerates of soils, etc.			
Mortar & Pestle	HM-109		
Rubber Tip Pestle	HM-111		
Spatulas with mirror-finished stainless steel blades riveted to hardwood handles. HMA-11A meets ASTM C1252 and AASHTO T 304.			
L x W of Blade, in (mm)		**Overall Size, in (mm)**	
4x0.75 (102x19)	HMA-10	7.8 (197)	-
6x0.5 (152x13)	HMA-9	11.5 (292)	-
6x1 (152x25)	HMA-11	10.5 (267)	-
3.9x0.9 (100x23)	HMA-11A	8.25 (210)	-
10x1.5 (254x38)	HMA-12	14.3 (368)	-
Evaporating Dishes, Porcelain, MA-275 and MA-276 are glazed inside and out; MA-277 and MA-278 are glazed inside and around rim, bottom is not glazed.		**Diameter x Height, mm**	**ml**
	MA-275	80 x 34	80
	MA-276	93 x 40	120
	MA-277	104 x 40	150
	MA-278	120 x 42	250
Round Sample Containers, Metal Round aluminum or tin metal containers with tight-fitting lids prevent moisture loss in samples. All have straight sides and flat bottoms. Covers fit bottom of container during drying. Premium aluminum never needs tare adjustment for rusting. Both models are sold in packages of twelve. Add "-1" to model numbers to order single containers.	**Aluminum**	**Dimensions, in**	**oz**
	SC-400	2dia. x 0.9h	1.5
	SC-402	2.5dia. x 1.8h	4
	SC-404	3dia. x 1h	5
	SC-406	3.5dia. x 2h	11
	Tinned		
	SC-498	1.9dia. x 1.3h	2
	SC-500	2.2dia. x 1.6h	3
	SC-502	2.4dia. x 1.6h	4
	SC-504	2.9dia. x 1.9h	6
	SC-506	3dia. x 2.2h	8
	SC-508	3.8dia. x 2.8h	16
Plastic Graduated Cylinders are quality poly-methylpentene (PMP). PMP is highly transparent, rigid, resists impact, and handles temperatures of 200°C (180°C continuous). Not recommended for use with chlorinated solvents or strong oxidizing agents. Cylinders have pour-out lip, stable base, and molded-in graduations. Models with "P" suffix are sold in case quantities.			**Capacity x Graduations, ml**
	GW-40	-	10x0.2
	GW-40P, 10/Case	-	10x0.2
	GW-41	-	25x0.5
	GW-41P, 5/Case	-	25x0.5
	GW-42	-	50x1
	GW-42P, 5/Case	-	50x1
	GW-43	-	100x1
	GW-43P, 5/Case	-	100x1
	GW-44	-	250x2
	GW-45	-	500x5
	GW-46	-	1,000x10
	GW-47	-	2,000x20

GW-40 thru GW-47

HM-536

SA-45

SAA-24

CALCIUM CARBONATE CONTENT CHAMBER
ASTM D4373

Calcium carbonate (CaCO3) content of soils can be determined rapidly with this simple, portable test. The test is often used as an index to the presence and quantity of calcium carbonate in marine soil specimens, expressed as the percent calcite equivalent.

The method involves treating a one gram soil specimen with hydrochloric acid (HCl) in an enclosed reactor vessel. Carbon dioxide gas is generated from the reaction between the acid and carbonates in the specimen when the chamber is tilted and agitated, and the resulting pressure is measured. The 10 psi (69kPa) Bourdon-tube pressure gauge is pre-calibrated with reagent grade calcium carbonate. The 2.5x5.5in (63.5x140mm) IDxH clear acrylic chamber assembly is sealed to the anodized aluminum end caps with o-rings, and secured by threaded rods and knobs. It is supplied with the pressure gauge, bleed valve, and a 20ml cup with handle. **Product Dimensions:** 4x11in (102x279mm), WxH.

Calcium Carbonate Content Chamber	
Calcium Carbonate Content Chamber	HM-536

SOIL GRINDER

The Soil Grinder quickly prepares dry soil samples for Atterberg limits, particle-size analysis, and other standard laboratory tests. It is an efficient method for reducing agglomerations of caked soil to individual grains, and less labor intensive than manual mortar and pestle operation. The SA-45 Soil Grinder is designed to preserve the true grain size for accurate and repeatable test results. Most soil types are processed completely in less than 30 seconds per pint.

The hopper has a capacity of 1 pint (0.6L) and features a manually operated gate to control feed rate to the grinding chamber. Operation is simple, just load the hopper, start the grinder and use the gate to control material feed. A #10 (2.0mm) perforated stainless steel plate is included to retain oversize particles. #4 and #35 stainless steel perforated plates can be purchased separately.

Rugged stainless steel contact parts reduce sample contamination. The grinding unit is driven by a powerful and reliable 1/3hp direct drive motor, and mounted on a sturdy painted steel tripod stand. A stainless steel lid covers the hopper during operation. **Product Dimensions:** 12x15x19 (305x381x483) WxDxH.

Soil Grinder	
Soil Grinder, 115V/50-60Hz	SA-45
220V/50-60Hz	SA-45F
Accessories	
#4 Perforated Plate	SAA-22
#10 Perforated Plate	SAA-23
#35 Perforated Plate	SAA-24

SA-1 & SA-2

SA-5

HYDROMETER TEST COMPONENTS
ASTM D7298; AASHTO T 88

Tests for complete particle size distribution in soils require sedimentation methods to determine silt and clay fractions. Soil specimens are mixed in a solution of water and sodium hexametaphosphate. Hydrometers are used to measure suspended solids in sedimentation cylinders over time periods of up to twenty four hours.

Hydrometer Test Components	
Description	**Model**
ASTM 151H Soil Hydrometer is graduated to read specific gravity, with a range of 0.995 to 1.038 in 0.001 divisions at 68°F (20°C). Supplied with a certificate of calibration traceable to NIST.	SA-1
ASTM 152H Soil Hydrometer measures in grams per liter (g/L) of suspension and has a range of -5 to +60 g/L, in 1g/L divisions at 68°F (20°C). Both models have 280mm total length. Supplied with a certificate of calibration traceable to NIST.	SA-2
1000ml Sedimentation Cylinder (hydrometer jar), is required for each sample. Cylinders are heavy-wall clear glass with a stable base, scribed at 1,000ml mark. An optional #12 Neoprene Stopper is convenient for use during agitation. **Product Dimensions:** 18x2.5in (457x64mm) HxDia.	
1000ml Sedimentation Cylinder	SA-5
#12 Neoprene Stopper	GWA-512
Stirring Apparatus thoroughly mixes soil samples using a special mixing blade and a baffled dispersion cup. The Apparatus has selectable 13,000/16,000/18,000rpm speeds and an aluminum housing with 5ft (1.5m) cord. The Stirring Apparatus can be purchased by itself, or as the SA-12 set, which includes the Baffled Dispersion Cup. Additional Stainless Steel Dispersion Cups are available separately to improve sample preparation efficiency.	
Stirring Apparatus with Dispersion Cup	SA-12
Stirring Apparatus, 115V, 50/60Hz	SA-10
Dispersion Cup alone	SA-16
Replacement Blade for SA-10	SAA-2
Sodium Hexametaphosphate is available in dry powder form as a dispersing aid when mixing soil sample solutions. Use is required in the test method and prevents clay platelets from sticking together in the sedimentation solution.	
Sodium Hexametaphosphate, 1lb	SA-20
Sodium Hexametaphosphate, pkg of 6	SA-20C
Constant Temperature Bath is an option when conducting the Hydrometer Test, and maintains temperature at a uniform 68°F (20°C) ±0.5°C with gentle, thorough circulation. Built-in brackets hold eight SA-5 Sedimentation Cylinders. Bath has stainless steel interior parts; exterior is enameled steel. An over-temperature safety cutoff is provided. **Product Dimensions:** 50x12x18in (1,245x356x965mm), LxWxD; **Internal Product Dimensions:** 38x8x15.5in (1,270x305x457mm), LxWxD.	
Constant Temperature Bath, 120V, 50/60Hz	SA-25
230V, 50/60Hz	SA-25F

SA-12

SA-16

SA-20

SA-25

technote

Wet-Wash Sieves are used for washing sieve and hydrometer samples.

HM-66

BALLOON DENSITY
ASTM D2167

The Balloon Density is used to determine in-place density of soil when testing compacted earth fills. The unit is a water-filled, calibrated vessel fitted with a hand-operated pump to pressurize the chamber. A thin, flexible membrane on the bottom displaces under pressure to fill a void. Using the base plate as a template, a hole is dug in the surface and the excavated soil is retained as a specimen. To determine the volume of the hole, the Balloon Density is mounted on the plate, the membrane (balloon) is pumped into the hole, and fluid displacement from the vessel is noted. In-place density is computed easily by dividing weight of the retained soil by the measured volume of the hole. A portion of the retained specimen is used to determine moisture content. This method is not suitable for very soft, easily deformed soils or in a hole which will not maintain constant volume. Water volume is read from the double-graduated scale on the high-strength clear plastic cylinder. Graduations are .00025ft³ or 7cm³.

Selection of Balloon Density model is determined by top-size of soil particles. 1/20ft³ HM-66 model is used for soils with 0.5in (13mm) maximum particle size and 1/13ft³ HM-67 model is for soils with particle size up to 1in (25mm). Each unit includes 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. Extra Balloons are available in packs of ten. MA-26X Aqua-Check for moisture determinations and HMA-8 In-Place Density Accessory Kit are recommended accessories. **Product Dimensions:** 9x9x7in (229x229x178mm), WxDxH.

Balloon Density	
Balloon Density, 1/20ft³	HM-66
Balloon Density, 1/13ft³	HM-67
Accessories	
Balloons, pkg. 10	HMA-5

HM-100

HM-104

SAND CONE DENSITY 6.5IN
ASTM D1556; AASHTO T 191

The sand cone density test is a proven method to measure in-place density of soils with maximum particle sizes up to 2in (51mm) using test hole volumes of approximately 0.1ft³ (2.8L).

HM-100 Sand Cone Density Apparatus is a 1gal (3.8L) threaded plastic jar with detachable cone fitting. The metal cone is flanged to 6.5in (165mm), with a cylindrical valve of 0.5in (12.7mm) dia. orifice. Valve has stops to prevent rotating past completely open or closed positions.

HM-104 Density Plate is 12x12in (305x305mm) aluminum alloy with 0.5in (12.7mm) high edge walls to contain soil sample that is dug using 6.5in (165mm) center hole of plate as a guide. After test hole is prepared, flange of cone fits plate opening for filling hole with special Density Sand.

HM-106 Density Sand is clean, dry, uniform, uncemented, durable, and free-flowing. Few particles pass No.200 (75µm) or are retained on No.10 (2mm) sieves. Bulk density varies less than 1%. 50lb (22.7kg) packing bag is heavy and reinforced. MA-26X Aqua-Check for moisture determinations and HMA-8 In-Place Density Accessory Kit are recommended accessories.

Sand Cone Density 6.5in	
Sand Cone Density Apparatus	HM-100
Accessories	
Replacement Plastic Jar	HM-102
Density Plate	HM-104
Density Sand	HM-106

HM-98

SAND CONE DENSITY 12IN

Large 12in (305mm) diameter sand cone apparatus is used for density determinations in gravels and coarse soils where a larger hole is necessary for accurate results. The unit has two identical cones with a valve in the center. A metal cylinder attached to the top cone has a clear plastic end for viewing sand flow, and handles for carrying. A circular density plate is included.

Sand Cone Density 12in	
Sand Cone Density	HM-98

HMA-8

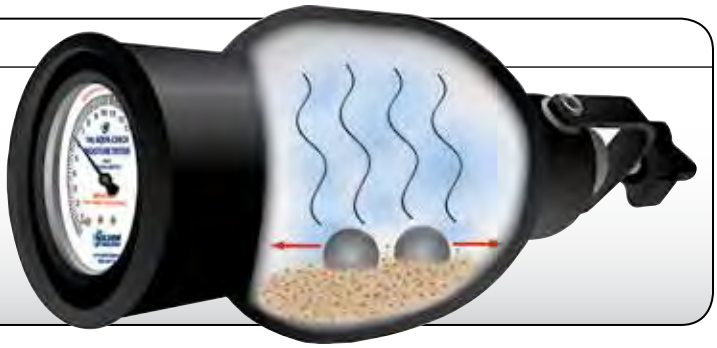
IN-PLACE DENSITY ACCESSORY KIT

In-Place Density Accessory Kit has all items necessary for field tests with either the Voluvessel or Sand Cone Density apparatus. Kit includes SC-103 poly sample bags qty. 100, MA-102 25°—125°F pocket dial thermometer, TSA-170 bristle brush, HMA-302 1in steel chisel, HMA-304 stainless steel spoon, and HMA-300 rubber mallet. See individual listings elsewhere for full descriptions.

In-Place Density Accessory Kit	
In-Place Density Accessory Kit	HMA-8

GAS PRESSURE MOISTURE TESTER

The gas-pressure method for moisture determination has long been in use and is widely accepted for accurate field testing of soils, aggregates, coal, abrasives and other materials. These devices are essentially pressure vessels and depend on the formation of gas when the calcium carbide reacts with moisture in the sample. A precision gauge in the sealed chamber measures pressure for relative readings, and results are easily correlated to laboratory results for enhanced accuracy.



VIDEO ONLINE

MA-26X

MAA-45

MA-26X additional views

GILSON AQUA-CHECK MOISTURE TESTER

ASTM D4944; AASHTO T 217; FLORIDA FM 5-507

Gilson Aqua-Check is made in the USA, and an affordable choice for rapid, accurate, and reliable moisture tests on sand, aggregates, ores, coal, soils, and other materials with particle size up to 20mm (0.8in). Samples can be quickly tested on-site, eliminating risk of moisture loss during transport. Portable units are easy to use, and meet ASTM, AASHTO and Florida DOT requirements. The Gilson Aqua-Check was evaluated by the Florida DOT and verified to meet FM5-507 DOT requirements.

A pre-weighed 20g sample is placed in the test chamber, along with a measured quantity of calcium carbide reagent. When the chamber is sealed and agitated for one to three minutes, free moisture in the test sample reacts with the reagent to produce acetylene gas. The integral pressure gauge registers 0—20% moisture by weight in 0.2% graduations. Moisture range can be doubled by halving the pre-weighed sample weight.

MA-26X Aqua-Check has a rugged, die-cast aluminum body with a tough, wear-resistant coating and includes a 0—20x0.2% pressure gauge, with certificate of calibration. Also included; electronic digital balance, two 1.25in (32mm) dia. steel pulverizing balls, reagent measuring scoop, brush, and instructions in a heavy-duty, waterproof plastic case. Approximate pressure chamber dimensions: 14x5.5in (356x140mm), LxDia. Recalibration of existing Aqua-Check gauges is available as MAA-53. Calcium Carbide Reagent is available separately in 10lb (4.5kg) cans as MAA-44. These bulk containers can be used to refill smaller containers for field use. The pressure gauge and all accessories are compatible with both Aqua-Check and Speedy-brand Moisture Testers.

MAA-45 Aqua-Check 0—20% Replacement Pressure Gauge includes a certificate of calibration, and is also compatible with Speedy-brand MA-21A and MA-25 Moisture Testers. Due to shipping restrictions, additional reagent is sold in 10lb (4.5kg) cans only. Reagent from these larger cans can be used to replenish smaller containers, MAA-43 or SC-116, for field use. **Product Dimensions:** 20x17x9in (508x431x228mm), WxDxH.

Gilson Aqua-Check Moisture Tester	
Gilson Aqua-Check Moisture Tester, without Reagent	MA-26X
Accessories	
Calcium Carbide Reagent, 10lb can	MAA-44
Empty 1lb Metal Can for Reagent	MAA-43
Aqua-Check 0—20% Pressure Gauge	MAA-45
Recalibration of MAA-45 Pressure Gauge	MAA-53
Electronic Balance, 200 x 0.1g	OB-205
1.25in (32mm) Steel Balls, pkg. 2	MAA-47
Sample Cup	MAA-52
Long-Handle Reagent Scoop	MAA-48
Large, Coarse Clean-Out Brush	MAA-51
Small, Fine-Bristle Brush	MAA-50
Heavy-Duty Waterproof Plastic Case	MAA-46
Round Plastic Sample Jar	SC-116

technote

Gilson Company, Inc. now offers a repair service for the MA-26X Aqua-Check Moisture Tester. Please call **800.444.1508** for pricing or to schedule repairs.

VIDEO ONLINE

MA-25C

SPEEDY 2000 MOISTURE TESTERS
ASTM D4944; AASHTO T 217; FLORIDA FM 5-507

The Speedy is widely accepted for rapid, accurate, and reliable moisture tests on all kinds of materials–sand, aggregates, ores, coal, soils, ceramics, abrasives, and other powders. Units are portable, easy to use and do not require a power supply. Samples can be tested on-site, eliminating risk of moisture loss during transport.

Selection of four available models is based on particle size, percent moisture range, and gauge accuracy desired. Standard Models MA-20A and MA-21A are used for sand, grains, clays and fine powders. Large MA-25 and MA-25C handle soils, aggregates, coal and ores. Model MA-25 meets ASTM and AASHTO requirements for soil moisture measurements. Moisture range may be doubled by using 1/2 specimen weight and multiplying gauge reading by two.

All units have tough, die-cast polished aluminum body (pressure chamber) with integral dial. Place weighed sample in the tester with measured quantity of calcium carbide reagent and seal with cap. Upon agitation, free moisture in test sample reacts with calcium carbonate to form acetylene gas. Pressure gauge reads directly in percent moisture by weight within 1—3 minutes.

Each Speedy 2000 Kit includes an electronic digital balance, reagent measuring scoop, brush, cleaning cloth, and instructions in a heavy-duty, waterproof plastic case. MA-25 and MA-25C include two steel balls to pulverize samples. Due to shipping restrictions, calcium carbide reagent is sold separately in 10lb (4.5kg) cans. Material from these larger cans can be used to replenish smaller MAA-43 or SC-116 containers for field use.

MA-20A and MA-21A Product Dimensions: 12x4in (305x102mm), LxDia. **MA-25 and MA-25C Product Dimensions:** 14x 5.5in (356x140mm), LxDia.

Speedy 2000 Moisture Testers				
Model	**Description**	**Max. Particle Size**	**Moisture Range[1]**	**Specimen Weight**
MA-20A	Standard Speedy	10mm	0—10 x 0.1%	12g
MA-21A	Standard Speedy	10mm	0—20 x 0.2%	6g
MA-25	Large Speedy	20mm	0—20 x 0.2%	20g
MA-25C	Large Speedy	20mm	0—50 x 0.5%	8g

Accessories	
Calcium Carbide Reagent, 10lb can[2]	MAA-44
Empty 1lb Metal Can for Reagent	MAA-43
Aqua-Check 0—20% Pressure Gauge	MAA-45
Electronic Balance, 200 x 0.1g	OB-205
1.25in (32mm) Steel Balls, pkg. 2	MAA-47
Sample Cup	MAA-52
Long-Handle Reagent Scoop	MAA-48
Large, Coarse Clean-Out Brush	MAA-51
Small, Fine-Bristle Brush	MAA-50
Heavy-Duty Waterproof Plastic Case	MAA-46
Round Sample Jar	SC-116

[1] Moisture range may be doubled by using 1/2 specimen weight. [2] Due to shipping restrictions, calcium carbide reagent is sold in 10lb (4.5kg) cans. Material from these larger cans can be used to replenish smaller containers for field use.

MA-78

KELWAY SOIL ACIDITY/MOISTURE METER

Unique, dual-purpose Kelway Field Testing Meter gives accurate soil pH (3.5—8.0 range) and moisture (0—100% relative saturation) measurements in three minutes or less. Simply insert pointed end to achieve good soil contact. Readings from scales on top dial are based on measured electrical potential between two dissimilar metal plates. No batteries, electrodes, or buffer solutions are needed, and the meter is durable and insensitive to normal temperatures. Meter is supplied complete with belt-loop carrying case, two 3x4in (76x102mm) conditioning film sheets, and instructions. Conditioning film is used to clean electrode plates prior to use. Not for use with liquids. **Product Dimensions:** Meter is 6.5in (165mm) long with 1.5in (38mm) diameter dial; net wt. is 8oz (0.2kg).

Kelway Soil Acidity/Moisture Meter	
Kelway Soil Acidity/Moisture Meter	MA-78
Accessories	
Conditioning Film, pkg. 12	MAA-116

HM-500

HM-500 closeup

HMA-15

HM-504A

HM-502

POCKET PENETROMETER
OSHA 29 CFR 1926

Lightweight, direct-reading, hand-held soil penetrometer provides approximate unconfined compressive strength information instantly for classification of fine-grained cohesive soils on-site or in the lab. Use is required by OSHA Publication 29 CFR 1926, Subpart P for trenching and excavation inspection. This simple hand-operated device has a 0.25in (6.4mm) dia. loading piston that is spring activated and pushed into the soil up to a calibration groove machined into the piston 0.25in from the end.

The permanent, laser-etched scale on the piston reads approximate unconfined compressive strength in equivalent values of tons per square foot (tsf) or kilograms per square centimeter (kg/cm²). An indicator sleeve retains the maximum reading after piston is released. The calibrated loading spring is plated for rust resistance. Knurled stainless steel barrel provides a sure grip in wet and muddy conditions. A protective cloth sleeve is included. Complete penetrometer weighs only 6.8oz (193g); is 0.75in (19mm) in diameter, and 6.6in (168mm) long. Optional 1in (25.4mm) Adapter Foot Attachment has a loading area of 0.785in² (0.32cm²), sixteen times greater than the standard piston, for enhanced accuracy when testing soft soils.

Pocket Penetrometer	
Pocket Penetrometer	HM-500
Accessories	
Adapter Foot Attachment	HMA-15

POCKET SHEAR VANE SET
ASTM PENDING

The Pocket Shear Vane (Torvane) rapidly measures approximate shear strength of cohesive soils in the field or lab. Set includes all-metal driver, three vanes of different shear strength ranges, and a carrying case with belt loop. In use, the blades of the vane are pressed into the soil, and the knob is turned slowly until failure. Maximum reading is retained by the indicator needle. Values using the standard vaned foot are read directly on the dial from 0—1kg/cm² in 0.05kg/cm² divisions (1 kg/cm² is approximately equal to 1tsf). Readings can be interpolated to 0.01kg/cm² and are multiplied by 0.2 and 2.5 when using the large (sensitive) and small (high-capacity) vanes. Total range is 0—2.5kg/cm². Extensive laboratory testing has indicated close correlation with undrained shear strengths. The tester can be used on any flat 2in (51mm) diameter surface. **Product Dimensions:** 3.5x2.5x1in (89x64x25mm), WxDxH.

Pocket Shear Vane Set	
Pocket Shear Vane Set	HM-504A

POCKET GEOTESTER

The Pocket Geotester dial penetrometer set is ideal for on-site measurement of soil strength. It gives estimated unconfined compressive strength directly in tsf or kg/cm² when used with the standard 1/4in dia. plunger. In addition, readings with four other plungers of 10, 15, 20 and 25mm dia. give strengths over a wide range of cohesive soil types.

The plunger is pressed into the soil to the calibration notch. The maximum value is retained on the dial until released by a push button. Inner dial scale is 0—6.0 tsf or kg/cm² with 0.1 divisions. Outer scale gives total force over 0—11kg range in 0.1kg divisions, and this reading is used with charts provided to estimate bearing capacities depending on plunger used and soil type.

Geotester has large 2.5in (63mm) dial and sturdy noncorrosive construction. Dial is user-calibrated using register plates provided and any reliable scale of 10—15lb capacity. Penetrometer is complete with stainless steel Plungers in carrying case with instructions, Data Tables, and Register Plates. Net Wt. is 13oz (369g); length is 5.4in (138mm). **Product Dimensions:** 6x3x1in (152x76x25mm), WxDxH.

Pocket Geotester	
Pocket Geotester	HM-502

HM-97

HM-930

SOIL CLASSIFICATION KIT

The Soil Classification Kit provides a full range of gauges, charts, and instruments for field evaluation and classification of various soil characteristics. The convenient carrying case contains tools for visual classification, particle size estimation, and for estimating shear strength, density, and bearing capacity.

Kit includes:
- HM-500 Pocket Penetrometer
- HMA-15 Adapter Foot for HM-500
- HM-504A Pocket Shear Vane Set
- HM-930 Soil Density Volumeter
- HM-513 Sand Gauge
- HM-519 Munsell Soil Color Chart Set
- 3in (76mm) Diameter all-stainless steel sieves, 1 ea. #4, #10, #40, #100, #200, Pan, and Cover,
- Sturdy Plastic Carrying Case

Complete descriptions for individual components can be found under their respective model numbers. **Product Dimensions:** 16x8.4x8in (406x213x203mm) WxDxH.

Soil Classification Kit	
Soil Classification Kit	HM-97

SOIL DENSITY VOLUMETER

The Soil Density Volumeter utilizes a calibrated cylinder to make rapid measurements of density of cohesive soils. With the stem of the piston completely retracted, a 30cm^3 capacity cylinder with cutting edge is pushed into the soil. After squaring off the bottom of the core, soil volume in the Volumeter is read to 0.05cm^3 via a scale on the piston stem and a fine-reading vernier scale on the top face of the cylinder. The sample is then extracted for weighing by screwing in the piston. Density is easily computed. The Volumeter is all stainless steel and measures 3.75in (95mm) long by 2in (51mm) maximum diameter.

Soil Density Volumeter	
Soil Density Volumeter	HM-930

SF-20

SFA-20

SFA-22

SFA-21

SF-10

SFA-24

SFA-25

HM-559A

DYNAMIC CONE PENETROMETERS (DCP)

ASTM D6951

Dynamic Cone Penetrometers (DCP) provide quick field determinations of soil shear strengths at depths up to 6ft (1.8m), with extensions. This accurate and portable field equipment measures soil properties that can be related to CBR or Resilient Modulus laboratory values. Original design by United States Army Corps of Engineers meets ASTM requirements. The DCP bridges the gap between laboratory pavement design and construction quality assurance.

Penetration resistance from the sliding hammer is measured in blows per millimeter. Cone diameter of the point is larger than the rod to ensure driving energy is not lost to skin friction on the rods. The driven points are available as multi-use Hardened Steel or single-use Disposable Cones. The Disposable Cones are abandoned in place and often used when points would be difficult to extract. Both cones have a maximum diameter of 0.790in (20.1mm) tapering at a 60° angle to a point. Rods assemble easily with quick-connect pin fittings and can be driven to a depth of about 28.25in (71.8cm). Extension rods with threaded connections can be purchased separately for testing to greater depths.

SF-20 Dual-Mass Dynamic Cone Penetrometer is effective in soils with CBR values from 0.5 to 100. Penetration of higher-strength soils is assisted using the exclusive Dual-Mass Hammer Assembly. This 8kg (17.6lb) Hammer assembly is constructed of stainless steel. For better test values in weaker soils with CBR values of ten or less, the hammer quickly converts to a 4.6kg (10.1lb) unit. The kit includes a crush resistant Pelican case with transport wheels, the Dual-Mass Hammer assembly, 30in (76.2cm) Drive rod, and twenty five disposable cones with an adapter. Also included are a vertical scale, hardened point, T-handled hex wrench, 3-in-1 oil, and Loctite. The user's manual contains software with an Excel® template for use as a DCP data reduction aide. Additional disposable cones, cone adapters, and hardened points are available separately. **Product Dimensions:** 45x17x7in (1,143x432x178mm), WxDxH.

SF-10 Dynamic Cone Penetrometer measures shear strength in soils with CBR values from 10 to 100. This kit is ideal for occasional use in areas where very weak soils are not common. The single-mass 8kg (17.6lb) structural steel hammer is standard. 2" depth rings are marked on the 37.75in (95.9cm) Drive Rod. Also included is one SFA-22 hardened point, manual & CD, and 3-in-1 oil. The Manual provides look-up tables for to correlate blow counts with CBR and unit weight values. The SF-10 is not supplied with a field carrying case. Disposable cones, Adapters, and additional Hardened Points, are sold separately. **Product Dimensions:** 42x5x6in (1,067x127x152mm), WxDxH.

Dynamic Cone Penetrometers (DCP)	
Dual-Mass Dynamic Cone Penetrometer	SF-20
Dynamic Cone Penetrometer	SF-10
Accessories	
Disposable Cones, pkg. 25	SFA-20
Disposable Cone Adapter	SFA-21
Hardened Steel Cone	SFA-22
Lower Drive Rod, 12in (305mm)	SFA-24
Extension Rod, 24in (610mm)	SFA-25

STATIC CONE PENETROMETER

Designed for evaluating soil consistency, compaction, and bearing capacity of foundations and pavement subgrades, the Static Cone Penetrometer yields accurate results, especially from fine-grained, soft soils. Gravel and rocks in the soil can cause misleading readings.

Operation involves pressing the Penetrometer into the soil 6in (152mm), taking a reading, pulling back until the gauge reads zero pressure, advancing another 6in (152mm), taking another reading. Continue in this manner until the entire depth is evaluated.

The Penetrometer is constructed of two rods. The inner rod is connected to the cone tip and is independent of the outer rod. Friction of soil along the shaft of the outer rod does not affect the inner rod's function. The load on the cone is transferred via the inner rod to the hydraulic load cell in the head assembly. The pressure gauge reads the cone stress directly.

Outer rod is high strength chrome alloy tubing. Inner rod is ground 316 stainless steel. Shaft assembly is designed for a maximum of 250lbf axial force. The Penetrometer includes the 0—70kgf/cm² gauge, T-handle and 2ft starter rod. HMA-271A 2ft extension rods can be added as necessary to achieve greater depth capability.

Maximum area of the 60° cone is 1.5cm². Halve the readings when the 3cm² cone is used. **Product Dimensions:** 24x8in (610x203mm), WxH (penetrometer); 3.5x24in (89x610mm), WxH (starter rod).

Static Cone Penetrometer	
Static Cone Penetrometer	HM-559A
Accessories	
2ft Extension Rod	HMA-271A
2ft Starter Rod	HMA-276A
3cm² Cone	HMA-272
1.5cm² Cone	HMA-277

SP-254

SP-258

SP-261

SP-274

SP-284

SP-138

SPA-256

Soil Samplers

Description	Carbon Steel	Stainless Steel
Standard Augers are the best for a wide range of soil types. Open bit design allows larger particles to pass through for recovery. Suplied with quick-connect fittings. Inquire for augers with threaded connectors.		
3in (76mm)	SP-254	SP-258
4in (102mm)	SP-256	SP-259
Clay Augers have an open bit design and windows machined in sides that make sample viewing and recovery easier in cohesive soils. Length is 18in (457mm). Supplied with quick-connect fittings. Inquire for augers with threaded connectors.		
3in (76mm)	SP-261	SP-264
4in (102mm)	SP-262	SP-266
Sand Augers have partially closed bodies and closed bits that aid sample retention in loose, granular soils. Length is 18in (457mm). Suplied with quick-connect fittings. Inquire for augers with threaded connectors.		
3in (76mm)	SP-268	SP-271
4in (102mm)	SP-269	SP-272
Mud (Dutch) Augers have a unique, open design that is ideal for cutting in mucky, boggy, root-bound soils. Sample recovery and clean-up are easier. Available in 3in (76mm) diameter only. Length is 12in (305mm). Suplied with quick-connect fittings. Inquire for augers with threaded connectors.	SP-274	SP-278
Handles & Extensions 16in (406mm) T-Handles are fitted with comfort-grip padding for ease of use. Extensions are high-strength 1in tubing, permanently marked with 6in (152mm) increments. Supplied with quick-connect fittings. Inquire for handles and extensions with threaded connectors.		
2ft (610mm)	SP-284	SP-289
3ft (914mm)	SP-285	SP-290
4ft (1,219mm)	SP-286	SP-291
5ft (1,524mm)	SP-287	SP-292
T-Handle	SP-288	SP-293
Adapters allow our Quick-Connect Augers to be used on older extensions with 5/8in-11 NC threaded connections. A locking pin is included.	SPA-255	—
Quick-Connect Pins 0.25x1.25in pins have spring retention clips.	SPA-256	SPA-257
One-Piece Soil Samplers T-Handle samplers take 0.75in (19mm) diameter cores in tubes with replaceable hardened tips. Welded high-quality plated steel construction. SP-140 has a footstep to assist insertion in the soil.		
One-Piece Soil Sampler, 19in (482mm) Long, 14in (360mm) Open Tube	—	SP-138
One-Piece Soil Sampler, 36in (914mm) Long, 11in (279mm) Open Tube	—	SP-140

technote

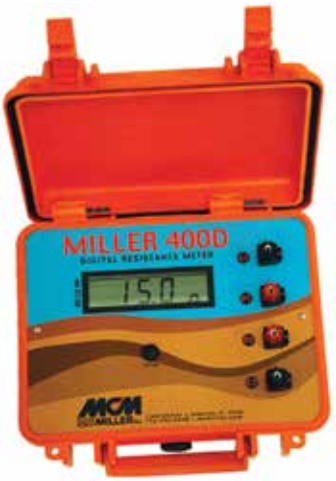
Systems using 5/8-11NC threaded connectors and stainless steel systems for environmental sampling applications are available.

helpfulhint

Soil Samplers are a fast, accurate way to profile soil layers and obtain samples for classification and testing. Gilson Augers and Extensions use precision quick-connect fittings of high-strength steel. One-piece pins are used to secure the components. This system is faster, more robust and easier to use than conventional threaded systems. Heat-treated super alloy bits can be rebuilt when worn. Call for a quotation.

HM-940

HM-942



HM-944

HMA-670

HMA-673

HMA-672

HMA-671

SOIL RESISTIVITY APPARATUS

ASTM G57; AASHTO T 288

This Soil Resistivity equipment utilizes the four electrode method developed by the National Bureau of Standards known as the Wenner 4-pin Method. The test determines the average resistivity of the soil to a depth equal to the spacing between electrodes (soil pins). This kit is designed for the maximum pin spacing of 20ft (6.1m) recommended for a standard survey.

HM-940 Soil Resistivity Kit consists of the Soil Resistivity Reel with four color-coded lead wires harnessed together, four Heavy Duty Soil Pins, and a Soil Box with leads for laboratory testing, housed in a sturdy, foam-lined plastic case. Lead wires plug into the reel hub and terminate with spring-loaded clamps at the opposite end. Soil Pins are 18x0.375in (457x9.5mm) stainless steel with T-handles. The plexiglas Soil Box for laboratory testing has removable potential pins of brass and current plates of stainless steel. Inside dimensions are 9x2.5x1.5in (229x64x38mm), LxWxD. Set of 4 Soil Box Lead wires are 4ft (1.2m) in length. HM-942 or HM-944 Soil Resistance Meters are purchased separately.

HM-942 Analog Soil Resistance Meter is used together with the HM-940 kit, and allows soil resistance values to be read directly from the analog dial without performing additional calculations. The wide-range, high-sensitivity meter has a large dial for easy readability and 8 ranges from 0.1 Ohms to 1.1 Mega-Ohms. Powered by conventional C-cell alkaline batteries. Rugged, weatherproof plastic case is IP67 rated and is12x10x5in (310x250x125mm).

HM-944 Digital Soil Resistance Meter is used with the HM-940 Resistivity Kit. There is no need to select ranges or adjust dials when using this meter. Resistance readings display instantly with the push of a button, or log them directly to a Bluetooth-enabled PC or mobile device (not included) using the included ProCP Soil Resistivity software. Logged readings can be automatically date/time stamped with positioning when integrated with GPS feature in user's handheld device. The HM-944 has a total range from 0.01 Ohms to 10 Mega-Ohms. Powered by conventional D-cell replaceable alkaline batteries. Rugged, weatherproof plastic case is IP67 rated and is12x10.5x5.8in (310x267x147mm).

Soil Resistivity Apparatus	
Soil Resistivity Kit	HM-940
Analog Soil Resistance Meter	HM-942
Digital Soil Resistance Meter	HM-944
Accessories	
Soil Resistivity Reel w/four Lead Wires	HMA-670
Heavy Duty Soil Pin	HMA-671
Soil Box for Laboratory Testing	HMA-672
Leads for Soil Box, set of four	HMA-673

MA-257

MA-260 shown with MAA-192, MAA-194 and MAA-196

MA-267

PEN PH METERS
ASTM D4972; AASHTO T 289

Pen pH meters from Ohaus provide accurate, straightforward operation at an affordable price. Units show pH measurements in the 0 to 14pH range on the large, easy to read LCD display. The pocket-size pH meters are constructed with a durable ABS housing, a protective cap to safeguard the sensor, and automatic shutdown feature that preserves battery life. Pen meters endure prolonged use in rugged environments and feature IP67 waterproof design to prevent water damage when dropped in liquid. A wrist strap is included. The meters operate for approximately 200 hours on four included AG13 button-cell batteries. Working Environment for both units is 50°F to 104°F (10°C to 40°C) and 85%RH, non-condensing. **Product Dimensions:** 1.8x7.3x1.5in (45x185x38mm) WxLxH

Economy Pen pH Meter has single line LCD display, range of 0 to 14x0.1 pH and accuracy of ±0.1pH. The built-in electrode is factory calibrated with no need for use of Buffer Solution, and the meter is not equipped with temperature measurement or compensation functions.

Standard Pen pH Meter has dual line display for all pH and temperature values. The pH range is 0 to 14 x0.01ph with ±0.05pH accuracy. The built-in electrode features 3-point calibration using 4.01, 7.00, and 10.01 buffers. This meter has temperature compensation with range of 0 to 99.0°C (32.0 to 210.2°F).

PORTABLE PH METER
ASTM D4972; AASHTO T 289

Versatile Ohaus Portable pH Meter is rugged, reliable and easy to use in the lab or field. With an IP54-rated protective ABS plastic casing shielding the meter from water and dust damage, the compact and ergonomic design is adaptable for a wide array of environments. Automatic and manual temperature compensation ensures accurate readings while a data library stores up to thirty measurements for future reference. Large, easy to read LCD display.

The auto buffer recognition stores calibration data and helps avoid errors during the calibration process. A maintenance-free 3-in-1 non-refillable plastic gel pH electrode with integrated temperature probe is included. Measurement range of the meter as equipped with supplied probe is 0 to 13x0.01pH. Accuracy is ±0.01pH. Temperature measurement is 0° to 80°C (32° to 212°F)x0.1°. The meter also reads -1999 to +1999x1mv. MA-260 includes the pH electrode, a meter stand, wrist strap, pH buffer packets (4.01, 7.00, and 10.01pH) and carrying bag. Working Environment 41° to 104°F (5° to 40°C), 80%RH, non-condensing. Operates approximately 500 hours on four included AAA batteries. **Product Dimensions:** 3.5x6x1.4in (90x150x35mm).

PORTABLE TURBIDITY METER
USEPA 180.1

The amount of suspended particles in water is quickly determined with the Portable Turbidity Meter Kit. This easy-to-use hand-held instrument accurately measures turbidity by intensity of reflected light. Values are proportional to the quantity of suspended particles in the sample. The MA-267 meets EPA specifications for testing drinking water and is useful for measuring clarity of aqueous solutions in general.

Range selection is automatic over a total range of 0—4,000 NTU (Nephelometric Turbidity Units) with accuracies of ±0.05 NTU from 0—2.5 NTU, ±2% from 2.5—100 NTU, and ±3% above 100 NTU. Resolution is 0.01—1.0 NTU, dependent upon range. Other features include IP67 waterproof construction, tungsten light source, six line backlit LCD display, 500 point data-logging, and auto shut-off. Meter carries the CE mark. SmartLink 3 software can be purchased separately for data transfer to PC.

MA-267 Portable Turbidity Meter includes meter, 0, 1, and 10 NTU Calibrating Standards, sample bottle, four sample tubes, USB cable with wall plug adapter, and waterproof carrying case. Power is provided by a built-in 3.7V Lithium ion battery, rechargeable via included USB cable or 115V AC wall adapter. A 12VDC Car Charger is optional. **Product Dimensions:** 7.5x3.5x2.5in (191x88x64mm), LxWxH.

Pen pH Meters	
Economy Pen pH Meter	MA-257
Standard Pen pH Meter	MA-258
Accessories	
pH Electrode Storage Solution	MAA-190
Buffer Solution, pH 4.01, 250ml	MAA-192
Buffer Solution, pH 7.00, 250ml	MAA-194
Buffer Solution, pH 10.01, 250ml	MAA-196

Portable pH Meter	
Portable pH Meter	MA-260
Accessories	
Buffer Solution, pH 4.01, 250ml	MAA-192
Buffer Solution, pH 7.00, 250ml	MAA-194
Buffer Solution, pH 10.01, 250ml	MAA-196
Replacement 3-in-1 pH Gel Electrode	MAA-196

Portable Turbidity Meter	
Portable Turbidity Meter	MA-267
Accessories	
Calibration Standard, 0 NTU	MAA-240
Calibration Standard, 1 NTU	MAA-241
Calibration Standard, 10 NTU	MAA-242
SmartLink 3 Software	MAA-247
Car Charger, 12 V	MAA-248

technote

Inquire for the full Ohaus line of Pen and Portable meters and electrodes for pH, Total Dissolved Solids (TDS), Dissolved Oxygen (DO), Oxidation Reduction Potential (ORP) and Salinity.

Find Estimated Ship Weights for all our products in the Ship Weight Index

HM-128

HMA-635

DOUBLE-RING INFILTROMETER
ASTM D3385

The Double-Ring Infiltrometer is used for field measurement of infiltration rate of water or other liquid into fine-grained surface soils for geotechnical and environmental studies. Infiltration rates give important data for studies of liquid waste disposal, leaching, drainage, irrigation requirements, canal or reservoir leakage, etc. This proven method produces reliable field test results.

Two galvanized steel rings, 12in and 24in (305mm and 610mm) in diameter and 20in (508mm) high, are driven into the soil in a concentric arrangement using the special driving cap provided. The rings are filled with water and the level is maintained by constant-head Mariotte reservoir cylinders. Velocity of liquid passing to the soil from the inner ring is equivalent to the infiltration rate. Water between the two rings promotes one-dimensional vertical flow beneath the inner ring. The Double-Ring Infiltrometer meets ASTM D3385 requirements.

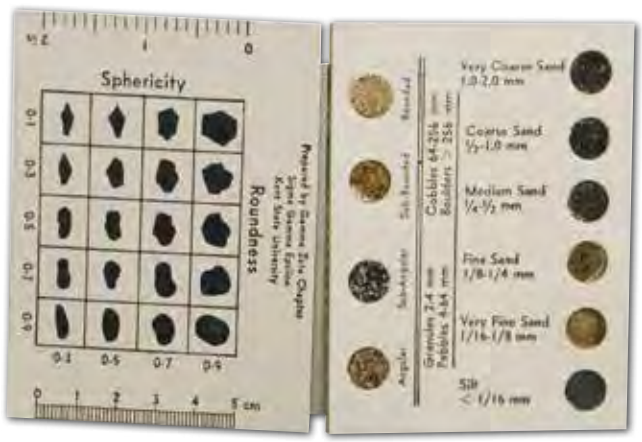
Both rings are constructed with a double-thick, reinforced top edge, and beveled bottom edge for easy driving in stiff soils. The hard-alloy aluminum driving cap is 0.5in (12.7mm) thick and fitted with centering pins. Rugged aluminum and stainless steel construction stands up to harsh field conditions. A sealed adjusting tube is used to raise or lower the head inside the Infiltrometer ring. A bleed valve is located next to the adjusting tube seal.

The graduated plastic Mariotte Cylinders have 3,000ml and 10,000ml volume capacity and are equipped with support stands, flexible tubing, and rubber splash guards. These cylinders provide a constant head of water for the test.

Gilson's optional HMA-635 Infiltrometer Field Set provides essential tools for setting-up and running the test. The set includes a small sledge hammer, rubber mallet, water bucket, carpenter's level, dial thermometer, pH paper, 2x4in (54x102mm) wooden driving block, and shovel.

Double-Ring Infiltrometer	
Double-Ring Infiltrometer	HM-128
Accessories	
Infiltrometer Field Set	HMA-635

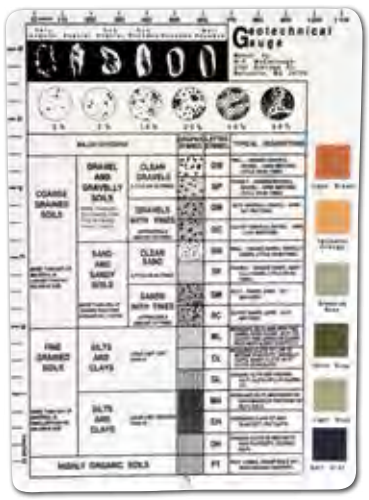
HM-519



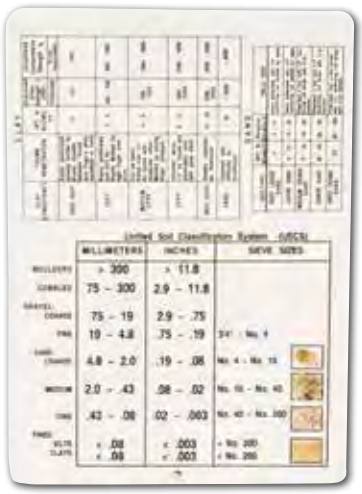
HM-510

Geotechnical Classification Charts

Description	Model
Munsell Soil Color Charts were developed with the U.S. Soil Conservation Service for classifying soil color, but may also be used for rocks, archeological 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, 7.25x4.25in (184x108mm) water resistant pages in an 8x6in (203x152mm) loose-leaf binder.	HM-519
Grain Size Chart is widely used by field geologists for describing samples. It is handy, economical and pocket-sized with recessed die-cut sample cavities filled with precision sieved sedimentary particles permanently mounted to the chart, classed according to the Wentworth grading system.	HM-510
Geotechnical Gauge is a water-resistant 5x8in (127x203mm) plastic card on a lanyard and has a wealth of information for classification of soils. Six color chips, four patches of sized grains, and four tables assist in classifying: • Soils by particle size using the Unified Soils Classification System. • Coarse and fine grained soils into fifteen descriptive categories from gravels and sands to silts and clays. • Sand by type from very loose to very dense. • Clays from very soft to hard. Categories are defined by appearance, by handling properties, or by ranges of field and laboratory test results. Edges of the card have separate 0—6in and 0—110mm scales.	HM-512
Sand Gauge has nine granule patches which are firmly attached to the handy 3.5x2.5in (89x64mm) water-resistant plastic card to assist in defining roundness and size of particles from 2mm very coarse sand to 1/16mm silt. A checklist is included to assist in making field notes and defining bed thickness. Flip side of chart has tables of geologic age and carbonate classification information. Model HM-513 has a 0—50mm scale on one edge and an attached lanyard.	HM-513



HM-512 Front



HM-512 Back

HM-513

Find Estimated Ship Weights for all our products in the Ship Weight Index

How to select the oven that best meets your requirements:

Step 1: Decide on gravity or forced convection airflow.

Step 2: Choose desired temperature range.

Step 3: Determine appropriate dimensions and capacity.

Having trouble deciding? Call a Gilson representative to discuss your application.

Oven Selection Guide

Model	Temperature Max. °F (°C)	Uniformity °C	Chamber Dimensions WxDxH, in (cm)	Product Dimensions WxDxH, in (cm)	Capacity ft³ (L)	Electrical[1] Volts	Amps	Page Number
Gravity Convection								
BO-10R	450 (232)	±3	12x10x10 (30x25x25)	14x12x17 (36x30x43)	0.7 (20)	115	5.2	220
BO-20R	450 (232)	±3	13x13x13 (33x33x33)	15x15x21 (38x38x53)	1.3 (37)	120	6.3	220
BO-30R	450 (232)	±3	18x12x16 (46x30x41)	20x14x25 (51x36x64)	2.0 (57)	120	10.5	220
BO-40	450 (232)	±3	18x14x21 (46x36x53)	20x16x30 (51x41x77)	3.0 (85)	120	12.5	220
PO-23[2]	550 (288)	Not-Rated	33x22x7.5 (84x55x19)	41.5x27x61 (105x69x155)	12.6 (357)	—	—	222
Forced Convection								
OT-2	105 (41)	Not-Rated	35.8x22.5x64 (9x57x163)	36x29.8x78 (92x76x198)	30.0 (850)	115	20	223
BO-250	300 (149)	±2.5	26x24x20 (66x61x51)	33x36x24 (84x91x61)	7.0 (198)	115	9.2	221
BO-250ER	300 (149)	±2	26x24x20 (66x61x51)	33x36x24 (84x91x61)	7.0 (198)	115	9.2	221
BO-60[3]	400 (204)	±2	50x30x54 (127x77x137)	70x46x80 (178x117x203)	46.9 (1,328)	230/460	43/22	222
BO-62[3]	400 (204)	±2	56x30x60 (142x77x152)	76x46x86 (193x117x218)	58.3 (1,651)	230/460	65/33	222
BO-64[3]	400 (204)	±2	68x30x66 (173x77x168)	88x46x92 (224x117x234)	77.9 (2,206)	230/460	87/43	222
BO-323	400 (204)	±4	36x21x36 (91x53x91)	49x28x57 (124x71x145)	15.8 (447)	230/460	19/10	223
BO-333	400 (204)	±4	36x36x36 (91x91x91)	49x43x57 (124x109x145)	27.0 (764)	230/460	29/14	223
BO-343	400 (204)	±4	36x48x36 (91x122x91)	49x55x57 (124x140x145)	36.0 (1,019)	230/460	29/14	223
BO-110	450 (232)	±3	12x10x9 (30x25x22)	14x12x21 (36x30x53)	0.6 (17)	120	6.6	220
BO-120	450 (232)	±3	13x13x12 (33x33x30)	15x15x25 (38x38x64)	1.1 (31)	120	8.8	220
BO-130	450 (232)	±3	18x12x15 (46x30x38)	20x14x29 (51x36x74)	1.8 (51)	120	12.5	220
BO-140	450 (232)	±3	18x14x20 (46x36x51)	20x16x34 (51x41x86)	2.9 (82)	120	12.5	220
BO-350	450 (232)	±2.5	26x24x20 (66x61x51)	33x36x24 (84x91x61)	7.0 (198)	120	16	221
BO-350ER	450 (232)	±2	26x24x20 (66x61x51)	33x36x24 (84x91x61)	7.0 (198)	120	16	221
BO-355	450 (232)	±3	26x24x30 (66x61x76)	33x36x34 (84x91x86)	10.6 (300)	120	16	221
BO-355ER	450 (232)	±2	26x24x30 (66x61x76)	33x36x34 (84x91x86)	10.6 (300)	120	16	221
SH-142	500 (260)	±3.0	30.7x24.7x31.0 (78.1x62.8x78.7)	37.8x34.0x48.0 (95.9x86.4x122.0)	13.7 (387)	230	12	219
SH-282	500 (260)	±3.5	30.7x24.7x31.0 (78.1x62.8x78.7)	37.8x34.0x48.0 (95.9x86.4x122.0)	27.5 (781)	230	20	219
BO-61[3]	550 (288)	±3.0	50x30x54 (127x77x137)	70x46x80 (178x117x203)	46.69 (1,328)	230/460	65/33	222
BO-63[3]	550 (288)	±3.0	56x30x60 (142x77x152)	76x46x86 (193x117x218)	58.3 (1,651)	230/460	87/43	222
BO-65[3]	550 (288)	±3.0	68x30x66 (173x77x168)	88x46x92 (224x117x234)	77.9 (2,206)	230/460	109/55	222
BO-550	550 (288)	±3.5	26x23x20 (66x58x51)	33x36x24 (84x91x61)	6.6 (187)	230	12.5	221
BO-550ER	550 (288)	±2.5	26x23x20 (66x58x51)	33x36x24 (84x91x61)	6.6 (187)	230	12.5	221
SH-100	583 (306)	±2.25	12.1x13.7x14.5 (30.7x34.9 x36.8)	22.7x23.5x31.5 (57.7x59.6x80.0)	1.39 (39.4)	115	12	219
SH-100F	583 (306)	±1.75	12.1x13.7x14.5 (30.7x34.9 x36.8)	22.7x23.5x31.5 (57.7x59.6x80.0)	1.39 (39.4)	230	8	219
SH-300	583 (306)	±1.75	16.5x16.2x19.5 (41.9x41.2x49.5)	26.9x28.6x34.0 (68.4x72.7x86.4)	3.0 (85)	115	14	219
SH-300F	583 (306)	±2.5	16.5x16.2x19.5 (41.9x41.2x49.5)	26.9x28.6x34.0 (68.4x72.7x86.4)	3.0 (85)	230	10	219
SH-500	583 (306)	±1.75	21.0x19.4x20.7 (53.3x49.4x52.7)	31.4x28.1x38.8 (79.8x71.4x98.5)	4.9 (138)	115	14	219
SH-500F	583 (306)	±1.5	21.0x19.4x20.7 (53.3x49.4x52.7)	31.4x28.1x38.8 (79.8x71.4x98.5)	4.9 (138)	230	10	219

[1] Other voltages and standard accessories available. [2] PO-23 Gas Oven has four chambers of indicated size. [3] Base dimensions shown, see listing in this section for dimensions as supplied.

SH-100

SH-282

SHEL LAB® OVENS

Durable, accurate and reliable forced-air lab ovens from SHEL LAB® are made in the USA. All feature turbo blower-assisted mechanical convection for fast heat-up and recovery times with excellent uniformity. Interiors and adjustable shelves are easy to clean quality stainless steel, and 3in (76mm) adjustable exhaust ports are standard. Stainless steel shelves are adjustable in 0.5in (13mm) increments. Two shelves are included with each oven. Heavy-gauge steel cabinets are fitted with quality hinge and latch hardware and have long-lasting exterior powder-coat finish. Additional shelves and stands with casters are optionally available. All SHEL LAB® ovens carry the manufacturer's two-year limited warranty. Models operate on 115 or 230 Volt single-phase 50 or 60 Hertz electrical supplies.

Deluxe SHEL LAB® ovens are UL/CSA/CE Approved and meet ASTM E145 and DIN 12880 standards. These models have advanced features and quality construction. Dual digital displays show countdown timer values and chamber temperatures, and an advanced PID control system regulates temperatures. A separate over-temperature limit control is manually adjusted to prevent unchecked heating of the oven. Triple-wall insulated construction on SH-300 and SH-500 models assures minimal heat loss and cooler surface temperatures. Two standard shelves with 50lb (23kg) capacity are included. Additional standard shelves or heavy-duty shelves with 75lb (34kg) capacity are available separately. A built-in 1.75in (44mm) rear port allows easy access for monitoring and logging instrumentation. Large capacity SH-142 and SH-282 units are ideal for large volumes of samples.

SHEL LAB® Ovens

Model	Max. Temp. °F (°C)	Uniformity C°	Chamber Capacity ft^3 (L)	Chamber Dimensions WxDxH, in (cm)	Product Dimensions WxDxH, in (cm)	Electrical Volts/Amps	Standard Shelf	Heavy-Duty Shelf	Stand w/Casters
SH-100	583 (306)	±2.25 at 150	1.39 (39.4)	12.1x13.7x14.5 (30.7x34.9 x36.8)	22.7x23.5x31.5 (57.7x59.6x80.0)	115/12	SHA-21	SHA-31	-
SH-100F		±1.75 at 150				230/8			
SH-300	583 (306)	±1.75 at 150	3.0 (85)	16.5x16.2x19.5 (41.9x41.2x49.5)	26.9x28.6x34.0 (68.4x72.7x86.4)	115/14	SHA-23	SHA-33	SHA-43
SH-300F		±2.5 at 150				230/10			
SH-500	583 (306)	±1.75 at 150	4.9 (138)	21.0x19.4x20.7 (53.3x49.4x52.7)	31.4x28.1x38.8 (79.8x71.4x98.5)	115/14	SHA-25	SHA-35	SHA-45
SH-500F		±1.5 at 150				230/10			
SH-142	500 (260)	±3.0 at 110	13.7 (387)	30.7x24.7x31.0 (78.1x62.8x78.7)	37.8x34.0x48.0 (95.9x86.4x122.0)	230/12	-	SHA-38	SHA-47
SH-282	500 (260)	±3.5 at 150	27.5 (781)	30.7x25.0x62.0 (78.1x63.5x157.4)	37.5x35.0x78.3 (95.3x88.9x198.8)	230/20	-	SHA-38	SHA-47

Find Estimated Ship Weights for all our products in the Ship Weight Index

BO-10R

BO-40

BO-140

QUINCY LAB OVENS

Lab Ovens with gravity or forced convection are competitively priced and offer exceptional value and reliability. Well-crafted and versatile, they are used for drying, testing, sterilizing, evaporating, heat treating and annealing. Their compact size means more efficient operation and smaller footprint. Models have temperature range to 450°F (232°C).

BO-10R and BO-110 have bimetallic thermostat controllers; others have hydraulic thermostats. Gravity convection models employ a special perforated heat shield which absorbs radiant heat and distributes it more evenly and include BOA-7 Spirit Thermometers for precise temperature monitoring. Forced air models maintain more uniform temperature via a special fan and air transfer plenum. Forced air models also include a dual range °F/°C dial thermometer mounted in the door. Energy efficient, low-watt density Incoloy-sheathed elements are engineered into a compact design for quick run-up and recovery times.

Cabinet exteriors are painted light gray with a durable, scratch-resistant hammer-tone finish. Doors open with high impact thermoplastic handles. Cabinets have heavy steel double-wall construction. Interiors are made of corrosion-resistant aluminized steel, and insulated from the outer cabinet with one inch of high density mineral wool. Ovens are supplied with one fixed and two adjustable shelves. Extra shelves are available as accessories.

Quality UL and CSA recognized components are used in all models. The control panels feature an illuminated On/Off rocker switch and a heat/cycle pilot light. Standard models are equipped to operate 120V/60Hz electrical supplies and are supplied with cords and plugs. Lab Ovens can be ordered for 230V/50Hz operation by adding "F" to the model number.

Quincy Lab Ovens

Type	Model	Uniformity	Max. Temp. °F (°C)	Chamber Capacity, ft³ (L)	Chamber Dimensions WxDxH, in (cm)	Product Dimensions WxDxH, in (cm)	Electrical Volts/Amps	Shelf
Gravity Convection	BO-10R	±3°C	450 (232)	0.7 (20)	12x10x10 (30x25x25)	14x12x17 (36x30x43)	115/5.2	BOA-30
	BO-20R	±3°C	450 (232)	1.3 (36)	13x13x13 (33x33x33)	15x15x21 (38x38x53)	120/6.3	BOA-31
	BO-30R	±3°C	450 (232)	2.0 (57)	18x12x16 (46x30x41)	20x14x25 (51x36x64)	120/10.5	BOA-32
	BO-40	±3°C	450 (232)	3.0 (85)	18x14x21 (46x36x53)	20x16x30 (51x41x77)	120/12.5	BOA-33
Forced Convection	BO-110	±3°C	450 (232)	0.6 (17)	12x10x9 (30x25x22)	14x12x21 (36x30x53)	120/6.6	BOA-30
	BO-120	±3°C	450 (232)	1.1 (32)	13x13x12 (33x33x30)	15x15x25 (38x38x64)	120/8.8	BOA-31
	BO-130	±3°C	450 (232)	1.8 (52)	18x12x15 (46x30x38)	20x14x29 (51x36x74)	120/12.5	BOA-32
	BO-140	±3°C	450 (232)	2.9 (81)	18x14x20 (46x36x51)	20x16x34 (51x41x86)	120/12.5	BOA-33

VIDEO ONLINE

BO-350

BO-350 Analog Controller close-up

BO-355ER

BO-355ER Digital Controller close-up

QUINCY BENCH OVENS

Quincy Bench Ovens offer quality standard features and a wide range of low-cost options. All are forced-air convection with double-wall steel construction, corrosion resistant aluminized steel interiors and a baked hammertone exterior finish. Popular models are stocked for immediate shipment. Full-width gasketed double doors feature high-impact "cool" handles, full-length piano hinges and 2in (51mm) of high-density mineral wool insulation. Ovens hold up to 11 shelves (17 for BO-355 models), adjustable on 1.5in centers, with capacity of 80lb (36kg) per shelf. Two standard shelves and a grounded 6ft (1.8m) cord with plug are included. Additional shelves are available as BOA-1.

The digital "ER" series Quincy Bench Ovens feature a PID Microprocessor Controller with digital display for greater uniformity, repeatability and resolution. This precise microprocessor with a J-type thermocouple holds set temperatures accurately to ±1° F or C with improved chamber uniformity. Control features include large easy-to-read dual LED display in °C or °F units, showing both set and process temperatures. Autotune feature optimizes PID oven performance for various loads and applications. A versatile On/Off control mode allows fast recovery times and processing of batch-style loads.

A hydraulic thermostat controls standard models. A high/low heat switch controls heating and recovery rates for BO-350 and BO-550. Incoloy-sheathed heating elements have low watt density and large 7/16in diameter for long life. UL listed and CSA approved electrical components are 50/60Hz, single phase. Inquire for other electrical configuration.

Long-lasting stainless steel interior is factory-installed, and ordered by adding "S" to the model number. Quincy Bench Ovens can be stacked or mounted on matching BOA-3 Floor Stand or BOA-2 Floor Cabinet. BOA-5 Timer accessory shuts off oven at up to twelve hours and has continuous "hold" feature.

: PRODUCT SPOTLIGHT ::::::::::::::::

POPULAR ACCESSORIES FOR QUINCY BENCH OVENS

Heavy-Duty Oven Shelf	BOA-1
Floor Cabinet with 2 Sliding Shelves	BOA-2
Floor Stand with 1 Fixed Shelf	BOA-3
Exhaust Adapter for 3in (76mm) Pipe	BOA-4
12 Hour Timer	BOA-5[1]
Spirit Thermometer with Grommet	BOA-7[2]

[1] Also fits Lab Ovens, except BO-10R and BO-110. [2] Fits all Bench and Lab Ovens.

Quincy Bench Ovens

Model	Uniformity	Max. Temp. °F (°C)	Chamber Capacity, ft³ (L)	Chamber Dimensions WxDxH, in (cm)	Product Dimensions WxDxH, in (cm)	Electrical Volts/Amps
BO-250	±2.5°C	300 (149)	7.0 (198)	26x24x20 (66x61x51)	33x36x24 (84x91x61)	115/9.2
BO-250ER	±2°C	300 (149)	7.0 (198)	26x24x20 (66x61x51)	33x36x24 (84x91x61)	115/9.2
BO-350	±2.5°C	450 (232)	7.0 (198)	26x24x20 (66x61x51)	33x36x24 (84x91x61)	120/16
BO-350ER	±2°C	450 (232)	7.0 (198)	26x24x20 (66x61x51)	33x36x24 (84x91x61)	120/16
BO-355	±3°C	450 (232)	10.6 (300)	26x24x30 (66x61x76)	33x36x34 (84x91x86)	120/16
BO-355ER	±2°C	450 (232)	10.6 (300)	26x24x30 (66x61x76)	33x36x34 (84x91x86)	120/16
BO-550	±3.5°C	550 (288)	6.6 (187)	26x23x20 (66x58x51)	33x36x24 (84x91x61)	230/12.5
BO-550ER	±2.5°C	550 (288)	6.6 (187)	26x23x20 (66x58x51)	33x36x24 (84x91x61)	230/12.5

Find Estimated Ship Weights for all our products in the Ship Weight Index

BO-60EB

PO-23

LARGE CABINET OVENS

- **High Volume Gas or Electric Ovens.**
- **Capacities up to 78ft³ (2.206L).**
- **Ovens suppled in 230V or 460V.**
- **Temperatures up to 400°F (204°C) or 550°F (288°C).**

Extra-large 47—78ft³ capacity Cabinet Ovens have convenient double-door access to 30in (762mm) deep shelves. The exterior depth is 46in (1,168mm) for efficient use of floor space. Choose models with operating temperatures to 400°F (204°C) or 550°F (288°C) maximum. Control accuracy is ±0.3% and uniformity is ±2°C (±4°F) for 400°F models and ±3°C (±6°F) for 550°F models. All have forced horizontal air flow. Two reinforced 100lb (45.5kg) capacity nickel-plated wire shelves are supplied, and the 6in (152mm) support centers accommodate eight to ten shelves depending on model. An LED indicating temperature controller is provided.

Cabinet Ovens have 4in (102mm) of insulation between type 304 stainless steel interior walls and enameled steel exterior. The UL-listed side access control panel houses the digital controller, blower control push-button, On/Off heat switch, adjustable over-temperature control and pilot lights. Heaters are shut off if blower fails, and the 1hp blower can be run without the heater for cooling.

Construction includes explosion-venting latches, silicone rubber door gaskets, adjustable air intake and exhaust dampers, adjustable interior ductwork louvers to balance air flow and built-in baffles to prevent radiant heat. Order Model BOA-46 Shut-Down Timer accessory to turn off ovens at a preset time. Model BOA-48 Operation Timer rings bell at end of preset time until door is opened or timer is reset. Specify 1, 5, 10, or 30 hour range when ordering either timer accessory.

To specify operating voltage for Electric Ovens, add "EB" to model number for 230V/three phase, or "EC" for 460V/three phase. All units operate on 60Hz current. Inquire for 50Hz models. For Gas Ovens, add "GB" to model number to specify 230V/three phase or "GC" for 460V/three phase.

Large Cabinet Ovens

Model	Max. Temp. °F (°C)	Uniformity	Chamber Capacity, ft³ (L)	Chamber Dimensions WxDxH, in (cm)	Product Dimensions[1] WxDxH, in (cm)	Shelf
BO-60	400 (204)	±2°C	46.9 (1,328)	50x30x54 (127x77x137)	70x46x80 (178x117x203)	BOA-70
BO-62	400 (204)	±2°C	58.3 (1,651)	56x30x60 (142x77x152)	76x46x86 (193x117x218)	BOA-71
BO-64	400 (204)	±2°C	77.9 (2,206)	68x30x66 (173x77x168)	88x46x92 (224x117x234)	BOA-72
BO-61	550 (288)	±3°C	46.9 (1,328)	50x30x54 (127x77x137)	70x46x80 (178x117x203)	BOA-70
BO-63	550 (288)	±3°C	58.3 (1,651)	56x30x60 (142x77x152)	76x46x86 (193x117x218)	BOA-71
BO-65	550 (288)	±3°C	77.9 (2,206)	68x30x66 (173x77x168)	88x46x92 (224x117x234)	BOA-72

[1] Add 10in width to allow for blower and control panel on right side. For Gas models, add additional 15in to left side for burner.

PEERLESS GAS OVEN

The PO-23 Peerless Gas Oven is a four-deck unit with 120°—288°C (250°—550°F) range for drying of large samples. The oven is for use with natural or LP gas (specify at time of order), and has 60,000Btu/HR input for fast, efficient operation. Included Low Temperature System device allows accurate temperature control in the 66°—260°C (150°—500°F) range for sensitive materials.

Each of the four chambers is 33x22x7.5in (838x559x191mm), WxDxH. Construction includes steel doors, enameled exterior, sturdy steel shelf decks and aluminized interior liners. Oven is supplied for natural gas with 5in (127mm) direct vent connection. If directly venting, order POA-10 Flue Diverter. This unit may also be vented under a canopy hood. **Product Dimensions:** 41.5x27x61in (1,054x686x1,549mm), WxDxH.

Peerless Gas Oven	
Peerless Gas Oven	PO-23
Accessories	
Flue Diverter	POA-10

BO-333 shown with BOA-42

OT-2

BUDGET HI-CAPACITY OVENS

Budget Hi-Capacity Ovens offer high capacity and efficient operation at affordable prices. These forced convection electric bench ovens operate to 400°F (204°C) with ±0.5% control accuracy and ±4°C (±8°F) uniformity for rapid drying of large sample loads. Ovens may be used on the bench or ordered with a 24in (610mm) high Stand Kit for most convenient working height. Two 50lb (23kg) capacity nickel-plated wire shelves fit any of ten support channels on 3in centers; order extra shelves as needed. Smallest model BO-323 is designed to fit through a 30in (762mm) wide door.

All Budget Hi-Capacity models have double doors and 2in (51mm) rockwool insulation between type 304 stainless steel interior walls and enameled steel exterior. The UL-listed side access control panel has a thermocouple-actuated temperature controller, blower controls, On/Off heat switch, adjustable oven-temperature controller and pilot lights. Heaters shut off if blower fails, and the 1/3hp blower can be run without the heater for cooling. Adjustable air intake and exhaust dampers are provided. Construction includes explosion venting latches, silicone rubber door gaskets and incolloy-sheathed tubular heating elements with built-in baffle to prevent radiant heat.

The BOA-46 Shut Down Timer accessory turns off oven at a preset time and has "hold" feature for continuous operation. The BOA-48 Operation Timer rings bell at end of preset time until door is opened or timer is reset. When ordering BOA-46 or BOA-48 timers specify 1, 5, 10, or 30 hour range. Extra shelves are also available. Stand Kits are shipped separately and require assembly; other accessories are factory installed.

Budget Hi-Capacity Ovens

Model[1]	Chamber Capacity, ft³ (L)	Chamber Dimensions WxDxH, in (cm)	Product Dimensions[2] WxDxH, in (cm)	Stand Kit	Shelf
BO-323	15.8 (447)	36x21x36 (91x53x91)	49x28x57 (124x71x145)	BOA-40	BOA-50
BO-333	27 (764)	36x36x36 (91x91x91)	49x43x57 (124x109x145)	BOA-41	BOA-51
BO-343	36 (1,019)	36x48x36 (91x122x91)	49x55x57 (124x140x145)	BOA-42	BOA-52

[1] Add letter suffix to model number to specify electrical characteristics desired: "A" suffix, 230V/60Hz/single phase; "B" suffix, 230V/60Hz/three phase; "C" suffix, 460V/60Hz/three phase. Other electrical characteristics quoted on request. [2] Dimensions include 10in (25cm) for blower motor on top of case, and 9in (23cm) control panel on right side.

AIR DRYING OVEN

ASTM D197, D421, D558, D559, D698, D2013, D3302, E605; AASHTO R 58, R 74, T 99, T 180

Designed originally for coal drying, the OT-2 Air Drying Oven has proven useful for drying soil and fire-proofing samples as well as other procedures calling for air drying at lower temperatures. The 105°F (41°C) maximum oven temperature is below 140°F (60°C) allowed for some other soil procedures, but drying is still rapid and efficient because of the high air flow of 1 to 4 air changes per minute.

The large 30ft³ chamber measures 35.75x22.5x64in (91x57x163cm), WxDxH to accommodate large drying pans. Includes six shelves that adjust on 2in (51mm) centers. Entering air passes over the 2,000 watt heating element to the rear plenum for distributed horizontal flow through the chamber and out the holes in the front door. Two separate 24 hour timers are included for heater and fan control, so the unit may be run with unheated air circulation if desired. The solid state temperature controller has digital chamber display with switch to read or set the setpoint temperature. Required power is 20 amps at 115V. Heat-up time is 30 minutes or less. **Product Dimensions:** 36x29.75x78in (91x76x198cm), WxDxH.

Air Drying Oven

Air Drying Oven, 115V/60Hz	OT-2
230V/50Hz	OT-2F

LABORATORY MUFFLE FURNACES

Gilson Laboratory Muffle Furnaces have chamber capacities from 242—5,841in³ (3.9—95.7L). The 242in³ models have 2,350°F (1,287°C) maximum temperature; other models are 2,000°F (1,093°C). All models have chambers with minimum 2.5in (64mm) of refractory firebrick enclosed in heavy-gauge painted steel cases. Heating elements mounted in the firebrick are easily accessible for maintenance. All models are supplied with a cord and plug. Models with side-hinged door have a manual door latch and are UL and Canadian UL approved. MF-4A, MF-6A, and MF-8A drop-front door models have a counter-weight to hold door closed. The inside surface of drop doors provides convenient space for loading/unloading. Power to heating elements is interrupted when the door is open.

Manual Control models have indicating pyrometer with a needle temperature indicator accurate to ±2% of reading. The pyrometer is supplied with a chromel-alumel thermocouple. These furnaces are ideal for single-point operation or where manual adjustments to temperature are acceptable. The percent input knob on the furnace manually adjusts output to control temperature.

Automatic Digital Control furnaces feature precise programming, control and digital display at costs well below competitive units. The electronic controller displays temperatures to the nearest degree in °F or °C. The display also provides alphanumeric prompts for easy programming and operation via the membrane keypad. Up to four programs can be stored in nonvolatile memory. The first program can store up to 18 segments, and the other three programs can store up to ten segments each. An audible temperature alarm or delayed start time can be programmed. An advanced Type K thermocouple probe with protective metal sheath senses temperatures.

MFA-120 Vent Master 120 is an effective powered exhaust venting system, and is purchased separately for MF-4 and MF-6 series Laboratory Muffle Furnaces to actively remove fumes. The Vent Master draws air from the kiln, dilutes it with room air, and pushes it outdoors through a vent hose. A 36in long, 2in diameter (914x51mm) duct comes with each vent, and runs from the collection cup to the blower motor. User-supplied 4in (102mm) aluminum dryer duct or PVC pipe between the motor and the vent outlet. (Do not use vinyl dryer duct.) Existing Furnaces require drilling of 0.25in holes. If ordered when purchasing a Furnace, holes will be drilled at factory for no extra charge. Requires a 120V/60Hz outlet.

MF-4A

MF-4

MF-8A

MF-2

Laboratory Muffle Furnaces

Model	Max. Temp. °F (°C)	Controller	Chamber Capacity, in³ (L)	Chamber Dimensions WxDxH, in (cm)	Product Dimensions WxDxH, in (cm)	Electrical Volts/Amps/Watts
MF-2	2,350 (1,287)	Manual	227 (3.72)	6x6x6.3 (152x152x159)	11x15x18 (279x381x457)	115/12/1,440
MF-2F	2,350 (1,287)	Manual	227 (3.72)	6x6x6.3 (152x152x159)	11x15x18 (279x381x457)	230/6/1,440
MF-2A	2,350 (1,287)	Automatic Digital	227 (3.72)	6x6x6.3 (152x152x159)	11x15x18 (279x381x457)	115/12/1,440
MF-2AF	2,350 (1,287)	Automatic Digital	227 (3.72)	6x6x6.3 (152x152x159)	11x15x18 (279x381x457)	230/6/1,440
MF-4	2,000 (1,093)	Manual	673 (11)	8.5x9x8.8 (216x229x224)	14x18x20.5 (356x457x521)	115/14/1,680
MF-4F	2,000 (1,093)	Manual	673 (11)	8.5x9x8.8 (216x229x224)	14x18x20.5 (356x457x521)	230/7/1,680
MF-4A	2,000 (1,093)	Automatic Digital	673 (11)	8.5x9x8.8 (216x229x224)	14x18x20.5 (356x457x521)	115/14/1,692
MF-4AF	2,000 (1,093)	Automatic Digital	673 (11)	8.5x9x8.8 (216x229x224)	14x18x20.5 (356x457x521)	230/7/1,692
MF-6	2,000 (1,093)	Manual	1,544 (25.3)	13x13.5x8.8 (330x343x224)	18.25x22.5x20.5 (464x572x521)	230/13/3,120
MF-6A	2,000 (1,093)	Automatic Digital	1,544 (25.3)	13x13.5x8.8 (330x343x224)	18.25x22.5x20.5 (464x572x521)	230/13/3,120
MF-8A	2,000 (1,093)	Automatic Digital	5,865 (96.1)	21x21x13.3 (533x533x338)	37.5x30x23 (953x762x584)	230/30/7,200

MF-7910

MF-8020

MF-6010

MUFFLE FURNACES

Laboratory furnaces from Thermolyne are used for ashing, ignition tests, gravimetric analyses, and volatile matter determinations. For construction materials, furnaces are used for tests of soils, aggregates, and cement. All have rugged components and top quality materials to assure longest service life. Select from standard digital, single set-point, or programmable controllers.

The standard digital control displays chamber temperature until the push to set temperature button is pressed. The display then indicates set-point temperature until released. Models with single set-point control ramp directly to the set-point and dwell at that temperature. The display shows actual temperature or set-point. Furnaces with this control also feature over-temperature protection. Programmable controllers operate like single set-point controllers, except they can be programmed to ramp up or down as well as to dwell for constant temperature periods. These models also feature over-temperature protection. MF-6020 has 2-ramp/2-dwell program capability. All single set-point and programmable controllers have 0.3in (7.6mm) LED digital displays in either °C or °F.

All models have multiple elements in sides, tops, and/or bottoms. Since doors and backs have no elements, only the center two-thirds of the chamber is considered uniform in temperature and chamber size should be selected accordingly. MF-1310 and MF-1315 have ceramic fiber insulation for faster heat-up and reduction of energy consumption. All furnaces are equipped with safety interlock door switches. Power to the elements is automatically cut off when the door is opened. The MF-6020 must be hardwired on installation, all other furnaces are supplied with a cord and plug. All models operate on either 50Hz or 60Hz power supply.

alsoavailable

See our listings for the MA-196 Crucible Tongs and SE-31 Heat-Resistant Gloves listed separately in the Pans, Tools and Glassware section.

Muffle Furnaces

Model	Max. Temp. °F (°C)	Controller	Chamber Capacity, in³ (L)	Chamber Dimensions WxDxH, in (cm)	Product Dimensions WxDxH, in (cm)	Electrical Volts/Amps/Watts
MF-1310	2,012 (1,100)	Digital	79 (1.3)	4x5x3.8 (102x127x97)	9x13x14 (236x330x356)	240/4.4/1,060
MF-1315	2,012 (1,100)	Digital	79 (1.3)	4x5x3.8 (102x127x97)	9x13x14 (236x330x356)	120/8.9/1,060
MF-7910	2,192 (1,200)	Digital	120 (2)	5x6x4 (127x152x102)	11.3x15.5x18.5 (287x394x470)	240/4.2/1,000
MF-7915	2,192 (1,200)	Digital	120 (2)	5x6x4 (127x152x102)	11.3x15.5x18.5 (287x394x470)	120/8.3/1,000
MF-8010	2,192 (1,200)	Digital	350 (5.8)	7x10x5 (178x254x127)	13.3x19.5x19 (338x495x483)	240/7.5/1,800
MF-8015	2,192 (1,200)	Digital	350 (5.8)	7x10x5 (178x254x127)	13.3x19.5x19 (338x495x483)	120/15/1,800
MF-8020	2,192 (1,200)	Single Set	350 (5.8)	7x10x5 (178x254x127)	13.3x19.5x19 (338x495x483)	240/7.5/1,800
MF-8025	2,192 (1,200)	Single Set	350 (5.8)	7x10x5 (178x254x127)	13.3x19.5x19 (338x495x483)	120/15/1,800
MF-6010	2,192 (1,200)	Digital	864 (14.2)	12.8x10x6.8 (325x254x173)	19.1x20.1x21 (485x510x533)	240/12.9/3,095
MF-6020	2,192 (1,200)	Programmable	864 (14.2)	12.8x10x6.8 (325x254x173)	19.1x20.1x21 (485x510x533)	240/18.3/4,400

Find Estimated Ship Weights for all our products in the Ship Weight Index

MA-1807

MA-1827

MA-839

MA-812

MA-290

Temperature Accessories

Description	Model	Maximum Temperature, °F (C°)	Dimensions in (mm)
Thermolyne Cimarec® Hot Plates feature digital displays with settings adjustable in 5°C (9°F) increments. Microprocessor-controlled feedback maintains accurate, consistent temperatures. Hot-surface alert system warns of high temperatures regardless of On/Off status. Ceramic heating plate is easy to clean and resistant to most chemicals. Low-profile aluminum housing prevents fluid spills into electronics. Large wire-wound mica heating element assures fast, even heat up. Model with magnetic stirrer uses ceramic drive magnet and stepless control for quiet, reliable operation. Patented Stir-Trac Technology provides exceptional slow-speed stirring 60 to 1,200rpm and immediate braking. A 2x0.375in (51x10mm) Teflon-coated stir bar is included with MA-1827. Models operate on 100-120V/50-60Hz. Add "F" suffix for models that operate on 220-240V, 50/60Hz power supplies.			
Hot Plate, 100-120V/50-60Hz	MA-1807	1,004 (540)	13x8.2x3.8 (330x208x96)
Magnetic Stirring Hot Plate, 100-120V/50-60Hz	MA-1827	1,004 (540)	13x8.2x3.8 (330x208x96)
Electric Ranges with one or two element heavy-duty burner plates are ideal for laboratory heating/drying applications where precise temperature control is not required. High quality commercial grade cast iron elements are built for long service life and stand up to daily use. Single-burner MA-838 is rated at 1,300 watts and 11amp operation for quick warm-up and heat retention. Double-burner MA-839 has one 1,300 watt and one 500 watt burner for lower temperature warming and drying with 15amp draw. Adjustable thermostatic heat controls have On and Ready indicator lights. Brushed stainless steel case and non-slip rubber feet allow safe operation and low maintenance. 120V, 60Hz.			
Electric Range, Single-Burner, 120V/60Hz	MA-838	-	11x12.25x3.25 (279x311x82)
Electric Range, Double-Burner, 120V/60Hz	MA-839	-	19.75x12.25x3.25 (501x311x82)
Propane Hot Plates are ideal for remote operation. Cast metal construction is rugged enough for reliable use in the most demanding field conditions. Single and Double Burner Heavy-Duty models weigh 21.5 and 53lb (9.8 and 24kg) respectively, and have 35,000 BTU rating for each burner. Economy models have 15,000 btu burners and weigh 9.5 and 18lb (4.3 and 8.1kg) each. All operate on standard propane cylinders connected to the 3/8in (9.5mm) male flare fitting. Each Hot Plate requires a Low-Pressure (11in Water Column) Regulator, purchased separately with either POL or Type 1 tank connectors. Regulators include 5ft (1.5m) length of U.L. listed LPG hose with a 3/8in (9.5mm) female flare swivel.			
Single Burner Economy Propane Hot Plate	MA-812	-	10.5x11.5x5.75 (266x292x146)
Double Burner Economy Propane Hot Plate	MA-814	-	20.5x11.5x5.75 (520x292x146)
Single Burner Heavy-Duty Propane Hot Plate	MA-816	-	13x13x7.5 (330x330x190)
Double Burner Heavy-Duty Propane Hot Plate	MA-818	-	27x13x7.5 (685x330x190)
Low Pressure Regulator w/POL Connector	MAA-181	-	-
Low Pressure Regulator w/Type 1 Connector	MAA-182	-	-
Heat Gun Driers are industrial-duty and ideal for use on soil and aggregate samples. Versatile design allows hand-held or bench-top operation on a nonslip, removable base. Heating elements are reinforced mica-insulated ceramic and the housing is sturdy die-cast aluminum. The 1.19in (30mm) diameter heat nozzle rotates and locks over 90°. Maximum air volume is 23cfm (651L/min) at 3,000ft/min (914m/min) velocity. An adjustable air intake shutter controls air temperature. Models operate on 120V/60Hz power supply and are UL listed and CSA approved. Add "F" suffix for models that operate on 220-240V/50Hz.			
Standard Dryer, 600Watts	MA-290	300 (149)	10x5.25x9.5 (254x133x241)
High-Temperature Dryer, 1,440 Watts	MA-291	500 (260)	10x5.25x9.5 (254x133x241)

Scale & Balance Selection Guide (6g—12,000g)

Capacity g / lb	Readability g / lb	Com Port RS-232	Weigh-Below	Brand	Model	Page
Electronic						
120	0.0001/—	•	•	Ohaus	OBX-124	236
120	0.001/—	•	—	A&D	AD-123	235
120	0.01/—	OPT	—	A&D	AD-122	235
120	0.001/—	•	•	Adam	CP-300	236
150	0.005/—	•	•	Adam	CP-301	236
210	0.01/—	OPT	—	A&D	AD-202	235
220	0.0001/—	•	•	Ohaus	OBX-224	234
220	0.001/—	•	•	Ohaus	OBX-223	234
220	0.001/—	•	•	Ohaus	OBD-223	234
220	0.001/—	•	OPT	Adam	CP-80	235
300	0.01/—	•	•	Adam	CP-303	236
310	0.01/—	OPT	—	A&D	AD-302	235
310	0.001/-	•	OPT	A&D	AD-303	235
320	0.0001/—	•	•	Ohaus	OBX-324	236
410	0.01/—	OPT	—	A&D	AD-402	235
420	0.001/—	•	•	Ohaus	OBX-423	234
420	0.001/—	•	OPT	Adam	CP-81	235
600	0.01/—	•	•	Adam	CP-306H	236
600	0.02/—	•	•	Adam	CP-306	236
610	0.01/—	OPT	—	A&D	AD-602	235
620	0.001/—	•	•	Ohaus	OBX-623	234
620	0.001/—	•	OPT	Adam	CP-82	235
820	0.01/-	•	•	Ohaus	OBD-822	234
820	0.001/-	•	OPT	Adam	CP-83	235
1,000	0.01/—	•	•	Adam	CP-310	236
1,100	0.001/—	•	•	Ohaus	OBX-911	234
1,500	0.01/—	OPT	OPT	A&D	AD-154	235
1,500	0.05/—	•	•	Adam	CP-315	236
1,520	0.01/—	•	•	Ohaus	OBD-152	234
1,600	0.01/—	•	OPT	Adam	CP-84	235
2,100	0.01/—	OPT	OPT	A&D	AD-214	235
2,200	0.01/—	•	•	Ohaus	OBX-922	234
2,600	0.01/—	•	OPT	Adam	CP-85	235
3,000/6	0.01/0.00002	•	•	Ohaus	OB-132H	230
3,000/6	0.05/0.0001	•	•	Ohaus	OB-132	230
3,000	0.1/—	•	•	Adam	CP-330	236
3,100	0.1/—	OPT	OPT	A&D	AD-314	235
3,600	0.01/—	•	OPT	Adam	CP-86	235
4,000/8	0.1/0.0002	•	OPT	Adam	CP-36	232
4,100	0.01/—	OPT	OPT	A&D	AD-414	235
4,200	0.01/—	•	•	Ohaus	OBX-942	234
4,200	0.01/—	•	•	Ohaus	OBD-421	234
4,200	0.1/—	•	•	Ohaus	OBD-422	234
4,200	0.1/—	•	OPT	Adam	CP-88	235
4,600	0.01/-	•	OPT	Adam	CP-87	235
6,000/15	0.02/0.00005	•	•	Ohaus	OB-133H	230
6,000/15	0.1/0.0002	•	•	Ohaus	OB-133	230
6,000/13	2.0/0.005	•	—	Adam	CP-6	233
6,000/13	2.0/0.005	•	—	Adam	CP-7	233
6,100	0.01/—	OPT	OPT	A&D	AD-614	235
6,200	0.01/—	•	•	Ohaus	OBX-961	234
6,200	0.1/—	•	•	Ohaus	OBX-962	234
6,200	0.1/—	•	OPT	Adam	CP-89	235
8,000/16	0.2/0.0005	•	OPT	Adam	CP-312	236
8,000/16	0.1/0.0002	•	OPT	Adam	CP-313	236
8,000/16	0.1/0.0002	•	—	Adam	CP-401	229
8200	0.1/-	•	OPT	Adam	CP-90	235
8,200/16	0.1/—	•	•	Ohaus	OBD-821	234
10,000/25	1.0/0.002	•	—	Ohaus	OB-710	229
10,200	0.01/—	•	•	Ohaus	OBX-101	234
10,200	0.1/—	•	•	Ohaus	OBX-102	234
12,000	0.1/-	•	OPT	Adam	CP-91	235
12,000/26	0.1/0.0005	•	OPT	Adam	CP-61	228
12,000/26	0.1/0.0005	•	OPT	Adam	CP-61C	228
12,000/26	0.1/0.0005	•	OPT	A&D	AD-12KA	228
12,000/26	0.1/0.0005	•	•	Ohaus	OBX-512	231
15,000/30	1/0.002	•	—	Ohaus	OB-720	229

Scale & Balance Selection Guide (12,000g—300,000g)

Capacity g / lb	Readability g / lb	Com Port RS-232	Weigh-Below	Brand	Model	Page
Electronic						
15,000/30	0.2/0.005	•	•	Ohaus	OB-134	230
15,000/30	0.1/0.0002	•	•	Ohaus	OB-134H	230
15,000/33	5.0/0.01	•	—	Adam	CP-15	233
15,000/33	5.0/0.01	•	—	Adam	CP-16	233
16,000	0.1/-	•	OPT	Adam	CP-92	235
16,000/35	0.1/0.0005	•	OPT	Adam	CP-62	228
16,000/35	0.1/0.0005	•	OPT	Adam	CP-62C	228
16,000/35	0.5/0.001	•	OPT	Adam	CP-335	232
16,000/35	0.5/0.001	•	—	Adam	CP-403	229
21,000/46	0.1/0.0005	•	OPT	A&D	AD-20KA	228
22,000	0.1/-	•	OPT	Adam	CP-93	235
22,000/48	0.1/0.0005	•	OPT	Adam	CP-63	228
22,000/48	0.1/0.0005	•	OPT	Adam	CP-63C	228
25,000/50	2/0.005	•	—	Ohaus	OB-712	229
24,000/52	0.1/0.0005	•	•	Ohaus	OBX-524	231
30,000/60	2/0.005	•	•	Ohaus	OB-722	229
31,000/68	0.1/0.0005	•	OPT	A&D	AD-30KA	228
31,000/68	1.0/0.005	•	OPT	A&D	AD-32KDA[1]	231
31,000/68	0.1/0.0005	•	OPT	A&D	AD-30KD	228
30,000/60	2.0/0.005	OPT	—	A&D	AD-60PA	232
32,000/70	0.1/0.0005	•	OPT	Adam	CP-64	228
32,000/70	0.1/0.0005	•	OPT	Adam	CP-64C	228
32,000/70	1.0/0.002	•	OPT	Adam	CP-365	232
32,000/70	1.0/0.002	•	—	Adam	CP-405	229
35,000/70	0.1/0.002	•	•	Ohaus	OB-135H	230
35,000/70	0.5/0.001	•	•	Ohaus	OB-135	230
35,000/77	0.1/0.0005	•	•	Ohaus	OBX-535	231
35,000/75	10.0/0.02	•	—	Adam	CP-35	233
35,000/75	10.0/0.02	•	—	Adam	CP-46	233
41,000/90	0.5/0.002	•	OPT	A&D	AD-40KA	228
48,000/100	2.0/0.005	•	OPT	Adam	CP-3100	232
50,000/100	5/0.01	•	—	Ohaus	OB-714	229
50,000/100	10/0.02	—	•	Adam	CP-52	238
60,000/100	2.0/0.005	•	—	Adam	CP-407	229
60,000/150	5.0/0.01	OPT	—	A&D	AD-150PA	232
60,000/150	5.0/0.01	•	—	Ohaus	OB-724	229
60,000/150	5.0/0.01	•	—	Ohaus	OB-726	229
61,000/134	1.0/0.005	•	OPT	A&D	AD-60KA	228
61,000/134	1.0/0.005	•	OPT	A&D	AD-60KD	228
61,000/134	0.1/0.0005	•	OPT	A&D	AD-61KD	228
61,000/134	1.0/0.005	•	•	A&D	AD-102KDA[1]	231
75,000/165	20.0/0.05	•	—	Adam	CP-75	233
75,000/165	20.0/0.05	•	—	Adam	CP-76	233
100,000/250	10/0.02	•	—	Ohaus	OB-716	229
100,000/250	10/0.02	•	—	Ohaus	OB-728	229
101,000/222	1.0/0.005	•	OPT	A&D	AD-101KA	228
101,000/222	1.0/0.005	•	OPT	A&D	AD-101KD	228
101,000/222	10.0/0.05	•	•	A&D	AD-102KDA[1]	231
120,000/260	5.0/0.01	•	—	Adam	CP-409	229
150,000/300	10.0/0.02	OPT	—	A&D	AD-300PA	232
150,000/300	10.0/0.02	•	—	Ohaus	OB-730	229
150,000/300	20/0.05	—	•	Adam	CP-54	238
150,000/330	50.0/0.1	•	—	Adam	CP-150A	233
150,000/330	50.0/0.1	•	—	Adam	CP-151	233
200,000/440	50.0/0.1	•	—	Adam	CP-200	233
200,000/440	50.0/0.1	•	—	Adam	CP-201	233
250,000/500	20.0/0.05	—	—	Ohaus	OB-718	229
300,000/600	20.0/0.05	•	•	Ohaus	OB-732	229
300,000/600	50.0/0.1	—		Adam	CP-56	238
Mechanical						
311	0.01/—	—	—	Ohaus	OB-311	237
3,000[2]	10.0/—	—	•	Marcy	CS-10	238
3,000[2]	10.0/—	—	•	Marcy	CS-10W	238
16,000	5.0/—	—	—	Ohaus	OB-2400M	237
—/36	—/0.1	—	—	Ohaus	OB-2400P	237

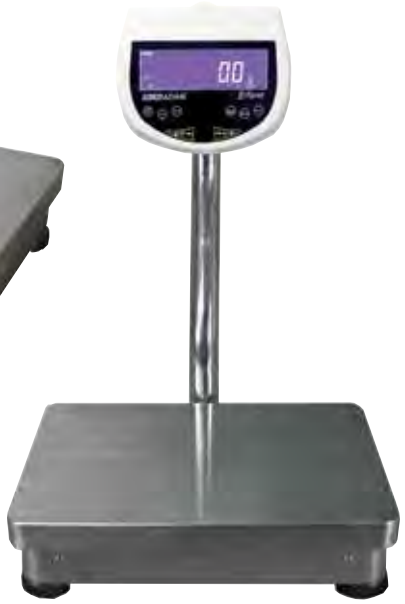
[1] Dual-Range Balance. [2] Pulp Density Scale range = 1.2—7.8 specific gravity. OPT = Optional

AD-12KA
Swing-Arm Up

AD-30KD

AD-12KA
Swing-Arm Down

CP-61



CP-61C

A&D GP INDUSTRIAL HIGH CAPACITY BALANCES

- High-capacity balances with laboratory precision
- g, kg and lb selectable weighing units (12 units total)
- 25.7in swing-arm positions display at any angle
- Detached display allows convenient remote mounting with 3 meter cable
- Easily readable vacuum fluorescent digital display
- NEMA4/IP65 rated, all metal body
- 15.1x13.5in (384x344mm) stainless steel platform
- Automatic Self-Calibration when ambient temperature change occurs
- One Touch Automatic Internal Calibration
- Built-in Windows Communication Tools software
- USB and RS-232 interface
- Weigh-below capability with hook accessory
- 5-year warranty
- **Product Dimensions:** 13.5x15.1x24.5in (344x384x662mm), WxDxH with display up; 14.6x24.2x5.1in (372x615x130mm), WxDxH with display down

A&D GP Industrial High Capacity Balances

Model	Capacity x Readability g (lb)	Precision (Std. Dev.), g	Weigh-Below Hook
AD-12KA	12,000 x 0.1 (26 x 0.0005)	±0.1	ADA-4A
AD-20KA	21,000 x 0.1 (46 x 0.0005)	±0.1	ADA-4A
AD-30KA	31,000 x 0.1 (68 x 0.0005)	±0.1	ADA-4A
AD-40KA	41,000 x 0.5 (90 x 0.002)	±0.5	ADA-4A
AD-60KA	61,000 x 1.0 (134 x 0.005)	±0.7	ADA-6A
AD-101KA	101,000 x 1.0 (222 x 0.005)	±1.0	ADA-6A
AD-30KD	31 x 0.1 (68 x 0.0005)	±0.1	ADA-4A
AD-60KD	61 x 1.0 (134 x 0.005)	±0.7	ADA-6A
AD-61KD	61 x 0.1 (134 x 0.0005)	±0.1	ADA-6A
AD-101KD	101 x 1.0 (222 x 0.005)	±1.0	ADA-6A

ADAM ECLIPSE® HIGH CAPACITY BALANCES

- High capacity with affordable precision
- 16 weighing units, including g, kg, lb, and oz
- Sealed, illuminated touch keypad has durable, smooth surface for easy wipe-down
- Vivid, backlit LCD display is easily visible in any lighting conditions
- Weigh-Below capability with optional CPA-15 Weigh-Below Hook
- Electronic overload protection and capacity tracker
- External calibration for verification and adjustment with Calibration Masses
- RS-232 and USB data ports for computer and printer communications
- Models available with column-mounted or low-profile attached displays
- Large, 304 stainless steel platforms, 15.7x11.8in (400x300mm)
- Rugged metal frame with level indicator and adjustable feet
- 18VDC AC adapter included. CE and CUL marked
- **Product Dimensions:** Attached Display: 15.8x18.1x4in (401x460x-102mm), Column-Mounted Display: 15.8x19.7x23.6in (401x500x-600mm) WxDxH

Adam Eclipse® High Capacity Balances

Models with Attached Display	Models with Column-Mounted Display	Capacity x Readability, G (lb)	Precision (Std. Dev.), g
CP-61	CP-61C	12,000 x 0.1 (26 x 0.0005)	0.2
CP-62	CP-62C	16,000 x 0.1 (35 x 0.0005)	0.2
CP-63	CP-63C	22,000 x 0.1 (48 x 0.0005)	0.2
CP-64	CP-64C	32,000 x 0.1 (70 x 0.0005)	0.2
Accessories			
Weigh-Below Hook			CPA-15

CP-401

OB-724C

OB-710

ADAM GBK BENCH SCALES

- Affordable high capacity, simple, user-friendly operation
- kg, g, lb, oz and lb:oz selectable weighing units
- Large, backlit LCD with capacity tracker
- Tough, splash proof ABS housing
- 11.8x15.7in (300x400mm) stainless steel platform
- RS-232 interface
- Overload protection
- Rechargeable battery pack for cordless use
- 2-year warranty
- **Product Dimensions:** 11.8x20.5x26.8in (300x520x680mm), WxDxH

Adam GBK Bench Scales

Model	Range x Readability, kg/g (lb)	Precision (Std. Dev.), g
CP-401	8 x 0.1 (16 x 0.0002)	±0.2
CP-403	16 x 0.5 (35 x 0.001)	±1
CP-405	32 x 1 (70 x 0.002)	±2
CP-407	60 x 2 (130 x 0.005)	±4
CP-409	120 x 5 (260 x 0.01)	±10

Accessories	
RS-232 to PC cable	CPA-41
RS-232 to USB Interface Cable	CPA-43
Adam Data Collection Software	CPA-45

OHAUS DEFENDER® 7000 BENCH SCALES

- Fast display of weight within 2 seconds
- kg, g, lb, oz and lb:oz selectable weighing units
- Large dual line LCD display with high-contrast white backlight
- Included wall mount bracket to maximize viewing angles
- Painted steel base with ABS indicator housing
- Stainless steel weighing platform
- RS-232 interface
- Library data storage function records up to 255 items
- Use six C batteries (not included) for cordless operation
- Add “C” suffix for Column-Mounted display (inquire for dimensions)
- 2-year warranty

Ohaus Defender® 7000 Bench Scales

Model	Capacity x Readability kg (lb)	Precision (Std. Dev.), g	Platform Size in (mm)	Product Dimensions, WxDxH in (mm)
OB-710	10 x 0.001 (25 x 0.002)	±1.0	12x12 (305x305)	12x20.8x3.7 (305x530x95)
OB-712	25 x 0.002 (50 x 0.005)	±2.0	12x12 (305x305)	12x20.8x3.7 (305x530x95)
OB-714	50 x 0.005 (100 x 0.01)	±5.0	18x18 (457x457)	18x26.8x4.5 (457x680x115)
OB-716	100 x 0.01 (250 x 0.02)	±10.0	18x18 (457x457)	15.7x28.5x4.1 (400x725x105)
OB-718	250 x 0.02 (500 x 0.05)	±20.0	24x24 (610x610)	24x32.8x5.4 (610x833x137)
OB-720	15 x 0.001 (30 x 0.002)	±1.0	12x14 (305x355)	12x22.8x3.7 (305x580x95)
OB-722	30 x 0.002 (60 x 0.005)	±2.0	12x14 (305x355)	12x22.8x3.7 (305x580x95)
OB-724	60 x 0.005 (150 x 0.01)	±5.0	12x14 (305x355)	12x22.8x3.7 (305x580x95)
OB-726	60 x 0.005 (150 x 0.01)	±5.0	15.7x19.7 (400x500)	15.7x28.5x4.1 (400x725x105)
OB-728	100 x 0.01 (250 x 0.02)	±10.0	15.7x19.7 (400x500)	15.7x28.5x4.1 (400x725x105)
OB-730	150 x 0.01 (300 x 0.02)	±10.0	16.5x21.7 (420x520)	16.5x30.5x4.9 (420x775x125)
OB-732	300 x 0.02 (600 x 0.05)	±20.0	16.5x21.7 (420x520)	16.5x30.5x4.9 (420x775x125)

Find Estimated Ship Weights for all our products in the Ship Weight Index

OB-132

OB-134

OHAUS RANGER® 7000 COMPACT BENCH SCALES

- Standard and high-resolution models are built for demanding industrial applications
- Exclusive Sieving Analysis mode
- g, kg lb, and oz selectable weighing units
- Weigh-below density, percent weighing, differential weighing, filling and more
- Display features a 4.3in (109mm) TFT graphical LCD
- Base and indicator housing are die-cast metal and the platform is stainless steel
- Stainless steel platform (size varies, see below)
- Models with “H” suffix have higher resolution and exclusive Auto-Cal function
- Operation is powered by exclusive Ohaus SmarText 2.0 software
- USB and RS-232 interfaces
- Weigh-below hook included
- Optional column mounted display, rechargeable battery and printer accessories
- 1-year warranty

Ohaus Ranger® 7000 Compact Bench Scales

Model	Capacity x Readability, g (lb)	Precision (Std. Dev.), g	Platform Size in (mm)	Product Dimensions, WxDxH in (mm)
OB-132	3,000 x 0.05 (6 x 0.0001)	±0.1	11x11 (280x280)	11x16.5x4.5 (280x420x114)
OB-133	6,000 x 0.1 (15 x 0.0002)	±0.2	11x11 (280x280)	11x16.5x4.5 (280x420x114)
OB-134	15,000 x 0.2 (30 x 0.005)	±0.4	14.8x12.2 (377x311)	14.9x18.4x5 (377x467x128)
OB-135	35,000 x 0.5 (70 x 0.001)	±1.0	14.8x12.2 (377x311)	14.9x18.4x5 (377x467x128)
OB-132H	3,000 x 0.01 (6 x 0.00002)	±0.02	11x11 (280x280)	11x16.5x4.5 (280x420x114)
OB-133H	6,000 x 0.02 (15 x 0.00005)	±0.04	11x11 (280x280)	11x16.5x4.5 (280x420x114)
OB-134H	15,000 x 0.1 (30 x 0.002)	±0.2	14.8x12.2 (377x311)	14.9x18.4x5 (377x467x128)
OB-135H	35,000 x 0.1 (70 x 0.002)	±0.2	14.8x12.2 (377x311)	14.9x18.4x5 (377x467x128)

Accessories	
Rechargeable Battery	OBA-42
Impact Printer	OBA-44
Column Kit for Display	OBA-46

technote

Ranger 7000 Sieving Analysis Mode

Ohaus Ranger 7000 Compact Bench Scales now feature an exclusive new operating mode for Sieve Analysis. This application quickly calculates distributions for particle size analysis, enhancing lab efficiency and minimizing recording errors.

After a set of sieves is set up in the Ranger 7000's library, operation in the Sieve Analysis Mode quickly weighs the contents of each sieve fraction and computes percent retained and passed, along with any weight lost during the process. The end result is displayed on the Ranger's bright QVGA display, and can be sent to the OBA-44 printer, for ticket printing or to a PC for integration into a data management system. The Ranger 7000 will also compute Fineness Modulus, and provides cumulative percent retained for each particle size.

Fully customizable print templates allow printed display of information like company name, address, phone number, website, and contact email, as well as GMP/GLP data for date, time, user ID, project ID, Scale ID, and a unique Sample ID. The Ranger 7000 supports full capture of scale settings and data via the included USB port, and can support a range of printers and bar code scanners.

```
Sample Tag#: 12345
DATA
Start Weight: 1271.9 g
Size      Measured Weight
25mm              169.9 g
12.5mm            715.9 g
6.3mm             246.9 g
Pan               138.2 g
          ----------------
Weight Lost:        1.0 g
End Weight:      1270.9 g
ANALYSIS
Size   Retained    Passed
25mm     13.37%    86.63%
12.5mm   56.33%    30.30%
6.3mm    19.43%    10.87%
Pan      10.87%     0.00%
Size     Acc % retained
25mm              13.37%
12.5mm            69.70%
6.3mm             89.13%
Pan                  ---
Fineness Modulus: 1.72
```

Sample print-out from OBA-44 Impact Printer

AD-32KDA

OBX-512 with OBA-709

OBX-512

A&D GP SMART-RANGE INDUSTRIAL BALANCES

- A&D GP Industrial balances have dual weighing ranges
- Standard range features high capacity with normal readability
- Precision range has limited capacity with enhanced precision and readability
- g, kg, and lb selectable weighing units (12 units total)
- 25.7in swing arm positions display at any angle
- Easily readable vacuum fluorescent digital display
- NEMA4/IP65 washdown rated, all metal body
- 13.5x15.1in (344x384mm) stainless steel platform
- One Touch Automatic Internal Calibration
- Windows Communication Tools software
- Weigh-below capability with optional hook accessory
- Affordable alternative for multiple weighing applications
- RS-232 interface
- 5-year warranty
- **Product Dimensions:** 14x24.2x5.1in (372x615x130mm), WxDxH

OHAUS EXPLORER® PRECISION HIGH CAPACITY BALANCES

- Touchless sensors for hands-free operation of zero, tare, and calibration functions
- Parts counting, percent weighing, differential weighing, density determination, statistics and more
- g, kg and lb selectable weighing units (16 units total)
- Full-color 5.7in (145mm) VGA graphic touch screen display
- Detachable display with 5ft (1.5m) cable
- OBA-709 Display Column Kit accessory
- Die-cast metal base and IP54 rated enclosure for protection against spills, debris, and humidity
- 12.2x14.8in (311x377mm) stainless steel platform
- Ohaus SmarText™ 2.0 software with AutoCal™ for fast internal calibration
- USB and RS-232 interface
- Weigh-below hook included
- Operate on 100/120V or 220/240V, 50/60Hz electrical supplies, inquire for rechargeable battery accessory
- 2-year warranty
- **Product Dimensions:** 14.8x17.4x4.7in (377x443x120mm), WxDxH

A&D GP Industrial High Capacity Balances

Model	Standard Capacity and Readability, g (lb)	Precision Capacity and Readability, g (lb)	Precision	Weigh-Below Hook
AD-32KDA	31,000 x 1 (68 x 0.005)	6,000 x 0.1 (15 x 0.0005)	0.5/0.1	ADA-4A
AD-102KDA	101,000 x 10 (222 x 0.05)	61,000 x 1 (134 x 0.005)	5.0/1.0	ADA-6A

Ohaus Explorer® Precision High Capacity Balances

Model	Capacity x Readability, kg (lb)	Precision (Std. Dev.), g
OBX-512	12,000 x 0.1 (26 x 0.0005)	±0.1
OBX-524	24,000 x 0.1 (52 x 0.0005)	±0.1
OBX-535	35,000 x 0.1 (77 x 0.0005)	±0.1
Accessories		
Display Column Kit, 18in high		OBA-709

Find Estimated Ship Weights for all our products in the Ship Weight Index

AD-150PA

AD-61P

CP-36

A&D FG-K BENCH/PLATFORM SCALES

- Cost effective scale for lab or field use
- kg, lb and oz selectable weighing units
- Platform mounted LCD display, inquire for column-mounted model
- IP65 rated, all metal body and rock-solid frame construction
- 12x15in (305x381mm) stainless steel platform
- USB/RS-232 Interface with ADA-30A cable
- ADA-33A Carrying Handle purchased separately as ADA-33A
- Powered by included AC adapter or 4 C-dry cell batteries (not included)
- 2-year warranty
- **Product Dimensions:** 15x18.3x4.6in (380x464x118mm), WxDxH

ADAM CBK BENCH SCALES

- Large capacity, high resolution
- g, kg, lb, oz and lb:oz selectable weighing units
- Large, backlit LCD with capacity tracker
- Tough, splash proof ABS housing
- 8.9x10.8in (225x275mm) stainless steel platform
- RS-232 interface
- Overload protection
- Weigh-below capability with factory-installed CPA-33 Hook accessory
- Rechargeable battery pack for cordless use
- 2-year warranty
- **Product Dimensions:** 12.4x14.4x4.3in (315x355x110mm), WxDxH

A&D FG-K Bench/Platform Scales

Model	Capacity x Readability, kg (lb)	Precision (Std. Dev.), g
AD-60PA	30 x 0.002 (60 x 0.005)	±5.0
AD-150PA	60 x 0.005 (150 x 0.01)	±10.0
AD-300PA	150 x 0.01 (300 x 0.02)	±20.0
Accessories		
RS-232 Serial Interface For Bench /Platform Scale		ADA-30A
Wall Mount Kit for A&D Bench/Platform Scales		ADA-32A
Carrying Handle for A&D Bench/Platform Scales		ADA-33A
17ft Extension Cable for Bench/Platform Scales		ADA-34A

Adam CBK Bench Scales

Model	Capacity x Readability, kg (lb)	Precision (Std. Dev.), g
CP-36	4,000 x 0.1 (8 x 0.0002)	±0.1
CP-312	8,000 x 0.2 (16 x 0.0005)	±0.2
CP-313	8,000 x 0.1 (16 x 0.0002)	±0.1
CP-335	16,000 x 0.5 (35 x 0.001)	±0.5
CP-365	32,000 x 1.0 (70 x 0.002)	±1.0
CP-3100	48,000 x 2.0 (100 x 0.005)	±2.0
Accessories		
Weigh-Below Option		CPA-33

CP-46

CP-75 shown with HM-30 Air Meter Base

ADAM CPW PLUS BENCH SCALES

- Simple, 4-button operation for fast, affordable weighing operations
- High capacity with extra readability
- kg, lb, oz and lb:oz selectable weighing units
- Corded remote display with large, easy-to-read LCD display and backlight
- Wall Mount Bracket
- Tough, splash proof housing
- Low profile 11.8x11.8in (300x300mm) stainless steel platform
- RS-232 interface
- AC adapter or battery powered with 6 AA batteries
- Hold function allows continuous display of weight readings
- 1-year warranty
- **Product Dimensions:** 11.8x11.8x2in (300x300x50mm), WxDxH

Adam CPW Plus Bench Scales		
Model	Capacity x Readability, kg (lb)	Precision (Std. Dev.), g
CP-7	6 x 0.002 (13 x 0.005)	±2.0
CP-16	15 x 0.005 (33 x 0.01)	±5.0
CP-46	35 x 0.01 (75 x 0.02)	±10.0
CP-76	75 x 0.02 (165 x 0.05)	±20.0
CP-151	150 x 0.05 (330 x 0.1)	±50.0
CP-201	200 x 0.05 (440 x 0.1)	±50.0

COMPACT FIELD SCALES

- Portable, affordable solution for field weights of soil, concrete and asphalt
- kg, lb, oz and lb:oz selectable weighing units
- Large, easy-to-read LCD display
- Wall Mount Bracket
- Large 11.8x11.8in (300x300mm) stainless steel weighing platform
- RS-232 interface
- Aluminum carrying case with fitted foam interior and AC adapter
- Compliant with ASTM C29, C138 and AASHTO T 19 and T 121 for field unit weights and yield tests
- Hold function allows continuous display of weight readings
- 1-year warranty
- **Product Dimensions:** 11.8x11.8x2in (300x300x50mm), WxDxH
- **Outside Case Dimensions:** 18.63x14.25x6in (473.08x361.95x152.4mm), WxDxH

Compact Field Scales		
Model	Capacity x Readability, kg (lb)	Precision (Std. Dev.), g
CP-6	6 x 0.002 (13 x 0.005)	±2.0
CP-15	15 x 0.005 (33 x 0.01)	±5.0
CP-35	35 x 0.01 (75 x 0.02)	±10.0
CP-75	75 x 0.02 (165 x 0.05)	±20.0
CP-150A	150 x 0.05 (330 x 0.1)	±50.0
CP-200	200 x 0.05 (440 x 0.1)	±50.0

Find Estimated Ship Weights for all our products in the Ship Weight Index

OBX-922

OBX-423

OBD-223

OBD-822

OHAUS EXPLORER® PRECISION BALANCES

- Versatile scale with 14 weighing functions including density, differential weighing, check weighing and percent weighing
- Four touch-free sensors offer hands-free control of calibration, tare, print, or other programmable commands
- g, kg and lb selectable weighing units (16 units total)
- 5.7in (145mm) full color touch-screen display separates easily from the base for remote mounting
- Stainless steel platform
- Intelligent Calibration automatically calibrates daily or at significant temperature changes
- Library function makes it easy to store and recall applications
- USB and RS-232 interface
- Weigh-below hook included
- Models with 0.001g readability include a draft shield with large sliding side doors and flip-open top
- Operates on AC power supplies from 100—240V, and 50—60Hz
- Inquire for data cables, display column, additional data ports and printers
- 2-year warranty
- **Product Dimensions:** 9.1x15.5x3.9in (230x393x98mm) WxDxH. Height with Draftshield: 13.8in (350mm)

Ohaus Explorer® Precision Balances

Model	Capacity x Readability g	Precision (Std. Dev.), g	Platform size in (mm)
OBX-223	220 x 0.001	±0.001	5.1 (130) Dia.
OBX-423	420 x 0.001	±0.001	5.1 (130) Dia.
OBX-623	620 x 0.001	±0.001	5.1 (130) Dia.
OBX-911	1,100 x 0.001	±0.001	5.1 (130) Dia.
OBX-922	2,200 x 0.01	±0.01	7.5x7.9 (190x200)
OBX-942	4,200 x 0.01	±0.01	7.5x7.9 (190x200)
OBX-961	6,200 x 0.01	±0.01	7.5x7.9 (190x200)
OBX-962	6,200 x 0.1	±0.1	7.5x7.9 (190x200)
OBX-101	10,200 x 0.01	±0.01	7.5x7.9 (190x200)
OBX-102	10,200 x 0.1	±0.1	7.5x7.9 (190x200)

OHAUS ADVENTURER PRECISION BALANCES

- High-resolution balances for laboratory, industrial and educational applications
- g, kg and lb selectable weighing units (16 units total)
- Adventurer series is designed for stability, accuracy and fast response time
- 4.3in (109mm) full color LCD touch screen makes application control easy, even with laboratory gloves on
- Dual USB ports
- Weigh-below hook, protective cover, integral security bracket and stability indicator are included
- OBD-223 model features a draftshield with wide-entry, glass panel doors
- Sealed front panel, molded spill ring, large stainless steel platforms, and leveling feet for quick setup
- Models operate on 100 to 240V/50 to 60Hz power supplies with the included AC Adapter
- Inquire for models conforming to National Type Evaluation Program (NTEP) Standards and units with internal calibration
- 2-year warranty
- **Product Dimensions:** 9.1x13.9x3.9in (230x354x100mm) WxDxH. OBD-223 with draftshield has 9.5in (241mm) height.

Ohaus Adventurer Precision Balances

Model	Capacity x Readability g	Precision (Std. Dev.), g	Platform size in (mm)
OBD-223	220 x 0.001	±0.001	5.1 Dia. (130)
OBD-152	1,520 x 0.01	±0.01	6.9x7.7 (175x195)
OBD-421	4,200 x 0.01	±0.01	6.9x7.7 (175x195)
OBD-422	4,200 x 0.1	±0.1	6.9x7.7 (175x195)
OBD-821	8,200 x 0.1	±0.1	6.9x7.7 (175x195)
OBD-822	820 x 0.01	±0.01	6.9x7.7 (175x195)

CP-80

CP-90

AD-214

ADAM NIMBUS PRECISION BALANCES

- Affordable precision
- g, kg and lb selectable weighing units (9 total units)
- Large, easy-to-read LCD display with backlight
- Sealed keypad protects against dirt and accidental spills
- Solid die-cast aluminum body
- Stainless steel weighing platform (size varies, see below)
- USB and RS-232 interfaces
- Weigh-below capability with CPA-20 Hook accessory
- Removable draftshield
- 3-year warranty
- **Product Dimensions:** 8.7x12.2x6.6in (221x309.9x167.6mm), WxDxH

Adam Nimbus Precision Balances

Model	Range x Readability g	Precision (Std. Dev.), g	Pan Dimensions in (mm)
CP-80	220 x 0.001	±0.002	4.7 (120) Dia.
CP-81	420 x 0.001	±0.002	4.7 (120) Dia.
CP-82	620 x 0.001	±0.002	4.7 (120) Dia.
CP-83	820 x 0.001	±0.002	4.7 (120) Dia.
CP-84	1600 x 0.01	±0.02	6.3 (160) Dia.
CP-85	2600 x 0.01	±0.02	6.3 (160) Dia.
CP-86	3600 x 0.01	±0.02	6.3 (160) Dia.
CP-87	4600 x 0.01	±0.02	6.3 (160) Dia.
CP-88	4200 x 0.1	±0.2	6.3 (160) Dia.
CP-89	6200 x 0.1	±0.2	6.3 (160) Dia.
CP-90	8200 x 0.1	±0.2	6.3 (160) Dia.
CP-91	12000 x 0.1	±0.2	15.7x11.8 (300x400)
CP-92	16000 x 0.1	±0.2	15.7x11.8 (300x400)
CP-93	22000 x 0.1	±0.2	15.7x11.8 (300x400)

Accessories	
Weigh-Below Hook for Nimbus Balances	CPA-20

A&D NEWTON COMPACT BALANCES

- Affordable precision, easy portability
- g and lb selectable weighing units (7 units total)
- LCD display with backlight and fast 1 second response time
- Optional USB and RS-232 Interfaces for printing or data collection
- Weigh-below capability for models with 1,500g capacity or more with underhook accessory
- Built-in specific gravity functions
- AC or battery operation with four AA batteries (not included)
- Optional ADA-35 Carrying Case for easy portability (excludes AD-123 and AD-303 models)
- 5-year warranty
- **Product Dimensions:** 7.5x8.2x2.3in (190x208x59mm), WxDxH

A&D Newton Compact Balances

Model	Capacity x Readability g	Precision (Std. Dev.), g	Platform Size in (mm)
AD-123	120 x 0.001	±0.003	4.3 (110) Dia.
AD-303	310 x 0.001	±0.003	4.3 (110) Dia.
AD-122	120 x 0.01	±0.01	4.3 (110) Dia.
AD-202	210 x 0.01	±0.01	4.3 (110) Dia.
AD-302	310 x 0.01	±0.01	4.3 (110) Dia.
AD-402	410 x 0.01	±0.01	4.3 (110) Dia.
AD-602	610 x 0.01	±0.01	4.3 (110) Dia.
AD-154	1,500 x 0.1	±0.1	5.5x5 (127x140)
AD-214	2,100 x 0.1	±0.1	5.5x5 (127x140)
AD-314	3,100 x 0.1	±0.1	5.5x5 (127x140)
AD-414	4,100 x 0.1	±0.1	5.5x5 (127x140)
AD-614	6,100 x 0.1	±0.1	5.5x5 (127x140)

Accessories	
Underhook for AD-154, AD-214, AD-314, AD-414 & AD-614	ADA-20
Underhook for AD-314, AD-414, & AD-614	ADA-22
Carrying Case	ADA-35
USB Interface	ADA-202
RS-232C Interface	ADA-203

OBX-124

CP-310

OHAUS EXPLORER® ANALYTICAL BALANCES

- Versatile scale with density, differential weighing, check weighing, percent weighing and more
- Four touch-free sensors offer hands-free control of calibration, tare, print, or other commands
- g, kg and lb selectable weighing units (16 units total)
- 5.7in (145mm) full color touch-screen display separates easily from the base for remote mounting
- 3.5in (90mm) diameter stainless steel platform
- Intelligent Calibration automatically calibrates daily or at significant temperature changes
- Library function makes it easy to store and recall applications
- USB and RS-232 interfaces
- Weigh-below hook included
- Included draftshield with large sliding side doors has flip-open top
- Operates on AC power supplies from 100—240V, and 50—60Hz
- 2-year warranty
- **Product Dimensions:** 9.1x15.5x13.8in (230x393x350mm), WxDxH

Ohaus Explorer® Analytical Balances

Model	Capacity x Readability g	Precision (Std. Dev.), g
OBX-124	120 x 0.0001	±0.0001
OBX-224	220 x 0.0001	±0.0001
OBX-324	320 x 0.0001	±0.0001

ADAM PORTABLE PRECISION BALANCES

- Rugged, lightweight and portable
- g and lb selectable weighing units (15 units total)
- LCD display with backlight
- 4.7in (120mm) diameter stainless steel platform
- HandiCal™ calibration with built-in mass
- ShockProtect™ overload protection
- USB and RS-232 interface
- Weigh-below hook included
- Internal rechargeable battery with AC adapter
- Removable draft shield standard on all models
- 2-year warranty
- **Product Dimensions:** 6.7x9.6x3.1in (170x245x80mm), WxDxH

Adam Portable Precision Balances

Model	Capacity x Readability g	Precision (Std. Dev.), g
CP-300	120 x 0.001	±0.001
CP-301	150 x 0.005	±0.005
CP-303	300 x 0.01	±0.01
CP-306	600 x 0.02	±0.02
CP-306H	600 x 0.01	±0.01
CP-310	1,000 x 0.01	±0.01
CP-315	1,500 x 0.05	±0.05
CP-330	3,000 x 0.1	±0.1

OB-311

OB-2400P

OHAUS CENT-O-GRAM BALANCE

- Reliable mechanical design for economical weighing of small samples
- 311x0.01g capacity with four notched beams for counterweights
- Magnetic damping, agate bearings, precision-ground knives, and
- Stainless steel pan with handle and two pouring spouts is 3.5in (89mm) diameter
- Adjustable platform can be used for determination of specific gravity of solids
- Optional Vinyl Dust Cover protects the balance between uses
- 5-year warranty
- **Product Dimensions:** 14.1x6.5x9.8in (360x166x249mm), WxDxH

Ohaus Cent-O-Gram Balance	
Ohaus Cent-O-Gram Balance	OB-311
Accessories	
Vinyl Dust Cover	OBA-110

OHAUS FIELD TEST SCALES

- Rugged mechanical balances are designed for field use
- Both have a single beam graduated in 0.01lb and 5g divisions, and are supplied with slotted iron weights
- OB-2400P capacity is 36x0.01lb and is supplied with Imperial (pound) weights
- OB-2400M capacity is 16kgx5g and is supplied with metric weights
- Models can be converted between metric and Imperial weighing systems with purchase of additional weight sets
- Heavy, cast metal base features an integral carrying handle
- Weighing platform is 11in (279mm) diameter
- **Product Dimensions:** 15.3x7.6x8.2in (390x194x209mm), WxDxH

Ohaus Field Test Scales	
Ohaus Field Test Scale, with Weight Set in pounds	OB-2400P
Ohaus Field Test Scale, with Weight Set in kilograms	OB-2400M
Accessories	
Pounds Weight Set, 36lb	OBA-137P
Kilograms Weight Set, 16kg	OBA-137M
Stainless Steel Scoop	OBA-126A

Weighing/Handling Scoops

WEIGHING/HANDLING SCOOPS

Select from a range of sizes and capacities of scoops with pouring spouts for weighing and handling of samples. Types of construction include stainless steel (SS), aluminum (AL), polypropylene (PP). For larger samples, see TSA-162, TSA-163, and HMA-68 chute-end Handling Pans described elsewhere.

Weighing/Handling Scoops			
Model	**Description**	**Size, LxWxH, in**	**Approx. Tare, g**
OBA-10783A	SS Flat Bottom	11.9x7.38x1.7	190
OBA-1101	PP Footed	12x6x2.8	125
OBA-171[1]	AL Flat Bottom with Tab	3x2.3x0.8	9
OBA-170[1]	AL Flat Bottom with Tab	2x1.5x0.4	4
OBA-126A	SS Flat Bottom	17.2x11x3.4	800

[1]Includes counterweight.

CP-52

CP-54

CP-56

CS-10

CS-10W

ADAM SHS CRANE SCALES

- Ideal for rapid weight determinations of large, difficult-to-position items
- Lb and kg selectable weighing units
- Die-cast metal frame and 360° rotary safety hook
- Overload rated to 150% of total capacity with full-range taring
- Included remote control promotes safety when selecting units, hold functions and zeroing
- Large, red LCD display with easily readable 0.6in (15mm) digits
- Rechargeable lithium batteries last up to 20 hours; or use AA batteries
- 100-240V/50-60Hz battery charger
- 1-year warranty
- **Product Dimensions:** 5.8x2.6x12.6in (148x65x320mm), WxDxH

Adam SHS Crane Scales		
Model	**Capacity x Readability, kg (lb)**	**Precision (Std. Dev.), g**
CP-52	50 x 0.01 (100 x 0.02)	±10
CP-54	150 x 0.02 (300 x 0.05)	±20
CP-56	300 x 0.05 (600 x 0.1)	±50

PULP DENSITY/SPECIFIC GRAVITY SCALES

- Suspension Scale for direct readings of specific gravity, percent solids, and weight in kilograms
- Simple, direct determination of pulp densities and specific gravities of pulps, liquids, and dry solids
- Operator and computation errors are eliminated
- Wide range for specific gravities from 1.2 to 7.8 using one of twelve included interchangeable analog dial faces
- Scale is constructed of sturdy painted steel and has 10in (254mm) circular dial with acrylic lens
- CS-10W Marcy™ brand requires 1,000ml container with slotted overflow holes in CSA-25 clear plastic or CSA-26 stainless steel, sold separately
- CS-10 Scale has identical function and construction but is supplied with the CSA-25 clear plastic container
- **Product Dimensions:** 17.5x12x3in (445x305x76mm), WxDxH

Pulp Density/Specific Gravity Scales	
Marcy™ Pulp Density/Specific Gravity Scale, without Container	CS-10W
Pulp Density/Specific Gravity Scale, with Clear Container	CS-10
Accessories	
1,000ml Plastic Container	CSA-25
1,000ml Stainless Steel Container	CSA-26
Set of 12 Dial Faces for CS-10W or CS-10	CSA-30

Calibration Weights

Calibration Sets

NIST Weights

CALIBRATION WEIGHTS FOR BALANCES

Sophisticated testing and frequent auditing of laboratory equipment has made it increasingly necessary for laboratories to calibrate their own balances. Calibration Weights check span and linearity and calibrate electronic balances. The commonly used Span Calibration method uses one-point calibration with a single mass approximately equal to the capacity of the balance. Some balances use the Linearity Calibration method which allows the user to select multiple mass settings, normally defined as zero, center (half span), and full span of the balances capacity. This method minimizes deviation throughout the balance's weighing range.

Gilson offers Calibration Weights in ASTM Classes 1 and 4, NIST Class F and Ultra Class. Ultra Class weights boast weight tolerances 40—50% tighter than ASTM Class 1 and equal to or exceeding OIML Class E2. Ultra Class and ASTM Class 1 weights are highly polished stainless steel. ASTM Class 4 weights are satin-finished stainless steel. Recessed grip handles are part of the 10kg and 20kg weights for easier handling and stacking. Individual weights from 10—4,000g include a glove and protective, foam-lined plastic case. Cases for 10kg and 20kg weights are high-impact plastic, reinforced with metal edges.

Precision Weights Sets are available in Ultra Class, ASTM Class 1 and ASTM Class 4 with ranges of 1mg—100g and 1—100g. Weights are supplied in 5-2-2-1 series as ASTM E617 specifies.

NIST Class F Calibration Weights are available for higher capacity balances and scales. Fabricated of cast iron with integral grip handles.

Traceable or NVLAP Certificates are available for all weights and sets. Traceable Certificates document traceability to NIST and compliance with ASTM or OIML specifications. They include nominal value and correction, date of calibration, accuracy class, customer name and purchase order number. NVLAP Weight Calibration Certificates should be requested by users who must provide certification to ISO, FDA, ANSI or other requirements. Report format and contents comply with NVLAP requirements. Order weights or sets with these certifications, by adding "T" for Traceable certificate or "W" for NVLAP Certificate to the catalog number.

helpfulhint

Ultra Class: For analytical and sensitive balances and applications that demand superior accuracy.

ASTM Class 1: For analytical balances and applications requiring first-order accuracy.

ASTM Class 4: For most balances less sensitive than 0.01g and applications having average accuracy requirements.

NIST Class F: For higher capacity, less sensitive balances and scales.

Calibration Weights for Balances

Weight	Ultra Class	ASTM Class 1	ASTM Class 4	NIST Class F
Individual Weights				
10g	OBA-201	OBA-301	OBA-401	—
20g	OBA-202	OBA-302	OBA-402	—
30g	OBA-203	OBA-303	OBA-403	—
50g	OBA-204	OBA-304	OBA-404	—
100g	OBA-205	OBA-305	OBA-405	—
200g	OBA-206	OBA-306	OBA-406	—
300g	OBA-207	OBA-307	OBA-407	—
400g	OBA-208	OBA-308	OBA-408	—
500g	OBA-209	OBA-309	OBA-409	—
1,000g	OBA-210	OBA-310	OBA-410	—
2,000g	OBA-211	OBA-311	OBA-411	—
3,000g	OBA-212	OBA-312	OBA-412	—
4,000g	OBA-213	OBA-313	OBA-413	—
10kg	OBA-214	OBA-314	OBA-414	OBA-282
20kg	OBA-215	OBA-315	OBA-415	OBA-284
25kg	—	—	—	OBA-286
50kg	—	—	—	OBA-288
100kg	—	—	—	OBA-289
250kg	—	—	—	OBA-291
25lb	—	—	—	OBA-278
50lb	—	—	—	OBA-280
Sets				
1mg—100g	OBA-216	OBA-316	OBA-416	—
1g—100g	OBA-217	OBA-317	OBA-417	—

Accessories	
Plastic Case for all 10kg Weights	OBA-10
Plastic Case for all 20kg Weights	OBA-20

Find Estimated Ship Weights for all our products in the Ship Weight Index

VIDEO ONLINE

LC-33

LC-37 shown with LCA-57

BICO JAW CRUSHERS

Sturdy Bico Crushers are designed for size reduction of hard rock, ores, and minerals. Capacity is exceptional with minimum power consumption. Time proven designs are effective and have long service life, and all parts are accessible for cleaning and maintenance.

Electric motor starting switch is included, but must be installed on-site. Single phase motors can be configured for 110V or 220V operation. Three phase motors can be set to operate on 220V or 440V. Please specify voltage, phase, and frequency at time of order.

LC-33 and LC-34 Chipmunk Jaw Crushers have reversible jaw plates to extend life. Stationary jaw lifts easily from frame for cleaning interior parts, and both jaws are replaced easily when worn. Construction is wear-resistant alloy steel with sealed bronze bearings and alloy steel shafts. Semi-enclosed motor with mounting blocks drives four V-belt drive. Sample Pan, Feed Hopper, and Guards for belts and flywheel are included. Both the LC-33 and LC-34 Crushers have 3x6in (76x152mm) jaw size with 3x2.25in (76x57mm) opening. A hand-wheel on the side adjusts wedge blocks to set jaw discharge to 1/16—3/8in (1.6—9.5mm) particle size.

LC-35 and LC-36 Chipmunk Jaw Crushers have 4x9in (102x229mm) jaw size with 4x2.375in (102x60mm) opening, and reduction adjusts for 1/16—5/8in (1.6—15.9mm) particle size.

LC-37 Badger Jaw Crusher has the highest crushing capacity needed for labs and pilot plants. This heavy-duty unit has a jaw size of 5x7in (127x178mm) and a unique vertical/horizontal jaw action to aggressively and efficiently reduce 4x6in (102x152mm) topsize rock sample to 1/8—3/4in (3—19mm) at a rate of 1,300lb/hour (590kg). Guards for belts and flywheel and a Feed Hopper are included. Dust Collector Base with Pan is available as LCA-57.

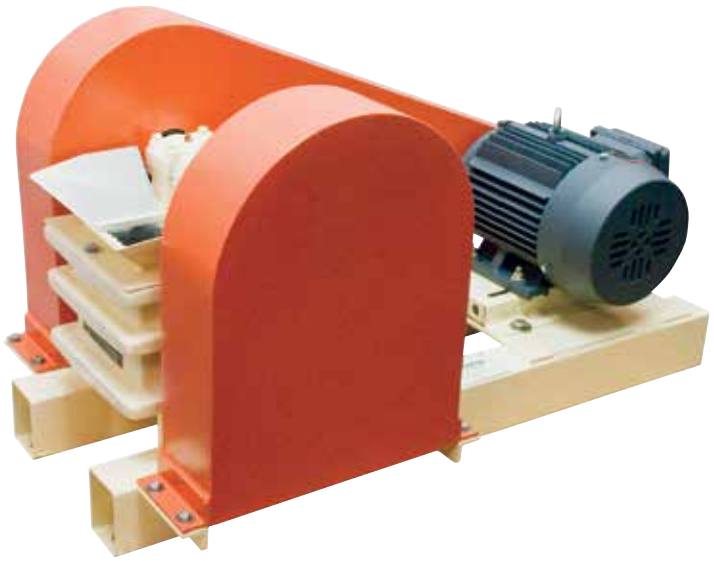
LCA-91 Dust Enclosure Bench can accomodate either LC-33 or LC-34 Jaw Crusher. The 47x36x35in (1,194x914x889mm), WxDxH painted sheet metal enclosure has lighted interior and a hinged cover with view panel. The removable-grate work surface is made up of 0.75in (19mm) bars. A high-capacity blower with 500—700FPM (152—213m/min) air velocity moves dust to a collector drawer with replaceable filter cartridge. An exhaust silencer controls noise. Pulverizer plates may be changed without moving the machine. Shipped fully assembled and requires no installation or special duct work. **Product Dimensions: 65x36x60in (1,651x914x1,524mm), WxDxH.**

Bico Jaw Crushers

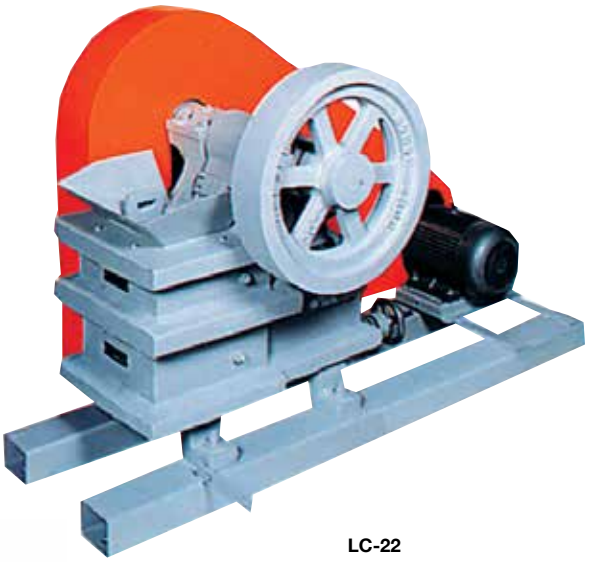
Model	Description	Max. Feed Size, in	Capacity[1] lb (kg)/hour	Motor HP	Electrical Supply	Dimensions WxDxH, in (cm)
LC-33	Chipmunk Jaw Crusher	2.2x3	400 (182)	2	110V, 1ph, 50/60Hz	25x19x30 (64x48x76)
LC-33A	Chipmunk Jaw Crusher	2.2x3	400 (182)	2	220V,1ph,50/60Hz	25x19x30 (64x48x76)
LC-34	Chipmunk Jaw Crusher	2.2x3	400 (182)	2	220V, 3ph, 50/60Hz	25x19x30 (64x48x76)
LC-34A	Chipmunk Jaw Crusher	2.2x3	400 (182)	2	440V, 3ph, 50/60Hz	25x19x30 (64x48x76)
LC-35	Chipmunk Jaw Crusher	2.4x4	800 (363)	3	110V, 1ph, 50/60Hz	28x19x32 (71x48x81)
LC-35A	Chipmunk Jaw Crusher	2.4x4	800 (363)	3	220V,1ph,50/60Hz	28x19x32 (71x48x81)
LC-36	Chipmunk Jaw Crusher	2.4x4	800 (363)	3	220V, 3ph, 50/60Hz	28x19x32 (71x48x81)
LC-36A	Chipmunk Jaw Crusher	2.4x4	800 (363)	3	440V, 3ph, 50/60Hz	28x19x32 (71x48x81)
LC-37	Badger Jaw Crusher	4x6	1,300 (590)	5	220V, 3ph, 60Hz only	32x24x20 (81x61x51)
LC-37A	Badger Jaw Crusher	4x6	1,300 (590)	5	440V, 3ph, 60Hz only	32x24x20 (81x61x51)

Accessories	
Dust Collector Base for LC-37	LCA-57
Dust Enclosure Bench (specify 3ph voltage)	LCA-91
Replacement Filter for LCA-91	LCA-92

[1] *Capacity is for reduction of 7 Mohs hardness quartz to 1/4in for crusher, to No.100 for pulverizers.*



LC-20



LC-22

LC-20 alternate view

MORSE JAW CRUSHERS

Heavy-duty Morse Jaw Crushers are built for high throughput and oversize feed. These high horsepower units have heavy cast frames and flywheels. Guards for belts and flywheels are included. Eccentric overhead action and corrugated jaw plates work together to force-feed material and avoid back-flow or "pop out" of particles. Particle size down to 1/4in (6.4mm) minus is set via handwheel adjustment of a single toggle. Jaw plates are reversible for extended life. Crushing rates vary with hardness and size of feed.

Jaw and cheek plates are heat treated, abrasion-resistant steel alloy. Heavy-duty bronze bearing inserts may be replaced easily in the field. Cast iron alloy frame, motor guard, and feed hopper are mounted on a tubular steel frame.

Select from models with 4x6in (102x 152mm), 5x6in (127x152mm), or extra-large 8x8in (203x203mm), DxW jaw inlets, all equipped with TEFC, three phase motor. Voltage and Hz of supply must be specified with order.

Morse Jaw Crushers

Model	Jaw Size in (mm)	Motor	Capacity lb (kg)/hour	Dimensions WxDxH, in (cm)
LC-20	4x6 (102x152)	3hp, 230/460V, 3 phase, 60Hz	400-1,200 (182-545)	42x24x24 (107x61x61)
LC-20F	4x6 (102x152)	3hp, 220/380/440V, 3 phase, 50Hz	400-1,200 (182-545)	42x24x24 (107x61x61)
LC-22	5x6 (127x152)	5hp, 230/460V, 3 phase, 60Hz	1,000-2,500 (454-1134)	54x30x38 (137x76x97)
LC-22F	5x6 (127x152)	5hp, 220/380/440V, 3 phase, 50Hz	1,000-2,500 (454-1134)	54x30x38 (137x76x97)
LC-24	8x8 (203x203)	10hp, 230/460V, 3 phase, 60Hz	1,500-4,000 (682-1818)	73x39x38 (185x99x97)
LC-24F	8x8 (203x203)	10hp, 220/380/440V, 3 phase, 50Hz	1,500-4,000 (682-1818)	73x39x38 (185x99x97)

helpfulhint

Make sure to determine your electrical supply and capacity before ordering. Many crushers and pulverizers are supplied with different electrical configurations. Contact one of our technical service representatives if you have any questions.

Find Estimated Ship Weights for all our products in the Ship Weight Index

VIDEO ONLINE

LC-44

LC-47

PORTABLE CRUSHERS

Rugged and versatile, new crushers excel at processing bulk aggregate, minerals, and ore materials for high-volume lab testing, pilot-plant, and even small production operations. Outfitted with your choice of gasoline, diesel, or electric power, their tough construction allows easy adaptation for the most remote placements or in permanent installations. Both crusher models feature robust design and use heavy welded-steel plate and high-quality materials throughout for uninterrupted reliability in the harshest environments. Top of the line bearings, pillow blocks, and other components mean less downtime and higher production. Crushers are pre-mounted on sturdy welded-steel frames. Inquire for available mounting options on single or dual-axle trailers for truly mobile operation.

Jaw Crusher and Hammermill models can be used independently, but also work efficiently together as primary and secondary crushers for reduction of bulk materials from 8in (203mm) to finer than No. 35 (0.5mm) sizes. Each crusher arrives fully assembled, ready for immediate use.

LC-44 10in Jaw Crusher has a maximum feed size of 8in (203mm) and final output size can be regulated from 0.25 to 3in (6 to 76mm) through clearance adjustment of the jaw plates. Throughput is approximately 1 to 2 tons (900 to 1,800kg) per hour. Jaw sizes are 10 x 6in (254 x 152mm) WxD and are made from 0.75in (19mm) material hard-faced with abrasion resistant steel. Facing material has Brinell hardness of 450. Special abrasion-resistant LCA-415 Cast Manganese/Chrome jaw plates are also available for longer life or for processing of especially hard and tough materials. Available power options are 20hp Gasoline or 18hp Diesel engines, or a 10hp Electric Motor. The main shaft is 2.4in (61mm) at the cam shaft and 2in (51mm) at the drive shaft. The efficient electric motor is supplied ready for wiring to a number of common three-phase voltage configurations from 208 to 460 volt. **Product Dimensions:** 56x32x48in (1422x812x1220mm) WxDxH. Net Weight: 950lb (430kg).

LC-47 Hammermill Crusher has a maximum feed size of 2in (51mm) and final output sizes as fine as No. 80 (0.2mm), controlled by standard screen inserts of No. 35 (0.5mm) or No. 20 (1.0mm) openings. Production is higher and hammer life is enhanced by feeding 1in (25mm) material. Approximately 1 to 2 tons (900 to 1,800kg) of throughput per hour. The ten 1.5in (38mm) wide hammers are made from wear-resistant high-chrome steel for long service life. One standard screen is included, specify at time of order. Custom Screens are also available with any opening size, Inquire. Screens are laser-cut from long-lasting 0.25in (6mm) material. Proprietary non-slip disc system allows complete change-out of the hammers in less than ten minutes. Power is supplied by 30hp Gasoline or 24hp Diesel engines, or a 15hp Electric Motor. The powerful electric motor is supplied ready for wiring to a number of common three-phase voltage configurations from 208 to 460 volt. The drive shaft is 2in (51mm) diameter. **Product Dimensions:** 56x33x53in (1422x838x1346mm) WxDxH. Net Weight: 1,400lb (635kg).

Portable Crushers	
Portable 10in Jaw Crusher, 20hp Gasoline Engine	LC-44G
Portable 10in Jaw Crusher, 18hp Diesel Engine	LC-44D
Portable 10in Jaw Crusher, 10hp Electric Motor	LC-44E
Portable Hammermill Crusher, 30hp Gasoline Engine	LC-47G
Portable Hammermill Crusher, 24hp Diesel Engine	LC-47D
Portable Hammermill Crusher, 15hp Electric Motor	LC-47E
Accessories	
Replacement Hard-Faced Steel Jaw Plates for LC-44	LCA-412
Cast Manganese/Chrome Steel Jaw Plates for LC-44	LCA-415
0.125in (3.18mm) Screen for LC-47	LCA-416
No. 10 (2.0mm)) Screen for LC-47	LCA-417
No. 20 (1.0mm) Screen for LC-47	LCA-418
0.75mm Screen for LC-47	LCA-419
No. 35 (0.5mm) Screen for LC-47	LCA-422

VIDEO ONLINE

LC-53

LC-53 alternate view

LC-53 shown with LCA-91

BICO PULVERIZER

The Bico Pulverizer features efficient operation with minimum power consumption and long service life. Time proven design is compact and effective for processing hard rock, ores, and minerals. The grinding chamber is easily accessible for cleaning, maintenance and complete sample recovery.

The LC-53 Pulverizer grinds 1/4in (6.4mm) feed material to approximately 75µm (No.200 sieve size) in a single pass, depending on material. Throughput is about 60lb (27kg) per hour. A threaded knob with locking lever adjusts the gap between the 8in (203mm) diameter grinding plates to control particle size output. Stationary and revolving grinding plates are easily replaced. Grinding Plate Sets are available in a variety of materials and hardnesses to suit individual applications. One LCA-6 Iron Alloy Grinding Plate Set is included. LCA-5 Semi-Steel set is recommended for most applications, and has up to three times the wear resistance of LCA-6. Semi-steel is a compound of iron carbide in a Martensite matrix, with a Rockwell C-Scale hardness of 55—62. Other heavy-duty or special-use plate sets available for specialized applications. Contact a Gilson Product Specialist for advice on selecting the best grinding plate options for your application.

Power from the 2hp motor rotates the shaft at 900—1,000rpm through a double V-belt drive. Three phase 50 or 60Hz motors can be set to operate on 220V or 440V. A motor starting switch is included, and must be installed separately. Inquire for additional voltages. Totally enclosed motor has thermal overload protection. Safety guards and catch pan are included. Lubrication to shaft bearings is supplied by manually adjusted grease cups. **Product Dimensions:** 37x22x23 (940x559x584mm), WxDxH.

The LCA-91 Dust Enclosure Bench has a lighted interior, removable bottom grate and a hinged cover with a viewing panel. High capacity blower moves dust to a collection drawer with a replaceable filter cartridge and exhaust silencer. **Product Dimensions:** 67x37x67.5in (1,702x940x1,715mm), WxDxH.

Bico Pulverizer	
Bico Pulverizer, 220-240V, 50/60Hz, 3 phase	LC-53
Accessories	
Semi-Steel Grinding Plate Set	LCA-5
Iron Alloy Grinding Plate Set	LCA-6
Low-Phosphorus Carbon Steel Grinding Plate Set	LCA-7
Manganese Steel Grinding Plate Set	LCA-8
Hardened Alloy Grinding Plate Set	LCA-9
Ceramic Grinding Plate Set	LCA-11
Dust Enclosure Bench, 115V/60Hz	LCA-91
Replacement Filter for LCA-91	LCA-92

Find Estimated Ship Weights for all our products in the Ship Weight Index

LC-115

SSA-39

VIBRATING CUP PULVERIZER

The Vibrating Cup Pulverizer is also known as a puck mill or shatterbox. This pulverizer efficiently uses pressure, impact and friction to grind rock, ore, minerals, soil, and other materials to analytical size. It has many useful applications in the laboratory and small-scale pilot plants. An 8in (203mm) diameter bowl containing grinding rings and a puck is driven by a rotating eccentric and swings contents on a horizontal plane at a precise speed and distance for maximum grinding efficiency. The grinding bowl is locked down and held securely in-place by a cam lever system, and a protective cover encloses the grinding chamber for safe and quiet operation. Wet or dry samples of 0.5in (12.7mm) maximum feed size are rapidly reduced to a final particle size of 150—38µm (No.100 to No.400 U.S. Standard sieve size), depending on material.

The included chrome-steel alloy Grinding Set has a sample volume of 250ml and consists of an 8in (203mm) bowl with cover, two rings and a puck. For more efficient processing, additional Grinding Sets can be ordered as LCA-240. LCA-242 Tungsten Carbide Grinding Set with 100ml capacity is also available. Contact a Gilson Product Specialist for expert advice on applications for this unit. The heavy-duty 1hp motor includes a starting switch and drives the eccentric at a speed of 900rpm (750rpm at 50Hz). The control panel is set at the proper angle and height for best visibility and ease of operation. A 0-100 minute digital timer resets itself automatically after each test for maximum repeatability. An emergency stop button is provided. Sturdy painted-steel insulated cabinet reduces noise. The motor operates on 208/220/400V, 50/60Hz, and 3 phase power supplies. Single phase available as well. **Product Dimensions:** 24x24x43in (610x610x1092mm) WxDxH.

Vibrating Cup Pulverizer	
Vibrating Cup Pulverizer, 208/220/400V, 50/60Hz, 3 phase	LC-115
Accessories	
Chrome Steel 250ml Grinding Set	LCA-240
Tungsten Carbide 100ml Grinding Set	LCA-242

BALL-PAN HARDNESS TEST
ASTM D3802

The ball-pan hardness test method determines degradation resistance of granulated activated carbons. SSA-39 set consists of a special 8in (204mm) diameter brass ball-pan and two sets of 0.5in (12.7mm) and 0.375in (9.5mm) steel balls. The ball-pan has a special 8mm thick hardened brass bottom plate dished out at 1.092mm inner radius to give a 3.2mm thickness at its center. The bottom plate is mounted in a standard full-height sieve frame with extended rim for stacking.

A sample is placed in the ball-pan with the steel balls and run for 30 minutes in a Model SS-30 Ro-Tap Sieve Shaker. The ball-pan is stacked with five regular 8in sieves, sieve pan, and cover. "Hardness" of the activated carbon sample is determined by degradation resistance as measured by sieving the ground sample. The Ro-Tap, sieves, sieve pan, and cover are listed separately.

Ball-Pan Hardness Test	
Ball-Pan Hardness Set	SSA-39
Accessories	
Ball-Pan	SSA-41
0.5in Steel Balls, set of 15	SSA-43
0.375in Steel Balls, set of 15	SSA-44

LC-8

LC-7

VIDEO ONLINE

LC-82

LC-80

MINI-PULVERIZER & MINI-CRUSHER

LC-7 Mini-Pulverizer reduces up to 20g of 1/8in (3.2mm) material to minus No.140 (106µm). Unit is supplied with 1.625in (41mm) diameter high-density alumina ceramic grinding plates. A switch reverses direction of plate rotation for extended plate life of up to 3,000 samples. For extra-hard materials, the LCA-56 Tungsten Carbide Plate Set is available as an accessory. Grind is adjustable to produce sample sizes from No.40—No.140 (425—106µm). Nearly all product is recoverable by brushing.

The Mini-Pulverizer has cam-action closure with sealed bearings and is driven by a 1/3hp capacitor-start motor mounted on rubber feet. **Product Dimensions: 15x10x10in (381x254x254mm), LxWxH.**

LC-8 Mini-Crusher has 2x2in (51x51mm) feed opening for crushing 1in (25.4mm) and smaller feed material to 1/16in (1.6mm) and finer at about 1/4lb (114g) per minute. The unit comes standard with hardened steel alloy jaw and cheek plates. For special applications, also order LCA-46 ceramic jaw and cheek set (85% alumina) to avoid metal contamination or LCA-47 tungsten carbide set (in 6% cobalt binder) for extra tough jobs. Sets are interchangeable and adjust in opening to produce product from 1/4in (6.4mm) to below 1/16in (1.6mm) in size.

Construction of the LC-8 features a case-hardened alloy steel eccentric shaft running in heavy-duty sealed needle bearings. The crusher is belt driven by a 1/4hp motor with overload and On/Off switches, all mounted on a steel base with rubber feet for freestanding operation. **Product Dimensions:** 16x9x9in (406x229x229mm), LxWxH. Samples are collected in a stainless steel tray.

Mini-Pulverizer & Mini-Crusher	
Mini-Pulverizer, 115V/60Hz	LC-7
230V/50Hz	LC-7F
Mini-Crusher, 115V/60Hz	LC-8
230V/50Hz	LC-8F
Accessories	
Replacement Alumina Plate Set for LC-7	LCA-55
Tungten Carbide Plate Set for LC-7	LCA-56
Replacement Alloy Steel Plate Set for LC-8	LCA-45
Ceramic Plate Set for LC-8	LCA-46
Tungsten Carbide Plate Set for LC-8	LCA-47

LABORATORY DISC MILLS

Hand-Cranked or Motorized Laboratory Disc Mills provide effective performance for limited dry or wet grinding to moderate fineness. Mills are useful for coal, chemicals, ores, pharmaceuticals, nuts, grains, and other friable materials. Both mills process materials between a set of iron alloy fixed and rotating 4in (102mm) diameter grinding discs for reduction. Feed hoppers have 50in³ (0.8L) volume, and final fineness is easily set by thumb screw adjustment of grinding disc clearance. No.80—No.100 (180—150µm) is typical fineness limit. Mills disassemble quickly without tools for cleaning.

Disc mills are supplied with tooth-type feed augers for dry materials and a set of fine-grinding discs. For wet or oily materials, optional Wet-Feed Auger sets are available and include a worm-type feeder and fine-grinding discs. LCA-171 Coarse Grinding Disc Set is purchased separately to fit either mill and allows higher throughput of coarse product. Feeders and Grinding Discs quickly interchange and extras are useful for different sample types and to avoid contamination.

LC-80 Hand-Crank Disc Mill has painted, cast iron body that mounts by screw clamp on a bench top up to 1.5in (38.1mm) thick. Throughput varies with material type, but 10lb (4.5kg) per hour is typical. Overall height is 14in (356mm). Includes LCA-175 Dry-Feed Auger and Grinding Disc Set.

LC-82 Motorized Disc Mill has a 1/3hp gearmotor mounted to a welded steel base. Body is plated cast iron. Capacity varies with type of material, but 40lb (18kg) per hour is typical. The LC-82 meets ASTM C409 requirements for preparation of Hardgrove Grindability specimens. The oil-filled gear box features the replaceable LCA-179 Safety Coupling to prevent overload damage. An 8ft (2.4m) grounded cord with in-line switch is provided. Includes LCA-176 Dry Feeder and Grinding Disc Set. LCA-178 is a complete Grinding Head with body, dry tooth-feed auger and fine-grinding discs. Product Dimensions: 25x8x12in (635x203x305mm) WxDxH.

Laboratory Disc Mills	
Hand-Crank Disc Mill	LC-80
Motorized Disc Mill, 115V/60Hz	LC-82
220V/60Hz	LC-82S
220V/50Hz	LC-82F
Accessories	
Fine Grinding Disc Set	LCA-170
Coarse Grinding Disc Set	LCA-171
Wet-Feed Auger & Grinding Disc Set for LC-80	LCA-172
Wet-Feed Auger & Grinding Disc Set for LC-82	LCA-173
Dry-Feed Auger & Grinding Disc Set for LC-80	LCA-175
Dry-Feed Auger & Grinding Disc Set for LC-82	LCA-176
Complete Grinding Head for LC-82	LCA-178
Safety Coupling for LC-82	LCA-179

Find Estimated Ship Weights for all our products in the Ship Weight Index

LC-88

LCA-34 thru LCA-37

BENCHTOP LABMILL

Compact Benchtop Labmill rotate milling jars smoothly and quietly, adjusting easily for four sizes of jars from 0.5—10L (16—320oz). Sample volumes from 75ml to 4L can be handled with unattended ease. Estimated specimen capacity is approximately 25% of total jar volume. Volume for grinding media required is approximately 50% of jar volume. The special HDPE (High Density Polyethylene) jars are disposable to avoid cross-contamination and feature baffled interiors for efficient wet or dry grinding action. Each milling jar is held in a supporting metal sleeve for rigidity.

The unit also holds other grinding jars, from 3—7in (75—178mm) diameter, and up to 11in (279mm) width. A speed control switch gives 10—260rpm roller speed from the direct-drive 60 Watt DC motor. For 230V, 50/60Hz electrical supplies, order TR-502 Transformer separately. Disposable Grinding Jars and Supporting Metal Sleeves are ordered separately. **Product Dimensions:** 18x14x2.5in (457x356x64mm), WxDxH.

Benchtop Labmill	
Benchtop Labmill, 115V, 50/60Hz	LC-88
Accessories	
Disposable HDPE Jars, 500ml, pkg. 12	LCA-73
Disposable HDPE Jars, 1L, pkg. 6	LCA-74
Disposable HDPE Jars, 4L, pkg. 6	LCA-75
Disposable HDPE Jars, 10L, pkg. 4	LCA-76
Stainless Steel Sleeve for 500ml Jar	LCA-34
Stainless Steel for 1,000ml Jar	LCA-35
Anondized Sleeve for 4,000ml Jar	LCA-36
Aluminum Sleeve for 10,000ml Jar	LCA-37

LC-91 shown with LCA-63

JAR MILLS

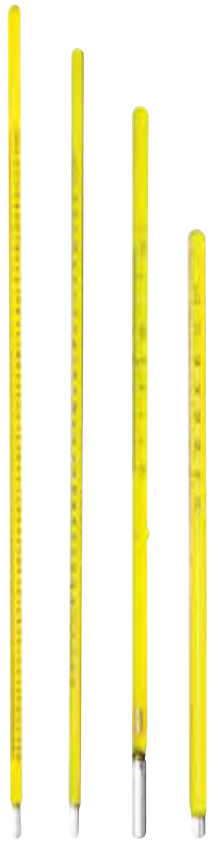
Jar Mills are used for wet or dry grinding, mixing and blending for a wide variety of materials like ores, chemicals, paints, ceramics, glass, etc. Particle topsize is approximately 1mm, with final sizes in the range of 1 to 50µm. Bench or floor model Jar Mills from Gilson have capacities from one to six jars.

Totally enclosed DC motors drive special 2in (50.8mm) diameter neoprene-covered rollers at speeds from 20 to 300rpm. Roller spacing adjusts easily to accommodate jars from 2 to 15in (51 to 381mm) diameter and are configured to keep jars centered during operation. Welded steel frames, roller chain drives, and sealed ball bearings assure long service life. Mills operate on 115V, 50/60Hz electrical supply. Add "F" to model number for 230V/50Hz models. Grinding Jars and Media are ordered separately.

Grinding Jars are ceramic-based Roalox™ or premium High Alumina material. High-strength Roalox has four times the wear life of ordinary porcelain and reduces levels of silica contamination. Ultra-high fired High Alumina jars have higher service life, negligible silica contamination, and polyurethane coated body to minimize breakage. Both have wide mouths for fast loading/cleaning and neoprene gasketed lids with positive-locking bar and hand wheel. Jar capacities range from 0.1 to 6.6gal (0.3 to 25.0L), and diameters from 3.4 to 14.63in (86 to 372mm). Specimen capacity is approximately 25% of total jar volume, and Grinding Media should take up approximately 50% of total volume.

Grinding Media is cylindrical, with equal length and diameter for maximum surface area. Ultra-high fired Burundum alumina with 3.42 specific gravity is ideal for most milling and has low contamination. Burundum is supplied in 10lb (5kg) packages. Premium high-density 5.55 specific gravity Zirconia mills faster than Burundum, with less wear of grinding jars and media. Zirconia is sold in 5lb (2kg) packages.

Jar Mills				
Model	Tiers	Maximum Jars	Motor hp	Dimensions WxDxH, in (mm)
LC-91	1	2	1/4	30x13x16 (762x330x406)
LC-92	2	2	1/4	20x12x34 (508x305x864)
LC-95	3	6	3/4	40x12x50 (1,016x305x1,270)
Accessories				
Roalox Porcelain Grinding Jar, 0.3L				LCA-50
Roalox Porcelain Grinding Jar, 1.0L				LCA-51
Roalox Porcelain Grinding Jar, 1.8L				LCA-52
Roalox Porcelain Grinding Jar, 5.6L				LCA-53
Roalox Grinding Jar, 8.3L				LCA-80
Roalox Grinding Jar, 12.4L				LCA-81
Roalox Grinding Jar, 17.6L				LCA-82
Roalox Grinding Jar, 25.0L				LCA-83
High Alumina Grinding Jar, 1.0L				LCA-60
High Alumina Grinding Jar, 5.6L				LCA-61
High Alumina Grinding Jar, 12.4L				LCA-63
Burundum Media, 13x13mm, 10lb pkg				LCA-65
Burundum Media, 21x21mm, 10lb pkg				LCA-66
Burundum Media, 32x32mm, 10lb pkg				LCA-68
Zirconia Media, 10x10mm, 5lb pkg				LCA-70
Zirconia Media, 13x13mm, 5lb pkg				LCA-72



ASTM Thermometers

ASTM THERMOMETERS
ASTM E1, E77

ASTM thermometers have strict manufacturing tolerances. Accuracy is assured by inspection and testing of samples from each production run. Each thermometer is supplied with a statement of compliance to E1 and E77 requirements. ASTM Thermometers are yellow-backed glass with permanent graduations, mercury-filled and individually packed in cardboard tubes. MA-450 Sets include one each of ASTM 62 to 70 (°C or °F) in a velvet-lined protective case. Inquire for other ASTM Thermometers.

To order ASTM thermometers with NIST traceable Certificate of Calibration at five points, add "T" suffix to the model number.

helpfulhint

State or local ordinances may prevent sales or shipment of instruments containing Mercury into your area.

Please check for restrictions before ordering or consult our customer service specialists.

ASTM Thermometers

Type	Model	ASTM Number	Range	Division	Length in (mm)	Immersion in (mm)
General Use	MA-420F	1F	0°— 302°F	2.0°F	12.7 (322)	3 (76)
	MA-420C	1C	-20°— 150°C	1.0°C	12.7 (322)	3 (76)
	MA-421F	2F	20°— 580°F	2.0°F	15.4 (390)	3 (76)
	MA-421C	2C	-5°— 300°C	1.0°C	15.4 (390)	3 (76)
	MA-422F	3F	20°— 760°F	2.0°F	16.3 (415)	3 (76)
	MA-422C	3C	-5°— 400°C	1.0°C	16.3 (415)	3 (76)
Cloud & Pour	MA-424F	5F	-36°— 120°F	2.0°F	9.0 (230)	4.3 (108)
	MA-424C	5C	-38°— 50°C	1.0°C	9.0 (230)	4.3 (108)
	MA-425F	6F	-112°— 70°F	2.0°F	9.0 (230)	3 (76)
	MA-425C	6C	-80°— 20°C	1.0°C	9.0 (230)	3 (76)
Distillation	MA-426F	7F	30°— 580°F	2.0°F	15.1 (384)	Total
	MA-426C	7C	-2°— 300°C	1.0°C	15.1 (384)	Total
	MA-427F	8F	30°— 760°F	2.0°F	15.1 (384)	Total
	MA-427C	8C	-2°— 400°C	1.0°C	15.1 (384)	Total
Precision Use	MA-430F	62F	-36°— 35°F	0.2°F	14.9 (379)	Total
	MA-430C	62C	-38°— 2°C	0.1°C	14.9 (379)	Total
	MA-431F	63F	18°— 89°F	0.2°F	14.9 (379)	Total
	MA-431C	63C	-8°— 32°C	0.1°C	14.9 (379)	Total
	MA-432F	64F	77°— 131°F	0.2°F	14.9 (379)	Total
	MA-432C	64C	25°— 55°C	0.1°C	14.9 (379)	Total
	MA-433F	65F	122°— 176°F	0.2°F	14.9 (379)	Total
	MA-433C	65C	50°— 80°C	0.1°C	14.9 (379)	Total
	MA-434F	66F	167°— 221°F	0.2°F	14.9 (379)	Total
	MA-434C	66C	75°— 105°C	0.1°C	14.9 (379)	Total
	MA-435F	67F	203°— 311°F	0.5°F	14.9 (379)	Total
	MA-435C	67C	95°— 155°C	0.2°C	14.9 (379)	Total
	MA-436F	68F	293°— 401°F	0.5°F	14.9 (379)	Total
	MA-436C	68C	145°— 205°C	0.2°C	14.9 (379)	Total
	MA-437F	69F	383°— 581°F	1.0°F	14.9 (379)	Total
	MA-437C	69C	195°— 305°C	0.5°C	14.9 (379)	Total
	MA-438F	70F	563°— 761°F	1.0°F	14.9 (379)	Total
	MA-438C	70C	295°— 405°C	0.5°C	14.9 (379)	Total
Precision Use Full Set	MA-450F	F	-36°— 761°F	Varies	14.9 (379)	Total
	MA-450C	C	-38°— 405°C	Varies	14.9 (379)	Total
Pensky-Martens & Tag Closed High	MA-210F	9F	20°— 230°F	1.0°F	11.8 (290)	2.3 (57)
	MA-210C	9C	-5°— 110°C	0.5°C	11.8 (290)	2.3 (57)
Tag Closed Low	MA-428F	57F	4°— 122°F	1.0°F	11.8 (290)	2.3 (57)
	MA-428C	57C	-20°— 50°C	0.5°C	11.8 (290)	2.3 (57)
Pensky-Martens High	MA-211F	10F	200°— 700°F	5.0°F	11.8 (290)	2.3 (57)
	MA-211C	10C	90°— 370°C	2.0°C	11.8 (290)	2.3 (57)
Open Flash	MA-212F	11F	20°— 760°F	5.0°F	12.1 (310)	1 (25)
	MA-212C	11C	-6°— 400°C	2.0°C	12.2 (310)	1 (25)
Gravity	MA-429F	12F	-5°— 215°F	0.5°F	16.5 (420)	Total
	MA-429C	12C	-20°— 102°C	0.2°C	16.5 (420)	Total
Loss on Heat	MA-223C	13C	155°— 170°C	0.5°C	7.0 (155)	Total
Bituminous Softening Point	MA-225F	15F	30°— 180°F	0.5°F	15.6 (396)	Total
	MA-225C	15C	-2°— 80°C	0.2°C	15.6 (396)	Total
	MA-226F	16F	85°— 392°F	1.0°F	15.6 (396)	Total
	MA-226C	16C	30°— 200°C	0.5°C	15.6 (396)	Total
	MA-227F	113F	30°— 350°F	1.0°F	15.9 (405)	Total
	MA-227C	113C	-1°— 175°C	0.5°C	15.9 (405)	Total
Saybolt Viscosity	MA-213F	17F	66°— 80°F	0.2°F	10.8 (275)	Total
	MA-213C	17C	19°— 27°C	0.1°C	10.8 (275)	Total
	MA-214F	18F	94°— 108°F	0.2°F	10.8 (275)	Total
	MA-214C	18C	34°— 42°C	0.1°C	10.8 (275)	Total
	MA-215F	19F	120°— 134°F	0.2°F	10.8 (275)	Total
	MA-215C	19C	49°— 57°C	0.1°C	10.8 (275)	Total
	MA-216F	20F	134°— 148°F	0.2°F	10.8 (275)	Total
	MA-216C	20C	57°— 65°C	0.1°C	10.8 (275)	Total
	MA-217F	21F	174°— 188°F	0.2°F	10.8 (275)	Total
	MA-217C	21C	79°— 87°C	0.1°C	10.8 (275)	Total
	MA-218F	22F	204°— 218°F	0.2°F	10.8 (275)	Total
	MA-218C	22C	95°— 103°C	0.1°C	10.8 (275)	Total
	MA-452F	77F	245°— 265°F	0.5°F	10.8 (275)	Total
	MA-454F	78F	295°— 315°F	0.5°F	10.8 (275)	Total
	MA-453F	108F	270°— 290°F	0.5°F	10.8 (275)	Total
	MA-455F	109F	320°— 340°F	0.5°F	10.8 (275)	Total
	MA-456F	79F	345°— 365°F	0.5°F	10.8 (275)	Total
	MA-457F	80F	395°— 415°F	0.5°F	10.8 (275)	Total
	MA-458F	81F	445°— 465°F	0.5°F	10.8 (275)	Total
Kinematic Viscosity	MA-219F	47F	137.5°— 142.5°F	0.1°F	12.0 (305)	Total
	MA-219C	47C	58.6°— 61.4°C	0.05°C	12.0 (305)	Total
	MA-220F	110F	272.5°— 277.5°F	0.1°F	12.0 (305)	Total
	MA-220C	110C	133.6°— 136.4°C	0.05°C	12.0 (305)	Total
Solvents Distillation	MA-460C	37C	-2°— 52°C	0.2°C	15.6 (396)	3.9 (100)
	MA-462C	39C	48°— 102°C	0.2°C	15.6 (396)	3.9 (100)
	MA-464C	41C	98°— 152°C	0.2°C	15.6 (396)	3.9 (100)
	MA-467C	103C	148°— 202°C	0.2°C	15.6 (396)	3.9 (100)
	MA-469C	105C	198°— 252°C	0.2°C	15.6 (396)	3.9 (100)
	MA-471C	107C	248°— 302°C	0.2°C	15.6 (396)	3.9 (100)

Find Estimated Ship Weights for all our products in the Ship Weight Index

ASTM NON-MERCURY THERMOMETERS
ASTM E1, E77, E2251

These ASTM Non-mercury Thermometers meet standard test method requirements for use in their referenced applications. The liquid-in-glass thermometers have the same performance characteristics as ASTM Mercury Thermometers, but use safe blue liquid instead of mercury. The proprietary formula is biodegradable, nontoxic, and nonhazardous. Dark blue color is easily read against the white-backed stem.

For individual thermometers with five-point certification by an ISO/IEC accredited laboratory, add a "T" suffix to the model number when ordering. Full sets of Certified Precision Use Thermometers are available as MA-751CT for S62C to S67C ASTM numbers, or MA-751FT for S62F to S67F. To prevent fluid column separation, always store Non-Mercury Thermometers vertically, using our MA-305 Thermometer Storage Rack.

MA-531F

ASTM Non-Mercury Thermometers

Type	Model	ASTM Number	Range	Division	Length mm	Immersion
Bomb Calorimeter	MA-538C	S56C	19°— 35°C	0.02°	600	Total
	MA-538F	S56F	66°— 95°F	0.05°	600	Total
	MA-521C	5116C	18.9°— 25.1°C	0.01°	614	Total
	MA-522C	5117C	23.9°— 30.1°C	0.01°	614	Total
Cloud & Pour	MA-524C	S5C	-38°— 50°C	1.0°	235	108mm
	MA-524F	S5F	-36°— 120°F	2.0°	235	108mm
Gravity	MA-529C	S12C	-20°— 102°C	0.2°	425	Total
	MA-529F	S12F	-5°— 215°F	0.5°	425	Total
Kinematic Viscosity	MA-536	S120C	38.5°— 41.5°C	0.05°	305	Total
Low Softening Point	MA-525C	S15C	-2°— 80°C	0.2°	400	Total
	MA-525F	S15F	30°— 180°F	0.2°	400	Total
Precision Use	MA-530C	S62C	-38°— 2°C	0.1°	400	Total
	MA-530F	S62F	-36°— 35°F	0.2°	400	Total
	MA-531C	S63C	-8°— 32°C	0.1°	400	Total
	MA-531F	S63F	18°— 89°F	0.2°	400	Total
	MA-532C	S64C	25°— 55°C	0.1°	400	Total
	MA-532F	S64F	77°— 131°F	0.2°	400	Total
	MA-533C	S65C	50°— 80°C	0.1°	400	Total
	MA-533F	S65F	122°— 176°F	0.2°	400	Total
	MA-534C	S66C	75°— 105°C	0.1°	400	Total
	MA-534F	S66F	167°— 221°F	0.2°	400	Total
	MA-535C	S67C	95°— 155°C	0.2°	400	Total
	MA-535F	S67F	203°— 311°F	0.5°	400	Total
Precision Use, Full Set Thermometers	MA-751CT	-	-38°— 155°C	Varies	400	Total
	MA-751FT	-	-36°— 311°F	Varies	400	Total
Saybolt Viscosity	MA-514C	S18C	34°— 42°C	0.1°	280	Total
	MA-514F	S18F	94°— 108°F	0.2°	280	Total
	MA-518C	S22C	95°— 103°C	0.1°	280	Total
	MA-518F	S22F	204°— 218°F	0.2°	280	Total
Tank	MA-540C	S58C	-34°— 49°C	0.5°	305	Total
	MA-540F	S58F	-30°— 120°F	1.0°	305	Total
	MA-542C	S59C	-18°— 82°C	0.5°	305	Total
	MA-542F	S59F	0°— 180°F	1.0°	305	Total
	MA-543C	5130C	-7°— +105°C	0.5°	305	Total
	MA-543F	5130F	20°— 220°F	1.0°	305	Total

technote

To prevent fluid column separation, always store Non-Mercury Thermometers vertically, using our MA-305 Thermometer Storage Rack.

ASTM EQUIVALENT NON-MERCURY THERMOMETERS
ASTM E1, E77

These liquid-in-glass thermometers have physical and performance characteristics matching those of ASTM thermometers for their referenced applications, but have not yet been reviewed and accepted by ASTM for these purposes. They use a safe blue indicating liquid that is biodegradable, nontoxic, and nonhazardous. Dark blue color is easily read against the white-backed stem. Add a "T" suffix to the model number to specify thermometers with five-point certification by an ISO/IEC accredited laboratory. Always store Non-Mercury Thermometers vertically to prevent indicator fluid separation using our MA-305 Thermometer Storage Rack.

MA-526C

ASTM Equivalent Non-Mercury Thermometers

Type	Model	ASTM Number	Range	Division	Length mm	Immersion
Bituminous Softening Point	MA-526C	S16C	30°— 200°C	0.5°	400	Total
	MA-526F	S16F	85°— 392°F	1.0°	400	Total
	MA-527C	S113C	-1°— 175°C	0.5°	410	Total
	MA-527F	S113F	30°— 350°F	1.0°	410	Total
Bomb Cabrimeter	MA-521C	5116C	18.9°— 25.1°C	0.01°	614	Total
	MA-522C	5117C	23.9°— 30.1°C	0.01°	614	Total
Cloud & Pour	MA-545C	S6C	-80°— 20°C	1.0°	232	76mm
	MA-545F	S6F	-112°— 70°F	2.0°	232	76mm
General Use	MA-520C	S1C	-20°— 150°C	1.0°	327	76mm
	MA-520F	S1F	0°— 302°F	2.0°	327	76mm
Kinematic Viscosity	MA-519C	S47C	58.6°— 61.4°C	0.05°	320	Total
	MA-519F	S47F	137.5°— 142.5°F	0.1°	320	Total
	MA-557C	S110C	133.6°— 136.4°C	0.05°	320	Total
	MA-557F	S110F	272.5°— 277.5°F	0.1°	320	Total
Loss on Heat	MA-523C	S13C	155°— 170°C	0.5°	175	Total
Pensky-Martens & Tag Closed High	MA-510F	S9F	20°— 230°F	1.0°	295	57mm
	MA-510C	S9C	-5°— 110°C	0.5°	295	57mm
Saybolt Viscosity	MA-513C	S17C	19°— 27°C	0.1°	280	Total
	MA-513F	S17F	66°— 80°F	0.2°	280	Total
	MA-515C	S19C	49°— 57°C	0.1°	280	Total
	MA-515F	S19F	120°— 134°F	0.2°	280	Total
	MA-516C	S20C	57°— 65°C	0.1°	280	Total
	MA-516F	S20F	134°— 148°F	0.2°	280	Total
	MA-517C	S21C	79°— 87°C	0.1°	280	Total
	MA-517F	S21F	174°— 188F	0.2°	280	Total
	MA-552F	S77F	245°— 265°F	0.5°	290	Total
	MA-553F	S108F	270°— 290°F	0.5°	290	Total
	MA-554F	S78F	295°— 315°F	0.5°	290	Total
	MA-555F	S109F	320°— 340°F	0.5°	290	Total
	MA-556F	S79F	345°— 365°F	0.5°	290	Total
Solvents Distillation	MA-567C	S103C	148°— 202°C	0.2°	410	100mm
	MA-560C	S37C	-2°— 52°C	0.2°	400	100mm
	MA-562C	S39C	48°— 102°C	0.2°	400	100mm
	MA-564C	S41C	98°— 152°C	0.2°	410	Total
Tag Closed Low	MA-528C	S57C	-20°— 50°C	0.5°	292	57mm
	MA-528F	S57F	-4°— 122°F	1.0°	292	57mm
Tank	MA-543C	5130C	-7°— 105°C	0.5°	305	Total
	MA-543F	5130F	20°— 220°F	1.0°	305	Total

technote

To prevent fluid column separation, always store Non-Mercury Thermometers vertically, using our MA-305 Thermometer Storage Rack.

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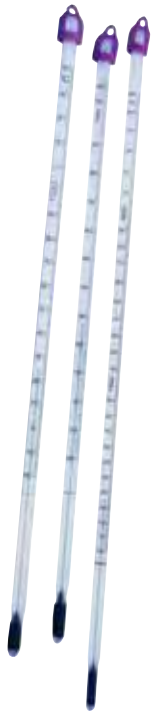


MA-155, MA-156 & MA-157

GENERAL PURPOSE NON-MERCURY THERMOMETERS

General Purpose Lab Thermometers are liquid-in-glass and SAMA (Scientific Apparatus Makers Association) approved. Each Thermometer is filled with an environmentally safe, non-hazardous Blue-Spirit liquid. Single fixed scale is accurate to ±1 division below 105°C (221°F), ±1.5 division above 105°C (221°F), and ±2 divisions above 200°C (392°F). Thermometers are calibrated for partial or total immersion as noted, serial numbered, and shipped with an accuracy statement. To prevent fluid column separation, these thermometers should be stored vertically in our MA-305 Thermometer Storage Rack.

General Purpose Non-Mercury Thermometers

Model	Range	Divisions	Length, mm	Immersion
MA-655	-20° — 110°C	1.0°	305	Total
MA-645	0° — 230°F	2.0°	305	Total
MA-145	0° — 230°F	2.0°	305	76mm
MA-646	0° — 300°F	2.0°	305	Total
MA-146	0° — 300°F	2.0°	305	76mm
MA-657	-10° — 260°C	1.0°	355	Total
MA-157	-10° — 260°C	1.0°	405	76mm
MA-155	-20° — 110°C	1.0°	305	76mm
MA-656	-20° — 150°C	1.0°	305	Total
MA-156	-20° — 150°C	2.0°	305	76mm
MA-147	20° — 500°F	1.0°	405	76mm
MA-648	-30° — 120°F	1.0°	305	Total
MA-649	-30° — 120°F	1.0°	305	76mm
MA-650	-35° — 50°C	1.0°	305	Total
MA-650P	-35° — 50°C	1.0°	305	76mm

MA-110

MA-161

MA-159

MA-149

Non-Mercury Thermometers

Description	Model	Range	Division	Length in (mm)
Pocket Copper-Plated Thermometer is red spirit-filled. Pointed copper bulb prevents abrasion and breakage. Reversible aluminum storage case serves as a handle.	MA-110	0° — 120°F	1.0°	6.0 (152)
Max/Min Registering Thermometer shows maximum and minimum temperatures in °F and °C since last reset, as well as current temperature. Reset button and protective plastic case for the spirit filled U-shaped capillary instrument are included. **Product Dimensions:** 3x9.5x1in (76x241x25mm), WxDxH.	MA-161	-40° — 120°F (-40° — 50°C)	2.0°F (1.0°C)	8.0 (203)
Hybrid Max/Min Thermometer is a unique Mercury-Free model with spirit-in-glass units showing current temperatures, and a built-in digital display to indicate maximum and minimum temperatures since last reset. Both display in °F or °C. **Product Dimensions:** 10x4x1.5in (254x102x38mm), WxDxH.	MA-159	-40° — 120°F (-40° — 50°C)	2.0°F 1.0°C (0.10 for digital)	8.0 (203)
Non-Mercury Concrete Reference Thermometer meets ASTM C1064 and E 77 requirements to verify temperature measuring devices for cement and concrete testing. Blue liquid spirit filled glass thermometer is calibrated for 3in (76mm) immersion and includes documented certification at seven points with NIST traceability.	MA-149	-1° — 51°C	0.2°C	15.7 (400)
Armored Non-Mercury Thermometers are red spirit-filled glass for general laboratory use and accurate to NIST tolerances. Sturdy nickel-plated brass cases with built-in suspension rings protect against accidental breakage and have slotted front for ease of reading. 76mm Immersion depth. Etched black divisions against white background. To order glass thermometer refill only, add "R" suffix to model number.	MA-780 MA-781 MA-783 MA-784 MA-785 MA-786 MA-787	-35° — 50°C -20° — 150°C -10° — 200°C -10° — 260°C -30° — 120°F 0° — 230°F 30° — 300°F	1°C 1°C 1°C 1°C 1°F 2°F 2°F	12 (305) 12 (305) 12 (305) 16 (405) 12 (305) 12 (305) 12 (305)

technote

To prevent fluid column separation, always store Non-Mercury Thermometers vertically, using our MA-305 Thermometer Storage Rack.

MA-140 & MA-150

MA-240

MA-111

MA-162

MA-158

MA-305

MAA-90

Mercury-In-Glass Thermometers

Description	Model	Range	Division	Length in (mm)
General Purpose Lab Thermometers have single scale to S.A.M.A. standards and engraved stem. Calibrated for total immersion, mercury filled.	MA-140 MA-150 MA-141 MA-151 MA-142 MA-152 MA-143 MA-153 MA-144 MA-154	-30°— 120°F -35°— 50°C 0°— 230°F -20°— 110°C 0°— 300°F -20°— 150°C 20°— 500°F -10°— 250°C 20°— 750°F -10°— 400°C	1° 1° 2° 1° 2° 1° 2° 1° 5° 2°	12 (305) 12 (305) 12 (305) 12 (305) 12 (305) 12 (305) 16 (405) 16 (405) 16 (405) 16 (405)
Armored Mercury-in-Glass Thermometers have 12in (305mm) slotted penetration cases of plated steel. Case has top ring and threaded cap. For glass thermometer refill only, add "R" suffix to desired model.	MA-240 MA-241 MA-242	50°— 450°F 50°— 600°F 0°— 120°F	5° 5° 1°	12 (305) 12 (305) 12 (305)
Teflon®-tipped Pocket Thermometer is mercury-filled. Teflon® wrapped bulb resists abrasion and breakage. Sturdy aluminum case has a loop for lanyard.	MA-111	100°— 450°F	5°	6 (152)
Max/Min Registering Thermometer shows maximum and minimum temperatures since last reset, as well as current temperature in °F and °C. Reset button and protective plastic case for the mercury-filled U-shaped thermometer are included. **Product Dimensions:** 9x3.25in (229x83mm), WxH.	MA-162	-60°— 120°F -50°— 50°C	2°F & 1°C	8 (203)
Concrete Reference Thermometer checks calibration of other devices used for temperature determinations in cement and concrete. Meets ASTM C 1064 and E 77. Mercury-filled with black engraved numbers against yellow background. Calibrated for 3in (76mm) immersion and includes a certificate with NIST traceability. Purchase the MA-149 for a non-mercury alternative.	MA-158	30°— 124°F	0.2°F	18 (457)
Thermometer Storage Rack holds up to 25 thermometers in correct vertical position to prevent filler separation and reduce risk of breakage. Construction is 0.25in (6.35mm) thick polyethylene with sturdy base and large carrying handles. Retaining holes are 0.3125in (7.9mm) and base plate has 0.125in (3.2mm) drain holes. **Product Dimensions:** 6x9x9.5in (152x229x241mm), WxDxH.	MA-305	—	—	—
Thermometer Well provides temperature stability when checking and calibrating laboratory ovens. The solid aluminum block with machined internal well protects 1/4in (6.4mm) dia. glass thermometers, transfers heat efficiently, and maintains constant temperature when oven doors are opened. The large, square cross-section is stable on most oven shelves. **Product Dimensions:** 2x2x3.75in (51x51x95mm) WxDxH.	MAA-90	—	—	—
Armored Mercury-Filled Thermometers feature rugged nickel-plated brass cases to reduce accidental breakage and clean up of hazardous material. Thermometers for general laboratory use meet NIST requirements and tolerances. Cases have slotted front for ease of reading and built-in suspension rings. Etched black divisions against yellow background. 76mm Immersion depth. To order glass thermometer refill only, add “R” suffix to model number.	MA-680 MA-681 MA-682 MA-683 MA-684 MA-685 MA-686 MA-687 MA-688 MA-689 MA-690 MA-691 MA-692	-30°— 120°F -35°— 50°C 0°— 220°F -20°— 105°C 0°— 300°F -20°— 150°C -2°— 150°C -2°— 205°C -2°— 260°C 20°— 400°F 20°— 500°F -2°— 315°C -2°— 400°C	1°F 1°C 2°F 1°C 2°F 1°C 1°C 1°C 1°C 2°F 2°F 1°C 1°C	12 (305) 12 (305) 12 (305) 12 (305) 12 (305) 12 (305) 14 (355) 14 (355) 14 (355) 16 (405) 16 (405) 16 (405) 16 (405)

helpfulhint

State or local ordinances may prevent sales or shipment of instruments containing Mercury into your area.

Please check for restrictions before ordering or consult our customer service professionals.

MA-372

MA-373

MA-381

Infrared Thermometers

Description	Model	Range	Resolution	Accuracy	D:S Ratio
Infrared Thermometer has selectable °F/°C temperature units, 8-point circular laser pointing, and maximum temperature capture shown on the LCD display. Emissivity is fixed at 0.95, and D:S ratio is 12:1. **Product Dimensions:** 8x3x1.5in (203x76x38mm), WxDxH.		-76°— 932°F -60°— 500°C	0.1°F or °C	±2% or 2°C	12:1
Infrared Thermometer Soft Carry Case	MA-372 MAA-10B				
Infrared/Thermocouple Thermometer features port for Type K Thermocouple Probes (purchased separately). Also includes high and low alarms, selectable °F/°C, and 8-point circular laser aiming. Emissivity is adjustable from 0.10—1.00, with default setting of 0.95. Selectable modes for IR or probe functions include Max/Min, Difference (Max/Min), and Lock, for continuous scanning.		-76°— 1,157°F -60°— 625°C	0.1°F or °C	±2% or 2°C	16:1
Infrared/Thermocouple Thermometer Soft Carry Case	MA-373 MAA-10B				
Infrared/Thermocouple Extended Range Thermometer is similar to MA-373, but has extended range and higher D:S ratio of 20:1. High/low alarms, and Type K Thermocouple port (probes purchased separately) are standard. Adjustable emissivity from 0.10—1.00. Selectable modes for IR or probe functions include Max/Min, Difference (Max/Min), and Lock, for continuous scanning. **Product Dimensions:** 3.5x7x2in (89x178x51mm), WxDxH.		-76°— 1,400°F -60°— 760°C	0.1°F or °C	±2% or 2°C	20:1
Infrared/Thermocouple Extended Range Thermometer Soft Carry Case	MA-381 MAA-10B				

MA-102

MA-117

MA-118

MA-123

MA-127

Dial & Pocket Thermometers

Description	Model	Range	Division	Length in (mm)
Pocket Dial Thermometers Dial case and pointed 0.15in diameter stem are type 304 stainless steel. Accurate to 1% of range. Have calibration reset adjustment and plastic carrying case with clip. 1in diameter dial face.	MA-100 MA-101 MA-102 MA-103 MA-104 MA-105	-40°— 160°F 0°— 250°F 25°— 125°F 50°— 550°F 0°— 150°C 10°— 285°C	2° 2° 1° 5° 2° 5°	5 (127) 5 (127) 5 (127) 5 (127) 5 (127) 5 (127)
Pocket Digital Thermometers both have wide range, °F/°C switch. LCD display, included long-life 1.5V battery, On/Off switch, pocket case and clip. Economical MA-117 has 5x0.15in (127x3.8mm) stainless steel stem and one-second response time. Premium MA-118 model is waterproof and features backlit display, auto-off, max/min memory and hold functions. 4.5x0.12in (114x3mm) stainless steel probe has 0.06in (1.5mm) step-down tip for very fast response time. The MA-118 can be recalibrated.	MA-117 MA-118	-58°— 500°F (-50°— 260°C) -40°— 500°F (-40°— 260°C)	0.1° 0.1°	5 (127) 4.5 (114)
Dial Lab Testing, Dual Range Dial cases and 0.15in (3.8mm) diameter stems are type 304 stainless steel. 1.75in (44.45mm) °F/°C dual-scale Polycarbonate dials. MA-121 has 2in (50.8mm) dial. Accurate to 1% of range. Indicating pointer and adjustable mounting clip. Adjustment nut allows calibration to known temperature. MA-123 has 2in dial with sturdy Glass crystal, less expensive MA-123P has 2in (50.8mm) polycarbonate crystal. Polycarbonate dial face not intended for use in oven chamber.	MA-120 MA-121 MA-122 MA-123 MA-123P	0°— 220°F -18°— 105°C 25°— 125°F 0°— 50°C 50°— 300°F 10°— 150°C 0°— 550°F 0°— 285°C 50°— 510°F 10°— 265°C	2° 1° 2° 5° 5°	8 (203) 8 (203) 8 (203) 8 (203) 8 (203)
Dial Lab Testing, Single Range 304 stainless steel dial cases with 0.15in (3.8mm) diameter stems. Polycarbonate dials are 1.75in (44.45mm) diameter with single-range °F or °C dial faces and indicating pointers. Accurate to 1% of range. Adjustment nut allows calibration to known temperature. Polycarbonate dial face not intended for use in oven chamber.	MA-120F MA-121F MA-124	0°— 220°F 25°— 125°F 0°— 50°C	2° 1° 0.5°	8 (203) 8 (203) 8 (203)
Surface Dial, Dual Range Dials are 2in (50.8mm) diameter with 2% accuracy and measure on contact with any horizontal surface. Also attach to non-horizontal ferrous surfaces via two integral magnets.	MA-125 MA-126 MA-127	0°— 150°F -15°— 65°C 0°— 250°F -15°— 120°C 0°— 500°F -15°— 250°C	2° 1° 5° 1° 10° 5°	— — —

MA-341

MA-115

MA-343

MA-347

Dial & Pocket Thermometers

Description	Model	Range	Resolution	Accuracy
Traceable® Jumbo Display Digital Dial Thermometers provide continuous display for over a year. Switchable between °F/°C. MA-342 Ultra™ accuracy is ±0.3°C at tested points. Extra large LCD display is easy to read. Stainless steel probe is resistant to most laboratory chemicals. Plastic and stainless steel construction make it safer than mercury thermometers. An individually serial numbered NIST traceable certificate is included. Stem: 5.25x0.14in (133x3.8mm), LxDia. Top Diameter: 2.125in (54mm). Overall Length: 6.5in. Supplied with silver oxide battery.		-58°—302°F (-50°—150°C)	0.1° from -20° — 200°, 1° otherwise	
Traceable® Jumbo Display Digital Dial Thermometer	MA-341			±1°C
Traceable® Ultra™ Jumbo Display Digital Dial Thermometer	MA-342			±0.3°C
Traceable® Long-Stem Thermometers feature stainless steel probes for easy measurements in flasks, beakers, and other recessed areas. Rugged ABS Plastic and stainless steel construction. MA-115 and MA-116 models have 8in (203mm) probes but differ in accuracy. MA-119 has a longer 11.4in (290mm) stem. Bright 0.25in (6.4mm) digital display switches between °C/°F ranges. Includes protective probe sleeve, NIST Traceable certificate and battery.		-58°—302°F (-50°—150°C)	0.1° from -20° — 200°, 1° otherwise	
Traceable® Long-Stem Thermometer	MA-115			±1°C
Traceable® Long-Stem Ultra Thermometer	MA-116			±0.2°C
Traceable® Long-Stem Thermometer	MA-119			±1°C
Traceable® Pocket Thermometer has flat profile design. Stainless steel and plastic construction makes it safe for all lab tests. Probe guard extends overall length to 10.75in (273.1mm). MA-344 Ultra™ model accuracy is ±0.4°C at tested points. Recall Max/Min readings at the touch of a key. HOLD key freezes display; another switches from °F/°C. Large, bright LCD display is easy to read. Operates continuously for 1.5 years on a replaceable silver oxide battery. Includes an individually serial numbered NIST traceable certificate and a protective case. Overall Length: 7in (178mm). Stem: 3.5x0.14in (89x3.6mm), LxDia.		-58°—572°F (-50°—300°C)	0.1° from -20° — 200°, 1° otherwise	
Traceable® Pocket Thermometer	MA-343			±1.5°C
Traceable® Ultra™ Pocket Thermometer	MA-344			±0.4°C
Traceable® Robo™ Thermometer has rotating digital display for easy viewing. Switchable between °F/°C. MA-348 Ultra™ accuracy is ±0.4°C. Stainless steel probe is resistant to most laboratory chemicals. Rugged plastic and stainless steel construction makes it safer than mercury in glass thermometers. An individually serial numbered NIST traceable certificate is included. Large, bright 0.25in (6.4mm) high LCD display is easy to read. Overall Length: 9.25in (235mm). Stem: 8x0.14in (203x3.6mm), LxDia. Battery is included.		-58°—536°F (-50°—280°C)	0.1° from -20° — 200°, 1° otherwise	
Traceable® Robo™ Thermometer	MA-347			±1°C
Traceable® Ultra™ Robo™ Thermometer	MA-348			±0.4°C

MA-238

MA-322A

MA-323

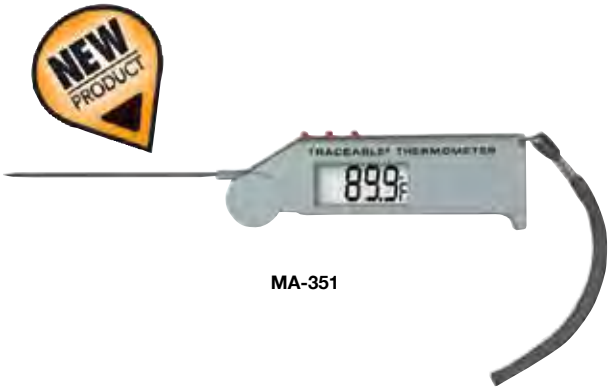
MAA-288, MAA-287 & MAA-286

Digital Thermometers

Description	Model	Range	Resolution
Traceable® Workhorse™ Thermometer has adjustable calibration to a specific temperature or sensor. The sharp LCD display is easy to read in variable light conditions. Compatible with all Type K probes, and features a hold key. An individually serial numbered NIST traceable certificate is provided. Includes a Type K sensor with probe and cable. A bench stand, 9V battery, and carrying case are also supplied. Probe cable is 30in (762mm). **Product Dimensions:** 2.75x1.25x5.5in (70x32x140mm), WxDxH.	MA-238	-58°— 2,372°F (-50°— 1,300°C)	0.1° from -50°—200°F Otherwise 1°
Basic Type K or J Thermometers pocket-sized thermometers accept standard Type K or J thermocouples. Features Max/Min memory, hold, auto power-off and relative temperature function. Four digit LCD display switches between °C and °F. Includes a 9V battery and beaded wire probe (two probes for MA-322A). Dual channel MA-322A reads and displays results from two probes simultaneously. Add "T" to model number for NIST traceable certificate of calibration. Accuracy is ±0.05% of reading +0.7°C (1.4°F). MAA-203 Rubber Boot Accessory provides protection for rugged use. **Product Dimensions:** 2.25x1.25x5.25in (56x38x130mm), WxDxH.		Type K -328°— 2,498°F (-200°— 1,370°C) Type J -328°— 1,922°F (-200°— 1,050°C)	0.1°C
Basic Type K Thermometer, Single-Channel	MA-321A		
Basic Type K Thermometer, Single-Channel with NIST Certificate	MA-321AT		
Basic Type K Thermometer, Dual Channel	MA-322A		
Basic Type K Thermometer, Dual Channel with NIST Certificate	MA-322AT		
Rubber Boot Accessory	MAA-203		
4-Channel Thermometer displays data from four probes simultaneously on a backlit LCD screen in °C or °F, using standard Type K thermocouples. Features include automatic shut-off, auto ranging, Max/Min, and hold functions. Accuracy is ±0.5% of reading +1°C or 2°F, full-scale. Includes foam-lined case, two beaded-wire probes, and 9V battery. An AC adapter is optional. A plastic, water-resistant pouch and bench-top mounting tripod are also available. Add “C” to the model number for models with NIST Traceable Certification. **Product Dimensions:** 2.5x1.25x7.25in (64x30x184mm), WxDxH.		-328°— 2,498°F (-200°— 1,370°C)	0.1°—200°F and 1° above 200°F
4-Channel Thermometer	MA-323		
4-Channel Thermometer with NIST Certificate	MA-323C		
AC Adapter, 115V/60Hz	MAA-227		
Water Resistant Instrument Pouch	MAA-228		
Bench-Top Tripod	MAA-229		
Thermocouple Probes & Accessories Type K thermocouple probes have standard two-blade connector. Separate connectors and bulk rolls of Type K thermocouple wire allow users to fabricate probes as needed. Simply install a connector and solder or crimp the ends of the two wires together to form an inexpensive, disposable probe.			
Short General Purpose Probe, 0.0625x4in (1.6x101.6mm)	MAA-286	—	—
Long General Purpose Probe, 0.125x6in (3.2x152.4mm)	MAA-287	—	—
High-Temperature[1] Probe, 2,200°F (1,200°C), 0.3125x3.25in (7.9x83mm)	MAA-288	—	—
Type K Wire Probe, 3ft (914mm)	HMA-320	—	—
Type K Male Connector	HMA-323	—	—
Type K Wire, 100ft (30m)	HMA-324	—	—
Type T Wire, 100ft (30m)	HMA-20	—	—
Type K Wire Extension with Female Connectors, 10ft (3m)	HMA-321	—	—

MA-249

MA-182



MA-351

MA-114

MA-270

Digital Thermometers

Description	Model	Range	Resolution
Waterproof Thermometers Waterproof and shockproof digital thermometers monitor temperature inside chambers, water baths, and other lab and field environments. Max/Min readings can be recalled for any time period. Accuracy is ±1°C between -20°—100°C for MA-248 and ±0.5°C for MA-249. Tough 1.75in (44mm) dia. ABS plastic case and 4.75in (120.6mm) long stainless steel probe with 10ft (3m) cable can be installed anywhere with included suction cups, Velcro®, or magnetic mounts. °F/°C switchable. An individually serial numbered NIST traceable certificate is provided.		-58°—572°F (-50°—300°C)	0.1° from -19.9°—199.9° Otherwise 1°
Waterproof Thermometer	MA-248		
Hi-Accuracy Waterproof Thermometer	MA-249		
Max/Min Memory Thermometer Displays inside and outside temperature simultaneously in large 1.25in (32mm) LCD digits and has memory for maximum and minimum limits of both until cleared. Accuracy is ±2% of reading. The unit comes with an 8ft (2.4m) sensor cable for outside measurements. The case has a built-in stand and a wall-mount bracket is also provided. One AAA battery is included. **Product Dimensions:** 5x3.5x.5in (127x89x127mm), WxDxH.	MA-182	-58°—158°F (-50°—70°C)	0.1°F
Traceable® Flip-Stick™ Thermometer has flip-to-open design. Stainless steel probe can be positioned at any angle. When folded, protected probe permits carrying by the wrist strap or in a pocket. Large LCD display. Ultra™ model accuracy is ±0.3°C at tested points. Features include °F/°C switch, Max/Min memory, and a HOLD switch. An individually serial numbered NIST traceable certificate is included. Accuracy for MA-351 is ±1°C and ±0.3°C for MA-352. Length: extended 11in (279mm), folded 6in (152mm). **Stem Product Dimensions:** 4.5x0.14in (114x3.6mm), LxDia. Weight: 2.4oz (340g).		-58°—572°F (-50°—300°C)	0.1° from -20°—200°, 1° otherwise
Traceable Flip-Stick Thermometer	MA-351		
Traceable Ultra Flip-Stick Thermometer	MA-352		
Thermistor/Infrared Pen Unit handles both infrared surface and penetration temperature measurements. Infrared surface temperatures are displayed on a backlit LCD. Accuracy is ±2% of reading or 2°C, whichever is greater. The stainless steel thermistor probe rotates out and locks at 90° or 180° for penetration measurements, and features min-max and hold functions. Accuracy is ±1.5% of reading. Carrying case and batteries are included. **Product Dimensions:** 7x0.75in (185x15mm). Probe: 6x0.06in (155x3mm).	MA-114	IR: -28°—428°F (-33°—220°C) Thermistor: -58°—302°F (-50°—150°C)	IR: 0.1°, 1° above 200°C Thermistor: 0.1°
Platinum RTD Thermometer is accurate, reliable and meets requirements for ASTM D2726, D6927, D2041and other standard test methods as an alternative to Mercury thermometers. This highly accurate unit has accuracy to ±0.1% + 0.2°C below 200°C and ±0.15% + 0.5°C above 200°C. It also features RS 232 port for transfer of data to PC or datalogger. Display shows low battery and probe condition. Matched, four-wire probe is included and has 6in (152mm) stem and 40in (1m) cable. °F/°C switchable and includes 9V battery. **Product Dimensions:** 3x1.25x7in (76x32x178mm).		–58 to 752°F (–50 to 400°C)	0.01° below 200°, 0.1° above 200°
Platinum RTD Thermometer	MA-270		
Optional 115V/60Hz AC Adapter	MAA-152		

USB DATA LOGGERS

These rugged, accurate, and reliable USB Data Loggers are fast and easy to set-up by plugging directly into the USB port of any Windows-based PC. Data for graphing and printing of stored readings is quickly exported using free Easy-Log Software downloaded from the internet. The software also exports data to other applications for detailed analysis. Inquire for Calibration Certification.

MA-491

MA-492

MA-493

MA-494

MA-495

MA-496

USB Data Loggers

Description	Model	Range °F (°C)	Resolution	Accuracy °F (°C)
Thermocouple Data Logger with Graphic Screen measures and stores more than 250,000 temperature readings from K, J or T-type thermocouples. It is supplied with a K-type thermocouple. A high contrast dot-matrix LCD graphic display has three buttons to navigate through the on-screen menu. This menu provides access to real-time trend analysis, data summaries and the ability to start, stop and restart the data logger independently of the host-PC. The max/min reading can be reset on-screen; introducing an event marker into the data which can later be viewed in the graphing software and data file. Logging intervals selectable from 2 seconds to 1 hour. The data logger is supplied with two lithium batteries, with typical life of up to one year. **Product Dimensions:** 4x1.9x1.2in (102x48.5x30.5mm), LxWxD.	MA-491	-112°—752° (-80°—400°)	0.1 (0.1)	±2.7° (±1.5°) Logger Only
Thermocouple Temperature Data Logger with Display measures and stores over 32,000 temperature readings from K, J or T type thermocouples. Thermocouples are attached via a standard connector the base of the unit. The user can cycle between several different temperature variables on the LCD display using the push button. The logger can be started immediately, delayed or with push-start button. Logging intervals selectable from 1 second to 12 hours. The data logger is supplied with a long-life lithium battery, with typical life of up to one year. **Product Dimensions:** 5.31x0.94x0.82in (135x24x21mm), LxWxD.	MA-492	-112°—752° (-80°—400°)	1.0 (0.5)	±2 (±1) Logger Only
Temperature and Humidity Data Logger with Display stores up to 16,379 each relative humidity and temperature readings over 0 to 100%RH and -35 to +80°C (-31 to +176°F) measurement ranges. Relative humidity, temperature and dew point data can be graphed, printed and exported to other applications. At the touch of a button, the user can cycle between current temperature and humidity, and max/min stored values. Logging intervals selectable from 10 seconds to 12 hours. The data logger is supplied with a long-life lithium battery, with typical life of up to one year. **Product Dimensions:** 5x1x0.9in (126x25x22mm), LxWxD.	MA-493	Temperature: -31°—176° (-35°—80°) Relative Humidity: 0—100% Non-Condensing	Temp: 0.2 (0.1) RH: 0.5%	Temp: ±4 (±2) RH: ±2.25%
Temperature Data Logger stores up to 16,382 readings. Operational status is indicated by flashing red, green and orange LEDs. The data logger is protected against moisture to IP67 standard when the protective cap is fitted. Selectable parameters include logging rate from 10 seconds to 12 hours, temperature units, high & low alarms and start-time. The data logger is supplied with a long-life lithium battery, with typical life of up to one year. **Product Dimensions:** 3.9x1x0.9in (99x25x23mm), LxWxD.	MA-494	-31°—176° (-35°—80°)	1.0 (0.5)	±2 (±1)
Thermocouple Temperature Data Logger measures and records over 32,000 temperature readings from K, J, or T type thermocouples. A standard Type K thermocouple is included. Thermocouples are attached via a standard connector the base of the unit. Start times are programmed, and recorded temperatures displayed through connection to the USB port of a Windows-based PC. Selectable logging intervals from 1 second to 12 hours. The data logger is supplied with a long-life lithium battery, with typical life of up to one year. **Product Dimensions:** 4.6x1.1x1.1in (118x27x27mm), LxWxD.	MA-495	-112°—752° (-80°—400°)	1.0 (0.5)	±2 (±1) Logger Only
Submersible Temperature Data Logger measures and stores up to 32,510 temperature readings. The logger is housed in a 316 grade stainless steel case for years of protection from corrosion, impact and moisture. Selectable logging intervals from 1 second to 12 hours. Moisture protection is rated at IP-67 standards. A slot for a retrieval lanyard is provided. A long life, high-capacity lithium battery is included for logging for up to 3 years. **Product Dimensions:** 4.3x0.7in (110x18mm), LxDia.	MA-496	-40°—257° (-40°—125°)	0.2 (0.1)	±0.4° (±0.2°)

Find Estimated Ship Weights for all our products in the Ship Weight Index

MA-81

MA-324

MA-245

MA-46

MA-246

Temperature Humidity Recorders & Data Loggers

Description	Model	Range	Division	Accuracy
Key-Wound Temperature Recorders save data on 8in (203mm) circular paper charts and feature selectable 24 hour or 7-day operation. No power source or batteries required. Wall-mounted or Portable models can be equipped with air or liquid sensors. Air sensors have a bendable 14-3/8in (365mm) cable. Liquid sensors are supplied with 5ft (1.5m) cable. Heavy aluminum cases have gasket seals. Includes 100 7-day charts and a felt-tip pen. Extra pens and 24 hour charts are ordered separately. Recorders for other ranges (°F or °C), and/or electric and battery operated drives are quoted on request. Inquire for models with NIST traceable calibration. Temperature sensors contain mercury and may be restricted for sale in some areas. Check local regulations before ordering. **Product Dimensions:** 10.5x5x14.5in (267x127x368mm), WxHxD.		0°—150°F	3°	±1%
Wall-Mounted Recorder with Air Sensor	MA-80			
Wall-Mounted Recorder with Liquid Sensor	MA-80B			
Portable Recorder with Air Sensor	MA-81			
Portable Recorder with Liquid Sensor	MA-81B			
7-Day Charts, pkg. 100	MAA-60			
24 Hour Charts, pkg. 100	MAA-61			
Felt-Tip Pens, pkg. 5	MAA-62			
4-Channel Data Logging Thermometer displays data from four probes simultaneously on a multi-line backlit LCD screen in °C or °F, using standard Type J, K, E and T thermocouples. Features include automatic shut-off, hi-lo alarms, auto ranging, max/min, and hold functions. Accuracy is ±0.5% of reading +1°C or 2°F, full-scale. 99 memories store up to 16,000 data points for downloading to PC with USB cable and downloadable software. Includes foam-lined case, two beaded-wire probes, and 9V battery. An AC adapter is optional. A plastic, water-resistant pouch and bench-top mounting tripod are also available. Add "C" to the model number for models with NIST Traceable Certification. **Product Dimensions:** 2.5x1.25x7.25in (64x30x184mm), WxDxH.		-328°—2,498°F (-200°—1,370°C)	0.1°—200°F and 1° above 200°F	±0.5% of reading +1°C/2°F
4-Channel Data Logging Thermometer	MA-324			
USB Cable	MAA-231			
AC Adapter, 115V/60Hz	MAA-227			
Water Resistant Instrument Pouch	MAA-228			
Bench-Top Tripod	MAA-229			
Datalogging Thermometer captures 5.9 million date, time and temperature readings on a 256mb SD memory card. Data is quickly uploaded to any Windows™ PC via the included USB flash drive with built-in SD card reader port. Features include max/min memory and user-adjustable high/low alarms. Four-line display shows probe and ambient temperatures, relative humidity, and time of day. Range is -22° to 158°F (-30° to 70°C) with 0.1° resolution. Accuracy is ±0.6°C from 0° to 50°C, and ±1.2°C otherwise. Stainless steel probe is 0.16x1in (4x25mm) ODxL. A 256mb SD card, USB card reader, bench stand, wall mount, batteries, AC adaptor, and certificate are included. **Product Dimensions:** 3.5x1.25x4.25in (3.5x31.75x108mm), WxDxH.	MA-245	-22°—158°F (-30°—70°C)	0.1°	±0.6°C from 0°—50°C
Temperature and Humidity Data Logger stores up to 16,000 measurements of temperature and relative humidity (non-condensing) in one second to two hour intervals. Ambient temperature and relative humidity are displayed directly. Sensors are built into the rugged plastic case. Reading dates and times are stored in non-volatile memory. Docking station allows programming of start times, intervals and alarms, as well as downloading of data to PC. Set includes Logger, software, docking station with RS-232 computer cable, battery and instructions. Additional Data Logger without docking station and RS-232 to USB Adaptor Cable are available. **Product Dimensions:** 2x0.9x3in (51x22x76mm), WxDxH.		Temperature -40°—185°F (-40°—85°F) Humidity 0—100%RH Non-Condensing	0.1° 0.1% RH	±0.6°C from -20°—50°C ±5% RH
Temperature and Humidity Data Logger	MA-46			
Temperature and Humidity Data Logger, with NIST Traceable Certificate	MA-46C			
Additional Data Logger, without Docking Station	MAA-230			
RS-232 to USB Adaptor Cable	MAA-231			
Platinum RTD Datalogging Thermometer is highly accurate and allows direct transfer of recorded data (CSV files) to PC or Mac using a USB flash drive (not included) - no need for additional software. Temperature range is –130° to 221°F (–90° to 105°C) with 0.01° resolution and accuracy of ±0.2°C across the entire range. Rolling datalogging memory captures temperatures at user-defined intervals from 1 minute to 24 hours with capacity for a year of recorded data using 1-minute intervals. Smart-Alarm™ visual and audible indicators signal continuously until acknowledged. Up to ten alarm events are stored and time-stamped in memory. Also features max/min, difference, and average functions. This two-channel unit is available supplied with one or two 316 stainless steel factory-calibrated Probes, for connection to high-impact, chemical-resistant ABS plastic case with 10ft (3M) leads. Replacement probes must be factory-installed and calibrated. Each CE marked thermometer features NIST Traceable calibration from an A2LA lab and has a unique ID for identification. Includes AAA batteries, AC adaptor, built in stand and wall-mount accessories. **Product Dimensions:** 2.75 x 0.75 x 4.25in (70x19x108mm) WxDxH.		–130° to 221°F (–90° to 105°C)	0.01°	±0.20°C across entire range
Platinum RTD Datalogging Thermometer, w/1 Probe	MA-246			
Platinum RTD Datalogging Thermometer, w/2 Probes	MA-247			

TSA-169R

TSA-1167

TSA-190

MA-193

MA-189

MA-38

TSA-195

MA-30

Timers & Stopwatches

Description	Model	Power Supply	Range
Digital Lab Timer controls electrical loads up to 20 amps. Bright 0.5in (12.6mm) LED display shows remaining time, stops machine at zero, then resets to programmed time for next use. Test times are set with tactile panel buttons. When stopped and restarted, countdown resumes from remaining time when paused. Electronics are mounted in a stainless steel case. The timer has a three-pronged receptacle for timed devices. TSA-169RF has two 6ft (3m) three-wire cords without plugs for connection to mains and machine. **Product Dimensions:** 4.5x5x5.5in (114x127x140mm), WxDxH.	TSA-169R TSA-169RF	100-250V 50/60Hz	Four Modes: 9,999 sec 9,999 min 99:59 min:sec 99:59 hr:min
Gralab Timer is an electromechanical timer that plugs into wall outlet, and controlled device plugs into timer. Option for continuous-run without removing timer from circuit. Rugged plastic case with gray and white finish. 6.5in (165mm) Dial has black markings and hands. Smaller red numerals allow alternate use as a stop-clock. Controls up to 1/3hp motor or 1,200 Watt resistive load. **Product Dimensions:** 7.5x2.5x7.5in (190x65x190mm), WxDxH.	TSA-1167 TSA-1167F	120V/60Hz 230V/50Hz	60min x 1sec
Spring-Wound Timers are simple to operate and have 30 or 60 minute ranges in 1 minute increments. Just plug the timed device into the back of the timer and turn the dial to the desired interval. When the dial returns to zero, power is cut off and the device stops. The black plastic case features an easy to set indicator dial and satin chrome face with black numerals. These timers are fully grounded for single-phase rated to control up to 10 amps at 125 VAC. **Product Dimensions:** 3x2.75x3.3in (76x70x84mm), WxDxH.	TSA-190 TSA-191	115V/60Hz/15A	30min x 1min 60min x 1min
Dual Timer has 0.6in LCD displays for two independent timers, with both audio and flashing green/red visual alarms. Two memory settings for repetitive times. Large buttons and simple programming make it easy to use. NIST Traceable certificate for ±0.01% accuracy. Supplied with magnetic back, stand/spring-clip, lanyard opening, and two AAA alkaline batteries. **Product Dimensions:** 3.5x0.6x3in (89x15x76mm), WxDxH.	MA-193	Two AAA Batteries (Included)	2 Timers 99hr:99min x 1sec
Thermo-Timer is a 99 minute countdown timer that also displays temperature in 32°—392°F (0°—200°C) range, and is switchable between °F and °C. Temperature cable with probe fits into closed oven door. 4ft cord is resistant to 482°F (250°C).Alarm sounds when time or temperature limit is reached. Time and temperature functions can be used separately or simultaneously. The display swivels for easy reading, and magnets permit mounting on sides of ovens. Accuracy is ±2°C. Probe and two AAA batteries included. **Product Dimensions:** 3x1x5in (76x25x127mm), WxDxH.	MA-189	Two AAA Batteries (Included)	24hr x 1sec
Four-Channel Traceable® Alarm Timer has a large, 0.75in (19mm) display for viewing from across the lab. Accuracy is 0.01%. The extra-loud, high-decibel alarm sounds for one minute or until silenced. At zero, the timer starts counting up, showing time elapsed since alarm. All 4 channels may be used simultaneously and separately to count-down or count-up. For repetitive tests, the memory returns the display to the previously programmed countdown time at the touch of a key. Finger-size keys make it easy to set times and change channels. An individually serial-numbered certificate traceable to NIST is provided from an A2LA accredited laboratory. Magnetic back and flip-open stand allows the timer to be placed on any surface. **Product Dimensions:** 2.75x 2.5x0.5in (70x64x13mm) Weight is 2oz (60g).	MA-38	2-year, silver-oxide battery (Included)	99 hr, 59 min, 59sec x 1sec
Field Test Timer is a simple LCD digital timer with a magnetic back, audible signal, and large 1.2in (30mm) start button, ideal for laboratory or field applications. Test times reset automatically until new time is programmed. Timer can be hand held or attached to magnetic material. A 30 second alarm sounds at zero. Durable plastic case measures 1.8x0.5x3.5in (89x46x13mm), WxDxH.	TSA-195	1.5V Battery (Included)	99min x 1sec
Large Display Digital Stopwatch has click-stop controls with positive tactile feedback and a large LCD display. Unit has split interval, clock and calendar functions. Housed in a rugged 3x2.5x0.75in (76x64x19mm) ABS plastic case. A vinyl case is included.	MA-30	Battery (Included)	30min x 0.1sec 24hr x 1sec

Find Estimated Ship Weights for all our products in the Ship Weight Index

TSA-163

SPA-100

SC-4, SC-1 , SC-5 & SC-3

SC-45

SC-55, SC-56, SC-51 & SC-50

Metal Sample Pans & Containers

Description	Type	Model	External Dimensions, in	Capacity qt
Steel Painted, welded, durable for long life. Cross-stacking Handling Pans have chute end and swing-down handle to permit oven access. Sample Pans have end flanges for lifting. SPA-120 is also available in aluminum as SPA-122.	Steel Handling Pans	TSA-162	15 x 30 x 4H	39.0
		TSA-163	12 x 20.5 x 4H	17.0
	Steel Sample Pans	SPA-105	29 x 12 x 9H	48.0
		SPA-104	22 x 13 x 11H	49.0
		SPA-400	25 x 9 x 8H	31.0
		SPA-101	20 x 7 x 6H	14.0
		SPA-100	26 x 9 x 6H	24.0
		SPA-120	29 x 13.75 x 6.75H	36.0
Galvanized Iron Wire-bound rolled top edges and two drop handles. Often used for drying or mixing. Pans SC-2 , SC-4 and SC-5 have tapered sides for nesting. Others have straight sides. Combined with maximum oven temperatures to 350°F (177°C).	Galvanized Pans	SC-1	18 x 18 x 1.5H	8.0
		SC-2	18 x 18 x 3H	17.0
		SC-3	24 x 24 x 4H	40.0
		SC-4	24 x 24 x 3H	30.0
		SC-5	10 x 20 x 3H	10.0
Stainless Steel Top quality seamless construction with rounded corners. Rectangular pans have straight sides. SC-45 thru SC-47 have handles, others have oversize flanges for handling. Round pans have tapered sides. SC-77 is sized to contain 8in (203mm) sieves. SC-80 thru SC-84 are round sided.	SS Rectangular Pans	SC-45	17.2 x 14.5 x 2.5H	8.3
		SC-46	15.3 x 13 x 2.5H	6.5
		SC-47	13.5 x 11.2 x 2.5H	4.3
		SC-50	20.7 x 12.7 x 2.5H	8.3
		SC-51	20.7 x 12.7 x 4H	14.0
		SC-55	10.4 x 12.7 x 2.5H	4.0
		SC-56	10.4 x 12.7 x 4H	6.7
		SC-57	10.4 x 12.7 x 6H	9.6
		SC-60	6.9 x 12.7 x 2.5H	2.6
		SC-61	6.9 x 12.7 x 6H	5.9
		SC-65	6.4 x 10.4 x 2.5H	1.8
		SC-70	6.9 x 6.3 x 2.5H	1.2
	SS Round Pans	SC-73	10 dia. x 1.9H	0.7
		SC-74	14.2 dia. x 1.9H	1.3
		SC-77	11 dia. x 3.5H	5.0
		SC-78	13.5 dia. x 5H	7.5
	SS Round Bowls	SC-80	7.7 dia. x 2.7H	1.5
		SC-81	9 dia. x 3.2H	3.0
		SC-82	11.3 dia. x 3.6H	5.0
		SC-83	13.3 dia. x 4.4H	8.0
		SC-84	17.5 dia. x 5.2H	16.0
Aluminum Popular seamless, heavy-gauge aluminum pans are economical, durable, lightweight and rust-proof. Models SC-149 thru SC-151 have end handles. Large SC-149 is extra heavy-duty.	Aluminum Pans	SC-149	26 x 18 x 3.5H	27.0
		SC-150	18 x 12 x 2.5H	7.7
		SC-151	15.5 x 11 x 2.5H	4.5
		SC-163	13.5 x 10 x 2.5H	4.0
		SC-152	8 x 8 x 2H	2.0
		SPA-301	7.5 x 3.7 x 2.3H	1.1
	Aluminum Round Pans	SC-165	8 dia. x 1.5H	1.3

SC-74, SC-73, SC-78 & SC-77

SC-83, SC-84, SC-81, SC-82 & SC-80

SC-151, SC-149, SC-150 & SC-152

SC-250 & SC-251

SC-252

SC-259

SC-400 thru SC-406

SC-498 thru SC-508

Sample Pans & Containers

Description	Type	Model	External Dimensions, in	Capacity
Glass Ovenware Heavy-duty 0.375in (9.5mm) thick ovenproof clear glass is microwavable. Dimensions include handles.	Rectangular Dish	SC-250	10.9 x 15.8 x 2.3	3qt
	Rectangular Dish	SC-251	8.5 x 13.7 x 2.3	2qt
	Square Dish	SC-252	8.5 x 10.5 x 2.5	1.5qt
	Deep Dish	SC-253	5.5 x 11.3 x 3	1.5qt
	Round Bowl	SC-258	8.5dia. x 4.3	2.5qt
	Round Bowl	SC-259	7.3dia. x 3.5	1.5qt
Round Sample Containers, Metal Round containers with tight-fitting lids prevent moisture loss in samples. All have straight sides and flat bottoms. Covers fit bottom of container during drying. Premium aluminum never needs tare adjustment for rusting. Sold in packages of twelve. Add "-1" to model numbers to order single containers.	Aluminum, Round Pkg. of 12	SC-400	2dia. x 0.9h	1.5oz
		SC-402	2.5dia. x 1.8h	4oz
		SC-404	3dia. x 1h	5oz
		SC-406	3.5dia. x 2h	11oz
	Tinned, Round Pkg. of 12	SC-498	1.9dia. x 1.3h	2oz
		SC-500	2.2dia. x 1.6h	3oz
		SC-502	2.4dia. x 1.6h	4oz
		SC-504	2.9dia. x 1.9h	6oz
		SC-506	3dia. x 2.2h	8oz
		SC-508	3.8dia. x 2.8h	16oz
Round Sample Jars, Plastic Lightweight and enclosed to protect from moisture, dust, etc. Intermediate Polypropylene wide-mouth jars with leakproof screw-top lids. Sold in case lots only.	Plastic, Round			
	12/case	SC-115	4.4dia. x 3.8h	32oz
	12/case	SC-116	3.4dia. x 4.1h	16oz
	12/case	SC-117	2.5dia. x 3.5h	8oz
	24/case	SC-118	2dia. x 2.8h	4oz
	24/case	SC-119	1.6dia. x 2.8h	2oz
Sample Cans Round, tinned-metal cans ideal for storing or transporting soil, aggregates, or other samples. Epoxy lacquered interiors and tight fitting friction-type lids provided.	Tinned-Metal, Round			
	6/Case	SC-272	6.6dia. x 7.5h	4qt
	12/Case	SC-270	4.3dia. x 4.9h	1qt
	1 each	MAA-43	3.3da. x 4.0h	1pt
Sample Buckets Ideal for bulk field samples. Thick-wall, high-density polyethylene containers have sturdy bail handles for easy transport. Tight-fitting lids prevent moisture loss and spillage.	Plastic Square	HM-450	9.5x9.5x13	16qt

SC-115 & SC-118

SC-270 & SC-272

HM-450

TSA-168 TSA-170 TSA-179 TSA-173

TSA-172

TSA-171

TSA-174 TSA-176

WT-6

Brushes

Description	Model
Small Fine Sieve Cleaning Brush has soft, 100% China bristles tapered for use with fine mesh sieves in round 0.75in (19mm) ferrule. Especially handy for 3in diameter test sieves or Precision Electroformed sieves. Overall length is 5in (127mm) with wood handle.	TSA-168
Fine Sieve Cleaning Brush is ideal for cleaning No.16 and finer sieves. Soft bristles, nickeled steel ferrule, lacquered wood handle, 1.25in diameter and 5.75in long.	TSA-170
Nylon Sieve Cleaning Brush is a hardwood block brush with nylon bristles, optimal for cleaning No. 120 mesh and finer sieves. 1.875in diameter and 0.875in thick with 3.75in straight wood handle. Overall brush length is 5.88in.	TSA-179
Wire Loop Brush is a 1.25in wide fan type brush with 1.625in long metal bristles and a wire loop handle. The 4.75in long brush is designed for use on #16 and coarser wire cloth.	TSA-173
Coarse Sieve Cleaning Brush has an 8.5in curved plastic handle with 1.5in x 1.75in of slanted brass wire bristles—perfect for No.30 and coarser wire cloth in round sieves.	TSA-172
Coarse Screen Tray Brush is recommended for No.30 and coarser wire cloth in screen trays. The 13in curved wooden handle has 5.5in x 0.75in of fine (0.005) brass wire bristles, which slant toward the tip for cleaning corners of screen trays. Also useful for cleaning molds.	TSA-171
Table Brush has 9x3in of horsehair bristles. This 14in long brush comes with a plastic or wood handle, depending on availability. A general purpose brush suitable for clean up of lab equipment.	TSA-174
Wire Scratch Brush has flat wire bristles that are grouped in 5x10 rows. Sturdy wood block handle is 7.75in long x 2.625in wide. The TSA-176, with 2in bristles, may be used on soil-cement specimens to meet ASTM D559, D560, AASHTO T 135, and T 136. The TSA-176A is the same brush with 1.25in bristles. Wire Scratch Brush, 2in Bristles Wire Scratch Brush, 1.25in Bristles	 TSA-176 TSA-176A
Scrub Brushes are available in 20in (508mm) long-handled, or 8in (203mm) short-handled versions, and stand up to heavy everyday use in the field. Both feature durable, solid plastic handles and sturdy, acid-resistant synthetic fibers. Short Scrub Brush, 8in (203mm) Long Scrub Brush, 20in (508mm)	 TSA-232 TSA-233
Camel Hair Brush Set for delicate sieve meshes includes two flat-tip and two round-tip brushes.	WT-6

TSA-232

TSA-233

TSA-177 & TSA-178 TSA-182 & TSA-183

TSA-184, TSA-186 & TSA-188 TSA-198 TSA-205, 207 and 208

Scoops

Type	Model	Capacity oz (L)	Bottom Type	Bowl LxW, in	Overall Length in (mm)
Plastic	TSA-177	32 (0.95)	Flat	6.5 x 5.0	11.5 (292)
	TSA-178	82 (2.4)	Flat	9.0 x 6.0	14.5 (368)
Aluminum	TSA-182	38 (1.12)	Flat	8.8 x 5.3	14.0 (355)
	TSA-183	3.5 (0.10)	Flat	4.8 x 2.8	8.5 (216)
	TSA-193	2 (0.05)	Round	4.5 x 2.0	7.8 (198)
	TSA-184	5 (0.15)	Round	4.8 x 2.5	7.3 (185)
	TSA-185	12 (0.36)	Round	5.8 x 3.3	8.8 (223)
	TSA-186	24 (0.71)	Round	7.0 x 3.8	10.5 (267)
	TSA-187	85 (2.37)	Round	11.8 x 6.3	16.0 (406)
	TSA-188	38 (1.12)	Round	8.8 x 4.6	12.3 (312)
	TSA-189	58 (1.71)	Round	10.0 x 5.3	14.3 (363)
Stainless Steel	TSA-198	4 (0.11)	Round	3.0 x 5.0	9.0 (229)
	TSA-205	12 (0.36)	Flat	5.5 x 3.0	9.0 (229)
	TSA-206	24 (0.71)	Flat	7.0 x 4.5	12.0 (305)
	TSA-207	45 (1.33)	Flat	8.0 x 5.5	13.5 (343)
	TSA-208	63 (1.86)	Flat	10 x 7.0	15.0 (381)

LABORATORY FLASKS, BEAKERS & GRADUATED CYLINDERS

Kimax, Pyrex, or equivalent quality borosilicate glass is chemical, heat and wear resistant. Stainless steel is smooth, seamless, and corrosion resistant. Plasticware is transparent, rigid poly-methylpentene, resists impact and handles temperature to 200°C.

GW-11

GW-74

VIDEO ONLINE

GW-20 thru GW-24

GW-32

MA-45, MA-48 & MA-50

SG-250

GW-60

MA-42, MA-41 & MA-40

VIDEO ONLINE

GW-40 thru GW-47

Laboratory Flasks, Beakers & Graduated Cylinders

Description	Capacity ml	Other Features	Models Unit	Models Pkg.	Pkg. Qty.
Erlenmeyer Flasks		Graduations, ml			
Narrow-mouth Erlenmeyer Flasks have heavy-duty rim and volume graduations for approximate measuring/mixing. Large matte spot for easy writing and erasing. Not for vacuum or pressure use.	125	50-125	GW-10	GW-10P	12
	250	50-200	GW-11	GW-11P	12
	500	100-500	GW-12	GW-12P	6
	1,000	250-1,000	GW-13	GW-13P	6
	2,000	600-1,800	GW-14	GW-14P	4
	4,000	1,000-4,000	GW-15	—	1
	6,000	1,500-6,000	GW-16	—	1
Filter Flasks		Stopper Size			
With side tubulation for 0.375in ID tubing. Heavy-duty 2,000/4,000ml sizes have thick wall for maximum strength.	1,000	#8	GW-74	—	1
	2,000	#9	GW-75	—	1
	4,000	#12	GW-76	—	1
Graduated Cylinders		Graduations, ml			
Durable borosilicate glass cylinders have etched single scale. Large stable base. Enlarged funnel top on 10ml size.	10	0.2	GW-20	GW-20P	4
	25	0.5	GW-21	GW-21P	4
	50	1.0	GW-22	GW-22P	4
	100	1.0	GW-23	GW-23P	4
	250	2.0	GW-24	GW-24P	2
	500	5.0	GW-25	—	1
	1,000	10.0	GW-26	—	1
	2,000	20.0	GW-27	—	1
Beakers		Graduations, ml			
Low form Griffin Beakers have reinforced rims, uniform wall thickness, and spouts designed for excellent pouring. Approximate volume graduations guide measuring/mixing. Large matte area for pencil markings.	50	10-40	GW-30	GW-30P	12
	100	20-80	GW-31	GW-31P	12
	250	25-200	GW-32	GW-32P	12
	400	50-350	GW-33	GW-33P	12
	600	100-500	GW-34	GW-34P	6
	800	100-750	LPA-43	LPA-43P	6
	1,000	100-900	GW-35	GW-35P	6
Volumetric Flasks	100	—	SG-100	—	1
Calibrated to contain indicated quantity at 20°C. Supplied with plastic snap cap. Meets ASTM E288, E694; useful for specific gravity tests such as ASTM D854.	250	—	SG-250	—	1
	500	—	SG-500	—	1
	1,000	—	SG-1000	—	1
Stainless Steel Beakers		Top Dia. x Ht. in (mm)			
Heavy-duty, smooth, seamless, and corrosion resistant beakers have rolled top rims. Larger MA-45 through MA-48 are straight-sided Bain Marie style beakers with no handles or graduations. Useful for handling, collecting corrosive solvents and/or extracts and bitumen samples without fear of breakage.	500	3.5x4.5 (89x114)	MA-40	—	1
	1,000	4.5x5 (114x127)	MA-41	—	1
	2,000	5.5x6.5 (140x165)	MA-42	—	1
	1,893	4.9x6.8 (124x172)	MA-45	—	1
	5,678	7.3x8.6 (185x218)	MA-48	—	1
	11,356	9x10.9 (229x279)	MA-50	—	1
Plastic Graduated Cylinders	Cylinders	Graduations, ml			
Plastic cylinders are quality polymethylpentene (PMP). PMP is highly transparent, rigid, resists impact, and handles temperatures of 200°C (180°C continuous). Not recommended for use with chlorinated solvents or strong oxidizing agents. Cylinders have pour-out, stable base, and molded-in graduations.	10	0.2	GW-40	GW-40P	10
	25	0.5	GW-41	GW-41P	5
	50	1.0	GW-42	GW-42P	5
	100	1.0	GW-43	GW-43P	5
	250	2.0	GW-44	—	1
	500	5.0	GW-45	—	1
	1,000	10.0	GW-46	—	1
	2,000	20.0	GW-47	—	1
Measuring Pipettes		Color Code			
Mohr-type Measuring Pipettes are color coded by size and calibrated to deliver at 20°C. Each has permanent markings with zero at the top. Mouth end of 5ml and larger sizes is reduced in diameter for ease of use.	1	Yellow	GW-60	—	1
	5	Blue	GW-62	—	1
	10	Orange	GW-63	—	1
	25	White	GW-64	—	1
	50	None	GW-65	—	1
Neoprene Stoppers		Size #			
Stoppers fit various sizes of Filter Flasks and some Graduated Cylinders.	—	8	GWA-508	—	1
	—	8.5	GWA-585	—	1
	—	9	GWA-509	—	1
	—	12	GWA-512	—	1

MA-278

MA-275

HMA-302

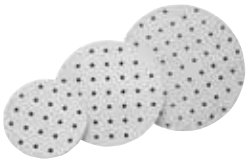
HMA-340

HMA-300

HMA-304

HMA-307

MA-203



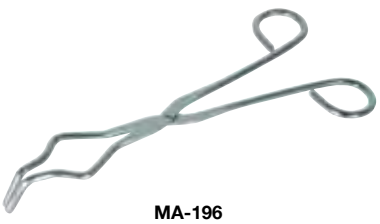
MA-207, MA-208 & MA-209

MA-187

MA-194

WT-4R

MA-195



MA-196

MA-198

Laboratory Tools

Description	Model
Evaporating Dishes, Porcelain, MA-275 and MA-276 are glazed inside and out; MA-277 and MA-278 are glazed inside and around rim, bottom is not glazed.	
Diameter x Height, mm — ml	
80 x 34 — 80	MA-275
93 x 40 — 120	MA-276
104 x 40 — 150	MA-277
120 x 42 — 250	MA-278
Chisel, hardened steel with 1in (25.4mm) wide blade; 10in (254mm) long.	HMA-302
Estwing Rock Hammer is top quality for digging, splitting, and prying. One-piece forged solid steel. Handle has nylon-vinyl grips.	HMA-340
Rubber Mallet, hard rubber, 2.25in (57mm) face, wooden handle, 12in (305mm) overall length.	HMA-300
Spoon, for mixing, digging of soils, etc., one piece stainless steel. Approximate length: 11.5in (292mm).	HMA-304
Trowel, 4.5x3in (114x76mm), LxW flat blade with wood handle.	HMA-306
ASTM Trowel, 4.5x3in (114x76mm), LxW flat blade with wood handle. Has straight edges to meet ASTM C109, AASHTO T 106.	HMA-307
Desiccators, Scheibler, complete with cover. Clear heavy glass, ground cover with knob. Desiccator Plates and Desiccant Cartridges are purchased separately.	
6in (152mm) ID	MA-203
8in (203mm) ID	MA-204
10in (254mm) ID	MA-205
Desiccator Plates support specimens in Desiccators. Stable and chemical resistant. Withstand temperatures to 300°F (149°C).	
140mm (for 6in)	MA-207
190mm (for 8in)	MA-208
230mm (for 10in)	MA-209
Desiccant Cartridges in durable perforated bags fit desiccators. Nutrasorb indicating silica gel beads are blue when dry, pink when moist, and cartridges regenerate repeatedly when dried in a 300°F (150°C) oven.	
114mm (for 6in and 8in)	MA-187
197mm (for 10in)	MA-188
Aspirator with Coupling, Chapman style. Low cost vacuum using 10—50psi water source. Has 3/8in NPT water inlet or fits threaded faucet with included coupling. Ni-plated, 6in long, with ball valve to prevent water backflow.	MA-194
Tongs, 9in (229mm) long, Ni-plated steel with riveted joint. MA-195 has 4.5in plastisol jaws to fit 50—2,000ml beakers.	
Beaker Tongs	MA-195
Crucible Tongs	MA-196
Clear Vinyl Tubing, 1/16in wall thickness.	
3/8in ID, per foot	WT-4
100ft pack	WT-4R
1/4in ID, per foot	WT-8
100ft pack	WT-8R
Hose Clamp, with adjustment screw to permit accurate flow regulation in flexible tubing. Ni-plated brass with pivoting lower jaw.	MA-198

HMA-25 & HMA-24

HM-109

HM-111

HMA-10, HMA-11, HMA-11A & HMA-12

HMA-13

SC-90

SPA-22

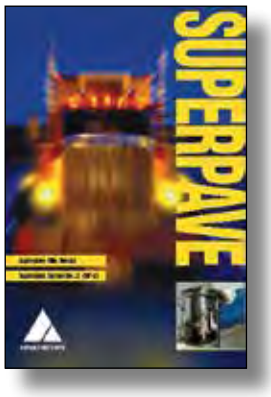
SP-92

TR-1002

Laboratory Tools

Description	Model
Wash Bottles, polyethylene, squeeze dispensing; adjust flow by cutting tip.	
Wash Bottle, 250ml	HMA-24
Wash Bottle, 500ml	HMA-25
Mortar & Pestles, heavy porcelain 5in dia. mortar has 320ml, glazed except for sample contact area (small porcelain pestle included). Use rubber tipped wooden pestle to break up agglomerates of soils, etc.	
Mortar & Pestle	HM-109
Rubber Tip Pestle	HM-111
Spatulas with mirror-finished stainless steel blades riveted to hardwood handles. HMA-11A meets ASTM C1252 and AASHTO T 304.	
L x W of Blade, in (mm) / Overall Size, in (mm)	
4 x 0.75 (102 x 19) / 7.8 (197)	HMA-10
6 x 0.5 (152 x 13) / 11.5 (292)	HMA-9
6 x 1 (152 x 25) / 10.5 (267)	HMA-11
3.9 x 0.9 (100 x 23) / 8.25 (210)	HMA-11A
10 x 1.5 (254 x 38) / 14.3 (368)	HMA-12
Stainless Steel Spatula & Spoon is handy for mixing, scraping, and handling powders. Constructed entirely of stainless steel, the overall length is 7.8in (198mm). Spatula blade is 1.8x0.4in (30x9mm).	HMA-13
Sample ID Tags of soft embossable aluminum, can be permanently marked by either pencil or ballpoint to attach to bags, containers, etc. via wire ties provided. Weatherproof and ovenproof. Packages of 500. **Product Dimensions:** 3x0.8in (76x22mm), LxW.	SC-90
Bucket Liner Sample Bags are a fast, efficient way for one person to collect and handle bulk soil, aggregate or asphalt samples, and a perfect fit for metal or plastic buckets with 3 to 6gal (11 to 22L) capacity. Fabric and thread are temperature-rated to 400°F (204°C). Simply drop the sturdy cotton 20x24in (508x610mm) WxH bags into a bucket, fill with material, and secure using heavy-gauge wire ties and Wire Twister, purchased separately.	
Bucket-Liner Sample Bags, qty. of 10	SPA-22
Bucket-Liner Sample Bags, qty. of 100	SPA-22C
Bucket-Liner Sample Bags, qty. of 1,000	SPA-22K
Double-Loop Wire Ties, 8in (200mm), qty. of 50	SPA-23
Wire Tie Twister, Plastic Handle	SPA-24
Sample Bags are heavy-duty and ordered with or without poly liners. Bags are quality high count drill textile with drawcords and are suitable for use with soil, sand, aggregates, ores, and similar materials. Use lined bags for fine or wet materials. Capacity for 10x8in bags is approximately 50lbs (23kg) and for 17x32in bags approximately 75lbs (34kg). Packages of 10.	
Sample Bags, 10 x 18in (254 x 457mm)	SP-92
Sample Bags, 17 x 32in (432 x 813mm)	SP-96
Lined Sample Bags, 10 x 18in (254 x 457mm)	SP-93
Lined Sample Bags, 17 x 32in (432 x 813mm)	SP-97
Step-up/Step-Down Transformers convert electrical voltages up from 110-120 volt to 220-240 volt, or down from 220-240 volt to 110-120 volt. Included adaptor allows input connection to common grounded power supplies in North America, Europe, and many other parts of the world. Universal output accepts North American, UK, European, and other plugs. Transformers have an on/off switch, two spare fuses, and are CE marked. Do not exceed maximum rated wattage. **TR-502 Product Dimensions:** 6x5x4in (152x127x102mm), WxDxH. **TR-1002 Product Dimensions:** 8.5x7.5x5.5in (216x191x140mm), WxDxH. **TR-3002 Product Dimensions:** 7.2x9.8x6in (183x249x152mm), WxDxH.	
Step-Up/Step-Down Transformer, 500W	TR-502
Step-Up/Step-Down Transformer, 1000W	TR-1002
Step-Up/Step-Down Transformer, 3000W	TR-3002

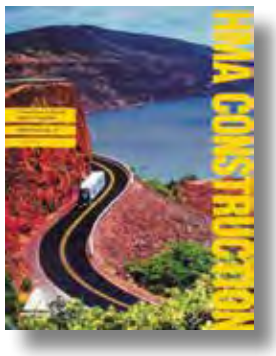
BK-50



BK-42

BK-43

BK-44



BK-45

BK-447R

BK-36

Reference Library

Description	Model
ASPHALT BINDER HANDBOOK A comprehensive manual devoted entirely to information about asphalt binders and bitumen. It is a compilation of information contained in numerous other Asphalt Institute publications, including SP-1, MS-4, MS-5, MS-19, and MS-25 manuals. It also includes previously unpublished information on topics like the Multiple-Stress Creep Recovery (MSCR) test, testing variability and resolution, and the generation of mastercurves. Fully illustrated, 223 pages. **Product Dimensions:** 6x9in (150x225mm)	BK-50
SUPERPAVE LEVEL 1 MIX DESIGN Concepts of and requirements for Superpave asphalt mix design. Aggregate tests described include source properties, gradation control points and forbidden zones. Level 1 mix design is presented with discussion of design, volumetrics, and the gyratory compactor. Fully illustrated paperback. 1995, 128 pp. **Product Dimensions:** 6x9in(152x229mm)	BK-42
ASPHALT MIX DESIGN METHODS A practical guide to asphalt mix design by Marshall and Hveem methods. Fully illustrated in 6x9in (152x229mm) paperback. 6th edition. 1994, 112 pp.	BK-43
THE ASPHALT HANDBOOK Chapters include types of asphalts, mix designs, mixing facilities, paving, compaction, surface treatments, recycling, maintenance, structural design and more. Leatherette bound, 7th edition, 832 pp. **Product Dimensions:** 6x9in (150x225mm)	BK-44
CONSTRUCTION OF HOT-MIX ASPHALT PAVEMENTS Prepared by the Asphalt Institute for the U.S. Federal Highway Administration to define asphalt pavement quality control procedures. Chapters include Inspection and the Inspector, Materials, Mix Design, Plant Operations, Placing Operations and Compaction. Useful for engineers, inspectors and technicians. Paperback with appendices. 2nd edition. **Product Dimensions:** 8.5x11in (216x279mm)	BK-45
ASTM MANUAL ON TEST SIEVING METHODS New 5th edition ASTM publication supplements current ASTM sieving standards. Subject matter covers sieve types, sampling methods, sieving procedures, calculation and graphing. Appendices include reference tables and charts. 66 pp. soft cover. **Product Dimensions:** 6x9in (152x229mm)	BK-447R
THE AGGREGATES HANDBOOK This compilation of articles creates a comprehensive reference for anyone dealing with aggregates. Discusses basic properties, aggregate as a component of Portland cement and asphalt concrete, sampling and testing principles and more. New second edition features expanded coverage of many industry topics. **Product Dimensions:** 8.5x11in (216x279mm)	BK-36

NEW! Ship Weight Index

The Estimated Ship Weight for every product is easy to find in the NEW Ship Weight Index!

VIDEO ONLINE

Watch video tutorials for our products online at **www.globalgilson.com!**

SE-20

MA-74

SE-26

SE-42

SE-28

SE-24

SE-31

SE-30

Safety Equipment

Description	Model
Lightweight Hearing Protector earmuff features three-position contoured headband for use with helmets and shields, and is made from non-conductive materials. Cushion-seal earpieces adjust easily for comfortable fit. Includes an auxiliary headband strap for multi-position wear. Noise reduction rating (NRR) is 25dB.	SE-20
Compressible Hearing Protectors are reusable, form-fitting foam ear plugs. Bright orange plugs have a smooth, soil-resistant skin and tapered shape for easy insertion. Once inserted, the plugs expand slightly for a snug, comfortable fit. Flared ends enable effortless removal. Noise reduction rating (NRR) 33. Sold in packs of twenty five pairs.	MA-74
Safety Goggles have soft, clear vinyl frame that fits snugly and comfortably. Perforated side-shields permit air flow but still protect from splashes, flying chips, and particles. Premium clear polycarbonate lenses are scratch-resistant with anti-fog coating. Can be worn over prescription glasses; adjustable elastic headband provided.	SE-26
Face Shield with full coverage protects from sparks, particles, short duration heat exposure, etc. The headgear has ratchet type adjustment, floating suspension and pivots up when not in use. The 70 mil thick 9x15.5" (229x394mm) impact and heat resistant polycarbonate window is held securely in place by locking cams. Meets ANSI Z87.1.	SE-42
Safety Glasses have clear, impact-resistant polycarbonate lenses with full coverage side-shields for maximum protection. Wrap around ear pieces for secure fit.	SE-28
Disposable Dust Masks provide relief from non-toxic nuisance dusts. Lightweight, contoured design has a comfortable fit, adjustable elastic headband, and an adjustable metal nosepiece. They are not NIOSH approved. Packed in boxes of fifty.	SE-24
Heat Resistant Gloves are heavy leather with extended gauntlet for maximum protection around ovens and furnaces. Ideal for asphalt lab testing. One size fits all. Gloves are tanned to be soft and flexible. Fully lined with seamless index finger and wing thumb.	SE-31
Nitrile Rubber Gloves are durable and outperform other rubber types for petroleum and chlorinated solvents. They are ideal for use with oils, acids, caustics, and alcohol compounds. Sturdy embossed-grip gloves are 12.5in (318mm) long, 17mil thick, flock lined and resistant to cuts and snags. Available individually or by the dozen in M, L, or XL sizes.	
Nitrile Rubber Glove, Medium, 1 pair	SE-30M
Nitrile Rubber Gloves, Medium, pkg. 12	SE-30MD
Nitrile Rubber Gloves, Large, 1 pair	SE-30L
Nitrile Rubber Gloves, Large, pkg. 12	SE-30LD
Nitrile Rubber Gloves, XL, 1 pair	SE-30X
Nitrile Rubber Gloves, XL, pkg. 12	SE-30XD

A

B

C

M

N

O

P

Q

R

T

U

V

W

Z

This index is designed to help you find products based on your ASTM, AASHTO or other testing requirements. The pages with products related to the specific Test ID are listed. For assistance, contact a Gilson Technical Service representative at 800-444-1508.

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS) INDEX

AASHTO (AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS)

INTERNATIONAL STANDARDS ORGANIZATION (ISO)

BRITISH STANDARDS (BS)

CALIFORNIA DEPARTMENT OF TRANSPORTATION TEST METHODS (CALIFORNIA)

PENNSYLVANIA TEST METHODS (PTM)

TEXAS DEPARTMENT OF TRANSPORTATION TEST METHODS (TxDOT)

AD

	lb	(kg)
AD-12KA	40	(18)
AD-12KE	5	(2)
AD-20KA	40	(18)
AD-25	2	(1)
AD-30KA thru 60KA	40	(18)
AD-60PA	22	(10)
AD-61P	25	(11)
AD-101KA	40	(18)
AD-122	3	(1)
AD-150PA	22	(10)
AD-151P	25	(11)
AD-154 thru 214	3	(1)
AD-300PA	22	(10)
AD-301P	25	(11)
AD-302	3	(1)
AD-314	3	(1)
AD-401P	37	(17)
AD-402 thru 614	3	(1)
AD-1200E	3	(1)
AD-1200R	12	(5)
AD-2000E	5	(2)
AD-2000R	12	(5)
AD-3000E	5	(2)
AD-3000R	12	(5)
AD-6000E	5	(2)
AD-6000R	12	(5)
AD-6100R	12	(5)
AD-8000R	12	(5)
AD-8100R	12	(5)
ADA-4A	2	(1)
ADA-6A	2	(1)
ADA-9 thru 22	1	(0.5)
ADA-28	6	(3)
ADA-30A	1	(0.5)
ADA-32A	1	(0.5)
ADA-33A	4	(2)
ADA-34A	4	(2)
ADA-35	6	(3)
ADA-42R	16	(7)
ADA-45	1	(0.5)

AJ / AP

	lb	(kg)
AJ-101 thru 102F	45	(20)
AJA-3R	40	(18)
AJA-8	5	(2)
AJA-133, 133F	18	(8)
AJA-134, 134F	42	(19)
AJA-135	11	(5)
AJA-139	10	(5)
AJA-140 thru 144	2	(1)
AJA-210 thru 245	2	(1)
AP-1B	51	(23)
AP-14	18	(8)
AP-16	20	(9)
AP-20	350	(159)
AP-20L	393	(178
APA-11B	6	(3)
APA-18	1	(0.5)
APA-19	1	(0.5)
APA-22	8	(4)
APA-25	80	(36)
APA-31 thru 34	3	(1)
APA-35	2	(1)
APA-36	16	(7)
APA-105	2	(1)
APA-120	3	(1)
APA-144	2	(1)
APA-166	3	(1)

BK

	lb	(kg)
BK-14	20	(9)
BK-36	4	(2)
BK-42	1	(0.5)
BK-43	1	(0.5)
BK-44	3	(1)
BK-447R	1	(0.5)
BK-45	2	(1)
BK-50	2	(1)
BK-400	50	(23)
BK-400C	4	(2)
BK-401	3	(1)
BK-401C	4	(2)
BK-402	3	(1)
BK-402C	1	(0.5)
BK-403	3	(1)
BK-403C	1	(0.5)
BK-405	5	(2)
BK-405C	4	(2)
BK-408	5	(2)
BK-408C	4	(2)
BK-409	5	(2)
BK-409C	4	(2)

BO

	lb	(kg)
BO-10R, 10RF	43	(20)
BO-20R, 20RF	57	(26)
BO-30R thru 30RF	77	(35)
BO-40 thru 40F	92	(42)
BO-60EB thru 60GC	1875	(850)
BO-61EB thru 61GC	2075	(941)
BO-62EB thru 62GC	2075	(941)
BO-63EB thru 63GC	2285	(1036)
BO-64EB thru 64GC	2850	(1293)
BO-65EB thru 65GC	2960	(1342)
BO-110, 110F	51	(23)
BO-120, 120F	66	(30)
BO-130, 130F	85	(39)
BO-140, 140F	99	(45)
BO-250 thru 250SF	225	(102)
BO-250ER thru 250ERS	185	(84)
BO-323A thru 323C	600	(272)
BO-333A thru 333CF	750	(340)
BO-343A thru 343C	850	(385)
BO-350 thru 350SF	185	(84)
BO-350ER thru 350ERS	185	(84)
BO-355 thru 355SF	260	(118)
BO-550 thru 550SF	195	(88)
BOA-1	12	(5)
BOA-2	100	(45)
BOA-3	50	(23)
BOA-4	7	(3)
BOA-5	1	(0.5)
BOA-7	1	(0.5)
BOA-30 thru 32	2	(1)
BOA-33	4	(2)
BOA-40, 41	59	(27)
BOA-42	61	(28)
BOA-46	1	(0.5)
BOA-48	1	(0.5)
BOA-50	15	(7)
BOA-51	20	(9)
BOA-52	25	(11)
BOA-70	24	(11)
BOA-71	28	(13)
BOA-72	32	(15)
BOA-75	2	(1)

BR

	lb	(kg)
BR-2	38	(17)
BR-3	38	(17)
BR-10	148	(67)
BRA-30	7	(3)
BRA-31	7	(3)
BRA-32	62	(28)
BRA-33	6	(3)
BRA-34	1	(0.5)
BRA-40	15	(7)
BRA-41	15	(7)
BRA-42	25	(11)
BRA-45	50	(23)
BRA-59	20	(9)
BRA-59M	9	(4)
BRA-60	21	(10)
BRA-60M	11	(5)
BRA-61	20	(9)
BRA-62	20	(9)
BRA-63	6	(3)
BRA-64	6	(3)
BRA-67	4	(2)
BRA-70	4	(2)
BRA-75	1	(0.5)
BRA-76	1	(0.5)

BS

	lb	(kg)
BS-5	1	(0.5)
BS-10 thru BS-420	1	(0.5)

CD / CF

	lb	(kg)
CD-1	375	(170)
CD-6, 6F	150	(68)
CDA-15	8	(4)
CDA-16	9	(4)
CDA-20	10	(5)
CDA-22	45	(20)
CDA-24	12	(5)
CDA-26	10	(5)
CDA-32	3	(1)
CDA-40	4	(2)
CDA-41	4	(2)
CDA-43	6	(3)
CDA-45	7	(3)
CDA-46	8	(4)
CDA-50	12	(5)
CDA-51	12	(5)
CDA-55	6	(3)
CDA-122	7	(3)
CDA-123	9	(4)
CDA-130	8	(4)
CDA-131	10	(5)
CDA-132	8	(4)
CDA-133	10	(5)
CDA-140	10	(5)
CDA-141	12	(5)
CDA-142	10	(5)
CDA-143	12	(5)
CDA-160	14	(6)
CDA-161	16	(7)
CDA-162	14	(6)
CDA-163	16	(7)
CDA-220	6	(3)
CDA-221	8	(4)
CDA-222	7	(3)
CDA-223	9	(4)
CDA-230	8	(4)
CDA-231	10	(5)
CDA-232	8	(4)
CDA-233	10	(5)
CDA-240	10	(5)
CDA-241	12	(5)
CDA-242	10	(5)
CDA-243	12	(5)
CDA-260	14	(6)
CDA-261	16	(7)
CDA-262	14	(6)
CDA-263	16	(7)
CF-1, 1F	398	(180)
CFA-100 thru 102	30	(14)
CFA-112	35	(16)
CFA-113	30	(14)

CP / CS

	lb	(kg)
CP-6 thru 7	11	(5)
CP-15	11	(5)
CP-16	11	(5)
CP-35	11	(5)
CP-36	14	(6)
CP-46	11	(5)
CP-75 thru 76	11	(5)
CP-150A thru 151	11	(5)
CP-200 thru 201	11	(5)
CP-210 thru CP-230	15	(7)
CP-301 thru 310	6	(3)
CP-312	14	(6)
CP-315	6	(3)
CP-330	6	(3)
CP-335	14	(6)
CP-365	14	(6)
CP-3100	14	(6)
CPA-15	2	(1)
CPA-33	2	(1)
CS-10	12	(5)
CS-10W	10	(5)
CS-60	5	(2)
CSA-25	6	(3)
CSA-26	2	(1)
CSA-30	1	(0.5)

DO

	lb	(kg)
DOBA-2	3	(1)
DOBA-40A	7	(3)
DOBA-50A	7	(3)
DOC-38	270	(122)
DOC-67	360	(163)
DOC-120	480	(218)
DOC-180	600	(272)
DOCA-20 thru 50	5	(2)
DOCA-70 thru 73	130	(59)
DOL-69A, 69AF	320	(145)
DOL-120A	385	(175)
DOL-180A	485	(220)
DOL-24A, 24AF	205	(93)
DOL-270A	635	(288)
DOLA-20 thru 40A	5	(2)
DOLA-82	130	(59)
DOLA-83 thru 84	145	(66)
DOLA-85	130	(59)

GA

	lb	(kg)
GA-6	47	(21)
GA-8	170	(77)
GAA (All)	3	(1)

GP / GV

	lb	(kg)
GP-4 thru 6	3	(1)
GP-8	2	(1)
GP-12	7	(3)
GP-14	8	(4)
GP-16	9	(4)
GP-22	10	(5)
GP-24	11	(5)
GP-25	9	(4)
GP-29 thru 29A	11	(5)
GP-68A	20	(9)
GP-70A	22	(10)
GP-80	3	(1)
GP-82	4	(2)
GP-106	2	(1)
GP-112	2	(1)
GP-118	10	(5)

GW / GX

	lb	(kg)
GW-10 thru 13	2	(1)
GW-14	4	(2)
GW-15	6	(3)
GW-16	8	(4)
GW-20 thru 26	1	(0.5)
GW-27	5	(2)
GW-30 thru 47	3	(1)
GW-50 thru 63	2	(1)
GW-64	5	(2)
GW-65	1	(0.5)
GW-74	3	(1)
GW-75	4	(2)
GW-76	6	(3)
GWA-1 thru 3	2	(1)
GX-4A1thru 4A1F	3250	(1474)
GX-4A2 thru 4A2F	2550	(1156)
GX-5A1 thru 5A1F	3300	(1497)
GX-5A2 thru 5A2F	3025	(1372)
GXA (All)	20	(9)

HM

	lb	(kg)
HM-5, 5F	30	(14)
HM-6, 6F	50	(23)
HM-8	70	(32)
HM-10	23	(10)
HM-11	14	(6)
HM-12	12	(5)
HM-13	4	(2)
HM-15	35	(16)
HM-20	35	(16)
HM-21	22	(10)
HM-22	19	(9)
HM-23	7	(3)
HM-24	3	(1)
HM-25	1	(0.5)
HM-27	3	(1)
HM-28	15	(7)
HM-29	8	(4)
HM-30	35	(16)
HM-31	8	(4)
HM-32L	29	(13)
HM-33	18	(8)
HM-34	2	(1)
HM-35	70	(32)
HM-36	19	(9)
HM-37	26	(12)
HM-38B	10	(5)
HM-38R	9	(4)
HM-39, 39F	3	(1)
HM-42	24	(11)
HM-43	4	(2)
HM-45	5	(2)
HM-45M	7	(3)
HM-47	2	(1)
HM-48, 48A	3	(1)
HM-49	225	(102)
HM-50	150	(68)
HM-51	10	(5)
HM-52, 52F	35	(16)
HM-53	2	(1)
HM-54	20	(9)
HM-56, 56A	2	(1)
HM-57R, 57RF	50	(23)
HM-58R	16	(7)
HM-59, 59F	375	(170)
HM-60, 60F	182	(83)
HM-62, 62F	500	(227)
HM-63	4	(2)
HM-65	2	(1)
HM-66	15	(7)
HM-67	15	(7)
HM-68	10	(5)
HM-70A, 70AF	1180	(535)
HM-71	4	(2)
HM-73, 73F	390	(177)
HM-74	550	(249)
HM-75	5	(2)
HM-76B	60	(27)
HM-78	1	(0.5)
HM-80	1	(0.5)
HM-81	5	(2)
HM-85	8	(4)
HM-86, 86F	165	(75)
HM-98	50	(23)
HM-100	5	(2)
HM-101	7	(3)
HM-102	2	(1)
HM-104	4	(2)
HM-106 thru 108	52	(24)
HM-109	2	(1)
HM-111	2	(1)
HM-112	17	(8)
HM-114	5	(2)
HM-116	31	(14)
HM-117A	2	(1)
HM-122D	601	(273)
HM-122P	64	(29)
HM-122S	4	(2)
HM-124E	40	(18)
HM-124H	41	(19)
HM-124P	37	(17)
HM-125E	433	(196)
HM-125H	442	(200)
HM-125P	403	(183)
HM-128	150	(68)
HM-130 thru 131D	25	(11)
HM-133, 133F	19	(9)
HM-134	10	(5)
HM-136	10	(5)
HM-140, 140F	151	(68)
HM-141	5	(20)
HM-142	23	(10)
HM-143	12	(5)
HM-144	25	(11)
HM-145 thru 148	7	(3)
HM-151 thru 153	36	(16)
HM-154	46	(21)
HM-156 thru 159	15	(7)
HM-160	1	(0.)5
HM-161	7	(3)
HM-162	2	(1)
HM-163 thru 164	18	(8)
HM-166	35	(16)
HM-178	1	(0.5)
HM-179	1	(0.5)
HM-180	20	(9)
HM-181	20	(9)
HM-182	8	(4)
HM-183	4	(2)
HM-184	52	(24)
HM-188	2	(1)
HM-189	52	(24)
HM-195	45	(20)
HM-196	3	(1)
HM-197	3	(1)
HM-200, 200F	20	(9)
HM-201, 201F	39	(17)
HM-202, 202F	39	(17)
HM-203, 203D	25	(11)
HM-204, 204F	55	(25)
HM-205, 205F	55	(25)
HM-206, 206F	55	(25)
HM-207, 207D	25	(11)
HM-210	2	(1)
HM-220	296	(134)
HM-221	355	(161)
HM-228	115	(52)
HM-229	20	(9)
HM-231	6	(3)
HM-232	7	(3)
HM-239	160	(73)
HM-240, 240D, 240F	5	(2)
HM-241, 241F	2	(1)
HM-242, 242F	2	(1)
HM-246	21	(10)
HM-250, 250D	33	(15)
HM-252	250	(113)
HM-254	3	(1)
HM-255	27	(12)
HM-256	10	(5)
HM-257	10	(5)
HM-258	25	(11)
HM-259	25	(11)
HM-262	2	(1)
HM-262X	1	(0.5)
HM-266	2	(1)
HM-268	2	(1)
HM-270	25	(11)
HM-271, 271F	350	(159)
HM-272, 272F	110	(50)
HM-273, 273F	85	(39)
HM-274	25	(11)
HM-277	10	(5)
HM-279	25	(11)
HM-280	59	(27)
HM-281	25	(11)
HM-282	67	(30)
HM-284	82	(37)
HM-286	100	(45)
HM-290	27	(12)
HM-291	5	(2)
HM-294, 294M	14	(6)
HM-295	8	(4)
HM-296, 296M	14	(6)
HM-297	4	(2)
HM-298	1	(0.5)
HM-299	7	(3)
HM-300	5	(2)
HM-302	5	(2)
HM-309	2	(1)
HM-310	6	(3)
HM-315, 315F	500	(227)
HM-317	99	(45)
HM-318	282	(128)
HM-319	8	(4)
HM-320	25	(11)
HM-322, 322D, 322DF	32	(15)
HM-325	8	(4)
HM-331	15	(7)
HM-335	2	(1)
HM-340	7	(3)
HM-350A	50	(23)

HM-350M 50 (23)
HM-353 ....50 (23)
HM-354 , 354F 44 (20)
HM-355, 355F 44 (20)
HM-360 ....1 (0.5)
HM-360CS 12 (5)
HM-361 ....1 (0.5)
HM-361CS 12 (5)
HM-362 ....1 (0.5)
HM-362CS 12 (5)
HM-363 ....1 (0.5)
HM-363CS 12 (5)
HM-364 ....1 (0.5)
HM-364CS 12 (5)
HM-365 ....1 (0.5)
HM-365CS 12 (5)
HM-366 thru 369 ....2 (1)
HM-370 ....1 (0.5)
HM-372A 8 (4)
HM-372B 11 (5)
HM-375 ....49 (22)
HM-378 ....523 (237)
HM-380R, 380RF 250 (113)
HM-381, 381F 175 (79)
HM-382, 382F 175 (79)
HM-384, 384F 1025 (465)
HM-385, 385F 1025 (465)
HM-396 thru 398F 250 (113)
HM-401 ....25 (11)
HM-403 ....21 (10)
HM-410 ....15 (7)
HM-413 ....23 (10)
HM-414 ....23 (10)
HM-415 ....24 (11)
HM-416 ....25 (11)
HM-418 ....7 (3)
HM-419 ....7 (3)
HM-420 thru 422D 2 (1)
HM-424 thru 425D 4 (2)
HM-428, 428D 5 (2)
HM-430 ....6 (3)
HM-430D 5 (2)
HM-438D 22 (10)
HM-442 ....27 (12)
HM-444 ....11 (5)
HM-447 ....3 (1)
HM-450 ....5 (2)
HM-451 ....1150 (522)
HM-452 ....3 (1)
HM-455 ....1700 (771)
HM-491 ....40 (18)
HM-493 ....30 (14)
HM-495 ....40 (18)
HM-500 thru 504A 1 (0.5)
HM-510 thru 513 ....1 (0.5)
HM-514 ....48 (22)
HM-516 ....49 (22)
HM-519 ....2 (1)
HM-524, 524F 195 (88)
HM-530, 530F 382 (173)
HM-531, 531F 382 (173)
HM-534 ....6 (3)
HM-536 ....6 (3)
HM-550 ....10 (5)
HM-551 ....15 (7)
HM-559A 8 (4)
HM-560 ....16 (7)
HM-562 ....22 (10)
HM-564 ....18 (8)
HM-565 ....18 (8)
HM-570 ....40 (18)
HM-571 ....16 (7)
HM-574 ....100 (45)
HM-591, 591F 6 (3)
HM-602W 85 (39)
HM-614, 614F 450 (204)
HM-620 ....62 (28)
HM-621 ....86 (39)
HM-622 ....120 (54)
HM-623 ....34 (15)
HM-626 ....135 (61)
HM-631, 631F 45 (20)
HM-632, 632F 45 (20)
HM-634 thru 639 ....1 (0.5)
HM-642 ....2 (1)
HM-643 ....2 (1)
HM-648 thru 649F 10 (5)
HM-651 ....5 (2)
HM-655, 655F 4 (2)
HM-668A 1 (0.5)
HM-669 ....1 (0.5)
HM-674B 5 (2)
HM-674D 2 (1)
HM-680 ....10 (5)
HM-681 ....9 (4)
HM-714A 1100 (499)
HM-716A 1100 (499)
HM-723 ....28 (12)
HM-738 thru 740 ....2 (1)
HM-806, 806F 113 (51)
HM-807, 807F 113 (51)
HM-808, 808F 113 (51)
HM-815 ....1 (0.5)
HM-816 ....2 (1)
HM-817 ....1 (0.5)
HM-818 ....2 (1)
HM-831 ....8 (4)
HM-832 ....8 (4)
HM-833 ....9 (4)
HM-834 ....13 (6)
HM-835 ....25 (1)1
HM-891 ....12 (5)
HM-892 ....12 (5)
HM-893 ....10 (5)
HM-894 ....17 (8)
HM-895 ....25 (11)
HM-921, 921F 155 (70)
HM-925 ....3 (1)
HM-926 ....3 (1)
HM-940 ....24 (11)
HM-942 ....7 (3)
HM-944 ....9 (4)

HMA

	lb	(kg)
HMA-2	1	(0.5)
HMA-5	1	(0.5)
HMA-9	1	(0.5)
HMA-10 thru 12	2	(1)
HMA-13	1	(0.5)
HMA-15	1	(0.5)
HMA-20	2	(1)
HMA-21	2	(1)
HMA-24 thru 49	1	(0.5)
HMA-51	10	(5)
HMA-52	4	(2)
HMA-53	2	(1)
HMA-54	3	(1)
HMA-55V	1	(0.5)
HMA-56	6	(3)
HMA-56B	58	(26)
HMA-58	2	(1)
HMA-60	6	(3)
HMA-61	10	(5)
HMA-62	4	(2)
HMA-63	4	(2)
HMA-64	5	(2)
HMA-68	9	(4)
HMA-69	25	(11)
HMA-78	2	(1)
HMA-79	2	(1)
HMA-82	2	(1)
HMA-83	10	(5)
HMA-84	10	(5)
HMA-85	6	(3)
HMA-86	4	(2)
HMA-88	1	(0.5)
HMA-89	30	(14)
HMA-94	100	(45)
HMA-95	100	(45)
HMA-104, 104C	26	(12)
HMA-108	1	(0.5)
HMA-109	1	(0.5)
HMA-110	13	(6)
HMA-110B	6	(3)
HMA-110C	3	(1)
HMA-110M	6	(3)
HMA-111	6	(3)
HMA-113	3	(1)
HMA-114	30	(14)
HMA-115	5	(2)
HMA-116	19	(9)
HMA-116C	5	(2)
HMA-116M	8	(4)
HMA-117	21	(9)
HMA-117M	8	(4)
HMA-118	6	(3)
HMA-119	15	(7)
HMA-120	6	(3)
HMA-121 thru 123	10	(5)
HMA-124	20	(9)
HMA-125	3	(1)
HMA-129	6	(3)
HMA-130	13	(6)
HMA-131	20	(9)
HMA-132, 132WR	20	(9)
HMA-133	3	(1)
HMA-134	2	(1)
HMA-135	2	(1)
HMA-136	3	(1)
HMA-137	1	(0.5)
HMA-139	2	(1)
HMA-140	6	(3)
HMA-141	1	(0.5)
HMA-145	1	(0.5)
HMA-150 thru 155	2	(1)
HMA-156	3	(1)
HMA-157	4	(2)
HMA-180, 180C	1	(0.5)
HMA-181, 181C	1	(0.5)
HMA-182	2	(1)
HMA-183, 183S	1	(0.5)
HMA-188	2	(1)
HMA-190	3	(1)
HMA-191	16	(7)
HMA-203	2	(1)
HMA-204W	25	(11)
HMA-207	2	(1)
HMA-208	1	(0.5)
HMA-209	26	(12)
HMA-214 thru 220	2	(1)
HMA-221	3	(1)
HMA-224	28	(13)
HMA-225	17	(8)
HMA-227	26	(12)
HMA-228	3	(1)
HMA-229	3	(1)
HMA-232, 232D	3	(1)
HMA-234, 234D	5	(2)
HMA-236, 236D	8	(4)
HMA-240	55	(25)
HMA-247 thru 249	4	(2)
HMA-250	10	(5)
HMA-251	3	(1)
HMA-258	4	(2)
HMA-259	2	(1)
HMA-260	6	(3)
HMA-261	6	(3)
HMA-263	5	(2)
HMA-264	5	(2)
HMA-265	2	(1)
HMA-266	5	(2)
HMA-271A	3	(1)
HMA-272	1	(0.5)
HMA-276A	3	(1)
HMA-277	1	(0.5)
HMA-278	7	(3)
HMA-282	5	(2)
HMA-283	6	(2)
HMA-284	17	(7)
HMA-286	20	(9)
HMA-287	25	(11)
HMA-290	1	(0.5)
HMA-292	1	(0.5)
HMA-293	3	(1)
HMA-295	3	(1)
HMA-296	5	(2)
HMA-299	4	(1)
HMA-300	2	(1)
HMA-302	3	(1)
HMA-304 thru 308R	2	(1)
HMA-320	2	(1)
HMA-321	1	(0.5)
HMA-323	1	(0.5)
HMA-324	2	(1)
HMA-326	5	(2)
HMA-327	6	(3)
HMA-338	2	(1)
HMA-339	2	(1)
HMA-340	3	(1)
HMA-348R	1	(0.5)
HMA-353	1	(0.5)
HMA-354	50	(23)
HMA-355	2	(1)
HMA-356	1	(0.5)
HMA-359	12	(5)
HMA-385	2	(1)
HMA-386	1	(0.5)
HMA-387	1	(0.5)
HMA-401	2	(1)
HMA-402, 402F	6	(3)
HMA-490	2	(1)
HMA-491	3	(1)
HMA-492	5	(2)
HMA-493	10	(5)
HMA-506	2	(1)
HMA-511	2	(1)
HMA-514, 514S	19	(9)
HMA-515	2	(1)
HMA-516, 516S	30	(14)
HMA-517, 517S	31	(14)
HMA-518, 518S	90	(41)
HMA-519, 519S	130	(59)
HMA-520	13	(6)
HMA-521	7	(3)
HMA-522	2	(1)
HMA-523	2	(1)
HMA-524	3	(1)
HMA-526	5	(2)
HMA-527 thru 529	2	(1)
HMA-542 thru 549	1	(0.5)
HMA-552	2	(1)
HMA-553	2	(1)
HMA-554	3	(1)
HMA-556	6	(3)
HMA-557	1	(0.5)
HMA-558	1	(0.5)
HMA-559	2	(1)
HMA-562 thru 569	1	(0.5)
HMA-572 thru 579	1	(0.5)
HMA-591	7	(3)
HMA-592	10	(5)
HMA-593	3	(1)
HMA-635	18	(8)
HMA-640	38	(17)
HMA-641	38	(17)
HMA-642	53	(24)
HMA-643	53	(24)
HMA-645	35	(16)
HMA-646 thru 648	40	(18)
HMA-650	1	(0.5)
HMA-651	1	(0.5)
HMA-652	3	(1)
HMA-653	1	(0.5)
HMA-654	1	(0.5)
HMA-655	2	(1)
HMA-656	1	(0.5)
HMA-657 thru 659	80	(36)
HMA-663	50	(23)
HMA-665	6	(3)
HMA-667	15	(7)
HMA-670	4	(2)
HMA-671	1	(0.5)
HMA-672	1	(0.5)
HMA-673	1	(0.5)
HMA-683D	24	(11)
HMA-685D	33	(15)
HMA-687D	30	(14)
HMA-701	1	(0.5)
HMA-702	1	(0.5)
HMA-723	4	(2)
HMA-725	166	(75)
HMA-727	79.5	(36)
HMA-729	243	(110)
HMA-730	95	(43)
HMA-731	219	(99)
HMA-732	134	(61)
HMA-734 thru 734S	3	(1)
HMA-735, 735S	3	(1)
HMA-736, 736S	6	(3)
HMA-737, 737S	6	(3)
HMA-744 thru 744S	1	(0.5)
HMA-745	1	(0.5)
HMA-746, 746S	1	(0.5)
HMA-747S	1	(0.5)
HMA-764 thru 764S	2	(1)
HMA-765	2	(1)
HMA-766, 766S	3	(1)
HMA-767S, 767S	3	(1)
HMA-810	173	(78)
HMA-812	2	(1)
HMA-813	20	(9)
HMA-814	2	(1)
HMA-834D, 834E	7	(3)
HMA-836	7	(3)
HMA-837	6	(3)
HMA-838	7	(3)
HMA-839	6	(3)
HMA-850 thru 854	1	(0.5)
HMA-855	2	(1)
HMA-856	2	(1)
HMA-891	12	(5)
HMA-920	14	(6)
HMA-922	12	(5)
HMA-924	4	(2)
HMA-953	5	(2)
HMA-954	7	(3)
HMA-956	13	(6)
HMA-957 thru 957B	2	(1)
HMA-958	2	(1)
HMA-958A	4	(2)
HMA-958B	3	(1)
HMA-959	3	(1)
HMA-959A	5	(2)
HMA-963	4	(2)
HMA-964	6	(3)
HMA-966	13	(6)
HMA-967 thru 967B	2	(1)
HMA-968	2	(1)
HMA-968A thru 969	3	(1)
HMA-969A	4	(2)
HMA-973	4	(2)
HMA-974	6	(3)
HMA-976	13	(6)
HMA-977 thru 978	2	(1)
HMA-978A thru 979	3	(1)
HMA-979A	4	(2)
HMA-983	9	(4)
HMA-984	10	(5)
HMA-986	17	(8)
HMA-987 thru 988	7	(3)
HMA-988A thru 989	8	(4)
HMA-989A	9	(4)
HMA-1050	65	(29)
HMA-1051	20	(9)
HMA-1052	1	(0.5)
HMA-1053	27	(12)
HMA-1054	65	(29)

HS

	lb	(kg)
HS-50K	30	(14)

LC

	lb	(kg)
LC-7, 7F	50	(23)
LC-8, 8F	75	(34)
LC-13	774	(351)
LC-14, 14F	1588	(720)
LC-20, 20F	737	(334)
LC-22, 22F	1736	(787)
LC-24, 24F	3770	(1710)
LC-33	430	(195)
LC-34	430	(195)
LC-35	610	(277)
LC-36	610	(277)
LC-37	885	(401)
LC-53	370	(168)
LC-70, 70F	282	(128)
LC-72, 72F	670	(304)
LC-80	15	(7)
LC-82, 82F	63	(29)
LC-82S	83	(38)
LC-88	33	(15)
LC-91, 91F	90	(41)
LC-92, 92F	130	(100)
LC-95, 95F	255	(116)
LC-100, 100F	256	(116)
LC-115	630	(286)
LC-201	542	(246)
LC-350, 350F	157	(71)
LC-401, 401F	1040	(472)
LC-500, 500F	181	(82)
LC-502, 502F	130	(59)

LCA

	lb	(kg)
LCA-5 thru 9	22	(10)
LCA-11	23	(10)
LCA-30	33	(15)
LCA-34	4	(2)
LCA-35	5	(2)
LCA-36	6	(3)
LCA-37	12	(5)
LCA-45	15	(7)
LCA-46	5	(2)
LCA-47	9	(4)
LCA-50	3	(1)
LCA-51	7	(3)
LCA-52	9	(4)
LCA-53	23	(10)
LCA-55	2	(1)
LCA-56	2	(1)
LCA-57	210	(95)
LCA-61	8	(4)
LCA-63	22	(10)
LCA-65 thru 68	11	(5)
LCA-70	6	(3)
LCA-72	6	(3)
LCA-73	4	(2)
LCA-74	3	(1)
LCA-75	9	(4)
LCA-76	10	(5)
LCA-91	700	(317)
LCA-92	13	(6)
LCA-96	306	(139)
LCA-97	306	(139)
LCA-170	2	(1)
LCA-171	2	(1)
LCA-172 thru 176	3	(1)
LCA-178	12	(5)
LCA-179	1	(0.5)
LCA-240	38	(17)
LCA-242	28	(13)

LP

	lb	(kg)
LP-9, 9F	430	(195)
LP-16	3	(1)
LP-22, 22F	38	(17)
LP-23, 23F	38	(17)
LPA-10 thru 12	3	(1)
LPA-20	2	(1)
LPA-21	2	(1)
LPA-24	1	(0.5)
LPA-26	2	(1)
LPA-30, 30F	53	(24)
LPA-31	10	(5)
LPA-35	20	(9)
LPA-43	2	(1)
LPA-52	15	(7)
LPA-55	1	(0.5)
LPA-56	4	(2)
LPA-58	1	(0.5)
LPA-62	1	(0.5)
LPA-121	1	(0.5)
LPA-127	1	(0.5)
LPA-127D	4	(2)
LPA-128	1	(0.5)
LPA-129	1	(0.5)
LPA-182, 182F	12	(5)

MA

	lb	(kg)
MA-10	7	(3)
MA-11	1	(0.5)
MA-12	4	(2)
MA-13	2	(1)
MA-15	65	(29)
MA-23, 23F	27	(12)
MA-24, 24F	20	(9)
MA-26	23	(10)
MA-26X	16	(7)

MA-28, 28F....90 (41)
MA-29, 29F....90 (41)
MA-30....1 (0.5)
MA-32, 32F....25 (11)
MA-38....1 (0.5)
MA-40 thru 45....2 (1)
MA-46....3 (1)
MA-48....2 (1)
MA-50....2 (1)
MA-52....55 (25)
MA-54A, 54AF....210 (95)
MA-66, 66F....53 (24)
MA-67, 67F....113 (51)
MA-68, 68F....125 (57)
MA-74....2 (1)
MA-76....80 (36)
MA-78....5 (2)
MA-80, 80B....10 (5)
MA-81, 81B....10 (5)
MA-84R, 84RF....7 (3)
MA-100 thru 127....1 (0.5)
MA-130 thru 169....2 (1)
MA-170 thru 170F....3 (1)
MA-182....1 (0.5)
MA-187....1 (0.5)
MA-188....2 (1)
MA-189....1 (0.5)
MA-193 thru 198....2 (1)
MA-203 thru 205....5 (2)
MA-207 thru 209....1 (0.5)
MA-210C thru MA-234....3 (1)
MA-236R, 236RF....800 (363)
MA-238....2 (1)
MA-240 thru 242R....3 (1)
MA-243 thru 249....2 (1)
MA-250R....1 (0.5)
MA-252R....4 (2)
MA-267....2 (1)
MA-275 thru 278....1 (0.5)
MA-27A, 27AF....30 (14)
MA-290, 290F....5 (2)
MA-291, 291F....5 (2)
MA-305....2 (1)
MA-316....2 (1)
MA-321A thru 322AT....2 (1)
MA-323 thru 324C....3 (1)
MA-330 thru 373C....2 (1)
MA-381, 381C....3 (1)
MA-383....4 (2)
MA-391 thru 393....2 (1)
MA-420C thru 471T....3 (1)
MA-491 thru 496....1 (0.5)
MA-529C thru 541T....3 (1)
MA-542, 542T....2 (1)
MA-751CT, 751FT....3 (1)
MA-767....3 (1)
MA-771....0.3 (0.13)
MA-774 thru 778....7 (3)
MA-812....11 (5)
MA-814....22 (10)
MA-816....22 (10)
MA-818....45 (20)
MA-838....9 (4)
MA-839....20 (9)
MA-950....5 (2)
MA-1807, 1807F....9 (4)
MA-1810, 1810F....16 (7)
MA-1817, 1817F....1 (0.5)
MA-1827, 1827F....11 (5)
MAA-10B....2 (1)
MAA-12....2 (1)
MAA-28....6 (3)
MAA-30A....1 (0.5)
MAA-31....2 (1)
MAA-32....3 (1)
MAA-34A....9 (4)
MAA-38A....20 (9)
MAA-44....13 (6)
MAA-45....2 (1)
MAA-46....5 (2)
MAA-47....2 (1)
MAA-48 thru 52....1 (0.5)
MAA-60....2 (1)
MAA-61....2 (1)
MAA-62....1 (0.5)
MAA-64, 64F....12 (5)
MAA-65, 65F....25 (11)
MAA-70 thru 90....1 (0.5)
MAA-116....1 (0.5)
MAA-141....6 (3)
MAA-142....2 (1)
MAA-143....2 (1)
MAA-144....6 (3)
MAA-145....18 (8)
MAA-146....4 (2)
MAA-147....4 (2)
MAA-148....3 (1)
MAA-149....4 (2)
MAA-162 thru 165....2 (1)
MAA-175....1 (0.5)
MAA-176....1 (0.5)
MAA-181 thru 227....2 (1)
MAA-228 thru 230....1 (0.5)
MAA-231 thru 247....2 (1)
MAA-248....1 (0.5)
MAA-260....1 (0.5)
MAA-261A....4 (2)
MAA-266....5 (2)
MAA-269A....7 (3)
MAA-271....1 (0.5)
MAA-274 thru 288....2 (1)
MAA-321....1 (0.5)
MAA-322....1 (0.5)

MC

	lb	(kg)
MC-60, 60F	780	(354
MC-250P thru 250PRF	800	(363)
MC-300P thru 300PRF	975	(442)
MC-400P thru 400PRF	1620	(735)
MC-400PRP, 400PRPF	2375	(1077)
MC-500P thru 500PRF	2500	(1134)
MC-500PRP, 500PRPF	2960	(1342)
MCA-3	44	(20)
MCA-4	190	(86)
MCA-5	41	(19)
MCA-6	41	(19)
MCA-7	38	(17)
MCA-8	117	(53)
MCA-9	101	(46)
MCA-10	152	(69)
MCA-11	114	(52)
MCA-12R	300	(136)
MCA-13R	342	(155)
MCA-14	34	(15)
MCA-15	33	(15)
MCA-16	47	(21)
MCA-17	24	(11)
MCA-18	22	(10)
MCA-19	32	(15)
MCA-20	40	(18)
MCA-24	90	(41)
MCA-26	10	(5)
MCA-27	90	(41)
MCA-29	1	(0.5)
MCA-30	83	(38)
MCA-32	300	(136)
MCA-34	190	(86)

MD / MF

	lb	(kg)
MD-2000 thru 2000F	252	(114)
MF-2 thru 2AF	43	(20)
MF-4 thru 4F	71	(32)
MF-6 thru 6AF	121	(55)
MF-8A	310	(141)
MF-1310	45	(20)
MF-1315	50	(23)
MF-6010	140	(63)
MF-6020	135	(61)
MF-7910	65	(29)
MF-7915	65	(29)
MF-8010 thru 8025	85	(39)

MO / MS

	lb	(kg)
MO-30, 30F	400	(181)
MO-32, 32F	400	(181)
MO-38	400	(181)
MOA-2	1	(0.5)
MOA-3	2	(1)
MOA-5	1	(0.5)
MOA-6	2	(1)
MOA-10	5	(2)
MOA-12	2	(1)
MOA-14	3	(1)
MS-1, 1F	198	(90)
MS-2, 2F	265	(120)
MS-3, 3F	357	(162)
MS-5, 5F	400	(181)
MS-6, 6F	400	(181)
MS-10	145	(66)
MS-45	14	(6)
MS-26	21	(10)
MS-27	4	(2)
MS-29	41	(19)
MS-35	6	(3)
MS-36	20	(9)
MS-42	32	(15)
MS-43, 43F	40	(18)
MS-62, 62F	20	(9)
MS-64, 64F	29	(13)
MS-66, 66F	39	(17)
MS-67, 67F	55	(25)
MS-86, 86F	225	(102)
MS-398, 398F	250	(113)
MSA-100	8	(4)
MSA-100B thru 100M	4	(2)
MSA-101 thru 101M	9	(4)
MSA-106, 106M	15	(7)
MSA-111	24	(11)
MSA-112	20	(9)
MSA-113	25	(11)
MSA-114	26	(12)
MSA-120	4	(2)
MSA-121	4	(2)
MSA-125	22	(10)
MSA-130, 130F	109	(49)
MSA-131, 131F	100	(45)
MSA-860D	15	(7)

NM

	lb	(kg)
NM (All)	1	(0.5)

OB / OT

	lb	(kg)
OB-60	33	(15)
OB-132 thru 133H	20	(9)
OB-134 thru 135H	22	(10)
OB-160	33	(15)
OB-160L	51	(23)
OB-201	3	(1)
OB-210	3	(1)
OB-215	3	(1)
OB-300	51	(23)
OB-300L	71	(32)
OB-310	4	(2)
OB-311	4	(2)
OB-505	31	(14)
OB-510	31	(14)
OB-515	61	(28)
OB-520	61	(28)
OB-525	99	(45)
OB-600	71	(32)
OB-760	6	(3)
OB-1119	44	(20)
OB-1650	4	(2)
OB-2400M	19	(9)
OB-2400P	19	(9)
OBA-10	6	(3)
OBA-15R	13	(6)
OBA-20	6	(3)
OBA-110	2	(1)
OBA-126A	4	(2)
OBA-137M	10	(5)
OBA-137P	10	(5)
OBA-160	5	(2)
OBA-170	2	(1)
OBA-171	2	(1)
OBA-201 thru 204W	1	(0.5)
OBA-205 thru 209W	2	(1)
OBA-210 thru 210W	4	(2)
OBA-211 thru 211W	7	(3)
OBA-212 thru 212W	8	(4)
OBA-213 thru 213W	12	(5)
OBA-214 thru 214W	25	(11)
OBA-215 thru 215W	50	(23)
OBA-216 thru 217W	2	(1)
OBA-278 thru 278W	25	(11)
OBA-280 thru 280W	50	(23)
OBA-282 thru 282W	23	(10)
OBA-284 thru 284W	45	(20)
OBA-286 thru 286W	56	(25)
OBA-288 thru 288W	111	(50)
OBA-289 thru 289W	221	(100)
OBA-291 thru 291W	552	(250)
OBA-301 thru 305W	1	(0.5)
OBA-306 thru 309W	2	(1)
OBA-310 thru 310W	4	(2)
OBA-311 thru 311W	6	(3)
OBA-312 thru 312W	8	(4)
OBA-313 thru 313W	11	(5)
OBA-314 thru 314W	23	(10)
OBA-315 thru 315W	45	(20)
OBA-316 thru 317W	2	(1)
OBA-401 thru 405W	1	(0.5)
OBA-406 thru 409W	2	(1)
OBA-410 thru 410W	4	(2)
OBA-411 thru 411W	6	(3)
OBA-412 thru 412W	8	(4)
OBA-413 thru 413W	11	(5)
OBA-414 thru 414W	23	(10)
OBA-415 thru 415W	45	(20)
OBA-416 thru 417W	2	(1)
OBA-703, 703S	2	(1)
OBA-707	3	(1)
OBA-1101	2	(1)
OBA-10783A	2	(1)
OBD-152	20	(9)
OBD-210A	6	(3)
OBD-223	20	(9)
OBD-410A	6	(3)
OBD-421 thru 622	20	(9)
OBD-810A	6	(3)
OBD-821	20	(9)
OBD-2100A thru 8100A	6	(3)
OBX-101	17	(8)
OBX-102	17	(8)
OBX-124 thru 423	22	(10)
OBX-512 thru 535	26	(12)
OBX-623	22	(10)
OBX-911	23	(10)
OBX-922	16	(7)
OBX-942	16	(7)
OBX-961	17	(8)
OBX-962	17	(8)
OT-2, 2F	362	(164)

PM / PO

	lb	(kg)
PM (All)	1	(0.5)
PO-23	536	(243)
POA-10	5	(2)

PR / PS

	lb	(kg)
PR-10	380	(172)
PRA-14	5	(2)
PS-3, 3F	206	(93)
PS-4, 4F	197	(89)
PSA-114	4	(2)
PSA-299 thru 316	12	(5)
PSA-312	26	(12)
PSA-324 thru 335	3	(1)
PSA-336	12	(5)
PSA-367	20	(9)

PT

	lb	(kg)
PT-6A, 6AF	20	(9)
PT-8, 8F	10	(5)
PT-12, 12F	101	(46)
PT-53, 53F	80	(36)
PT-61, 61F	65	(29)
PT-62, 62F	65	(29)
PT-65	6	(3)
PT-82, 82F	94	(43)
PT-101 thru 115	2	(1)
PTA-59	10	(5)
PTA-61	20	(9)
PTA-70	51	(23)
PTA-85	1	(0.5)
PTA-86	1	(0.5)
PTA-90, 90F	197	(89)
PTA-100	2	(1)
PTA-161	42	(19)
PTA-162	1	(0.5)
PTA-163	1	(0.5)
PTA-164	10	(5)
PTA-165	1	(0.5)
PTA-166	1	(0.5)
PTA-168	2	(1)
PTA-169	1	(0.5)
PTA-176 thru 180	1	(0.5)

RL

	lb	(kg)
RLA-8 thru 12	2	(1)
RLA-22	1	(0.5)
RLA-24	3	(1)
RLA-25	3	(1)
RLA-30	6	(3)
RLA-32	6	(3)

SA

	lb	(kg)
SA-1	2	(1)
SA-2	2	(1)
SA-5	3	(1)
SA-10	18	(8)
SA-12	17	(8)
SA-16	3	(1)
SA-18	3	(1)
SA-19	15	(7)
SA-20, 20C	2	(1)
SA-25, 25F	155	(70)
SA-45	36	(16)
SA-55A	1	(0.5)
SA-60, 60F	18	(8)
SA-61	5	(2)
SA-62	5	(2)
SA-66	8	(4)
SA-80, 80F	68	(31)
SAA-2	1	(0.5)
SAA-8	3	(1)
SAA-9 thru 12	1	(0.5)
SAA-15	6	(3)
SAA-17	1	(0.5)
SAA-18	1	(0.5)
SAA-22 thru 24	1	(0.5)
SAA-30	12	(5)
SAA-31	38	(17)

SC

	lb	(kg)
SC-1	8	(4)
SC-2	8	(4)
SC-3	9	(4)
SC-4	9	(4)
SC-5	5	(2)
SC-45	7	(3)
SC-46	3	(1)
SC-47	4	(2)
SC-50	3	(1)
SC-51	4	(2)
SC-55	2	(1)
SC-56 thru 65	3	(1)
SC-70 thru 81	2	(1)
SC-82	3	(1)
SC-83	3	(1)
SC-84	4	(2)
SC-90	3	(1)
SC-108	10	(5)
SC-115	4	(2)
SC-116 thru 119	2	(1)
SC-149	8	(4)
SC-150	3	(1)
SC-151	3	(1)
SC-152 thru 165	2	(1)
SC-180	6	(3)
SC-181	7	(3)
SC-183	5	(2)
SC-184	4	(2)
SC-185	5	(2)
SC-186	8	(4)
SC-187	12	(5)
SC-188 thru 190	15	(7)
SC-195	12	(5)
SC-250	6	(3)
SC-251	6	(3)
SC-252	5	(2)
SC-253 thru 259	3	(1)
SC-270	7	(3)
SC-272	9	(4)
SC-400	1	(0.5)
SC-402	2	(1)
SC-404	3	(1)
SC-406	4	(2)
SC-498 thru 504	2	(1)
SC-506	3	(1)
SC-508	3	(1)

SE / SF

	lb	(kg)
SE-2B, 2BF	190	(86)
SE-5	31	(14)
SE-6	75	(34)
SE-20	4	(2)
SE-24	2	(1)
SE-26	2	(1)
SE-28	1	(0.5)
SE-30L	1	(0.5)
SE-30LD	5	(2)
SE-30M	1	(0.5)
SE-30MD	5	(2)
SE-30X	1	(0.5)
SE-30XD	5	(2)
SE-31	2	(1)
SEA-100A	3	(1)
SEA-100B	2	(1)
SEA-100C	2	(1)
SEA-100E	10	(5)
SEA-100F	2	(1)
SEA-100G	1	(0.5)
SEA-101	3	(1)
SEA-102	1	(0.5)
SEA-103	11	(5)
SF-10	45	(20)
SF-20	55	(25)
SFA-20	2	(1)
SFA-21	1	(0.5)
SFA-22	1	(0.5)
SFA-24	2	(1)
SFA-25	3	(1)

SG

	lb	(kg)
SG-4	37	(17)
SG-7A	3	(1)
SG-8	4	(2)
SG-15	7	(3)
SG-20	40	(18)
SG-24	3	(1)
SG-26	10	(4.5)
SG-27	8	(3.6)
SG-28	18	(8.2)
SG-40	3	(1)
SG-42	29	(13)
SG-62 thru 66	2	(1)
SG-70	3	(1)
SG-100 thru 500	2	(1)
SG-1000	3	(1)
SGA-5R, 5RT	23	(10)
SGA-7	2	(1)
SGA-8	2	(1)
SGA-91	1	(0.5)
SGA-92	1	(0.5)
SGA-94	3	(1)
SGA-95	1	(0.5)
SGA-106	6	(3)
SGA-119	1	(0.5)
SGA-120	20	(9)
SGA-122	20	(9)
SGA-125	2	(1)
SGA-130	5	(2)

SM

	lb	(kg)
SM-1	1250	(567)
SM-2	1150	(522)
SM-3, 3L, 3LC	900	(408)
SM-4, 4L, 4LC	500	(227)
SM-4X, 4XL, 4XLC	700	(317)
SM-5, 5L, 5LC	500	(227)
SM-6, 6L, 6LC	300	(136)
SM-6SL	145	(66)
SM-6SLC	175	(79)
SM-31	1000	(454)
SM-41	700	(317)
SM-51	600	(272)
SM-61	400	(181)

SP

	lb	(kg)
SP-0	600	(272)
SP-1, 1C	134	(61)
SP-2	71	(32)
SP-2.5	50	(22)
SP-3	15	(7)
SP-6	330	(150)
SP-10	385	(175)
SP-12CA, 12CG	250	(113)
SP-33	15	(7)
SP-42, 42F	40	(18)
SP-48R, 48RF	470	(213)
SP-50	50	(23)
SP-55	70	(32)
SP-90	8	(4)
SP-92	3	(1)
SP-93	3	(1)
SP-96	5	(2)
SP-97	5	(2)
SP-138	4	(2)
SP-140	6	(3)
SP-171	3	(1)
SP-171X	6	(3)
SP-173	16	(7)
SP-174	28	(13)
SP-175	15	(7)
SP-177	16	(7)
SP-230	46	(21)
SP-245, 245F	735	(333)
SP-254	65	(29)
SP-256	72	(33)
SP-258	64	(29)
SP-259	72	(33)
SP-261	51	(23)
SP-262	57	(26)
SP-264	51	(23)
SP-266	57	(26)
SP-268	65	(29)
SP-269	74	(34)
SP-271	65	(29)
SP-272	74	(34)
SP-274	33	(15)
SP-278	33	(15)
SP-284	27	(12)
SP-285	33	(15)
SP-286	41	(19)
SP-287	49	(22)
SP-288	20	(9)
SP-289	27	(12)
SP-290	33	(15)
SP-291	41	(19)
SP-292	49	(22)
SP-293	20	(9)
SP-300	22	(10)
SP-302 thru 306	15	(7)
SP-1015FX	40	(18)
SP-1017FX	50	(23)
SP-1018FX	65	(29)
SP-1050, 1050X	115	(52)
SP-1060 thru 1070X	192	(87)
SPA-21	16	(7)
SPA-22, 22C	5	(2)
SPA-22K	45	(20)
SPA-23	5	(2)
SPA-24	5	(2)
SPA-30	9	(4)
SPA-31	13	(6)
SPA-60	5	(2)
SPA-64	4	(2)
SPA-100, 100S	10	(5)
SPA-101, 101S	6	(3)
SPA-102	6	(3)
SPA-104	55	(25)
SPA-105	55	(25)
SPA-108	4	(2)
SPA-109	12	(5)
SPA-110	10	(5)
SPA-111	12	(5)
SPA-114	15	(7)
SPA-120	20	(9)
SPA-122	10	(5)
SPA-129 thru 132	2	(1)
SPA-151	4	(2)
SPA-171	6	(3)
SPA-181	6	(3)
SPA-240X	1	(0.5)
SPA-241	1	(0.5)
SPA-242	2	(1)
SPA-244	1	(0.5)
SPA-245X	4	(2)
SPA-255	4	(2)
SPA-256 thru 262	2	(1)
SPA-263	5	(2)
SPA-264	1	(0.5)
SPA-301	1	(0.5)
SPA-302	8	(4)
SPA-303	2	(1)
SPA-400	20	(9)
SPA-450	30	(14)
SPA-501	12	(5)
SPA-501X	10	(5)
SPA-502	8	(4)

SS

	lb	(kg)
SS-3	17	(8)
SS-8R, 8RF	135	(61)
SS-10	137	(62)
SS-12R, 12RF	200	(91)
SS-14 thru 14F	105	(48)
SS-15 thru 15F	55	(25)
SS-18, 18F	76	(34)
SS-20, 20F	210	(95)
SS-21, 21F	210	(95)
SS-22, 22F	215	(98)
SS-23	8	(4)
SS-25, 25F	148	(67)
SS-28, 28F	8	(4)
SS-30 thru 30S	215	(98)
SS-31 thru 31S	215	(98)
SS-33 thru 33S	250	(113)
SS-34, 34F	210	(95)
SS-35	25	(11)
SS-36, 36F	210	(95)
SS-45A	55	(25)
SS-82, 82F	95	(43)
SSA-10	1	(0.5)
SSA-11 thru 15	2	(1)
SSA-20	5	(2)
SSA-22	3	(1)
SSA-41 thru 58	2	(1)
SSA-72 thru 76	1	(0.5)
SSA-77	5	(2)
SSA-320A	115	(52)
SSA-321	165	(75)
SSA-325	55	(25)
SSA-351 thru 355	2	(1)
SSA-801 thru 803	10	(5)
SSA-804	5	(2)
SSA-805R	125	(57)
SSA-807 thru 810	10	(5)
SSA-811	8	(4)
SSA-812	8	(4)
SSA-820	26	(12)
SSA-822	40	(18)
SSA-823	3	(1)

SV

	lb	(kg)
SV-125	2	(1)
SV-126	2	(1)
SV-135 thru 218	1	(0.5)
SV-800	2	(1)
SV8-2C, 2F	2	(1)

TM

	lb	(kg)
TM-5, 5F	680	(308)
TM-6, 6F	695	(315)

TS

	lb	(kg)
TS-1, 1F	405	(184)
TS-2, 2F	399	(181)
TS-3, 3F	454	(206)
TSA-100 thru 115	15	(7)
TSA-116	22	(10)
TSA-117	22	(10)
TSA-124 thru 135	3	(1)
TSA-136	13	(6)
TSA-137	13	(6)
TSA-140 (All)	3	(1)
TSA-153	1	(0.5)
TSA-154R	30	(14)
TSA-155	24	(11)
TSA-156	45	(20)
TSA-157	20	(9)
TSA-159	30	(14)
TSA-162	15	(7)
TSA-163	10	(5)
TSA-167	51	(23)
TSA-168	1	(0.5)
TSA-169R, 169RF	5	(2)
TSA-170	1	(0.5)
TSA-171	2	(1)
TSA-172 thru 174	1	(0.5)
TSA-175 thru 178	2	(1)
TSA-180	290	(132)
TSA-182 thru 189	1	(0.5)
TSA-190	2	(1)
TSA-191	2	(1)
TSA-193	1	(0.5)
TSA-195	3	(1)
TSA-198	1	(0.5)
TSA-205	2	(1)
TSA-206	5	(2)
TSA-207	5	(2)
TSA-208	3	(1)
TSA-232 thru 271	2	(1)
TSA-273	3	(1)
TSA-275 thru 279	2	(1)
TSA-300	3	(1)
TSA-1167, 1167F	3	(1)

UB

	lb	(kg)
UB-5, 5A	120	(54)
UB-15	5	(2)
UB-18 thru 18B	183	(83)
UBA-1	7	(3)
UBA-4	11	(5)
UBA-100	7	(3)

V

	lb	(kg)
V3 (All)	1	(0.5)
V3 Covers	1	(0.5)
V3 Pans	1	(0.5)
V6 (All)	2	(1)
V6 Covers	1	(0.5)
V6 Pans	1	(0.5)
V8 (All)	2	(1)
V8 Covers	1	(0.5)
V8 Pans	2	(1)
V10 (All)	3	(1)
V10 Covers	2	(1)
V10 Pans	2	(1)
V12 (All)	4	(2)
V12 Covers	2	(1)
V12 Pans	4	(2)
V18 (All)	8	(4)
V18 Covers	4	(2)
V18 Pans	8	(4)
V200 (All)	2	(1)
V200 Covers	2	(1)
V200 Pans	2	(1)
V300 (All)	4	(2)
V300 Covers	4	(2)
V300 Pans	4	(2)

WC

	lb	(kg)
WC-3S thru 5S	2	(1)
WC-200 thru 625S	2	(1)

WT / WV

	lb	(kg)
WT-1, 1A	3	(1)
WT-3	2	(1)
WT-3S	3	(1)
WT-4	2	(1)
WT-4B	1	(0.5)
WT-4R	3	(1)
WT-5	1	(0.5)
WT-8	1	(0.5)
WT-8R	3	(1)
WT-10	4	(2)
WT-13	1	(0.5)
WT-13S	2	(1)
WT-33CSB thru 33ESB	1	(0.5)
WT-44CSB thru 44ESB	1	(0.5)
WT-60	3	(1)
WT-61	1	(0.5)
WT-62	1	(0.5)
WT-84CSB thru 86ESB	3	(1)
WT-88CSB thru 88ESB	4	(2)
WT-128CSB thru 128ESB	5	(2)
WT-204	2	(1)
WT-206	3	(1)
WT-324	2	(1)
WT-326	3	(1)
WTA-1 thru 54	1	(0.5)
WV-1, 1F	510	(231)
WV-2, 2F	510	(231)
WV-3, 3F	510	(231)
WVA-100 thru 165	5	(2)

TERMS & CONDITIONS

Terms - These Terms and Conditions and the Confirmation of Order (collectively, "Terms") apply to all Gilson Company, Inc. ("Gilson") sales and shall take precedence over and supersede any terms and conditions which appear in Purchaser's order or in any documents incorporated by reference in Purchaser's order. No term or condition of Purchaser's order additional to or different from these Terms shall become part of the contract unless explicitly agreed to in writing by Gilson.

Domestic Orders: Net 30 days, FOB shipping point, subject to prior credit approval.

Export Orders: All payments shall be in US dollars by an acceptable irrevocable Letter of Credit, or wire transfer.

Interest will accrue on overdue amounts at 2% per month (or, if lower, the maximum amount permitted by law). We accept MasterCard, Visa, and American Express for all orders. Purchaser shall be responsible for all costs of collection including reasonable attorney's fees and court costs.

Pricing - Price lists are available on our website at **globalgilson.com.** All illustrations, specifications and prices in our catalog and on our website are based on the latest information available at the time of publication and subject to change without notice. Models may be changed, improved or discontinued at any time at Gilson's sole discretion. Prices are exclusive of, and Purchaser shall pay, all applicable federal, state and local taxes, duties and levies including sales, use, excise, value-added and similar taxes and charges imposed by any taxing authority (other than taxes imposed on Gilson's income) related to Purchaser's order. For international orders, Purchaser shall pay all import and export and customs taxes, fees and other similar charges.

Shipping/Delivery - Unless specified, Gilson will determine means of shipment. Shipping and handling fees are applied to all orders to compensate for packaging, shipping costs and insurance. International orders require special handling fees to be calculated at the time of a quote or order. If Purchaser designates the carrier, title to and risk of loss for product passes to the Purchaser upon tender to the carrier at the shipping point. Shipping dates are approximate and are based upon receiving all necessary information from Purchaser. Gilson shall not be liable for failure or delays in manufacture or delivery due to causes beyond Gilson's control. In the event of such a delay, the delivery dates shall be deferred for a period equal to the time lost by reason of such delay. Gilson shall, where feasible, promptly advise Purchaser of the occurrence of such cause of its delay, and of its effect upon delivery. Title and right of possession to the products or shipments sold hereunder shall remain with Gilson until all payments hereunder (including deferred payments) shall have been made in full. Purchaser agrees to do all acts necessary to reflect and record such interest.

Claims - Items are shipped in new condition and packed to withstand normal shipping risks. The Purchaser is responsible to check all packages for damage or loss before accepting any shipment. Any damage or loss apparent from the shipping container must be noted on the bill of lading and Gilson must be notified by the Purchaser of the loss or damage within 5 business days of delivery. After 5 business days and in the absence of such notice, Purchaser is deemed to have accepted any shipment. Gilson is not responsible for damaged or lost items that have been accepted by the Purchaser. Concealed damage, where the box is in good condition but the product is missing or damaged, is an exception.

Returns - Equipment may not be returned to Gilson without a Return Goods Authorization (RGA) number which may be obtained by contacting our returns department at (800) 444-1508 or (740) 548-5314. RGAs must be requested within 30 days of delivery date. All returns are subject to a minimum 15% restocking fee. Items must be in new, unused condition and must be sent back in the original packaging including all manuals, power cords, software and options to be eligible for return. Customers are responsible for all shipping charges when returning an item. Returns sent COD will not be accepted. After your return has been received, inspected, and approved for a refund, a credit will be issued minus any applicable restocking fees, freight charges, and handling fees. Damage resulting from improper packing of returned items is solely the customer's responsibility. Please Note: Certain items such as cut-to-size screen cloth and other special order products are non-returnable.

Liability and Purchaser Indemnity - Use of Gilson products may involve hazardous procedures and materials. Our descriptions of items do not proclaim to address all of the safety issues involved with their use. The user is solely responsible for using these products in a safe and responsible manner as outlined in the appropriate published test procedures, operating instructions, warning labels and applicable regulatory requirements. Gilson shall not be liable for and Purchaser assumes all risk of any advice or failure to provide advice by Gilson regarding the products or Purchaser's use of the same. Gilson shall have no responsibility for any particular application made of any product. Purchaser agrees to indemnify and hold Gilson harmless from and against any costs, losses, liabilities and expenses (including reasonable attorney's fees) arising out of third-party claims related to Purchaser's use of Gilson products.

Warranty - Gilson warrants that the products supplied are suitable for the standard purpose for which they are designed. These products are warranted to be free of defects in materials and workmanship for a period of one (1) year from the date of original shipment and any claim must be submitted within such period. This warranty excludes damage from or repairs necessitated by neglect, abuse, normal wear and tear, use of the equipment for other than its intended purpose or other than under normal operating conditions, alterations or modifications, repairs attempted by anyone other than Gilson and any failure to comply with installation, maintenance or operating instructions. Also excluded are damages caused by lightning strikes, floods, electrical supply irregularities or other occurrences beyond our control. Purchaser may be required to establish that the product has not been altered or modified and has been properly installed, maintained and operated within the limits of rated and normal use. Products may not be returned to Gilson for warranty repair or replacement without obtaining a Returns Goods Authorization (RGA) number. If Gilson determines in its sole discretion that the product is defective and is covered by this warranty, Gilson's sole obligation, and Purchaser's sole and exclusive remedy, is the repair or replacement of the product by Gilson in Gilson's discretion. Gilson will not be responsible for labor charges or other expenses associated with a repair of a defective item (e.g., to reinstall a repaired or replaced part). Additional Third Party Manufacturer warranties are honored and passed through when applicable. Purchaser's sole and exclusive remedy for any defect covered by the warranty shall be as set forth in this section. This exclusive remedy shall not have failed of its essential purpose (as that term is used in the Uniform Commercial Code). Purchaser specifically acknowledges that Gilson's price for the products is based upon the limitations of Gilson's liability as set forth in these terms. These limitations of liability shall survive any finding that the exclusive remedy failed of its essential purpose.

DISCLAIMER. THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER REPRESENTATIONS AND WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. GILSON'S LIABILITY WHETHER UNDER THESE TERMS OR OTHERWISE RELATING TO THE SALE OR USE OF THE PRODUCTS IS LIMITED TO THE AMOUNT RECEIVED FROM CUSTOMER. UNDER NO CIRCUMSTANCES SHALL GILSON BE LIABLE FOR CONSEQUENTIAL, SPECIAL, INDIRECT, INCIDENTAL, LIQUIDATED OR PUNITIVE DAMAGES.

Governing Law - This sale and these Terms are governed by Ohio law without regard to choice of law rules. The parties agree that certain material events, occurrences, and transactions relating to the sale of the products bear a reasonable relationship to the State of Ohio. The State and Federal district courts located in Columbus, Ohio shall have exclusive jurisdiction and venue in any action or proceeding arising out of or relating to this sale or these Terms. The parties hereto irrevocably consent to the exclusive personal jurisdiction of such courts and to such venue and expressly waive any right to a trial by jury. For international sales, the parties hereby agree that the United Nations Convention on the International Sale of Goods does not apply to this sale or these Terms. Gilson shall be entitled to recover its fees and costs (including attorney's fees) in collecting any amounts due from Purchaser.

www.globalgilson.com

24 Hours a Day. 7 Days a Week. GET THERE!

VIDEOS

View our online videos detailing product features, specifications, How-To and best practice topics. Have a video idea? Let us know as we continue to add videos monthly.

SHIPPING COSTS

Gilson now calculates the shipping cost during check-out for all domestic customers ordering online at our website. The amount shown for shipping is not an estimate – it is the total cost you will pay for shipping. Check it out!

BLOG

Visit our blog each month for new posts, how-to guides and more. We cover industry insights, equipment operation/maintenance, and product line recommendations - all designed to better serve you!

MOBILE-FRIENDLY

Visit our **NEW** Mobile-Friendly Website!