

ASTM Soil Specifications



ASTM D421

Related Standards: ASTM D422, D2217, E11

Practice for Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants

Qty.	Model	Description
1	Choose one: HB-5322A HB-5322A.4F	Ohaus adventurer balance, 2,100g x 0.1g capacity, 120V 60Hz Ohaus adventurer balance, 2,100g x 0.1g capacity, 220V 50/60Hz
1	H-4257	Heavy porcelain soil mortar
1	H-4258	Rubber-tipped soil pestle
1	H-3920FS4	8" dia. brass frame sieve, # 4 SS mesh
1	H-3920FS10	8" dia. brass frame sieve, #10 SS mesh
1	H-3920FS40	8" dia. brass frame sieve, # 40 SS mesh
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz
1	H-3964	Soil sample splitter

ASTM D422

Related Standards: ASTM D421, E11, E100, AASHTO T11,T27, T88

Standard Test Method for Particle-Size Analysis of Soils

Qty.	Model	Description
1	H-3920CS3.000	8" dia. brass frame sieve, 3" SS mesh
1	H-3920CS2.000	8" dia. brass frame sieve, 2" SS mesh
1	H-3920CS1.500	8" dia. brass frame sieve, 1.5" SS mesh
1	H-3920CS1.000	8" dia. brass frame sieve, 1" SS mesh
1	H-3920CS.750	8" dia. brass frame sieve, 0.75" SS mesh
1	H-3920FS4	8" dia. brass frame sieve, #4 SS mesh
1	H-3920FS10	8" dia. brass frame sieve, #10 SS mesh
1	H-3920FS20	8" dia. brass frame sieve, #20 SS mesh
1	H-3920FS40	8" dia. brass frame sieve, #40 SS mesh
1	H-3920FS60	8" dia. brass frame sieve, #60 SS mesh
1	H-3920FS140	8" dia. brass frame sieve, #140 SS mesh
1	H-3920FS200	8" dia. brass frame sieve, #200 SS mesh
1	H-3930BC	8" dia. brass sieve cover
1	H-3920P	8" dia. brass sieve pan
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz
4	H-4244	Hydrometer jar
4	H-4244RS	Rubber stopper for hydrometer jar
1	H-4241	Soil hydrometer

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ASTM D422 (contd.)

Related Standards: ASTM D421, E11, E100, AASHTO T11,T27, T88

Standard Test Method for Particle-Size Analysis of Soils

Qty.	Model	Description
1	Choose one: H-4260A H-4260A.4F	Soil dispersion mixer, 120V 60Hz Soil dispersion mixer, 230V 50/60 Hz
1	H-4247	Sodium hexametaphosphate
1	Choose one: H-4239A H-4239A.4F	Hydrometer jar bath, 20.5 gal. (77.6 L), 120V, 60Hz Hydrometer jar bath, 20.5 gal. (77.6 L), 220V, 50/60Hz
8	Choose one: H-4241 H-4242	Soil Hydrometer A Soil Hydrometer B
8	H-4244	Hydrometer jars
1	H-3575A	Timer
1	HT-4052U	Long-Stem digital thermometer, accuracy 0.2° C
1	Choose one: HB-4713A HB-4713A.4F	Electronic balance, 1000g x 0.01g capacity, 120V 60Hz Electronic balance, 1000g x 0.01g capacity, 220V 50/60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz

ASTM D427

Related Standards: ASHTO T92

Standard Test Method for Shrinkage Factors of Soils by the Mercury Method (Standard has been withdrawn from ASTM)

Qty.	Model	Description
1	H-4254	Set of shrinkage limit equipment

ASTM D558

Related Standards: ASTM C150, C595, D559, D560, D653, D698, D2168, D2216, D3740, D4753, D6026, E11, E145 AASHTO T99

Standard Test Method for Moisture-Density Relations of Soil-Cement Mixtures

Qty.	Model	Description
1	Choose one: H-4169 H-4169.4F H-4160B H-4170A	Automatic mechanical compactor, 120V 60Hz Automatic mechanical compactor, 220V 50/60Hz Manual compaction hammer Modified compaction hammer
1	H-4169CK	Calibration kit for H-4169 automatic mechanical compactor
1	Choose one: H-4141 H-4225 H-4162 H-4161A	Standard proctor density/moisture, 4" mold Standard proctor density/moisture, 4" split mold Modified proctor density/moisture, 6" mold Modified proctor density/moisture, 6" split mold
1	Choose one: HB-4730 HB-4730.4F	Ohaus ranger 3000 balance, 3,000g x 0.1g, 120V 60Hz Ohaus ranger 3000 balance, 3,000g x 0.1g, 220V 50/60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) capacity, 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) capacity, 230V 50/60Hz
1	Choose one: H-4155A H-4150 H-4150.4F	Hand-operated sample ejector Motorized sample ejector, 120V 60Hz Motorized sample ejector, 220V 50/60Hz
1	H-4144.12	Straight edge 1/8" x 1.25" x 12"
1	H-3700	Mixing pan galvanized iron rolled-top edges, 18"x 18" x 1.5" deep
1	H-4974	Spoon for mixing
12	H-4929	Aluminum moisture boxes, 3.5" (89 mm) dia. x 2" (51mm)

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ASTM D558 (contd.)

Related Standards: ASTM C150, C595, D559, D560, D653, D698, D2168, D2216, D3740, D4753, D6026, E11, E145 AASHTO T99

Standard Test Method for Moisture-Density Relations of Soil-Cement Mixtures

Optional

Qty.	Model	Description
1	Choose one: H-4215 H-4215.2F H-4215.5F	Rapid soil processor, 120V 60Hz Rapid soil processor, 220V 60Hz Rapid soil processor, 220V 50Hz
1	Choose one: H-4199 H-4199.5F	Soil grinder, 120V 60Hz Soil grinder, 220V 50Hz
1	Choose one: H-3839 H-3839.2F H-3839.5F	Laboratory bench mixer, 5-qt. (4.73L), 120V 60Hz Laboratory bench mixer, 5-qt. (4.73L), 230V 60Hz Laboratory bench mixer, 5-qt. (4.73L), 230V 50Hz
1	H-3920CS3.000	8" dia. brass frame sieve, 3.0" SS mesh
1	H-3920CS.750	8" dia. brass frame sieve, 0.75" SS mesh
1	H-3920FS4	8" dia. brass frame sieve, #4 SS mesh
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Choose one: Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz

ASTM D560

Related Standards: ASTM C150, C595, D559, D560, D653, D698, D2168, D2216, D3740, D4753, D6026, E11, E145 AASHTO T99

Standard Test Methods for Freezing and Thawing Compacted Soil-Cement Mixtures

Qty.	Model	Description
1	Choose one: H-4169 H-4169.4F H-4160B	Automatic mechanical compactor, 120V 60HZ Automatic mechanical compactor, 220V 50/60Hz Manual compaction hammer
1	H-4141 H-4225	Standard proctor density/moisture, 4" mold Standard proctor density/moisture, 4" split mold
1	Choose one: HB-4730 HB-4730.4F	Ohaus ranger 3000 balance, 3,000g x 0.1g, 120V 60Hz Ohaus ranger 3000 balance, 3,000g x 0.1g, 220V 50/60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	Choose one: H-4155A H-4150 H-4150.4F	Hand-operated sample ejector Motorized sample ejector, 120V 60Hz Motorized sample ejector, 220V 50/60Hz
1	H-4144.12	Straight edge 1/8" X 1.25" X 12"
1	H-3700	Mixing pan galvanized iron rolled-top edges, 18" x 18" x 1.5"
1	H-4974	Spoon for mixing
12	H-4929	Aluminum moisture boxes, 3.5" (89mm) dia. by 2" (51mm) ht.
1	H-4259	Wire scratch brush, with wire #26 gauge flat, 50 groups in hard wood block
1	H-2937 H-2937M	Precision diameter tape – units in inches Precision diameter tape – units in mm
1	H-2816.8	Digital caliper, 8" (200mm)
1	H-2970.2	Test cylinder transport rack 4"
1	H-4916P.250	Graduated plastic cylinder 250ml
1	H-3920CS3.000	8" dia. brass frame sieve, 3.0" SS mesh
1	H-3920CS.750	8" dia. brass frame sieve, 0.75" SS mesh
1	H-3920FS4	8" dia. brass frame sieve, #4 SS mesh

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ASTM D560 (contd.)

Related Standards: ASTM C150, C595, D559, D560, D653, D698, D2168, D2216, D3740, D4753, D6026, E11, E145 AASHTO T99

Standard Test Methods for Freezing and Thawing Compacted Soil-Cement Mixtures

Qty.	Model	Description
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Choose one: Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz

ASTM D698

Related Test Standards: ASTM C127, C136, D653, D854, D2168, D2216, D2487, D2488, D3740, D4253, D4718, D4753, D4914, D5030, D6026, D6913, E11, E177, E691 AASHTO T99

Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort

Qty.	Model	Description
1	Choose one: H-4169 H-4169.4F H-4160B H-4170A H-4173	Automatic mechanical compactor, 120V 60HZ Automatic mechanical compactor, 220V 50/60Hz Manual compaction hammer Modified compaction hammer Army corps of engineers hammer
1	H-4169CK	Calibration kit for H-4169 automatic mechanical compactor
1	Choose one: H-4141 H-4225 H-4162 H-4161A	Standard proctor density/moisture, 4" mold Standard proctor density/moisture, 4" split mold Modified proctor density/moisture, 6" mold Modified proctor density/moisture, 6" split mold
1	Choose one: HB-4950 HB-4950.4F	Digital balance, 1500g x 0.1g, 120V 60Hz Digital balance, 1500g x 0.1g, 220V 50/60Hz
1	Choose one: H-30140 H-30140.4F	Laboratory bench oven, 7.8 cu. ft. (220 L) cap., 115V 60Hz Laboratory bench oven, 7.8 cu. ft. (220 L) cap., 230V 50/60Hz
1	Choose one: H-4155A H-4150 H-4150.4F	Hand-operated sample ejector Motorized sample ejector, 120V 60Hz Motorized sample ejector, 220V 50/60Hz
1	H-4144.12	Straight edge 0.25" X 1.25" X 12"
1	H-3700	Mixing pan galvanized iron rolled-top edges, 18" x 18" x 1.5"d
1	H-4974	Spoon for mixing
12	H-4929	Aluminum moisture boxes, 3.5" (89 mm) dia. and 2" (51mm) ht.

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ASTM D698 (contd.)

Related Test Standards: ASTM C127, C136, D653, D854, D2168, D2216, D2487, D2488, D3740, D4253, D4718, D4753, D4914, D5030, D6026, D6913, E11, E177, E691 AASHTO T99

Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort

Qty.	Model	Description
1	H-3920CS.750	8" dia. brass frame sieve, 0.75" SS mesh
1	H-3920CS.375	8" dia. brass frame sieve, 0.375" SS mesh
1	H-3920FS4	8" dia. brass frame sieve, # 4 SS mesh
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Choose one: Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz
1	Choose one: H-4215 H-4215.2F H-4215.5F	Rapid soil processor, 120V 60Hz Rapid soil processor, 220V 60Hz Rapid soil processor, 220V 50Hz
1	Choose one: H-4199 H-4199.5F	Soil grinder, 120V 60Hz Soil grinder, 220V 50Hz
1	Choose one: H-3839 H-3839.2F H-3839.5F	Laboratory bench mixer, 5-qt. (4.73L), 120V 60Hz Laboratory bench mixer, 5-qt. (4.73L), 230V 60Hz Laboratory bench mixer, 5-qt. (4.73L), 230V 50Hz

ASTM D854

Related Standards: ASTM C127, D653, D2216, D2487, D3740, D4753, D5550, D6026, E11, E177, E691, AASHTO T100

Standard Test Method for Specific Gravity of Soil Solids by Water Pycnometer

Qty.	Model	Description
1	HT-4052U	Long-stem digital thermometer, accuracy 0.2°C
4	H-3395	Volumetric flask (500ml) with Stopper
1	Choose one: H-1763A H-1763A.4F	High-vacuum pump, 120V 60Hz High-vacuum pump, 220V 50/60Hz
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	H-3920FS4	8" dia. brass frame sieve, #4 SS mesh
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz
1	H-4962	Desiccab desiccator, stainless steel cabinet
1	H-1758	Desiccant

ASTM D1140

Related Standards: ASTM C702, D75, D422, D2216, D2487, D3740, D4753, D6026, E11, E145, E177, E691, AASHTO T11

Standard Test Method for Amount of Material in Soils Finer than #200 Sieve

Qty.	Model	Description
1	H-3920FS40	8" dia. brass frame sieve, #40 SS mesh
4	H-3920FS200	8" dia. brass frame sieve, #200 SS mesh
3	H-3955SP	8" dia. brass separator pans 1" deep
1	H-3960P	8" dia. brass sieve pan 1" deep
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Choose one: Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz
1	H-4247	Dispersant agent, hexametaphosphate
1	H-3947RC	8" dia. brass wash sieve 8" deep with back-wire mesh
1	H-4315A	Mechanical sieve shaker (Mary Ann sieve sifter)
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 115V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz

ASTM D1452

Related Standards: ASTM D1585, D1587, D2488, D5434, D4750, D5784, D6026, D6151

Standard Practice for Soil Exploration and Sampling by Auger Boring

Qty.	Model	Description
1	Choose one: H-4416.x* H-4419.xx* H-4418.xx*	Basic soil sampling kit with 5/8" threaded connection Soil auger kit with 5/8" threaded connection Soil auger kit with quick connection

Note: A wide variety of Individual bucket-type augers, extensions and handles are also available.

Additional Items

1	H-4208	Plastic-lined sample bags 10" x 18" (254 x 357mm)
1	H-4184A	Sample cans 1 gal. (3.48L)

*Items with .x or .xx require a size indication.

ASTM D1556

Related Test Standards: D698, D1557, D2216, D3740, D4253, D4254, D4643, D4718, D4753, D4914, D4944, D4959, D5030, D6026

Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone

Qty.	Model	Description
1	Choose one: H-4245 (H-4246)	Sand cone density apparatus with 1 gal. (3.79L) jar and bottom cone is 6.5" (165mm) dia. with flanged opening to fit bottom plate (requires H-4246 bottom plate)
	H-4249 (H-4249P)	Sand cone density apparatus with 1 gal. (3.79L) jar and bottom cone is 4.5" (114mm) dia. with flanged opening to fit bottom plate (requires H-4249P bottom plate)
	H-4248	Sand cone density apparatus for gravel and coarse sand soil and bottom cone for 12" (304.8mm) dia. hole
1	H-3821	Density sand with few particles passing #200 (75mm) or retained on the #10 (2.00mm)
1	H-4117	In-place density accessory kit (includes: sample bags, thermometer, brush, spoon, chisel and rubber mallet)
1	Choose one: HB-4930 HB-4930.4F	Ohaus defender balance, 30kg x 2g, 120V 60Hz (battery)
		Ohaus defender balance, 30kg x 2g, 220V 50/60Hz (battery)

ASTM D1557

Related Test Standards: ASTM C127, C136, C670, D653, D698, D854, D2168, D2216, D2487, D2488, D3740, D4220, D4253, D4718, D4753, D4914, D5030, D6026, D6913, E11, E319, AASHTO T99

Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort

Qty.	Model	Description
1	Choose one: H-4169 H-4169.4F H-4170A	Automatic mechanical compactor, 120V 60Hz Automatic mechanical compactor, 220V 50/60Hz Manual compaction hammer
1	H-4169CK	Calibration kit for H-4169 automatic mechanical compactor
1	Choose one: H-4141 H-4225 H-4162 H-4161A	Standard proctor density/moisture, 4" mold Standard proctor density/moisture, 4" split mold Modified proctor density/moisture, 6" mold Modified proctor density/moisture, 6" split mold
1	Choose one: HB-4950 HB-4950.4F	Digital balance, 1600g x 0.1g, 120V 60Hz (battery) Digital balance, 1600g x 0.1g, 220V 50/60Hz (battery)
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	Choose one: H-4155A H-4150 H-4150.4F	Hand-operated sample ejector Motorized sample ejector, 120V 60Hz Motorized sample ejector, 220V 50/60Hz
1	H-4144.12	Straight edge 0.25" x 1.25" x 12"
1	H-3700	Mixing pan galvanized iron rolled-top edges, 18" x 18" x 1.5" deep
1	H-4974	Spoon for mixing
12	H-4929	Aluminum moisture boxes, 3.5" (89 mm) dia. and 2" (51mm) height
1	H-3920CS.750	8" dia. brass frame sieve, 0.75" SS mesh
1	H-3920CS.375	8" dia. brass frame sieve, 0.375" SS mesh
1	H-3920FS4	8" dia. brass frame sieve, #4 SS mesh

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ASTM D1557 (contd.)

Related Test Standards: ASTM C127, C136, C670, D653, D698, D854, D2168, D2216, D2487, D2488, D3740, D4220, D4253, D4718, D4753, D4914, D5030, D6026, D6913, E11, E319, AASHTO T99

Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort

Qty.	Model	Description
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Choose one: Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz
1	Choose one: H-4215 H-4215.2F H-4215.5F	Rapid soil processor, 120V 60Hz Rapid soil processor, 220V 60Hz Rapid soil processor, 220V 50Hz
1	Choose one: H-4199 H-4199.5F	Soil grinder, 120V 60Hz Soil grinder, 220V 50Hz
1	Choose one: H-3841 H-3841.2F H-3841.5F	Laboratory bench mixer, 5-qt. (4.73L), 120V 60Hz Laboratory bench mixer, 5-qt. (4.73L), 230V 60Hz Laboratory bench mixer, 5-qt. (4.73L), 230V 50Hz
1	H-4169CK	Calibration kit for H-4169 automatic mechanical compactor, if being used.

ASTM D1558

Referenced Standards: ASTM C670, D698, D1557, D2216, D3740, D4753, D6026, E691

Standard Test Method for Moisture Content Penetration Resistance Relationships of Fine-Grained Soils

Qty.	Model	Description
1	H-4139	Proctor penetrometer set (moisture-density apparatus required by D698)

ASTM D1633

Referenced Standards: ASTM D559, D560, D563, D1632, D2216, D3740, D4753, D6026

Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders

MasterLoader Load Frame

Qty.	Model	Description
1	HM-5030.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz
1	HM-2300.100	S-type load cell, 10,000 lb. (50KN)
1	H-4169CK	Calibration kit for H-4169 automatic mechanical compactor, if being used.

Multi-Speed Load Frame

Qty.	Model	Description
1	Choose one: HM-2850.3F HM-2850.3F	Multi-speed load frame, 120V 60Hz Multi-speed Load frame, 220V 50/60Hz
1	H-4454.100	Load ring, 10,000 lb. (50KN)

Qty.	Model	Description
1	HM-2003E	Swivel, top platen
1	HM-4173	Length comparator
1	Choose One: HM-4174 HM-4174M	Precision diameter tape, 0.75" to 7" diameter Precision diameter tape, 28 mm to 200 mm diameter

ASTM D1883

Referenced Standards: ASTM D422, D653, D698, D1557, D2168, D2216, D2487, D2488, D3740, D4318, D4429, D4753, D6026, E11

Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soil

Qty.	Model	Description
1	Choose one: H-4169 H-4169.4F H-4170A	Mechanical compactor, Automatic , 120V 60Hz Mechanical compactor, Automatic, 220V 50/60Hz Compaction hammer, Manual AASHTO
4	H-4151	CBR mold with perforated base, 6" ID x 7" height
1	H-4153	Spacer disk
4	H-4154	Filter screens
2	H-4172	Swell plates
1	H-4158	Tripod attachment
1	H-4158.1	Dial indicator, 1.000" x 0.001"
4	H-4175	Surcharge weights
4	H-4176	Slotted surcharge weights
1	H-4174	Cutting edge
1	H-4144.12	Straight edge
1	Choose one: HB-4950 HB-4950.4F	Ohaus navigator XT portable balance, 120V 60Hz Ohaus navigator XT portable balance, 220V 50/60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) capacity, 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) capacity, 230V 50/60Hz
1	Choose one: H-4155A H-4150 H-4150.4F	Choose one: Hand-operated sample ejector Motorized sample ejector, 120V 50/60Hz Motorized sample ejector, 220V 50/60Hz
1	H-4144.12	Straight edge 0.25" x 1.25" x 12"
1	H-3700	Mixing pan galvanized, 18" x 18" x 1.5" deep
1	H-4974	Spoon for mixing
12	H-4929	Aluminum moisture boxes, 3.5" (89 mm) x 2" (51mm) height
1	H-3920CS.750	8" dia. brass frame sieve, 0.75" SS mesh
1	H-3920FS4	8" dia. brass frame sieve, #4 SS mesh

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ASTM D1883 (contd.)

Referenced Standards: ASTM D422, D653, D698, D1557, D2168, D2216, D2487, D2488, D3740, D4318, D4429, D4753, D6026, E11

Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soil

Qty.	Model	Description
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Choose one: Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz

Load Frame Options

MasterLoader Load Frame

Qty.	Model	Description
1	HM-5030.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz
1	HM-2300.100	S-type load cell, 10,000 lb. (50KN)
1	HM-2310.10	Strain transducer 1" (25mm)
1	H-4178	Penetration piston with stud
1	HM-4178BRT	Displacement transducer bracket
1	HM-5001SW	CBR/LBR reporting software

CBR-Specific Automatic Load Frame

Qty.	Model	Description
1	Choose one: HM-5150.3F HM-5150.4F	CBR/LBR-specific automatic load frame, 120V 60Hz CBR/LBR-specific automatic load frame, 220V 50/60Hz

Note: This Load Frame includes: HM-2300.100 S-type load cell (10,000lbf/50kN); HM-2310.10 Strain transducer (1"/25mm); H-4178 Penetration piston with stud; HM-4178BRT Displacement transducer bracket, and HM-5001SW CBR/LBR reporting software.

Continued on the next page...

ASTM D1883 (contd.)

Referenced Standards: ASTM D422, D653, D698, D1557, D2168, D2216, D2487, D2488, D3740, D4318, D4429, D4753, D6026, E11

Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soil

CBR-Specific Manual Loading System

Qty.	Model	Description
1	H-4156	CBR mechanical, loading press with loading ring, displacement dial and piston

Multi-Speed Load Frame

Qty.	Model	Description
1	Choose one: HM-2850.3F HM-2850.3F	Multi-speed load frame, 120V 60Hz Multi-speed load frame, 220V 50/60Hz
1	H-4454.100	Load ring, 10,000 lb. (50KN)
1	H-4158.1	Dial gauge 1.000" x 0.001"
1	H-4178	Penetration piston with stud
1	H-4178BR	Dial indicator bracket

Optional

Qty.	Model	Description
1	Choose one: H-4215 H-4215.2F H-4215.5F	Rapid soil processor, 120V 60Hz Rapid soil processor, 220V 60Hz Rapid soil processor, 220V 50Hz

ASTM D2166

Related Standards: ASTM D653, D854, D1587, D2216, 2488, D2850, D3740, D4220, D4318, D6026, D6913, E177, E691

Standard Test Method for Unconfined Compressive Strength of Cohesive Soil

Qty.	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf) , 110/220V 50/60Hz
1	HM-2002	Upper unconfined platen
1	HM-3000.10.2	Displacement indicator platform
1	HM-3000.10.1	Displacement indicator rod
1	HM-2300.005	Load cell, 500 lbf (2.5kN)
1	HM-2310.20	LSCT, 2.0" (50mm)
1	HM-4178BRT	LSCT mounting bracket
1	HM-3130	Soil sample trimmer, 1.0" to 3.0"
1	HM-3130.xx*	Sample trimmer top platen
1	HM-3175	Wire saw
1	HM-4186.xx*	Sample length trimmer, with knife to trim sample ends
1	HM-4173	Length comparator
1	Choose one: HM-4174 HM-4174M	Precision diameter tape, 0.75" to 7" Precision diameter tape, 28 to 200mm*

*Items with .x or .xx require a size indication.

ASTM D2167

Related Standard: ASTM D653, D698, D1557, D2216, D3740, D4253, D4643, D4718, D4753, D4914, D4944, D4959, D5030, D6026

Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

Qty.	Model	Description
1	Choose one: H-4166 H-4116 H-4167	Voluvessel, 1/20 cu. ft. (1600 ml) capacity Voluvessel, 1/20 cu. ft. (1600 ml) capacity Voluvessel, 1/13 cu. ft. (2230 ml) capacity
1	H-4166S	Voluvessel, saddle weights for H-4166 and H-4167
1	H-4117	In-place density accessory kit sample bags, thermometer, brush, spoon, chisel and rubber mallet
1	H-4168	Balloons, 10pk

ASTM D2168

Related Standards: ASTM D698, D1557, D2487, D3740, D6026, E11, E145

Standard Practices for Calibration of Laboratory Mechanical-Rammer Soil Compactors

Qty.	Model	Description
1	H-4169CK	Calibration kit for H-4169 automatic mechanical compactor

ASTM D2216

Related Standards: ASTM D653, D2974, D3740, D4220, D4318, D4542, D4643, D4753, D4944, D4959, D5079, D6026, D7363, E145

Standard Test Method for Determination of Water Content of Soil and Rock by Mass

Qty.	Model	Description
24	H-4927	Aluminum moisture boxes, 8.4 cu. in. (137 cc)
1	H-4973	Preparation knife, sharp blade and thin blade, 6" long
1	H-4906	Straight-edge spatula, 7/8" x 6" long blade
1	H-3730	Aluminum scoop square nose, 6" long x 3.75" width
1	HM-3175	Wire saw
1	H-3746	Heat resistant gloves
1	H-4359A	Bakalon rectangular mixing pan, 18" x 13" x 1.875"
1	H4962	Desiccab desiccator, 13" x 13" x 13.25"
1	Choose one: HB-4713A HB-4713A.4F	Adam hcb precision balance, 1000g x 0.01g, 120V 60Hz Adam hcb precision balance, 1000g x 0.01g, 220V 50/60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz

ASTM D2434

Standard withdrawn in January 2015 in accordance with Section 10.6.3

Standard Test Method for Permeability of Granular Soils (Constant Head)

Qty.	Model	Description
1	HM-5802	Permeameter cell 3" diameter (other diameters 2.5, 4.5, 6, 9)
1	Choose one: HM-5801 HM-5803 HM-5804 HM-5805	Permeameter Cell, 2.5" (63mm) Permeameter Cell, 4.5" (114mm) Permeameter Cell, 6" (152mm) Permeameter Cell, 9" (229mm)
1	HM-5880	Constant head tank
1	HM-3701	Compaction hammer
1	Choose one: HB-5220 HB-5220.4F	Ohaus adventurer balance, 2200g x 0.01g, 120V 60Hz Ohaus adventurer balance, 2200g x 0.01g, 220V 50/60Hz
1	H-3730	Scoop
1	HT-4052U	Digital thermometer, -58 to 302°F (-50 to 150°C)

NOTES: Other item (clock with second hand, 250 ml graduated cylinder, mixing pan)

ASTM D2435

Related Standards: ASTM D422, D653, D854, D1587, D2216, D2487, D2488, D3550, D3740, D4186, D4318, D4452, D4546, D6026

Standard Test Method for One-Dimension Consolidation Properties of Soil Using Incremental Loading

Qty.	Model	Description
1	HM-5470.3F	ConMatic IPC, automated system, 120/220V 50/60Hz (includes the next four items)
1	HM-2300.020	S-type load cell 2,000 lbs (10kN) with 3/4" adapter
1	HM-2310.10	Linear strain transducer, 1.0" (25mm)
1	HM-2310BR	Linear strain transducer bracket
1	HM-5100SW	HMTS consolidation software module

Pneumatic Consolidation Using Dial Gauges

1	HM-5470.3F	ConMatic, 32 TSF, 120/220V 50/60Hz
1	H-4471CC	Dial gauge, 0.5" x 0.0001" CC

Pneumatic Consolidation Using Analog Transducers

1	HM-5470.3F	ConMatic, 32 TSF, 110/220 50-60Hz
1	HM-2310.04	Strain transducer 0.4" (10mm)
1	HM-2310BR	Strain transducer bracket
1	HM-5320.3F	miniLogger 4-channel, analog data acquisition
1	HM-5100SW	HMTS consolidation reporting software

Pneumatic Consolidation Using Digital Indicators

1	HM-5470.3F	ConMatic, 32 TSF, 110/220 50-60Hz
1	HM-4470.10	Digital indicator 1" x 0.0001" (25x0.002 mm)
1	HM-4469C	Data cable for indicator
1	HM-5330.3F	miniLogger 4-channel, digital data acquisition
1	HM-5100SW	HMTS consolidation reporting software

Dead Weight Consolidation Using Dial Gauges

1	HM-1100A	Dead-weight consolidation frame
1	HM-112x*	Weight set, 16 TSF
1	H-4471CC	Dial gauge, 0.5" x 0.0001" CC

Consolidation Cells (all methods)

1	Choose one: HM-1210.xx* HM-1220.xx* HM-1230.xx*	Floating ring consolidation cell Fixed ring consolidation cell Fixed ring permeability cell
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*Items with .x or .xx require a size indication.

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ASTM D2435 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2216, D2487, D2488, D3550, D3740, D4186, D4318, D4452, D4546, D6026

Standard Test Method for One-Dimension Consolidation Properties of Soil Using Incremental Loading

Qty.	Model	Description
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Dead Weight Consolidation Using Analog Transducer

1	HM-1100A	Dead weight consolidation frame-front loader
1	HM-112x*	Weight set, 16 TSF
1	HM-2310.04	Strain transducer 0.4" (10mm)
1	HM-2310BR	Strain transducer bracket
1	HM-5320.3F	miniLogger 4-channel, analog data acquisition
1	HM-5100SW	HMTS consolidation reporting software

Dead Weight Consolidation Using Digital Indicators

1	HM-1100A	Dead weight consolidation frame-front loader
1	HM-112x*	Weight set, 16 TSF
1	HM-4470.10	Digital indicator 1" x 0.0001" (25 x 0.002 mm)
1	HM-4469C	Data cable for indicator
1	HM-5330.3F	miniLogger 4-channel, digital data acquisition
1	HM-5100SW	HMTS consolidation reporting software

Consolidation Cells (all methods)

1	Choose one: HM-1210.xx* HM-1220.xx* HM-1230.xx*	Floating ring consolidation cell Fixed ring consolidation cell Fixed ring permeability cell
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Additional Tools

1		Set of trimming equipment and tools (see page 51)
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
4	H-4927	Aluminum moisture boxes, 2.47" (63mm) dia. by 1.75" (44mm)
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) capacity, 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) capacity, 230V 50/60Hz
1	HM-4173	Length comparator with digital indicator 1" (25mm) range accurate to 0.0001" (0.002mm) accuracy
1	HM-1220.xx.4	Calibration Disk

*Items with .x or .xx require a size indication.

ASTM D2488

Related Standards: ASTM D653, D1452, D1586, D1587, D2113, D2487, D3740, D4083, AASHTO M145

Description and Identification of Soil (Visual-Manual Procedure)

Qty.	Model	Description
1	H-4200	Humboldt soil penetrometer
1	H-4212	Torvane shear strength testing set, plastic
1	H-4368A	Soil color charts, munsell soil color charts

ASTM D2573

Related Standards: ASTM D1587, D2166, D2488, D3740, D4648, D5434, D5783, D6151

Standard Test Method for Field Vane Shear Test in Cohesive Soil

Qty.	Model	Description
1	H-4227	Vane Inspection set
1	H-4227.1	Extension rod, 0.5 meter
1	Choose one: H-4227.2 H-4221	Vane blade, 50.8 x 101.6 mm Geovane soil shear strength tester
1	H-4221.1	Vane blade, 33mm
1	H-4221.2A	Extension rod, 12"
1	H-4221.3A	Extension rod, 19.7"
1	H-4221.4	Extension rod adapter

ASTM D2850

Related Standards: ASTM D427, D653, D854, D1587, D2166, D2216, D2487, D2488, D3740, D4220, D4318, D4753, D4767, D6062

Standard Test Method for Unconsolidated - Undrained Triaxial Compression Test on Cohesive Soils

Qty.	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf) , 110/220V 50/60Hz
1	HM-4199B	Triaxial cell 3" (75mm) dia. capacity
1	HM-4199.xx*	Top cap/ base pedestal set
1	HM-2300.xx*	Load cell
1	HM-2310.20	Displacement transducer 2" (25mm) (LSCT)
1	HM-200387	Mounting ball seat adapter
1	HM-4178BRT	Displacement transducer bracket
1	HM-5003SW	CU triaxial software module
1	HM-4154	Pressure distribution panel for automated system, 1-cell
1	HM-3130	Sample trimmer
1	HM-3175	Wire saw
1	HM-3130.xx*	Sample trimmer top platen
1	HM-4186.xx*	Sample length trimmer with knife
1	HM-4173	Length comparator for length
1	Choose one: HM-4174 HM-4174M	Precision diameter tape, 0.75" to 7" Precision diameter tape, 28 to 200mm
2	HM-4179.xx*	Acrylic disk
1	HM-4180.xx*	Latex membranes
1	HM-4181.xx*	Membrane stretcher
1	HM-4182.xx*	O-Rings
1	HM-4183.xx*	O-Ring placing tool
1	HM-4189.xx	Filter Paper

*Items with .x or .xx require a size indication.

NOTE: Items specified for ASTM D2216 also required

ASTM D2937

Related Standards: ASTM D698, D1557, D1587, D2216, D2488, D3740, D4643, D4753, D4944, D4959, D6026

Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method

Qty.	Model	Description
1	Choose one: H-4203.3 H-4203.4	Density drive sampler, 3" (76.2mm) drive head Density drive sampler, 4" (101.6mm) drive head
1	H-4203DT.3	Drive tube for use with H-4203.3
1	H-4203DT.4A	Drive tube for use with H-4203.4
1	H-4144.8	Straight edge, .125" x 1.25" x 8" (3 x 32 x 203 mm)
1	H-4982	Round-point shovel

Additional Items

1	H-4208	Plastic-lined sample bags 10" x 18" (254 x 357mm)
1	H-4184A	Sample cans 1 gal. (3.48L)
1	Choose one: HB-4533A HB-4533A.4F	Adam core balance with case, 2600g x 0.1g, 120V 60Hz Adam core balance with case, 2600g x 0.1g, 120V 60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	H-2816.8	Digital caliper 0 - 8" (0-200mm)

ASTM D3080

Related Standards: ASTM D422, D653, D698, D1557, D1587, D2216, D2435, D2487, D2488, D3740, D4220, D4318, D4753, D6026, D6027

Standard Test Method for Direct Shear Test of Soils Under Consolidated Drained Conditions

Qty.	Model	Description
1	HM-5760.3F	Pneumatic direct/residual shear apparatus 110/220V 50/60Hz
1	HM-2701.xx(S/D)*	Shear box assembly (S-square and D-round sample)
1	HM-2300.xxx*	S-type load cells
1	HM-2702.xx(S/D)*	Shear box cutter
1	HM-2703.xx(S/D)*	Dolly/tamper
1	HM-5700SW	HMTS direct shear reporting software

Dead Weight Loading Units

1	Choose one: HM-5750.3F HM-5750M.3F HM-5750A.3F HM-5750D.3F	Direct/residual shear, standard controller, 120/220V 50/60Hz Direct/residual shear, standard controller, 120/220V 50/60Hz Direct/residual shear, analog controller, 120/220V 50/60Hz Direct/residual shear, digital controller, 120/220V 50/60Hz
1	HM-2751.xx(S/D)*	Shear box assembly (S-square and D-round sample)
1	HM-2702.xx(S/D)*	Shear box cutter
1	HM-2703.xx(S/D)*	Dolly/tamper
1	HM-1120x*	Weight set (5 optional sets)
1	HM-5700SW	HMTS direct shear reporting software (for both systems)
1	HM-2755.xxS* HM-1220.xx.4*	Calibration disk, square Calibration disk, round
1	Choose one: HB-4961 HB-4961.4F	Ohaus navigator xl balance, 2100g x 0.1g, 120V 60Hz Ohaus navigator xl balance, 2100g x 0.1g, 220V 50/60Hz
1	HM-3175	Wire saw for sample trimming with replacement wire
1	H-4144.8	Straight edge, .125" x 1.25" x 8" (3 x 32 x 203 mm)
12	H-4929	Water content cans 3.5" dia. x 2" height
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	HM-4198	Vacuum grease

*Items with .x or .xx require a size indication.

ASTM D3282

Related Standards: ASTM D420, D421, D422, D653, D1140, D1452, D1586, D1587, D2217, D4318, AASHTO M 145

Standard Practice for Classification of Soil and Soil-Aggregate Mixtures for Highway Construction Purposes

From ASTM D421

Qty.	Model	Description
1	Choose one: HB-5322A HB-5322A.4F	Ohaus adventurer balance, 2,100g x 0.1g capacity, 120V 60Hz Ohaus adventurer balance, 2,100g x 0.1g capacity, 220V 50/60Hz
1	H-4257	Heavy porcelain soil mortar
1	H-4258	Rubber-tipped soil pestle
1	H-3920FS4	8" dia. brass frame sieve, # 4 SS mesh
1	H-3920FS10	8" dia. brass frame sieve, #10 SS mesh
1	H-3920FS40	8" dia. brass frame sieve, # 40 SS mesh
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Choose one: Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz
1	H-3964	Soil sample splitter

From ASTM D422

Qty.	Model	Description
1	Choose one: H-4260A H-4260A.4F	Soil dispersion mixer, 120V 60Hz Soil dispersion mixer, 230V 50/60 Hz
1	H-4247	Sodium hexametaphosphate
1	Choose one: H-4239A H-4239A.4F	Hydrometer jar bath, 20.5 gal. (77.6 L), 120V, 60Hz Hydrometer jar bath, 20.5 gal. (77.6 L), 220V, 50/60Hz
8	Choose one: H-4241 H-4242	Soil hydrometer A Soil hydrometer B
8	H-4244	Hydrometer jars

ASTM D3282 (contd.)

Related Standards: ASTM D420, D421, D422, D653, D1140, D1452, D1586, D1587, D2217, D4318, AASHTO M 145

Standard Practice for Classification of Soil and Soil-Aggregate Mixtures for Highway Construction Purposes

Qty.	Model	Description
1	H-3575A	Timer
1	HT-4052U	Long-Stem digital thermometer, accuracy 0.2° C
1	Choose one: HB-4713A HB-4713A.4F	Electronic balance, 1000g x 0.01g capacity, 120V 60Hz Electronic balance, 1000g x 0.01g capacity, 220V 50/60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz

ASTM D3385

Related Standards: ASTM D653, D1452, D2216, D2488, D3740, D5093

Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer

Qty.	Model	Description
1	HM-4502	Double ring infiltrometer
1	H-4975	Rubber mallet, 2.1 lb.
1	H-2260	Stop watch
1	H-4901	Tape measure, 16.4' (5m)
1	H-4983	Square-point shovel
1	HT-4135	Digital thermometer, -58 to 752°F (-50 to 400°C) accuracy 0.01°C below 200°C, 0.1°C above 200°C

ASTM D3551

Related Standard: ASTM D653, D2216, D3740

Standard Practice for Laboratory Preparation of Soil-Lime Mixture Using Mechanical Mixer

Qty.	Model	Description
1	Choose one: HB-4961 HB-4961.4F	Ohaus navigator xl balance, 2100g x 0.1g, 120V 60Hz Ohaus navigator xl balance, 2100g x 0.1g, 220V 50/60Hz
1	Choose one: H-3839 H-3839.2F H-3839.5F	Mixer, 5 qt. (4.73L), 120V 60 Hz Mixer, 5 qt. (4.73), 230V 60Hz Mixer, 5 qt. (4.73L), 230 V 50Hz
1	H-4906	Spatula 6" long, straight-edge, 7/8" wide
1	H-3738	Stainless steel scoop
1	H-3760	Trowel 2.75" x 5" (70 x 127mm)

ASTM D3877

Related Standards: ASTM C51, D427, D653, D698, D854, D1452, D1557, D2216, D2435, D3551, D3740, D4943, D6026

Standard Test Methods for One-Dimensional Expansion, Shrinkage, and Uplift Pressure of Soil-Lime Mixture

Qty.	Model	Description
1	HM-1230.xx*	Consolidation cell with base drainage feature
1	H-4160B	Manual compaction hammer

*Items with .x or .xx require a size indication.

NOTE: Items required for test method D2435 with manual loading and displacement readings

ASTM D4219

Related Standards: ASTM D2166, D3740, D4320, D6026, E4

Standard Test Method for Unconfined Compressive Strength Index of Chemical- Grouted Soils

Qty.	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf) , 110/220V 50/60Hz
1	HM-2002	Upper unconfined platen
1	HM-3000.10.2	Displacement indicator platform
1	HM-3000.10.1	Displacement indicator rod
1	HM-2300.005	Load cell, 500 lbf (2.5kN)
1	HM-2310.20	LSCT, 2.0" (50mm)
1	HM-4178BRT	LSCT mounting bracket
1	HM-3130	Soil sample trimmer, 1.0" to 3.0"
1	HM-3130.xx*	Sample trimmer top platen
1	HM-3175	Wire saw
1	HM-4186.xx*	Sample length trimmer, with knife to trim sample ends
1	HM-4173	Length comparator
1	Choose one: HM-4174 HM-4174M	Precision diameter tape, 0.75" to 7" Precision diameter tape, 28 to 200mm*

*Items with .x or .xx require a size indication.

ASTM D4253

Related Standards: ASTM C127, D422, D653, D698, D854, D1140, D1557, D2216, D2487, D2488, D3740, D4254, D4753, E11, E177, E691

Standard Test Method for Maximum Index Density and Unit Weight of Soil Using Vibratory Table

Qty.	Model	Description
1	Choose one: H-30140 H-30140.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	H-3920CS3.000	8" dia. brass frame sieve, 3" SS mesh
1	H-3920CS1.500	8" dia. brass frame sieve, 1.5" SS mesh
1	H-3920CS.750	8" dia. brass frame sieve, 0.75" SS mesh
1	H-3920CS.375	8" dia. brass frame sieve, 0.375" SS mesh
1	H-3920FS4	8" dia. brass frame sieve, #4 SS mesh
1	H-3920FS10	8" dia. brass frame sieve, #10 SS mesh
1	H-3920FS200	8" dia. brass frame sieve, #200 SS mesh
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz
1	Choose one: H-3750.2F H-3750.5F	Relative density of cohesion less soils apparatus 230V 60Hz Relative density of cohesionless soils apparatus, 230V 50Hz
1	Choose one: HB-4961 HB-4961.4F	Ohaus navigator xl balance, 2100g x 0.1g, 120V 60Hz Ohaus navigator xl balance, 2100g x 0.1g, 220V 50/60Hz

ASTM D4254

Related Standards: ASTM C127, D422, D653, D698, D854, D1140, D1557, D2216, D2487, D2488, D3740, D4254, D4753, E11, E177, E691

Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density

Qty.	Model	Description
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	H-3920CS3.000	8" dia. brass frame sieve, 3" SS mesh
1	H-3920CS1.500	8" dia. brass frame sieve, 1.5" SS mesh
1	H-3920CS.750	8" dia. brass frame sieve, 0.75" SS mesh
1	H-3920CS.375	8" dia. brass frame sieve, 0.375" SS mesh
1	H-3920FS4	8" dia. brass frame sieve, #4 SS mesh
1	H-3920FS10	8" dia. brass frame sieve, #10 SS mesh
1	H-3920FS200	8" dia. brass frame sieve, #200 SS mesh
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz
1	Choose one: HB-4961 HB-4961.4F	Ohaus navigator xl balance, 2100g x 0.1g, 120V 60Hz Ohaus navigator xl balance, 2100g x 0.1g, 220V 50/60Hz

ASTM D4318

Related Standards: C702, D75, D420, D653, D1241, D2216, D2487, D3282, D3740, D4542, D4753, D6026, E11, E177, E691, AASHTO T89, T90

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

Qty.	Model	Description
1	Choose one: H-4234	ASTM liquid limit test set, includes: H-4230, manual, liquid limit machine w/o counter, mixing dish, spatula, graduated cylinder and moisture cans
	H-4235	ASTM liquid limit test set, H-4228, manual, liquid limit machine with counter, mixing dish, spatula, graduated cylinder, and moisture cans

or

1	Choose one: H-4230	ASTM liquid limit machine
	H-4228	ASTM liquid limit machine with counter
	H-4226 H-4226.5F	ASTM liquid limit machine, motorized, 120V 60Hz ASTM liquid limit machine, motorized, 220V 50/60Hz
1	H-4253	ASTM plastic limit set, plastic limit plate, mixing dish, spatula, graduated cylinder and moisture cans
1	H-4233	Resiliency tester, for testing base every 90 days
1	H-4222D	Durometer, for testing feet of base

Options

1	H-4232	AASHTO liquid limit metal grooving tool
1	H-4229P	Plastic ASTM grooving tool
1	H-4262	Plastic limit roller and 50 sheets of paper for surface
1	Choose one: H-5315A	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz
	H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
1	H-4926	Aluminum moisture boxes 2" (51mm) dia. x 7/8" (22mm) Height
1	Choose one: H-30145	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz
	H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz

ASTM D4373

Reference Standards: ASTM C25, D653, D3740, D4753, D6026, E143

Test Method for Rapid Determination of Carbonate Content of Soils

Qty.	Model	Description
1	HM-4501	Calcium carbonate analyzer
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	H-17300	Mortar and pestle

Other Items required:

Hydrochloric Acid

Reagent Grade Calcium Carbonate

ASTM D4643

Related Standards: ASTM D2216, D4753, D6026

Determination of Water Content of Soil by Microwave Oven Heating

Qty.	Model	Description
1		Microwave oven
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
4	H-4930.765	Porcelain evaporating dishes
1	H-4962	Desiccator
1	H-3743.10	Hot mill gloves
1	Choose one: H-1758 H-1761	Indicating drierite desiccant, 1 lb. / 8 mesh Indicating drierite desiccant, 5 lb. / 8 mesh

ASTM D4644

Related Standards: ASTM D2113, D2216, D5079, E11

Test Method for Slake Durability of Shales and Similar Weak Rock

Qty.	Model	Description
1	Choose one: HM-4100 HM-4100.5F	Slake durability apparatus, 120V 60Hz Slake durability apparatus, 220V 50Hz
2	HM-4100.1	Wire mesh drums, Set of 2
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
1	H-3800	Mold cleaning brush, with brass bristles
1	H-4893	Rock hammer, with chisel edge

Note: Items for ASTM D2216, below, are also required

Qty.	Model	Description
24	H-4927	Aluminum moisture boxes, 8.4 cu. in. (137 cc)
1	H-4973	Preparation knife, sharp blade and thin blade, 6" long
1	H-4906	Straight-edge spatula, 7/8" x 6" long blade
1	H-3730	Aluminum scoop square nose, 6" long x 3.75" width
1	HM-3175	Wire saw
1	H-3746	Heat resistant gloves
1	H-4359A	Bakalon rectangular mixing pan, 18" x 13" x 1.875"
1	H-4962	Desiccab desiccator, 13" x 13" x 13.25"
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz

ASTM D4647

Related Standards: ASTM D422, D698, D1193, D2216, D2487, D2488, D4221, D4318, D4753

Test Method for Identification of Dispersive Clay Soils by Pinhole Test

Qty.	Model	Description
1	HM-3930	Pin hole dispersion apparatus
1	H-4915.010	Graduated cylinder 10ml
1	H-4915.025	Graduated cylinder 25 ml
1	H-4915.050	Graduated cylinder 50ml
1	H-4915.100	Graduated cylinder 100ml
1	H-2260	Stopwatch
1	H-4165	Harvard miniature compaction apparatus
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz

ASTM D4767

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2850, D3740, D4220, D4318, D4753, D6026

Consolidated Undrained Triaxial Compression Test for Cohesive Soil

Automatic Pressure Control System for 1-Cell Setup

Qty	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf) , 110/220V 50/60Hz
1	HM-2300.020	Load cell
1	HM-2310.20	Strain transducer 2" (50mm) (LSCT)
1	HM-200387	Mounting-ball seat adapter
1	HM-4178BRT	Displacement transducer bracket
1	HM-5003SW	CU triaxial software module
1	HM-4154	Pressure distribution panel
2	HM-4151A	Air/water bladder
1	HM-5240.3F	Pressure controller
1	HM-4187A.3F	De-airing system
1	HM-4170	Pore pressure transducer
1	Choose one: HM-4220 HM-4220.4F	Silent air compressor, 115V 50/60Hz Silent air compressor, 220V 50/60Kz
1	Choose one: H-1763A H-1763A.4F	Vacuum pump, 120V 60Hz Vacuum pump, 220V 50/60Hz
1	HM-2315	Volume change apparatus
1	HM-2310.10	Displacement transducer, 1" (25mm)
1	HM-2310BR	LSCT/LVDT bracket
1	HM-4199B	Triaxial cell, up to 3" (75mm) capacity
1	HM-4199.xx*	Top cap/base pedestal set
1	HM-4167	Triaxial installation kit (see page 54 for contents)

*Items with .x or .xx require a size indication.

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ASTM D4767 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2850, D3740, D4220, D4318, D4753, D6026

Consolidated Undrained Triaxial Compression Test for Cohesive Soil

Automatic Pressure Control System for 3-Cell Setup

Qty	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf) ,110/220V 50/60Hz
1	HM-2300.020	Load cell
1	HM-2310.20	Strain transducer 2" (50mm) (LSCT)
1	HM-200387	Mounting-ball seat adapter
1	HM-4178BRT	Displacement transducer bracket
1	HM-5003SW	CU triaxial software module
1	HM-4155	Pressure distribution panel
6	HM-4151A	Air/water bladder
3	HM-5240.3F	Pressure controller
1	HM-4187A.3F	De-airing system
3	HM-4170	Pore pressure transducer
1	HM-5320.3F	miniLogger, 120/220V 50/60Hz
1	Choose one: HM-4220 HM-4220.4F	Silent air compressor, 115V 50/60Hz Silent air compressor, 220V 50/60Kz
1	Choose one: H-1763A H-1763A.4F	Vacuum pump, 120V 60Hz Vacuum pump, 220V 50/60Hz
3	HM-2315	Volume change apparatus
3	HM-2310.10	Displacement transducer, 1" (25mm)
3	HM-2310BR	LSCT/LVDT bracket
3	HM-4199B	Triaxial cell, up to 3" (75mm) capacity
3	HM-4199.xx*	Top cap/base pedestal set (specify specimen size)
3	HM-4167	Triaxial installation kit (see page 54 for contents)

*Items with .x or .xx require a size indication.

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ASTM D4767 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2850, D3740, D4220, D4318, D4753, D6026

Consolidated Undrained Triaxial Compression Test for Cohesive Soil

Manual Pressure Control System for 1-Cell Setup

Qty	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf), 110/220V 50/60Hz
1	HM-2300.020	Load cell
1	HM-2310.20	Strain transducer 2" (50mm) (LSCT)
1	HM-200387	Mounting-ball seat adapter
1	HM-4178BRT	Displacement transducer bracket
1	HM-5003SW	CU triaxial software module
1	Choose one: HM-4164.3F HM-4164M.3F	Pressure distribution panel, 120/220V 50/60Hz Pressure distribution panel (kPa), 120/220V 50/60Hz
2	HM-4151A	Air/water bladder
1	HM-4187A.3F	De-airing system
1	HM-4170	Pore pressure transducer
1	Choose one: HM-4220 HM-4220.4F	Silent air compressor, 115V 50/60Hz Silent air compressor, 220V 50/60Kz
1	Choose one: H-1763A H-1763A.4F	Vacuum pump, 120V 60Hz Vacuum pump, 220V 50/60Hz
1	HM-2315	Volume change apparatus
1	HM-2310.10	Displacement transducer, 1" (25mm)
1	HM-2310BR	LSCT/LVDT bracket
1	HM-4199B	Triaxial cell, up to 3" (75mm) capacity
1	HM-4199.xx*	Top cap/base pedestal set (specify specimen size)
1	HM-4167	Triaxial installation kit (see page 54 for contents)

*Items with .x or .xx require a size indication.

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ASTM D4767 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2850, D3740, D4220, D4318, D4753, D6026

Consolidated Undrained Triaxial Compression Test for Cohesive Soil

Manual Pressure Control System for 3-Cell Setup

Qty	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf) ,110/220V 50/60Hz
1	HM-2300.020	Load cell
1	HM-2310.20	Strain transducer 2" (50mm) (LSCT)
1	HM-200387	Mounting ball seat adapter
1	HM-4178BRT	Displacement transducer bracket
1	HM-5003SW	CU triaxial software module
1	Choose one: HM-4165.3F HM-4165M.3F	Pressure distribution panel, 120/220V 50/60Hz Pressure distribution panel (kPa), 120/220V 50/60Hz
6	HM-4151A	Air/water bladder
1	HM-4187A.3F	De-airing system
3	HM-4170	Pore pressure transducer
1	HM-5320.3F	miniLogger, 120/220V 50/60Hz
1	Choose one: HM-4220 HM-4220.4F	Silent air compressor, 115V 50/60Hz Silent air compressor, 220V 50/60Kz
1	Choose one: H-1763A H-1763A.4F	Vacuum pump, 120V 50/60Hz Vacuum pump, 220V 50/60Hz
3	HM-2315	Volume change apparatus
3	HM-2310.10	Displacement transducer, 1" (25mm)
3	HM-2310BR	LSCT/LVDT bracket
3	HM-4199B	Triaxial cell, up to 3" (75mm) capacity
3	HM-4199.xx*	Top cap/base pedestal set (specify specimen size)
3	HM-4167	Triaxial installation kit (see page 54 for contents)

*Items with .x or .xx require a size indication.

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ASTM 4767 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2850, D3740, D4220, D4318, D4753, D6026

Consolidated Undrained Triaxial Compression Test for Cohesive Soil

FlexPanel Pressure Control System, 1-Cell Setup

Qty	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf) , 110/220V 50/60Hz
1	HM-2300.020	Load cell
1	HM-2310.20	Strain transducer 2" (50mm) (LSCT)
1	HM-200387	Mounting ball seat adapter
1	HM-4178BRT	Displacement transducer bracket
1	HM-5003SW	CU triaxial software module
1	Choose one: HM-4150.3F HM-4150M.3F	Pressure control panel, 1-cell, psi, 110/220V 50/60Hz Pressure control panel, 1-cell, kPa, 110/220V 50/60Hz
1	HM-4187A.3F	De-airing system
1	HM-4170	Pore pressure transducer
1	Choose one: HM-4220 HM-4220.4F	Silent air compressor, 115V 50/60Hz Silent air compressor, 220V 50/60Kz
1	Choose one: H-1763A H-1763A.4F	Vacuum pump, 120V 60Hz Vacuum pump, 220V 50/60Hz
1	HM-2315	Volume change apparatus
1	HM-2310.10	Displacement transducer, 1" (25mm)
1	HM-2310BR	LSCT/LVDT bracket
1	HM-4199B	Triaxial cell, up to 3" (75mm) capacity
1	HM-4199.xx*	Top cap/base pedestal set (specify specimen size)
1	HM-4167	Triaxial installation kit (see page 54 for contents)

*Items with .x or .xx require a size indication.

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ASTM 4767 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2850, D3740, D4220, D4318, D4753, D6026

Consolidated Undrained Triaxial Compression Test for Cohesive Soil

FlexPanel Pressure Control System, 3-Cell Setup

Qty	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf), 110/220V 50/60Hz
1	HM-2300.020	Load cell
1	HM-2310.20	Strain transducer 2" (50mm) (LSCT)
1	HM-200387	Mounting ball seat adapter
1	HM-4178BRT	Displacement transducer bracket
1	HM-5003SW	CU triaxial software module
1	Choose one: HM-4150.3F HM-4150M.3F	Pressure control panel, 1-cell, psi, 110/220V 50/60Hz Pressure control panel, 1-cell, kPa, 110/220V 50/60Hz
1	HM-4160A	Pressure distribution auxiliary panel, 2-cell
3	HM-4170	Pore pressure transducer
1	HM-5320.3F	miniLogger, 120/220V 50/60Hz
1	Choose one: HM-4220 HM-4220.4F	Silent air compressor, 115V 50/60Hz Silent air compressor, 220V 50/60Kz
1	Choose one: H-1763A H-1763A.4F	Vacuum pump, 120V 50/60Hz Vacuum pump, 220V 50/60Hz
3	HM-2315	Volume change apparatus
3	HM-2310.10	Displacement transducer, 1" (25mm)
3	HM-2310BR	LSCT/LVDT bracket
3	HM-4199B	Triaxial cell, up to 3" (75mm) capacity
3	HM-4199.xx*	Top cap/base pedestal set (specify specimen size)
3	HM-4167	Triaxial installation kit (see page 54 for contents)

ASTM 4767 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2850, D3740, D4220, D4318, D4753, D6026

Consolidated Undrained Triaxial Compression Test for Cohesive Soil

Triaxial Sample Prep Accessory Kit

Qty.	Model	Description
2	HM-4179.xx*	Acrylic base disk
1	HM-4180.xx*	Membranes
1	HM-4181.xx*	Membrane stretcher
1	HM-4182.xx*	O-Rings (12-pack)
1	HM-4183.xx*	O-Ring placing tool
2	HM-4184.xx*	Porous stone
1	HM-4185.xx*	Membrane tester
1	HM-3818.xx*	2-Part compaction mold
1	HM-3827.xx*	2-Part vacuum split mold
1	HM-3847.xx*	Split miter box
1	HM-4189.xx*	Filter paper (100-pack)
1	HM-4189FS	Filter strips
1	HM-4198	High vacuum grease

*Items with .x or .xx require a size indication.

Trimming Tools

1	HM-3130	Soil sample trimmer, 1.0" to 3.0" dia.
1	HM-3130.xx*	Sample trimmer top platen
1	HM-4182.xx*	Sample length trimmer with knife
1	HM-4173	Length comparator for length
1	HM-4174	Precision diameter tape, 0.75" to 7"

*Items with .x or .xx require a size indication.

ASTM D4829

Related Standards: ASTM D698, D854, D2216, D2435, D3740, D3877, D4753, D6026, E11, E145

Standard Test Method for Expansion Index of Soils

Qty.	Model	Descriptions
1	HM-5405	Expansion index consolidometer
1	H-4471	Dial indicator for consolidometer
1	HM-3701	Compaction hammer
1	Choose one: H-30140 H-30140.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	H-4144.8	Straight edge 8" length with one beveled edge
1	H-4144.8	8" dia. brass frame sieve, #4 SS mesh
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz
1	Choose one: HB-5322A HB-5322A.4F	Ohaus adventurer balance, 2200g x 0.01g, 120V 60Hz Ohaus adventurer balance, 2200g x 0.01g, 220V 50/60Hz
1	Choose one: H-3839 H-3839.2F H-3839.5F	Mixer, 5 qt. (4.73L), 120V 60 Hz Mixer, 5 qt. (4.73), 230V 60Hz Mixer, 5 qt. (4.73L), 230 V 50Hz
1	H-4906	Spatula 6" long, straight-edge, 7/8" wide
1	H-3738	Stainless steel scoop
1	H-3760	Trowel 2.75" x 5" (70x 127mm)
10	H-4928	Aluminum moisture boxes 3" (76mm) dia. and 1" (25mm) height

ASTM D4914

Related Standards: ASTM C127, C566, D653, D698, D1556, D1557, D2167, D2216, D3740, D4253, D4254, D4718, D4753, D5030, D6026, E11

Standard Test Methods for Density and Unit Weight of Soil and Rock in Place by the Sand Replacement Method in a test Pit

Qty.	Model	Description
1	Choose one: HB-4533A HB-4533A.4F	Adam core balance, 2600g x 0.1g, with case, 120V 60Hz Adam core balance, 2600g x 0.1g, with case, 220V 50/60Hz
1	Choose one: HB-4964 HB-4964.4F	Ohaus navigator xl balance, 20,000g x 1g, 120V 60Hz Ohaus navigator xl balance, 20,000g x 1g, 220V 50/60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	H-3912CS3.000	Brass 12" (305mm) sieve 3" (75mm) height with 3" (75mm) stainless steel mesh
1	H-3922FS4	Brass 12" (305mm) sieve 2" (75mm) height with #4 stainless steel mesh
1	H-3922P	12" x 2" Sieve bottom pan
1	H-3912BC	12" Sieve cover with ring handle
1	Choose one: H-4330 H-4330.2F H-4330.5F	Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz
2	H-3821	Density sand
1	H-4983	Square-point shovel
1	H-4905A	Dura-soft chisel
1	H-4893	Hammer 20 oz. rock pick with chisel edge
5	H-4208	Plastic-lined sample bags
1	H-3735	Stainless steel scoop, with flat nose

ASTM D4943

Related Standards: ASTM C670, C702, D75, D420, D653, D854, D3740, D4318, D4753, D6026, E11

Standard Test Method for Shrinkage Factors of Soils by the Wax Method

Qty.	Model	Description
1	Choose one: HB-4702A HB-4702A.4F	Digital balance, 820g x 0.001g, 120V 60Hz Digital balance, 820g x 0.001g, 220V 50/60Hz
4	H-4256	Monel shrinkage dish
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	H-4257	Soil mortar
1	H-4258	Soil pestle rubber tip
1	H-3912FS40	Brass sieve 12" (305mm) with #40 (0.425mm) SS mesh
1	H-4960	Desiccator jar for humidity enclosure
1	H-4144.8	8" Straightedge, 0.125" x 1.25" x 8" (3 x 32 x 203mm)
1	H-3049	Glass Plate, 4" x 4" x 3/16" (102.6 x 101.6 x 4.8mm)
1	HT-4353U	Long stem digital thermometer, -58 to 572°F (9150 to 300° C)
1	Choose one: H-4952 H-4952.4F	Hotplate, 120V 60Hz Hotplate, 230V 50/60Hz
1	H-4911.250	Glass Beaker, 250 ml

ASTM D4944

Related Standards: ASTM D2216, D4753, D6026, E11, E177, E691, AASHTO T217

Standard Test Method for Field Determination of Water Content of Soil by the Calcium Carbide Gas Pressure Tester

Qty.	Model	Description
1	H-4967	Speedy 2000 moisture tester (20g)
1	H-4965A	Calibration kit, speedy moisture tester
1	H-4966	Moisture tester reagent, 24 – 1 lb. (0.5g) containers

ASTM D4959

Related Standards: ASTM D2216, D4753, D6026

Standard Test Method for Determination of Water Content of Soil by Direct Heating

Qty.	Model	Description
1	H-4947AC	Gas hotplate, two-burner used with gas cylinders
1	Choose one: HB-4961 HB-4961.4F	Digital balance, 2100g x 0.1g, 120V 60Hz (AA batteries) Digital balance, 2100g x 0.1g, 220V 50/60Hz (AA batteries)
4	H-3969	Mixing pan stainless steel
1	H-3734	Scoop stainless steel
1	H-4974	Mixing spoon
1	H-3746	Heat resistant glove
1	H-4973	Knife

Related Standards: ASTM D1193, G51

Standard Test Method for pH of Soils

Qty.	Model	Description
1	Choose one: HO-4930 HO-4940	Waterproof, pH/mV and Temperature pH Meter pH and Temperature pH Meter
1	H-4360A.4	Buffer solution pH 4.01
1	H-4360A.7	Buffer solution pH 7.00

ASTM D5080

Related Standards: ASTM D653, D698, D1556, D1557, D2167, D2216, D2937, D3740, D4718, D6026, D6938

Standard Test Method for Rapid Determination of Percent Compaction

Qty.	Model	Description
1	H-4915.100	Graduated glass cylinder, 100ml
1	Choose one: H-3839 H-3839.2F H-3839.5F	Mixer 5qt. (4.73L), 120V 60Hz Mixer 5qt. (4.73L), 230V 60Hz Mixer 5qt. (4.73L), 230V 50Hz
1	H-3922FS4	12" (305mm) brass sieve 2" (75mm) height with #4 stainless steel mesh

Also needed:

Equipment required for determining in-place density by one of following standards: D1556, D2167, D6938, D2937, D7698

Equipment for compaction, see method D698

ASTM D5084

Related Standards: ASTM D698, D854, D1140, D1557, D2216, D2434, D2435, D4220, D4318, D4753, D4767, E177

Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

Qty.	Model	Description
1	Choose one: HM-4150.3F HM-4150M.3F	Pressure control panel, 1-cell, psi, 110/220V 50/60Hz Pressure control panel, 1-cell, kPa, 110/220V 50/60Hz
1	Choose one: HM-4188B HM-4199B	Permeability cell Triaxial cell
1	Choose one: HM-4188.xx* HM-4199.xx*	Cap/base pedestal set for permeability cell Cap/base pedestal set for triaxial cell
1	HM-4184.xx*	Porous stone
1	HM-4180.xx*	Membranes
1	HM-4181.xx*	Membrane stretcher
1	HM-4182.xx*	O-Rings
1	HM-4189.xx*	Filter paper
1	HM-4198	High-vacuum grease
1	HM-3847.xx*	Split miter box
1	HM-4173	Length comparator
1	HM-3130	Soil sample trimmer
1	HM-3130.xx*	Trimmer, top platen
1	HM-3175	Wire saw
1	HM-4174	Precision diameter tape
1	HM-4175	Digital pore pressure set
1	H-3575A	Digital timer clock
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
1	HM-4187A.3F	De-airing water system
1	Choose one: H-1763A H-1763A.4F	High-vacuum pump, 120V 60Hz High-vacuum pump, 220V 50/60Hz

*Items with .x or .xx require a size indication.

ASTM D5102

Related Standards: C977, D653, D698, D2166, D2216, D2488, D3551, D3740, D4753, D6026

Standard Test Methods for Unconfined Compressive Strength of Compacted Soil-Lime Mixture

Qty.	Model	Description
24	H-4927	Aluminum moisture boxes, 8.4 cu. in. (137 cc)
1	H-4973	Preparation knife, 6" long
1	H-4906	Straight-edge spatula, 7/8" x 6" long blade
1	H-3730	Aluminum scoop square nose, 6" long x 3.75" width
1	HM-3175	Wire saw
1	H-3746	Heat resistant glove
1	H-4359A	Bakalon rectangular mixing pan, 18" x 13" x 1.875"
1	H-4962	Desiccab desiccator, 13" x 13" x 13.25"
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
1	H-4160B	Manual Compaction Hammer
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz

For Procedure A

1	H-4142	Compaction split mold, 2.8" ID x 4" height
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ASTM D5102 (contd.)

Related Standards: C977, D653, D698, D2166, D2216, D2488, D3551, D3740, D4753, D6026

Standard Test Methods for Unconfined Compressive Strength of Compacted Soil-Lime Mixture

For Procedure B

Qty.	Model	Description
1	Choose one: H-4169 H-4169.4F H-4160B H-4173	Mechanical compactor, automatic, 120V 60Hz Mechanical compactor, automatic, 220V 50/60Hz Compaction hammer, manual Army corps of engineers hammer
1	H-4169CK	Calibration Kit for H-4169 Automatic Mechanical Compactor
1	Choose one: H-4141 H-4225 H-4162 H-4161A	Standard proctor density/moisture, 4" mold Standard proctor density/moisture, 4" split mold Modified proctor density/moisture, 6" mold Modified proctor density/moisture, 6" split mold
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz
1	Choose one: H-4155A H-4150 H-4150.4F	Hand-operated sample ejector Motorized sample ejector, 120V 50/60Hz Motorized sample ejector, 220V 50/60Hz
1	H-4144.12	Straight edge 0.125" X 1.25" X 12"
1	H-3700	Mixing pan galvanized iron rolled-top edges, 18" x 18" x 1.5" d
1	H-4974	Spoon for mixing
12	H-4929	Aluminum moisture boxes, 3.5" (89 mm) dia. and 2" (51mm) ht.
1	H-3920CS.750	8" dia. brass frame sieve, 0.75" SS mesh
1	H-3920CS.375	8" dia. brass frame sieve, 0.375" SS mesh
1	H-3920FS4	8" dia. brass frame sieve, # 4 SS mesh

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ASTM D5102 (contd.)

Related Standards: C977, D653, D698, D2166, D2216, D2488, D3551, D3740, D4753, D6026

Standard Test Methods for Unconfined Compressive Strength of Compacted Soil-Lime Mixture

Optional For Procedure B

Qty.	Model	Description
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz
1	Choose one: H-4215 H-4215.2F H-4215.5F	Rapid soil processor, 120V 60Hz Rapid soil processor, 220V 60Hz Rapid soil processor, 220V 50Hz
1	Choose one: H-4199 H-4199.5F	Soil grinder, 120V 60Hz Soil grinder, 220V 50Hz
1	Choose one: H-3839 H-3839.2F H-3839.5F	Mixer, 5-qt. (4.73L), 120V 60Hz Mixer, 5-qt. (4.73L), 230V 60Hz Mixer, 5-qt. (4.73L), 230V 50Hz

ASTM D5333

Related Standards: ASTM D653, D2216, D2435, D3740, D4829, D6026

Test Method for Measurement of Collapse Potential of Soil

Qty.	Model	Description
1	HM-5470.3F	ConMatic IPC, automated consolidation system, 120/220V 50/60Hz (includes the next four items)
1	HM-2300.020	S-type load cell 2,000 lbs (10kN) with 3/4" adapter
1	HM-2310.10	Linear strain transducer, 1.0" (25mm)
1	HM-2310BR	Linear strain transducer bracket
1	HM-5100SW	HMTS consolidation software module
1	HM-1220.xx*	Fixed-ring consolidation cell

Pneumatic Consolidation Using Dial Gauges

1	HM-5470.3F	ConMatic, 32 TSF, 120/220V 50/60Hz
1	H-4471CC	Dial gauge, 0.5" x 0.0001" CC
1	HM-1220.xx	Fixed-ring consolidation cell

Pneumatic Consolidation Using Analog Transducers

1	HM-5470.3F	ConMatic, 32 TSF, 110/220 50-60Hz
1	HM-1220.xx*	Fixed-ring consolidation cell
1	HM-2310.04	Strain transducer 0.4" (10mm)
1	HM-2310BR	Strain transducer bracket
1	HM-5320.3F	miniLogger 4-channel, analog data acquisition
1	HM-5100SW	HMTS consolidation reporting software

Pneumatic Consolidation Using Digital Indicators

1	HM-5470.3F	ConMatic, 32 TSF, 110/220 50-60Hz
1	HM-1220.xx*	Fixed-ring consolidation cell
1	HM-4470.10	Digital indicator 1" x 0.0001" (25x0.002 mm)
1	HM-4469C	Data cable for indicator
1	HM-5330.3F	miniLogger 4-channel, digital data acquisition
1	HM-5100SW	HMTS consolidation reporting software

Dead Weight Consolidation Using Dial Gauges

1	HM-1100A	Dead-weight consolidation frame
1	HM-112x*	Weight set, 16 TSF
1	HM-1220.xx*	Fixed-ring consolidation cell
1	H-4471CC	Dial gauge, 0.5" x 0.0001" CC

*Items with .x or .xx require a size indication.

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ASTM D5333 (contd.)

Related Standards: ASTM D653, D2216, D2435, D3740, D4829, D6026

Test Method for Measurement of Collapse Potential of Soil

Qty.	Model	Description
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Dead Weight Consolidation Using Analog Transducer

1	HM-1100A	Dead weight consolidation frame-front loader
1	HM-112x*	Weight set, 16 TSF
1	HM-2310.04	Strain transducer 0.4" (10mm)
1	HM-2310BR	Strain transducer bracket
1	HM-5320.3F	miniLogger 4-channel, analog data acquisition
1	HM-5100SW	HMTS consolidation reporting software

Dead Weight Consolidation Using Digital Indicators

1	HM-1100A	Dead weight consolidation frame-front loader
1	HM-112x*	Weight set, 16 TSF
1	HM-4470.10	Digital indicator 1" x 0.0001" (25 x 0.002 mm)
1	HM-4469C	Data cable for indicator
1	HM-5330.3F	miniLogger 4 channel digital data acquisition
1	HM-5100SW	HMTS consolidation reporting software

Consolidation Cells (all methods)

1	Choose one: HM-1210.xx* HM-1220.xx* HM-1230.xx*	Floating ring consolidation cell Fixed ring consolidation cell Fixed ring permeability cell
1	HM-1220.XX.4	Calibration disk

Additional Tools

1		Set of trimming equipment and tools (see page 51)
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
4	H-4927	Aluminum moisture boxes, 2.47" (63mm) dia. by 1.75" (44mm)
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) capacity, 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) capacity, 230V 50/60Hz
1	HM-4173	Length comparator with digital indicator 1" (25mm) range accurate to 0.0001" (0.002mm) accuracy

*Items with .x or .xx require a size indication.

ASTM D5446

Related Standards: ASTM D422, D653, D698, D854, D1557, D1587, D2216, D2435, D3550, D3740, D3877, D4220, D4318, D4718, D4753, D6026, E145

Standard Test Methods for One-Dimensional Swell or Collapse of Cohesive Soils

Qty.	Model	Description
1	HM-5470.3F	ConMatic IPC, automated consolidation system, 120/220V 50/60Hz
1	HM-2300.020	S-type load cell 2,000 lbs (10kN) with 3/4" adapter
1	HM-2310.10	Linear strain transducer, 1.0" (25mm)
1	HM-2310BR	Linear strain transducer bracket
1	HM-5100SW	HMTS consolidation software module
1	HM-1220.xx*	Fixed-ring consolidation cell

Pneumatic Consolidation Using Dial Gauges

1	HM-2432A.3F	ConMatic, 32 TSF, 120/220V 50/60Hz
1	H-4471CC	Dial gauge, 0.5" x 0.0001" CC
1	HM-1220.xx*	Fixed-ring consolidation cell

Pneumatic Consolidation Using Analog Transducers

1	HM-2432A.3F	ConMatic, 32 TSF, 110/220 50-60Hz
1	HM-1220.xx*	Fixed-ring consolidation cell
1	HM-2310.04	Strain transducer 0.4" (10mm)
1	HM-2310BR	Strain transducer bracket
1	HM-5320.3F	miniLogger 4-channel, analog data acquisition
1	HM-5100SW	HMTS consolidation reporting software

Pneumatic Consolidation Using Digital Indicators

1	HM-2432A.3F	ConMatic, 32 TSF, 110/220 50-60Hz
1	HM-1220.xx*	Fixed-ring consolidation cell
1	HM-4470.10	Digital indicator 1" x 0.0001" (25x0.002 mm)
1	HM-4469C	Data cable for indicator
1	HM-5330.3F	miniLogger 4-channel, digital data acquisition
1	HM-5100SW	HMTS consolidation reporting software

Dead Weight Consolidation Using Dial Gauges

1	HM-1100A	Dead-weight consolidation frame
1	HM-1120	Weight set, 16 TSF
1	HM-1220.xx*	Fixed-ring consolidation cell
1	H-4471CC	Dial gauge, 0.5" x 0.0001" CC

*Items with .x or .xx require a size indication.

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ASTM D5446 (contd.)

Related Standards: ASTM D422, D653, D698, D854, D1557, D1587, D2216, D2435, D3550, D3740, D3877, D4220, D4318, D4718, D4753, D6026, E145

Standard Test Methods for One-Dimensional Swell or Collapse of Cohesive Soils

Qty.	Model	Description
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Dead Weight Consolidation Using Analog Transducer

1	HM-1100A	Dead-weight consolidation frame
1	HM-112x*	Weight set, 16 TSF
1	HM-2310.04	Strain transducer 0.4" (10mm)
1	HM-2310BR	Strain transducer bracket
1	HM-5320.3F	miniLogger 4-channel, analog data acquisition
1	HM-5100SW	HMTS consolidation reporting software

Dead Weight Consolidation Using Digital Indicators

1	HM-1100A	Dead weight consolidation frame-front loader
1	HM-112x*	Weight set, 16 TSF
1	HM-4470.10	Digital indicator 1" x 0.0001" (25x0.002 mm)
1	HM-4469C	Data cable for indicator
1	HM-5330.3F	miniLogger 4-channel, digital data acquisition
1	HM-5100SW	HMTS consolidation reporting software

Consolidation Cells (all methods)

1	Choose one: HM-1210.xx* HM-1220.xx* HM-1230.xx*	Floating-ring consolidation cell Fixed ring consolidation cell Fixed-ring permeability cell
1	HM-1220.XX.4	Calibration disk

Additional Tools

1		Set of trimming equipment and tools (see page 54)
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
4	H-4927	Aluminum moisture boxes, 2.47" (63mm) dia. by 1.75" (44mm)
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) capacity, 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) capacity, 230V 50/60Hz
1	HM-4173	Length comparator with digital indicator 1" (25mm) range accurate to 0.0001" (0.002mm) accuracy

*Items with .x or .xx require a size indication.

ASTM D5856

Related Test Standards: ASTM D698, D854, D1557, D2216, D2434, D4753, D5084, D145

Test Method for Determination of Hydraulic Conductivity of Porous Material Using a Rigid-wall Compaction-Mold Permeameter

Qty.	Model	Description
1	Choose one: H-4145 H-4146 HM-3913 HM-3914 HM-3915	Compaction permeameter, 4" Compaction permeameter, 6" Shelby tube permeameter, 2" Shelby tube permeameter, 2.5" Shelby tube permeameter, 3"
1	Choose one: HM-5860 HM-5861	Manometer tube stand, wall mount Manometer tube stand, free standing

ASTM D5873

Related standards: C805, D420, D653, D3740, D4543, D4879, D7012

Standard Test Method for Determination of Rock Hardness by Rebound Hammer method

Qty.	Model	Description
1	H-2975.ROCN	Schmidt hammer, type I
1	H-2972	Calibration anvil
1	H-2975.27	Grinding stone

ASTM D6023

Related Standards: ASTM C29/29M, C125, C128, C138/C138M, C150, C231, D653, D3740, 4832, D5971, D6024, D6026, D6103

Standard Test Method for Density (Unit Weight), Yield, Cement Content, and Air Content (Gravimetric) of Controlled Low-Strength Material (CLSM)

Qty.	Model	Description
1	Choose one: H-3660.1 H-3663.1 H-3661.1 H-3662.1	Unit weight measure, 1/10 cu.ft. (2.8 liter) Unit weight measure, 1/3 cu.ft. (9.3 liter) Unit weight measure, 1/2 cu.ft. (14.1 liter) Unit weight measure, 1 cu.ft. (28.3 liter)
1	Choose one: H-3669.1P H-3669.4P H-3669.2P H-3669.3P	Strike-off plate for 1/10 cu.ft. (2.8 liter) measure Strike-off plate for 1/3 cu.ft. (9.3 liter) measure Strike-off plate for 1/2 cu.ft. (14.1 liter) measure Strike-off plate for 1 cu.ft. (28.3 liter) measure
1	H-1702	Material handling scoop
1	Choose one: HB-3535 HB-3535.4F	High-capacity balance, 35,000g x 0.1g 120V 60Hz High-Ccapacity bBalance, 35,000g x 0.1g 220V 50/60Hz

ASTM D6024

Related Standards: ASTM C125, D653, D3740, D4832, D6023, D6026, D6103

Standard Test method for Ball Drop on Controlled Low Strength Material (CLSM) to Determine Suitability for Load Application

Qty.	Model	Description
1	H-3655.D6024	Ball drop apparatus (Kelly Ball)
1	H-3656	Carrier for ball drop apparatus

ASTM D6035

Related Standards: ASTM D653, D1587, D2113, D2216, D3740, D4220, D4753, D5084, D6026, E145

Standard Test Method for Determining the Effect of Freeze-Thaw on Hydraulic Conductivity of Compacted or Intact Soil Specimens Using a Flexible Wall Permeameter

Qty.	Model	Description
1	Choose one: HM-4150.3F HM-4150M.3F	Pressure control panel, 1-cell, psi, 110/220V 50/60Hz Pressure control panel, 1-cell, kPa, 110/220V 50/60Hz
1	Choose one: HM-4188B HM-4199B	Permeability cell Triaxial cell
1	Choose one: HM-4188.xx* HM-4199.xx*	Cap/base pedestal set for permeability cell Cap/base pedestal set for triaxial cell
1	HM-4184.xx*	Porous stone
1	HM-4180.xx*	Membranes
1	HM-4181.xx*	Membrane stretcher
1	HM-4182.xx*	O-Rings
1	HM-4189.xx*	Filter paper
1	HM-4198	High-vacuum grease
1	HM-3847.xx*	Split miter box
1	HM-4173	Length comparator
1	HM-3130	Soil sample trimmer
1	HM-3130.xx*	Trimmer top platen
1	HM-3175	Wire saw
1	Choose one: HM-4174 HM-4174M	Precision diameter tape, 0.75 to 7" Precision diameter tape, 28 to 200mm
1	HM-4175	Digital pore pressure set
1	H-3575A	Digital timer clock
1	Choose one: HB-5315AC HB-5315AC.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
1	HM-4187A.3F	De-airing water system
1	H-1763A	High-vacuum pump

*Items with .x or .xx require a size indication.

ASTM D6276

Related Standards: ASTM C51, C977, D421, D1193, D1293, D2216, D3740, D4753, E11, E145

Standard Test Method for Using pH to Estimate the Soil-Lime Proportion Requirement for Soil Stabilization

Qty.	Model	Description
1	Choose one: HO-4930 HO-4940	Waterproof, pH/mV and Temperature pH Meter pH and Temperature pH Meter
1	H-4360A.12	Buffer solution pH 12.45
1	Choose one: HB-5315AC HB-5315AC.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
1	H-3920FS40	8" dia. brass frame sieve, #40 SS mesh
1	Choose one: H-30115 H-30115.4F	1.14 cu. ft. (32L) Forced-air oven, 437°F (225°C), 120V 60Hz 1.14 cu. ft. (32L) Forced-air oven, 437°F (225°C), 220V 50/60Hz

ASTM D6473

Related Standards: ASTM C127, D653, D3740, D4753, D4992, E145

Standard Test method For Specific Gravity and Adsorption of Rock for Erosion Control

Qty.	Model	Description
1	Choose one: H-2713B H-2713B.4F	Specific gravity bench set, 120V 60Hz Specific gravity bench set, 220V 50/60Hz
1	Choose one: H-3351 H-3353 H-3371	Sample container, cylindrical 10" x 4" dia. (254x102mm) made with #4 mesh Sample container, cylindrical 5.5" x 4" dia. (140 x 102mm) made with #8 mesh Sample container, cylindrical 8" x 8" dia. (203x 203) made with #8 mesh, reinforced construction
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) cap., 230V 50/60Hz

ASTM D6758

Related Standards: ASTM D653, D698, D1557, D2216, D3740, D4220, D4643, D4944, D4959

Standard Test Method for Measuring Stiffness and Apparent Modulus of Soil and Soil-Aggregate In-Place by Electro-Mechanical Method

Qty.	Model	Description
1	H-4140	GeoGauge, measures in-place engineering properties
1	H-4140.20	Verifier mass, 10Kg
1	H-4140.C	Calibration platen, 10Kg
1	H-4140.12	Infrared data cable

ASTM D6913

Related Standards: ASTM C136, C702, D422, D653, D1140, D1557, D2216, D2487, D2488, D3740, D4318, D4753, D5519, D6026, E11, E177, E691, AASHTO 11, 27, 88

Particle-Size Distribution (Gradation) of Soil Using Sieve Analysis

Qty.	Model	Description
1	H-3920CS3.000	8" dia. brass frame sieve, 3" SS mesh
1	H-3920CS2.000	8" dia. brass frame sieve, 2" SS mesh
1	H-3920CS1.500	8" dia. brass frame sieve, 1.5" SS mesh
1	H-3920CS1.000	8" dia. brass frame sieve, 1" SS mesh
1	H-3920CS.750	8" dia. brass frame sieve, 0.75" SS mesh
1	H-3920CS.375	8" dia. brass frame sieve, 0.374" SS mesh
1	H-3920FS4	8" dia. brass frame sieve, #4 SS mesh
1	H-3920FS10	8" dia. brass frame sieve, #10 SS mesh
1	H-3920FS20	8" dia. brass frame sieve, #20 SS mesh
1	H-3920FS40	8" dia. brass frame sieve, #40 SS mesh
1	H-3920FS60	8" dia. brass frame sieve, #60 SS mesh
1	H-3920FS100	8" dia. brass frame sieve, #100 SS mesh
1	H-3920FS140	8" dia. brass frame sieve, #140 SS mesh
1	H-3929FS200	8" dia. brass frame sieve, #200 SS mesh
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz

ASTM D6938

Related Standards: ASTM D698, D1556, D1557, D2167, D2487, D2488, D2216, D2937, D3740, D4253, D4254, D4643, D4718, D4944, D4959, D6026, D7013

Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

Qty.	Model	Description
1	Choose one: HS-5001SD121	Humboldt SD moisture density gauge, measures to 12" (300mm) in 1" (25mm) increments
	HS-5001SD122	Humboldt SD moisture density gauge, measures to 12" (300mm) in 2" (50mm) increments
	HS-5001SD081	Humboldt SD moisture density gauge, measures to 8" (200mm) in 1" (25mm) increments
	HS-5001SD082	Humboldt SD moisture density gauge, measures to 8" (200mm) in 2" (50mm) increments
	HS-5001EZ081	Humboldt EZ moisture density gauge, measures to 8" (200mm) in 1" (25mm) increments
	HS-5001EZ082	Humboldt EZ moisture density gauge, measures to 8" (200mm) in 2" (50mm) increments
	HS-5001EZ121	Humboldt EZ moisture density gauge, measures to 12" (300mm) in 1" (25mm) increments
	HS-5001EZ122	Humboldt EZ moisture density gauge, measures to 12" (300mm) in 2" (50mm) increments
1	HS-200130	Drill rod
1	HS-200145	Drill rod extraction tool
1	HS-200127	Scrape plate/rod guide
1	HS-000176	Double-faced hammer, 4 lbs.
1	Choose one: HS-200177	Leak test kit, 10-pack
	HS-200185	Leak test kit, 2-pack
1	HS-200313	Infrared RS232 data cable and software for EZ Gauge
1	HS-001057	Caution radioactive material sign, 8" x 10"
1	HS-2000820	Nuclear gauge security restraint, cable security
1	HS-000177	Padlock

ASTM D7100

Related Standards: ASTM: D698, D854, 8, D1125, D1293, D1429, D1498, D1557, D1587, D1889, D2216, D2435, D3550, D3740, D3977, D4128, D4220, D4327, D4448, D4691, D4696, D4700, D4753, D4767, D4972, D5084, D5673, D5790, D6001, D6026, D6151, D6286, D6517, D6519, D6919, E70, E691

Standard Test Method for Hydraulic Conductivity Compatibility Testing of Soils with Aqueous Solutions

Qty.	Model	Description
2	HM-4190	Toxic interface unit

ASTM D7181

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2487, D2850, D3740, D4220, D4318, D4753, D4767, D6026, 7263

Standard Test Method for Consolidated Drained Triaxial Compression Test for Soils

Automatic System for 1-Cell

Qty	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf) ,110/220V 50/60Hz
1	HM-2300.xx*	Load cell
1	HM-2310.20	Displacement transducer 2" (50mm) (LSCT)
1	HM-200387	Mounting ball seat adapter
1	HM-4178BRT	Displacement transducer bracket
1	HM-5003SW	CU triaxial software module
1	HM-4154	Pressure distribution panel for automated system, 1-cell
2	HM-4151A	Air/water bladder
1	HM-5240.3F	Pressure controller
1	HM-4187A.3F	De-airing system
1	HM-4170	Pore pressure transducer
1	Choose one: HM-4220 HM-4220.4F	Silent air compressor, 115V 50/60Hz Silent air compressor, 220V 50/60Kz
1	Choose one: H-1763A H-1763A.4F	High-vacuum pump, 120V 60Hz High-vacuum pump, 220V 50/60Hz
1	HM-2315	Volume change apparatus
1	HM-2310.10	Displacement transducer, 1" (25mm)
1	HM-2310BR	LSCT/LVDT bracket

Triaxial Cell Setups

1	Choose one: HM-4199B HM-4199B-4	3" (75mm) dia. capacity 4" (100mm) dia. capacity
1	HM-4199.xx*	Top cap/ base pedestal set
1	HM-4167	Installation kit

*Items with .x or .xx require a size indication.

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ASTM D7181 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2487, D2850, D3740, D4220, D4318, D4753, D4767, D6026, 7263

Standard Test Method for Consolidated Drained Triaxial Compression Test for Soils

Automatic Pressure Control System, 3-Cell Setup

Qty.	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf), 110/220V 50/60Hz
1	HM-2300.xx*	Load cell
1	HM-2310.20	Displacement transducer 2" (50mm) (LSCT)
1	HM-200387	Mounting ball seat adapter
1	HM-4178BRT	Displacement transducer bracket
1	HM-5003SW	CU triaxial software module
1	HM-4155	Pressure distribution panel for automated system, 3-cell
6	HM-4151A	Air/water bladder
3	HM-5240.3F	Pressure controller
1	HM-4187A.3F	De-airing system
3	HM-4170	Pore pressure transducer
1	HM-5320.3F	miniLogger 4-channel, analog data acquisition
1	Choose one: HM-4220 HM-4220.4F	Silent air compressor, 115V 50/60Hz Silent air compressor, 220V 50/60Kz
1	Choose one: H-1763A H-1763A.4F	High-vacuum pump, 120V 60Hz High-vacuum pump, 220V 50/60Hz
3	HM-2315	Volume change apparatus
3	HM-2310.10	Displacement transducer, 1" (25mm)
3	HM-2310BR	LSCT/LVDT bracket

Triaxial Cell Setups

3	Choose one: HM-4199B HM-4199B-4	3" (75mm) dia. capacity 4" (100mm) dia. capacity
3	HM-4199.xx*	Top cap/ base pedestal set
3	HM-4167	Installation kit

*Items with .x or .xx require a size indication.

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ASTM D7181 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2487, D2850, D3740, D4220, D4318, D4753, D4767, D6026, 7263

Standard Test Method for Consolidated Drained Triaxial Compression Test for Soils

Manual Pressure Control System, 1-Cell Setup

Qty.	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf) ,110/220V 50/60Hz
1	HM-2300.xx*	Load cell
1	HM-2310.20	Displacement transducer 2" (50mm) (LSCT)
1	HM-200387	Mounting ball seat adapter
1	HM-4178BRT	Displacement transducer bracket
1	HM-5003SW	CU triaxial software module
1	Choose one: HM-4164.3F HM-4164M.3F	Pressure distribution panel, manual control, 1-cell, psi Pressure distribution panel, manual control, 1-cell, kPa
2	HM-4151A	Air/water bladder
1	HM-4187A.3F	De-airing system
1	HM-4170	Pore pressure transducer
1	Choose one: HM-4220 HM-4220.4F	Silent air compressor, 115V 50/60Hz Silent air compressor, 220V 50/60Kz
1	Choose one: H-1763A H-1763A.4F	High-vacuum pump, 120V 60Hz High-vacuum pump, 220V 50/60Hz
1	HM-2315	Volume change apparatus
1	HM-2310.10	Displacement transducer, 1" (25mm)
1	HM-2310BR	LSCT/LVDT bracket

Triaxial Cell Setups

1	Choose one: HM-4199B HM-4199B-4	3" (75mm) dia. capacity 4" (100mm) dia. capacity
1	HM-4199.xx*	Top cap/ base pedestal set
1	HM-4167	Installation kit

*Items with .x or .xx require a size indication.

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ASTM D7181 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2487, D2850, D3740, D4220, D4318, D4753, D4767, D6026, 7263

Standard Test Method for Consolidated Drained Triaxial Compression Test for Soils

Manual Pressure Control System, 3-Cell Setup

Qty.	Model	Description
1	Choose one: HM-5030.3F HM-2900.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf), 110/220V 50/60Hz
1	HM-2300.xx*	Load cell
1	HM-2310.20	Displacement transducer 2" (50mm) (LSCT)
1	HM-200387	Mounting ball seat adapter
1	HM-4178BRT	Displacement transducer bracket
1	HM-5003SW	CU triaxial software module
1	Choose one: HM-4165.3F HM-4165M.3F	Pressure distribution panel, manual control, 3-cell, psi Pressure distribution panel, manual control, 3-cell, kPa
6	HM-4151A	Air/water bladder
1	HM-4187A.3F	De-airing system
3	HM-4170	Pore pressure transducer
1	HM-5320.3F	miniLogger 4-channel, analog data acquisition
1	Choose one: HM-4220 HM-4220.4F	Silent air compressor, 115V 50/60Hz Silent air compressor, 220V 50/60Kz
1	Choose one: H-1763A H-1763A.4F	High-vacuum pump, 120V 60Hz High-vacuum pump, 220V 50/60Hz
3	HM-2315	Volume change apparatus
3	HM-2310.10	Displacement transducer, 1" (25mm)
3	HM-2310BR	LSCT/LVDT bracket

Triaxial Cell Setups

1	Choose one: HM-4199B HM-4199B-4	3" (75mm) dia. capacity 4" (100mm) dia. capacity
3	HM-4199.xx*	Top cap/ base pedestal set
3	HM-4167	Installation kit

*Items with .x or .xx require a size indication.

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ASTM D7181 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2487, D2850, D3740, D4220, D4318, D4753, D4767, D6026, 7263

Standard Test Method for Consolidated Drained Triaxial Compression Test for Soils

FlexPanel Pressure Control System, 1-Cell Setup

Qty.	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf), 110/220V 50/60Hz
1	HM-2300.xx*	Load cell
1	HM-2310.20	Displacement transducer 2" (50mm) (LSCT)
1	HM-200387	Mounting ball seat adapter
1	HM-4178BRT	Displacement transducer bracket
1	HM-5003SW	CU triaxial software module
1	Choose one: HM-4150.3F HM-4150M.3F	Pressure control panel, 1-cell, psi, 110/220V 50/60Hz Pressure control panel, 1-cell, kPa, 110/220V 50/60Hz
1	HM-4187A.3F	De-airing system
1	HM-4170	Pore pressure transducer
1	Choose one: HM-4220 HM-4220.4F	Silent air compressor, 115V 60Hz Silent air compressor, 220V 50/60Hz
1	Choose one: H-1763A H-1763A.4F	High-vacuum pump, 120V 60Hz High-vacuum pump, 220V 50/60Hz
1	HM-2315	Volume change apparatus
1	HM-2310.10	Displacement transducer, 1" (25mm)
1	HM-2310BR	LSCT/LVDT bracket

Triaxial Cell Setups

1	Choose one: HM-4199B HM-4199B-4	3" (75mm) dia. capacity 4" (100mm) dia. capacity
1	HM-4199.xx*	Top cap/ base pedestal set
1	HM-4167	Installation kit

*Items with .x or .xx require a size indication.

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ASTM D7181 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2487, D2850, D3740, D4220, D4318, D4753, D4767, D6026, 7263

Standard Test Method for Consolidated Drained Triaxial Compression Test for Soils

FlexPanel Pressure Control System, 3-Cell Setup

Qty.	Model	Description
1	Choose one: HM-5030.3F HM-5020.3F	Digital masterloader, 50kN (11000 lbf), 110/220V 50/60Hz Digital proloader, 15kN (3000 lbf) ,110/220V 50/60Hz
1	HM-2300.xx*	Load cell
1	HM-2310.20	Displacement transducer 2" (50mm) (LSCT)
1	HM-200387	Mounting ball seat adapter
1	HM-4178BRT	Displacement Transducer Bracket
1	HM-5003SW	CU triaxial software module
1	Choose one: HM-4150.3F HM-4150M.3F	Pressure control panel, 1-cell, psi, 110/220V 50/60Hz Pressure control panel, 1-cell, kPa, 110/220V 50/60Hz
1	HM-4160A	Pressure distribution auxiliary panel, 2-cell
1	HM-4187A.3F	De-airing System
3	HM-4170	Pore pressure transducer
1	HM-5320.3F	miniLogger 4-channel, analog data acquisition
1	Choose one: HM-4220 HM-4220.4F	Silent air compressor, 115V 60Hz Silent air compressor, 220V 50/60Hz
1	Choose one: H-1763A H-1763A.4F	High-vacuum pump, 120V 60Hz High-vacuum pump, 220V 50/60Hz
3	HM-2315	Volume change apparatus
3	HM-2310.10	Displacement transducer, 1" (25mm)
3	HM-2310BR	LSCT/LVDT bracket

Triaxial Cell Setups

1	Choose one: HM-4199B HM-4199B-4	3" (75mm) dia. capacity 4" (100mm) dia. capacity
3	HM-4199.xx*	Top cap/ base pedestal set
3	HM-4167	Installation kit

*Items with .x or .xx require a size indication.

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ASTM D7181 (contd.)

Related Standards: ASTM D422, D653, D854, D1587, D2166, D2216, D2435, D2487, D2850, D3740, D4220, D4318, D4753, D4767, D6026, 7263

Standard Test Method for Consolidated Drained Triaxial Compression Test for Soils

Triaxial Sample Prep Accessory

Qty.	Model	Description
2	HM-4179.xx*	Acrylic base disk
1	HM-4180.xx*	Membranes
1	HM-4181.xx*	Membrane stretcher
1	HM-4182.xx*	O-rings (12-pack)
1	HM-4183.xx*	O-ring placing tool
2	HM-4184.xx*	Porous stone
1	HM-4185.xx*	Membrane tester
1	HM-3818.xx*	2-part compaction mold
1	HM-3827.xx*	2-part vacuum split mold
1	HM-3847.xx*	Split miter box
1	HM-4189.xx*	Filter paper (100-pack)
1	HM-4189FS	Filter strips
1	HM-4198	High-vacuum grease

Trimming Tools

1	HM-3130	Soil sample trimmer, 1.0" to 3.0" dia.
1	HM-3130.xx*	Sample trimmer top platen
1	HM-4182.xx*	Sample length trimmer with knife
1	HM-4173	Length comparator for length
1	HM-4174	Precision diameter tape, 0.75" to 7"

*Items with .x or .xx require a size indication.

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ASTM D7263

Related Standards: ASTM D653, D698, D1557, D2166, D2216, D2488, D3740, D4220, D4318, D4753, D6026, E225

Standard Test Methods for Laboratory Determination of Density (Unit Weight) of Soil Specimen

Qty.	Model	Description
1	Choose one: H-5315A H-5315A.4F	Ohaus adventurer balance, 1520g x 0.01g, 120V 60Hz Ohaus adventurer balance, 1520g x 0.01g, 220V 50/60Hz
6	H-4927	Aluminum moisture boxes, 2.5" dia. and 1.75" height
1	Choose one: H-30145 H-30145.4F	Laboratory bench oven, 7.0 cu. ft. (198 L) capacity, 115V 60Hz Laboratory bench oven, 7.0 cu. ft. (198 L) capacity, 230V 50/60Hz
1	H-3353	Sample container, cylindrical 5.5" x 4" (140 x 102mm) with #8 mesh
1	H-2713B	Specific gravity bench set with tank, heater, circulator
1	HT-4132	RTD digital thermometer, -58 to 752°F (-50 to 400°C)
1	H-4210W	Wax
1	Choose one: H-2953 H-2953.4F	Melting pot, 4qt. (3.8L), 120V 60Hz Melting pot, 4qt. (3.8L), 220V 50/60Hz

ASTM D7382

Related Standards: ASTM C127, C136, C778, 422, D653, D698, D854, D1140, D1557, D2216, D2487, D2488, D3282, D3740, D4220, D4253, D4254, D4318, D4718, D4753, D6026, E11, E145

Determination of Maximum Dry Unit Weight and Water Content Range for Effective Compaction of Granular Soils Using a Vibrating Hammer

Qty.	Model	Description
1	H-4115	Vibration compaction hammer set, includes mold for Method B
1	H-4161A	6" Split compaction mold for Method A
1	HB-4831	150 lb (60kg) x 10g Ohaus Defender bench scale, can be used for Method A and B
1	H-3920CS3.000	8" dia. brass frame sieve, 3" SS mesh
1	H-3920CS1.500	8" dia. brass frame sieve, 1.5" SS mesh
1	H-3920CS.750	8" dia. brass frame sieve, 0.75" SS mesh
1	H-3920CS.375	8" dia. brass frame sieve, 0.375" SS mesh
1	H-3920FS4	8" dia. brass frame sieve, #4 SS mesh
1	H-3920FS200	8" dia. brass frame sieve, #200 SS mesh
1	H-3920P	8" x 2" Sieve bottom pan
1	H-3930BC	8" Sieve cover with ring handle
1	Choose one: H-4325 H-4325.2F H-4325.5F	Humboldt economy sieve shaker for 8" sieves, 120V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 60Hz Humboldt economy sieve shaker for 8" sieves, 220V 50Hz

Related Standards: G187, AASHTO T-288

Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method

Qty.	Model	Description
1	Choose one: H-4385 H-4385D	Resistivity meter, analog Resistivity meter, digital
1	H-4386	Soil box, 280 ml capacity
1	H-4386SM	Soil box, 75 ml capacity
1	H-4388	Resistivity test reel with soil pins
1	H-4387	Soil box leads, set of 4

ASTM G187

Related Standards: G57, AASHTO T-288

Standard Test Method for Measurement of Soil Resistivity Using the Two-Electrode Soil Box Method

Qty.	Model	Description
1	Choose one: H-4385 H-4385D	Resistivity meter, analog Resistivity meter, digital
1	H-4386	Soil box, 280 ml capacity
1	H-4386SM	Soil box, 75 ml capacity
1	H-4387	Soil box leads, set of 4
1	H-4385.5	Soil cylinder

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