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Testing Equipment for Construction Materials

HUMBOLDT

www.humboldtmfg.com

1.800.544.7220 • 708.468.6300

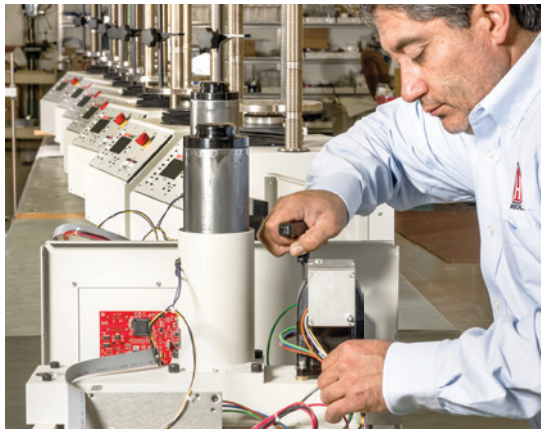
hmc@humboldtmfg.com

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

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

About Us

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



Facilities

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

Dealer Network

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

Testing Equipment For Construction Materials
HUMBOLDT

History

Humboldt began operations as a manufacturer of cement testing equipment in the Humboldt Park neighborhood of Chicago, IL — establishing from the beginning, a solid reputation for producing high-quality, scientific products, as well as providing excellent customer service. During World War II, Humboldt expanded its manufacturing operations to meet the demand for general laboratory equipment and began manufacturing a line of top-quality labware, which included Bunsen and high-temperature burners. These products were the beginning of Humboldt's general laboratory equipment line of laboratory burners, stands and clamps. In the past 50 years Humboldt has transformed into the company we are today, focused on the development, manufacturing and distribution of construction materials testing equipment, though the company still manufacturers a line of lab burners.

Quality

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

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

Service

Calibration and Repair

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

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

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

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

Cleaning concrete rebound hammer before reassembly and calibration

Calibrating a load ring on a NIST-traceable load frame

Load cell calibration matched to a specific load frame

Testing Equipment For Construction Materials
HUMBOLDT


HS-3001SD
HUMBOLDT
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Soil, Field

Testing Equipment For Construction Materials

HUMBOLDT

Nuclear Gauges

Choose from Two, High-Quality Gauge Models

Radiation Safety and Certification Classes

Learn quickly with these exclusive training courses.

Call 1.800.537.4183
or go to
www.humboldtscientific.com/classes.html

Humboldt Nuclear Gauges are available in two models: the SD and EZ Gauges. The SD Gauge, which provides more efficient operation, data collection and processing than any other gauge in its class. Using state-of-the-art technology, the SD gauge brings you a host of features aimed at making your job easier. Featuring a 4.3" touch-screen, the SD Gauge provides intuitive operation of all gauge operations. It also provides touch pad operation as an alternative control method. Our EZ gauge is easy to operate, easy to power and easy to service. The EZ gauge features a menu-driven control panel with easy-to-use, built-in test routines and auto features, making testing a quick and accurate operation. It also features our innovative trigger release handle that eliminates pinched fingers while providing smooth operation. Unlike some competitors, all Humboldt nuclear gauges are manufactured with 100% new parts. Humboldt Scientific also offers gauge calibration and repair services and is certified to ISO 17025 and NIST-traceable standards in 3 and 5-block calibrations. We also provide leak test analysis services, rental and disposal services and radiation safety and certification classes.

Choose from one of four SD configurations:

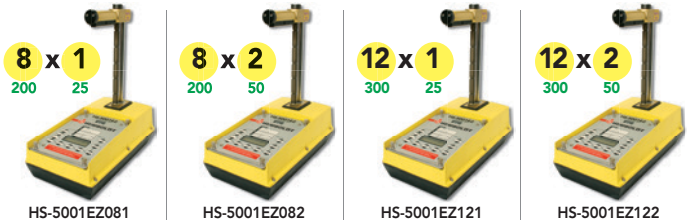
HS-5001SD121
Measure to 12" (300mm) depth in 1" (25mm) increments

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

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

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

Choose from one of four EZ configurations:



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

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

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

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

Testing Equipment for Construction Materials
HUMBOLDT
NUCLEAR GAUGES

HS-5001SD

HS-5001SD

Humboldt's NEW HS-5001SD Moisture/Density Gauge provides more efficient operation, data collection and processing than any other gauge in its class. Using state-of-the-art technology, the HS-50001SD brings you a host of new features aimed at making your job easier. Featuring a 4.3" touch-screen, the SD Gauge provides intuitive operation of all gauge operations. It also provides touch pad operation as an alternative control method.

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

Touch-Screen or Touch Pad—

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

Easy to Power—

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

NiMH

GPS—

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

WiFi Enabled —

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

USB Port—

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

Easy Self Repairs—

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

Nuclear Density Gauge

HS-5001EZ

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

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

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

HS-5001EZ

Easy to Operate—

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

Easy to Power—

The EZ is powered by six standard AA alkaline batteries, which provide up to 2000 hrs of service. No chargers are needed and you can buy batteries almost anywhere, including the corner convenience store.

Easy Self Repairs—

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

Radioactive Materials Data Needed for License Application

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

Radiological

Gamma Source	
Material, Type and Amount:	Cs-137, 370MBq (10mCi)
Special Form Registration:	USA/0356/S-96 Rev 12
ANSI and ISO Class:	ANSI 77C66535
Neutron Source	
Material, Type and Amount:	Am-241: Be, 1.48GBq (40mCi)
Neutron Yield:	70 Knps ±10%
Special Form Registration:	CZ/1009/S-96 Rev 1
ANSI and ISO Class:	ANSI 77C66545
Source	
Type:	Sealed Source, Special Form
Housing:	Stainless Steel, Double Encapsulated
Surface Dose Rates	18.7 mrem/hr Maximum (Neutron and Gamma)
Transit (shipping) Case	DOT 7A, Type A, Yellow II Label, O.2 TI

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

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

Dimensions/Weight

Gauge:	
Dimensions (base):	15.75" x 8.66" x 5.5" (400 x 220 x 140mm)
Handle Height:	18" or 21.5" (450 or 550mm)
Weight:	30 lbs (13.6kg)
Reference Standard:	
Dimensions:	25" x 7.8" x 3" (350 x 200 x 75mm)
Weight:	10 lbs (4.5kg)
Transit Case:	
Dimensions:	31" x 14" x 19.5" (787 x 356 x 495mm)
Weight:	31 lbs (11.8kg)
Accessory Case (loaded):	
Dimensions:	19.7" x 9.8" x 5" (500 x 250 x 125mm)
Weight:	16 lbs (7.3kg)
Total Shipping Weight:	90 lbs (41kg)

Specifications

Electrical

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

Mechanical

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

Nuclear Density Gauge

Tool Set
HS-200112

HS-000176

HS-200145

HS-200127

HS-200130

HS-200313

HS-200177

HS-001057

HS-200152

HS-001067

HS-200153

HS-000185

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

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

Drill Rod
Drill rod used to create hole for nuclear gauge to take reading.

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

Rod Extraction Tool
Tool used to extract drill rod from compacted soil.

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

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

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

Hammer, 4 lb., Double-Faced
Hammer used to drive Drill Rod into compacted soil.

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

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

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

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

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

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

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

Transit Label – Yellow II
DOT, Type 7A Radioactive materials transport label required for transporting nuclear density gauges.

Transit Label – Yellow II — HS-200153
Ship wt. 0.01lb (0.004kg)

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

Cargo Aircraft Only Label — HS-001067
Ship wt. 0.01lb (0.004kg)

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

Type A Label — HS-200152
Ship wt. 0.01lb (0.004kg)

Security Seal
Security seal for nuclear density gauge transport cases.

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

HS-200820

HS-200800— Boxes include mounting bracket

HS-130508

HS-130512

Security Restraint for Nuclear Gauge

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

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

Nuclear Gauge Containment System

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

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

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

Mounting Bracket for all NUX Boxes	HS-200801

Radiation Alert Monitor 200

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

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

Monitor 200 **HS-130508**
Monitor 200, NIST Traceable **HS-130508C**
Ship wt. 2lbs (0.9kg)

Radiation Survey Meter, Analog

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

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

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

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

Electrical Density Gauge

Electrical Density Gauge
ASTM D7698

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

Easy-to-use, the EDG can be used as a construction aid to monitor day-to-day compaction operations by providing performance and measurement results highly comparable to those achieved with traditional methods, including the nuclear gauge and/or a sand-cone and oven moisture test combination. When conducting a test, the EDG measures and displays the results for wet and dry density, gravimetric moisture content and percent compaction.

The advantages of using the EDG are:

- it does not require a highly-trained or licensed technician,
- it does not require special handling for shipping or the regulatory compliance for hazardous materials
- it is easy-to-learn and easy-to-use with its step-by-step menu
- lightweight and easily transportable
- it is accurate and repeatable with results that mirror known testing methods

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

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

Electrical Density Gauge

Power—

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

NiMH

GPS—

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

Blue-tooth Enabled—

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

USB Port—

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

EDG

Touch-Screen/Touch Pad—

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

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

During the testing procedure, four tapered electrodes (darts) are driven into the ground in a cross pattern using the supplied template. Between the two sets of two tapered darts, four point-to-point electrical measurements are made and the electrical characteristics averaged. The dielectric properties that are measured by the unit are compared to a "soil model", which has been developed and programed into the unit prior to testing. These soil models are required only once for each soil type. The soil model is used as a calibration reference during the testing procedure. It is developed by establishing a curve of measured dielectric properties for different densities and moisture combinations of the actual soil to be tested or a similar material. This soil model is used by the unit through a proprietary correction algorithm to automatically determine the wet and dry density, gravimetric moisture content and percent compaction values for the material being tested. Soil models can be named using the unified soil classifications listed in the drop-down menu or unique names can be entered using the alpha-numeric keypad. In addition, the temperature probe, which is inserted into the material being tested ensures accurate results by compensating for changes in recorded temperatures. Similar to nuclear gauges, proctor numbers for optimum compaction may be input into the gauge, which would allow for percent compaction to be automatically calculated and displayed at the end of each test. The Proctor numbers would be input into the gauge during the development of the soil model. When determined, this value is entered into the EDG to enable the computation of percent compaction.

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

Electrical Density Gauge

EDG Software

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

EDG Software Features

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

Darts for Electrical Density Gauge

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

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

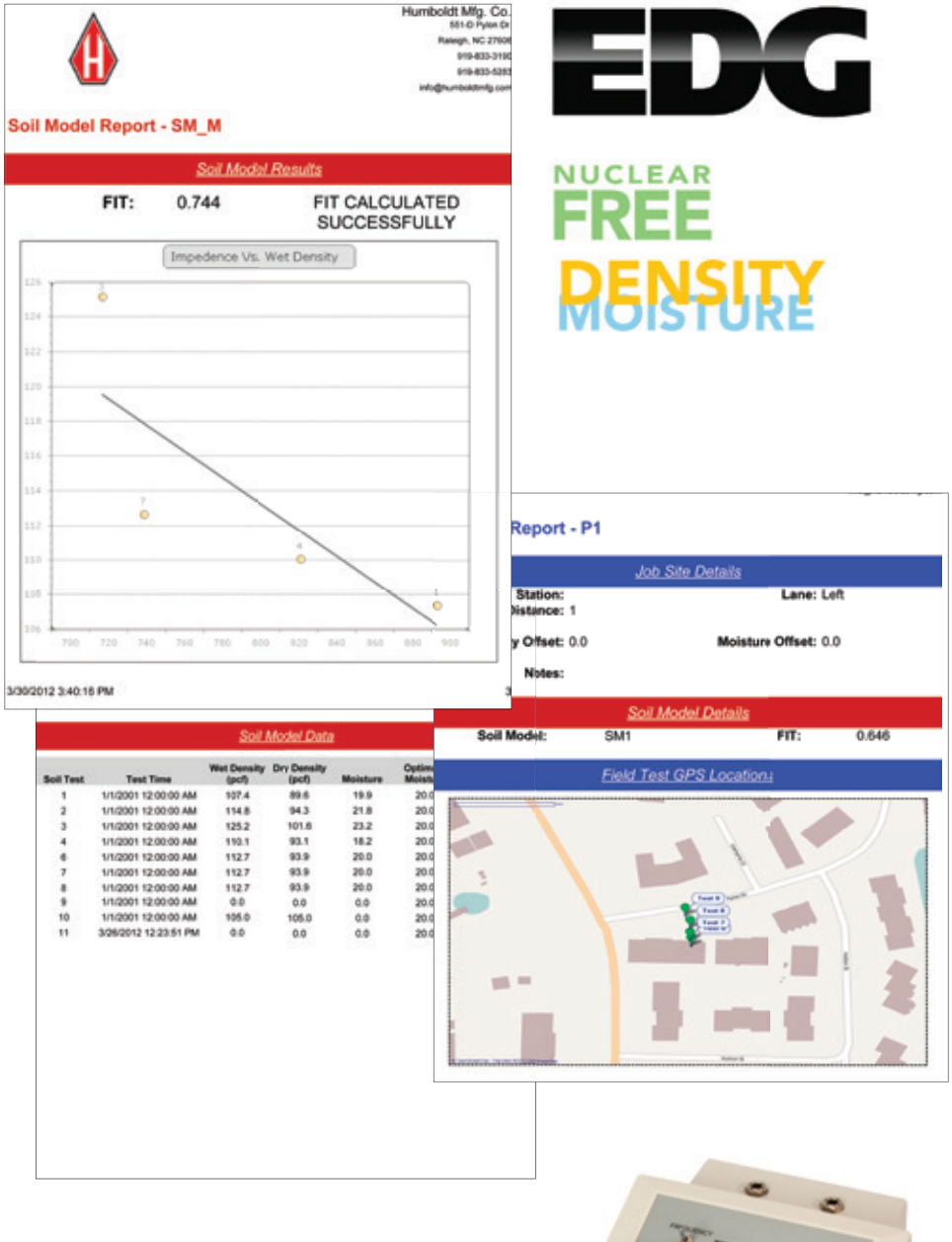
Shipping wt. 1.5 lbs (.68kg)

Calibration Verifier for EDG

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

Calibration Verifier for EDG	H-4114.MCU

Shipping wt. 4 lbs (1.8kg)



EDG
NUCLEAR FREE DENSITY MOISTURE

Darts for EDG

H-4114.MCU

HD-4139.3F

Static Plate Load Tester

ASTM D1194, D1195, D1196; DIN 1834; BS1377

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

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

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

The modulus of deformation Ev is determined from the load settlement line of the first load (Ev1) and the second load (Ev2). By comparing the initial deformation from Ev1 and the subsequent deformation of Ev2 provides an indication of the compaction attained.

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

The HD-4139.3F Plate Load tester features:

- Handy measuring instrument with extra large illuminated display, which is easily viewed in all light conditions and a thermal printer within a aluminum case
- Automatic data transfer, Data-Secure, error-free automatic interpretation
- intuitive menu navigation with a clearly arranged display
- Evaluation, displaying and printout immediately at the site shows Ev1, Ev2, Ev1/Ev2 and settlement curve
- PC-connection, Software for creation of professional test protocols
- USB interface for easy data transfer, GPS for accurate localization of the measuring point
- modular design provides flexibilty in use

Static Plate Load Tester — HD-4139.3F

Ship wt. 65lbs (29.4kg)

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

Printer Paper

Replacement paper for use with Plate Load Tester and LWD.

Printer Paper — HD-4129.5

Shipping wt. 2 lbs (0.9kg)

Lightweight Deflectometer

LIGHTWEIGHT **Deflectometer**

Fast, accurate and easy compaction control!

Areas of application:

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

HD-4129.3F

Lightweight Deflectometers

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

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

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

The HD-4129.3F features a deluxe controller that includes:

- a large, 3.5" colorful display
- light sensor-controlled backlighting that provides the optimum readability even in bright sunlight
- easy menu navigation
- integrated GPS
- integrated Bluetooth
- interface for a thermal printer and USB
- help function
- efficient and fast 32-bit processor
- internal memory for up to 1000 tests
- high-performance rechargeable battery

The graphic interface of the HD-4129.3F provides an intuitive menu, which guides the user through the testing procedure and provides real-time test results. Measured data is presented in tabular, as well as curve formats with date. time and GPS location clearly depicted. This data can be exported from the control unit via USB or Bluetooth directly into the Cloud or to your PC for archiving and further processing. This allows personnel in any office to have access to data while you are still on site testing. It is also possible to print out results to a small portable printer on site.

Lightweight Deflectometer

HD-4130.3F

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

Use of the web-based evaluation software: HMPre-port, provides the ability to produce professional reports for each measuring point, which can include your logo and contact details. This software allows you to work with your data from the Cloud or your PC. The software also enables you to store the data in a database with easy-to-use search and editing options.

Units include:

- The LWD
- magnetic base plate
- portable printer (USB)
- GPS
- PC Software
- Android App (HD-4129.3F and HD-4149.3F only)

Light Weight Deflectometer, 10kg, Deluxe	HD-4129.3F
Light Weight Deflectometer, 10kg, Standard	HD-4130.3F
Light Weight Deflectometer, 15kg, Deluxe	HD-4159.3F
Light Weight Deflectometer, 15kg, Standard	HD-4149.3F

Ship wt. 65lbs (29.4kg)

Transport Cart

Cart allows for easy moving of LWD.

Transport Cart HD-4129.01A

Shipping wt. 20 lbs (9kg)

Transport Case

Wooden case for storage and transport

Transport Case HD-4129.05A

Shipping wt. 25.7 lbs (11.7kg)

Printer Paper

Replacement paper for use with Plate Load Tester and LWD.

Printer Paper HD-4129.5

Shipping wt. 2 lbs (0.9kg)

HD-4129.01A

Electronic settlement measuring instrument	HD-4129.3F	HD-4119.3F
Settlement measuring range 0.1 bis 2.0 mm ± 0.02 mm	✓	✓
Measuring range Evd < 225 MN/m2	✓	✓
Temperature range 0 to 40 °C	✓	✓
Very robust, splash-water proof, connection cable with high-quality LEMO connectors	✓	✓
Graphic display in mm	56 x 73	38 x 68
Colorful, lightsensor-controlled and illuminated	✓	
Black/white		✓
Help function	✓	
Fast, efficient 32-bit processor	✓	
Bluetooth, USB, thermal printer interface	✓	✓
GPS	✓	✓
Dimensions in mm	210 x 100 x 31	211 x 100 x 26
Storage capacity, internal in measurement series	1000	500
Power supply:		
High-performance rechargeable lithium-polymer-battery 3.7 V, 6300 mAh	✓	
4 x R6 Batteries		✓
Menu navigation (18 languages available)	✓	✓
Loading Mechanism		
Total weight 15.0 kg	✓	✓
Drop weight 10.0 kg	✓	✓
Max. impact force 7.07 kN	✓	✓
Duration of impact 17.0 ± 1.5 ms	✓	✓
Material: zinc coated/hard-chrome plated steel	✓	✓
Spring element 17 disk springs	✓	✓
Load plate		
Diameter 300 mm, Plate thickness 20.0 mm	✓	✓
Total weight 15,0 kg, Material: zinc coated steel	✓	✓

HD-4129.05A

Compaction Uniformity

H-4140 with Case

GeoGauge
ASTM D6758

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

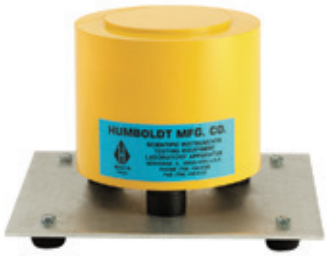
The GeoGauge is the perfect companion instrument for density measuring devices such as nuclear gauges and the electrical density gauge. Density measuring devices can be used to ensure that proper compaction is achieved and the GeoGauge can be used to verify that the stiffness/modulus values assumed in the design specifications of new or rehabilitated pavement structures are met. Compacting and monitoring pavement layers directly to design requirements of structural layer stiffness or material modulus in addition to percent compaction during the construction process establishes the means to effectively control structural uniformity, strength and deflection, as well as enabling the monitoring and control of the construction quality of various materials. This leads to better smoothness and longer lasting pavement surfaces at lower cost.

The GeoGauge works by applying a vibrating force at 25 specific frequencies, which produce small deflections in the material. The resulting displacement is measured by the GeoGauge and displayed as stiffness determined by the ratio of the force to deflection. The GeoGauge produces stress and strain levels common for pavement, bedding and foundation applications. In addition, Young's and shear modulus can be determined from GeoGauge measurements if a Poisson's ratio is assumed. This dynamic technology used by the GeoGauge simulates real in-use conditions. This factor allows the GeoGauge to directly measure in-place engineering properties during the construction process. The GeoGauge supports and directly links the in-place engineering properties of compacted materials with Mechanistic-Empirical Design for effective QC/QA. Successful control of compaction creates a quality functional structure with the desired engineering properties for the application and life intended.

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

GeoGauge	H-4140
	Shipping wt. 40 lbs (18.1kg)

H-4140 Face Detail



H-4140.20

H-4140.C

Features include:

- Dynamically measures in-place engineering properties using structural layer stiffness, MN/m (klbf/in) and Young's modulus of a material, MPa (kpsi)
- In-place QC/QA links compaction and material performance directly to design requirements while advancing mechanistic-empirical pavement design
- Enables maximum lift stiffness with minimum compactive effort
- Facilitates uniform stress transmission and distribution from pavement to subgrade resulting in longer pavement life, reduced maintenance costs and longer lasting surface smoothness.
- Enables reduced structural variability in construction
- In-place QC/QA of the strength gain of stabilized materials
- Data base development supporting mechanistic-empirical design and performance specifications
- Portable, fast, simple, reliable, non-invasive
- Other compaction applications include: lime, cement, fly-ash and polymer stabilized materials, cement-treated and rehabilitated bases, large particle aggregate bases, as well as underground utility backfills
- Gauge includes simple, easy-to-use software application, which provides download and storage of test data. Application allows printing of data reports, as well as saving information in other formats (.pdf, .csv and rich text) for importing data into other programs

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

Verifier Mass

10kg Mass used to verify calibration of gauge.

Verifier Mass — H-4140.20
Shipping wt. 25.7 lbs (11.7kg)

Calibration Platen

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

Calibration Platen — H-4140.C
Shipping wt. 30 lbs (13.6kg)

Data Cable, Infrared

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

Data Cable, Infrared — H-4140.12
Shipping wt. 2 lbs (0.9kg)


H-4245


H-4249

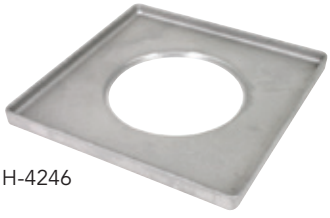

H-4238


H-4238L


H-4248


H-3821


H-4117


H-4246


H-4249P

Sand Cone Apparatus Set, 6.5" (165mm)
ASTM D1556; AASHTO T191

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

Sand Cone Apparatus Set — H-4245
Shipping wt. 3 lbs (4.5kg)

Sand Cone Apparatus Set, 4.5" (114mm)
ASTM D1556; AASHTO T191

The 4.5" sand cone apparatus can be used when it is desired to collect a smaller sample or when gathering a sample is difficult due to extremely hard compacted soil. The cone also determines the in-place density of soils having a maximum particle size of up to 2" (51mm) using test hole volumes of approximately 0.1ft³ (2.8L). The set is comprised of a 1-gal. (3.79L) threaded plastic jar; a detachable double cone, which is threaded on one end for attaching the threaded plastic jar; and, has a 4.5" (114mm) dia. flanged opening on the other, which fits the opening of the H-4249P sand cone plate. (order separately). The cone has a brass cylindrical valve with a 0.5" (12.7mm) dia. orifice and stops that prevent the valve from rotating past the completely open or completely closed positions.

Sand Cone Apparatus Set — H-4249
Shipping wt. 6 lbs (4.5kg)

Sand Cone Plate
ASTM D1556; AASHTO T191

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

Sand Cone Plate, 6.5" (165mm) Hole — H-4246
Sand Cone Plate, 4.5" (114mm) Hole — H-4249P
Shipping wt. 4.5 lbs (2.1kg)

Replacement Jar for Sand Cone
ASTM D1556; AASHTO T191

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

Replacement Jar for Sand Cone — H-4238
Shipping wt. 1.5 lbs (0.5kg)

Replacement Lid for Plastic Sand Cone Jar
Replacement lid for use with 1-gal (3.79L) capacity, threaded-plastic jar.

Replacement Lid for Sand Cone Jar — H-4238L
Shipping wt. 0.6 lbs (7.3kg)

Sand Cone, Large, 12" (165mm)
ASTM D1556; AASHTO T191, COE

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

Sand Cone, Large, 12" (165mm) — H-4248
Shipping wt. 50 lbs (23kg)

Density Sand
ASTM D1556; AASHTO T191, COE

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

Density Sand — H-3821
Shipping wt. 55 lbs (25kg)

Sand Cone Accessory Kit
Accessory kit for use with sand density cones and voluvessels. Includes: 100 Sample bags and ties, a pocket dial thermometer, a bristle brush, a stainless steel spoon, a steel chisel and a rubber mallet. Does not include sand.

Sand Cone Accessory Kit — H-4117
Shipping wt. 9.5 lbs (4.3kg)

Sample Bags and Ties
100 Sample bags and ties.

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

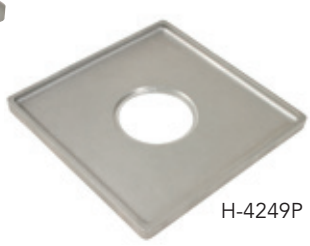

H-4166
H-4167


H-4166S
w/H-4166


H-4116


H-4166.10


H-4168


H-4249P


H-4166.5


H-4203.4
H-4203.3


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

Voluvessel

ASTM D2167; AASHTO T205

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

Voluvessel, 1/20 ft³ (1600ml) H-4166
Voluvessel, 1/13 ft³ (2230ml) H-4167
Shipping wt. 15.7 lbs (7.3kg)

Voluvessel Saddle Weights

ASTM D2937

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

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

Balloons, 10pk

Package of 10 balloons for Voluvessel.

Balloons, 10pk H-4168
Shipping wt. 0.2 lbs (0.09kg)

Pump Assembly, Replacement

Rubber-bulb, pump assembly for all Voluvessels.

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

Voluvessel Base

ASTM D2167; AASHTO T205

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

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

Voluvessel Cylinder Seal Gasket

Replacement seal gasket for Voluvessels.

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

Voluvessel w/ Metal Guard

ASTM D2167; AASHTO T205

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

Voluvessel, 1/20 ft³ (1600ml) H-4116
Shipping wt. 14 lbs (6.8kg)

Density Drive Sampler

ASTM D2937

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

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

Drive Tubes for Density Drive Sampler

ASTM D2937

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

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

CBR, Shear Strength

H-4219T

Threaded Ends

Both include a pelican case

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

H-4219QC

Quick-Connect Ends

Dual-Mass Dynamic Cone Penetrometers
ASTM D6951

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

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

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

Dual-Mass DCP, Threaded Ends **H-4219T**
Ship wt. 66lbs. (29.5kg)

Included with the H-4219T DCP:

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

Accessories	Model
Drive Rod, 12-inch Threaded	H-4219T.12
Drive Rod, 12-inch Quick-Connect	H-4219QC.12
Extension Rod, 24-inch, Threaded (For use with both Quick-Connect and Threaded models)	H-4219.8
Disposable Cones (100 pk.)	H-4219.100

Dual-Mass DCP, Quick-Connect Ends **H-4219QC**
Ship wt. 60lbs. (29.5kg)

Included with the H-4219QC DCP:

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

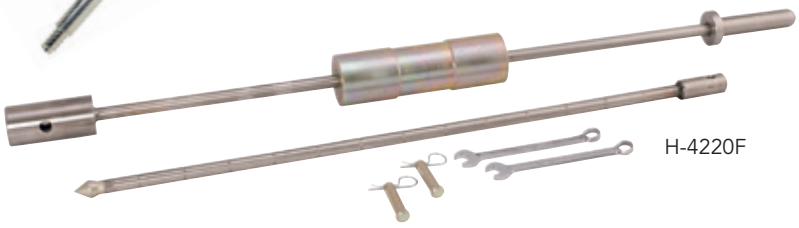
H-4219QC.12
H-4219T.12
H-4219.8

H-4219.100

H-4202A

H-4202.1A

H-4202.7A



H-4220F

Dynamic Cone Penetrometer for Shallow Insitu Tests

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

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

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

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

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

Sleeved Hammer for Dynamic Cone Penetrometer

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

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

DCP Test Set without Augers

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

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

Dynamic Cone Penetrometer Individual Items

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

Shelby Tube Drive Head

Drive head for Shelby tubes for use with H-4202.1 or H-4202.1A drive hammers with 3" "E" rod connection. (See page 31 for Shelby tubes.)

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

Foundation, Single-Mass DCP, Quick-Connect

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

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

Foundation, Single-Mass DCP H-4220F
Ship wt. 27lbs. (12kg)

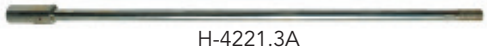
Accessories	Model
Drive Rod, 12-inch Quick-Connect	H-4219QC.12
Extension Rod, 24-inch, Threaded (For use with both Quick-Connect and Threaded models)	H-4219.8


H-4227


H-4221

H-4221.1


H-4221.4


H-4221.3A


H-4139

Vane Inspection Set

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

Vane Inspection Set **H-4227**

Ship wt. 15.6lb (6kg)

Vane Inspection Kit Replacement Parts

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

Geovane Soil Shear Strength Tester

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

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

Ship wt. 7lb (3kg)

Geovane Accessories and Replacement Parts

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

Proctor Penetrometer Set

ASTM D1558

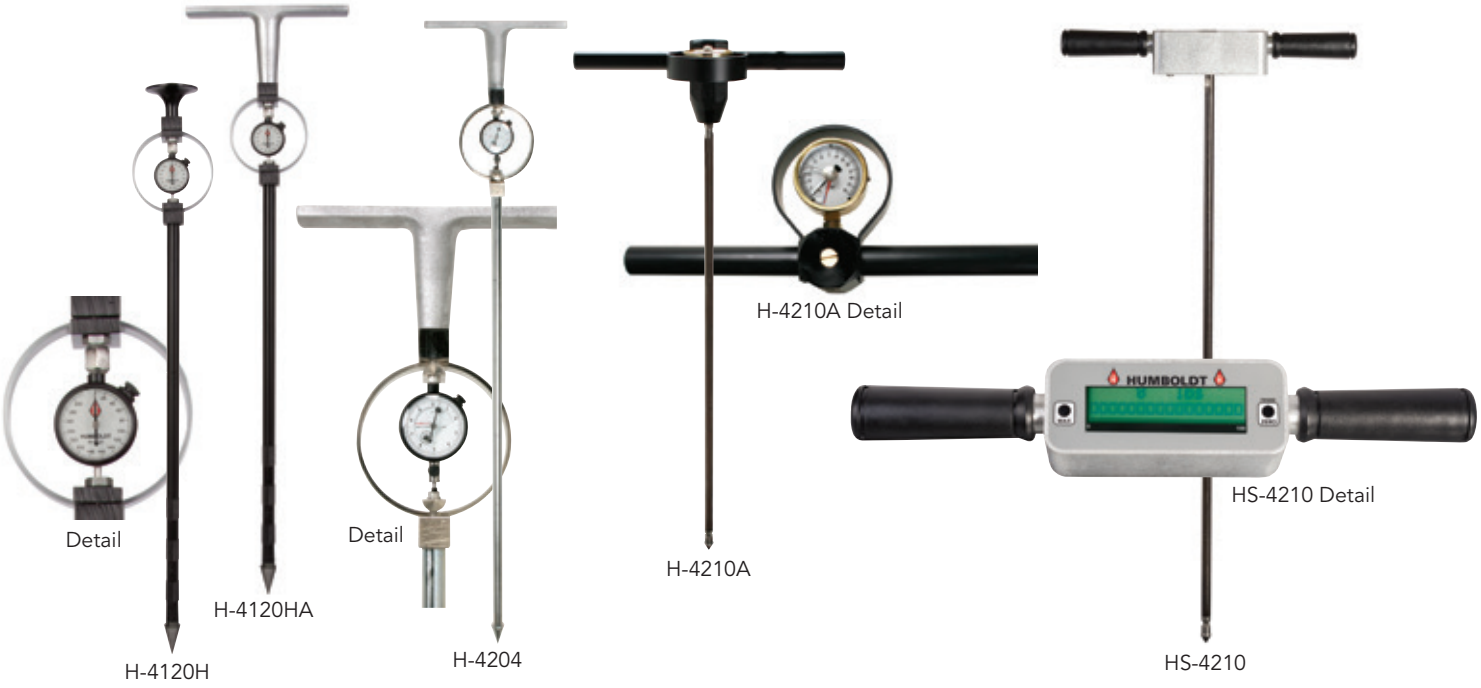
Establishes the moisture-penetration resistance relations of fine-grained soils. Includes these interchangeable needles (area in sq. in. or sq. cm): 1in.^{2} (6.45cm^2), 3/4 in.^{2} (4.84cm^2), 1/2 in.^{2} (3.22cm^2), 1/3 in.^{2} (2.15cm^2), 1/5 in.^{2} (1.29cm^2), 1/10 in.^{2} (.65cm^2), 1/20 in.^{2}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

Proctor Penetrometer Set **H-4139**

Ship wt. 17lb (7.7kg)

Proctor Penetrometer Needles

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



Cone Penetrometer, Corps of Engineers
IL DOT 502

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

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

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

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

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

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

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

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

Description	Model
60° Cone, 3cm² max area	H-4210.3
60° Cone, 1.5cm² max area	H-4210.1
Extension rod, 24" (0.6m)	H-4210E.2A
Starter rod, 24" (0.6m)	H-4210.2A
Replacement O-ring	H-4210.9

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

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

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

Description	Model
Extension Rod, 30"	HS-4210.2
Starter Rod, 30"	HS-4210.3
Inside Push Rod, (29.875") For Starter Rod	HS-4210.3.1
60° Cone, 1.5cm² max area	H-4210.1
60° Cone, 3cm² max area	H-4210.3

Penetrometers

H-4200


H-4200F
H-4195F


H-4195


H-4205

H-4212MH


H-4212

Humboldt Soil Penetrometer (Tire-Gauge Design)
For use by field personnel to check visual classification of soils. Verifies whether excavation side walls require shoring, based on OSHA cohesive soils classifications. Indicates consistency, shear strength, and approximate unconfined shear strength. Direct-reading scale—in tons/sq ft, or kg/sq cm—corresponds to equivalent unconfined compressive strength. Range: 0 to 4.5 tons. High quality construction. Includes belt-loop style carrying case and operating instructions. Should not replace laboratory testing or field analysis, or be used to produce foundation design data.

Humboldt Soil Penetrometer H-4200
Ship wt. 0.4lb (0.2kg)

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

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

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

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

Soil Penetrometer, Dial-Type
A sophisticated pocket penetrometer offering greater capacity and sensitivity than others. Maximum value is retained on the dial until released via push-button. Inner dial scale 0 to 6.0, with 0.1 divisions in tsf and kg/cm^2. Outer scale gives load strength over 0 to 11.0 with 0.1 divisions in kg. This reading is used with charts (included) to estimate safe bearing pressures, depending on plunger used and soil type. Values indicated relate to the standard 0.25" dia. plunger. In addition, readings with four other included plungers (10, 15, 20, 25mm) indicate safe bearing pressures for foundations in consolidated soils over a range of sandy to clay-type soils. The 2.5" (63mm) dia. dial can be easily recalibrated using register plates (included) and any readable scale of 10-15 lbs. capacity. Includes data tables, register plates, instructions, and carrying case.

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

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

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

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

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

Pocket Shear Vane, Plastic
The H-4212 pocket shear vane tester provides a quick and efficient method for determining shear strength values of cohesive soils. The pocket shear vane is widely used for taking on-site measurements of excavations, including trenches and test pits. It is also used for taking readings from thin-wall or split core soil samples. It can also be used in the laboratory for evaluations. The device is widely used by safety and OSHA inspectors, back hoe operators, field testing technicians, consulting engineers, etc. This device comes with three vanes, which are easily attached or removed. The torvane shear tester is molded plastic and comes in a plastic molded case.

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

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

Probe Rod, Steel

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

Probe Rod, Steel — H-4188

Ship wt. 8lbs (2.2kg)

Probe Rod, Fiberglass

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

Probe Rod, Fiberglass — H-4188F

Ship wt. 8lbs (2.2kg)

Soil Sampling Auger, Spiral-Type

ASTM D1452

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

Soil Sampling Auger, Spiral-Type — H-4250

Ship wt. 5lbs (2.7kg)

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

Soil Sampling Tube

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

Soil Sampling Tube — H-4362

Ship wt. 4.2lbs (2.2kg)

Auger Set, Quick-release Handle and Bucket

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

Auger Set, QR Handle and Bucket — H-4202.6A

Ship wt. 8lbs (2.2kg)

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

T-Handle Auger, Iwan-Type

ASTM D1452

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

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

Ship wt. 8lbs (3.2kg)

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

Soil Sampling Tube Set

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

Soil Sampling Tube Set — H-4269

Ship wt. 2.7lbs (1.4kg)

Soil Sampling Auger Tube Set

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

Soil Sampling Auger Tube Set — H-4268

Ship wt. 5.4lbs (3.2kg)

Sampling Augers

Augers, Quick-Connect

Augers, Threaded

H-4442QC H-4442TH

Augers, Bucket-Type, Quick-Connect

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

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

Augers, Bucket-Type, Quick-Connect See Chart

Ship wt. 3lb (1.37kg)

Augers, Extensions, Quick-Connnect

Extensions for use with the Augers above.

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

Auger Extensions, Quick-Connect See Chart

Ship wt. 3lb (1.3kg)

Augers, Bucket-Type, Threaded

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

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

Augers, Bucket-Type, Threaded See Chart

Ship wt. 3lb (1.3kg)

Augers, Extensions, Threaded

Extensions for use with the Augers above.

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

Auger Extensions, Threaded See Chart

Ship wt. 3lb (1.3kg)

Auger Handles, Quick-Connect

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

Auger, Cross-Handle, Padded H-4447QC
Auger, Cross-Handle, 16" Ratcheting H-4449QC

Ship wt. 2.6lb (1.3kg)

Auger Handles, Threaded

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

Auger, Cross-Handle, Padded H-4447TH
Auger, Cross-Handle, 16" Ratcheting H-4449TH

Ship wt. 3lb (1.3kg)

Sampling Auger Kits

H-4418.23

H-4419.23

H-4416.2

H-4449

H-4451

H-4452

Soil Auger Kits, Threaded

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

2.25" Augers with (4) 3' Extensions	H-4419.23
2.25" Augers with (4) 4' Extensions	H-4419.24
3.25" Augers with (4) 3' Extensions	H-4419.33
3.25" Augers with (4) 4' Extensions	H-4419.34

Ship wt. 22lb (8.2kg)

Soil Auger Kits, Quick-Connect

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

2.25" Augers with (4) 3' Extensions	H-4418.23
2.25" Augers with (4) 4' Extensions	H-4418.24
3.25" Augers with (4) 3' Extensions	H-4418.33
3.25" Augers with (4) 4' Extensions	H-4418.34

Ship wt. 21lb (8.6kg)

Basic Soil Sampling Kits. 5/8" Threaded

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

2.25" Basic Soil Sampling Kit	H-4416.2
3.25" Basic Soil Sampling Kit	H-4416.3

Ship wt. 56lb (26kg)

Rock Breaker Set

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

Rock Breaker	H-4449

Ship wt. 3lb (1.3kg)

Slide Hammers

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

Regular Slide Hammer, 5/8" Threaded	H-4451
Compact Slide Hammer, 5/8" Threaded	H-4452

Ship wt. 9lb (4.1kg)

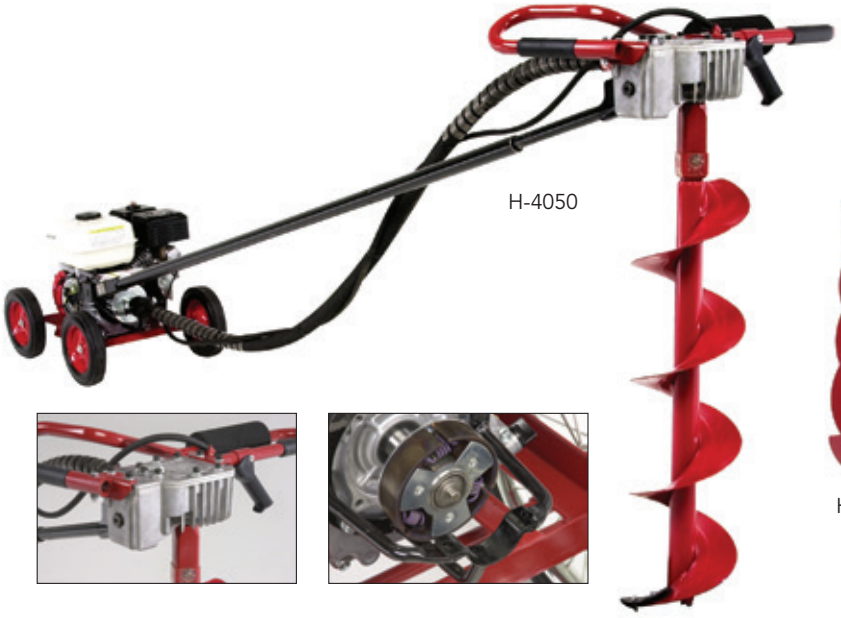
Universal Slip (Strap) Wrench

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

Universal Slip (Strap) Wrench	H-4453

Ship wt. 3lb (1.3kg)

Earth Drill & Augers



H-4050

H-4052A.6

H-4040.150

Power Mechanical Earth Drill

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

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

Ship wt. 225lb (102 kg)

42"Snap-On Augers

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

42" Long augers dig a 36" deep hole.

36", Full-flighted Snap-On Extensions

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

Tube Extensions

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

Replacement Points & Blades

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

Water Level Indicator

The Water Level Indicator determines water levels in drainage operations, dams, reservoirs, embankments, wells, bore holes, underground cavities, or any hydrological/geological work. Works well with small openings, holes & shafts that are not always straight. Compact, self-contained units feature a jointed design for easy access to difficult openings. Weighted probe is lowered into the opening via high-strength, flexible cable. Buzzer & light indicate when water level has been reached. Readings taken from marked cable to very tip of probe so less than 1 ml of water is displaced. Probe resists false readings caused by cascading water. Standard models have cables marked in feet, metric models marked in centimeters.

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

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

H-4210.3C

H-4210W

H-4210.5P
H-4210.25P

H-4210.3AW

H-4202.7A

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

Shelby Tubes

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

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

* galvanized

Shelby Tubes — See Table
Ship wt. See Table

Caps for Shelby Tubes

Plastic end caps for protecting tube and sample.

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

Caps for Shelby Tubes — See Table
Ship wt. See Table

Expansion Packer for Shelby Tubes

Expanding plugs to seal samples in Shelby tubes for transport.

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

Expansion Packer for Shelby Tubes — See Table
Ship wt. See Table

Sealing Wax

ASTM D109

Sealing wax to seal ends of shelby tubes for transport. 10 lb. box. For melting pots, please see page 190.

Sealing Wax — H-4210W
Ship wt. 11lb (5.4 kg)

Shelby Tube Head, 3" Tubes

Shelby Tube Head for 3" shelby tubes for use with H-4202.1 or H-4202.1A drive hammers with "E" rod connection (sold separately, see page 23).

Shelby Tube Head, 3" Tubes — H-4202.7A
Ship wt. 5.9lb (2.7 kg)

Shelby Tubes Heads

Various heads for different sized Shelby tubes.

Shelby Tubes Heads — See Table
Ship wt. See Table

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

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

ACCESSORIES

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

H-4385D


H-4385


H-4388


H-4388.1

H-4385.5


H-4387


H-4385.1


H-4386


H-4386SM

Resistivity Meter, Digital
ASTM G187, G57; AASHTO T-288

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

Accuracy:

0.01Ω to 1MΩ range: ±1.6% ±1LS Display Digit 1MΩ to 10MΩ range: ±5% ±1LS Display Digit

Resistivity Meter, Digital — H-4385D
Ship wt. 10.5lbs (5kg)

Resistivity Meter, Analog
ASTM G187, G57; AASHTO T-288

The resistivity meter can be easily used to measure resistivity of soil in-situ using the 2, 3, or 4 electrode method or with a soil box to measure resistivity of soil or water in the range of distilled to sea water. Resistance measurement range is from 0.01Ω to 1.1MΩ and resistance measurements are unaffected by any stray interference signals that may be present in the earth during measurement, due to use of narrow band-pass filters. It has a rugged, lightweight weatherproof case with an IP67 rating for dust and water intrusion. The lid can be removed to facilitate use and movement of the meter to new locations without removing test leads. Runs on a set of C-cell alkaline batteries eliminating recharging and plugged-in power sources.

Resistivity Meter — H-4385
Ship wt. 10lbs (5kg)

Soil Box

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

Soil Box, 280ml Capacity — H-4386
Soil Box, 75ml Capacity — H-4386SM
Ship wt. 1.3lb (0.5kg)

Soil Cylinder
ASTM G187; AASHTO T-288

The Soil Cylinder can be used to satisfy either of the 2-electrode methods— ASTM G187 or AASHTO T-288 Standards. The body of the Soil Cylinder is made of clear acrylic with PVC components and the distribution plates (conducting end plates) are stainless steel. Rubber O-rings provide sealing for the two end caps. Accommodates large sample volumes [approximately 2,714 cm³ (2.714 liters) and can accommodate crushed-rock samples, as well as regular soils and liquids. Water can be added in-situ for sample saturation (de-ionized water, simulated rain water etc.) Field-collected samples can be immediately "installed" in the cylinder, as opposed to filling a separate container for transportation. This means that resistance readings taken at a later stage will be representative of the "as-found" sample.

Soil Cylinder — H-4385.5
Ship wt. 4.6lbs (2.3kg)

Resistivity Test Reel with Soil Pins

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

Resistivity Test Reel with Soil Pins — H-4388
Ship wt. 6.7lbs (3.2kg)

Soil Pins (Electrodes)

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

Soil Pins (Electrodes) — H-4388.1
Ship wt. 3.9lbs (1.8kg)

Soil Box Leads, set of 4

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

Soil Box Leads, set of 4 — H-4387
Ship wt. 0.7lbs (0.3kg)

Resistivity Meter Test Kit
ASTM G187, G57; AASHTO T-288

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

Resistivity Meter Test Case — H-4385.1
Ship wt. 10lbs (6kg)

H-4967

H-4965A

H-4966

H-4377

Speedy® 2000 Moisture Tester, 20g

ASTM D4944; AASHTO T217; Florida FM5-507

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

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

Speedy® 2000 Moisture Tester, 20g H-4967
Shipping wt. 16.6 lbs (7.5kg)

Speedy® 2000 Moisture Tester, 6g

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

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

HAZARDOUS WARNING:

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

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

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

Moisture Tester Reagent

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

Moisture Testing Reagent H-4966
Ship wt. 28lbs (12.7kg)

Calibration Kit for Speedy® Tester

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

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

Replacement Parts for Speedy

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

Acidity and Moisture Tester

Provides the ability to make on-the-spot in field or lab tests for soil acidity in moist soil. Measures pH and moisture content (% relative saturation). The Kelway tester operates on the principle of electrical potential between two dissimilar metal plates - without batteries or any external power source. When inserted into moist soil the it registers degree of acidity on the upper scale. The lower scale shows degree of moisture (% saturation) when the switch button is held in. Tester is supplied with belt-loop case, two 3" x 4" (76 x 102mm) conditioning film sheets and instructions. Not for use with liquids.

Acidity and Moisture Tester H-4377
Ship wt. 2lbs (1kg)

Acidity and Moisture Tester Conditioner Film

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

Conditioner Film (12 pk) H-4377.1
Ship wt. 1lbs (0.5kg)

CBR, Infiltrometer, Guelph, Color


HM-4502


HSM-2100

CBR Field Test Set

ASTM D4429

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

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

CBR Field Test Set H-4152F
CBR Field Test Set, Metric Indicators H-4152FM
Ship wt. 289lbs. (172kg)

Double Ring Infiltrometer

ASTM D3385

Ideal for field testing, as well as lab use. Two stainless steel rings measure 12 and 24 dia x 20"H (304.8 and 609.6 dia x 508mm). Rings have double thick welded top edge for increased stability when driving into the soil. A mariotte tube provides a constant head of water for flow tests. Graduations on the side of the tube used to determine flow rate. Sealed adjusting tube raises or lowers the head inside the infiltrometer ring. Main flow valve in base platform, bleed valve next to adjusting tube seal. Includes: 0.5" thick (12.7mm) aluminum driving cap with centering pins; two 6" square (152.4mm) neoprene splash guards; and two mariotte tubes with 3,000 ml and 10,000 ml capacities.

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

Guelph Permeameter Kit

ASTM D5126

The Guelph permeameter is an easy-to-use instrument for quickly and accurately measuring in-situ, hydraulic conductivity in all types of soils. The equipment can be transported, assembled, and operated easily by one person. Measurements can be made in 1/2 to 2 hours, depending on soil type, and require only about 2.5 liters of water. Measurements can be made in the range of 15 to 75cm below the soil surface. The Guelph permeameter is a complete kit consisting of the permeameter, field tripod, well auger, well preparation and cleanup tools, collapsible water container, and vacuum test hand pump, all packaged in a durable carrying case.

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


H-4368A

Soil Color Charts

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

Soil Color Charts H-4368A
Ship wt. 1.5lbs (0.5kg)


HUMBOLDT
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HUMBOLDT

Aggregate

Testing Equipment For Construction Materials

HUMBOLDT

Sample Splitters

H-3962, H-3964

H-3980, H-3985

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

H-3970,
H-3975

Humboldt Sample Splitters

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

H-3994

H-3971C

H-3973

H-3974

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

H-4135

Humboldt Sample Splitters (See Previous Page)

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

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

One-Piece Construction Sample Splitters

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

Removable Hopper Sample Splitters

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

Enclosed Sample Splitters

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

16-1 Sample Reducer

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

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

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

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

Unit is supplied without sample containers. Order containers below.

16-1 Sample Reducer H-3994
Shipping wt. 29.3 lbs (13kg)

Container Set for 16-1 Sample Reducer

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

Container Set for 16-1 Sample Reducer H-3996S
Shipping wt. 12 lbs (5.4kg)

Micro and Precision Riffle Splitters & Pans

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

Micro & Precision Splitters see chart
Shipping wt. see chart

Quartering Canvas

ASTM C702; AASHTO T248

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

6' x 8' (1.5m x 2.4m) ASTM Canvas H-4136
5' x 5' (1.5m) Square Canvas H-4135
Shipping wt. 4.5 lbs (2kg)

Sample Splitters

H-4393

H-4288
H-4288FC

H-4289

H-4290

Model	Gilson #	Maximum Particle Size in. (mm)	Hopper Capacity ft³ (L)	Chute Bar Size in. (mm)	Chute Bar Quantity	Chute Slope	Dimensions L x W x H inches (mm)	Pans Replacements
H-4393	SP-0	6 (152)	3.5 (99.1)	1 (25)	48	60°	56 x 26 x 41 (1422 x 660 x 1041)	H-4393.2
H-4288	SP-1	4 (102)	1 (28.3)	0.5" (13)	48	45°	29 x 19 x 39 (737 x 483 x 991)	H-4288.2
H-4288FC	SP-1C	4 (102)	1 (28.3)	0.5" (13)	10 Fixed	45°	29 x 19 x 39 (737 x 483 x 991)	H-4288.2
H-4289	SP-2	2 (51)	0.55 (15.6)	0.5" (13)	36	45°	22 x 14.5 x 20.5 (559 x 368 x 521)	H-4289.1
H-4290	SP-2.5	0.75 (19)	0.28 (7.9)	0.25" (6)	48	60°	15.5 x 12.5 x 17.5 (394 x 318 x 445)	H-4290.1
H-4291	SP-3	0.25 (6)	0.06 (1.7)	0.125" (3)	48	60°	9.5 x 8.5 x 13.5 (214 x 216 x 343)	H-4291.1
H-4293	SP-10	0.25 (6)	0.06 (1.7)	0.125" (3)	48	60°	29 x 19 x 39 (737 x 483 x 991)	H-4288.2

Universal Splitter

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

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

Universal Splitter — H-4393
Shipping wt. 68 lbs (31kg)

Universal Sample Splitter

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

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

Universal-Sample Splitter — H-4288
Shipping wt. 135 lbs (75kg)

Universal, Fixed Chute Sample Splitter

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

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

Universal-Sample Splitter — H-4288FC
Shipping wt. 136 lbs (75kg)

Universal Splitter

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

The H-4289 universal splitter is compact and more durable than conventional portable splitters. Lightweight with ample hopper capacity of 0.55 ft³ (15.6 liters) for materials up to 2" (51mm). It is convenient to use in floor or bench-top positions. This splitter provides accurate, representative samples o a wide range of materials.

Porta-Splitter — H-4289
Shipping wt. 66 lbs (31kg)

Versa-Splitter

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

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

Versa-Splitter — H-4290
Shipping wt. 40 lbs (18kg)

Mini-Splitter

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

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

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

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


H-4291


H-4293


H-4287


H-4394

Totally Enclosed Splitter

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

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

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

Lift Cart Accessory for H-4393

Recommended lift cart for handling fully-loaded pans.

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

Dust Enclosures

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

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

60° Chute Adapter Kit

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

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

Bag Loading Chute Attachment

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

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

Fixed Chute Accessory

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

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

Porta Wheels for H-4288

Set of two wheels.

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

California Sample Splitter

CalTrans C201

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

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

California Sample Pans

Sample pans for California sample splitter.

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

Quadri-Splitter

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

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

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

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

Screen Shakers


H-4283A


H-4276A


H-4273B

Gilson Testing Screens
ASTM E11; ISO 565

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

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

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

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

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

Hydraulic-Clamping, 120V 60Hz	H-4283A
Hydraulic-Clamping, 220V 50Hz	H-4283A.5F
Manual-Clamping, 120V 60Hz	H-4276A
Manual-Clamping, 220V 50Hz	H-4276A.5F

Shipping wt. 485 lbs (220kg)

Gilson Test-Master® Screen
ASTM E11; ISO 565

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

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

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

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

Hydraulic-Clamping, 6-Tray, 120V 60Hz	H-4273B
Hydraulic-Clamping, 6-Tray, 220V 50Hz	H-4273B.5F
Hydraulic-Clamping, 7-Tray, 120V 60Hz	H-4274B
Hydraulic-Clamping, 7-Tray, 220V 50Hz	H-4274B.5F

Shipping wt. 700 lbs (318kg)


H-4295A
H-4297A


H-4288.1


H-4285


H-4283P3


H-4273DP


H-4283P4


H-4284, H-4284.5


H-4286


H-4283SE


H-4273CP


H-4307

Gilson Porta-Screen® Screen Shaker
ASTM E11; ISO 565

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

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

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

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

Porta-Screen® (8 slots), 120V 60Hz	H-4295A
Porta-Screen® (8 slots), 220V 50Hz	H-4295A.5F
Porta-Screen® (6 slots), 120V 60Hz	H-4297A
Porta-Screen® (6 slots), 220V 50Hz	H-4297A.5F

Shipping wt. 255 lbs (116kg)

Porta-Screen Accessories

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

Screen Shaker Accessories

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

Screen Shakers

Model	Gilson No.	Material Size	Maximum Capacity	Overall Tray Size	Dimensions inches (mm)
H-4283A	TS1	4" (104mm) to No. 200 mesh (14.75mm)	1 cu.ft. (0.3m³) 80 lbs (36kg)	18" x 26" (457 x 660mm)	23" x 31" x 33" (584 x 787 x 838)
H-4276A	TS2				
H-4273B	TM5	4" (104mm) to No. 200 mesh (14.75mm)			27" x 33" x 45" (686 x 838 x 1143)
H-4274B	TM6				
H-4295A	PS4	2" (51mm) to No. 200 (75mm)	.75 cu.ft. (0.23m³) 60 lbs (27kg)	16" x 16.5" (406 x 419mm)	19" x 16.5" x 48.3" (483 x 419 x 1222)
H-4297A	PS3				19" x 16.5" x 42" (483 x 419 x 1067)

Screen Trays

Screen Trays for Testing Screens

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

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

Standard ASTM Testing Screen Trays and Cloth

ASTM Sizes		Cloth Material	18" x 26" (457 x 660mm) Models: H-4273B, H-4274B, H-4276A, H-4283A		16" x 16.5" (406 x 419mm) Models: H-4295A, H-4297A,	
			Tray/Cloth	Cloth only	Tray/Cloth	Cloth only
125mm	5"	S	H-4278C5.000	H-4278WC5.000	NA	NA
106mm	4.24"	SS	H-4278C4.240	H-4278WC4.240	NA	NA
100mm	4"	S	H-4278C4.000	H-4278WC4.000	NA	NA
90mm	3.5"	S	H-4278C3.500	H-4278WC3.500	NA	NA
75mm	3"	S	H-4278C3.000	H-4278WC3.000	INQUIRE	INQUIRE
63mm	2.5"	S	H-4278C2.500	H-4278WC2.500	INQUIRE	INQUIRE
53mm	2.12"	SS	H-4278C2.120	H-4278WC2.120	INQUIRE	INQUIRE
50mm	2.00"	S	H-4278C2.000	H-34278WC2.000	H-4398C2.000	H-4398WC2.000
45mm	1.75"	S	H-4278C1.750	H-4278WC1.750	H-4398C1.750	H-4398WC1.750
37.5mm	1.50"	S	H-4278C1.500	H-4278WC1.500	H-4398C1.500	H-4398WC1.500
31.5mm	1.25"	S	H-4278C1.250	H-4278WC1.250	H-4398C1.250	H-4398WC1.250
26.5mm	1.06"	SS	H-4278C1.060	H-4278WC1.060	H-4398C1.060	H-4398WC1.060
25.0mm	1.00"	S	H-4278C1.000	H-4278WC1.000	H-4398C1.000	H-4398WC1.000
22.4mm	.875"	S	H-4278C.875	H-4278WC.875	H-4398C.875	H-4398WC.875
19.0mm	.750"	S	H-4278C.750	H-4278WC.750	H-4398C.750	H-4398WC.750
16.0mm	.625"	S	H-4278C.625	H-4278WC.625	H-4398C.625	H-4398WC.625
13.2mm	.530"	SS	H-4278C.530	H-4278WC.530	H-4398C.530	H-4398WC.530
12.5mm	.500"	S	H-4278C.500	H-4278WC.500	H-4398C.500	H-4398WC.500
11.2mm	.438"	S	H-4278C.438	H-4278WC.438	H-4398C.438	H-4398WC.438
9.5mm	.375"	S	H-4278C.375	H-4278WC.375	H-4398C.375	H-4398WC.375
8.0mm	.312"	S	H-4278C.312	H-4278WC.312	H-4398C.312	H-4398WC.312
6.7mm	.265"	SS	H-4278C.265	H-3910WC.265	H-4398C.265	H-4398WC.265
6.3mm	.250"	S	H-4278C.250	H-4278WC.250	H-4398C.250	H-4398WC.250
5.6mm	No. 3-1/2	SS	H-4278F3-1/2	H-4278WF3-1/2	H-4398F3-1/2	H-4398WF3-1/2
4.75mm	No. 4	S	H-4278F4	H-4278WF4	H-4398F4	H-4398WF4
4.00mm	No. 5	SS	H-4278F5	H-4278WF5	H-4398F5	H-4398WF5
3.35mm	No. 6	SS	H-4278F6	H-4278WF6	H-4398F6	H-4398WF6
2.80mm	No. 7	SS	H-4278F7	H-4278WF7	H-4398F7	H-4398WF7
2.36mm	No. 8	SS	H-4278F8	H-4278WF8	H-4398F8	H-4398WF8
2.00mm	No. 10	SS	H-4278F10	H-4278WF10	H-4398F10	H-4398WF10
1.70mm	No. 12	SS	H-4278F12	H-4278WF12	H-4398F12	H-4398WF12
1.40mm	No. 14	SS	H-4278F14	H-4278WF14	H-4398F14	H-4398WF14
1.18mm	No. 16	SS	H-4278F16	H-4278WF16	H-4398F16	H-4398WF16
1.00mm	No. 18	SS	H-4278F18	H-4278WF18	H-4398F18	H-4398WF18
850µm	No. 20	SS	H-4278F20	H-4278WF20	H-4398F20	H-4398WF20
710µm	No. 25	SS	H-4278F25	H-4278WF25	H-4398F25	H-4398WF25
600µm	No. 30	SS	H-4278F30	H-4278WF30	H-4398F30	H-4398WF30
500µm	No. 35	SS	H-4278F35	H-4278WF35	H-4398F35	H-4398WF35
425µm	No. 40	SS	H-4278F40	H-4278WF40	H-4398F40	H-4398WF40
355µm	No. 45	SS	H-4278F45	H-4278WF45	H-4398F45	H-4398WF45
300µm	No. 50	SS	H-4278F50	H-4278WF50	H-4398F50	H-4398WF50
250µm	No. 60	SS	H-4278F60	H-4278WF60	H-4398F60	H-4398WF60
212µm	No. 70	SS	H-4278F70	H-4278WF70	H-4398F70	H-4398WF70
180µm	No. 80	SS	H-4278F80	H-4278WF80	H-4398F80	H-4398WF80
150µm	No. 100	SS	H-4278F100	H-4278WF100	H-4398F100	H-4398WF100
125µm	No. 120	SS	H-4278F120	H-4278WF120	H-4398F120	H-4398WF120
106µm	No. 140	SS	H-4278F140	H-4278WF140	H-4398F140	H-4398WF140
90µm	No. 170	SS	H-4278F170	H-4278WF170	H-4398F170	H-4398WF170
75µm	No. 200	SS	H-4278F200	H-4278WF200	H-4398F200	H-4398WF200
63µm	No. 230	SS	H-4278F230	H-4278WF230	H-4398F230	H-4398WF230
53µm	No. 270	SS	H-4278F270	H-4278WF270	H-4398F270	H-4398WF270
45µm	No. 325	SS	H-4278F325	H-4278WF325	H-4398F325	H-4398WF325
38µm	No. 400	SS	H-4278F400	H-4278WF400	H-4398F400	H-4398WF400

ISO Testing Screen Trays and Cloth

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

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

U.S.A. Standard Sieve Sizes and Equivalents

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

U.S.A. Standard Sieve Series

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

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

Humboldt sieves are available with brass frame and mesh, brass frame with stainless steel mesh or stainless frame and mesh. Brass sieves are cost efficient while stainless sieves tend to last longer and have sag-resistant mesh. Sieve frames are seamless spun brass or stainless steel with rigid rolled edges and extended bottoms (skirts) to ensure a good fit between frames, pans and separators of the same diameter— ensuring that your set of sieves stacks properly.

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

USA Standard ASTM Test Sieves

8"

203mm

Sieve Size	Brass Frame Stainless Mesh		Stainless Frame Stainless Mesh	
	Full Height 2" (50mm)	Half Height 1" (25mm)	Full Height 2" (50mm)	Half Height 1" (25mm)
4" (100mm)	H-3920CS4.000	H-3910CS4.000	H-3920CSS4.000	H-3910CSS4.000
3-1/2" (90mm)	H-3920CS3.500	H-3910CS3.500	H-3920CSS3.500	H-3910CSS3.500
3" (75mm)	H-3920CS3.000	H-3910CS3.000	H-3920CSS3.000	H-3910CSS3.000
2-1/2' (63mm)	H-3920CS2.500	H-3910CS2.500	H-3920CSS2.500	H-3910CSS2.500
2.12" (53mm)	H-3920CS2.120	H-3910CS2.120	H-3920CSS2.120	H-3910CSS2.120
2" (50mm)	H-3920CS2.000	H-3910CS2.000	H-3920CSS2.000	H-3910CSS2.000
1-3/4" (45mm)	H-3920CS1.750	H-3910CS1.750	H-3920CSS1.750	H-3910CSS1.750
1-1/2" (37.5mm)	H-3920CS1.500	H-3910CS1.500	H-3920CSS1.500	H-3910CSS1.500
1-1/4" (31.5mm)	H-3920CS1.250	H-3910CS1.250	H-3920CSS1.250	H-3910CSS1.250
1.06" (26.5mm)	H-3920CS1.060	H-3910CS1.060	H-3920CSS1.060	H-3910CSS1.060
1" (25.0mm)	H-3920CS1.000	H-3910CS1.000	H-3920CSS1.000	H-3910CSS1.000
7/8" (22.4mm)	H-3920CS.875	H-3910CS.875	H-3920CSS.875	H-3910CSS.875
3/4" (19.0mm)	H-3920CS.750	H-3910CS.750	H-3920CSS.750	H-3910CSS.750
5/8" (16.0mm)	H-3920CS.625	H-3910CS.625	H-3920CSS.625	H-3910CSS.625
0.530" (13.2mm)	H-3920CS.530	H-3910CS.530	H-3920CSS.530	H-3910CSS.530
1/2" (12.5mm)	H-3920CS.500	H-3910CS.500	H-3920CSS.500	H-3910CSS.500
7/16" (11.2mm)	H-3920CS.438	H-3910CS.438	H-3920CSS.438	H-3910CSS.438
3/8" (9.5mm)	H-3920CS.375	H-3910CS.375	H-3920CSS.375	H-3910CSS.375
5/16" (8.0mm)	H-3920CS.312	H-3910CS.312	H-3920CSS.312	H-3910CSS.312
0.265" (6.7mm)	H-3920CS.265	H-3910CS.265	H-3920CSS.265	H-3910CSS.265
1/4" (6.3mm)	H-3920CS.250	H-3910CS.250	H-3920CSS.250	H-3910CSS.250
1/8" (3.17mm)	H-3920CS.125	H-3910CS.125	H-3920CSS.125	H-3910CSS.125
No. 3-1/2 (5.6mm)	H-3920FS3-1/2	H-3910FS3-1/2	H-3920FSS3-1/2	H-3910FSS3-1/2
No. 4 (4.75mm)	H-3920FS4	H-3910FS4	H-3920FSS4	H-3910FSS4
No. 5 (4.0mm)	H-3920FS5	H-3910FS5	H-3920FSS5	H-3910FSS5
No. 6 (3.35mm)	H-3920FS6	H-3910FS6	H-3920FSS6	H-3910FSS6
No. 7 (2.80mm)	H-3920FS7	H-3910FS7	H-3920FSS7	H-3910FSS7
No. 8 (2.36mm)	H-3920FS8	H-3910FS8	H-3920FSS8	H-3910FSS8
No. 10 (2.00mm)	H-3920FS10	H-3910FS10	H-3920FSS10	H-3910FSS10
No. 12 (1.70mm)	H-3920FS12	H-3910FS12	H-3920FSS12	H-3910FSS12
No. 14 (1.40mm)	H-3920FS14	H-3910FS14	H-3920FSS14	H-3910FSS14
No. 16 (1.18mm)	H-3920FS16	H-3910FS16	H-3920FSS16	H-3910FSS16
No. 18 (1.0mm)	H-3920FS18	H-3910FS18	H-3920FSS18	H-3910FSS18
No. 20 (850µm)	H-3920FS20	H-3910FS20	H-3920FSS20	H-3910FSS20
No. 25 (710µm)	H-3920FS25	H-3910FS25	H-3920FSS25	H-3910FSS25
No. 30 (600µm)	H-3920FS30	H-3910FS30	H-3920FSS30	H-3910FSS30
No. 35 (500µm)	H-3920FS35	H-3910FS35	H-3920FSS35	H-3910FSS35
No. 40 (425µm)	H-3920FS40	H-3910FS40	H-3920FSS40	H-3910FSS40
No. 45 (355µm)	H-3920FS45	H-3910FS45	H-3920FSS45	H-3910FSS45
No. 50 (300µm)	H-3920FS50	H-3910FS50	H-3920FSS50	H-3910FSS50
No. 60 (250µm)	H-3920FS60	H-3910FS60	H-3920FSS60	H-3910FSS60
No. 70 (212µm)	H-3920FS70	H-3910FS70	H-3920FSS70	H-3910FSS70
No. 80 (180µm)	H-3920FS80	H-3910FS80	H-3920FSS80	H-3910FSS80
No. 100 (150µm)	H-3920FS100	H-3910FS100	H-3920FSS100	H-3910FSS100
No. 120 (125µm)	H-3920FS120	H-3910FS120	H-3920FSS120	H-3910FSS120
No. 140 (106µm)	H-3920FS140	H-3910FS140	H-3920FSS140	H-3910FSS140
No. 170 (90µm)	H-3920FS170	H-3910FS170	H-3920FSS170	H-3910FSS170
No. 200 (75µm)	H-3920FS200	H-3910FS200	H-3920FSS200	H-3910FSS200
No. 230 (63µm)	H-3920FS230	H-3910FS230	H-3920FSS230	H-3910FSS230
No. 270 (53µm)	H-3920FS270	H-3910FS270	H-3920FSS270	H-3910FSS270
No. 325 (45µm)	H-3920FS325	H-3910FS325	H-3920FSS325	H-3910FSS325
No. 400 (38µm)	H-3920FS400	H-3910FS400	H-3920FSS400	H-3910FSS400
No. 450 (32µm)	H-3920FS450	H-3910FS450	H-3920FSS450	H-3910FSS450
No. 500 (25µm)	H-3920FS500	H-3910FS500	H-3920FSS500	H-3910FSS500
No. 635 (20µm)	H-3920FS635	H-3910FS635	H-3920FSS635	H-3910FSS635
No. 850 (10µm)	H-3920FS850	H-3910FS850	–	–
No. 1000 (2µm)	H-3920FS1000	H-3910FS1000	–	–

USA Standard ASTM Test Sieves

Sieve Size	Brass Frame Stainless Mesh			Stainless Frame Stainless Mesh	
	Full Height 3" (75mm)	Inter. Height 2" (50mm)	Half Height 1.625" (41mm)	Full Height 3" (75mm)	Half Height 1.625" (41mm)
4" (100mm)	H-3912CS4.000	H-3922CS4.000	H-3932CS4.000	H-3912CSS4.000	H-3932CSS4.000
3-1/2" (90mm)	H-3912CS3.500	H-3922CS3.500	H-3932CS3.500	H-3912CSS3.500	H-3932CSS3.500
3" (75mm)	H-3912CS3.000	H-3922CS3.000	H-3932CS3.000	H-3912CSS3.000	H-3932CSS3.000
2-1/2' (63mm)	H-3912CS2.500	H-3922CS2.500	H-3932CS2.500	H-3912CSS2.500	H-3932CSS2.500
2.12" (53mm)	H-3912CS2.120	H-3922CS2.120	H-3932CS2.120	H-3912CSS2.120	H-3932CSS2.120
2" (50mm)	H-3912CS2.000	H-3922CS2.000	H-3932CS2.000	H-3912CSS2.000	H-3932CSS2.000
1-3/4" (45mm)	H-3912CS1.750	H-3922CS1.750	H-3932CS1.750	H-3912CSS1.750	H-3932CSS1.750
1-1/2" (37.5mm)	H-3912CS1.500	H-3922CS1.500	H-3932CS1.500	H-3912CSS1.500	H-3932CSS1.500
1-1/4" (31.5mm)	H-3912CS1.250	H-3922CS1.250	H-3932CS1.250	H-3912CSS1.250	H-3932CSS1.250
1.06" (26.5mm)	H-3912CS1.060	H-3922CS1.060	H-3932CS1.060	H-3912CSS1.060	H-3932CSS1.060
1" (25.0mm)	H-3912CS1.000	H-3922CS1.000	H-3932CS1.000	H-3912CSS1.000	H-3932CSS1.000
7/8" (22.4mm)	H-3912CS.875	H-3922CS.875	H-3932CS.875	H-3912CSS.875	H-3932CSS.875
3/4" (19.0mm)	H-3912CS.750	H-3922CS.750	H-3932CS.750	H-3912CSS.750	H-3932CSS.750
5/8" (16.0mm)	H-3912CS.625	H-3922CS.625	H-3932CS.625	H-3912CSS.625	H-3932CSS.625
0.530" (13.2mm)	H-3912CS.530	H-3922CS.530	H-3932CS.530	H-3912CSS.530	H-3932CSS.530
1/2" (12.5mm)	H-3912CS.500	H-3922CS.500	H-3932CS.500	H-3912CSS.500	H-3932CSS.500
7/16" (11.2mm)	H-3912CS.438	H-3922CS.438	H-3932CS.438	H-3912CSS.438	H-3932CSS.438
3/8" (9.5mm)	H-3912CS.375	H-3922CS.375	H-3932CS.375	H-3912CSS.375	H-3932CSS.375
5/16" (8.0mm)	H-3912CS.312	H-3922CS.312	H-3932CS.312	H-3912CSS.312	H-3932CSS.312
0.265" (6.7mm)	H-3912CS.265	H-3922CS.265	H-3932CS.265	H-3912CSS.265	H-3932CSS.265
1/4" (6.3mm)	H-3912CS.250	H-3922CS.250	H-3932CS.250	H-3912CSS.250	H-3932CSS.250
1/8" (3.17mm)	H-3912CS.125	H-3922CS.125	H-3932CS.125	–	H-3932CSS.125
No. 3-1/2 (5.6mm)	H-3912FS3-1/2	H-3922FS3-1/2	H-3932FS3-1/2	H-3912FSS3-1/2	H-3932FSS3-1/2
No. 4 (4.75mm)	H-3912FS4	H-3922FS4	H-3932FS4	H-3912FSS4	H-3932FSS4
No. 5 (4.0mm)	H-3912FS5	H-3922FS5	H-3932FS5	H-3912FSS5	H-3932FSS5
No. 6 (3.35mm)	H-3912FS6	H-3922FS6	H-3932FS6	H-3912FSS6	H-3932FSS6
No. 7 (2.80mm)	H-3912FS7	H-3922FS7	H-3932FS7	H-3912FSS7	H-3932FSS7
No. 8 (2.36mm)	H-3912FS8	H-3922FS8	H-3932FS8	H-3912FSS8	H-3932FSS8
No. 10 (2.00mm)	H-3912FS10	H-3922FS10	H-3932FS10	H-3912FSS10	H-3932FSS10
No. 12 (1.70mm)	H-3912FS12	H-3922FS12	H-3932FS12	H-3912FSS12	H-3932FSS12
No. 14 (1.40mm)	H-3912FS14	H-3922FS14	H-3932FS14	H-3912FSS14	H-3932FSS14
No. 16 (1.18mm)	H-3912FS16	H-3922FS16	H-3932FS16	H-3912FSS16	H-3932FSS16
No. 18 (1.0mm)	H-3912FS18	H-3922FS18	H-3932FS18	H-3912FSS18	H-3932FSS18
No. 20 (850µm)	H-3912FS20	H-3922FS20	H-3932FS20	H-3912FSS20	H-3932FSS20
No. 25 (710µm)	H-3912FS25	H-3922FS25	H-3932FS25	H-3912FSS25	H-3932FSS25
No. 30 (600µm)	H-3912FS30	H-3922FS30	H-3932FS30	H-3912FSS30	H-3932FSS30
No. 35 (500µm)	H-3912FS35	H-3922FS35	H-3932FS35	H-3912FSS35	H-3932FSS35
No. 40 (425µm)	H-3912FS40	H-3922FS40	H-3932FS40	H-3912FSS40	H-3932FSS40
No. 45 (355µm)	H-3912FS45	H-3922FS45	H-3932FS45	H-3912FSS45	H-3932FSS45
No. 50 (300µm)	H-3912FS50	H-3922FS50	H-3932FS50	H-3912FSS50	H-3932FSS50
No. 60 (250µm)	H-3912FS60	H-3922FS60	H-3932FS60	H-3912FSS60	H-3932FSS60
No. 70 (212µm)	H-3912FS70	H-3922FS70	H-3932FS70	H-3912FSS70	H-3932FSS70
No. 80 (180µm)	H-3912FS80	H-3922FS80	H-3932FS80	H-3912FSS80	H-3932FSS80
No. 100 (150µm)	H-3912FS100	H-3922FS100	H-3932FS100	H-3912FSS100	H-3932FSS100
No. 120 (125µm)	H-3912FS120	H-3922FS120	H-3932FS120	H-3912FSS120	H-3932FSS120
No. 140 (106µm)	H-3912FS140	H-3922FS140	H-3932FS140	H-3912FSS140	H-3932FSS140
No. 170 (90µm)	H-3912FS170	H-3922FS170	H-3932FS170	H-3912FSS170	H-3932FSS170
No. 200 (75µm)	H-3912FS200	H-3922FS200	H-3932FS200	H-3912FSS200	H-3932FSS200
No. 230 (63µm)	H-3912FS230	H-3922FS230	H-3932FS230	H-3912FSS230	H-3932FSS230
No. 270 (53µm)	H-3912FS270	H-3922FS270	H-3932FS270	H-3912FSS270	H-3932FSS270
No. 325 (45µm)	H-3912FS325	H-3922FS325	H-3932FS325	H-3912FSS325	H-3932FSS325
No. 400 (38µm)	H-3912FS400	H-3922FS400	H-3932FS400	H-3912FSS400	H-3932FSS400
No. 450 (32µm)	H-3912FS450	H-3922FS450	H-3932FS450	H-3912FSS450	H-3932FSS450
No. 500 (25µm)	H-3912FS500	H-3922FS500	H-3932FS500	H-3912FSS500	H-3932FSS500
No. 635 (20µm)	H-3912FS635	H-3922FS635	H-3932FS635	H-3912FSS635	H-3932FSS635
No. 850 (10µm)	H-3912FS850	H-3922FS850	H-3932FS850	–	–
No. 1000 (2µm)	H-3912FS1000	H-3922FS1000	H-3932FS1000	–	–

12"

305mm

Inspection Test Sieves

USA Standard ASTM Inspection Test Sieves

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

8"

203mm

Sieve Size	Brass Frame Stainless Mesh		Stainless Frame Stainless Mesh	
	Full Height 2" (50mm)	Half Height 1" (25mm)	Full Height 2" (50mm)	Half Height 1" (25mm)
4" (100mm)	HI-3920CS4.000	HI-3910CS4.000	HI-3920CSS4.000	HI-3910CSS4.000
3-1/2" (90mm)	HI-3920CS3.500	HI-3910CS3.500	HI-3920CSS3.500	HI-3910CSS3.500
3" (75mm)	HI-3920CS3.000	HI-3910CS3.000	HI-3920CSS3.000	HI-3910CSS3.000
2-1/2' (63mm)	HI-3920CS2.500	HI-3910CS2.500	HI-3920CSS2.500	HI-3910CSS2.500
2.12" (53mm)	HI-3920CS2.120	HI-3910CS2.120	HI-3920CSS2.120	HI-3910CSS2.120
2" (50mm)	HI-3920CS2.000	HI-3910CS2.000	HI-3920CSS2.000	HI-3910CSS2.000
1-3/4" (45mm)	HI-3920CS1.750	HI-3910CS1.750	HI-3920CSS1.750	HI-3910CSS1.750
1-1/2" (37.5mm)	HI-3920CS1.500	HI-3910CS1.500	HI-3920CSS1.500	HI-3910CSS1.500
1-1/4" (31.5mm)	HI-3920CS1.250	HI-3910CS1.250	HI-3920CSS1.250	HI-3910CSS1.250
1.06" (26.5mm)	HI-3920CS1.060	HI-3910CS1.060	HI-3920CSS1.060	HI-3910CSS1.060
1" (25.0mm)	HI-3920CS1.000	HI-3910CS1.000	HI-3920CSS1.000	HI-3910CSS1.000
7/8" (22.4mm)	HI-3920CS.875	HI-3910CS.875	HI-3920CSS.875	HI-3910CSS.875
3/4" (19.0mm)	HI-3920CS.750	HI-3910CS.750	HI-3920CSS.750	HI-3910CSS.750
5/8" (16.0mm)	HI-3920CS.625	HI-3910CS.625	HI-3920CSS.625	HI-3910CSS.625
0.530" (13.2mm)	HI-3920CS.530	HI-3910CS.530	HI-3920CSS.530	HI-3910CSS.530
1/2" (12.5mm)	HI-3920CS.500	HI-3910CS.500	HI-3920CSS.500	HI-3910CSS.500
7/16" (11.2mm)	HI-3920CS.438	HI-3910CS.438	HI-3920CSS.438	HI-3910CSS.438
3/8" (9.5mm)	HI-3920CS.375	HI-3910CS.375	HI-3920CSS.375	HI-3910CSS.375
5/16" (8.0mm)	HI-3920CS.312	HI-3910CS.312	HI-3920CSS.312	HI-3910CSS.312
0.265" (6.7mm)	HI-3920CS.265	HI-3910CS.265	HI-3920CSS.265	HI-3910CSS.265
1/4" (6.3mm)	HI-3920CS.250	HI-3910CS.250	HI-3920CSS.250	HI-3910CSS.250
1/8" (3.17mm)	HI-3920CS.125	HI-3910CS.125	HI-3920CSS.125	HI-3910CSS.125
No. 3-1/2 (5.6mm)	HI-3920FS3-1/2	HI-3910FS3-1/2	HI-3920FSS3-1/2	HI-3910FSS3-1/2
No. 4 (4.75mm)	HI-3920FS4	HI-3910FS4	HI-3920FSS4	HI-3910FSS4
No. 5 (4.0mm)	HI-3920FS5	HI-3910FS5	HI-3920FSS5	HI-3910FSS5
No. 6 (3.35mm)	HI-3920FS6	HI-3910FS6	HI-3920FSS6	HI-3910FSS6
No. 7 (2.80mm)	HI-3920FS7	HI-3910FS7	HI-3920FSS7	HI-3910FSS7
No. 8 (2.36mm)	HI-3920FS8	HI-3910FS8	HI-3920FSS8	HI-3910FSS8
No. 10 (2.00mm)	HI-3920FS10	HI-3910FS10	HI-3920FSS10	HI-3910FSS10
No. 12 (1.70mm)	HI-3920FS12	HI-3910FS12	HI-3920FSS12	HI-3910FSS12
No. 14 (1.40mm)	HI-3920FS14	HI-3910FS14	HI-3920FSS14	HI-3910FSS14
No. 16 (1.18mm)	HI-3920FS16	HI-3910FS16	HI-3920FSS16	HI-3910FSS16
No. 18 (1.0mm)	HI-3920FS18	HI-3910FS18	HI-3920FSS18	HI-3910FSS18
No. 20 (850µm)	HI-3920FS20	HI-3910FS20	HI-3920FSS20	HI-3910FSS20
No. 25 (710µm)	HI-3920FS25	HI-3910FS25	HI-3920FSS25	HI-3910FSS25
No. 30 (600µm)	HI-3920FS30	HI-3910FS30	HI-3920FSS30	HI-3910FSS30
No. 35 (500µm)	HI-3920FS35	HI-3910FS35	HI-3920FSS35	HI-3910FSS35
No. 40 (425µm)	HI-3920FS40	HI-3910FS40	HI-3920FSS40	HI-3910FSS40
No. 45 (355µm)	HI-3920FS45	HI-3910FS45	HI-3920FSS45	HI-3910FSS45
No. 50 (300µm)	HI-3920FS50	HI-3910FS50	HI-3920FSS50	HI-3910FSS50
No. 60 (250µm)	HI-3920FS60	HI-3910FS60	HI-3920FSS60	HI-3910FSS60
No. 70 (212µm)	HI-3920FS70	HI-3910FS70	HI-3920FSS70	HI-3910FSS70
No. 80 (180µm)	HI-3920FS80	HI-3910FS80	HI-3920FSS80	HI-3910FSS80
No. 100 (150µm)	HI-3920FS100	HI-3910FS100	HI-3920FSS100	HI-3910FSS100
No. 120 (125µm)	HI-3920FS120	HI-3910FS120	HI-3920FSS120	HI-3910FSS120
No. 140 (106µm)	HI-3920FS140	HI-3910FS140	HI-3920FSS140	HI-3910FSS140
No. 170 (90µm)	HI-3920FS170	HI-3910FS170	HI-3920FSS170	HI-3910FSS170
No. 200 (75µm)	HI-3920FS200	HI-3910FS200	HI-3920FSS200	HI-3910FSS200
No. 230 (63µm)	HI-3920FS230	HI-3910FS230	HI-3920FSS230	HI-3910FSS230
No. 270 (53µm)	HI-3920FS270	HI-3910FS270	HI-3920FSS270	HI-3910FSS270
No. 325 (45µm)	HI-3920FS325	HI-3910FS325	HI-3920FSS325	HI-3910FSS325
No. 400 (38µm)	HI-3920FS400	HI-3910FS400	HI-3920FSS400	HI-3910FSS400
No. 450 (32µm)	HI-3920FS450	HI-3910FS450	HI-3920FSS450	HI-3910FSS450
No. 500 (25µm)	HI-3920FS500	HI-3910FS500	HI-3920FSS500	HI-3910FSS500
No. 635 (20µm)	HI-3920FS635	HI-3910FS635	HI-3920FSS635	HI-3910FSS635
No. 850 (10µm)	HI-3920FS850	HI-3910FS850	–	–
No. 1000 (2µm)	HI-3920FS1000	HI-3910FS1000	–	–

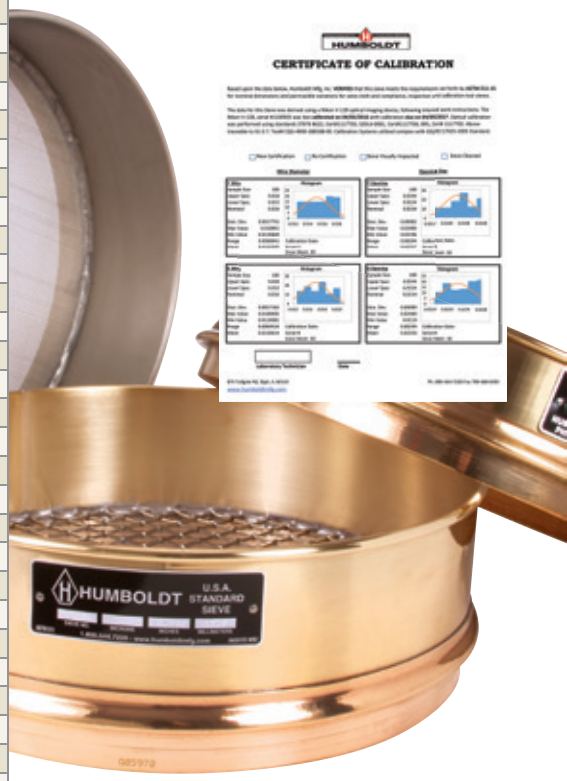
USA Standard ASTM Inspection Test Sieves

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

12"

305mm

Sieve Size	Brass Frame Stainless Mesh			Stainless Frame Stainless Mesh	
	Full Height 3" (75mm)	Inter. Height 2" (50mm)	Half Height 1.625" (41mm)	Full Height 3" (75mm)	Half Height 1.625" (41mm)
4" (100mm)	HI-3912CS4.000	HI-3922CS4.000	HI-3932CS4.000	HI-3912CSS4.000	HI-3932CSS4.000
3-1/2" (90mm)	HI-3912CS3.500	HI-3922CS3.500	HI-3932CS3.500	HI-3912CSS3.500	HI-3932CSS3.500
3" (75mm)	HI-3912CS3.000	HI-3922CS3.000	HI-3932CS3.000	HI-3912CSS3.000	HI-3932CSS3.000
2-1/2' (63mm)	HI-3912CS2.500	HI-3922CS2.500	HI-3932CS2.500	HI-3912CSS2.500	HI-3932CSS2.500
2.12" (53mm)	HI-3912CS2.120	HI-3922CS2.120	HI-3932CS2.120	HI-3912CSS2.120	HI-3932CSS2.120
2" (50mm)	HI-3912CS2.000	HI-3922CS2.000	HI-3932CS2.000	HI-3912CSS2.000	HI-3932CSS2.000
1-3/4" (45mm)	HI-3912CS1.750	HI-3922CS1.750	HI-3932CS1.750	HI-3912CSS1.750	HI-3932CSS1.750
1-1/2" (37.5mm)	HI-3912CS1.500	HI-3922CS1.500	HI-3932CS1.500	HI-3912CSS1.500	HI-3932CSS1.500
1-1/4" (31.5mm)	HI-3912CS1.250	HI-3922CS1.250	HI-3932CS1.250	HI-3912CSS1.250	HI-3932CSS1.250
1.06" (26.5mm)	HI-3912CS1.060	HI-3922CS1.060	HI-3932CS1.060	HI-3912CSS1.060	HI-3932CSS1.060
1" (25.0mm)	HI-3912CS1.000	HI-3922CS1.000	HI-3932CS1.000	HI-3912CSS1.000	HI-3932CSS1.000
7/8" (22.4mm)	HI-3912CS.875	HI-3922CS.875	HI-3932CS.875	HI-3912CSS.875	HI-3932CSS.875
3/4" (19.0mm)	HI-3912CS.750	HI-3922CS.750	HI-3932CS.750	HI-3912CSS.750	HI-3932CSS.750
5/8" (16.0mm)	HI-3912CS.625	HI-3922CS.625	HI-3932CS.625	HI-3912CSS.625	HI-3932CSS.625
0.530" (13.2mm)	HI-3912CS.530	HI-3922CS.530	HI-3932CS.530	HI-3912CSS.530	HI-3932CSS.530
1/2" (12.5mm)	HI-3912CS.500	HI-3922CS.500	HI-3932CS.500	HI-3912CSS.500	HI-3932CSS.500
7/16" (11.2mm)	HI-3912CS.438	HI-3922CS.438	HI-3932CS.438	HI-3912CSS.438	HI-3932CSS.438
3/8" (9.5mm)	HI-3912CS.375	HI-3922CS.375	HI-3932CS.375	HI-3912CSS.375	HI-3932CSS.375
5/16" (8.0mm)	HI-3912CS.312	HI-3922CS.312	HI-3932CS.312	HI-3912CSS.312	HI-3932CSS.312
0.265" (6.7mm)	HI-3912CS.265	HI-3922CS.265	HI-3932CS.265	HI-3912CSS.265	HI-3932CSS.265
1/4" (6.3mm)	HI-3912CS.250	HI-3922CS.250	HI-3932CS.250	HI-3912CSS.250	HI-3932CSS.250
1/8" (3.17mm)	HI-3912CS.125	HI-3922CS.125	HI-3932CS.125	–	HI-3932CSS.125
No. 3-1/2 (5.6mm)	HI-3912FS3-1/2	HI-3922FS3-1/2	HI-3932FS3-1/2	HI-3912FSS3-1/2	HI-3932FSS3-1/2
No. 4 (4.75mm)	HI-3912FS4	HI-3922FS4	HI-3932FS4	HI-3912FSS4	HI-3932FSS4
No. 5 (4.0mm)	HI-3912FS5	HI-3922FS5	HI-3932FS5	HI-3912FSS5	HI-3932FSS5
No. 6 (3.35mm)	HI-3912FS6	HI-3922FS6	HI-3932FS6	HI-3912FSS6	HI-3932FSS6
No. 7 (2.80mm)	HI-3912FS7	HI-3922FS7	HI-3932FS7	HI-3912FSS7	HI-3932FSS7
No. 8 (2.36mm)	HI-3912FS8	HI-3922FS8	HI-3932FS8	HI-3912FSS8	HI-3932FSS8
No. 10 (2.00mm)	HI-3912FS10	HI-3922FS10	HI-3932FS10	HI-3912FSS10	HI-3932FSS10
No. 12 (1.70mm)	HI-3912FS12	HI-3922FS12	HI-3932FS12	HI-3912FSS12	HI-3932FSS12
No. 14 (1.40mm)	HI-3912FS14	HI-3922FS14	HI-3932FS14	HI-3912FSS14	HI-3932FSS14
No. 16 (1.18mm)	HI-3912FS16	HI-3922FS16	HI-3932FS16	HI-3912FSS16	HI-3932FSS16
No. 18 (1.0mm)	HI-3912FS18	HI-3922FS18	HI-3932FS18	HI-3912FSS18	HI-3932FSS18
No. 20 (850µm)	HI-3912FS20	HI-3922FS20	HI-3932FS20	HI-3912FSS20	HI-3932FSS20
No. 25 (710µm)	HI-3912FS25	HI-3922FS25	HI-3932FS25	HI-3912FSS25	HI-3932FSS25
No. 30 (600µm)	HI-3912FS30	HI-3922FS30	HI-3932FS30	HI-3912FSS30	HI-3932FSS30
No. 35 (500µm)	HI-3912FS35	HI-3922FS35	HI-3932FS35	HI-3912FSS35	HI-3932FSS35
No. 40 (425µm)	HI-3912FS40	HI-3922FS40	HI-3932FS40	HI-3912FSS40	HI-3932FSS40
No. 45 (355µm)	HI-3912FS45	HI-3922FS45	HI-3932FS45	HI-3912FSS45	HI-3932FSS45
No. 50 (300µm)	HI-3912FS50	HI-3922FS50	HI-3932FS50	HI-3912FSS50	HI-3932FSS50
No. 60 (250µm)	HI-3912FS60	HI-3922FS60	HI-3932FS60	HI-3912FSS60	HI-3932FSS60
No. 70 (212µm)	HI-3912FS70	HI-3922FS70	HI-3932FS70	HI-3912FSS70	HI-3932FSS70
No. 80 (180µm)	HI-3912FS80	HI-3922FS80	HI-3932FS80	HI-3912FSS80	HI-3932FSS80
No. 100 (150µm)	HI-3912FS100	HI-3922FS100	HI-3932FS100	HI-3912FSS100	HI-3932FSS100
No. 120 (125µm)	HI-3912FS120	HI-3922FS120	HI-3932FS120	HI-3912FSS120	HI-3932FSS120
No. 140 (106µm)	HI-3912FS140	HI-3922FS140	HI-3932FS140	HI-3912FSS140	HI-3932FSS140
No. 170 (90µm)	HI-3912FS170	HI-3922FS170	HI-3932FS170	HI-3912FSS170	HI-3932FSS170
No. 200 (75µm)	HI-3912FS200	HI-3922FS200	HI-3932FS200	HI-3912FSS200	HI-3932FSS200
No. 230 (63µm)	HI-3912FS230	HI-3922FS230	HI-3932FS230	HI-3912FSS230	HI-3932FSS230
No. 270 (53µm)	HI-3912FS270	HI-3922FS270	HI-3932FS270	HI-3912FSS270	HI-3932FSS270
No. 325 (45µm)	HI-3912FS325	HI-3922FS325	HI-3932FS325	HI-3912FSS325	HI-3932FSS325
No. 400 (38µm)	HI-3912FS400	HI-3922FS400	HI-3932FS400	HI-3912FSS400	HI-3932FSS400
No. 450 (32µm)	HI-3912FS450	HI-3922FS450	HI-3932FS450	HI-3912FSS450	HI-3932FSS450
No. 500 (25µm)	HI-3912FS500	HI-3922FS500	HI-3932FS500	HI-3912FSS500	HI-3932FSS500
No. 635 (20µm)	HI-3912FS635	HI-3922FS635	HI-3932FS635	HI-3912FSS635	HI-3932FSS635
No. 850 (10µm)	HI-3912FS850	HI-3922FS850	HI-3932FS850	–	–
No. 1000 (2µm)	HI-3912FS1000	HI-3922FS1000	HI-3932FS1000	–	–



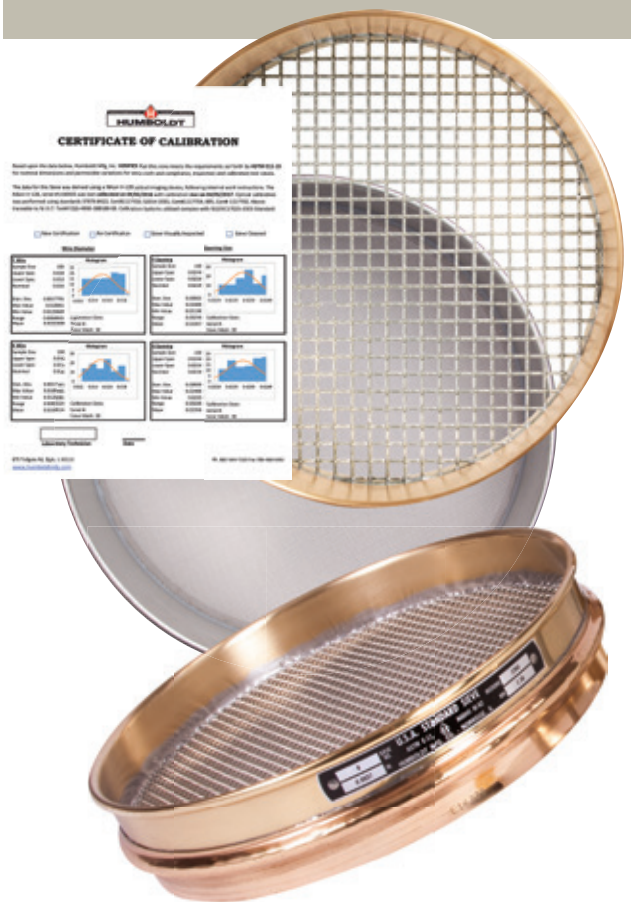
Calibration Test Sieves

USA Standard ASTM Calibration Test Sieves

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

8"

203mm



Sieve Size	Brass Frame Stainless Mesh		Stainless Frame Stainless Mesh	
	Full Height 2" (50mm)	Half Height 1" (25mm)	Full Height 2" (50mm)	Half Height 1" (25mm)
4" (100mm)	HC-3920CS4.000	HC-3910CS4.000	HC-3920CSS4.000	HC-3910CSS4.000
3-1/2" (90mm)	HC-3920CS3.500	HC-3910CS3.500	HC-3920CSS3.500	HC-3910CSS3.500
3" (75mm)	HC-3920CS3.000	HC-3910CS3.000	HC-3920CSS3.000	HC-3910CSS3.000
2-1/2' (63mm)	HC-3920CS2.500	HC-3910CS2.500	HC-3920CSS2.500	HC-3910CSS2.500
2.12" (53mm)	HC-3920CS2.120	HC-3910CS2.120	HC-3920CSS2.120	HC-3910CSS2.120
2" (50mm)	HC-3920CS2.000	HC-3910CS2.000	HC-3920CSS2.000	HC-3910CSS2.000
1-3/4" (45mm)	HC-3920CS1.750	HC-3910CS1.750	HC-3920CSS1.750	HC-3910CSS1.750
1-1/2" (37.5mm)	HC-3920CS1.500	HC-3910CS1.500	HC-3920CSS1.500	HC-3910CSS1.500
1-1/4" (31.5mm)	HC-3920CS1.250	HC-3910CS1.250	HC-3920CSS1.250	HC-3910CSS1.250
1.06" (26.5mm)	HC-3920CS1.060	HC-3910CS1.060	HC-3920CSS1.060	HC-3910CSS1.060
1" (25.0mm)	HC-3920CS1.000	HC-3910CS1.000	HC-3920CSS1.000	HC-3910CSS1.000
7/8" (22.4mm)	HC-3920CS.875	HC-3910CS.875	HC-3920CSS.875	HC-3910CSS.875
3/4" (19.0mm)	HC-3920CS.750	HC-3910CS.750	HC-3920CSS.750	HC-3910CSS.750
5/8" (16.0mm)	HC-3920CS.625	HC-3910CS.625	HC-3920CSS.625	HC-3910CSS.625
0.530" (13.2mm)	HC-3920CS.530	HC-3910CS.530	HC-3920CSS.530	HC-3910CSS.530
1/2" (12.5mm)	HC-3920CS.500	HC-3910CS.500	HC-3920CSS.500	HC-3910CSS.500
7/16" (11.2mm)	HC-3920CS.438	HC-3910CS.438	HC-3920CSS.438	HC-3910CSS.438
3/8" (9.5mm)	HC-3920CS.375	HC-3910CS.375	HC-3920CSS.375	HC-3910CSS.375
5/16" (8.0mm)	HC-3920CS.312	HC-3910CS.312	HC-3920CSS.312	HC-3910CSS.312
0.265" (6.7mm)	HC-3920CS.265	HC-3910CS.265	HC-3920CSS.265	HC-3910CSS.265
1/4" (6.3mm)	HC-3920CS.250	HC-3910CS.250	HC-3920CSS.250	HC-3910CSS.250
1/8" (3.17mm)	HC-3920CS.125	HC-3910CS.125	HC-3920CSS.125	HC-3910CSS.125
No. 3-1/2 (5.6mm)	HC-3920FS3-1/2	HC-3910FS3-1/2	HC-3920FSS3-1/2	HC-3910FSS3-1/2
No. 4 (4.75mm)	HC-3920FS4	HC-3910FS4	HC-3920FSS4	HC-3910FSS4
No. 5 (4.0mm)	HC-3920FS5	HC-3910FS5	HC-3920FSS5	HC-3910FSS5
No. 6 (3.35mm)	HC-3920FS6	HC-3910FS6	HC-3920FSS6	HC-3910FSS6
No. 7 (2.80mm)	HC-3920FS7	HC-3910FS7	HC-3920FSS7	HC-3910FSS7
No. 8 (2.36mm)	HC-3920FS8	HC-3910FS8	HC-3920FSS8	HC-3910FSS8
No. 10 (2.00mm)	HC-3920FS10	HC-3910FS10	HC-3920FSS10	HC-3910FSS10
No. 12 (1.70mm)	HC-3920FS12	HC-3910FS12	HC-3920FSS12	HC-3910FSS12
No. 14 (1.40mm)	HC-3920FS14	HC-3910FS14	HC-3920FSS14	HC-3910FSS14
No. 16 (1.18mm)	HC-3920FS16	HC-3910FS16	HC-3920FSS16	HC-3910FSS16
No. 18 (1.0mm)	HC-3920FS18	HC-3910FS18	HC-3920FSS18	HC-3910FSS18
No. 20 (850µm)	HC-3920FS20	HC-3910FS20	HC-3920FSS20	HC-3910FSS20
No. 25 (710µm)	HC-3920FS25	HC-3910FS25	HC-3920FSS25	HC-3910FSS25
No. 30 (600µm)	HC-3920FS30	HC-3910FS30	HC-3920FSS30	HC-3910FSS30
No. 35 (500µm)	HC-3920FS35	HC-3910FS35	HC-3920FSS35	HC-3910FSS35
No. 40 (425µm)	HC-3920FS40	HC-3910FS40	HC-3920FSS40	HC-3910FSS40
No. 45 (355µm)	HC-3920FS45	HC-3910FS45	HC-3920FSS45	HC-3910FSS45
No. 50 (300µm)	HC-3920FS50	HC-3910FS50	HC-3920FSS50	HC-3910FSS50
No. 60 (250µm)	HC-3920FS60	HC-3910FS60	HC-3920FSS60	HC-3910FSS60
No. 70 (212µm)	HC-3920FS70	HC-3910FS70	HC-3920FSS70	HC-3910FSS70
No. 80 (180µm)	HC-3920FS80	HC-3910FS80	HC-3920FSS80	HC-3910FSS80
No. 100 (150µm)	HC-3920FS100	HC-3910FS100	HC-3920FSS100	HC-3910FSS100
No. 120 (125µm)	HC-3920FS120	HC-3910FS120	HC-3920FSS120	HC-3910FSS120
No. 140 (106µm)	HC-3920FS140	HC-3910FS140	HC-3920FSS140	HC-3910FSS140
No. 170 (90µm)	HC-3920FS170	HC-3910FS170	HC-3920FSS170	HC-3910FSS170
No. 200 (75µm)	HC-3920FS200	HC-3910FS200	HC-3920FSS200	HC-3910FSS200
No. 230 (63µm)	HC-3920FS230	HC-3910FS230	HC-3920FSS230	HC-3910FSS230
No. 270 (53µm)	HC-3920FS270	HC-3910FS270	HC-3920FSS270	HC-3910FSS270
No. 325 (45µm)	HC-3920FS325	HC-3910FS325	HC-3920FSS325	HC-3910FSS325
No. 400 (38µm)	HC-3920FS400	HC-3910FS400	HC-3920FSS400	HC-3910FSS400
No. 450 (32µm)	HC-3920FS450	HC-3910FS450	HC-3920FSS450	HC-3910FSS450
No. 500 (25µm)	HC-3920FS500	HC-3910FS500	HC-3920FSS500	HC-3910FSS500
No. 635 (20µm)	HC-3920FS635	HC-3910FS635	HC-3920FSS635	HC-3910FSS635
No. 850 (10µm)	HC-3920FS850	HC-3910FS850	–	–
No. 1000 (2µm)	HC-3920FS1000	HC-3910FS1000	–	–

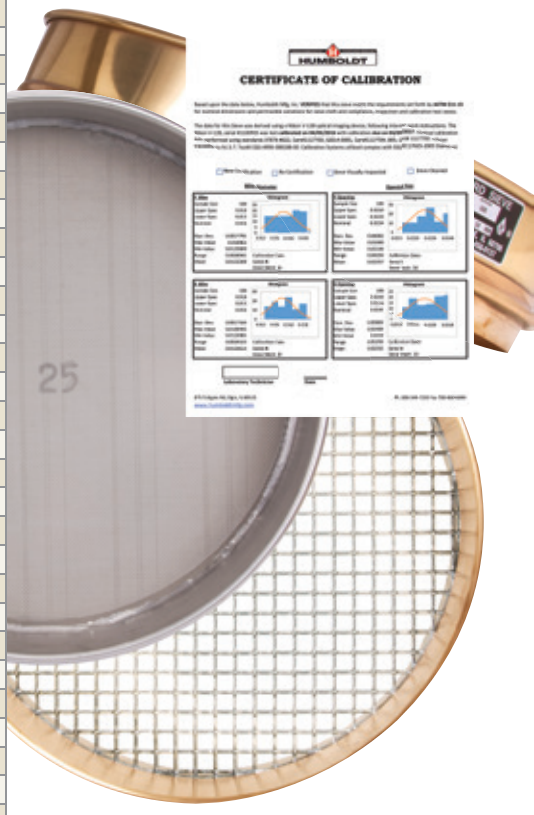
Sieve Size	Brass Frame Stainless Mesh			Stainless Frame Stainless Mesh	
	Full Height 3" (75mm)	Inter. Height 2" (50mm)	Half Height 1.625" (41mm)	Full Height 3" (75mm)	Half Height 1.625" (41mm)
4" (100mm)	HC-3912CS4.000	HC-3922CS4.000	HC-3932CS4.000	HC-3912CSS4.000	HC-3932CSS4.000
3-1/2" (90mm)	HC-3912CS3.500	HC-3922CS3.500	HC-3932CS3.500	HC-3912CSS3.500	HC-3932CSS3.500
3" (75mm)	HC-3912CS3.000	HC-3922CS3.000	HC-3932CS3.000	HC-3912CSS3.000	HC-3932CSS3.000
2-1/2' (63mm)	HC-3912CS2.500	HC-3922CS2.500	HC-3932CS2.500	HC-3912CSS2.500	HC-3932CSS2.500
2.12" (53mm)	HC-3912CS2.120	HC-3922CS2.120	HC-3932CS2.120	HC-3912CSS2.120	HC-3932CSS2.120
2" (50mm)	HC-3912CS2.000	HC-3922CS2.000	HC-3932CS2.000	HC-3912CSS2.000	HC-3932CSS2.000
1-3/4" (45mm)	HC-3912CS1.750	HC-3922CS1.750	HC-3932CS1.750	HC-3912CSS1.750	HC-3932CSS1.750
1-1/2" (37.5mm)	HC-3912CS1.500	HC-3922CS1.500	HC-3932CS1.500	HC-3912CSS1.500	HC-3932CSS1.500
1-1/4" (31.5mm)	HC-3912CS1.250	HC-3922CS1.250	HC-3932CS1.250	HC-3912CSS1.250	HC-3932CSS1.250
1.06" (26.5mm)	HC-3912CS1.060	HC-3922CS1.060	HC-3932CS1.060	HC-3912CSS1.060	HC-3932CSS1.060
1" (25.0mm)	HC-3912CS1.000	HC-3922CS1.000	HC-3932CS1.000	HC-3912CSS1.000	HC-3932CSS1.000
7/8" (22.4mm)	HC-3912CS.875	HC-3922CS.875	HC-3932CS.875	HC-3912CSS.875	HC-3932CSS.875
3/4" (19.0mm)	HC-3912CS.750	HC-3922CS.750	HC-3932CS.750	HC-3912CSS.750	HC-3932CSS.750
5/8" (16.0mm)	HC-3912CS.625	HC-3922CS.625	HC-3932CS.625	HC-3912CSS.625	HC-3932CSS.625
0.530" (13.2mm)	HC-3912CS.530	HC-3922CS.530	HC-3932CS.530	HC-3912CSS.530	HC-3932CSS.530
1/2" (12.5mm)	HC-3912CS.500	HC-3922CS.500	HC-3932CS.500	HC-3912CSS.500	HC-3932CSS.500
7/16" (11.2mm)	HC-3912CS.438	HC-3922CS.438	HC-3932CS.438	HC-3912CSS.438	HC-3932CSS.438
3/8" (9.5mm)	HC-3912CS.375	HC-3922CS.375	HC-3932CS.375	HC-3912CSS.375	HC-3932CSS.375
5/16" (8.0mm)	HC-3912CS.312	HC-3922CS.312	HC-3932CS.312	HC-3912CSS.312	HC-3932CSS.312
0.265" (6.7mm)	HC-3912CS.265	HC-3922CS.265	HC-3932CS.265	HC-3912CSS.265	HC-3932CSS.265
1/4" (6.3mm)	HC-3912CS.250	HC-3922CS.250	HC-3932CS.250	HC-3912CSS.250	HC-3932CSS.250
1/8" (3.17mm)	HC-3912CS.125	HC-3922CS.125	HC-3932CS.125	–	HC-3932CSS.125
No. 3-1/2 (5.6mm)	HC-3912FS3-1/2	HC-3922FS3-1/2	HC-3932FS3-1/2	HC-3912FSS3-1/2	HC-3932FSS3-1/2
No. 4 (4.75mm)	HC-3912FS4	HC-3922FS4	HC-3932FS4	HC-3912FSS4	HC-3932FSS4
No. 5 (4.0mm)	HC-3912FS5	HC-3922FS5	HC-3932FS5	HC-3912FSS5	HC-3932FSS5
No. 6 (3.35mm)	HC-3912FS6	HC-3922FS6	HC-3932FS6	HC-3912FSS6	HC-3932FSS6
No. 7 (2.80mm)	HC-3912FS7	HC-3922FS7	HC-3932FS7	HC-3912FSS7	HC-3932FSS7
No. 8 (2.36mm)	HC-3912FS8	HC-3922FS8	HC-3932FS8	HC-3912FSS8	HC-3932FSS8
No. 10 (2.00mm)	HC-3912FS10	HC-3922FS10	HC-3932FS10	HC-3912FSS10	HC-3932FSS10
No. 12 (1.70mm)	HC-3912FS12	HC-3922FS12	HC-3932FS12	HC-3912FSS12	HC-3932FSS12
No. 14 (1.40mm)	HC-3912FS14	HC-3922FS14	HC-3932FS14	HC-3912FSS14	HC-3932FSS14
No. 16 (1.18mm)	HC-3912FS16	HC-3922FS16	HC-3932FS16	HC-3912FSS16	HC-3932FSS16
No. 18 (1.0mm)	HC-3912FS18	HC-3922FS18	HC-3932FS18	HC-3912FSS18	HC-3932FSS18
No. 20 (850µm)	HC-3912FS20	HC-3922FS20	HC-3932FS20	HC-3912FSS20	HC-3932FSS20
No. 25 (710µm)	HC-3912FS25	HC-3922FS25	HC-3932FS25	HC-3912FSS25	HC-3932FSS25
No. 30 (600µm)	HC-3912FS30	HC-3922FS30	HC-3932FS30	HC-3912FSS30	HC-3932FSS30
No. 35 (500µm)	HC-3912FS35	HC-3922FS35	HC-3932FS35	HC-3912FSS35	HC-3932FSS35
No. 40 (425µm)	HC-3912FS40	HC-3922FS40	HC-3932FS40	HC-3912FSS40	HC-3932FSS40
No. 45 (355µm)	HC-3912FS45	HC-3922FS45	HC-3932FS45	HC-3912FSS45	HC-3932FSS45
No. 50 (300µm)	HC-3912FS50	HC-3922FS50	HC-3932FS50	HC-3912FSS50	HC-3932FSS50
No. 60 (250µm)	HC-3912FS60	HC-3922FS60	HC-3932FS60	HC-3912FSS60	HC-3932FSS60
No. 70 (212µm)	HC-3912FS70	HC-3922FS70	HC-3932FS70	HC-3912FSS70	HC-3932FSS70
No. 80 (180µm)	HC-3912FS80	HC-3922FS80	HC-3932FS80	HC-3912FSS80	HC-3932FSS80
No. 100 (150µm)	HC-3912FS100	HC-3922FS100	HC-3932FS100	HC-3912FSS100	HC-3932FSS100
No. 120 (125µm)	HC-3912FS120	HC-3922FS120	HC-3932FS120	HC-3912FSS120	HC-3932FSS120
No. 140 (106µm)	HC-3912FS140	HC-3922FS140	HC-3932FS140	HC-3912FSS140	HC-3932FSS140
No. 170 (90µm)	HC-3912FS170	HC-3922FS170	HC-3932FS170	HC-3912FSS170	HC-3932FSS170
No. 200 (75µm)	HC-3912FS200	HC-3922FS200	HC-3932FS200	HC-3912FSS200	HC-3932FSS200
No. 230 (63µm)	HC-3912FS230	HC-3922FS230	HC-3932FS230	HC-3912FSS230	HC-3932FSS230
No. 270 (53µm)	HC-3912FS270	HC-3922FS270	HC-3932FS270	HC-3912FSS270	HC-3932FSS270
No. 325 (45µm)	HC-3912FS325	HC-3922FS325	HC-3932FS325	HC-3912FSS325	HC-3932FSS325
No. 400 (38µm)	HC-3912FS400	HC-3922FS400	HC-3932FS400	HC-3912FSS400	HC-3932FSS400
No. 450 (32µm)	HC-3912FS450	HC-3922FS450	HC-3932FS450	HC-3912FSS450	HC-3932FSS450
No. 500 (25µm)	HC-3912FS500	HC-3922FS500	HC-3932FS500	HC-3912FSS500	HC-3932FSS500
No. 635 (20µm)	HC-3912FS635	HC-3922FS635	HC-3932FS635	HC-3912FSS635	HC-3932FSS635
No. 850 (10µm)	HC-3912FS850	HC-3922FS850	HC-3932FS850	–	–
No. 1000 (2µm)	HC-3912FS1000	HC-3922FS1000	HC-3932FS1000	–	–

USA Standard ASTM Calibration Test Sieves

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

12"

305mm



Deep, USA Standard ASTM Test Sieves

4" 101mm

12" 305mm

Sieve Size	4" Diameter		12" Diameter	
	Brass Frame, Stainless Mesh		Brass Frame, Stainless Mesh	
	1.5" Deep	4" Deep	4" Deep	8" Deep
4" (100mm)	-	-	H-3928CS4.000	H-3938CS4.000
3-1/2" (90mm)	-	-	H-3928CS3.500	H-3938CS3.500
3" (75mm)	-	-	H-3928CS3.000	H-3938CS3.000
2-1/2' (63mm)	-	-	H-3928CS2.500	H-3938CS2.500
2.12" (53mm)	-	-	H-3928CS2.120	H-3938CS2.120
2" (50mm)	-	-	H-3928CS2.000	H-3938CS2.000
1-3/4" (45mm)	-	-	H-3928CS1.750	H-3938CS1.750
1-1/2" (37.5mm)	-	-	H-3928CS1.500	H-3938CS1.500
1-1/4" (31.5mm)	-	-	H-3928CS1.250	H-3938CS1.250
1.06" (26.5mm)	-	-	H-3928CS1.060	H-3938CS1.060
1" (25.0mm)	H-3914CS1.000	H-3924CS1.000	H-3928CS1.000	H-3938CS1.000
7/8" (22.4mm)	H-3914CS.875	H-3924CS.875	H-3928CS.875	H-3938CS.875
3/4" (19.0mm)	H-3914CS.750	H-3924CS.750	H-3928CS.750	H-3910CS.750
5/8" (16.0mm)	H-3914CS.625	H-3924CS.625	H-3928CS.625	H-3938CS.625
0.530" (13.2mm)	H-3914CS.530	H-3924CS.530	H-3928CS.530	H-3938CS.530
1/2" (12.5mm)	H-3914CS.500	H-3924CS.500	H-3928CS.500	H-3938CS.500
7/16" (11.2mm)	H-3914CS.438	H-3924CS.438	H-3928CS.438	H-3938CS.438
3/8" (9.5mm)	H-3914CS.375	H-3924CS.375	H-3928CS.375	H-3938CS.375
5/16" (8.0mm)	H-3914CS.312	H-3924CS.312	H-3928CS.312	H-3938CS.312
0.265" (6.7mm)	H-3914CS.265	H-3924CS.265	H-3928CS.265	H-3938CS.265
1/4" (6.3mm)	H-3914CS.250	H-3924CS.250	H-3928CS.250	H-3938CS.250
1/8" (3.17mm)	H-3914CS.125	H-3924CS.125	H-3928CS.125	H-3938CS.125

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

USA Standard ASTM Test Sieves

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

3" 5" 6" 10"

76mm 127mm 152mm 254mm

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

Sieves


Sieve Pans and Covers


H-2813


H-3802


H-4329.5


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

Larger Brushes on Page 319

Sieve Covers and Pans

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

Sieve Covers with Ring Handle

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

Sieve Bottom Pans

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

NIST Reference Glass Beads

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

Sieve Separator Pans

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

Clean-N-Stor, for 8" Sieves

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

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

Magnifying Comparator

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

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

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

Sieve Balls

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

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

Sieve Brushes

Wire, wire loop handle; 1.5" x .75" x .125" (38 x 19 x 3mm), 5.5" (140mm) overall length.

Wire Sieve Brush for Coarse Mesh H-3772
Shipping wt. 1 lbs (.45kg)

Horsehair, wood handle; 1.5" x 1.25" dia. (38 x 32mm), 5.25" (133mm) overall length.

Horsehair Sieve Brush for Fine Mesh H-3774
Shipping wt. 1 lbs (.45kg)

Wire, plastic handle; 1.5" x 1.25" dia. (38 x 32mm), 5.25" (133mm) overall length.

Wire Sieve Brush for Fine Mesh H-3773
Shipping wt. 1 lbs (.45kg)

Horsehair, wood handle; 2.5" x 1" x .375" (64 x 25 x 10mm), 10.5" (267mm) overall length.

Horsehair Sieve Brush for Fine Mesh H-3770
Shipping wt. 1 lbs (.45kg)

Horsehair, wood handle; 2.75" x 1.125" x .75" (70 x 29 x 19mm), 10.5" (267mm) overall length.

Horsehair Sieve Brush, Oval Shape H-3799
Shipping wt. 1 lbs (.45kg)

H-4391

H-4100 Series

H-3903

H-3902

Sieve Set, Rocker-Type

For sieve analysis of coarse aggregates and other materials. Consists of a 12" (305mm) square frame with handles mounted on a collector box with rockers. Includes 3" (76.1mm), 2" (50.8mm), 1.5" (38.1mm), 1" (25.4mm), .75" (190mm), .5" (12.7mm), .375" (9.51mm) and No. 4 ASTM wire screen plates with square openings

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

Sieve Set, Rocker-Type H-4391

Shipping wt. 24 lbs (19kg)

Replacement Screens for Rocker-Type Sieves

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

18" Dia. Brass Frame, Riddle Sieves

ASTM E11, AASHTO M92

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

18" Brass Frame, Riddle Sieves See chart

18" Brass Frame Riddle Sieves

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

Sieve Set, Soil Analysis, 5" Dia.

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

Sieve Set, Soil Analysis, 5" Dia. H-3903

Shipping wt. 7 lbs (4.5kg)

Replacement Screens for Soil Analysis Sieves

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

Soil Analysis Sieve Set, 5" Dia. Perforated Plate

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

Soil Analysis Sieve Set, Perforated Plate H-3902

Shipping wt. 7 lbs (4.5kg)

Sieves, Wet Washing

H-3948

H-3945

H-3942, H-3943

Corps of Engineers Wash Screen Assembly

ASTM E11, AASHTO M92

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

COE Wash Screen Assembly — H-3948
Shipping wt. 15 lbs (7kg)

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

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

Wet-Wash Sieves, Deep Frame

ASTM E11, AASHTO M92

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

Wet Washing Sieves, Deep Frame — See chart

Wet Wash Sieves, Replaceable Mesh

ASTM E11, AASHTO M92

These sieves feature cost-effective, replaceable sieve cloth and mesh backups, which extend cloth life, as well as allow quick replacement of damaged screens. Sieves are available in either No. 200 or 325 mesh sizes with a No. 10 backup screen included. Screen material is held securely between rubber gaskets and bolted to the frame. Replacement sieve material is available in sizes 20 mesh and finer— call for availability.

Wet Wash Sieves, Replaceable Mesh — See chart

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

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

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

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

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

Wet Washing, Aggregate Washers

H-3807

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

H-3806

H-3949A

H-3880

Cement Wet Washing Sieves
ASTM E11; AASHTO M92

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

Cement, Wet Washing Sieves — See chart

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

Wet/Dry Sieve Shaker

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

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

Wet/Dry Sieve Shaker, 120V 60Hz — H-4328
Wet/Dry Sieve Shaker, 220V 50Hz — H-4328.5F
Shipping wt. 8.5 lbs (5kg)

Bucket, 5-gallon for H-4328

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

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

Wet Washing Sieve Apparatus
ASTM C430, D1514, AASHTO T192 and Test Standard No. 158 (Method 211)

Controls spray and water pressure. Includes valve, pressure gauge, piping and H-3808 spray nozzle.

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

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

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

Aggregate Washer
ASTM C117

Aggregate washer with 15lb. (6.8kg) capacity removes clay, aggregate particles and water-soluble materials by the decanted wash water. Specimen is agitated sufficiently to completely separate all particles. Revolving drum is 11" dia. x 13"D (27 x 33cm) and locks in four angle positions. Includes valve and .375" goose-neck water tube. O.D. 24" x 20" x 27" H (610 x 508 x 686mm). **Order USA Standard Sieve, 200 mesh separately from chart at right.**

Aggregate Washer, 120V 60Hz — H-3949A
Aggregate Washer, 220V 50Hz — H-3949A.5F
Shipping wt. 116 lbs (52kg)

Aggregate Washer, Table-Top Model
ASTM C117

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

Aggregate Washer, 120V 60Hz — H-3880
Aggregate Washer, 220V 50/60Hz — H-3880.4F
Shipping wt. 33.1 lbs (18kg)

Sieves for use with Aggregate Washers

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

Sieve Shakers

HA-4425, HA-4430

HA-4425V, HA-4430V

H-4325

H-4330

Sieve Shaker, Digital Timer
ASTM C136

The Humboldt digital shaker allows the user to set a time of up to 60 minutes with automatic shutoff. It features an easy-to-use digital interface with an accuracy of 0.5%. The HA-4425 sieve shaker builds upon the economical and time-proven design of the Humboldt Sieve Shaker, which has been providing dependable service for many years. This sieve shaker can be used with 3", 5" and 8" sieves and can handle up to ten 8" sieves, twelve 5" sieves, sixteen 3" full-height sieves or eighteen half-height 8" sieves.

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

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

Sieve Shaker, Digital Timer, 120V 60Hz	HA-4425
Sieve Shaker, Digital Timer, 220V 60Hz	HA-4425.2F
Sieve Shaker, Digital Timer, 220V 50Hz	HA-4425.5F

Shipping wt. 72 lbs (32.6kg)

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

Shipping wt. 95 lbs (43kg)

Variable-Speed Sieve Shaker, Digital Timer
ASTM C136

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

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

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

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

Variable Speed Shaker, Digital, 120V 60Hz	HA-4425V
Variable Speed Shaker, Digital, 220V 60Hz	HA-4425V.2F
Variable Speed Shaker, Digital, 220V 50Hz	HA-4425V.5F

Large Shaker, Digital, Variable 120V 60Hz	HA-4430V
Large Shaker, Digital, Variable 220V 60Hz	HA-4430V.2F
Large Shaker, Digital, Variable 220V 50Hz	HA-4430V.5F

Shipping wt. 72 lbs (29.5kg)

Humboldt, Economy Sieve Shaker
ASTM C136

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

Economy Sieve Shaker, 120V 60Hz	H-4325
Economy Sieve Shaker, 220V 60Hz	H-4325.2F
Economy Sieve Shaker, 220V 50Hz	H-4325.5F

Shipping wt. 72 lbs (29.5kg)

Humboldt, Large, Economy Sieve Shaker
ASTM C136

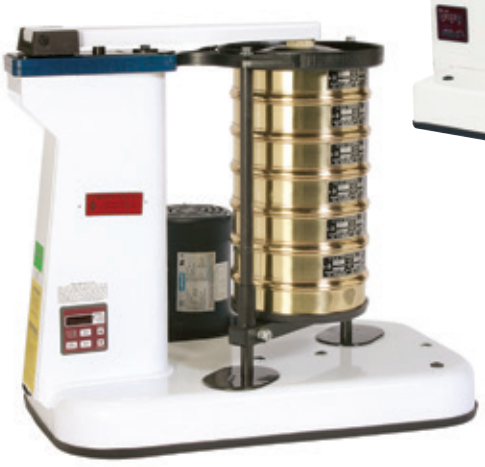
The Humboldt large economy sieve shaker can be used with 8", 10" and 12" sieves. It can handle up to eleven 8" sieves, seven 10" sieves, seven 12" full-height sieves, nineteen half-height 8" sieves or thirteen half-height 12" sieves. It features a 30 minute, easy-to-use, mechanical timer and durable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

Large Economy Shaker, 120V 60Hz	H-4330
Large Economy Shaker, 220V 60Hz	H-4330.2F
Large Economy Shaker, 220V 50Hz	H-4330.5F

Shipping wt. 95 lbs (38.5kg)

H-4310

H-4326



H-4320, H-4322

H-4321, H-4327

Humboldt, Hand-Operated Sieve Shaker
ASTM C136

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

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

Sieve Shaker for 3" Sieves

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

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

Ro-Tap® Sieve Shaker, 8" Sieves
ASTM C136

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

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

Ro-Tap® Sieve Shaker, 12" Sieves
ASTM C136

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

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

Sound Enclosure, Ro-Tap®

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

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

Shaker Stand

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

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

Dura Tap™, Motorized Sieve Shaker
ASTM C136

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

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

Dura Tap™, Motorized Sieve Shaker
ASTM C136

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

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

Sieve Shakers


H-4315A


H-4312

Mary Ann® Sieve Sifter
ASTM C136

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

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

Rotary Lab Sieve Sifter
ASTM C136

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

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

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

Description	Model	Sieve dia.		Sieve capacity*			ASTM	Timer minutes	Requires Mounting	Motor HP	Dimensions W x D x H
		in.	mm	full	inter.	half					
Humboldt Sieve Shaker, Digital Timer Humboldt Sieve Shaker, Digital, Variable Humboldt, Economy Sieve Shaker	HA-4425 HA-4425V H-4325	3	76	16			C136	60	Yes	1/4	15" x 15" x 45" (381 x 381 x 1143mm)
		5	127	12				60			
		8	203	10		18		30			
Large Sieve Shaker, Digital Timer Large Sieve Shaker, Digital, Variable Large Economy Sieve Shaker	HA-4430 HA-4430V H-4330	8	203	11		19	C136	60	Yes	1/4	21" x 18" x 47" (533 x 457 x 1194mm)
		10	254	7				60			
		12	305	7	11	13		30			
8" Hand Sieve Shaker	H-4310	3	76	16			C136	30	Yes	1/4	15" x 15" x 45" (381 x 381 x 1143mm)
		5	127	12							
		8	203	10		18					
Mary Ann Sieve Sifter	H-4315A	8	203	10			C136	99 Digital	No	1/3	13" x 35" x 45" (330 x 889 x 1143mm)
		12	305	6							
Rotary Lab Sieve Sifter	H-4312	8	203	10		20	C136	99 Digital	No	1/3	19" x 24" x 58" (483 x 610 x 1473mm)
		12	305	6							
Dura-Tap™ Sieve Shaker	H-4321	8	203	7		14	C136	24 hr. Digital	No	1/4	28" x 21" x 25" (711 x 533 x 635mm)
Dura-Tap™ Sieve Shaker	H-4327	12	203	4	7	8	C136	24 hr. Digital	No	1/4	28" x 21" x 25" (711 x 533 x 635mm)
Ro-Tap® Sieve Shaker	H-4320	8	203	6		13	C136	99 Digital	No	1/4	28" x 21" x 25" (711 x 533 x 635mm)
Ro-Tap® Sieve Shaker	H-4322	12	305	4	6		C136	99 Digital	No	1/4	28" x 21" x 25" (711 x 533 x 635mm)

* includes top cover and pan

Air-Jet Sieve, Specific Gravity

H-4334A.2

H-4334A.3F

H-4334A.3

H-4334A.4

H-4335F200

H-3373A

H-3360

H-3380

H-3381

Micron Air-Jet Sieving Apparatus

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

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

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

Micron Air-Jet Sieves

ASTM E11

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

Micron Air Jet Sieves see chart
Shipping wt. 2 lbs (1kg)

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

Specific Gravity of Fine Aggregate Kit,

ASTM C128; AASHTO T84

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

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

Conical Mold and Tamper

ASTM C128; AASHTO T84

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

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

Pycnometer Top and Glass Jar

ASTM C128

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

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

Specific Gravity


H-2710A.1


H-2713B


H-2712A


H-2712A.6


HB-4508A

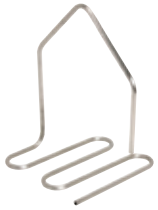

HB-3515


H-3351


H-3353


H-3371


H-3355
H-3356


H-2715


H-3372

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

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

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

Specific Gravity Bench Set
ASTM C20, C127, C642, C830, D1188, D2041, D2726; AASHTO T85, T166, T209, T275

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

Order a weigh-below scale separately.

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

Specific Gravity Tank with Heater & Circulator
ASTM C20, C127, C642, C830, D1188, D2041, D2726; AASHTO T85, T166, T209, T275

Polyethylene tank, 30 gal. (113.5L), which measures 18" x 18" x 18" (457 x 457 x 457mm) and comes with a drain valve and overflow port. It also comes with a H-2712A.6, 200-watt, durable tank heater and circulating pump, both of which are attached to a stainless steel mounting bracket that holds both securely to the tank.

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

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

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

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

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

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

15,000g x 0.1g Precision Balance HB-3515
Ship wt. 32lbs. (13.4kg)

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

Sample Container
ASTM C88; AASHTO T104

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

Sample Container H-3351
Shipping wt. 2.3 lbs (1.04kg)

Sample Container
ASTM C88; AASHTO T104

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

Sample Container H-3353
Shipping wt. 6 lbs (2.7kg)

Specific Gravity Basket
ASTM C127

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

Specific Gravity Basket H-3371
Shipping wt. 2.7 lbs (1.2kg)

Specific Gravity Sieve #4
Designed for use in specific gravity test applications. Heavy-gauge brass construction

8" Specific Gravity Sieve #4 H-3355
12" Specific Gravity Sieve #4 H-3356
Shipping wt. 3lbs (1.4kg)

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

Hollow Tube Specific Gravity Cradle H-2715
Shipping wt. 2.4 lbs (1.1kg)

Utility Bucket
ASTM C127

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

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


H-3383F
H-3383L


H-3393


H-3400


H-3460


H-2640


H-3386


H-3385


H-3387


H-2660

Specific Gravity Flask (Phunque Flask)

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

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

Shipping wt. 12 lbs (7kg)

Volumetric Flasks

ASTM D854; AASHTO T100

Glass flasks used in specific gravity determinations are calibrated to contain the rated capacity at 20°C within permissible tolerances. Available with and without a stopper100ml Volumetric Flask H-3391

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

Shipping wt. 1 lbs (0.45kg)

Specific Gravity Flask (Le Chatelier)

ASTM C128, C188; AASHTO T133

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

Specific Gravity Flask (Le Chatelier) H-3400

Shipping wt. 1.8 lbs (1kg)

Specific Gravity Flask (Chapman)

ASTM C70; AASHTO T142

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

Specific Gravity Flask (Chapman) H-3460

Shipping wt. 2.5 lbs (1kg)

Specific Gravity Bottles (Pycnometers)

ASTM D854; AASHTO T100

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

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

Shipping wt. 0.3 lbs (0.2kg)

Hubbard 24ml Specific Gravity Bottle

ASTM D70, D115, D1963; AASHTO T228

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

Hubbard 24ml Specific Gravity Bottle H-2640

Shipping wt. 0.3 lbs (0.15kg)

Hubbard-Carmick Specific Gravity Bottle

ASTM D70, D115, D2343; AASHTO T228, T43

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

Hubbard-Carmick Specific Gravity Bottle H-2660

Shipping wt. 0.4 lbs (0.2kg)

Moisture

H-4967
(includes pelican case)

H-4965A

H-4966

H-4978

Speedy® 2000 Moisture Tester, 20g
ASTM D4944; AASHTO T217; Florida FM5-507

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

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

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

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

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

HAZARDOUS WARNING:

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

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

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

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

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

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

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

Replacement Parts for Speedy

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

Aggrameter
The Aggrameter utilizes the latest microwave and microprocessor technology to measure moisture content in various fine and coarse-grained materials. The prongs of the probe are inserted into the material to be tested and the percentage of moisture content is instantaneously shown on the easy to read display. The Aggrameter comes calibrated for both sand and aggregate, and can be programmed by the user for up to ten different materials. The Aggrameter can store more than 150 readings – complete with time and date for future reference.

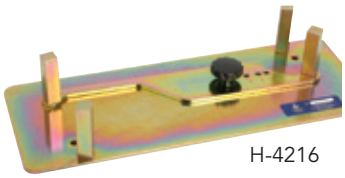
Aggrameter H-4978
Shipping wt. 5lbs (2.3kg)

H-3420

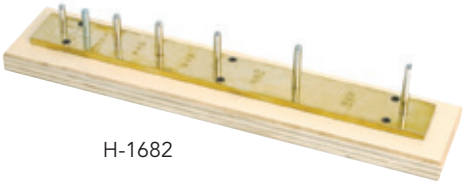
H-1680A

H-1686

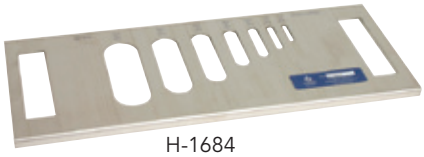
H-3422



H-4216



H-1682



H-1684

Scratch Hardness Tester

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

Scratch Hardness Tester H-3420

Shipping wt. 16 lbs (7kg)

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

Void Content Apparatus, Fine Aggregate

ASTM C1252; AASHTO TP33

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

Void Content Apparatus H-1680A

Shipping wt. 3 lbs (1kg)

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

Void Content Apparatus, Coarse Aggregate

AASHTO T326

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

Void Content Apparatus, Coarse H-1686

Shipping wt. 30 lbs (14kg)

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

Moh's Scale of Hardness

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

Moh's Scale of Hardness H-3422

Ship wt 2lbs. (1kg)

Proportional Caliper Device

ASTM D4791

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

Proportional Caliper Device H-4216

Shipping wt. 10 lbs (4kg)

Elongation Index for Aggregate Classification

BS 812

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

Elongation Index H-1682

Shipping wt. 3 lbs (1kg)

Flakiness Gauge for Classification of Aggregate

BS 812

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

Flakiness Gauge for Aggregate H-1684

Shipping wt. 3 lbs (1kg)

L.A. Abrasion, Slake, Flakiness

H-3860D

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

HM-4100

HM-4100.2

Flakiness Sieves

Los Angeles Abrasion Machine
ASTM C131, C535; AASHTO T96

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

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

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

Shipping wt. 870 lbs (394kg)

Abrasion Charge
ASTM C131, C535; AASHTO T96

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

Abrasion Charge	H-3865

Shipping wt. 12 lbs (6kg)

Materials Catch Pan for LA Abrasion

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

Materials Pan for LA Abrasion	H-3860.19

Shipping wt. 20.9 lbs (9kg)

Sound Enclosure for LA Abrasion Machine

Full enclosure designed to cut down on noise generated while using the LA abrasion machine. Unit is steel construction with foam lining for noise reduction.

Sound Enclosure for LA Abrasion	H-3860.100

Shipping wt. 250 lbs (113kg)

Slake Durability Apparatus
ASTM D4644

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

Slake Durability, 120V 60Hz	HM-4100
Slake Durability, 220V 50Hz	HM-4100.5F

Shipping wt. 78 lbs (32kg)

Slake Wire Mesh Drums
ASTM D4644

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

Slake Wire Mesh Drums	HM-4100.1

Shipping wt. 20 lbs (9.1kg)

Drum and Tank Assembly
ASTM D4644

Set of two wire mesh drums and water tank assemblies.

Drum and Tank Assembly	HM-4100.2

Shipping wt. 45lbs (20.4kg)

Flakiness Sieves Set
BS 812

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

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

Flakiness Sieves Set	H-4392

Shipping wt. 33 lbs (15.8kg)

Micro-Deval, Falling Sand

H-3875

H-3875.1

H-3875.2

HP-1160

HP-1108

Micro-Deval Apparatus

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

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

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

Sample jars revolve behind polycarbonate doors equipped with safety interlocks, so no moving parts are exposed during operation as opposed to older designs, which used unguarded open rollers. The micro-deval machine is a two-tier unit with sturdy steel frame. Each tier carries one stainless steel 5 liter sample jar, which has a 194mm ID and a 170mm internal height with locking cover. Power to the rubber-covered rollers is supplied by a .75hp, electric motor through a gear transmission and chain drive. The unit is supplied with two jars and two 5,500g abrasive charges. A magnet is included to assist in removing the abrasive charge after the test is complete. For additional sample preparation capacity and greatly reduced testing times, it is recommended that additional sample jars and abrasive charges be used.

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

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

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

Shipping wt. 248 lbs (113kg)

Micro-Deval 5L Sample Jar

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

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

Micro-Deval 5L Sample Jar H-3875.1

Shipping wt. 13 lbs (6kg)

Micro-Deval Abrasive Charge

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

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

Micro-Deval Abrasive Charge H-3875.2

Shipping wt. 13 lbs (6kg)

Sieves for Micro-Deval Testing

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

Sieves are required for use in conjunction with micro-deval testing, and are ordered separately. Below are the required mesh sizes called for by the ASTM specifications. Order 8" sieves from page 206 and 12" sieves from page 207. Wet wash sieving can be useful at completion of the abrasion cycle, see pages 214-215 for wet-sieving accessories.

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

Falling Sand Abrasion Tester

ASTM D333, D968, D1395, D2205

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

Falling Sand Abrasion Tester HP-1160

Shipping wt. 110 lbs (50kg)

Weight per Gallon Cup

ASTM D244

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

Weight per Gallon Cup HP-1108

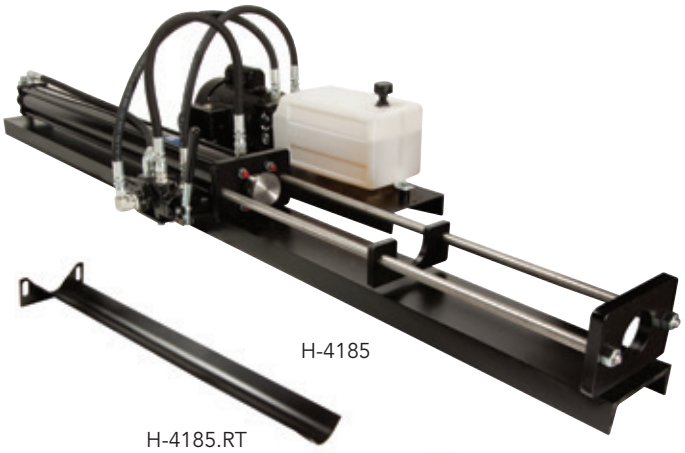
Shipping wt. 0.5 lbs (0.2kg)


HUMBOLDT
HUMBOLDT
HUMBOLDT
HUMBOLDT
HUMBOLDT
5030
HUMBOLDT

Soil Lab

GEOTECHNICAL TEST EQUIPMENT

HUMBOLDT


H-4185

H-4185.RT


H-4155A


H-4150


H-4185.100
(shown with ejector,
not included)


H-4257


H-4258

Horizontal Sample Ejector

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

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

Horizontal Sample Ejector, 120V 60Hz **H-4185**
Horizontal Sample Ejector, 220V 60Hz **H-4185.2F**
Horizontal Sample Ejector, 220V 50Hz **H-4185.5F**

Shipping wt. 310 lbs (140kg)

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

Portable Stand for Horizontal Sample Ejector

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

Portable Stand for Sample Ejector **H-4185.100**

Shipping wt. 170 lbs (77kg)

Sample Ejector, Hand-Operated

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

Sample Ejector, Hand-Operated **H-4155A**

Shipping wt. 56 lbs (25.5kg)

Sample Ejector, Motorized

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

Sample Ejector, Motorized, 120V 60Hz **H-4150**
Sample Ejector, Motorized, 220V 50/60Hz **H-4150.4F**

Shipping wt. 90 lbs (40kg)

Soil Mortar

ASTM D421; AASHTO T87

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

Soil Mortar **H-4257**

Shipping wt. 1.5 lbs (0.7kg)

Soil Pestle

ASTM D421; AASHTO T87

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

Soil Pestle **H-4258**

Shipping wt. 0.7 lbs (0.32kg)

H-4215

H-4199

H-3839

H-3843A

Rapid Soil Processor

Compact all-metal soil processor allows customer to produce five-point moisture density relationship test results in about 5 hours. Processor also handles samples for rapid compaction of a family of curves test. Processes up to 30 lbs. of lean-to-fat and tough clays at field moisture in fewer than 15 minutes. Automatically separates and retains up to .75" rocks from soil to prolong screen life. Processes soil to pass a No. 4 screen. Offset rotating drum is motor driven; pre-set adjustments aren't necessary. Automatic operation frees up technician's time. Order easy-to-install replacement screen separately. Replacement parts are available. Overall dimensions: 32 x 36 x 53" (813 x 915 x 1346mm).

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

Shipping wt. 406 lbs (184kg)

Replacement Screens for Rapid Soil Processor

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

Soil Grinder, Humboldt

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

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

Shipping wt. 28 lbs (12.7kg)

Soil Grinder Accessories

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

Mixer, 5-Qt.

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

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

Shipping wt. 55 lbs (25kg)

Laboratory Bench Mixer, 12Qt.

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

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

Shipping wt. 185 lbs (84kg)

Laboratory Bench Mixer, 20Qt.

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

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

Shipping wt. 230 lbs (104kg)


H-4141


H-4225


H-4162


H-4161A


H-4151


H-4149


H-4159


H-4163


H-4142

Standard Proctor Compaction Mold, 4"

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

Soil mold used where a compacted sample is required, such as standard proctor density/moisture tests. Mold volume is 1/30 ft^3. Cold-rolled steel tubing, plated for rust resistance. Mold dimensions are 4" ID x 4.584" H with a 2" detachable collar. Includes detachable base plate, studs and wing nuts. Compatible with H-4169 compactor.

Standard Proctor Compaction Mold, 4" H-4141

Shipping wt. 14 lbs (6.3kg)

Standard Proctor Mold, Split Design, 4"

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

Mold volume of 1/30 ft^3. Cold-rolled steel tubing, plated for rust resistance. Includes detachable base plate, studs and wing nuts. Mold has vertical split in body with 2 quick-acting clamps for easy removal of specimen. Mold dimensions are 4" ID x 4.584" H with a 2" detachable collar. Includes detachable base plate, studs and wing nuts. Compatible with H-4169 compactor.

Standard Proctor Mold, Split-Design, 4" H-4225

Shipping wt. 13 lbs (5.9kg)

Modified Proctor Compaction Mold, 6"

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

Soil mold used for modified proctor density/Moisture tests. Mold volume of 1/13.33 ft^3. Cold-rolled steel tubing, plated for rust resistance. Mold dimensions are" 6" ID x 4.584" H with a 2" detachable collar. Includes detachable base plate, studs and wing nuts. Compatible with H-4169 compactor.

Modified Proctor Compaction Mold, 6" H-4162

Shipping wt. 19 lbs (8.6kg)

Modified Proctor Mold, Split Design, 6"

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

Mold volume of 1/13.33 ft^3, cold-rolled steel tubing, plated for rust resistance. Includes detachable base plate, studs and wing nuts. Mold has vertical split in body with 2 quick-acting clamps for easy removal of specimen. Mold dimensions are 6" ID x 4.584" H with a 2" detachable collar. Includes detachable base plate, studs and wing nuts. Compatible with H-4169 compactor.

Modified Proctor Mold, Split Design, 6" H-4161A

Shipping wt. 18.3 lbs (8.3kg)

CBR Mold with Perforated Base, 6"

ASTM D1883; AASHTO T193

CBR mold with a volume of .1145 ft^3. Cold-rolled steel tubing, plated for rust resistance. Collar extension and perforated base plate can be clamped on either end of cylinder. Mold dimensions are 6" ID x 7" H with a 2.5" detachable collar. Includes detachable base plate, studs and wing nuts. Compatible with H-4169 compactor.

CBR Mold with Perforated Base, 6" H-4151

Shipping wt. 23.2 lbs (10.5kg)

CBR Mold with Solid Base, 6"

ASTM D1883; AASHTO T193

CBR mold with a volume of .1145 ft^3,. Cold-rolled steel tubing, plated for rust resistance. Collar extension and solid base plate can be clamped on either end of cylinder. Mold dimensions are 6" ID x 7" H with a 2" detachable collar. Includes detachable base plate, studs and wing nuts. Compatible with H-4169 compactor.

CBR Mold with Solid Base, 6" H-4149

Shipping wt. 22 lbs (10kg)

Compaction Mold, 6"

ASTM D1883; AASHTO T193

Compaction mold with a volume of 1/10th ft^3,. Cold-rolled steel tubing, plated for rust resistance. Mold dimensions are 6" ID x 6.1" H with a 2.5" detachable collar. Includes detachable base plate (8" x 8" x 0.5" thick), studs and wing nuts. Compatible with H-4169 compactor.

Compaction Mold, 6" H-4159

Shipping wt. 21 lbs (9.5kg)

LBR Mold, 6"

ASTM D1883; AASHTO T193

Compaction mold with a volume of 1/13.33 ft^3, cold-rolled steel tubing, plated for rust resistance. Mold dimensions are 6" ID x 6.1" H with a 2.5" detachable collar. Collar extension and solid base plate can be clamped on either end of cylinder. Compatible with H-4169 Compactor. LBR test requires H-4147 spacer disc, sold separately, see below.

LBR Mold, 6" H-4163

Shipping wt. 22 lbs (10kg)

Compaction Split Mold, 2.8"

Compaction mold with a volume of .0214 ft^3. Cold-rolled steel tubing, plated for rust resistance. Mold dimensions are 2.8" ID x 4" H with a 2" detachable collar. Mold has vertical-split body with 2 quick-acting clamps for easy removal of specimen. Not compatible with H-4169 compactor.

Compaction Split Mold, 2.8" H-4142

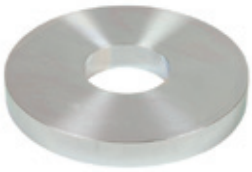
Shipping wt. 7.8 lbs (3.5kg)


H-4174


H-4172


H-4158


H-4158.1


H-4175


H-4177


H-4176


H-4179


H-4153


H-4147


H-4154FP


H-4154


H-4178BR


H-4178

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

Cutting Edge H-4174
Ship wt. 2 lbs. (0.9kg)

Swell Plate
Perforated 5.875" (149mm) dia. base with adjustable stem. Contact end of the stem is easily locked in place with a knurled nut.

Swell Plate H-4172
Ship wt. 5 lbs. (2.3kg)

Swell Tripod Attachment
Metal Tripod supports dial gauge for measuring the amount of swell during soaking. Attachment is used with H-4172 swell plate. Order dial indicator separately.

Swell Tripod Attachment H-4158
Ship wt. 0.8 lbs. (0.3kg)

Dial Indicator
Dial indicator has 1.000" operating range, graduated in 0.001" divisions, clockwise movement and revolution counter. Recommended for use with H-4158 tripod attachment.

Dial Indicator H-4158.1
Ship wt. 1.3 lbs. (0.5kg)

Surcharge Weight, 5 lb.
Used in the application of surcharged loads on the soil's surface during soaking and penetration. Rust-resistant, plated annular disk weighs 5 lbs. (2.3kg), 5.875" (149mm) OD with a 2.125" (54mm) ID hole in center.

5 lb. Surcharge Weight H-4175
Ship wt. 5.7 lbs. (2.5kg)

Surcharge Weight, 10 lb.
10 lb. (4.5kg) Field surcharge weight, made in two parts; 5.875" (149mm) OD; 2.125" (54mm) ID.

10 lb. Surcharge Weight H-4177
Ship wt. 12 lbs. (5kg)

Slotted Surcharge Weight, 5 lb.
Used in the application of surcharged loads on the soil's surface during soaking and penetration. Rust-resistant, plated annular disk weighs 5 lbs. (2.3kg), 5.875" (149mm) OD with a 2.125" (54mm) slot.

5 lb. Slotted Surcharge Weight H-4176
Ship wt. 6 lbs. (3kg)

Slotted Surcharge Weight, 10 lb.
10 lb. (4.5kg) slotted, field surcharge weight, 8.5" (216mm) dia.

Slotted Surcharge Weight, 10 lb. H-4179
Ship wt. 11 lbs. (5kg)

Spacer Disk
Disk is used as a false bottom in a soil mold during the compaction process. Plated, rust-resistant steel disk is 2.416" (36mm) high, 5-15/16" (152mm) dia.

Spacer Disk H-4153
Ship wt. 20 lbs. (9kg)

Spacer Disk LBR 6"
For use with the H-4163 LBR mold. Compatible with H-4169 Compactor. Disk is used as a false bottom in a soil mold during the compaction process. Plated, rust-resistant steel disk is 1.416" (36mm) high, 5-15/16" (152mm) dia.

Spacer Disc. LBR H-4147
Ship wt. 12.2 lbs. (5.5kg)

Filter Paper
100 pack of coarse grade filter paper used to separate spacer disc and soil in the CBR mold during compaction operation, or over the top surface of the soil when the compaction operation is completed.

Filter Paper H-4154FP
Ship wt. 0.3 lbs. (0.13kg)

Filter Screen
100 mesh stainless screen is 5-15/16" (152mm) dia.

Filter Screen H-4154
Ship wt. 0.1 lbs. (0.04kg)

Dial Indicator Bracket
Bracket used to attach a dial indicator to the penetration piston.

Dial Indicator Bracket H-4178BR
Ship wt. 0.8 lbs. (0.36kg)

Penetration Piston
CBR penetration piston has 3 sq. in. (19.35cm2) base area and is about 7.5" (191mm) long. Designed for use in conjunction with weights H-4175 and H-4176 to apply penetration surcharge loads.

Penetration Piston H-4178
Ship wt. 7 lbs. (3kg)

H-4169


H-4169.100-B


H-4169.2415


H-4169.2416

Replacement Hammers, New Style	
4" Round Hammer	H-4169.2415
6" Pie-Shape Hammer	H-4169.2416
Replacement Hammers, Old Style	
4" Round Hammer	H-4169.415
6" Pie-Shape Hammer	H-4169.416

Hammers do not include weights. New Style Hammers are only threaded in the middle of the shaft. Old Style Hammers are threaded almost to the end of the shaft.


H-4170A


H-4160A


H-4173

Mechanical Compactor, Automatic
ASTM D558, D559, D560, D698, D1557; AASHTO T99, T134, T135, T180

The mechanical compactor automatically compacts and rotates mold after each blow while keeping track of the number of hammer blows and shutting off once a preset number of blows is reached. The start/stop function of the compactor is independent of the counter. The unit can be used to perform standard or modified compaction tests using a 5.5 lb. (2.5kg) hammer with 12" (305mm) height of drop or a 10 lb. (4.5kg) hammer with 18" (457mm) drop. Hammer lift compensates the height of the drop for soil thickness in the mold during compaction. Hammer weight is concentrated at the foot, allowing free fall of the hammer. Hammer changes are made from in front of the compactor.

Included with the compactor are: (1) 5.5 lb (2.5kg) hammer; (1) 10 lb. (4.5kg) pie-shaped hammer; (1) hammer surcharge weight to convert hammers to 10lb (4.5kg); (1) hammer safety device; (1) 4" (102mm) mold, and (1) 6" (152mm) mold. Overall dimensions: 56"H x 16.5"W x 30"D (1422 x 419 x 762mm). Max. height in operation: 66" (1677mm).

Mechanical Compactor, 120V 60Hz H-4169
Mechanical Compactor, 230V 50/60Hz H-4169.4F
Shipping wt. 387 lbs (175kg)

Mechanical Compactor Safety Cage
Cage provides protection from moving parts during compaction. Cage is hinged to allow access to mold and hammer.

Mechanical Compactor Safety Cage H-4169.100-B
Shipping wt. 8 lbs (3.6kg)

California Mechanical Auto Compactor
Model complies with California method 216 and is supplied with a 2" round 10 lb hammer and corresponding piston and rod. Required split mold is available upon request.

California Mechanical Auto Compactor H-4169.CA
Shipping wt. 432 lbs (195kg)

Calibration Kit for Mechanical Compactor
ASTM D2168

For use with H-4169 automatic mechanical compactor. Calibration kit includes lead deformation apparatus, micrometer and 50 lead calibration cylinders.

Calibration Kit for Mechanical Compactor H-4169CK
Shipping wt. 4.9 lbs (2.2kg)

Compaction Hammer, Manual
ASTM D558, D698; AASHTO T99

Manual, moisture/density hammer meets ASTM and AASHTO specs. It incorporates a 5.5 lb (2.54kg) weight and a drop of 12" (305mm) with a 2" (51) face. Guide sleeve has four vent holes in each end of sleeve to release built-up air pressure. Machined steel, plated for rust resistance. Features resilient rubber ball handle.

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

Compaction Hammer, Manual, AASHTO
AASHTO T180

Manual, moisture/density hammer meets AASHTO specs. It incorporates a 10 lb (4.5kg) weight and a drop of 18" (457mm) with a 2" (51) face. Guide sleeve has four vent holes in each end of sleeve to release built-up air pressure. Machined steel, plated for rust resistance. Features resilient rubber ball handle.

Compaction Hammer, Manual, AASHTO H-4170A
Shipping wt. 15.6 lbs (7kg)

Compaction Hammer, Manual, Corps of Engineers
EM1110-1-1804

Hammer incorporates a 5.5 lb (2.54kg) weight and a drop of 12" (305mm) with a 2" (51) face. Hammer is guided on shaft. Length of drop is slightly adjustable. Foot assembly has recoil mechanism to reduce impact fatigue on parts. Tamping face is removable and replaceable.

Compaction Hammer, Manual, COE H-4173
Shipping wt. 11 lbs (4.9kg)

Compaction Hammer, 10lb, COE
Manual, moisture/density hammer, which incorporates a 10 lb (4.5kg) weight and a drop of 12" (305mm) with a 2" (51) face.

Compaction Hammer, 10lb, COE H-4171
Shipping wt. 18 lbs (8.3kg)

Relative Density Apparatus
ASTM D4253, D4254

Apparatus determines the relative density of cohesionless, free-draining soils and provides well-defined results on soils that do not respond well to conventional moisture-density impact compaction testing. Soils for which this method is appropriate may contain up to 12 percent of soil particles passing a No. 200 (75µm) sieve, depending on the distribution of particle sizes, which causes them to have free-draining characteristics. Relative density of cohesion less soils uses vibratory compaction to obtain maximum density and pouring to obtain minimum density. Complete set includes: vibrating table H-3756.2F, relative density mold sets H-3757 and H-3758 and relative density gauge set H-3759. Both models are 12 amps 1ph AC.

Relative Density Apparatus, 230V 60Hz H-3750.2F
Relative Density Apparatus, 230V 50Hz H-3750.5F
Shipping wt. 925 lbs (420kg)

Vibrating Table with Controller
Vibrating table for use with the relative density mold sets or other processes requiring vibratory compaction. Table is 30" x 30" (762 x 762mm), and vibration is provided by an electromagnetic vibrator rated above 100lbs (45.5kg). Capacity for tableis 750 lbs (341kg) and height is 21" (533mm).

Vibrating Table/Controller, 230V 60Hz H-3756.2F
Vibrating Table/Controller, 230V 50Hz H-3756.5F
Shipping wt. 605 lbs (275kg)

Relative Density Mold Set, 0.1 ft³
0.1 cu. ft. capacity mold set for use with relative density apparatus. Mold set comes with detachable guide sleeve and clamp assembly. Includes surcharge base plate with removable handle and surcharge weight with handle. Mold is 6" (152.4mm) ID x 6.112" (155.2mm) H.

Relative Density Mold Set, 0.1 ft³ H-3757
Shipping wt. 103 lbs (46kg)

Relative Density Mold Set, 0.5 ft³
0.5 cu. ft. capacity mold set for use with relative density apparatus. Mold set comes with detachable guide sleeve and clamp assembly. Includes surcharge base plate with removable handle and surcharge weight with handle. Mold is 11" (279.4mm) ID x 9.092" (230.9mm) H.

Relative Density Mold Set, 0.5 ft³ H-3758
Shipping wt. 280 lbs (127kg)

Pouring Funnel Set
Used for filling loose .375" (9.5mm) or finer soils into relative density mold. Includes two 6" (152mm) dia. x 12" (305mm) long metal cylinders, each with a integral funnel at the end. Orifices are 1" (25.4mm and 0.5" (12.7mm).

Pouring Funnel Set H-3750FS
Shipping wt. 25 lbs (11kg)

Gauge Set, Relative Density
Gauge set for use with relative density molds. Designed to fit guide brackets of either the H-3757 or H-3758 mold sets. Set includes a 2" (50.8mm) dia., 2.0 x 0.001" mechanical dial gauge. A metal, 3 x 12 x .125" (76 x 305 x 3.2mm), calibration bar is also included.

Gauge Set, Relative Density H-3759
Shipping wt. 8 lbs (4kg)

Vibration Indicator, Tachometer Type
Precision, pen-sized tachometer provides accurate readings even on hard-to-reach equipment. Scale gives readings from 2,000 to 21,000.

Vibration Indicator, Tachometer Type H-3753
Shipping wt. 0.5 lbs (0.2kg)

Vibration Compaction Frame and Hammer Set
ASTM D7382-08

Vibration compaction set used to compact soil samples for use in tests referencing ASTM D7382-08 methods. This method refers to the determination of the maximum dry unit weight and water content range for the effective compaction of granular soils using a vibrating hammer. The test set includes a heavy-duty frame designed specifically for easily mounting a vibration hammer. A vibration hammer, which includes a 5.75" tamper and a 12" long mounting shank. The set also includes an 11" split, compaction mold. The vibrating hammer test method may be performed in the field or in the laboratory.

Vibration Compaction Frame/Hammer Set H-4115
Shipping wt. 368 lbs (167kg)

Compaction Frame Only
Mounting frame for compaction hammer set up. Does not include hammer or mold.

Compaction Frame H-4115.2
Shipping wt. 269 lbs (122kg)

Vibration Compaction Hammer with Tamper
ASTM D7382-08

Includes hammer, 5.75" (146mm) Tamper and 12" (305mm) long mounting shank.

Compaction Hammer with Tamper H-4115.3
Shipping wt. 35 lbs (15.8kg)

Compaction Molds
ASTM D7382-08

Split compaction molds for use with vibration compaction mold set.

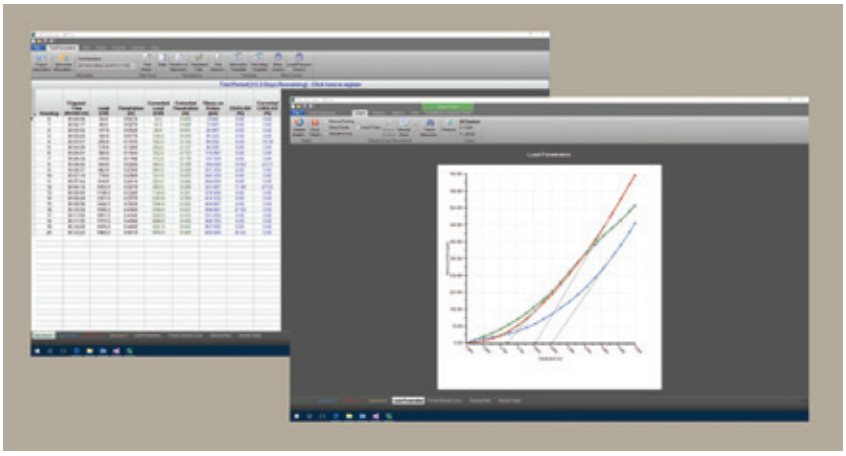
11-Inch Compaction Mold H-4115.4
6-Inch Compaction Mold H-4161A
Shipping wt. 60 lbs (27kg)

Tamper for Compaction Hammer
ASTM D7382-08

Replacement tamper and foot for compaction hammer.

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

HM-5030.3F



The California Bearing Ratio (CBR) test was developed by The California state highway department and is widely used to determine the resistance strength of sub-grade and sub-base materials. The test is basically a simple penetration test using a load frame and a standard, compacted CBR test mold of the material to be tested. The results of the test are then compared and evaluated to known standards already established for the material being tested.

LBR or lime-rock bearing ratio is a variation of the CBR test. Developed primarily in Florida, it is used on materials with a high lime content. Humboldt offers several CBR/LBR testing solutions based on your overall testing needs and budget, from the advanced HM-5030.3F load frame with computer interface using our NEXT software to a simple, hand-operated H-4156 load frame suitable for lab or field use.

Humboldt MasterLoader CBR/LBR Solution

ASTM D1883; AASHTO T193; BS 1377 Part 4

Designed for applications requiring multi-purpose loading systems, such as road construction projects in either mobile or fixed labs, educational institutions and consulting firms, the HM-5030 Master Loader is ideal for just about any application from road construction to high-volume commercial and educational laboratories.

While the HM-5030 has been specifically designed for soil testing labs conducting multiple testing operations including: UU, CU and CD triaxial, UC, CBR and LBR, it is also perfect for running Marshall, Hveem, TSR and SCB asphalt tests as well. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5030 to perform any tests required up to its load capacity of 11000 lbf (50kN).

Like all Elite Series load frames, the HM-5030 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

MasterLoader, 110/220V 50/60 Hz HM-5030.3F

Shipping wt. 300 lbs (136kg)

NEXT CBR/LBR Software Module

ASTM D1883; AASHTO T193; BS 1377 Part 4

Humboldt's NEXT software is used to control the operation of Humboldt's testing machines, as well as provide data acquisition and reporting of test data. The software provides a computer-based platform with the ability to configure testing machines and the testing process; calibrate transducers, load cells and digital indicators; specify testing parameters and limits, operate the machine during the testing and provide detailed reports of the data collected in tabular or graphical formats.

From controlling a single operation to a complete geotechnical lab, Humboldt's NEXT data acquisition software, in conjunction with compatible Humboldt testing equipment, provides a complete solution for the acquisition, recording and presentation of test data. NEXT software is included with many of Humboldt's load frames, consolidation and direct shear machines; providing robust machine control, calibration, data acquisition and report generation for those using a computer to control load frame operations.

- test-specific setup, which guides you through the process and includes selecting data collection parameters that best fit the specific test
- input specific project information for each test, such as project name, client information, etc
- all test-specific initial, intermediate, and final parameters required by ASTM and BS standards are dynamically calculated for you, based on your input of specimen information, such as size, weight, etc
- tabulated test data, graphs and all test-specific calculations are provided in real time, allowing you to monitor tests in process
- generate test-specific reports that include all graphs and data presented in a project

NEXT CBR/LBR Software Module HM-5001SW

Download

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

Typical CBR/LBR Setup for HM-5030.3F

Part #	Description
HM-2300.100	(1) S-type load cell, 10,000lbf (50kN)
HM-2310.10	(1) Strain Transducer, 1" (25mm)
H-4178	(1) Penetration piston with stud
HM-4178BRT	(1) Displacement transducer bracket
HM-5001SW	(1) CBR/LBR reporting software

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

HM-5150.3F

HM-2850.3F

CBR/LBR Specific Automatic Load Frame

ASTM D1883; AASHTO T193; BS 1377 Part 4

The HM-5150 Loader has been specifically designed to handle CBR and LBR applications. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service. From educational institutions and consulting firms to high-volume commercial labs and construction projects, the CBR and LBR Loader can handle these applications with ease.

The HM-5150 is built around Humboldt's integral, data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

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

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

In stand-alone mode, the HM-5150 load frame provides a 7" (178mm) touch-screen controller. These new waterproof, touch screens provide colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine while the test is running. Data can then be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software enhanced CBR and LBR-specific software module.

Specifications

Part #	Description
Load Capacity	10000 lbf (50kN)
Speed Range	0.05 in/min.(1.27mm/min.)
Data Channels	2
Data Storage	1000 tests and up to 3000 readings per test
Platen Size Travel	8" (203mm) / 4" (100mm)
Clearance	27" (686mm) Vertical 11" (279mm) Horizontal

Typical CBR/LBR Setup for HM-5150.3F

Part #	Description
HM-2300.100	(1) S-type load cell, 10,000lbf (50kN)
HM-2305.10	(1) Strain Transducer, 1" (25mm)
H-4178	(1) Penetration piston with stud
HM-2305BRT	(1) Displacement transducer bracket
HM-5001SW	(1) CBR/LBR reporting software

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

Shipping wt. 258 lbs (117kg)

Multi-Speed Load Frame

ASTM: D1883, D2850, D2166, D4767, D5581 and D6927 AASHTO: T193, T296, T297, T208, T245, and T246; BS 1377: Part 4: 1990, BS 1377: Part 7: 1990, BS 1377: Part 8: 1990, BS 598: Part 107

The HM-2850 Multi-speed Load Frame is designed for those who want a high-quality, but simple, multi-purpose load frame without built-in data acquisition capabilities. The HM-2850 is ideal for applications where the operator is either not concerned with data acquisition; or, already has or is planning to construct their own data acquisition system. With its large 7" color, touchscreen, the HM-2850 provides the operator with the ability to precisely select any speed with four decimal accuracy within the machine's speed range.

The HM-2850 features a quiet, direct drive, stepper motor that provides a range of loading speeds from .0001 to 2.2500 in/min. This speed range is more than adequate for the majority of standard soil tests. The HM-2850 also incorporates a separate, dedicated control to accommodate 2.00 in/min. for use in Marshall and TSR Testing, as well as a rapid travel speed of 2.25 in/min for moving the platen into position quickly. Speeds are controlled through the use of edit keys and a digital display.

Specifications

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

Typical CBR Setup for HM-2850

Part #	Description
H-4454.100	(1) Load ring, 10,000lbf (50kN)
H-4158.1	(1) Dial gauge 1.000" x .001"
H-4178	(1) Penetration piston with stud
H-4178BR	(1) Dial indicator bracket

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

Shipping wt. 258 lbs (117kg)

CBR Mechanical Loading Press
ASTM D1883; AASHTO T193

The H-4156 loading press (load frame) uses a two-position mechanical jack to provide steady test speeds, as well as rapid travel of the platen for positioning of the sample. The press, includes a H-4454.100, 11,000lbf (48.8kN) calibrated load ring, a H-4178, 1.95" (49.5mm) dia. (3 in2 area) penetration piston, a H-4158.1, 1.000" x .001, dial indicator and a H-4178BR dial indicator bracket, Overall dimensions: 18" x 12" x 34" (45.8 x 30.5 x 86.4cm).

CBR Mechanical Loading Press H-4156
Ship wt. 132lbs. (60kg)

Mechanical, Two-Speed Loading Jack
Mechanical, two-speed loading jack used in the H-4156 and H-4156M loading presses.

Mechanical, Two-Speed Loading Jack H-4156J
Ship wt. 42lbs. (19kg)

CBR Mechanical Test Set
ASTM D1883; AASHTO T193

Complete mechanical test set used for CBR testing. Includes a complete complement of test equipment for performing CBR testing. The test set features the H-4156 loading press (load frame), which uses a two-position mechanical jack to provide steady test speeds, as well as rapid travel of the platen for positioning of the sample. The press, includes a H-4454.100, 11,000lbf (48.8kN) calibrated load ring, a H-4178, 1.95" (49.5mm) dia. (3 in^2 area) penetration piston, a H-4158.1, 1.000" x .001, dial indicator and a H-4178BR dial indicator bracket, Overall dimensions: 18" x 12" x 34" (45.8 x 30.5 x 86.4cm). The CBR test set includes:

Part #	Description
H-4156	(1) Mechanical loading press
H-4151	(4) Mold
H-4153	(1) Spacer disk
H-4154	(4) Filter screens
H-4172	(2) Swell plates
H-4158	(1) Tripod attachment
H-4175	(4) Surcharge weights
H-4176	(4) Slotted surcharge weights
H-4170A	(1) Density hammer
H-4144.12	(1) Straight edge, 12-inch
H-4174	(1) Cutting edge

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

CBR Field Test Set
ASTM D4429

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

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

CBR Field Test Set H-4152F
CBR Field Test Set, Metric Indicators H-4152FM
Ship wt. 289 lbs. (131kg)


H-4165


H-4180A


H-4180D


H-4254


H-4253


H-4262


HM-4501

Harvard Miniature Compaction Apparatus

Used for moisture density tests using small samples, its compaction action duplicates the kneading action of a sheepsfoot roller. Mold is 1.2625" (33mm) ID by 2.816" (71mm) H. Unit is designed so collar remover and specimen ejector are consolidated into one piece. Set includes specimen ejector, collar remover with spacer plate, mold holder, 1/454 ft^3 (129m^3) volume mold and collar, compaction tamper with 20 lb. (9.07kg), 37.5 lb. (17kg), and 40 lb. (18.2kg) spring and operating instructions. Mold is machined from seamless tubing. Unit weight in pounds per ft^3 m^3 and the net weight of a compacted specimen in grams are figuratively equal.

H-4165 Individual Components	
Mold assembly	H-4165.15
Tamper assembly	H-4165.16
Spring, 20 lb.	H-4165.20
Spring, 37.5 lb.	H-4165.375
Spring, 40 lb.	H-4165.40

Harvard Miniature Compaction Apparatus H-4165
Shipping wt. 28 lbs (12.6kg)

Unconfined Soil Testers

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

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

Shrinkage Limit Set

Apparatus recommended to perform shrinkage limit test in accordance with specifications. Set includes: (1) H-4256 monel shrinkage dish; (1) H-4930.250 mixing dish; (1) H-4254C crystallizing dish; (1) H-4255A shrinkage prong plate, and (1) H-4915.025 graduated cylinder All components are also available individually.

Shrinkage Limit Set H-4254
Shipping wt. 3 lbs (1.3kg)

Adhesive Paper

Pad of 50 sheets of special adhesive backed paper for plastic limit.

Adhesive Paper H-4262P
Shipping wt. 0.5 lbs (0.2kg)

Plastic Limit Set

ASTM D4318; AASHTO T90

Includes all apparatus recommended to perform plastic limit test in accordance with specifications. Set includes the following: (1) H-4253.1 plastic limit plate, 12 x 12 x .375" (305 x 305 x 9.5mm) thick; (1) H-4930.250 mixing dish; (1) H-4904 spatula; (1) H-4915.025 graduated cylinder, and (1) H-1350.3A Pkg. of 48 sample cans All components are also available individually.

Plastic Limit Set H-4253
Shipping wt. 11 lbs (5kg)

Calcium Carbonate Content Chamber

This test method covers the quantitative determination of the calcium carbonate ($CaCO_3$) content of soils. It is a gasometric method that utilizes a simple portable apparatus. The test method is quickly performed for soils containing calcium carbonate. The acrylic chamber is 2.5" ID x 5.5" long and sealed with anodized end caps. The unit comes complete with 10psi test gauge, bleed valve and a 20ml cup with handle.

Calcium Carbonate Content Chamber HM-4501
Shipping wt. 6.1 lbs (2.7kg)

Plastic Limit Roller

ASTM D4318; AASHTO T90; TX DOT 105-E

Easily repeatable mechanical technique produces consistent test results and saves time. Includes integral top plate/handle, one pad of 50 sheets of special adhesive backed paper to cover contact surfaces (paper will not introduce fibers into soil samples), and instructions. Rigid acrylic 8 x 4.5 x 1.25" (203 x 114 x 32mm).

Plastic Limit Roller H-4262
Shipping wt. 3 lbs (1.3kg)


H-4230


H-4228


H-4226


H-4234


H-4233
(shown with base, not included)


H-4915.025


H-4232


H-4229P


H-4229


H-4222D


H-1350.3A

Atterberg Limits (Liquid Limit Testing)
Liquid limit testing determines the water content at which soil changes from a liquid to a plastic state. It is determined using the devices on this page. To perform, a soil sample is placed into the cup of the liquid limit machine and separated into two halves using a grooving tool. The crank on the machine is then rotated so that the cup holding the sample strikes the base of the test machine. The number of blows is recorded until the two halves flow together and close the groove.

ASTM Liquid Limit Test Set
ASTM D4318; AASHTO T89, T90

Recommended for performing liquid limit test in accordance with ASTM specifications. Includes 1 ea. of: H-4230 ASTM liquid limit machine, H-4930.250 mixing dish, H-4904 spatula, H-4915.025 graduated cylinder and a H-1350.3A 48 sample cans pack.

ASTM Liquid Limit Test Set H-4234
Shipping wt. 11 lbs (5kg)

ASTM Liquid Limit Test Set with Counter
ASTM D4318; AASHTO T89, T90

Same set as above except it has machine with counter. Includes 1 ea. of: H-4228 ASTM liquid limit machine, H-4930.250 mixing dish, H-4904 spatula, H-4915.025 graduated cylinder and a H-1350.3A 48 sample cans pack.

ASTM Liquid Limit Test Set w/ Counter H-4235
Shipping wt. 15 lbs (7kg)

ASTM Liquid Limit Machine
ASTM D4318; AASHTO T89, T90

Unit consists of brass cup, cam mechanism, carriage and crank mounted on a hard rubber base. Includes H-4229 ASTM grooving tool and gauge block. Crank can be shifted to right- or left-hand operation.

ASTM Liquid Limit Machine H-4230
Shipping wt. 5.5 lbs (2.5kg)

ASTM Liquid Limit Machine with Counter
ASTM D4318; AASHTO T89, T90

Hand-operated liquid limit machine features mechanical revolution counter attached to the shaft to register the number of drops in the liquid limit cup. Includes H-4229 ASTM grooving tool and gauge block. Crank can be shifted for left or right-hand operation.

ASTM Liquid Limit Machine with Counter H-4228
Shipping wt. 6 lbs (2.7kg)

ASTM Liquid Limit Machine, Motorized
ASTM D4318; AASHTO T89, T90

Motorized liquid limit machine gives uniform testing with greater degree of accuracy. Unit is comprised of H-4230 ASTM liquid limit machine with geared motor to give proper operating speed and automatic counter. Machine is attached to metal plate with rubber feet. Includes H-4229 ASTM grooving tool and gauge block.

Liquid Limit Machine, 120V 60Hz H-4226
Liquid Limit Machine, 220V 50Hz H-4226.5F
Shipping wt. 14 lbs (6.4kg)

Accessories	
ASTM metal grooving tool and gauge block	H-4229
ASTM plastic grooving tools (10 pk)	H-4229P
AASHTO liquid limit metal grooving tool	H-4232
Mixing dish	H-4930.250
Spatula	H-4904
Graduated cylinder (25ml)	H-4915.025
Sample cans, 2.5 oz. (48 pk.)	H-1350.3A
Replacement Parts	
Brass cup w/ screws for liquid limit machines	H-4231
Brass cup w/ screws and cam follower	H-4231.1
Stainless steel cup w/ screws (non ASTM)	H-4231.2
Base	H-4230.1

Resiliency Tester
ASTM D4318; AASHTO T89, T90

Used to test resiliency of hard rubber base of liquid limit machines, which should be done at 90-day intervals to ensure base is in compliance with ASTM D4318 standard. .

Resiliency Tester H-4233
Shipping wt. 1.2 lbs (0.5kg)

Durometer (D Scale)
ASTM D4318, D2240; AASHTO T89, T90

As required by ASTM D4318, a durometer is used to test the hardness of the base of a liquid limit machine. Sealed springs maintain load deflection rate to a tolerance of .0004". Other models are also available, see page 268.

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


H-5236


H-5237


H-4236


H-4237

Cone Penetrometer (Liquid Limit Testing)
The cone penetrometer test method for liquid limit is based on the relationship between the moisture content and the penetration of a cone into a soil sample. This method eliminates test results dependent upon operator skills and provides a visual measurement of penetration. Two cone penetrometer models are available. One, a manual operation model, and the other an automatic model, which releases the cone for a set amount of time and then locks the movement of the cone, registering the result.

Cone Penetrometer, Digital
BS 1337-2, NF P94-052,1; CEN ISO/TS 17892

The H-5236 digital cone penetrometer features an aluminum base with leveling screws and a spirit level for maintaining a level testing position. The digital readout provides readings in 0.1mm resolution in either mm or inches. The chromed support rod features micrometric vertical displacement for accurate positioning with a brass slider that provides smooth free fall, a stop and release button and an automatic zero set. Includes a stainless steel penetration test cone: 35mm long with a 30° angle, weighing 20g. Two brass cups are included (55 x 35mm and 70 x 45mm) This cone penetrometer can also be used to measure the shear undrained strength of undisturbed and reconstituted soil samples per CEN ISO/TS 17892-06. Overall dimensions are: 8.6" x 6.7" x 16.1" (220 x 170 x 410mm)

Cone Penetrometer, Digital H-5236
Shipping wt. 19 lbs (8.6kg)

Cone Penetrometer, Digital, Semi-Automatic
BS 1337-2, NF P94-052,1; CEN ISO/TS 17892

The H-5237 semi-automatic cone penetrometer is equipped with a magnetic controller device with an electronic, digital, programmable timer that automatically releases the plunger head and ensures free falling of the cone during the five second test. The digital readout provides readings in 0.1mm resolution in either mm or inches. The chromed support rod features micrometric vertical displacement for accurate positioning with a brass slider that provides smooth free fall, a stop and release button and an automatic zero set. Includes a stainless steel penetration test cone: 35mm long with a 30° angle, weighing 20g. Two brass cups are included (55 x 35mm and 70 x 45mm) This cone penetrometer can also be used to measure the shear undrained strength of undisturbed and reconstituted soil samples per CEN ISO/TS 17892-06. Overall dimensions are: 8.6" x 6.7" x 16.1" (220 x 170 x 410mm)

Cone Penetrometer, Digital Semi-Auto
120V 60Hz H-5237
230V 50Hz H-5237.5F
Shipping wt. 33 lbs (15kg)

Cone Penetrometer, Dial Indicator
BS 1337-2, NF P94-052,1; CEN ISO/TS 17892

The H-4236 cone penetrometer with dial indicator features a 6" (150mm) diameter dial gauge, which is easily readable and is graduated in 0.1mm divisions. Overall dimensions are: 8.6" x 6.7" x 16.1" (220 x 170 x 410mm)

Cone Penetrometer, Dial Indicator H-4236
Shipping wt. 21.6 lbs (9.8kg)

Cone Penetrometer, Semi-Automatic
BS 1337-2, NF P94-052,1; CEN ISO/TS 17892

The H-4237 semi-automatic cone penetrometer with dial indicator is equipped with the same magnetic controller device as the digital version, H-4237A. Its electronic, digital, programmable timer automatically releases the plunger head and ensures a free-falling cone during the five second test. Overall dimensions are: 8.6" x 6.7" x 16.1" (220 x 170 x 410mm)

Cone Penetrometer, 120V 60Hz H-4237
Cone Penetrometer, 220V 50Hz H-4237.5F
Shipping wt. 25 lbs (11.3kg)

Accessories / Replacement Parts	
Test cone, 35mm long, 30° angle	H-4236.1
Test cone, 60° angle w/ 60g weight	H-4236.5
Sample cup, brass, 70 x 45mm	H-4236.2
Sample cup, brass, 55 x 35mm	H-4236.3
Weight, 20g	H-4236.4
Weight, 320g (shear strength for 400g total weight)	H-4236.6
Test gauge, 30° angle (cone point check)	H-4236.7
Test gauge, 60° angle (cone point check)	H-4236.8
Mirror (for height adjustment)	H-4236.9

Sand Equivalent


H-4340


H-4378


H-4342 H-4342.2


H-4374


H-4379


H-4374.C


HM-3930

Sand Equivalent Testing

Sand equivalent tests serve as rapid field-correlation tests to show relative proportions of clay-like or plastic fines and dusts in granular soils and fine aggregates. The test separates sand and clay, a comparative reading is determined between the suspended clay and the settled sand in the measuring cylinder. Tests may be done in the laboratory or the field.

Sand Equivalent Test Set

ASTM D2419; AASHTO T176

The Humboldt sand equivalent test set includes all items required to perform a sand equivalent test except for a shaker. Be sure to choose a shaker from those offered on this page. These test sets include:

Components	
Measuring cylinder, plastic	H-4340.1
Rubber stopper	H-4340.5
Irrigator tube	H-4340.2.6
Weighted foot assembly	H-4340.3
Siphon assembly	H-4340.2
Wide-mouth funnel	H-4340.4
Measuring can	H-1350.3SP
Standard stock solution	H-4342

Sand Equivalent Test Set with Case H-4340
Sand Equivalent Test Set without Case H-4341
Shipping wt. 25.1 lbs (11kg)

Sand Equivalent Shaker, Manual Operation

ASTM D2419; AASHTO T176

Manually operated sand equivalent shaker is ideal for use on job site to give more uniform shaking action. Shaker consists of mounting bracket with cylinder holder and two spring steel straps, stroke indicator and counter mounted on one end. Uniform shaking action is accomplished by pushing the top frame by a simple stroke of the hand. Portable unit features removable wooden carrying case. Dimensions: 21" x 6.5" x 26.375" (53 x 17 x 67cm).

Sand Equivalent Shaker, Manual Operation H-4378
Shipping wt. 26 lbs (11.7kg)

Sand Equivalent Shaker, Motorized

ASTM D2419; AASHTO T176

Motorized sand equivalent shaker features two separate electronic timers (one preset at 45 seconds and the other preset at 10 minutes) to increase accuracy and ease of operation compared to a spring-type timer. It is recommended for samples in the laboratory. The consistent, repeatable oscillation of the apparatus eliminates operator-caused variation. Shaking operation delivers an 8" (203mm) stroke at a speed of 175 ±2 strokes per minute. Dimensions: 12" x 24" x 24"H (31 x 61 x 61cm).

Sand Equivalent Shaker, 120V 60Hz H-4374
Sand Equivalent Shaker, 220V 50Hz H-4374.5F
Shipping wt. 125 lbs (56.6kg)

Sand Equivalent Shaker, Digital Timer

ASTM D2419; AASHTO T176

Motorized sand equivalent shaker features a digital timer, which can be set from 0 to 60 minutes with automatic shutoff. It features an easy-to-use digital interface with an accuracy of 0.5%. to increase accuracy and ease of operation. It is recommended for samples in the laboratory. The consistent, repeatable oscillation of the apparatus eliminates operator-caused variation. Shaking operation delivers an 8" (203mm) stroke at a speed of 175 ±2 strokes per minute. Dimensions: 12" x 24" x 24"H (31 x 61 x 61cm).

Sand Equivalent Shaker, 120V 60Hz H-4379
Sand Equivalent Shaker, 220V 50Hz H-4379.5F
Shipping wt. 125 lbs (56.6kg)

Cover for Sand Equivalent Shaker

Clear acrylic cover encloses the sand equivalent shaker for safer operation. The cover swings back out of the way for loading.

Cover for Sand Equivalent Shaker H-4374.C
Shipping wt. 8 lbs (3.7kg)

Sand Equivalent Stock Solution

ASTM D2419; AASHTO T176

Standard stock solution, made from anhydrous calcium chloride, glycerin and formaldehyde. Use diluted with distilled water in ratio of 85ml solution per/gal. distilled water.

Sand Equivalent Stock Solution, 8oz (.24L) H-4342
Sand Equivalent Stock Solution, 1G (3.8L) H-4342.2
Shipping wt. 0.8 lbs (0.36kg)

Pin Hole Dispersion Apparatus

ASTM D4647

This test is used for evaluating clay soils for erodibility by flowing water through a small hole that is drilled through the compacted specimen. The test chamber has a unique clamping ring for holding the stainless steel mold to the base while compacting the sample. Included with the chamber are screens, base stand, constant head reservoir, tubing, connections, pipet and a tool for drilling the pinhole. The end cap has a pilot hole for drilling the 1.0mm (.040") hole through the sample. All aluminum parts are anodized for corrosion resistance.

Pin Hole Dispersion Apparatus HM-3930
Shipping wt. 6.6 lbs (3kg)

Hydrometer Jar Bath

ASTM D422; AASHTO T88; UNE 103.102

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

The H-4239A jar bath is fully-insulated and includes a circulating pump, which ensures a constant water temperature throughout bath. The H-4239A can accommodate (8) hydrometer jars at a time. All models include a stainless steel shelf, which supports specimens while allowing 2" of free circulating water above and below specimens. Tank volume: 20.5 gallons (77.6 Liters)

Bath dimensions: ID: 37"L x 8"W x 16"D (940 x 203 x406 mm)

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

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

Shipping wt. 195lbs (88 kg)

Soil Hydrometer A

ASTM D422; AASHTO T88

Seamless, symmetrical stem and bulb do not vary in diameter. One-piece ballast is secured to lower part of the body. Guaranteed calibration accuracy eliminates errors due to variable dilution. H-4241 uses ASTM 152 H scale, graduated to read in grams per liter (g/L) of suspension and has a range of -5 to +60g/L in 1g/L divisions at 68°F (20°C). Total length: 11" (280mm).

Soil Hydrometer A H-4241

Shipping wt. 2lbs (1kg)

Soil Hydrometer B

ASTM D422; AASHTO T88

Seamless, symmetrical stem and bulb do not vary in diameter. One-piece ballast is secured to lower part of the body. Guaranteed calibration accuracy eliminates errors due to variable dilution. H-4242 uses ASTM 151 H scale, graduated to read specific gravity with a range of 0.995 to 1.038 in 0.001 divisions at 68°F (20°C). Total length: 11" (280mm). Total length: 11" (280mm).

Soil Hydrometer B H-4242

Shipping wt. 1.3lbs (0.59 kg)

Hydrometer Analysis Set

ASTM D422; AASHTO T88

The Humboldt hydrometer jar bath combined with hydrometer analysis accessories to provide a complete testing set. Set includes:

Components	
Hydrometer jar bath	H-4239A
Soil hydrometer A	H-4241
Soil hydrometer B	H-4242
Hydrometer jars, (8)	H-4244
Soil dispersion mixer	H-4260A

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

Shipping wt. 225lbs (102 kg)

Hydrometer Jar

ASTM D422; AASHTO T88

Graduated glass cylinder used in determining amount of soil in dispersed suspensions contains 1000ml at 20°C (68°F). Open end is fire-polished without pour-out. Dimensions: 18" (457mm) x 2.5" OD (64mm). Base is 4.333" (110mm).

Hydrometer Jar H-4244

Shipping wt. 2lbs (1 kg)

Soil Dispersion Mixer

ASTM D422; AASHTO T88

Modified mixer to meet specifications is used for dispersing soil suspensions used in hydrometer method of testing sub-grade soils, heavy-duty mixer operates at a speed above 10,000 RPM (no load). Includes stirring apparatus with H-4266 stainless steel paddle and H-4265 chrome-plated dispersion cup with 4 sets of permanent interior baffles. Rounded cup bottom prevents soil accumulation. Furnished with 5' cord and 3-prong plug. Dimensions: 20" x 6.5" x 7" (508 x 165 x 178mm).

Soil Dispersion Mixer, 120V 60Hz H-4260A
Soil Dispersion Mixer, 230V 50/60Hz H-4260A.4F

Shipping wt. 17lbs (7.7 kg)

Dispersion Cup

Chrome-plated dispersion cup for use with H-4260 mixer.

Dispersion Cup H-4265

Shipping wt. 1.1lbs (0.49 kg)

Stirring Paddle

Stirring paddle with 3 blade surfaces, 0.75" (19mm) dia. for H-4260A mixer. Shaft threads onto mixer.

Stirring Paddle H-4266

Shipping wt. 0.1lbs (0.45 kg)

Sodium Hexametaphosphate

Dispersing agent used in combination with gradation analysis of soils.

1 lb (0.5kg) H-4247
10 lb (4.5kg) H-4247.10

Shipping wt. 1.6lbs (0.7kg) 11.6lbs (5.2 kg)

Stopper for Hydrometer Jar

Rubber stopper for hydrometer jars

Stopper (Hydrometer Jar) H-4244RS

Shipping wt. 0.2lbs (0.09 kg)


HM-5804

HM-5802


HM-5894


HM-5892


HM-3915

Constant Head Permeameter Cells
ASTM D2434; BS 1377 Part 5

Use to determine the coefficient of permeability by the constant head method for laminar flow of water through granular soils. Two manometer ports are grooved & screened on the inside. Distance between ports is always equal to diameter. 100 mesh screens used to prevent migration of material through valves & tubing during test. Acrylic chamber permits viewing sample. Spring incorporated into top cap to apply 5-10 lbs. force against screen to prevent soil density changes. End caps and clamping ring are anodized aluminum. Each cell comes complete with valves and perforated screens. **9" (229mm) cells are made to order.**

Permeameters with manometer outlets

Permeameter Cell, 2.5" (63mm)	HM-5801
Permeameter Cell, 3.0" (76mm)	HM-5802
Permeameter Cell, 4.5" (114mm)	HM-5803
Permeameter Cell, 6" (152mm)	HM-5804
Permeameter Cell, 9" (229mm)	HM-5805

Shipping wt. 3-33 lbs (1.3 - 14.9kg)

Falling Head Permeameter Cells
ASTM D2434; BS 1377 Part 5

For use with granular soils in determining the coefficient of permeability via the falling-head method for laminar flow of water. Compact and portable unit includes a spring incorporated into top cap to apply 5-10 lbs. force against screen to prevent soil density changes. End caps and clamping ring are anodized aluminum. Each cell comes complete with valves and perforated screens. **9" (229mm) cells are made to order.**

Permeameters without manometer outlets

Permeameter Cell, 2.5" (63mm)	HM-5891A
Permeameter Cell, 3.0" (76mm)	HM-5892
Permeameter Cell, 4.5" (114mm)	HM-5893
Permeameter Cell, 6" (152mm)	HM-5894
Permeameter Cell, 9" (229mm)	HM-5895

Shipping wt. 3-33 lbs (1.3 - 14.9kg)

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

Shelby Tube Permeameter

The Shelby tube permeameter allows you to perform permeability tests within a Shelby tube without removing the sample. Ideal for cohesionless materials and sands. It is suggested that the specimen be ejected at test conclusion and examined for voids or large aggregate, which possibly could affect the test results. Two sets of end caps fit over a Shelby tube liner up to 6" long. End caps each contain valve to control flow of permeants through the specimen, along with a porous stone to prevent material from flowing into and clogging the valve. End caps are anodized aluminum. Includes o-rings, connecting rods, clamping knobs, and tubing. Shelby tube not included.

Shelby Tube Permeameter, 2"	HM-3913
Shelby Tube Permeameter, 2.5"	HM-3914
Shelby Tube Permeameter, 3"	HM-3915

Shipping wt. 6 lbs (2.72kg)

Tubing for use with Permeameter Cells

Flexible, clear PVC tubing for use with Permeameter cells. 0.25" ID x 0.375" OD

Tubing, 0.25" ID x 0.375" OD, 25ft.	HM-003349

Shipping wt. 0.5 lbs (0.2kg)


HM-5861


HM-5860


HM-5896


HM-5890


HM-3701


HM-5880


H-4145


H-4146

Dual Manometer Tube Stand
ASTM D2434

Economical manometer tube setup for use with many permeameters. Two acrylic tubes with valves mounted on aluminum rail, with scale for monitoring flow volumes. Scale is 100cm long with cm and mm graduations. Each tube has its own valve to allow running two tests. Choose wall mount or free standing. Includes tubing.

Dual, Manometer Stand, Wall Mount	HM-5860
Dual, Manometer Stand, Free Standing	HM-5861

Shipping wt. 8 lbs (3.7kg)

Single Manometer Tube Stand
ASTM D2434

Economical manometer tube setup for use with many permeameters. Single acrylic tube with valves mounted on aluminum rail, with scale for monitoring flow volumes. Scale is 100cm long with cm and mm graduations. Choose wall mount or free standing. Includes funnel and tubing.

Single, Manometer Stand, Wall Mount	HM-5890
Manometer Stand, Free Standing	HM-5896

Shipping wt. 8 lbs (3.7kg)

Constant Head Tank

Acrylic tank with regulating valve for flow control of water and a porous media on bottom to filter out air bubbles. Maintains constant water head via an overflow port. Includes: saddle valve for connection to either de-aired or tap water source; rails for wall mounting with easy height adjustment and tubing for hook-up to test chamber. Tank measures 5.625" diameter x 5.25" height.

Constant Head Tank, 1500cc	HM-5880

Shipping wt. 5 lbs (2.2kg)

Compaction Hammer

Rod with sliding weights on a 2" (51mm) dia foot. Stop allows adjusting height of drop up to 8" (203mm). Includes one .25 lb. (100g) and one 2.25 lb. (1kg) weight.

Compaction Hammer	HM-3701

Shipping wt. 6 lbs (2 .7kg)

Compaction Permeameters
ASTM D5856

For determining permeability of clay, sand, and gravel soils. Uses Proctor plasticity compaction method. Two-piece cylindrical mold includes: upper plate with valve; water inlet/outlet; filter base plate; and filter stones. 6"W x 6"D x 12"H.

Compaction Permeameters, 4"	H-4145
Compaction Permeameters, 6"	H-4146

Shipping wt. 25.9 lbs (11.7kg)

Permeameter Replacement Parts	
Filter stone for H-4146	H-4148X
Filter stone for H-4145	H-4148
Porous stone for H-4146	H-4148.6
Porous stone for H-4145	HM-4184.100
Spring for H-4146 and H-4145	H-4145.8

Permeameter Accessories	
High Vacuum Pump	H-1763A or H-1763A.4F
Material Scoop, #2 Round	H-3731
Mixing Bowl, 8qt (7.6L) 12.5" x 5.5" (318 x 140mm)	H-4938
Graduated Cylinder, 250mL, Glass or Plastic	H-4915.250 H-4916P.250


HM-4150.3F


HM-4140.3F


HM-4150A


HM-4160.3F


HM-4160A

Humboldt FlexPanels

ASTM D5084; BS 1377 Part 6 1990

Permeability testing measures the rate of discharge of water under laminar flow conditions through a unit cross-sectional area of a porous medium under a unit hydraulic gradient and standard (20°C) temperature conditions. In permeability testing, soil is subjected to water under a known pressure, and the flow is measured. The coefficient of permeability (k), or simply permeability, expresses the ability of water to flow through the particular medium. The "constant head" test method is applicable to course granular soils such as sands and gravels. The "falling head" test method is applicable to fine grain soils. Either method may be used to test clay soils.

Humboldt FlexPanels

Humboldt FlexPanels provide a simple and highly efficient distribution system for providing air, water and de-aired water for use in permeability and triaxial testing applications. The FlexPanel's simple, straight-forward configuration, with its integral burettes provides a condensed/compact design that takes up less counter space than competing systems with air/water bladders.

The long, narrow burette design of Humboldt's FlexPanels provide faster test processing times when compared to larger, shorter burette systems, while providing the same volume. This is due to the reduced amount of meniscus formation in the narrower burettes, which allows the water level to drop faster, resulting in faster readings. In addition, the use of longer/narrower burettes and a scale graduation of 0.02ml, also provides an easier-to-read and more accurate scale.

FlexPanels also feature a bias regulator and bridge. The bias regulator maintains the differential pressure when confining and back pressures are increased. The bridge delivers simultaneous control of base and top pressures through the use of just one regulator. This feature minimizes operator time and reduces the margin of error in opening and adjusting regulators during a test. The Humboldt FlexPanel system is comprised of 5 separate panel configurations, which can be grouped together to accommodate from 1 to 6 cell setups.

Fast and Easy Setup and Operation

Humboldt FlexPanels make setup fast and easy with clearly labeled ports and quick-connect hookups. Operation is just as easy with clearly labeled controls, large gauges and easy-to-read burette markings.

All Humboldt FlexPanels use no-volume change Swagelock valves and Fairchild constant-bleed type precision regulators for accurate control. All inlets and outlets utilize quick-connects to ensure fast, accurate setup to permeameter cells, as well as air, water and drain hook ups. Fittings, tubing and connectors are supplied with each unit. All FlexPanels are designed to handle air pressures up to 150 psi. For testing contaminated samples, Humboldt offers an optional Toxic Interface Unit, which prevents toxic fluids and vapors from entering the FlexPanel. See facing page.

Humboldt FlexPanels Features:

Humboldt FlexPanels are constructed of lightweight aluminum for long, rust-free life. FlexPanels provide an accurate and easy-to-operate solution for controlling compressed air, water, de-aired water and vacuum without the need for air/water bladder interfaces to produce the pressures necessary for permeability and triaxial testing. FlexPanels utilize a set of three burettes to control cell, top cap and base pedestal pressures. This extremely versatile pressure system controls the pressure, water, de-airing tank and vacuum from a single panel. The three burettes allow for the control of the cell pressure and the back pressure for each cell. They can monitor volume change in the sample and can be used to measure the flow of water through the sample for permeability testing.

	HM-4140.3F	HM-4140M.3F	HM-4150.3F	HM-4150M.3F	HM-4160.3F	HM-4160M.3F	HM-4150A	HM-4160A
Pressure/ Resolution	2-150 psi (0.1 psi)	14-1000 kPa (1 kPa)	2-150 psi (0.1 psi)	14-1000 kPa (1 kPa)	2-150 psi (0.1 psi)	14-1000 kPa (1 kPa)	Not Applicable	
Vacuum	0-14.7 psi or 30 Hg	(0-100kPa) or 30 Hg	0-14.7 psi or 30 Hg	(0-100kPa) or 30 Hg	0-14.7 psi or 30 Hg	(0-100kPa) or 30 Hg		
Inner Burette								
Cell	Not Applicable		50cc x 0.1 cc (ml)					
Top	Not Applicable		10cc x 0.02 cc (ml)					
Base	Not Applicable		10cc x 0.02 cc (ml)					
Outer Burette								
Cell	Not Applicable		400 cc (ml)					
Top	Not Applicable		460 cc (ml)					
Base	Not Applicable		460 cc (ml)					
Voltage	110/220VAC 50/60Hz						Not Applicable	
Power	6 watts							
Operating Temperature	14 to 158°F (-10 to 70°C)							
Dimensions	8 x 8 x 37.5" (203 x 203 x 952mm)		8 x 25.5 x 37.5" (203 x 648 x 952mm)		8 x 43.5 x 37.5" (203 x 1105 x 952mm)		8 x 19.5 x 37.5" (203 x 495 x 952)	8 x 37.5 x 37.5" (203 x 952 x 952)
Shipping Weight	35lb (16kg)		95lb (43kg)		145lb (66kg)		107lb (49kg)	157lb (71kg)

FlexPanels can manually measure volume change or permeability in a triaxial test sample without the use of a volume change apparatus, a distinct benefit when compared to air/water bladder systems.

- Bias pressure regulator allows simultaneous control of confining and back pressures, while maintaining a constant differential
- Longer burette and 0.02ml graduation give more accurate results, better productivity, and faster turnaround
- Uses no-volume-change Swagelock valves
- Bridge feature delivers simultaneous control of base and top pressures by adjusting one pres sure regulator simplifying testing
- Quick-connect hookups for fast and reliable set up.
- Master control panel houses digital pressure readout for the controlling pressure, inlet vacuum regulator and gauge, inlet pressure regulators and gauge, de-aired water tank controls, tap and de-aired water supply outlets, and pressure and vacuum outlets

Control Panels

The HM-4140 stand-alone control panel or the integral control panels on the HM-4150 and HM-4160 provide pressure controls and readouts for permeability and triaxial applications. All three controllers provide identical controls, which include: a digital, readout pressure meter, a pressure supply gauge, a master pressure regulator, a vacuum supply gauge, a master vacuum regulator, de-aired water tank controls, tap and de-aired water supply outlets and pressure and vacuum outlets.

Auxiliary Panels

The HM-4150A and HM-4160A auxiliary panels provide additional sets of burettes, which can be used to expand the capacity of a system. Each set of three (3) burettes provide the controls necessary for another cell to be used. The HM-4150A provides one (1) set of burettes and the HM-4160A provides two (2) sets. Humboldt recommends any combination of up to six (6) burettes sets can be used with each control panel.

Toxic Interface Unit

Safe and convenient means of performing permeability tests of corrosive or toxic permeants. Flexible fluoroelastomer bladder accumulator interfaces between control panel and sample drains on permeameter. Serves as a fluid separator to prevent permeant from entering control panel. Also prevents contact of air with permeant, thus no toxic or corrosive vapors can escape into lab. Handles any fluid compatible with stainless steel, PTFE, and the fluoroelastomer bladder. Unit measure 8" H x 5" dia. Two units are required for each cell.

Toxic Interface Unit — HM-4190

Shipping wt. 7 lbs (3.1kg)

Rear of panel showing quick-connect hookups and plumbing.

HM-4190

HM-4188.28

Triaxial cells can also be used for permeability testing.

HM-4199B-6

HM-4199B-4

HM-4199B

Permeability Cells, Top Cap/Base Pedestal Sets and Individual Top Caps and Bases								
Size	Cell Standard	Cell Stainless	Set Aluminum	Top Cap Only	Base Only	Set Stainless Steel	SS Top Cap Only	SS Base Only
35mm	HM-4188B	HM-4188SS	HM-4188.35	HM-4199.35T	HM-4188.35B	HM-4188.35SS	HM-4199.35SST	HM-4199.35SSB
1.4"			HM-4188.14	HM-4199.14T	HM-4188.14B	HM-4188.14SS	HM-4199.14SST	HM-4199.14SSB
38mm			HM-4188.38	HM-4199.38T	HM-4188.38B	HM-4188.38SS	HM-4199.38SST	HM-4199.38SSB
1.5"			HM-4188.15	HM-4199.15T	HM-4188.15B	HM-4188.15SS	HM-4199.15SST	HM-4199.15SSB
50mm			HM-4188.50	HM-4199.50T	HM-4188.50B	HM-4188.50SS	HM-4199.50SST	HM-4199.50SSB
2.0"			HM-4188.20	HM-4199.20T	HM-4188.20B	HM-4188.20SS	HM-4199.20SST	HM-4199.20SSB
70mm			HM-4188.70	HM-4199.70T	HM-4188.70B	HM-4188.70SS	HM-4199.70SST	HM-4199.70SSB
2.8"			HM-4188.28	HM-4199.28T	HM-4188.28B	HM-4188.28SS	HM-4199.28SST	HM-4199.28SSB
100mm			HM-4188.100	HM-4199.100T	HM-4188.100B	HM-4188.100SS	HM-4199.100SST	HM-4199.100SSB
4.0"			HM-4188.40	HM-4199.40T	HM-4188.40B	HM-4188.40SS	HM-4199.40SST	HM-4199.40SSB

Permeability Cells

ASTM D5084; BS 1377 Part 6 1990

HM-4188B permeability cells are constructed of high-quality materials throughout for long-lasting performance. The cell top and base are precision machined from 6061 T6 aluminum and black anondized for a durable finish. To facilitate sample setup, the chamber and cell top can be quickly and easily removed by loosening the three knobs that hold the upper assembly to the base. The clear acrylic chamber provides a working pressure of 150 psi (1,000 kPa) and is tested to 250 psi (1,700 kPa).

The cell has five, no-volume-change, valves aligned along the front of the cell for maximum convenience. Two valves handle top drainage, two valves handle bottom drainage, and one valve handles filling/emptying and providing confining pressure to the cell.

The removable base pedestal accommodates various sample diameters from 35mm to 4 inch, see chart above for model numbers corresponding to the size needed. Cells are available with black-anodized aluminum or stainless steel top caps and base pedestals, refer to chart above.

Brass valves are standard with these cells, but stainless steel valves (stainless steel is typically used with hazardous materials) are an option, please inquire. Cell dimensions are: 13.75" H x 8.75" dia. (349.2 x 222.3mm). Overall dia. is: 11" (279.4mm).

Triaxial Cells— HM-4199

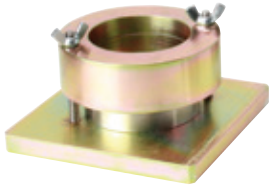
For those who plan to do triaxial tests in addition to permeability testing, consider using HM-4199B or HM-4199SS triaxial cells for the added convenience of using one cell for both tests. See page 117.


HM-5405

HM-4184.399T


HM-2415


HM-3701


HM-1975-D


HM-1972-1E

Expansion Index Consolidometer
ASTM D4829

Self-contained unit for conducting expansion tests on cured soil specimens. After compaction in stainless steel ring, specimen is placed in the consolidometer with air-dried porous stones, and loaded with a stainless steel weight. Specimen is allowed to consolidate for 10 minutes, after which it is immersed in distilled water for up to 24 hrs. During this time, height of specimen is recorded to determine maximum swell. Corrosion resistant, durable anodized aluminum and stainless steel construction. Includes anodized aluminum base and collar, stainless steel specimen ring and weight, 12.6 lb. (5.7kg) loading weight, and 3.99" dia. x 0.5" (101.4 x 12.5mm) porous stones. **Dial Indicator required, see below.** 6" dia x 11" H (152 x 279 mm).

Expansion Index Consolidometer HM-5405
Shipping wt. 20 lbs (9kg)

Dial Indicators for Consolidometer

The expansion index consolidometer requires one of these dial indicators

Dial Indicator, 0.2" range x 0.0001" H-4460
Dial Indicator, 0.5" range x 0.0001" H-4471
Dial Indicator, 1.0" range x 0.001" H-4158.1
Shipping wt. 1.3 lbs (0.6kg)

Porous Stone

Porous stone for use with HM-2405 consolidometer, 3.99" x 0.5".

Porous Stone, 3.99" x 0.5" HM-4184.399T
Shipping wt. 0.5 lbs (0.2kg)

Soil Volume Change Meter (PVC)

Used to evaluate potentially dangerous swelling/shrinking conditions found in clay soils in commercial/residential development sites. PVC (potential volume change) refers to maximum possible volume change a soil could undergo when submitted to changing moisture conditions. It features fast and simple operation, measuring both shrinkage and swelling of soils and is ideal for gauging swelling of clay soils. Includes: H-4454.010, 1,000 lb. (4.5 kN) capacity proving ring, mold assembly, loading cap, porous stones, loading pistons, 2-3/4" (70 mm) dia. specimen ring (HM-1220.70), and conversion charts. 7.25" (184 mm) dia. base x 15.5" (394 mm) height.

Soil Volume Change Meter (PVC) HM-2415
Shipping wt. 32 lbs (14.5kg)

Compaction Base and Collar

The compaction base and collar is used to produce a soil sample for use with the basic swell/expansion consolidometers. Use HM-3701 compaction hammer.

Compaction Base & Collar, 2.440" HM-1975-D
Compaction Base & Collar, 2.500" HM-1975-E
Shipping wt. 7 lbs (3kg)

Compaction Hammer

Rod with sliding weights on a 2" (51mm) dia foot. Stop allows adjusting height of drop up to 8" (203mm). Includes one .25 lb. (100g) and one 2.25 lb. (1kg) weight.

Compaction Hammer HM-3701
Shipping wt. 6 lbs (2.7kg)

Basic Swell/Expansion Consolidometer

A self-contained consolidometer used to conduct swell expansion tests on soil specimens. Set includes: stainless steel base/acrylic ring device with adjustable, dial indicator standard and bracket, a compaction specimen ring, top and bottom porous stones and a 60 psf stainless steel loading weight. Consolidometer can also be used with cutting ring, listed below, instead of supplied compaction ring for use in acquiring samples from undisturbed Shelby tube samples. A dial indicator is required, choose from either H-4471 with a range of .500" with .0001" divisions or H-4465.12 with a range of 12mm and .002mm divisions. Alternative loading weights are also available, please enquire.

Consolidometer, 2.440" HM-1972-1D
Consolidometer, 2.500" HM-1972-1E
Shipping wt. 8 lbs (4kg)

Components for HM-1972-1D	
Cutting Ring, SS	HM-1220.24.8
Compaction Ring, SS	HM-1972-3D
Loading Weight, 60 PSF (SS)	HM-1972-6D
Top Porous Stone	HM-4184.240
Base Porous Stone, 3.31" dia. x 0.25" thick	HM-4184.331

Components for HM-1972-1E	
Cutting Ring, SS	HM-1220.25.8
Compaction Ring, SS	HM-1972-3E
Loading Weight, 60 PSF (SS)	HM-1972-6E
Top Porous Stone	HM-4184.2485
Base Porous Stone, 3.31" dia. x 0.25" thick	HM-4184.331


HUMBOLDT
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HUMBOLDT
5470
HUMBOLDT
HUMBOLDT
MASTER LOADER
5030
HUMBOLDT

Soil Mechanics

GEOTECHNICAL TEST EQUIPMENT

HUMBOLDT

ELITE SERIES
Soil Mechanics Equipment

Humboldt's Elite Series testing machines feature a 7", full-color touch-screen controller that provides you with full, graphical monitoring of all testing functions in stand-alone applications, while maintaining full PC control when desired. With Elite Series machines you can have full, finger-tip control and monitoring of all testing functions with the touch-screen controllers, found on our load frames, consolidation and direct-shear machines, as well as our other data acquisition loggers and controllers.

Elite Series machines provide at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a PC, building upon Humboldt's dedication to modular, stand-alone, data-acquisition.

Stand-Alone Control

In stand-alone applications, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's USB port or the data can be transferred to a networked computer. The USB port can also be used to power a wireless access point, which can provide a wireless hook-up with the PC, if no LAN is available.

Computer Control

Humboldt's Next software is included with the all Elite Series machines. This software provides robust machine control, calibration, data acquisition and report generation for those using a computer to control consolidation testing operations.

In addition, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, while also providing report generating capabilities using Humboldt NEXT software test-specific modules, see pages 94-95.

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

Upgrade your existing equipment to the NEW Humboldt Elite Series

Upgrades to our new Elite Series machines are available. These upgrades require your existing machine to be sent to Humboldt for a complete refurbishment and upgrade to the new equipment. Upgrades include the new 7", full-color touch-screen controller, and a new enclosure. Refer to the chart on the right for available upgrades.

HM-3000.3F Upgrade to HM-5030.3F	HM-5030U
HM-2900.3F Upgrade to HM-5020.3F	HM-5020U
HM-2450.3F and HM-2315 Upgrade to HM-5240.3F	HM-5240U
HM-2325A.3F Upgrade to HM-5320.3F	HM-5320U
HM-2330D.3F Upgrade to HM-5330.3F	HM-5330U
HM-2470.3F Upgrade to HM-5470.3F	HM-5470U
HM-2560.3F Upgrade to HM-5560.3F	HM-5560U
HM-2750A.3F Upgrade to HM-5750A.3F	HM-5750AU
HM-2750D.3F Upgrade to HM-5750D.3F	HM-5750DU
HM-4469C Upgrade to HM-4470C	HM-4470U

control and monitoring of all testing functions

Choose: Stand-Alone or Computer Control

NEXT SOFTWARE

CONTROL, DATA ACQUISITION AND REPORTING

Humboldt's, NEXT software provides:

- Machine control, and data acquisition via networked computer
- Provides the ability to use NEXT software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display
- Effective sampling rate of 50 readings per second
- Stores unlimited tests with up to 3000 points per test.
- Up to 255 individual tests can be run simultaneously from a single PC
- Advanced, test-specific modules are available, which provide all the calculations and graphs required per testing standards
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQuIS, gINT, etc.

Humboldt's NEXT software is used to control the operation of Humboldt's testing machines, as well as provide data acquisition and reporting of test data. The software provides a computer-based platform with the ability to configure testing machines and the testing process; calibrate transducers, load cells and digital indicators; specify testing parameters and limits, operate the machine during the testing and provide detailed reports of the data collected in tabular or graphical formats.

From controlling a single operation to a complete geotechnical lab, Humboldt's NEXT data acquisition software, in conjunction with compatible Humboldt testing equipment, provides a complete solution for the acquisition, recording and presentation of test data. NEXT software is included with many of Humboldt's load frames, consolidation and direct shear machines; providing robust machine control, calibration, data acquisition and report generation for those using a computer to control load frame operations.

With Humboldt's NEXT software, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, as well as the ability to control and monitor multiple tests at the same time.

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

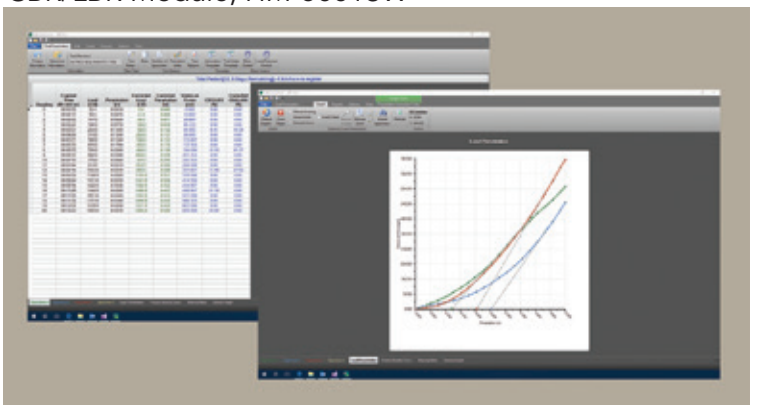
NEXT Test-Specific Software Modules

Humboldt NEXT software can be enhanced with the purchase of test-specific modules. These modules provide you with the following capabilities beyond the standard software included with your ELITE Series load frames.

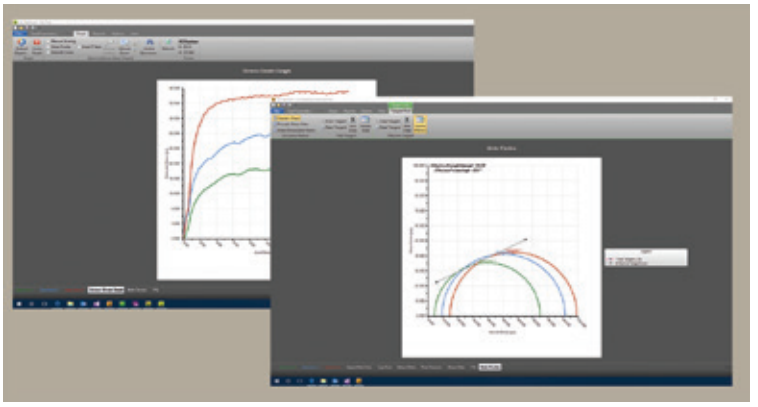
- test-specific setup, which guides you through the process and includes selecting data collection parameters that best fit the specific test
- input specific project information for each test, such as project name, client information, etc
- all test-specific initial, intermediate, and final parameters required by ASTM and BS standards are dynamically calculated for you, based on your input of specimen information, such as size, weight, etc
- tabulated test data, graphs and all test-specific calculations are provided in real time, allowing you to monitor tests in process
- generate test-specific reports that include all graphs and data presented in a project
- simultaneously run multiple tests on one computer, involving any of the available NEXT modules and any compatible Humboldt equipment up to 255 device connections, which is up to 1020 inputs
- create and store test-specific test setup templates for rapid setup of future tests
- produce test-specific graphs, which allow you to draw construction lines to calculate angles and other test-specific parameters
- automatically recover from a PC shutdown without loss of data
- all unit parameters can be adjusted individually
- easily change between different test standards
- access free, down loadable software upgrades for purchased modules
- additional modules are available, please enquire

Consolidation Module	HM-5100SW
Direct Shear Module	HM-5700SW
CBR/LBR Module	HM-5001SW
Unconsolidated Undrained (UU) Module	HM-5002SW
Consolidated Undrained (CU) Module	HM-5003SW
Unconfined Compression (UC) Module	HM-5004SW
Consolidated Drained (CD) Module	HM-5006SW
Marshall Module	HM-5005SW

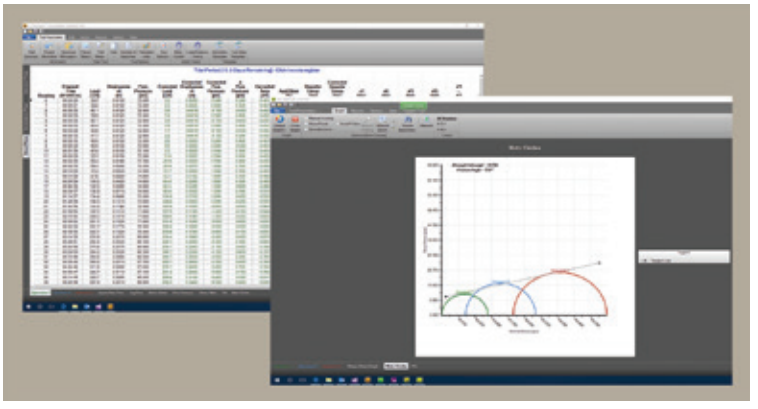
CBR/LBR Module, HM-5001SW



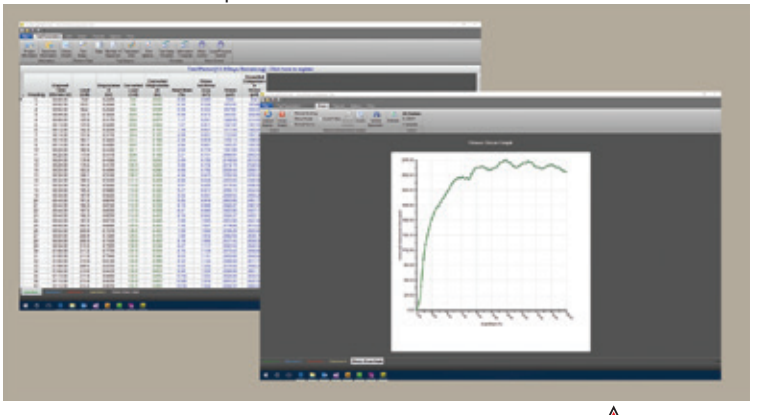
Unconsolidated Undrained (UU) Module, HM-5002SW



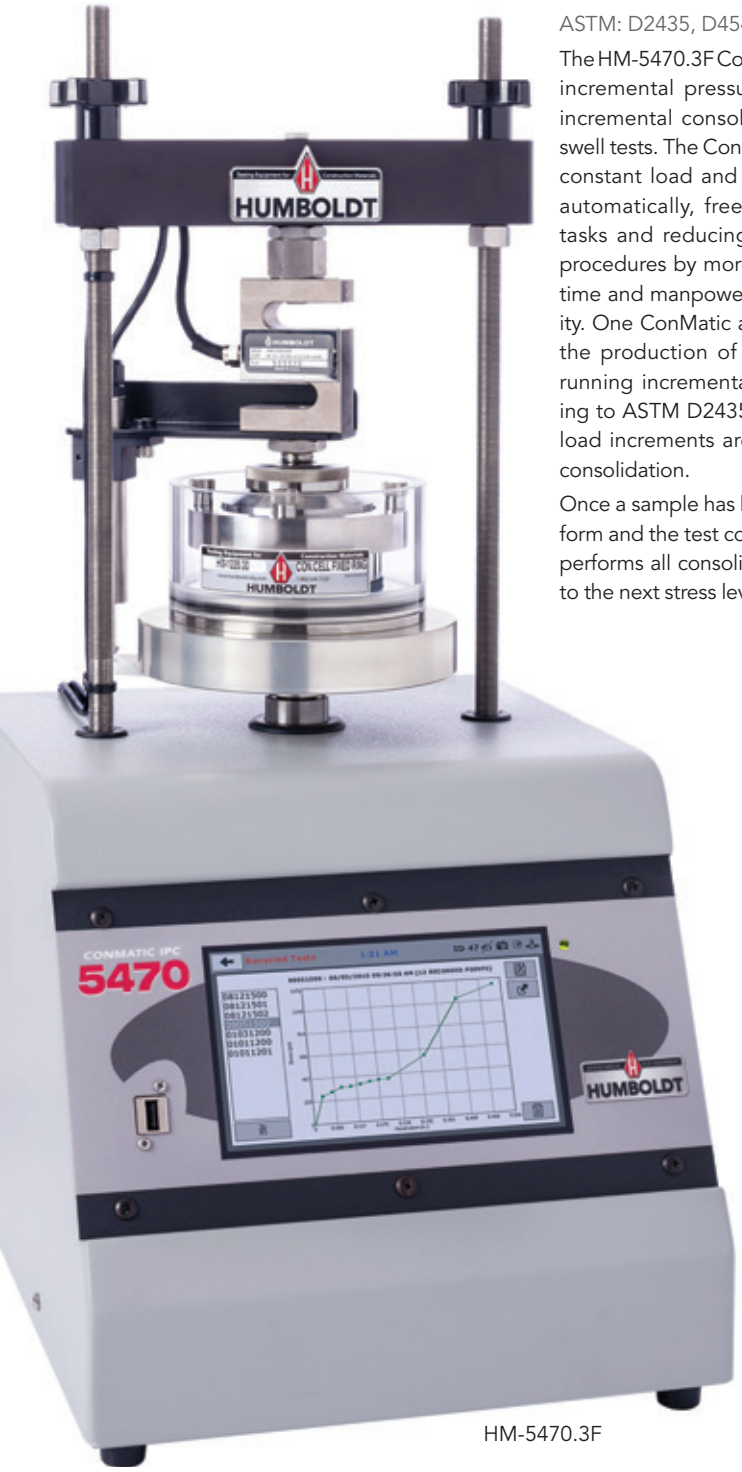
Consolidated Undrained (CU) Module, HM-5003SW



Unconfined Compression (UC) Module, HM-5004SW



ELITE SERIES
Automated Consolidation



HM-5470.3F

ConMatic IPC, Automated Consolidation System

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

The HM-5470.3F ConMatic IPC is a fully-automated, incremental pressure controller for performing incremental consolidation and one-dimensional swell tests. The ConMatic IPC allows consolidation, constant load and volume swell tests to be run automatically, freeing up technicians for other tasks and reducing the duration of the testing procedures by more than half—effectively saving time and manpower and increasing lab profitability. One ConMatic automated system can replace the production of several manual machines—running incremental consolidation tests according to ASTM D2435 Method B, where successive load increments are applied after 100% primary consolidation.

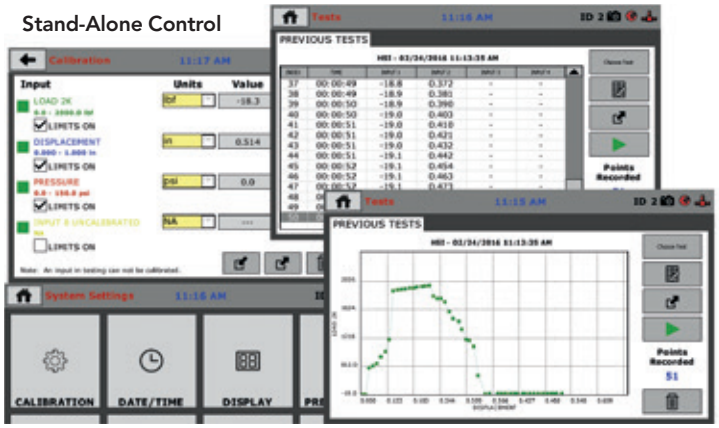
Once a sample has been placed onto the test platform and the test conditions set, the ConMatic IPC performs all consolidation tests, including moving to the next stress level, without operator assistance. The system automatically moves through the different test parameters specified by the user with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

- Live tests and live graphing capabilities (real-time)
- Complete test reporting including all calculations and graphs required for testing
- Review and exporting of tests using Microsoft Excel
- Smart Test Function: automatically picks up where it left off if the test was not finished due to unexpected events within your computer

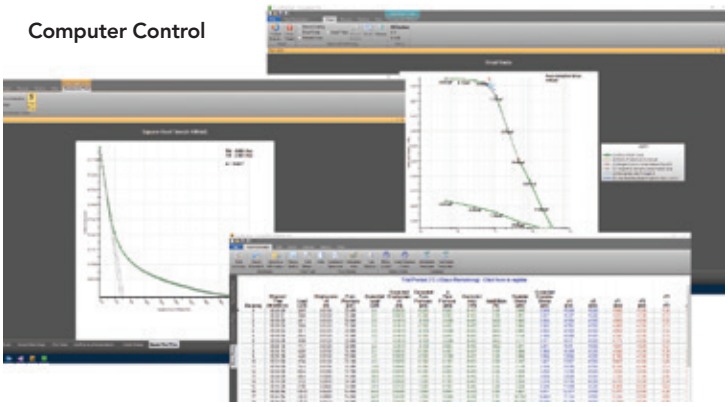
The unique design of the ConMatic IPC system enables the user to connect multiple Conmatic IPC units to a single computer and run them independently and simultaneously.

Controller Specifications:	
Display (Resistive Touch)	7" (178mm) VGA (480 x 800)
Real-time test data	Graphic and tabulation
Processor	Dual 32-bit ARM
RAM	64MB
Memory, non-volatile	4GB
Analog to digital converter	24 bit
Data acquisition	2 Channels
Logging speed	up to 50 readings per second
Multi-test storage	1000
Points per test	3000
USB port (front)	export data, import/export calibration data, WiFi
USB port (back)	provides external power for wireless access point
Ethernet connection	for network connectivity
Emergency stop	Large button
24-bit differential analog to digital converter	2
Ambient temperature sensor	1
Firmware Update	Ethernet or flash drive

Stand-Alone Control



Computer Control



Stand-Alone Control

Humboldt's touch-screen controller provides you with full, graphical monitoring of all testing functions in a stand-alone application, while maintaining full computer control when desired.

Now you can have full, finger-tip control and monitoring of all testing functions with Humboldt's touch-screen controller, found on the ConMatic IPC automated consolidation system. This seven-inch, waterproof screen provides at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer, building upon Humboldt's dedication to modular, stand-alone data acquisition.

Now, in a stand-alone application, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's FRONT USB port or the data can be transferred to a computer via the LAN port.

A second USB port located on the back of the machine can also be used to power a wireless access point, which can provide a wireless hook-up with a computer, if no LAN is available.

Touch-Screen Controller provides:

- 2-channel data acquisition
- Hi-res, 7", waterproof, touch-screen provides total control and real-time graphical display of tests
- Machine/Test control and data acquisition via touch-screen
- Control both channels at the same time
- Calibration of channels to load cell and transducer
- Real-time graphical chart and numerical display of tests via touch-screen display
- Effective sampling rate of 50 readings per second
- Stores up to 1000 tests with 3000 points per test
- 2 USB ports. One in front for data transfer and the rear port is for powering a wireless access point.

Computer Control

NEXT software and the enhanced Consolidation module, HM-5100SW, is included with the ConMatic IPC automated consolidation machine. This software provides robust machine control, calibration, data acquisition and report generation for those using a computer to control consolidation testing operations.

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

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

- Machine control, and data acquisition via networked computer
- Provides the ability to use Next Software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display
- Effective sampling rate of 50 readings per second
- Stores unlimited tests with up to 3000 points per test.
- Up to 255 individual tests can be run simultaneously from a single PC
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQuIS, gINT, etc.

Specifications:	
Sample size	up to 4" (100mm)
Maximum load	2200lbf (10kN)
Clearance, vertical	8.25" (210mm)
Clearance, horizontal	7.75" (197mm)
Maximum piston travel	0.5" (12.7mm)
Dimensions (L x W x H)	12" x 12" x 30" (305 x 305 x 762mm)

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

ConMatic IPC, 120/220V 50/60Hz HM-5470.3F

Shipping wt. 52 lbs (23.85kg)

Additional Items needed for setup:

Consolidation Installation and Spare Parts Kit

Installation and spare parts kit provides tubing, fasteners and tools to complete an installation of pneumatic consolidation equipment.

Consolidation Installation and Spare Parts Kit HM-4168

ConMatic IPC System Requirements:

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

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

HM-2432A.3F

ConMatic System Requirements:

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

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

ConMatic Consolidation Machine

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

Compact and easy-to-use, the HM-2432A.3F pneumatic consolidation load frame is used to estimate the rate and amount of settlement anticipated for a proposed structure. The unit applies loads instantly without impact for stress-controlled consolidation testing; and, maintains the load regardless of sample compression. Its small footprint saves valuable lab counter space while maintaining its versatility by supporting fixed ring, floating ring, or permeability cells.

- Highly-sensitive accuracy in lower load ranges
- Integral digital readout simplifies checking applied load and setup of predetermined load
- Adjustable upper cross beam
- Instantaneous loading without impact
- Flexible load choice
- Not sensitive to shock
- Choice of English or Metric models

Unit can be used with a standard mechanical dial gauge setup or, for data acquisition applications, it can be teamed with digital indicators or strain transducers (LSCT) coupled to one of the Humboldt data loggers.

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

Shipping wt. 48 lbs (21.7kg)

Typical HM-2432A.3F Consolidation Setup:

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

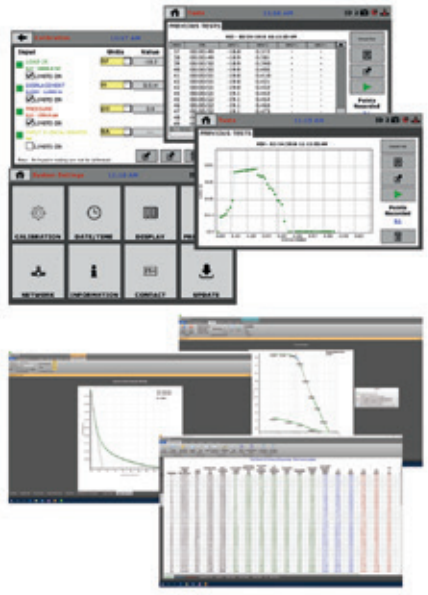
Typical HM-2432M.3F Consolidation Setup:

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

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

Typical Consolidation Data Acquisition Setups Using Humboldt Data Loggers

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



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

Data acquisition setup for Pneumatic consolidation using analog transducer and Logger	
HM-2432A.3F or HM-2432AM.3F	ConMatic 32 TSF or ConMatic 32 Kgf/cm²
HM-1220.XX	Fixed ring consolidation cell
HM-2310.04	Strain transducer 0.4" (10mm)
HM-2310BR	Strain transducer bracket
HM-5320.3F	Humboldt Logger 4 channel analog data acquisition
HM-5100SW	NEXT consolidation module

When used with one of Humboldt's 4-channel data loggers, the HM-2432A Consolidation machine becomes a semi-automatic pneumatic loading machine, which with the touch-screen monitor of the data logger provides test control and live test monitoring in either a stand-alone or computer-controlled configuration. While pneumatic loads are controlled by manual valve controls located on the front panel of the consolidation machine, the data logger provides four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configurations or accessed through a LAN-networked computer using Humboldt's NEXT software.

Stand-Alone Control

The touch-screen controller provides you with full, graphical monitoring of all testing functions in a stand-alone application, while maintaining full computer control when desired. This seven-inch, waterproof screen provides at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer, building upon Humboldt's dedication to modular, stand-alone data acquisition.

Now, in a stand-alone application, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's FRONT USB port or the data can be transferred to a computer via the LAN port.

A second USB port located on the back of the machine can also be used to power a wireless access point, which can provide a wireless hook-up with a computer, if no LAN is available.

Touch-Screen Controller provides:

- 4-channel data acquisition
- Hi-res, 7", waterproof, touch-screen provides total control and real-time graphical display of tests
- Machine/Test control and data acquisition via touch-screen
- Calibration of channels to load cell and transducer
- Real-time graphical chart and numerical display of tests via touch-screen display
- Effective sampling rate of 50 readings per second
- Stores up to 1000 tests with 3000 points per test
- 2 USB ports. One in front for data transfer and the rear port is for powering a wireless access point.

Computer Control

NEXT software and the enhanced Consolidation module, HM-5100SW, is included with the ConMatic IPC automated consolidation machine.

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

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

So, whether you are controlling a single consolidation machine, controlling multiple machines or

Data acquisition setup for Pneumatic consolidation using digital indicator and Logger	
HM-2432A.3F or HM-2432AM.3F	ConMatic 32 TSF or 32 Kgf/cm²
HM-1220.XX	Fixed ring consolidation cell
HM-4470.10	Digital indicator 1" x .0001" (25 x 0.002 mm)
HM-4470C	Digital Indicator Cable, 6 ft.
HM-5330.3F	Humboldt Logger 4 channel digital data acquisition
HM-5100SW	NEXT consolidation module

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

- Machine control, and data acquisition via networked computer
- Provides the ability to use Next Software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display
- Effective sampling rate of 50 readings per second
- Stores unlimited tests with up to 3000 points per test.
- Up to 255 individual tests can be run simultaneously from a single PC
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQuIS, gINT, etc.

Consolidation

HM-1100A

Specifications	
Load Capacity	48 tsf (4,597 kPa)
Beam Ratios	9:1, 10:1 and 11:1
Frame Construction	Heavy-duty aluminum frame with stainless steel vertical, horizontal and beam support rods
Cell Platform	Anodized aluminum with locating pins for centering cells.
Dimension (W x D x H)	7.75" x 32" x 19.5" (197 x 812 x 495 mm)
Weight	47 lbs. (21kg)

Consolidation (Dead-Weight) Typical Setups:

Part #	Description
Dead weight consolidation	
HM-1100A	Dead weight consolidation frame-front load
HM-1120* or HM-1123	Weight set, 16 TSF or Weight set, 64kg
HM-1220.XX	Fixed ring consolidation cell
H-4471CC or H-4465.12CC	Dial gauge, 0.5" X .0001" CC or (12 x 0.002mm) CC

Dead-Weight Consolidation Frame

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

Able to survive in even the harshest laboratory environments, the HM-1100A will provide you with reliable service day-in and day-out. The design features a rugged frame manufactured from aluminum with stainless steel vertical rods, horizontal cross arms and beam support rods. The load arm incorporates 9:1, 10:1, and 11:1 beam ratios for greater flexibility and loading weight requirements. Using the 10:1 ratio on 2.5" (63 mm) diameter samples, the system is capable of producing loads up to 48 tsf (4,597 kPa).

- Triple beam ratios minimize loading weight requirements
- 48 tsf (5,148 kPa) maximum load capacity
- Aluminum and stainless steel construction for corrosion resistance and long life
- Wide range of consolidation cells available in fixed ring, floating ring, permeability and back-pressure designs
- Loading weights available in both, tsf and kg versions
- Basic unit comes with standard, mechanical dial gauges
- The HM-1100A is also available with our Data Loggers with digital indicators or strain transducers (LSCT). See next page.

Dead-Weight Consolidation Frame HM-1100A

Shipping wt. 75 lb (34kg)


HM-1100.1


HM-1100.3

Consolidation Frame Stands

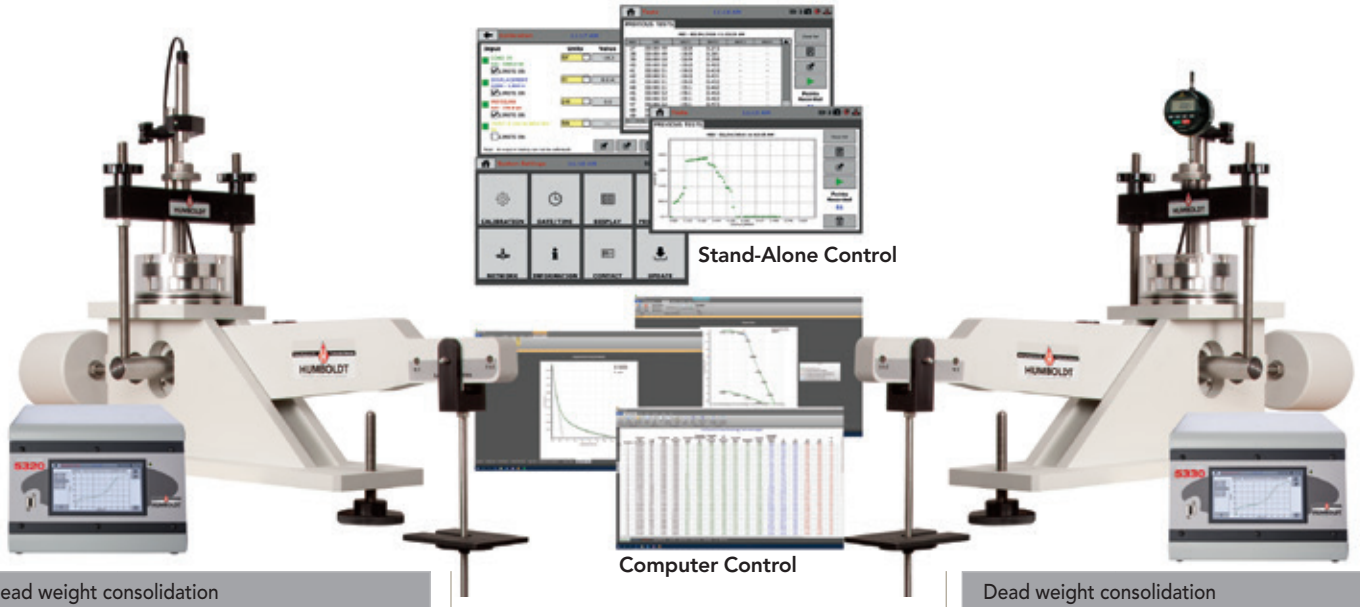
Butcher block table-top with heavy-duty, steel frame designed to provide stable mounting platform for HM-1100A consolidation frames. Consolidation frames can also be bolted to the table and the table can be bolted to floor for increased stability.

Single-Station Frame Stand HM-1100.1
Triple-Station Frame Stand HM-1100.3

Shipping wt. HM-1100.1: 50 lb (23kg), HM-100.3: 115 lb (52.1kg)

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

Typical Consolidation Data Acquisition Setups Using Humboldt Data Loggers



Dead weight consolidation w/ analog data acquisition	
HM-1100A	Dead weight consolidation frame-front Load
HM-1120 or HM-1123	Weight set, 16 TSF or Weight set, 64 kg
HM-1220.XX	Fixed ring consolidation cell
HM-2310.04	Strain transducer 0.4" (10mm)
HM-2310BR	Strain transducer bracket
HM-5320.3F	Logger 4-CH analog data acquisition
HM-5100SW	NEXT consolidation reporting software

When used with one of Humboldt's 4-channel data loggers, the HM-1100 Consolidation frame becomes a semi-automatic machine, which with the touch-screen monitor of the data logger provides test control and live test monitoring in either a stand-alone or computer-controlled configuration. While loads are still controlled by manually adding weights, the data logger provides four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configurations or accessed through a LAN-networked computer using Humboldt's NEXT software.

Stand-Alone Control

The touch-screen controller provides you with full, graphical monitoring of all testing functions in a stand-alone application, while maintaining full computer control when desired. This seven-inch, waterproof screen provides at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer, building upon Humboldt's dedication to modular, stand-alone data acquisition.

Now, in a stand-alone application, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's FRONT USB port or the data can be transferred to a computer via the LAN port.

A second USB port located on the back of the machine can also be used to power a wireless access point, which can provide a wireless hook-up with a computer, if no LAN is available.

Touch-Screen Controller provides:

- 4-channel data acquisition
- Hi-res, 7", waterproof, touch-screen provides total control and real-time graphical display of tests
- Machine/Test control and data acquisition via touch-screen
- Calibration of channels to load cell and transducer
- Real-time graphical chart and numerical display of tests via touch-screen display
- Effective sampling rate of 50 readings per second
- Stores up to 1000 tests with 3000 points per test
- 2 USB ports. One in front for data transfer and the rear port is for powering a wireless access point.

Computer Control

NEXT software is included with the Humboldt Data Loggers.

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

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

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

Dead weight consolidation w/ digital data acquisition	
HM-1100A	Dead Weight consolidation frame-front load
HM-1120 or HM-1123	Weight set, 16 TSF or Weight set, 64 kg
HM-1220.XX	Fixed ring consolidation cell
HM-4470.10	Digital indicator 1" x .0001" (25 x 0.002 mm)
HM-4470C	Digital Indicator Cable, 6 ft.
HM-5330.3F	Logger 4-CH digital data acquisition
HM-5100SW	NEXT consolidation reporting software

- Data acquisition via networked computer
- Provides the ability to use Next Software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display
- Effective sampling rate of 50 readings per second
- Stores unlimited tests with up to 3000 points per test.
- Up to 255 individual tests can be run simultaneously from a single PC
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQuIS, gINT, etc.

Fixed Ring Consolidation Cell

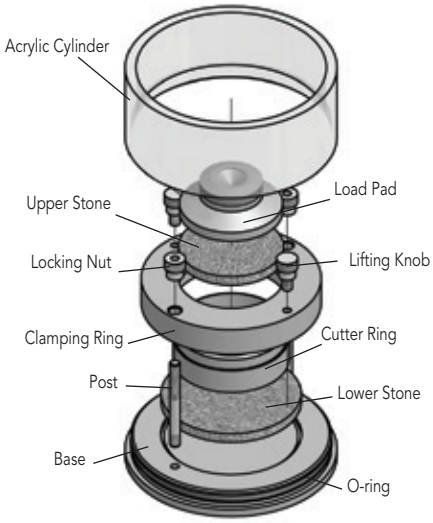
ASTM: D2435, D4546, AASHTO: T216, BS:1377:5

Complete cell assembly features stainless steel construction and self-trimming cutter ring. Cutter ring rests inside clamping ring on lower porous stone, which is larger than the sample. The top porous stone and loading pad rest on the sample. The assembly is fixed on the cell base and enclosed within an acrylic cylinder open to the atmosphere, which permits saturation of the sample. The cell comes complete with all the parts illustrated in the drawing below.

Fixed Ring Consolidation Cell — See Chart

Shipping wt. 9 lb (4kg)

Fixed Ring Consolidation Cell	
2.0"	HM-1220.20
2.42"	HM-1220.242
2.5"	HM-1220.25
3.0"	HM-1220.30
4.0"	HM-1220.40
50mm	HM-1220.50
70mm	HM-1220.70
75mm	HM-1220.75
100mm	HM-1220.100



Floating Ring Consolidation Cell

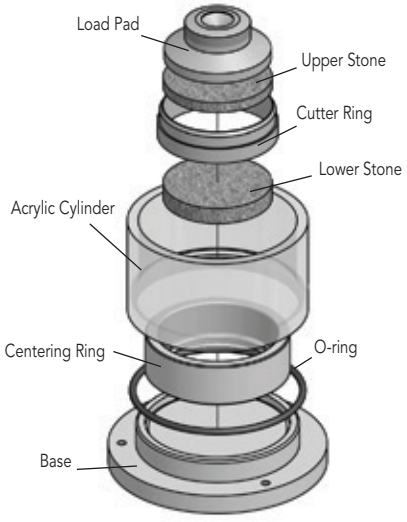
ASTM: D2435, D4546, AASHTO: T216, BS:1377:5

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

Floating Ring Consolidation Cell — See Chart

Shipping wt. 6 lb (2.27kg)

Floating Ring Consolidation Cell	
2.0"	HM-1210.20
2.42"	HM-1210.242
2.5"	HM-1210.25
3.0"	HM-1210.30
4.0"	HM-1210.40
50mm	HM-1210.50
70mm	HM-1210.70
75mm	HM-1210.75
100mm	HM-1210.100



Fixed Ring Permeability Cell

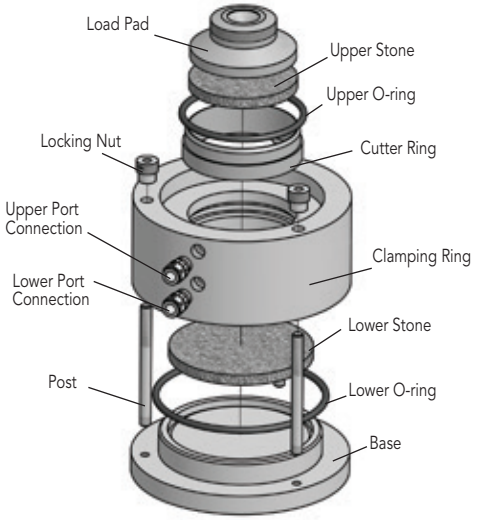
ASTM: D2435, D4546, AASHTO: T216, BS:1377:5

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

Fixed Ring Permeability Cell — See Chart

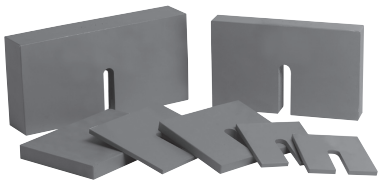
Shipping wt. 12 lb (5.4kg)

Fixed Ring Permeability Cell	
2.0"	HM-1230.20
2.42"	HM-1230.242
2.5"	HM-1230.25
3.0"	HM-1230.30
4.0"	HM-1230.40
50mm	HM-1230.50
70mm	HM-1230.70
75mm	HM-1230.75
100mm	HM-1230.100



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

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



HM-1240.25

Trimming Turntable for 2.5" Consolidation Specimens

Trims samples down to correct sizing.

Trimming Turntable, 2.5" Consolidation HM-1240.25

Shipping wt. 5lb (2.27kg)

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

Weight Set	Set Includes	Model No.	Ship. Wt.
16 TSF Set	includes: (2) .125 TSF, (1) .25 TSF, (1) .50 TSF, (1) 1.0 TSF, (1) 2.0 TSF, (3) 4.0 TSF weights	HM-1120	140 lbs. (64kg)
32 TSF Set	includes: (2) .125 TSF, (1) .25 TSF, (1) .50 TSF, (1) 1.0 TSF, (1) 2.0 TSF, (7) 4.0 TSF weights	HM-1121	275 lbs. (125kg)
32 kg Set	includes: (4) 1 kg, (3) 4 kg, (2) 8 kg weights	HM-1122	73 lbs. (33.1kg)
50 kg Set	includes: (3) 1 kg, (1) 2 kg, (1) 5 kg, (4) 10 kg weights	HM-1125	110 lbs. (50kg)
64 kg Set	includes: (4) 1 kg, (5) 4 kg, (5) 8 kg weights	HM-1123	150 lbs. (68kg)
88 kg Set	includes: (4) 1 kg, (5) 4 kg, (8) 8 kg weights	HM-1124	130 lbs. (59kg)

ELITE SERIES
Direct Shear

Direct/Residual Shear Apparatus

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

Humboldt's Elite Series Direct Shear machines provide the materials testing lab with a choice of a pneumatic loading and several dead-weight machines for direct shear testing applications. The HM-5760 is a pneumatic loading machine, which with its touch-screen monitor provides test control and live test monitoring in either a stand-alone or computer-controlled configuration.

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

These machines provide four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configurations or accessed through a LAN-networked computer using Humboldt's Next Software.

Elite Series Direct Shear machines are built with durable, high-quality components and feature the use of a stepper motor, precision gears and gear box to ensure smooth and reliable operation, as well as precise results.

In stand-alone mode, these direct shear machines provide a 7" (178mm) touch-screen controller, giving you finger-tip control of your testing processes, as well as providing real-time, visual views of your data in both tabular and graphic formats. These new waterproof, touch screens provide colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine while the test is running. Data can then be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced HM-5700SW Direct Shear software module.

When operated from a networked computer the NEXT software provides robust machine and test control, and report generation. It also allows the ability to control and monitor multiple machines from a single computer.

Pneumatic Direct/Residual Shear Apparatus

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

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

The microprocessor-based system features a stepper-motor drive system and a 7" touch-screen display that allows the operator to control and monitor all test functions.

Like all Elite Series machines, the HM-5760 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the HM-5760 to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

The HM-5760 is supplied complete with two 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, a 0.4" (10.2mm) vertical strain transducer and Humboldt's NEXT Direct Shear software module. Shear box assemblies and related accessories are not included and should be ordered separately.

Pneu. Direct/Residual Shear Apparatus HM-5760.3F

Shipping wt. 168 lb (76kg)

HM-5760.3F

HM-5760.3F Specifications:	
Horiz. movement	2" (50mm) Maximum
Horiz. shear force	2000 lbf (10kN)
Vertical load	2000 lbf (10kN)
Data Channels	4
Speed Range	0.00001 to 0.49999 in./min. 0.00001 to 12.9999 mm/min.
Data storage	1000 tests and up to 3000 readings per test
Dimensions (L x D x H)	30" x 15.5" x 22" (760 x 394 x 558mm)
Voltage	110/220V 50/60Hz - 6.5amps

Dead-Weight Direct/Residual Shear Machines

HM-5750A.3F

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

HM-5750D.3F

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

The HM-5750A Direct Shear machine is an economical choice for performing direct/residual shear tests utilizing the dead-weight method and analog measuring devices. The microprocessor-based system features a stepper-motor drive system and a 7" touch-screen display that allows the operator to control and monitor all test functions.

Like all Elite Series machines, the HM-5750A is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the HM-5750A to be used as a stand-alone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network. The carriage accepts shear box squares up to 4.0" (100mm) internal dimension. Forward and reverse measurements permit residual shear testing as standard. A built-in safety feature prevents the overloading of the load measuring system.

The HM-5750A is supplied complete with a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, and a 0.4" (10.2mm) vertical strain transducer. Shear box assemblies and related accessories are not included and should be ordered separately.

Direct Shear Apparatus, Analog HM-5750A.3F
Shipping wt. 330 lb (149kg)

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

The HM-5750D Direct Shear machine is an economical choice for performing direct/residual shear tests utilizing the dead-weight method and digital measuring devices. The microprocessor-based system features a stepper-motor drive system and a 7" touch-screen display that allows the operator to control and monitor all test functions.

Like all Elite Series machines, the HM-5750D is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the HM-5750D to be used as a stand-alone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network. The carriage accepts shear box squares up to 4.0" (100mm) internal dimension. Forward and reverse measurements permit residual shear testing as standard. A built-in safety feature prevents the overloading of the load measuring system.

The HM-5750D is supplied complete with a 2,200 lbf (10kN) capacity load ring and two 1.0" x 0.0001" (25.40 x 0.002mm) digital indicators. Shear box assemblies and related accessories are not included and should be ordered separately.

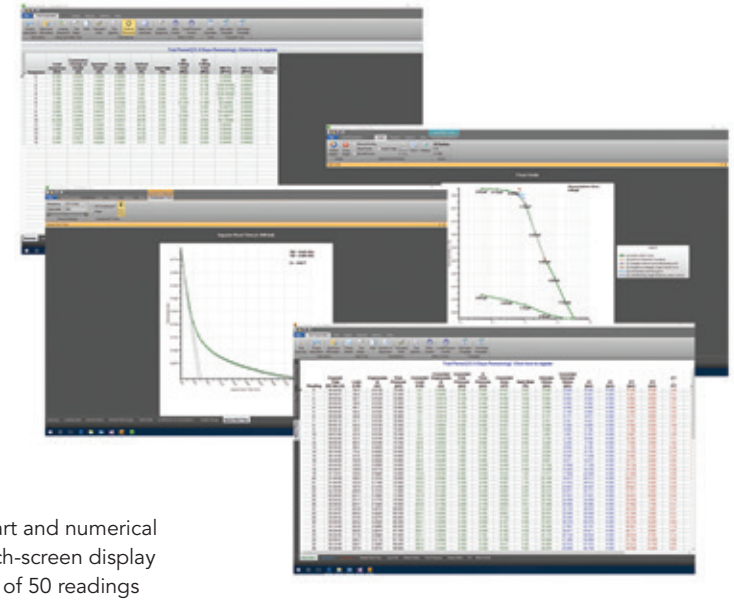
Direct Shear Apparatus, Digital HM-5750D.3F
Shipping wt. 300 lb (136kg)

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

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

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

Stand-Alone or Computer Control



Stand-Alone Control

Humboldt's touch-screen controller provides you with full, graphical monitoring of all testing functions in a stand-alone application, while maintaining full computer control when desired.

Now you can have full, finger-tip control and monitoring of all testing functions with Humboldt's touch-screen controller, found on Elite Series Direct Shear machines. This seven-inch, waterproof screen provides at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer, building upon Humboldt's dedication to modular, stand-alone data acquisition.

Now, in a stand-alone application, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's FRONT USB port or the data can be transferred to a computer via the LAN port.

A second USB port located on the back of the machine can also be used to power a wireless access point, which can provide a wireless hook-up with a computer, if no LAN is available.

Touch-Screen Controller provides:

- 3 or 4 channel data acquisition
- Hi-res, 7", waterproof, touch-screen provides total control and real-time graphical display of tests
- Machine/Test control and data acquisition via touch-screen
- Control both channels at the same time
- Calibration of channels to load cell and transducer
- Real-time graphical chart and numerical display of tests via touch-screen display
- Effective sampling rate of 50 readings per second
- Stores up to 1000 tests with 3000 points per test
- 2 USB ports. One in front for data transfer and the rear port is for powering a wireless access point.

Computer Control

Next software and the enhanced Consolidation module, HM-5011SW, is included with the ConMatic IPC automated consolidation machine. This software provides robust machine control, calibration, data acquisition and report generation for those using a computer to control consolidation testing operations.

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

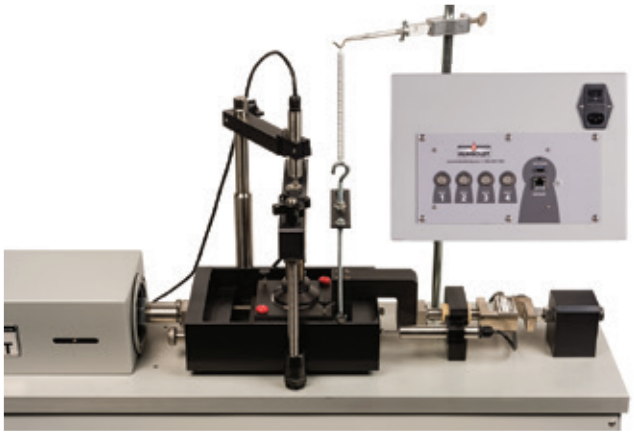
So, whether you are controlling a single consolidation machine, controlling multiple machines or even a complete geotechnical lab, Humboldt's NEXT software, in conjunction with Humboldt's ConMatic IPC, provides a complete solution for the calibration, acquisition, recording and presentation of consolidation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

- Machine control, and data acquisition via networked computer
- Provides the ability to use Next Software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display
- Effective sampling rate of 50 readings per second
- Stores unlimited tests with up to 3000 points per test.
- Up to 255 individual tests can be run simultaneously from a single PC
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQuIS, gINT, etc.

Controller Specifications:	
Display (Resistive Touch)	7" (178mm) VGA (480 x 800)
Real-time test data	Graphic and tabulation
Processor	Dual 32-bit ARM
RAM	64MB
Memory, non-volatile	4GB
Analog to digital converter	24 bit
Data acquisition	3-4 Channels
Logging speed	up to 50 readings per second
Multi-test storage	1000
Points per test	3000
USB port (front)	export data, import/export calibration data, WiFi
USB port (back)	provides external power for wireless access point
Ethernet connection	for network connectivity
Emergency stop	Large button
24-bit differential analog to digital converter	4
Ambient temperature sensor	1
Limit switches	2
Firmware Update	Ethernet or flash drive

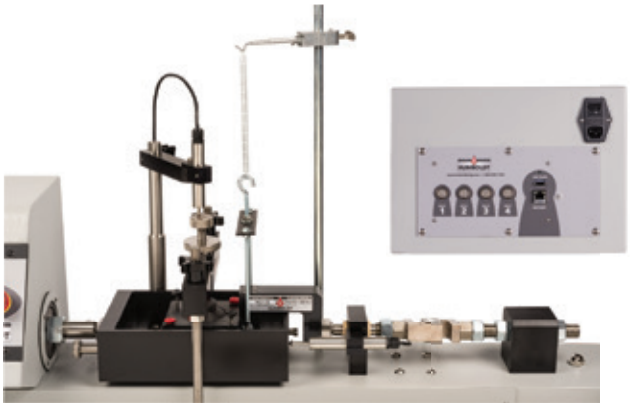
Typical Test Setup for HM-5760 and (HM-5560)

Part #	Description
HM-5760.3F	**Pneumatic Direct Shear with analog inputs** (includes a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, and a 0.4" (10.2mm) vertical strain transducer)
HM-5700SW	NEXT Direct Shear software module
HM-2751.XX(S/D)	Shear box assembly (specify size)
HM-2702.XX(S/D)	Shear box cutter (specify size)
HM-2703.XX(S/D)	Dolly/tamper (specify size)



Typical Test Setup for HM-5750A

Part #	Description
HM-5750A.3F	**Dead-weight Direct Shear with analog inputs** (includes a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, and a 0.4" (10.2mm) vertical strain transducer)
HM-5700SW	NEXT Direct Shear software module
HM-1120 or HM-1125	16 TSF or 50 kg weight set
HM-2751.XX(S/D)	Shear box assembly
HM-2702.XX(S/D)	Shear box cutter
HM-2703.XX(S/D)	Dolly/tamper



Typical Test Setup for HM-5750D

Part #	Description
HM-5750D.3F	**Dead-weight Direct Shear with digital inputs** (a 2,200 lbf (10kN) capacity load ring and two 1.0" x 0.0001" (25.40 x 0.002mm) digital indicators)
HM-5700SW	NEXT Direct Shear software module
HM-1120 or HM-1125	16 TSF or 50 kg weight set
HM-2751.XX(S/D)	Shear box assembly
HM-2702.XX(S/D)	Shear box cutter
HM-2703.XX(S/D)	Dolly/tamper

Typical Test Setup for HM-5750 & HM-5750M

Part #	Description
HM-5750D.3F	**Dead-weight Direct Shear with load ring** (a 2,200 lbf (10kN) capacity load ring, 1.0" x 0.001" (25.4 x 0.01mm) and 0.5" x 0.0001" (12 x 0.002mm) dial indicator
HM-1120 or HM-1125	16 TSF or 50 kg weight set
HM-2751.XX(S/D)	Shear box assembly
HM-2702.XX(S/D)	Shear box cutter
HM-2703.XX(S/D)	Dolly/tamper

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

Direct Shear

HM-5560.3F

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

HM-5750.3F

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

The HM-5560 is a semi-automatic pneumatic loading machine, which with its touch-screen monitor provides test control and live test monitoring in either a stand-alone or computer-controlled configuration. With the HM-5560, pneumatic loads are controlled by manual valve controls located on the front panel for easy use. The HM-5560 also provides four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configurations or accessed through a LAN-networked computer using Humboldt's Next Software.

In stand-alone mode, the HM-5560 direct shear machine provides a 7" (178mm) touch-screen controller, giving you finger-tip control of your testing processes, as well as providing real-time, visual views of your data in both tabular and graphic formats. These new waterproof, touch screens provide colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine while the test is running. Data can then be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced HM-5700SW Direct Shear software module.

When operated from a networked computer the NEXT software provides robust machine and test control, and report generation. It also allows the ability to control and monitor multiple machines from a single computer.

The HM-5560 is supplied complete with a 2,000 lbf (10kN) capacity load cell; 1" (25.4mm) horizontal strain transducer, a 0.4" (10.2mm) vertical strain transducer and Humboldt's NEXT software. Shear box assemblies, Humboldt's NEXT Direct Shear module and related accessories are not included and should be ordered separately.

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

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

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

The HM-5750 and HM-5750M Direct Shear machines are an economical choice for performing direct/residual shear tests utilizing the dead-weight method with load rings and dial gauges.

These models include the carriage, stand, vertical load hanger and a balanced lever loading arm with a 10:1 ratio that reduces the weight required to perform tests. The micro-processor-based system features a stepper motor drive system and 7" touch-screen display.

The carriage accepts shear box squares up to 4.0" (100mm) internal dimension. Forward and reverse measurements permit residual shear testing as standard. A built-in safety feature prevents the over travel of the load measuring system.

The HM-5750 and HM-5750M are supplied complete with a 2,000 lbf (10kN) capacity load ring, 1.0" x 0.001" (25.4 x 0.01mm) and 0.5" x 0.0001" (12 x 0.002mm) dial indicator. Shear box assemblies and related accessories are not included and should be ordered separately.

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

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


HM-2751.60S

HM-2751.25D


HM-2701.25D

HM-2701.60S

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

Shearbox assemblies include: sample box, (2) porous plates, (1) loading pad, and (1) grid plate. All shearboxes feature mounting screws for use with the HM-2750 ASTM D3080-compliant counter-balance device.

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

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

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

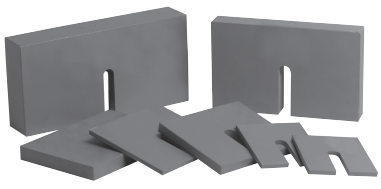
* Can be used for shear boxes and consolidation cells.

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

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

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

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



Weight Set	Set Includes	Model No.	Ship. Wt.
16 TSF set	includes: (2) .125 TSF, (1) .25 TSF, (1) .50 TSF, (1) 1.0 TSF, (1) 2.0 TSF, (3) 4.0 TSF weights	HM-1120	140 lbs. (64kg)
32 TSF set	includes: (2) .125 TSF, (1) .25 TSF, (1) .50 TSF, (1) 1.0 TSF, (1) 2.0 TSF, (7) 4.0 TSF weights	HM-1121	275 lbs. (125kg)
32 kg set	includes: (4) 1 kg, (3) 4 kg, (2) 8 kg weights	HM-1122	73 lbs. (33.1kg)
50 kg set	includes: (3) 1 kg, (1) 2 kg, (1) 5 kg, (4) 10 kg weights	HM-1125	110 lbs. (50kg)
64 kg set	includes: (4) 1 kg, (5) 4 kg, (5) 8 kg weights	HM-1123	150 lbs. (68kg)
88 kg set	includes: (4) 1 kg, (5) 4 kg, (8) 8 kg weights	HM-1124	130 lbs. (59kg)

High Capacity Direct Shear

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

High-Capacity Direct Shear Apparatus
ASTM D5321, D6243

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

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

In stand-alone mode, these direct shear machines provide a 7" (178mm) touch-screen controller, giving you finger-tip control of your testing processes, as well as providing real-time, visual views of your data in both tabular and graphic formats.

These new waterproof, touch screens provide colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine while the test is running. Data can then be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced HM-5700SW Direct Shear software module.

When operated from a networked computer the NEXT software provides robust machine and test control, and report generation. It also allows the ability to control and monitor multiple machines from a single computer. Applying the vertical load is accomplished by setting the precision regulator to the required pressure per the calibration chart. Load settings are verified on a pressure readout that reads to two decimal places and is accurate to 0.25%. The horizontal shear rate is set using the digital thumb wheel on the control panel. Limit switches are used to set the home position of the shear rings and to limit the travel to 4" (300mm).

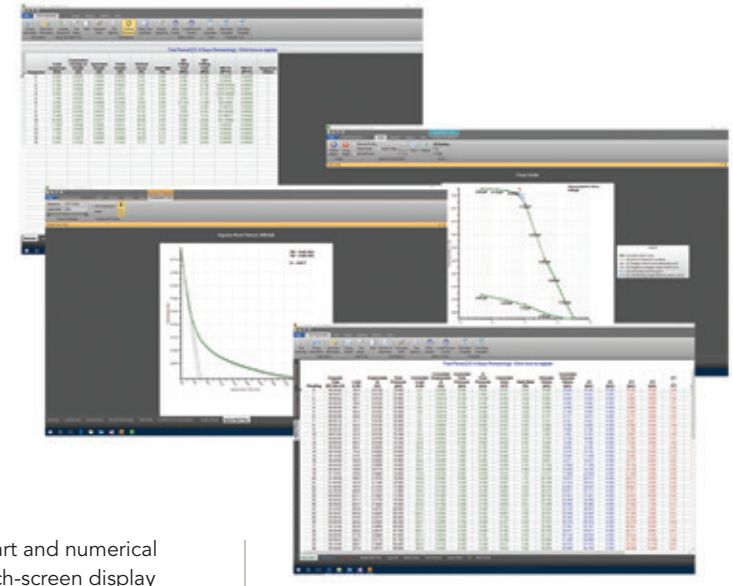
Consolidation and shear displacement are measured by linear displacement transducers and displayed on the digital readout. Shear load is measured from a load cell attached to the water chamber. The included software imports data onto spreadsheets such as Excel® for analysis and reporting. Displayed values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

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

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

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

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



Stand-Alone Control

Humboldt's touch-screen controller provides you with full, graphical monitoring of all testing functions in a stand-alone application, while maintaining full computer control when desired.

Now you can have full, finger-tip control and monitoring of all testing functions with Humboldt's touch-screen controller. This seven-inch, waterproof screen provides at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer, building upon Humboldt's dedication to modular, stand-alone data acquisition.

Now, in a stand-alone application, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's FRONT USB port or the data can be transferred to a computer via the LAN port.

A second USB port located on the back of the machine can also be used to power a wireless access point, which can provide a wireless hook-up with a computer, if no LAN is available.

Touch-Screen Controller provides:

- 2-channel data acquisition
- Hi-res, 7", waterproof, touch-screen provides total control and real-time graphical display of tests
- Machine/Test control and data acquisition via touch-screen
- Control both channels at the same time
- Calibration of channels to load cell and transducer
- Real-time graphical chart and numerical display of tests via touch-screen display
- Effective sampling rate of 50 readings per second
- Stores up to 1000 tests with 3000 points per test
- 2 USB ports. One in front for data transfer and the rear port is for powering a wireless access point.

Computer Control

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

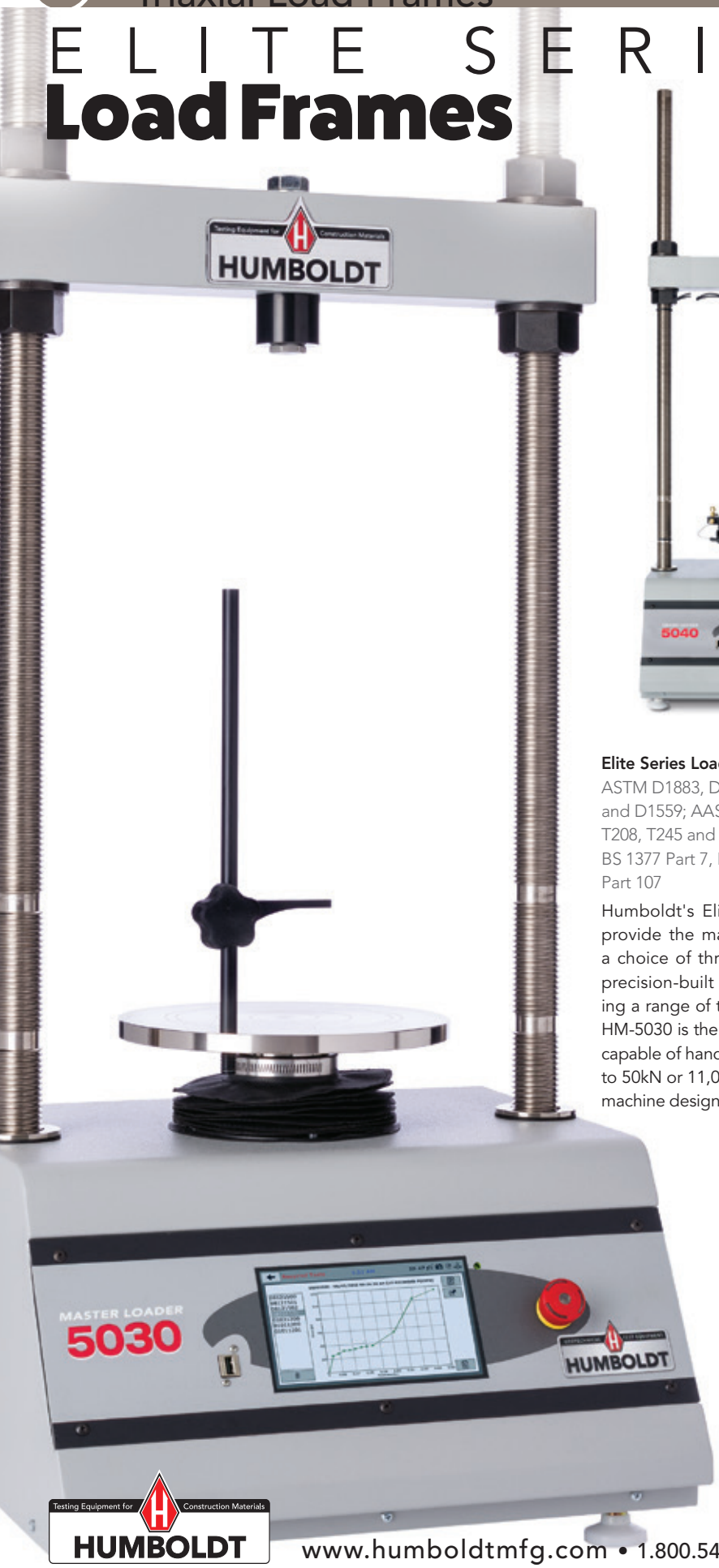
In addition, operators have the ability to view and control testing operations from a PC in the lab, in the next room or at a different location, while also providing report generating capabilities using the consolidation test-specific software module.

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

- Machine control, and data acquisition via networked computer
- Provides the ability to use Next Software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display
- Effective sampling rate of 50 readings per second
- Stores unlimited tests with up to 3000 points per test.
- Up to 255 individual tests can be run simultaneously from a single PC
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQuIS, gINT, etc.

Controller Specifications:	
Display (Resistive Touch)	7" (178mm) VGA (480 x 800)
Real-time test data	Graphic and tabulation
Processor	Dual 32-bit ARM
RAM	64MB
Memory, non-volatile	4GB
Analog to digital converter	24 bit
Data acquisition	3 Channels
Logging speed	up to 50 readings per second
Multi-test storage	1000
Points per test	3000
USB port (front)	export data, import/export calibration data, WiFi
USB port (back)	provides external power for wireless access point
Ethernet connection	for network connectivity
Emergency stop	Large button
24-bit differential analog to digital converter	4
Ambient temperature sensor	1
Limit switches	2
Firmware Update	Ethernet or flash drive

ELITE SERIES
Load Frames



Elite Series Load Frames

ASTM D1883, D2850, D2166, D4767 and D1559; AASHTO T193, T296, T297, T208, T245 and T246; BS 1377: Part 4, BS 1377 Part 7, BS 1377 Part 8, BS 598 Part 107

Humboldt's Elite Series Load Frames provide the materials testing lab with a choice of three, highly-versatile and precision-built loading systems covering a range of testing applications. The HM-5030 is the workhorse of the group, capable of handling any testing need up to 50kN or 11,000 lbf. The HM-5020 is a machine designed specifically for triaxial testing and other testing requirements up to 15kN or 3,000 lbf. and, the HM-5040, is a heavy-duty machine capable of handling testing requirements up to 100kN or 22,000 lbf.

These machines provide four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configurations or accessed through a LAN-networked computer using Humboldt's Next Software.

Elite Series load frames are built with durable, high-quality components and feature the use of a stepper motor, precision gears and gear box to ensure smooth and reliable operation, as well as precise results.

In stand-alone mode, these load frames provide a 7" (178mm) touch-screen controller. These new waterproof, touch screens provide colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine while the test is running. Data can then be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced test-specific modules.

HM-5030 MASTER LOADER

Load capacity	11000 lbf (50kN)
Speed range	0 - 3.0000 in/min. 0 - 75.0000 mm/min.
Data channels	4
Platen Size / Travel	10" (254mm) / 4" (100mm)
Data storage	1000 tests and up to 3000 readings per test
Clearance, vertical	40" (1000mm)
Clearance, horiz.	15" (380mm)
Voltage	110/220V 50/60Hz. 5.0 amps

Designed for applications requiring multi-purpose loading systems, such as road construction projects in either mobile or fixed labs, educational institutions and consulting firms, the HM-5030 Master Loader is ideal for just about any application from road construction to high-volume commercial and educational laboratories.

While the HM-5030 has been specifically designed for soil testing labs conducting multiple testing operations including: UU, CU and CD triaxial, UC, CBR and LBR, it is also perfect for running Marshall, Hveem, TSR and SCB asphalt tests as well. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5030 to perform any tests required up to its load capacity of 11000 lbf (50kN).

Like all Elite Series load frames, the HM-5030 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

Master Loader, 110/220V 50/60 Hz HM-5030.3F

Shipping wt. 300 lb (136kg)

HM-5020 TRIAXIAL LOADER

Load capacity	3000 lbf (15kN)
Speed range	0 - 3.0000 in/min. 0 - 75.0000 mm/min.
Data channels	4
Platen Size / Travel	10" (254mm) / 4" (100mm)
Data storage	1000 tests and up to 3000 readings per test
Clearance, vertical	27" (686mm)
Clearance, horiz.	11" (286mm)
Voltage	110/220V 50/60Hz - 5.0amps

A small-footprint, triaxial-specific load frame that provides the versatility, precision and durability found throughout Humboldt's Elite Series load frames.

The HM-5020 Triaxial Loader has been specifically designed to handle triaxial testing applications, including: UU, CU and CD triaxial and UC. From educational institutions and consulting firms to high-volume commercial labs and construction projects, the Triaxial Loader can handle any application with ease. Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5020 to perform any tests required up to its load capacity of 3000 lbf (15kN).

Like all Elite Series load frames, the HM-5020 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer at any location with access to the network.

Triaxial Loader, 110/220V 50/60 Hz HM-5020.3F

Shipping wt. 300 lb (54kg)

HM-5040 GRAND LOADER

Load capacity	22000 lbf (100kN)
Speed range	0 - .4999 in/min. 0 - 12.5000 mm/min.
Data channels	4
Platen Size / Travel	10" (254mm) / 4" (100mm)
Data storage	1000 tests and up to 3000 readings per test
Clearance, vertical	44" (1100mm)
Clearance, horiz.	21" (540mm)
Voltage	110/220V 50/60Hz - 5.0amps

The HM-5040 Grand Loader is ideal for just about any application from road construction to high-volume commercial and educational laboratories, which require higher pressure loading capacities up to 22000 lbf (100kN), such as those involving larger sized samples and samples comprised of rock and rock/soil mixtures. It's wider stance and large vertical and horizontal clearances allows it to accommodate much large sample cells.

Its heavy-duty design and precise stepper-motor control provide a stable platform for years of reliable service allowing the HM-5040 to perform any tests required up to its load capacity of 22000 lbf (100kN).

Like all Elite Series load frames, the HM-5040 is built around Humboldt's integral, 4-channel data logger with touch-screen control, which allows the load frame to be used as a standalone device capable of full test control and data logging. It can also be controlled by a networked computer

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

Shipping wt. 300 lb (54kg)

ELITE SERIES
Load Frames

Choose:
Stand-Alone or Computer Control

Stand-Alone Control

Humboldt's touch-screen controller provides you with full, graphical monitoring of all testing functions in a stand-alone application, while maintaining full computer control when desired.

Now you can have full, finger-tip control and monitoring of all testing functions with Humboldt's touch-screen controller, found on Humboldt's Elite Series Load Frames. This seven-inch, waterproof screen provides at-a-glance monitoring of testing functions, in a real-time graphical display, without the use of a computer, building upon Humboldt's dedication to modular, stand-alone data acquisition.

Now, in a stand-alone application, you will be able to run tests and display results while viewing tabulation, basic x-y graphs and instrument readings in real-time during the test, using user-defined, basic data acquisition. Test data is stored in the device and can be downloaded to a USB drive via the machine's FRONT USB port or the data can be transferred to a computer via the LAN port.

A second USB port located on the back of the machine can also be used to power a wireless access point, which can provide a wireless hook-up with a computer, if no LAN is available.

Touch-Screen Controller provides:

- 4-channel data acquisition
- Hi-res, 7", waterproof, touch-screen provides total control and real-time graphical display of tests
- Machine/Test control and data acquisition via touch-screen
- Control all channels at the same time
- Calibration of channels to load cell and transducer
- Real-time graphical chart and numerical display of tests via touch-screen display
- Effective sampling rate of 50 readings per second
- Stores up to 1000 tests with 3000 points per test
- 2 USB ports. One in front for data transfer and the rear port is for powering a wireless access point.

Computer Control

Humboldt's Next software is included with the all Elite Series Load Frames. This software provides robust machine control, calibration, data acquisition and report generation for those using a computer to control testing operations.

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

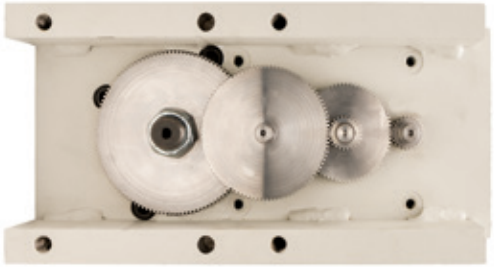
So, whether you are controlling a single load frame, controlling multiple machines or even a complete geotechnical lab, Humboldt's NEXT software, in conjunction with Humboldt's Elite Series Load Frames provide a complete solution for the calibration, acquisition, recording and presentation of testing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

- Machine control, and data acquisition via networked computer
- Provides the ability to use Next Software's, advanced test-specific modules
- Real-time graphical chart and numerical display of tests via computer display
- Effective sampling rate of 50 readings per second
- Stores unlimited tests with up to 3000 points per test.
- Up to 255 individual tests can be run simultaneously from a single PC
- Provides advanced graphing capabilities
- Provides full-unit customization
- Reports can also be exported to Excel or a CSV file, if desired, and, we can provide custom integration/export solutions for LIMS, EQuIS, gINT, etc.

Controller Specifications

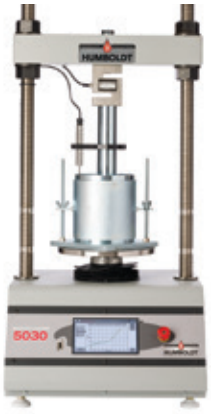
Specifications for the touch-screen controller, instrumentation and data acquisition used with Humboldt Elite series load frames

Controller Specifications:	
Display (Resistive Touch)	7" (178mm) VGA (480 x 800)
Real-time test data	Graphic and tabulation
Processor	Dual 32-bit ARM
RAM	64MB
Memory, non-volatile	4GB
Analog to digital converter	24 bit
Data acquisition	4 Channels
Logging speed	up to 50 readings per second
Multi-test storage	1000
Points per test	3000
USB port (front)	export data, import/export calibration data, WiFi
USB port (back)	provides external power for wireless access point
Ethernet connection	for network connectivity
Emergency stop	Large button
24-bit differential analog to digital converter	4
Ambient temperature sensor	1
Limit switches	2
Firmware Update	Ethernet or flash drive



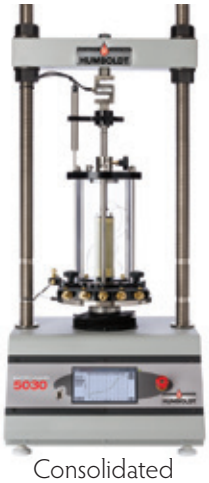
Humboldt stepper motor, precision gears and gear box used on all Elite Series Load Frames ensure smooth operation and precise results.

Typical Test Setups with HM-5030

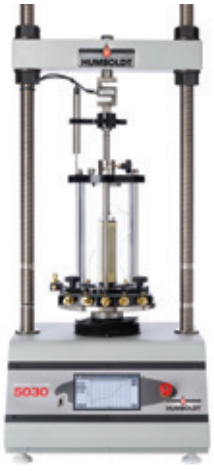


CBR/LBR

Unconfined Compression

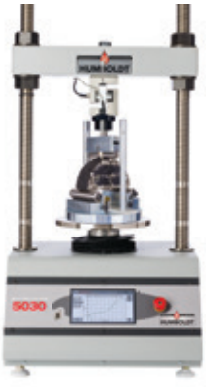


Consolidated Drained and Undrained



Unconsolidated Undrained

Marshall



Semi-Circular Bending

Triaxial Load Frames

HM-2850.3F

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

Specifications	
Load capacity	11000 lbf (50kN)
Speed range	0 - 3.0000 in/min. 0 - 75.0000 mm/min.
Platen Size / Travel	8" (203mm) / 3" (76mm)
Clearance, vertical	40" (1000mm)
Clearance, horiz.	15" (380mm)
Dimensions (l x w x h).	17 x 22 x 51 inch (432 x 559 x 1295mm)
Voltage	110/220V 50/60Hz. 5.0 amps

Multi-Speed Load Frame

ASTM: D1883, D2850, D2166, D4767, and D1559; AASHTO: T193, T296, T297, T208, T245, and T246; BS 1377: Part 4: 1990, BS 1377: Part 7: 1990, BS 1377: Part 8: 1990, BS 598: Part 107

The HM-2850 Multi-speed Load Frame is designed for those who want a high-quality, but simple, multi-purpose load frame without built-in data acquisition capabilities. The HM-2850 is ideal for applications where the operator is either not concerned with data acquisition; or, already has or is planning to construct their own data acquisition system. With its large 7" color, touchscreen, the HM-2850 provides the operator with the ability to precisely select any speed with four decimal accuracy within the machine's speed range.

The HM-2850 features a quiet, direct drive stepper motor that provides a range of loading speeds from 0.0001 to 2.2500 in/min. This speed range is more than adequate for the majority of standard soil tests. The HM-2850 also incorporates a separate, dedicated control to accommodate 2.00 in/min. for use in Marshall and TSR Testing, as well as a rapid travel speed of 2.25 in/min for moving the platen into position quickly. Speeds are controlled through the use of edit keys and the digital display.

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

Shipping wt. 300 lb (136kg)

Features include:

- 8" platen provides roomy, stable base for test equipment
- User selectable unit change from touchscreen between U.S. Standard and Metric units.

Multi-Speed Load Frame— HM-2850.3F
Includes:
SHH04—3/4"-16 Bolt x 3.5" long
WF04—Washer for SHH04 Bolt

CU/UU Triaxial Setup with HM-2800

Components	Item
Load	
50kN (11240 lbf) capacity	HM-2850.3F
Strain	
Load ring 2,200 lbf (10 kN)	H-4454.020
Dial gauge 2.0" travel, 0.001" divisions)	H-4463
Pore pressure transducer	HM-4170
Ball seat adapter	HM-200387
Single channel readout (choose)	HM-2350 HM-2350.4F
NEXT software basic, user defined	included
Pressure	
Pressure distribution panel for CU triaxial (choose)	HM-4150.3F HM-4150M.3F
Pressure distribution panel for UU triaxial (choose)	HM-4140.3F HM-4140M.3F
De-airing system	HM-4187A.3F
Vacuum pump (choose)	H-1763A H-1763A.4F
Triaxial Cell (choose 1 below)	
3"/ 75mm dia. capacity	HM-4199B
4"/ 100mm dia. capacity	HM-4199B-4
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX

Unconfined Compression Setup with HM-2800

Components	
Load	
50kN (11240 lbf) capacity	HM-2850.3F
Upper unconfined platen	HM-2002
Displacement indicator platform	HM-3000.10.2
Displacement indicator rod	HM-3000.10.1
Load ring 500 lbf (2.5 kN)	H-4454.005
Dial gauge 2.0" travel 0.001" divisions	H-4463

Typical Soil Cement Setup

Components	
Load	
50kN (11240 lbf) capacity	HM-2850.3F
Upper swivel platen	HM-2003E
Strain	
Load ring 5,000 lbf (25 kN)	H-4454.050


HM-4199B


HM-4199B-6

HM-4199B-4

HM-4199B


HM-4199.28

Triaxial Cells
Triaxial Cells are available for use with sample sizes from 1.4" (35mm) to 6" (150mm). The clear acrylic chamber has a working pressure of 150 psi (1,000 kPa) and is tested to 250 psi (1,700 kPa). The design features a solid base, which provides an extremely stable test platform making it faster and easier to center the cell on the load frame platen— reducing setup times. HM-4199B cells provide easy access to the test chamber by utilizing a one-piece, chamber unit that is quickly removed through the removal of three easy-turn knobs. These cells also have an integral de-airing block for the pore pressure transducer built into the side. The cells have five no-volume-change valves aligned on one side for maximum convenience. Two valves handle top drainage, two valves handle bottom drainage, and one valve handles filling and drainage, as well as providing confining pressure to the cell. The removable base pedestal accommodates various sample diameters. Top caps and base pedestals are available in a choice of black-anodized aluminum or stainless steel in various sizes (see chart below). Other sizes are available. The cell top and base are precision machined from 6061 T6 aluminum, black anodized for a durable finish. A .625" hardened stainless steel piston runs inside a linear bearing to reduce friction. Choice of brass or stainless steel valve fittings is available (stainless steel for use with hazardous materials). When ordering, specify top cap and base pedestal for desired sample size. Order porous stones separately, see page 79. Cell dimensions are: 13.75" H x 8.75" dia. (349.2 x 222.3mm); overall diameter is: 11" (279.4mm).

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

Triaxial Cells — See Table
Shipping wt. See Table

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

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

Triaxial Distribution Panels

HM-4155

HM-4154

HM-4165.3F

HM-4164.3F

Automated Control Panel

ASTM: D2850, D2166, D4767, and D1559; AASHTO: T193, T296, T297, T208; BS 1377: Part 4: 1990, BS 1377: Part 7: 1990, BS 1377: Part 8: 1990

Used in conjunction with the HM-2450A.3F pressure controller, Humboldt automated control panels provide an accurate and easy-to-operate solution for providing the controls necessary for distributing compressed air, water, de-aired water and vacuum within an air/water bladder-type triaxial testing system. The use of these control panels and the HM-2450A.3F pressure controller allows changes in cell and back pressures required for sample saturation to be done automatically without the need for an operator. This feature reduces the need for continual monitoring of the sample saturation process during a triaxial test.

Specifications			
Pressure gauge	psi	BAR	Mpa
Max. input pressure	200	14	1.4
Max. output pressure	150	10	1
Pressure resolution	0.1	0.01	0.001
Display	LCD		
HM-4164 dimensions (L x W x H)	8 x 8 x 37.5" (203 x 203 x 952mm)		
HM-4165 dimensions (L x W x H)	8 x 19.5 x 37.5" (203 x 495 x 952)		

Humboldt auto control panels feature an analog input pressure gauge and controller, an air/water filter for the input pressure and de-aired water tank input, as well as quick-disconnects for quickly connecting bladders, the pressure controller and triaxial cells.

The HM-4154 provides connections for one triaxial cell, while the HM-4155 provides connections for up to three triaxial cells. For each triaxial cell, one bladder is required for generating the cell pressure and a second bladder is required for back pressure.

Automated Panel, 1 Cell — HM-4154
Shipping wt. 100 lb (45.3kg)

Automated Panel, 3 Cell — HM-4155
Shipping wt. 80lb (36.2kg)

Manual Control Panel

ASTM: D2850, D2166, D4767, and D1559; AASHTO: T193, T296, T297, T208; BS 1377: Part 4: 1990, BS 1377: Part 7: 1990, BS 1377: Part 8: 1990

For those operations, which do not require automated control, Humboldt's HM-4164 and HM-4165 manual control panels provide an accurate and easy-to-operate solution for controlling compressed air, water, de-aired water and vacuum within an air/water bladder-type triaxial testing system.

The use of these control panels provides the necessary control for making changes in cell and back pressures required for sample saturation to be done from a central location on the panel. The operator has complete control of system pressure during the triaxial test with three independently-controlled pressure regulators. These control panels have a bias pressure regulator feature, which allows simultaneous control of confining and back pressures, while maintaining a constant differential pressure

Humboldt manual control panels feature an analog input pressure gauge and controller, an air/water filter for the input pressure and de-aired water tank input, a digital pressure readout for each set of cell functions, as well as quick-disconnects for quickly connecting bladders, the pressure controller and triaxial cells.

Specifications			
Pressure gauge	psi	BAR	Mpa
Max. input pressure	200	14	1.4
Max. output pressure	150	10	1
Pressure resolution	0.1	0.01	0.001
HM-4164 dimensions (L x W x H)	8 x 8 x 37.5" (203 x 203 x 952mm)		
HM-4165 dimensions (L x W x H)	8 x 19.5 x 37.5" (203 x 495 x 952)		

The HM-4164 provides connections for one triaxial cell, while the HM-4165 provides connections for up to three triaxial cells. For each triaxial cell, one bladder is required for generating the cell pressure and a second bladder is required for back pressure .

Manual Panel, psi, 1 Cell, 120/220V 50/60Hz — HM-4164.3F
Shipping wt. 100 lb (45.3kg)

Manual Panel, kPa, 1 Cell, 120/220V 50/60Hz — HM-4164M.3F
Shipping wt. 100 lb (45.3kg)

Manual Panel, psi, 3 Cell, 120/220V 50/60Hz — HM-4165.3F
Shipping wt. 76 lb (34.7kg)

Manual Panel kPa, 3 Cell, 120/220V 50/60Hz — HM-4165M.3F
Shipping wt. 100 lb (45.3kg)

HM-4140.3F HM-4150.3F HM-4150A HM-4160.3F HM-4160A

Humboldt FlexPanels

ASTM: D1559, D2850, D2166, D4767, and D5084; AASHTO: T193, T296, T297, T208; BS 1377: Part 4: 1990, BS 1377: Part 6, BS 1377: Part 7: 1990, BS 1377: Part 8: 1990

Humboldt FlexPanels provide an accurate and easy-to-operate solution for controlling compressed air, water, de-aired water and vacuum without the need for air/water bladder interfaces to produce the pressures necessary for triaxial testing. FlexPanels utilize a set of three burettes to control cell, top cap and base pedestal pressures.

This extremely versatile pressure system controls the pressure, water, de-airing tank and vacuum from a single panel. The three burettes allow for the control of the cell pressure and the back pressure for each cell. They can monitor volume change in the sample and can be used to measure the flow of water through the sample for permeability testing. FlexPanels can manually measure volume change or permeability in a triaxial test sample without the use of a volume change apparatus, a distinct benefit when compared to air/water bladder systems. See page 88-89 for more information and specifications for Humboldt's FlexPanels.

Control Panel (psi), 120/220V 50/60Hz — HM-4140.3F
Shipping wt. 35 lb (16kg)

Control Panel (kPa), 120/220V 50/60Hz — HM-4140M.3F
Shipping wt. 50 lb (22.6kg)

Control Panel, 1-Cell (psi), 120/220V 50/60Hz — HM-4150.3F
Shipping wt. 98 lb (44.5kg)

Control Panel, 1-Cell (kPa), 120/220V 50/60Hz — HM-4150M.3F
Shipping wt. 98 lb (44.5kg)

Control Panel, 2-Cell (kPa), 120/220V 50/60Hz — HM-4160.3F
Shipping wt. 175 lb (79.3kg)

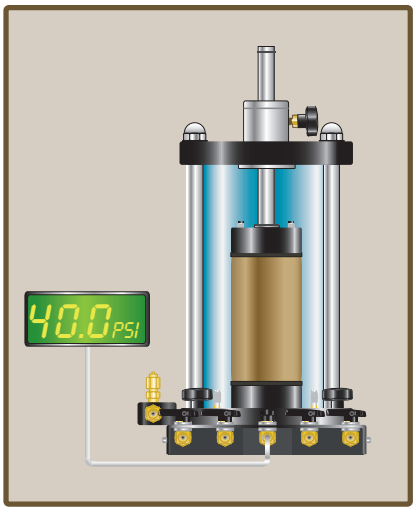
Control Panel, 2-Cell (kPa), 120/220V 50/60Hz — HM-4160M.3F
Shipping wt. 125 lb (56kg)

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

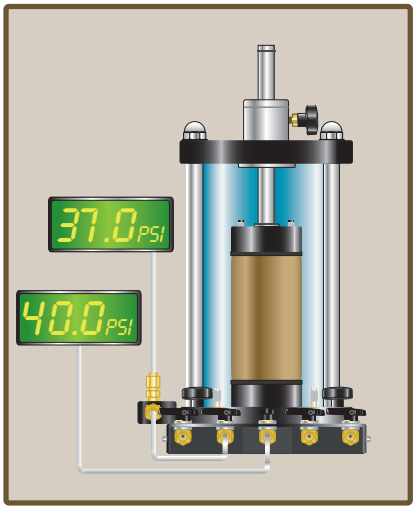
Auxiliary Panel, 2-Cell — HM-4160A
Shipping wt. 275 lb (124.7kg)

	HM-4140.3F	HM-4140M.3F	HM-4150.3F	HM-4150M.3F	HM-4160.3F	HM-4160M.3F	HM-4150A	HM-4160A
Pressure/ Resolution	2-150 psi (0.1 psi)	14-1000 kPa (1 kPa)	2-150 psi (0.1 psi)	14-1000 kPa (1 kPa)	2-150 psi (0.1 psi)	14-1000 kPa (1 kPa)	Not Applicable	
Vacuum	0-14.7 psi or 30 Hg	(0-100kPa) or 30 Hg	0-14.7 psi or 30 Hg	(0-100kPa) or 30 Hg	0-14.7 psi or 30 Hg	(0-100kPa) or 30 Hg		
Inner Burette								
Cell	Not Applicable		50cc x 0.1 cc (ml)					
Top	Not Applicable		10cc x 0.02 cc (ml)					
Base	Not Applicable		10cc x 0.02 cc (ml)					
Outer Burette								
Cell	Not Applicable		400 cc (ml)					
Top	Not Applicable		460 cc (ml)					
Base	Not Applicable		460 cc (ml)					
Voltage	110/220VAC 50/60Hz						Not Applicable	
Power	6 watts							
Operating Temperature	14 to 158°F (-10 to 70°C)							
Dimensions	8 x 8 x 37.5" (203 x 203 x 952mm)		8 x 25.5 x 37.5" (203 x 648 x 952mm)		8 x 43.5 x 37.5" (203 x 1105 x 952mm)		8 x 19.5 x 37.5" (203 x 495 x 952)	8 x 37.5 x 37.5" (203 x 952 x 952)
Shipping Weight	35lb (16kg)		98lb (44.4kg)		175lb (79.3kg)		77lb (34.9kg)	275lb (124.7kg)

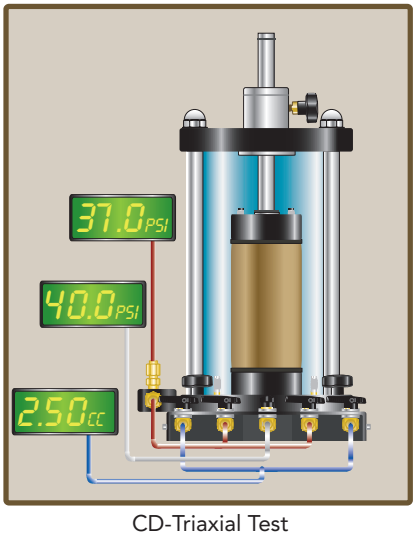
Triaxial Setups



UU-Triaxial Test
Typical Cell Setup



CU-Triaxial Test
Typical Cell Setup



CD-Triaxial Test
Typical Cell Setup

Humboldt Triaxial Testing Systems

Humboldt provides an extensive line of triaxial testing equipment solutions for today's soil labs.

Presented below and on the following pages are three triaxial systems based around our HM-5030 and HM-5020 load frames, our NEXT software with triaxial-specific software modules and three different pressure control solutions.

Automated Pressure Control Triaxial System

Designed for those who want the ultimate in control of their triaxial testing, Humboldt's automated pressure control triaxial system is a computer-controlled system specifically designed for soil testing laboratories conducting UU, CU and CD Triaxial tests, as well as unconfined compression. It is perfect for large, high-volume labs, as well as those who want to utilize technology to increase staff efficiencies and testing accuracy. This system provides complete control of the testing process including data acquisition.

Available in one or three-cell configurations, our automated control panels can handle your testing needs in stride. And, if you want to increase the number of simultaneous tests you can run, Humboldt's NEXT software can easily handle a multitude of tests. All you need to do is add cells and the other appropriate equipment to handle your needs.

Humboldt's automated pressure control triaxial system is built around the HM-5240.3F Stand-alone pressure controller. The HM-5240.3F is a fully-automated pneumatic pressure controller, which is highly accurate up to 150psi (1000kpa) in pressure and 100cc (100ml) in volume. It is designed specifically for geotechnical laboratory triaxial testing (UU, CU and CD) and provides control and monitoring of cell pressure, back pressure, pore water measurement and volume change when used with our Elite Series load frames.

The HM-5240 provides four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configuration or accessed through a LAN-networked computer using Humboldt's NEXT software. The unit is built with durable high-quality components and features the use of two electronic regulators to ensure smooth and reliable operation of pressures, as well as precise results.

In stand-alone mode, this pressure controller provides a 7" (178mm) touch-screen controller. This new waterproof, touch screen provides colorful, at-a-glance monitoring of testing functions without the use of a computer. Operator could see all the data in several formats at the controller while the test is running. Then can be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced test- specific modules. The system can also be configured for use with our triaxial-specific Load frame, the HM-2900. While Humboldt's automated pressure control triaxial system has been designed to work as a complete system, its make-up provides for the ultimate in versatility and expanded possibilities.

See pages 122-123 for a complete component list for the automated pressure control triaxial system

Automated Pressure Control Triaxial System Components

Manual Pressure Control Triaxial System

Humboldt's manual pressure control triaxial system provides a manually-controlled alternative to our automated system. The manual system eliminates the HM-5240.3F pressure controller from the system and replaces its function with a control panel that allows for manual control of the confining and back pressures. The HM-2315 Volume Change Apparatus, which measures the volume change of a soil sample by monitoring the flow of water through the chamber of the unit. The lower assembly contains changeover valves, which when used in conjunction with the upper assembly provides limitless capacity. It is accurate to better than ±0.05 ml and is easily de-aired in seconds

Like the automated system, our manually-controlled system can run UU, CU and CD triaxial tests, as well as unconfined compression. Manual control panels are available in one or three-cell configurations and can be used in multiple configurations. All you need to do is add cells and the other appropriate equipment to handle your needs.

Humboldt's manual pressure control triaxial system is built around our NEXT software and our enhanced test-specific modules, which monitors, controls and reports test data, and, the highly-regarded HM-5030 load frame with its built-in, 4-channel data acquisition controller for stress, strain, pore water pressure and volume change measurement. The system can also be configured for use with our triaxial-specific load frame, the HM-5020. While Humboldt's manual pressure control triaxial system has been designed to work as a complete system, its make-up provides for the ultimate in versatility and expanded possibilities.

See pages 124-125 for a complete component list for the Manual Pressure Control Triaxial System

FlexPanel Pressure Control Triaxial System

Humboldt's FlexPanel pressure control option eliminates the use of the air/water bladder interface concept of pressure control in lieu of its highly-accurate burette system. Humboldt FlexPanels provide an accurate and easy-to-operate solution for controlling compressed air, water, de-aired water and vacuum without the need for air/water bladder interfaces to produce the pressures necessary for triaxial testing. FlexPanels utilize a set of three burettes to control cell, top cap and base pedestal pressures.

This extremely versatile pressure system controls the pressure, water, de-airing tank and vacuum from a single panel. The three burettes allow for the control of the cell pressure and the back pressure for each cell. They can monitor volume change in the sample and can be used to measure the flow of water through the sample for permeability testing.

This is a benefit to using FlexPanels over the air/water bladder system.

Like our other control systems you can run UU, CU and CD triaxial tests, as well as unconfined compression with FlexPanels. They are available in one or three-cell configurations and can be used in multiple configurations. All you need to do is add cells and the other appropriate equipment to handle your needs.

Humboldt's FlexPanel pressure control system also uses our NEXT software and our enhanced test-specific modules, which monitors, controls and reports test data, and, the highly-regarded HM-5030 load frame with its built-in, 4-channel data acquisition controller for stress, strain, pore water pressure and volume change measurement. The system can also be configured for use with our triaxial-specific load frame, the HM-5020

See pages 126-127 for a complete component list for the FlexPanel Pressure Control Triaxial System.

Manual Pressure Control Triaxial System Components

FlexPanel Pressure Control Triaxial System Components

Automatic Pressure Control

Component List for 1 and 3-Cell Triaxial System with Automatic Pressure Control

Automatic Pressure Control System,1-Cell Setup

Components		
Load Frame (choose 1 below)		
50kN (11240 lbf) capacity	HM-5030.3F	1
15kN (3372 lbf) capacity	HM-5020.3F	1
Load/Strain		
Load Cell	HM-2300.020	1
Strain Transducer (LSCT)	HM-2310.20	1
Ball Seat Adapter	HM-200387	1
Strain Transducer Bracket	HM-4178BRT	1
UU Triaxial Software Module	HM-5002SW	1
CU Triaxial Software Module	HM-5003SW	1
CD Triaxial Software Module	HM-5006SW	1
Pressure		
Pressure Distribution Panel	HM-4154	1
Air/Water Bladder	HM-4151A	2
Pressure/Volume Controller	HM-5240.3F	1
De-airing System	HM-4187A.3F	1
Vacuum Pump	H-1763A or H-1763A.4F	1
Silent Air Compressor	HM-4220 or HM.4220.4F	1
Pore Pressure/Volume Change		
Pore Pressure Transducer	HM-4170	1
Strain Transducer, 1'' (25mm)	HM-2310.10	1
LSCT/LVDT Mounting Bracket	HM-2310BR	1
Triaxial Cell (choose 1 below)		
3"/ 75mm dia. capacity	HM-4199B	1
4"/ 100mm dia. capacity	HM-4199B-4	1
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX	1
Installation Kit	HM-4167	1

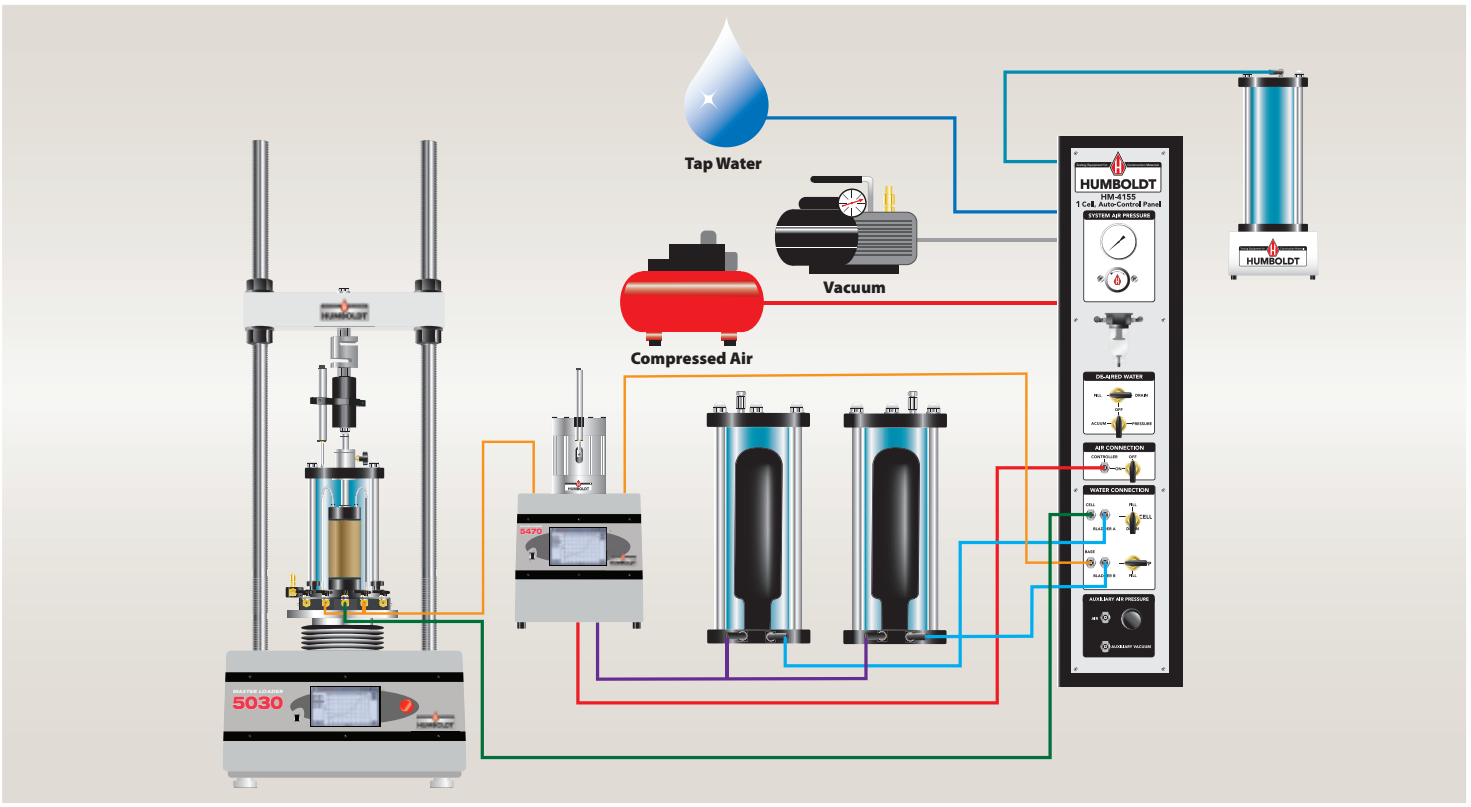
Automatic Pressure Control System, 3-Cell Setup

Components		
Load Frame (choose 1 below)		
50kN(11240 lbf) capacity	HM-5030.3F	1
15kN (3372 lbf) capacity	HM-5020.3F	1
Load/Strain		
Load Cell	HM-2300.020	1
Strain Transducer (LSCT)	HM-2310.20	1
Ball Seat Adapter	HM-200387	1
Strain Transducer Bracket	HM-4178BRT	1
UU Triaxial Software Module	HM-5002SW	1
CU Triaxial Software Module	HM-5003SW	1
CD Triaxial Software Module	HM-5006SW	1
Pressure		
Pressure Distribution Panel	HM-4155	1
Air/Water Bladder	HM-4151A	6
Pressure/Volume Controller	HM-5240.3F	3
De-airing System	HM-4187A.3F	1
Vacuum Pump	H-1763A or H-1763A.4F	1
Silent Air Compressor	HM-4220 or HM.4220.4F	1
Pore Pressure/Volume Change		
Pore Pressure Transducer	HM-4170	3
Strain Transducer, 1'' (25mm)	HM-2310.10	3
LSCT/LVDT Mounting Bracket	HM-2310BR	3
Triaxial Cell (choose 1 below)		
3"/ 75mm dia. capacity	HM-4199B	3
4"/ 100mm dia. capacity	HM-4199B-4	3
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX	3
Installation Kit	HM-4167	1

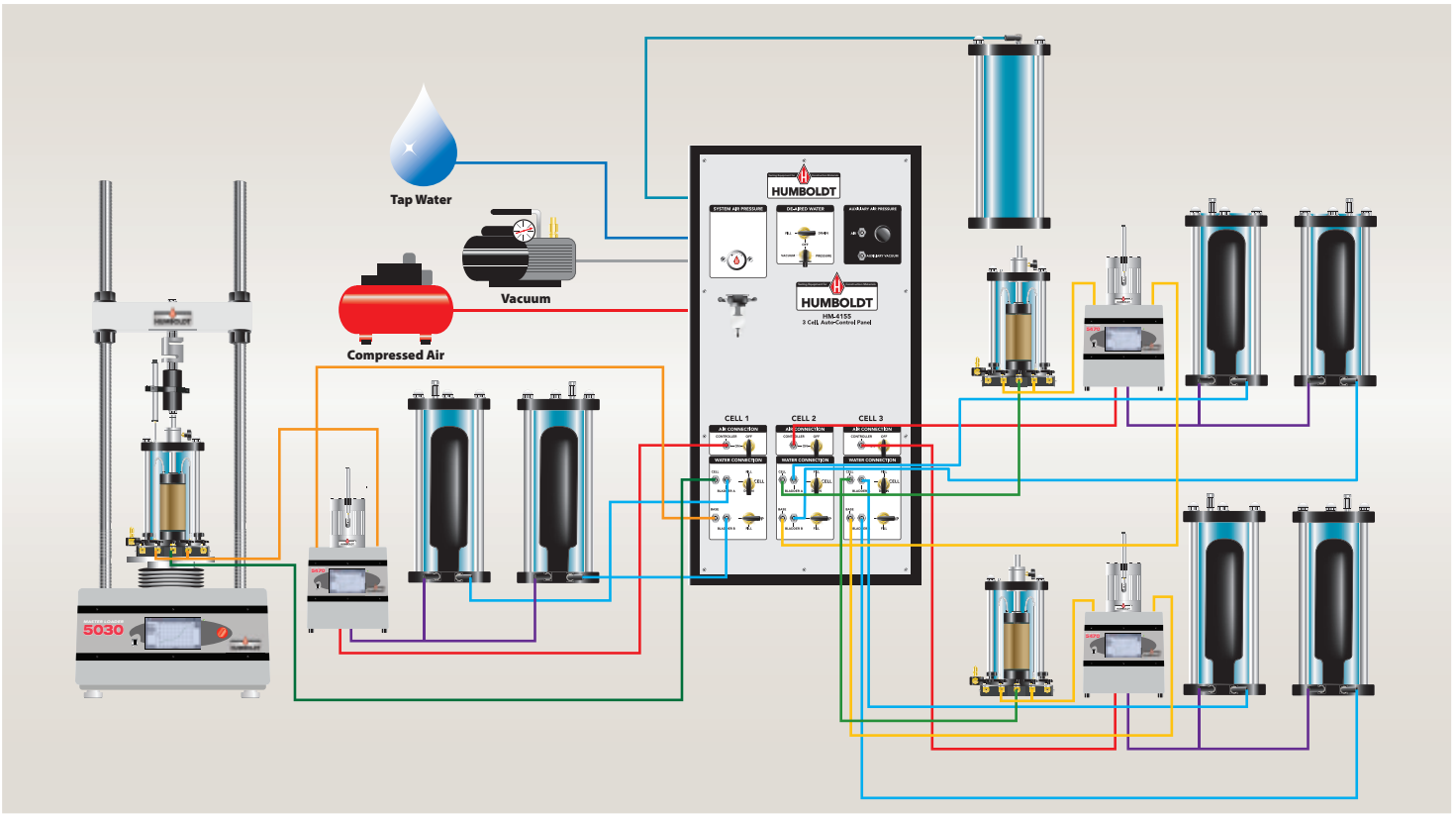
Triaxial Installation Kit
Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. See page 76 for kit contents and other individual set up items.

Standard Triaxial Sample Prep Accessories:
(See page 79 for a complete list and description. Items with .XX require a sample size)

Accessory	Item #	Required	Accessory	Item #	Required
Acrylic Base Disk	HM-4179.XX	2 or 6	2-Part Compaction Mold	HM-3818.XX	1
Membranes	HM-4180.XX	1	2-Part Vacuum Split Mold	HM-3827.XX	1
Membrane Stretcher	HM-4181.XX	1	Split Miter Box	HM-3847.XX	1
O-Rings (12-pack)	HM-4182.XX	1	Filter Paper (100-pack)	HM-4189.XX	1
O-Ring Placing Tool	HM-4183.XX	1	Filter Strips	HM-4189FS	1
Porous Stone	HM-4184.XX	2 or 6	High Vacuum Grease	HM-4198	1
Membrane Tester	HM-4185.XX	1			



Automatic Pressure Control System,1-Cell Setup



Automatic Pressure Control System, 3-Cell Setup

Manual Pressure Control

Component List for 1 and 3-Cell Triaxial System with Manual air/water bladder Pressure Control

Manual Pressure Control System,1-Cell Setup

Components		
Load Frame (choose 1 below)		
50kN (11240 lbf) capacity	HM-5030.3F	1
15kN (3372 lbf) capacity	HM-5020.3F	1
Load/Strain/Pore Pressure		
Load Cell	HM-2300.020	1
Strain Transducer (LSCT)	HM-2310.20	1
Ball Seat Adapter	HM-200387	1
Strain Transducer Bracket	HM-4178BRT	1
UU Triaxial Software Module	HM-5002SW	1
CU Triaxial Software Module	HM-5003SW	1
CD Triaxial Software Module	HM-5006SW	1
Pressure		
Pressure Distribution Panel	HM-4164.3F	1
Air/Water Bladder	HM-4151A	2
De-airing System	HM-4187A.3F	1
Pore Pressure Transducer	HM-4170	1
Silent Air Compressor	HM-4220 or HM.4220.4F	1
Vacuum Pump	H-1763A or H-1763A.4F	1
Volume Change		
Volume Change Apparatus (Required for CU & CD Triaxial)	HM-2315	1
Strain Transducer, 1'' (25mm)	HM-2310.10	1
LSCT/LVDT Mounting Bracket	HM-2310BR	1
Triaxial Cell (choose 1 below)		
3"/ 75mm dia. capacity	HM-4199B	1
4"/ 100mm dia. capacity	HM-4199B-4	1
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX	1
Installation Kit	HM-4167	1

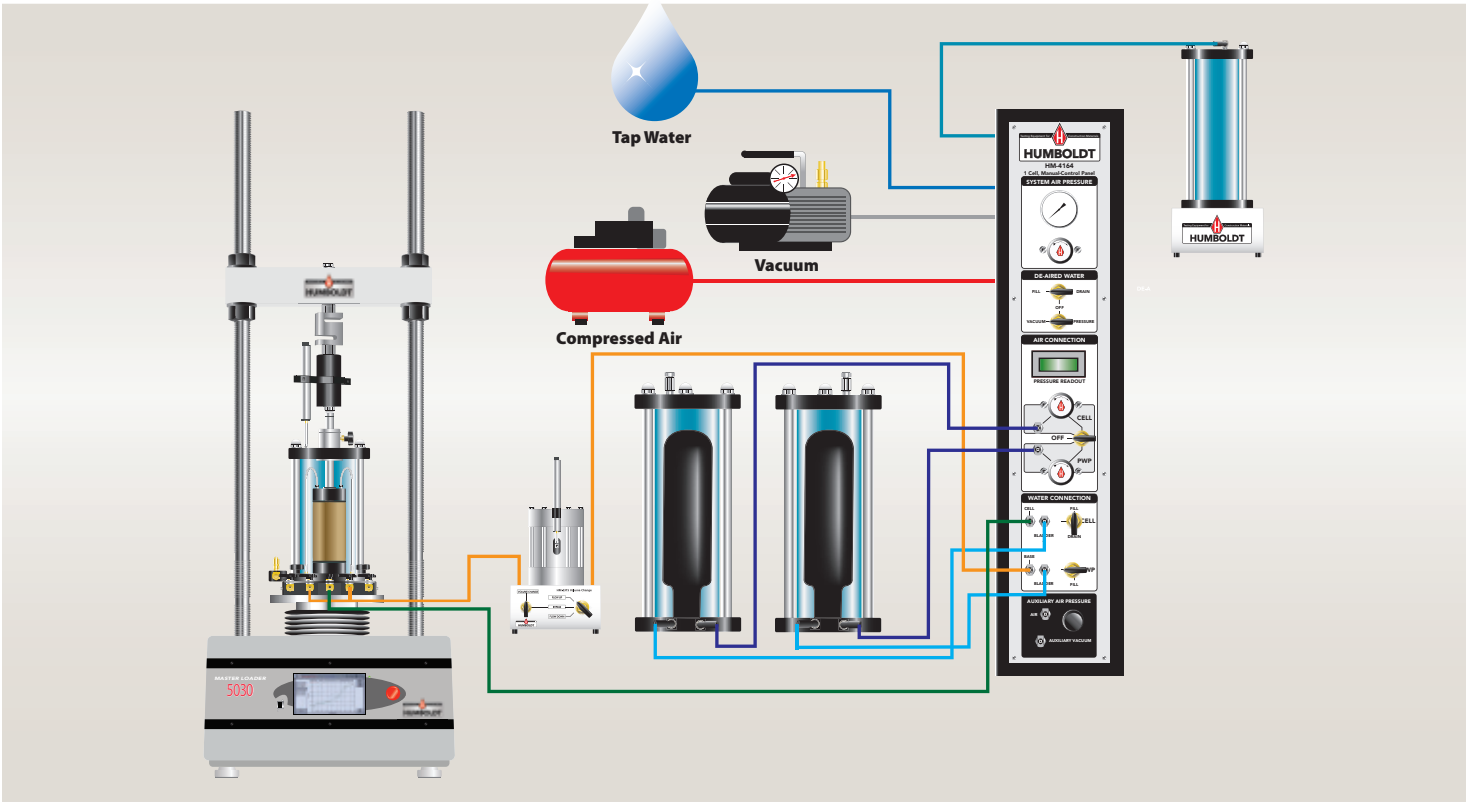
Manual Pressure Control System, 3-Cell Setup

Components		
Load Frame (choose 1 below)		
50kN (11240 lbf) capacity	HM-5030.3F	1
15kN (3372 lbf) capacity	HM-5020.3F	1
Load/Strain/Pore Pressure		
Load Cell	HM-2300.020	1
Strain Transducer (LSCT)	HM-2310.20	1
Ball Seat Adapter	HM-200387	1
Strain Transducer Bracket	HM-4178BRT	1
UU Triaxial Software Module	HM-5002SW	1
CU Triaxial Software Module	HM-5003SW	1
CD Triaxial Software Module	HM-5006SW	1
Humboldt Logger	HM-2325A.3F	1
Pressure		
Pressure Distribution Panel	HM-4165.3F	1
Air/Water Bladder	HM-4151A	6
De-airing System	HM-4187A.3F	1
Pore Pressure Transducer	HM-4170	3
Silent Air Compressor	HM-4220 or HM.4220.4F	1
Vacuum Pump	H-1763A or H-1763A.4F	1
Volume Change		
Volume Change Apparatus (Required for CU & CD Triaxial)	HM-2315	3
Strain Transducer, 1'' (25mm)	HM-2310.10	3
LSCT/LVDT Mounting Bracket	HM-2310BR	3
Triaxial Cell (choose 1 below)		
3"/ 75mm dia. capacity	HM-4199B	3
4"/ 100mm dia. capacity	HM-4199B-4	3
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX	3
Installation Kit	HM-4167	1

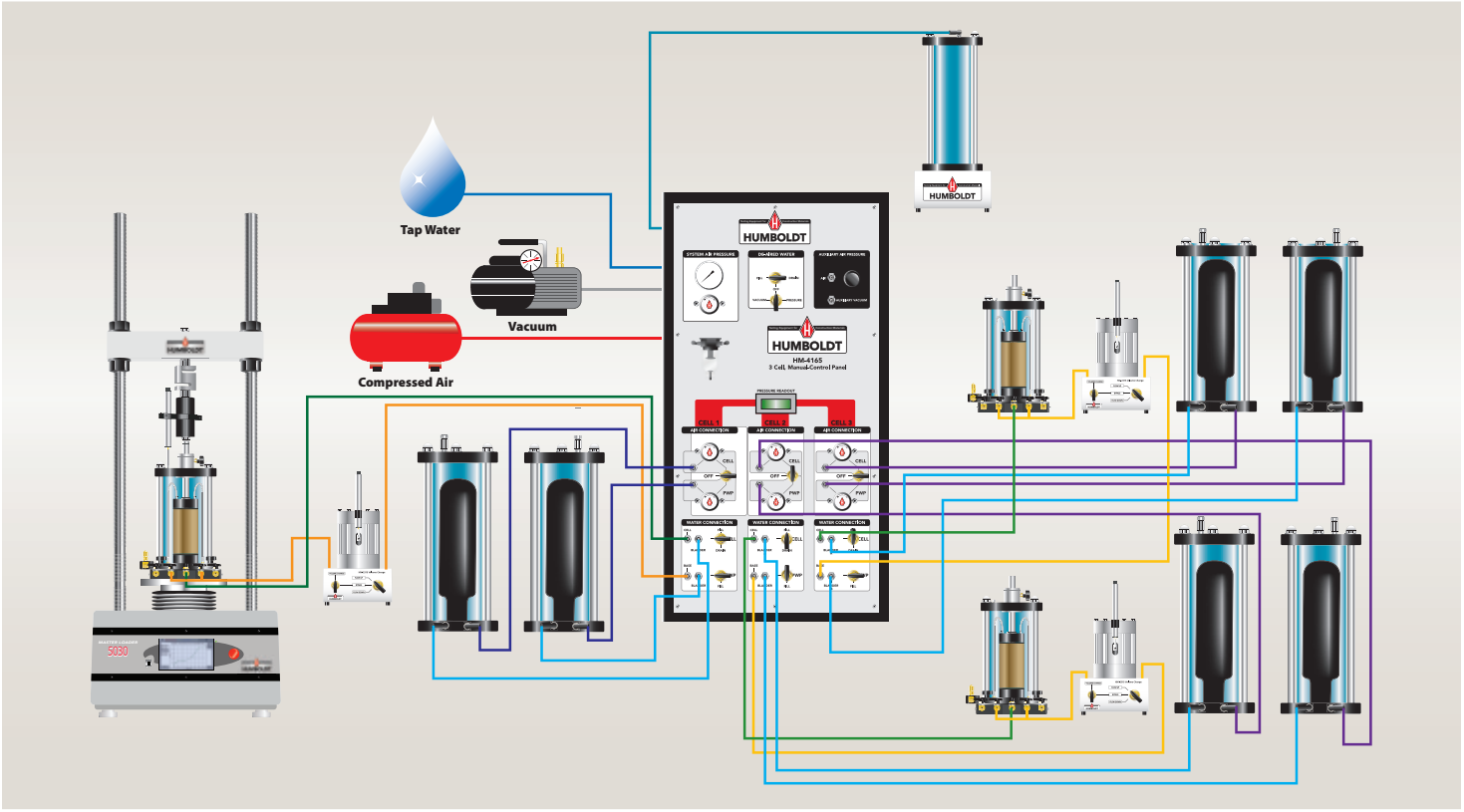
Triaxial Installation Kit
Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. See page 76 for kit contents and other individual set up items.

Standard Triaxial Sample Prep Accessories:
(See page 79 for a complete list and description. Items with .XX require a sample size)

Accessory	Item #	Required	Accessory	Item #	Required
Acrylic Base Disk	HM-4179.XX	2 or 6	2-Part Compaction Mold	HM-3818.XX	1
Membranes	HM-4180.XX	1	2-Part Vacuum Split Mold	HM-3827.XX	1
Membrane Stretcher	HM-4181.XX	1	Split Miter Box	HM-3847.XX	1
O-Rings (12-pack)	HM-4182.XX	1	Filter Paper (100-pack)	HM-4189.XX	1
O-Ring Placing Tool	HM-4183.XX	1	Filter Strips	HM-4189FS	1
Porous Stone	HM-4184.XX	2 or 6	High Vacuum Grease	HM-4198	1
Membrane Tester	HM-4185.XX	1			



Manual Pressure Control System,1-Cell Setup



Manual Pressure Control System, 3-Cell Setup

FlexPanels Pressure Control

Component List for 1 and 3-Cell Triaxial/Permeability System with FlexPanel Pressure Control

FlexPanel Pressure Control System,1-Cell Setup

Components		
Load Frame (choose 1 below)		
50kN (11240 lbf) capacity	HM-5030.3F	1
15kN (3372 lbf) capacity	HM-5020.3F	1
Load/Strain/Pore Pressure		
Load Cell	HM-2300.020	1
Strain Transducer (LSCT)	HM-2310.20	1
Pore Pressure Transducer	HM-4170	1
Ball Seat Adapter	HM-200387	1
Strain Transducer Bracket	HM-4178BRT	1
UU Triaxial Software Module	HM-5002SW	1
CU Triaxial Software Module	HM-5003SW	1
CD Triaxial Software Module	HM-5006SW	1
Pressure		
Pressure Distribution Panel	HM-4150.3F	1
De-airing System	HM-4187A.3F	1
Silent Air Compressor	HM-4220 or HM.4220.4F	1
Vacuum Pump	H-1763A or H-1763A.4F	1
Volume Change		
Volume Change Apparatus (Required for CD Triaxial)	HM-2315	1
Strain Transducer, 1'' (25mm)	HM-2310.10	1
LSCT/LVDT Mounting Bracket	HM-2310BR	1
Triaxial Cell (choose 1 below)		
3"/ 75mm dia. capacity	HM-4199B	1
4"/ 100mm dia. capacity	HM-4199B-4	1
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX	1
Installation Kit	HM-4167	1

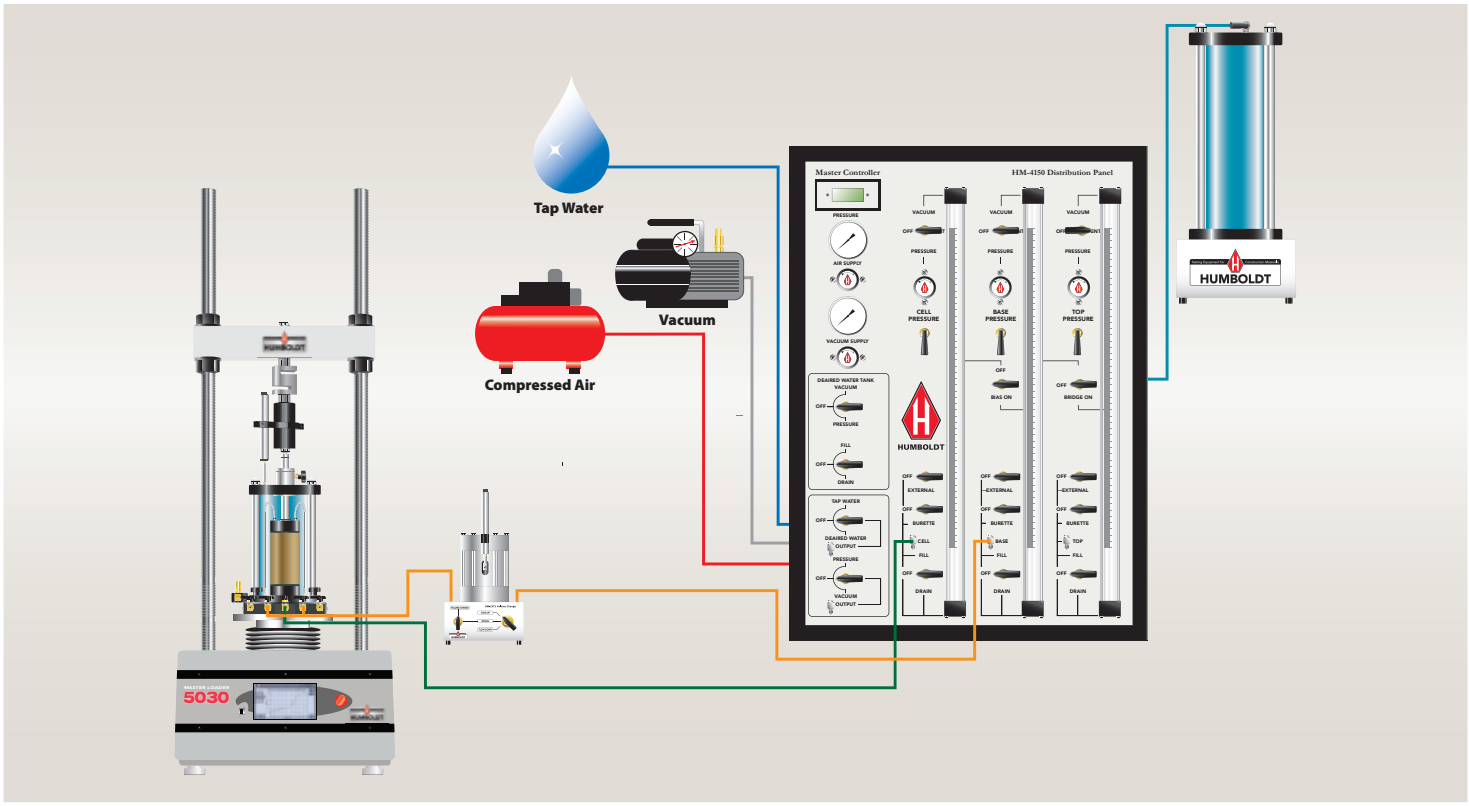
FlexPanel Pressure Control System, 3-Cell Setup

Components		
Load Frame (choose 1 below)		
50kN (11240 lbf) capacity	HM-5030.3F	1
15kN (3372 lbf) capacity	HM-5020.3F	1
Load/Strain/Pore Pressure		
Load Cell	HM-2300.020	1
Strain Transducer (LSCT)	HM-2310.20	1
Pore Pressure Transducer	HM-4170	3
Ball Seat Adapter	HM-200387	1
Strain Transducer Bracket	HM-4178BRT	1
UU Triaxial Software Module	HM-5002SW	1
CU Triaxial Software Module	HM-5003SW	1
CD Triaxial Software Module	HM-5006SW	1
Humboldt Logger	HM-2325A.3F	1
Pressure		
Pressure Distribution Panel	HM-4150.3F	1
Pressure Distribution Panel	HM-4160A	1
De-airing System	HM-4187A.3F	1
Silent Air Compressor	HM-4220 or HM.4220.4F	1
Vacuum Pump	H-1763A or H-1763A.4F	1
Volume Change		
Volume Change Apparatus (Required for CD Triaxial)	HM-2315	3
Strain Transducer, 1'' (25mm)	HM-2310.10	3
LSCT/LVDT Mounting Bracket	HM-2310BR	3
Triaxial Cell (choose 1 below)		
3"/ 75mm dia. capacity	HM-4199B	3
4"/ 100mm dia. capacity	HM-4199B-4	3
Top Cap/ Base Pedestal Set (specify specimen size)	HM-4199.XX	3
Installation Kit	HM-4167	1

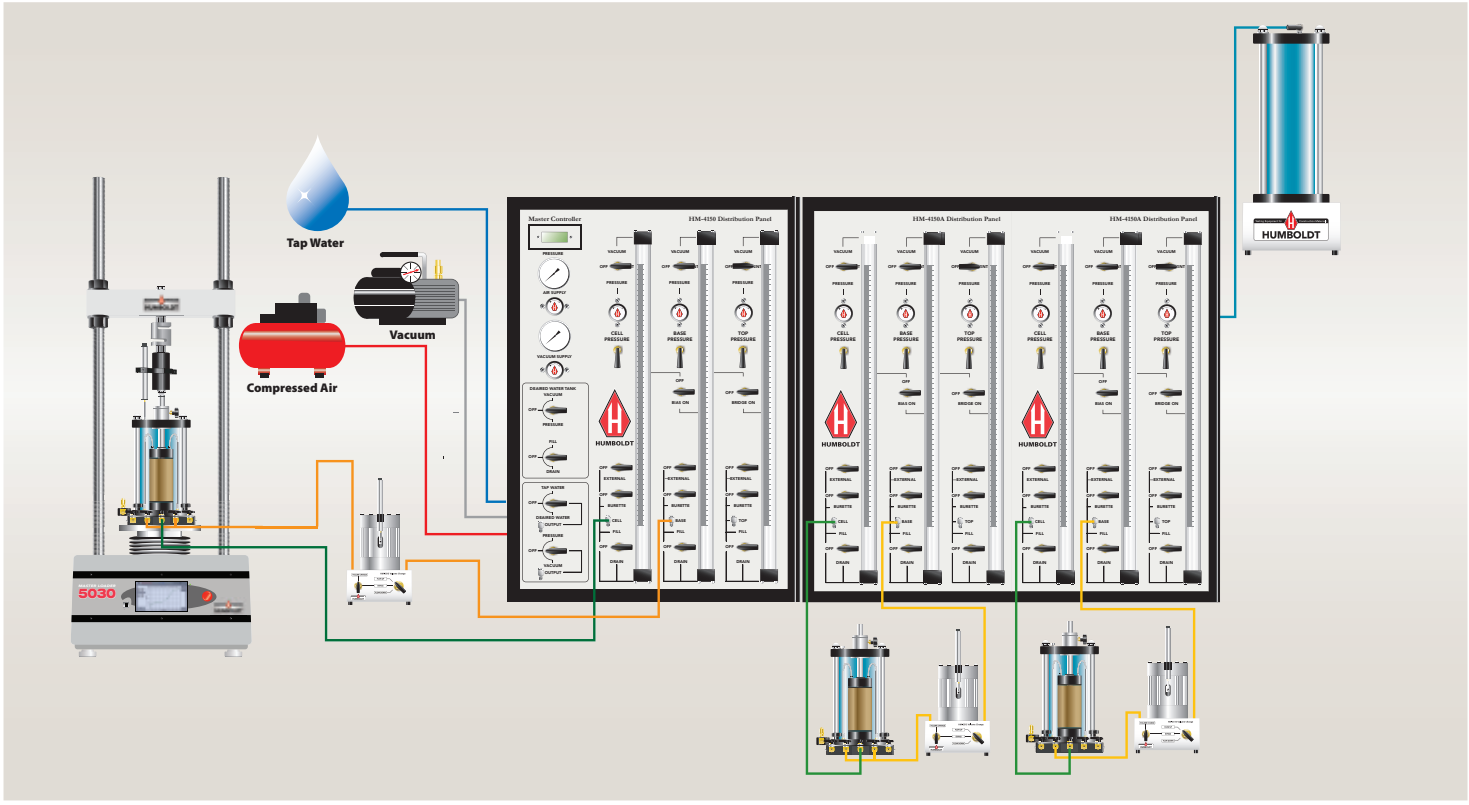
Triaxial Installation Kit
Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. See page 76 for kit contents and other individual set up items.

Standard Triaxial Sample Prep Accessories:
(See page 79 for a complete list and description. Items with .XX require a sample size)

Accessory	Item #	Required	Accessory	Item #	Required
Acrylic Base Disk	HM-4179.XX	2 or 6	2-Part Compaction Mold	HM-3818.XX	1
Membranes	HM-4180.XX	1	2-Part Vacuum Split Mold	HM-3827.XX	1
Membrane Stretcher	HM-4181.XX	1	Split Miter Box	HM-3847.XX	1
O-Rings (12-pack)	HM-4182.XX	1	Filter Paper (100-pack)	HM-4189.XX	1
O-Ring Placing Tool	HM-4183.XX	1	Filter Strips	HM-4189FS	1
Porous Stone	HM-4184.XX	2 or 6	High Vacuum Grease	HM-4198	1
Membrane Tester	HM-4185.XX	1			



FlexPanel Pressure Control System,1-Cell Setup



FlexPanel Pressure Control System, 3-Cell Setup

HM-5240.3F

HM-5250.3F

HM-2315
Shown with HM-2310 Transducer and HM-2310BR Bracket

Pneumatic Pressure Controller, 150psi (1000kpa)

The HM-5240.3F is a fully-automated pneumatic pressure controller, which is highly accurate up to 150psi (1000kpa) in pressure and 100cc (100ml) in volume. It is designed specifically for geotechnical laboratory triaxial testing (UU, CU and CD) and provides control and monitoring of cell pressure, back pressure, pore water measurement and volume change when used with our Elite Series load frames.

The HM-5240 provides four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configuration or accessed through a LAN-networked computer using Humboldt's NEXTsoftware. The unit is built with durable high-quality components and features the use of two electronic regulators to ensure smooth and reliable operation of pressures, as well as precise results.

In stand-alone mode, this pressure controller provides a 7" (178mm) touch-screen controller. This new waterproof, touch screen provides colorful, at-a-glance monitoring of testing functions without the use of a computer. Operator could see all the data in several formats at the controller while the test is running. Then can be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced test- specific modules.

Specifications	
Maximum Pressure	150psi (1000kpa)
Volume Capacity	100cc (100ml)
Voltage	110-220V 50/60Hz - 5.0 amps
Dimension (L x W x H)	13" x 11.5" x 22" (330 x 292 x 559mm)

Pressure Controller, HM-5240.3F

Shipping wt. 40 lb (18.1kg)

Hydraulic Pressure Controller, 500psi (3500kpa)

The HM-5250.3F is a fully-automated hydraulic pressure controller, which is highly accurate up to 500psi (3500kpa) in pressure and 200cc (200ml) in volume. It is designed specifically for geotechnical laboratory triaxial testing (UU, CU and CD) and provides control and monitoring of cell pressure, back pressure, pore water measurement and volume change when used with our Elite Series load frames.

The HM-5250 provides four (4) integral and independent data acquisition channels, which can be utilized in stand-alone configuration or accessed through a LAN-networked computer using Humboldt's NEXT software. The unit is built with durable, high-quality components and features the use of stepper motors and precision gears to ensure smooth and reliable operation of pressures, as well as precise results.

In stand-alone mode, this pressure controller provides a 7" (178mm) touch-screen controller. This new waterproof, touch screen provides colorful, at-a-glance monitoring of testing functions without the use of a computer. Operator could see all the data in several formats at the controller while the test is running. Then can be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced test-specific modules.

Specifications	
Maximum Pressure	500psi (3500kpa)
Volume Capacity	200cc (200ml)
Voltage	110-220V 50/60Hz - 8.0 amps
Dimension (L x W x H)	13" x 11.5" x 22" (330 x 292 x 559mm)

Pressure Controller, HM-5250.3F

Shipping wt. 75 lb (34kg)

Volume Change Apparatus, Automatic

The apparatus is used for measuring the volume change of a soil sample by monitoring the flow of water through the chamber of the unit. The lower assembly contains changeover valves, which when used in conjunction with the upper assembly provides limitless capacity. The unit can be used with a linear strain transducer, a digital indicator, or as part of an automated system. It is accurate to better than ±0.05 ml and is easily de-aired in seconds. Includes connectors, valves, and tubing. Order strain transducer or digital indicator separately.

Volume Change Apparatus HM-2315

Shipping wt. 22 lb (9.9kg)


HM-4151A


HM-4187H


HM-2310.10


HM-2310BR

HM-4187A.3F


HM-4170

HM-4221


HM-4222


HM-4223

Air/Water Bladder Cylinder
The Humboldt air/water bladder cylinder is used to deliver pressurized de-aired water to the triaxial cell. The bladder acts as an reservoir and interface between the compressed air, used as the pressure source, and the de-aired water, which is used as the pressurizing medium for the sample. The use of the bladder eliminates the reintroduction of air into the de-aired water, while providing a high-degree of accuracy. The cylinder will operate continuously to a maximum pressure of 150 psi (1000 kPa). It is constructed of anodized aluminum top and bottom plates, acrylic cylinder and a fluoroelastomer bladder.

Bladder Cylinder — HM-4151A
Shipping wt. 11 lb (4.9kg)

Bladder
Replacement bladder for HM-4151A Air/Water Bladder Cylinder.

Bladder — HM-4151.1
Shipping wt. 0.5 lbs (0.22kg)

De-Airing Water System
The HM-4187A.3F produces 8-liter batches of de-aired water without the use of heat. Combined mechanical agitation and vacuum evacuation removes gasses at much higher rate than conventional heat-boiling methods. Will de-air water to less than 0.5 pph dissolved oxygen in 4 minutes. Requires a vacuum pump, (see page 130) 1/55hp motor 110V, 60Hz. 7.5 x 7.5 x 20" (190 x 190 x 508mm).

De-Airing System, 120/220V 50/60Hz — HM-4187A.3F
Shipping wt. 24.5 lb (11.3kg)

De-Airing Water Tank
For use with Triaxial/Permeability Distribution Panels. Requires a Vacuum Pump, (see page 130).

De-Airing Water Tank — HM-4187H
Shipping wt. 17 lb (7.7kg)

Strain Transducer
Strain transducer, 1" (25mm) for use with HM-2315 automatic volume change apparatus

Strain Transducer — HM-2310.10
Shipping wt. 1 lb (0.45kg)

Transducer Bracket
Bracket to attach strain transducer to HM-2315 automatic volume change apparatus

Transducer Bracket — HM-2310BR
Shipping wt. 0.1 lb (0.04kg)

Pore Pressure Transducer
Highly accurate, 200 psi (1400 kPa) pore pressure transducer. Designed for geotechnical lab applications with outstanding overload protection and protected from corrosive water. Requires input of 10 V DC, with an output of 100 mV. Supplied with 2 meter cable and 5-pin DIN plug.

Pore Pressure Transducer — HM-4170
Shipping wt. 0.8 lb (0.36kg)

Refrigeration Dryer
Compressed air quality is often overlooked in many labs. Compressed air contains condensate which, when cooled, will turn into water, causing extensive damage to both the compressed air network and testing equipment. Refrigeration dryers actively remove this condensate to achieve near perfectly dry compressed air. The benefits are notable: less system downtime, reduced costs and maintenance, and improved test equipment life. This refrigeration dryer, thanks to its PlusPack heat exchanger and the most compact dimensions on the market, will prove a major asset in your lab. Dryer uses a 1/2" NPT-F pipe size and nominal flow is: 10 SCFM, 17 Nm3/hr and 0.3 Nm3/min. based on an ambient and inlet temperature of 100°F (38°C) and a working pressure of 100 psig (7 bar)

Refrigeration Dryer, 115V 60Hz 1ph — HM-4221
Shipping wt. 20 lb (9.1kg)

Desiccant Dryer
Ideal for drying small volumes of air at the point of use. Convenient in-line mounting saves space. ISO Class 2 dryer. Max. operating pressure is 150 psig. and max operating temperature is 125°F. Total capacity is 4400 ft^3, Female NPT inlet/outlet size is 0.25 NPTF, bowl size is 1.75 lbs, Height 11 Inches, Width 4.625", Includes one charge of desiccant

Refrigeration Dryer, 115V 60Hz 1ph — HM-4222
Shipping wt. 5 lb (2.3kg)

Filter/Regulator
One-piece, Filter/Regulator, 0-125 psi (0 - 8.6 bar) with standard filtration of 5 micron. Height is 9.77 and width is 2.36. Bowl material is polycarbonate and includes sight glass and pressure gauge.

Filter/Regulator — HM-4223
Shipping wt. 1.48lb (0.67kg)

Triaxial Setup Accessories

HM-4220


HM-4167


HM-4168


H-1763A


HM-4196.25


HM-4196.12


HM-003175


HM-4150.45


HM-4150.22AS


HM-4197.25


HM-4197.12


HM-4150.78


HM-003176


HM-4150.44


HM-4150.72

Compressor

When operating under full load this exceptionally quiet compressor offers a tremendously low noise level of 40 db/A. Each compressor is built with quality in mind, and comes equipped with powder-coated air tank, pressure switch, 1-micron air filter, regulator, and pressure gauges for completely automatic and trouble free operation.

Specifications	
Output	4.2 CFM120 L.Min
Horse Power	1.0Hp
Tank Size	13 Gal50 Lt.
Noise Level	42 db/A
Max Pressure	120 PSI (8 Bar)
Operating Pressure	90-120 PSI6-8 Bar

Compressor, 120V 50/60Hz — HM-4220
Compressor, 220V 50/60Hz — HM-4220.4F
Shipping wt. 147 lbs (66kg)

High-Vacuum Pump

Direct-drive two-stage rotary sliding vane high vacuum pump features gas ballast and trap to reduce risk of oil being sucked into the system. Produces free air displacement 85L per minute (3 cu. ft. per minute) and maximum vacuum 29-30". Operating temperature is 30 to 170°F (-1.11 to 76.6°C). Has 0.25" OD intake ports for 0.25" ID tubing. Dimensions: 11.25" x 15.5" x 6.5" (28.6 x 39.4 x 16.5cm).

High-Vacuum Pump, 120V 60Hz — H-1763A
High-Vacuum Pump 230V 50/60Hz — H-1763A.4F
Shipping wt. 31 lbs (14kg)

Triaxial Installation Kit

Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. Kit includes items in the table below. All items can be purchased individually as well.

Triaxial Installation Kit — HM-4167
Shipping wt. 4.5 lbs (2.04kg)

Triaxial Kit Components	
.125" Brass Ferrules (10)	HM-4197.12
.25" Brass Ferrules (10)	HM-4197.25
.125" OD Tubing, 10ft.	HM-4196.12
.25" OD Tubing, 100ft.	HM-4196.25
.375" to .25" Reducer Bushing (3)	HM-4150.77
Cutter, Flexible Tubing (1)	HM-000058
Thread Tape, PTFE (1)	HM-000059
Hex wrench, 3/16" (1)	HM-000060
Hex wrench, 7/64" (1)	HM-000061
Hex wrench, 2.5mm (1)	HM-000062
Wrench, 7/16 & 9/16" (1)	HM-000063
Wrench, Adjustable, 6" (1)	HM-000064
Union T Fitting, .25" (5)	HM-4150.45
Quick Valve Coupling, .25" (2)	HM-4150.72
Regulator Elbow, .25" (3)	HM-4150.44
.25" to .125" Reducer Coupling (3)	HM-4150.78
Tube Fitting T, 6mm OD (5)	HM-003175
Push-to-Connect Tube Fitting Coupler, .25" OD (4)	HM-003176
Plug, .25" Nylon (5)	HM-003193
O-ring (Upper Cap), .125" (10)	HM-4150.006
O-ring for Quick-Connect (10)	HM-4196.CXO

Shear & Consolidation Installation Kit

Kit designed to provide fittings, connectors, tubing and tools to complete a triaxial set up installation. Kit includes items in the table below. All items can be purchased individually as well.

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

Shear & Consolidation Kit Components	
.25" OD Tubing, 100ft.	HM-4196.25
.375" to .25" Reducer Bushing (3)	HM-4150.77
Cutter, Flexible Tubing (1)	HM-000058
Thread Tape, PTFE (1)	HM-000059
Wrench, Adjustable, 6" (1)	HM-000064
Union T Fitting, .25" (5)	HM-4150.45
Quick Valve Coupling, .25" (2)	HM-4150.72
Regulator Elbow, .25" (3)	HM-4150.44
Tube Fitting T, 6mm OD (5)	HM-003175
Push-to-Connect Tube Fitting Coupler, .25" OD (4)	HM-003176

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

HM-3818.28


HM-4173


HM-3130


HM-4198


HM-4189FS

HM-4174
HM-4174M

HM-3130.20

HM-3175

Compaction Mold, Two-Part

Two-part aluminum molds with easy-close band clamp closure. Molds include base plate and pedestal, which provides a stable platform for mold during production. Ratio of sample height to diameter is 2:1

Sample Size	Mold with Base Plate
1.4"	HM-3818.14
1.5"	HM-3818.15
1.875"	HM-3818.18
2.0"	HM-3818.20
2.36"	HM-3818.23
2.5"	HM-3818.25
2.8"	HM-3818.28
4.0"	HM-3818.40
6.0"	HM-3818.60
35mm	HM-3818.35
38mm	HM-3818.38
50mm	HM-3818.50
70mm	HM-3818.70
100mm	HM-3818.100
150mm	HM-3818.150

Compaction Mold, Two-Part — See Table
Shipping wt. 15 lbs (6.8kg)

Soil Sample Trimmer

Sample trimmer for cutting samples to precise diameters. The HM-3130 handles samples up to 3" and HM-3140 handles up to 4" samples by employing easily interchangeable top platens. Stainless steel pins in pedestal & top platen hold sample in position. Top platen bearing assembly is lowered & locked and sample trimmed with wire saw, order top platens and saw separately.

Soil Sample Trimmer, 1" to 3" — HM-3130
Soil Sample Trimmer, 1" to 4" — HM-3140
Shipping wt. 7 lb (3.1kg)

Top Platens for Soil Trimmer

Individual, sized, top platens for the soil sample trimmer. Platens are interchangeable.

Size	Model	Size	Model
1.0"	HM-3130.10	4.0"	HM-3130.40
1.4"	HM-3130.14	35mm	HM-3130.35
1.875"	HM-3130.18	38mm	HM-3130.38
2.0"	HM-3130.20	50mm	HM-3130.50
2.5"	HM-3130.25	70mm	HM-3130.70
2.8"	HM-3130.28	100mm	HM-3130.100
3.0"	HM-3130.30		

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

Length Comparator

ASTM D2166, D2850, D4767, BS 1377:8

Length comparator designed to quickly and accurately measure the height of soil samples to within ±0.1% of the total height. Includes a digital indicator accurate to within 0.0001 inches (0.002mm) with 0 to 1" (0 to 25mm) total range. The comparator is comprised of an upright support 14" (356mm) tall attached to a 6" x 6" x 2" (150 x 150 x 50mm) granite base and includes a 6" (152mm) reference bar. Other reference bars such as 4.0", 3.0" and 2.0" for other sample sizes are available. Reference bar includes Calibration Report traceable to the National Institute of Standards and Technology.

Length Comparator — HM-4173
Shipping wt. 20 lb (9.07kg)

Wire Saw

Sample trimming saw with replaceable wire blade.

Wire Saw — HM-3175
Shipping wt. 1 lbs (0.45kg)

Wire Saw Blade

Replacement wire for HM-3175 saw.

Wire Saw Blade — HM-3175.1
Shipping wt. 0.1 lb (0.04kg)

High-Vacuum Grease

Effective means of sealing latex membranes to sides of the top cap.

High-Vacuum Grease — HM-4198
Shipping wt. 0.8 lb (0.36kg)

Filter Paper Strips

Wrapped around sample to accelerate saturation in triaxial testing, 5 x 150mm, Grade 55, 100/pkg.

Filter Paper Strips — HM-4189FS
Shipping wt. 0.5 lb (0.22kg)

Precision Diameter Tape

ASTM D2166, D2850, D4767, BS 1377:8

Diameter tapes provide a fast, reliable method for measuring the diameter of concrete, soil and asphalt cores and cylinders. One reading provides round and out-of-round diameters within an accuracy of .001" (.03mm) by means of special graduations and vernier scale. All tapes are made from a stainless alloy and are precision engraved to ensure accuracy. Inch-scale tape has a diameter range of 0.75 to 7" and the metric-scale tape has a diameter of 28 to 200mm. Includes certificate of calibration. Tapes are calibrated and include a NIST-traceable certification.

Precision Diameter Tape, 0.75 to 7" — HM-4174
Precision Diameter Tape, 28 to 200mm — HM-4174M
Shipping wt. 0.8 lb (0.36kg)

Triaxial Sample Prep

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

Made from non-porous latex rubber. Length varies according to sample diameter. All have sufficient length to enclose full length of sample, both top & base of pedestal, and disc—plus enough surplus to allow doubling over the O-rings. 12/pkg. Membranes are 0.012" or 0.025"in thickness.

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

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

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

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

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

Positions rings to seal membrane with minimum disturbance to specimen.

Porous Stones	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-4184.35	HM-4184.38	HM-4184.50	HM-4184.70	HM-4184.100	HM-4184.150	HM-4184.14	HM-4184.15	HM-4184.20	HM-4184.28	HM-4184.40	HM-4184.60

Used for permeability and triaxial testing to allow even distribution of water through sample. Two stones required per cell, each 1/4" thick (6mm).

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

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

2-Part Split Miter Box	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-3847.35	HM-3847.38	HM-3847.50	HM-3847.70	HM-3847.100	HM-3847.150	HM-3847.14	HM-3847.15	HM-3847.20	HM-3847.28	HM-3847.40	HM-3847.60

For use with undisturbed samples and for sample trimming of cohesive soils. Made from non-ferrous metal.

2-Part Vacuum Split Former	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-3827.35	HM-3827.38	HM-3827.50	HM-3827.70	HM-3827.100	—	HM-3827.14	HM-3827.15	HM-3827.20	HM-3827.28	HM-3827.40	HM-3827.60

For use with non-cohesive soils and disturbed samples. Made from non-ferrous metal. Larger sizes require use of supporting jacks.

Sample Trimmer with Knife	35mm	38mm	50mm	70mm	100mm	150mm	1.4"	1.5"	2.0"	2.8"	4.0"	6.0"
	HM-4186.14	HM-4186.15	HM-4186.20	HM-4186.28	HM-4186.40	HM-3847.60	HM-4186.14	HM-4186.15	HM-4186.20	HM-4186.28	HM-4186.40	HM-3847.60

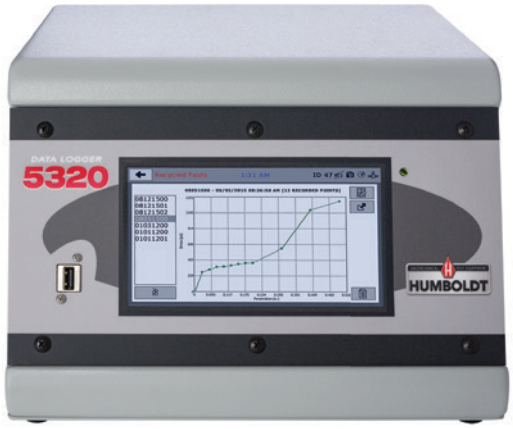
Used to trim sample ends or cut sample to a specific length.

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

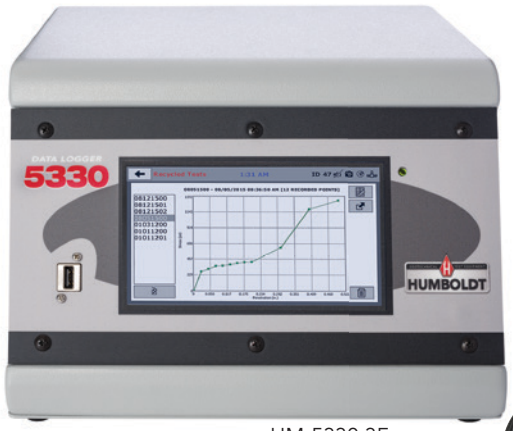
Used to prevent soil from penetrating into porous stones or into a panel. 100/pkg.

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

Acrylic disk used in UU triaxial tests.



HM-5320.3F



HM-5330.3F

Specifications	
Display	7" (178mm) VGA (480 x 800) Resistive-touch screen
Real-time test data	Graphic and tabulation
Processor	Dual 32-bit ARM
RAM	64MB
Memory, non-volatile	4GB
Analog to digital converter	24 bit
Data acquisition	4 Channels
Logging speed	up to 50 readings per second
Multi-test storage	1000
Points per test	3000
USB port (front)	use to export data and import/export calibration data, also use to provide external power for optional WIFI adapter
USB port (back)	provides external power at the back of the machine
Ethernet connection	for network connectivity
Emergency stop	Large button
24-bit differential analog to digital converter (21 bits @1000 samples/sec.	4
Ambient temperature sensor:	1
Limit switches	4
Firmware Update	Ethernet or flash drive

Humboldt Elite Series Data Loggers

Humboldt's Elite Series Data Loggers are specifically designed for use within construction materials testing labs. You can use Humboldt Data Loggers to cost-effectively update your older, non-computerized load frames, direct shear and consolidation machines with computerized data acquisition—increasing lab output, freeing-up technicians and providing more accurate test results.

Humboldt's modular-design, data acquisition concept is designed to give you the most flexible and cost-effective method of data logging for your lab. Rather than having to buy into a large data logging system and then growing into it, Humboldt Data Loggers give you the flexibility and low cost outlay of being able to buy loggers on an "as you grow" basis, increasing your data logging capability as your expansion demands.

Humboldt Data Loggers can be used with a wide variety of transducers, load cells and digital indicators; and both come with Humboldt's, highly-regarded, NEXT software. This software provides robust data acquisition, calibration and report generation for those wanting to use a computer to monitor tests and collect test data.

In stand-alone mode, these data loggers provide a 7" (178mm) touch-screen controller, which provides real-time, visual views of your data in both tabular and graphic formats. These new waterproof, touch screens provide colorful, at-a-glance monitoring of testing functions without the use of a computer. Operators can see all the data in several formats at the machine while the test is running. Data can then be viewed simultaneously or downloaded later to a computer in the lab, in the next room or at a different location, while also providing report generation capabilities from within Humboldt's NEXT software or our enhanced test-specific modules.

When operated from a networked computer the NEXT software provides robust machine and test control, and report generation. It also allows the ability to control and monitor multiple machines from a single computer.

Humboldt Elite Series Data Logger, Analog

Provides four individual, 24-bit analog to digital converters with an instrumentation excitation supply of 10 VDC. The analog Logger is ideal for use with instruments, such as pressure transducers, load cells, and strain transducers. It provides data storage for 1000 readings per channel.

Humboldt Elite Series Data Logger, Analog HM-5320.3F
Shipping wt. 5lb (2.2kg)

Humboldt Elite Series Data Logger, Digital

Provides four individual, Digital Indicator inputs with an instrumentation excitation supply of 5 VDC. The digital Logger is ideal for use with digital indicators. It provides data storage for 1000 readings per channel.

Humboldt Elite Series Data Logger, Digital HM-5330.3F
Shipping wt. 6 lb (2.7kg)

Digital Indicator Cable, 6ft.

For use with HM-4469 & HM-4470 Series digital gauges when used with Elite Series Machines and Digital Data Logger.

Digital Indicator Cable, 6 ft. HM-4470C
Shipping wt. 6 lb (2.7kg)


HM-2300.020

HM-2300.100


HM-2300.020S


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


HM-2003E


H-4178.2

S-type Load Cells

Load cells are bi-directional for compression loads. Constructed from stainless steel. Load cells can be used with various instrumentation to measure loads. Includes: 6 ft. cable with 5-pin DIN plug and calibration certificate.

Performance Specifications	
Excitation voltage:	10 VDC, max.15 VDC
Rated output:	3.0 mv/V minimum
Non-linearity:	0.03% full scale Output
Hysteresis:	0.02% FSO
Non-repeatability:	0.01% FSO
Creep (30 minutes):	0.03% FSO
Zero balance:	±1.0% FSO
Bridge resistance:	
Input:	350 ohms, nominal
Output:	350 ohms, ±3.5 ohms
Overload:	
Safe static:	150% of capacity
Ultimate:	175% of capacity
Temperature:	
Compensated range:	0-150°F
Effect on output:	0.0006% FSO/°F
Effect on zero:	0.0008% FSO/°F
Finish:	Nickel-plated or stainless steel
Seal:	Waterproof

Load Cell, 500 lbf (2.5 kN)	HM-2300.005
Load Cell, 1000 lbf (5 kN)	HM-2300.010
Load Cell, 2000 lbf (10 kN)	HM-2300.020
Load Cell, 5000 lbf (25 kN)	HM-2300.050
Load Cell, 10000 lbf (50 kN)	HM-2300.100

Shipping wt. from 1 lb (0.45kg) to 3.5 lbs (1.6kg)

Submersible Load Cells

For those concerned with reducing the effects of hysteresis on testing results, we offer a submersible load cell, which is designed to work within the triaxial cell. Positioning the load cell within the triaxial cell eliminates the possible drag effect introduced by using a plunger between the sample and an externally-mounted load

Performance Specifications	
Overload Capacity:	200%
Excitation Voltage:	10 VDC, Maximum
Non-linearity:	0 ± 0.05% Full Scale Output
Hysteresis:	0.05% Full Scale Output
Diameter:	3" (75mm)
Cable Length:	79" (2m)
Height: (excluding Ram)	2" (50mm)

Load Cell, 1000 lbf (5 kN)	HM-2300.010S
Load Cell, 2000 lbf (10 kN)	HM-2300.020S
Load Cell, 5000 lbf (25 kN)	HM-2300.050S

Shipping wt. 1 lb (0.45kg)

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

Pancake Load Cells

Pancake-design load cells are available for those who want to use a load cell design that theoretically provides the least amount of deflection in applications.

Performance Specifications	
Overload Capacity:	150%
Excitation Voltage:	20 VDC, Maximum
Non-linearity:	0 ± 0.05% Full Scale Output
Hysteresis:	0.05% Full Scale Output
Diameter:	4.13" (104.8mm)
Cable Length:	79" (2m)
Height: (excluding Ram)	2.5" (63.5mm)

Load Cell, 2000 lbf (10 kN)	HM-2300.020P
Load Cell, 5000 lbf (25 kN)	HM-2300.050P
Load Cell, 10000 lbf (50 kN)	HM-2300.100P
Load Cell, 15000 lbf (75 kN)	HM-2300.150P
Load Cell, 25000 lbf (125 kN)	HM-2300.250P
Load Cell, 50000 lbf (250 kN)	HM-2300.500P

Shipping wt. 11 lb (5kg)

Platen, Swivel Top

4.25" (108mm) diameter top swivel platen.

Platen, Swivel Top	HM-2003E

Shipping wt. 5.2 lb (2.35kg)

Stud, Threaded

Threaded stud for attaching S-type load cells to load frame cross beams.

Stud, Threaded	H-4178.2

Shipping wt. 0.2 lb (0.09kg)

Linear Strain Conversion Transducers (LSCT)
Extremely accurate and reliable strain gauge instruments. Compact size does not require a module. High resolution and performance superior to LVDT. Stainless steel casing for environmental protection. Operating temperature range 0 to 70°C. Requires input of 10V dc; output up to 6.5 mV per volt.

- Less than 250g spring force on spindle
- Non-linearity better than ± 0.1% of full scale deflection
- Hysteresis-compensated with linearity better than ± 0.1% of full scale in both directions
- Negligible temperature effect

LSCT, 0.4" (10mm)	HM-2310.04
LSCT, 1.0" (25mm)	HM-2310.10
LSCT, 2.0" (50mm)	HM-2310.20

Shipping wt. 0.8 lb (0.36kg)

Linear Potentiometer Transducers (LPT)
Accurate and reliable strain gauge instruments for use with Humboldt's HM-5150 and HM-5120 Load Frames.

Linear Potentiometer Transducer 1.0" (25mm)	HM-2305.10
Linear Potentiometer Transducer 2.0" (50mm)	HM-2305.20

Shipping wt. 0.8 lb (0.36kg)

LSCT Displacement Transducer Bracket
Bracket used with CBR piston.

LSCT Displacement Transducer Bracket HM-4178BRT
Shipping wt. 0.7 lb (0.32kg)

LSCT/LVDT Contact/Mounting Bracket
Bracket used in mounting LSCT to equipment in replacement of dial gauge.

LSCT/LVDT Mounting Bracket HM-2310BR
Shipping wt. 0.1 lb (0.04kg)

LSCT Triaxial Mounting Bracket
Bracket used in mounting LSCT or dial gauge to the upper part of a triaxial cell with a 0.625" (15.5mm) dia. ram for strain measurement. (HM-2310BR also required for use with LSCT.)

LSCT Triaxial Mounting Bracket HM-4193BR
Shipping wt. 2 lbs (0.9kg)

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

Linear Strain Transducer Bracket HM-2305BRT
Shipping wt. 0.7 lb (0.32kg)

Transducer Data Extension Cable
Data extension cable for use with load cells, LSCT or pressure devices. **Cable is 25ft.(7.6m) length.**

Transducer Data Extension Cable HM-2310C
Shipping wt. 1 lb (0.45kg)

Pore Pressure Transducer
Highly accurate, 200 psi (1400 kPa) pore pressure transducer. Designed for geotechnical lab applications with outstanding overload protection and protected from corrosive water. Requires input of 10 V DC, with an output of 100 mV. Supplied with 2 meter cable and 5-pin DIN plug.

Pore Pressure Transducer HM-4170
Shipping wt. 0.8 lb (0.36kg)

De-Airing Block
For use with pore pressure transducer

De-Airing Block HM-4170B
Shipping wt. 1 lb (0.45kg)

Digital Pore Pressure Set
For accurately measuring and monitoring pore water pressures and back pressure. For determining level of saturation ("B" parameter) during saturation stages of triaxial/permeability tests. Includes readout, pore pressure transducer, and de-airing block assembly.

Digital Pressure Set, 120V 60Hz	HM-4175
Digital Pressure Set, 220V 50/60Hz	HM-4175.4F

Shipping wt. 7 lb (3.1kg)

Digital Pressure Transducer
Solid state transducer/readout unit incorporates the latest semiconductor technology into a high-quality, yet inexpensive strain gauge. Three-digit readout display has ±.25% of full scale accuracy—comparable to others at twice the cost. Battery operated with very long battery life—typically up to 5 years. On/off button at top of readout has factory set "on" time built into the memory. Readout shuts off automatically after 20 minutes.

Digital Pressure Transducer HM-4172
Shipping wt. 2 lbs (0.9kg)

AC Adapter, 120V 60Hz
AC adapter for digital indicator, allows indicator to run off AC power.

AC Adapter, 120V 60Hz HM-4469AC
Shipping wt. 0.6 lb (0.27kg)

Data Cable
Data cable for digital indicator, used with HM-2330D.3F Humboldt Logger.

Data Cable HM-4469C
Shipping wt. 0.5 lb (0.23kg)

Multi-Device Cable
Allows one computer to control multiple daisy-chained machines.

Multi-Device Cable HM-000379
Shipping wt. 1 lb (0.45kg)

Single-Channel Displays
The HM-2350 provides 4-digit accuracy and the HM-2360 provides 6-digit accuracy.

Single-Channel Display, 120V 60Hz	HM-2350
Single-Channel Display, 220V 50/60Hz	HM-2350.4F
Single-Channel Display, 120V 60Hz	HM-2360
Single-Channel Display, 220V 50/60Hz	HM-2360.4F

Shipping wt. 6 lb (2.7kg)


H-4454. 050D

H-4454. 050


HM-4470.10


H-4158.1


H-4665.25CC


H-4470


H-4466.30
H-4466.15
H-4466.10

Load Rings
ASTM E74

Sometimes referred to as "proving rings," load rings are used with various asphalt, concrete, or soil instrumentation to measure loads, and are ideal for use with our Master Loader compression machines, direct shear machines and other testing equipment. Our high-quality, tensile steel rings have spherical seatings suitable for all shear boxes and load frames. Each load ring is shipped with a fitted gauge or indicator and calibration certificate, and supplied with tables listing all measurement units. 8.25" (210mm) high, 3/4-16 UNF thread female mounting. Available with digital indicators compatible with data acquisition systems. Eight models range in size from 110 to 22,000 lbf (0.5 to 100.0 kN).

Load Ring with Digital Indicator			
lbf	kN	kgf	Model
110	0.5	50	H-4454.001D
220	1.0	100	H-4454.002D
550	2.5	250	H-4454.005D
1100	5.0	500	H-4454.010D
2200	10.0	1000	H-4454.020D
5500	25.0	2500	H-4454.050D
11000	50.0	5000	H-4454.100D
22000	100.0	10000	H-4454.200D

Load Ring with Dial Indicator			
lbf	kN	kgf	Model
110	0.5	50	H-4454.001
220	1.0	100	H-4454.002
550	2.5	250	H-4454.005
1100	5.0	500	H-4454.010
2200	10.0	1000	H-4454.020
5500	25.0	2500	H-4454.050
11000	50.0	5000	H-4454.100
22000	100.0	10000	H-4454.200

Load Rings — See Tables
Shipping wt. 8 lb (3.7kg)

Digital Indicators

Switchable inch/metric digital indicator is accurate to ±.0001" (.002mm). Instant zero feature. Locks in maximum reading on LCD display with characters 0.240" high and 0.115" wide. Runs either clockwise or counter clockwise. Operates with replaceable batteries or AC power with automatic shutoff. Will replace any mechanical dial gauge.

Range	Resolution	Model
.250" / 6.35mm	.0001" .002mm	HM-4470.02
.600" / 15.0mm		HM-4470.05
1.0" / 25.4mm		HM-4470.10
2.0" / 50.0mm		HM-4470.20
4.0" / 101.6mm		HM-4470.40

Digital Indicators — See Table
Shipping wt. 1 lb (0.45kg)

Gauge Contact Point Extensions

Used in applications where gauges require longer contact points to ensure correct gauge placement. Contact points feature hardened steel points with polished tip to prevent scratching. Points fit all standard indicators and gauges. **Not compatible with H-4471, H-4471CC, H-4465.12, or H-4465.12CC gauges.**

Contact Point Extensions	Model
0.25" (6.4mm) Extension	H-4466.2
0.5" (13mm) Extension	H-4466.5
1" (25mm) Extension	H-4466.10
1.5" (38mm) Extension	H-4466.15
2" (50mm) Extension	H-4466.20
3" (76mm) Extension	H-4466.30
6" (152mm) Extension	H-4466.6

Gauge Contact Point Extensions — See Table
Shipping wt. 0.1 lb (0.04kg)

Magnetic Indicator Mount

Convenient, portable mount for mounting indicators and gauges. Mount has magnetic base, which mounts on metallic surfaces. Features non-magnetic stainless steel holding rod, 6 x 0.25" (154 x 6.4mm), set in hardened ball socket. Can be mounted in almost any position.

Magnetic Indicator Mount — H-4470
Shipping wt. 1.3 lb (0.58kg)

Dial Gauges

Indicators are built to American gauge design specifications for accuracy and are used in field and laboratory testing applications. Dials are high-quality, low-friction type, designed for long life and accurate repeatable readings. All dial indicators have continuous graduations and revolution counters that show revolutions of the indicator hand. They are furnished with a lug back (with a 90° mounting hole to be used vertically or horizontally), a regular contact point .25" long, and a dust cap.

Range	Division	Dia.	Brake	Model
.200"	.0001"	2.25"	No	H-4460
.200"	.0001"	2.25"	Yes	H-4461A
.300"	.0001"	2.25"	No	H-4462
.500"	.0001"	2.25"	No	H-4471
1.000"	.001"	2.25"	No	H-4158.1
2.000"	.001"	2.75"	No	H-4463
3.000"	.001"	2.75"	No	H-4464
4.000"	.001"	2.75"	No	H-4465
5.000"	.001"	2.75"	No	H-4466
12mm	.002mm	57mm	No	H-4465.12
25mm	.010mm	57mm	No	H-4465.25
50mm	.020mm	70mm	No	H-4465.50

All dial gauges above feature clockwise rotation. **Counter-clockwise models are available for all except: H-4461A, H-4466 and H-4465.08. To order counter-clockwise models, add CC to the end of the model number.**

Dial Gauges — See Table
Shipping wt. 1.3 lb (0.58kg)

Specifications	
Flow Rate	0 to 8 meters per second
Specimen Size	Accepts 3.0" OD x 2.875" (76.2 x 73mm) ID Shelby Tubes
Dimensions	96" x 40" x 96" (2,438 x 1016 x 2438mm) excludes wheels.

Erosion Function Apparatus

The HM-5940 erosion function apparatus (EFA) was designed and built to prevent bridge failures by measuring the erodibility of soil. Used in conjunction with the SRICOS scour prediction method, the HM-5940 can provide more accurate erodibility measurements and scour predictions than previously obtainable. Applications for its use include: scour at bridges, piping of dams, beach erosion and surface erosion problems. In the case of scour at bridges, the EFA leads to improved accuracy on scour depth predictions, offering several advantages over previous test methods. These advantages include: minimum sample disturbance; measurement of erosion rate vs. shear stress; measurement of critical shear stress, and incorporation of the test results from the SRICOS scour prediction method. The HM-5940 erosion function apparatus uses standard 3.0" OD x 2.875: ID (76.2 x 73 mm) Shelby tubes. The SRICOS method improves the accuracy of pier scour predictions. The HM-4000 EFA is designed to be used in conjunction with the SRICOS method of scour prediction. The SRICOS scour prediction method and the HM-5940 erosion function apparatus were developed through research carried out by Jean-Louis Briaud, PHD, PE. and the scour research team at the Texas Transportation Institute of the Texas A&M University System. In comparison with the HEC-18 equation (a standard for calculating scour predictions), SRICOS generally leads to smaller calculated scour depths and compares more favorably to actual measured scour depths.

- 7" touch screen interface
- Records and tabulates test data.
- Can store hundreds of tests at a time.
- Graphs flow rate vs. time as well as water temperature vs. time
- System can automatically fill the water tank using water level sensors.
- System can automatically cycle between water sump and water fill during tests to maintain lower water temps.
- If hooked up the internet then the machine will auto update with available firmware updates.
- Test data can be exported to USB stick for transfer to a PC with "data download software" from the Humboldt website.
- Motor can push the sample any specific distance customizable by the user.

The EFA uses either of two variants of the SRICOS method:

The Extended SRICOS Method

1) Calculate the maximum depth of scour.
2) Collect soil samples at the site.
3) Test samples in the EFA to obtain the erosion rate vs. the hydraulic shear stress applied.
4) Prepare the velocity hydrograph for the bridge.
5) Use the SRICOS program with 3 & 4 above as input and generate the depth of scour vs. time over the period covered by the chosen hydrograph.

The Simple SRICOS Method.

1) Calculate the maximum depth of scour.
2) Collect soil samples at the site.
3) Test samples in the EFA to obtain the erosion rate vs. hydraulic shear stress applied.
4) Calculate the equivalent time for a given design life of the bridge and for the design velocity.
5) Using known equations, calculate the scour depth at the end of the design life.

Erosion Function Apparatus HM-5940

Shipping wt. 1500 lbs (680kg)