



Concrete

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Testing Equipment for



Construction Materials

HUMBOLDT

www.humboldtmg.com
1.800.544.7220 • 708.468.6300

All Type B Concrete Air Meters feature our all-brass Super Pump (H-2785.DB) for reliability and faster operation. All air meters comply with ASTM C231; AASHTO T152.



H-2783

H-2786

H-2786C

H-2786P



H-2786

H-2783

H-2786C

Super Pump for Press-Ur-Meter Type B— H-2785.DB

The Super Pump's all brass construction resists acids in cement. All parts, including valve, are replaceable. For use with all Type B air meters. Ship wt. 1lb. (.45kg)

Plastic Air Meter Calibrator (5%)— H-2788

Calibrator checks the accuracy of any pressure-type concrete air meter. Set the specially designed canister upright at the bottom of the water-filled base, and the meter should read 5% air by volume. Two calibrators will check 10% air reading. Dimensions: 4" dia. x 3-3/4" (102 x 95mm). Ship wt. 2lbs. (0.9kg)

Brass Air Meter Calibrator (5%)— H-2789

Same concept as calibrator above, this model is constructed from machined brass for greater durability. Ship wt. 4lbs. (1.8kg)

Aluminum Air Meter Calibrator (5%)— H-2793

Same concept as calibrator above, this model is constructed from machined aluminum. Ship wt. 3lbs. (1.3kg)



H-2793

H-2789

H-2788

H-2785.DB

Air Meter Accessories

- Calibration Vessel, plastic— H-2783.30
- Calibration Vessel, metal— H-2785.31
- Calibration Tube (outside)— H-2785.32
- Calibration Tube (inside)— H-2785.33
- Strike-off Bar— H-2785.34
- Tamping Rod 5/8" x 16"— H-2785.35
- Syringe— H-2785.36
- Scoop— H-3731
- Wooden Case, Vert.— H-2785.38
- Plastic Case, Vert.— H-2785.38P
- Plastic Case, Horiz.— H-2783.62H

Humboldt Pressure Air Meter— H-2783

Easy-to-use, stainless steel clamping system employs four, one-piece, self-locking clamps to quickly seal lid to base with proper tension. O-ring assures watertight seal. Large, Easy-to-read (to nearest 0.1%) 4-inch diameter, direct percentage gauge with calibration adjustments. Features all-brass H-2785.DB super pump for reliability and faster operation. Unique pop-it valve eliminates seal failures. Furnished with all necessary accessories for calibration and operation, plus plastic, toolbox-style carrying case. Ship wt. 41lbs. (18.6kg)

Press-Ur-Meter with wooden case— H-2786

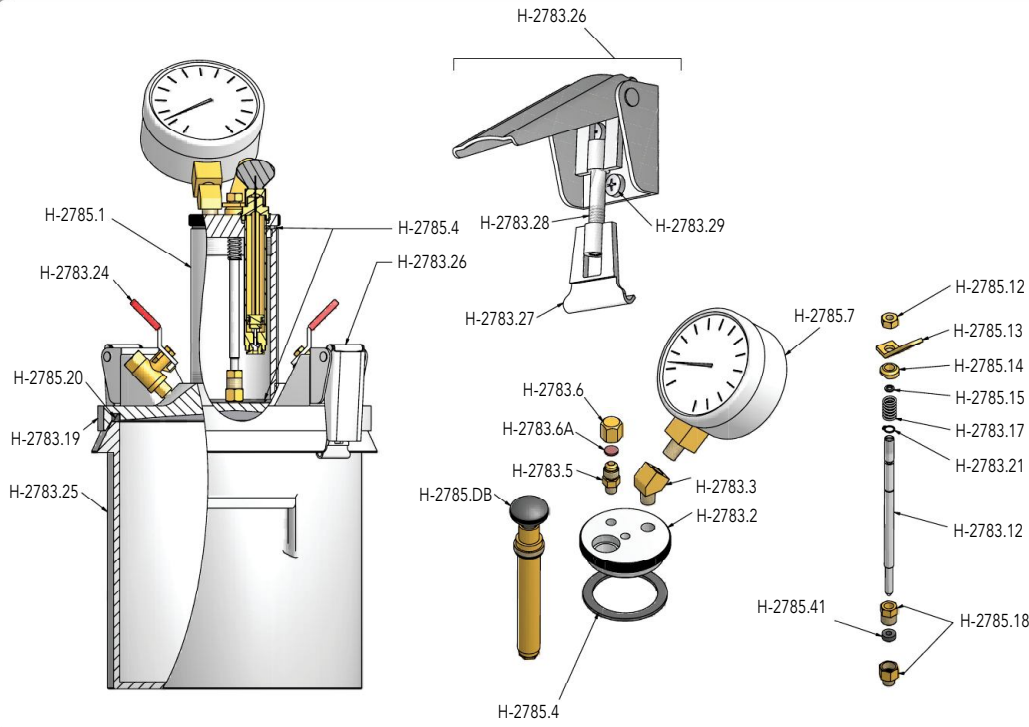
The original Press-Ur-Meter for field and laboratory tests, 1/4-cu.-ft. (.007m³) air meter is designed to determine air content, determination of specific gravity and free moisture test of aggregates. Designed to save time, reduce water used, ensure accuracy and maintain sample integrity (sample may be used for slump and compression tests). Features built-in, all-brass H-2785.DB super pump. Furnished with all necessary accessories for calibration and operation, plus wood upright carrying case. Overall height: 20-1/2" (521mm). Ship wt. 35lbs. (15.9kg)

Press-Ur-Meter with plastic case— H-2786P

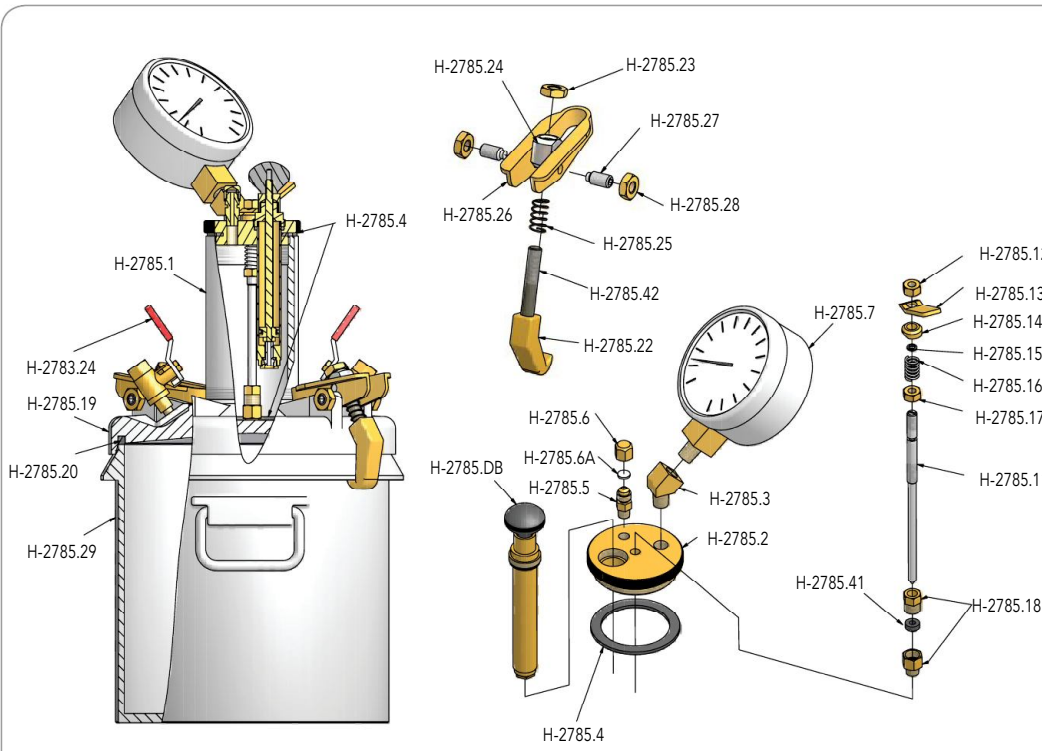
Same as H-2786 except that it comes with a plastic upright carrying case. Ship wt. 36lbs. (16.3kg)

Concrete Air Meter— H-2786C

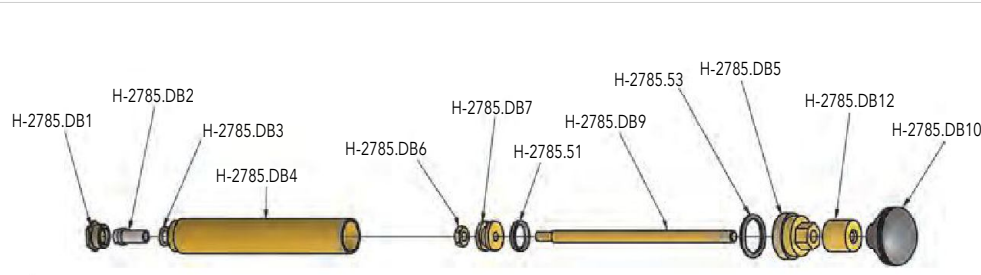
Low maintenance air meter. Similar to H-2786 except no moving parts inside chamber. Pressure is released into the base by an external, brass, quick-release T-valve. The base is machined inside and out for easy cleaning. Chamber and cover are one solid component. No more bottom gasket leaks. Furnished with all necessary accessories for calibration and operation, plus plastic toolbox-style carrying case. Ship wt. 36lbs. (16.3kg)



H-2783 Air Meter Replacement Parts	
Part No.	Description
H-2785.1	Pressure chamber
H-2783.2	Pressure chamber cap
H-2783.3	Pressure chamber elbow
H-2785.4	Pressure chamber gasket
H-2783.5	Air-release stem
H-2783.6	Air-release cap
H-2783.6A	Release cap gasket
H-2785.7	Air meter gauge
H-2783.12	Needle valve stem
H-2785.13	Needle valve lever
H-2785.14	Needle valve spacer
H-2785.15	Needle valve O-ring
H-2783.17	Needle valve spring
H-2785.18	Needle valve seat assembly
H-2783.19	Cover
H-2785.20	Cover O-ring
H-2783.21	Needle valve spring retainer
H-2783.24	Cover Petcock
H-2783.25	Base
H-2785.41	Needle valve seat gasket
H-2783.26	Latch Assembly
H-2783.27	Latch
H-2783.28	Adjusting rod
H-2783.29	Latch Assy. screw
H-2785.DB	Super Pump Assembly
H-2783.39	Gasket replacement kit



H-2786 Air Meter Replacement Parts	
Part No.	Description
H-2785.1	Pressure chamber
H-2785.2	Pressure chamber cap
H-2785.3	Pressure chamber elbow
H-2785.4	Pressure chamber gasket
H-2785.5	Air-release stem
H-2785.6	Air-release cap
H-2785.6A	Release cap gasket
H-2785.7	Air meter gauge
H-2785.12	Needle valve stem
H-2785.13	Needle valve lever
H-2785.14	Needle valve spacer
H-2785.15	Needle valve O-ring
H-2785.16	Needle valve spring
H-2785.17	Needle valve spring retainer
H-2785.18	Needle valve seat assembly
H-2785.19	Cover
H-2785.20	Cover O-ring
H-2783.24	Cover Petcock
H-2785.22	Clamp with stud
H-2785.23	Clamp nut
H-2785.24	Clamp trunnion
H-2785.25	Clamp spring
H-2785.26	Clamp toggle
H-2785.27	Clamp toggle set screw
H-2785.28	Clamp toggle lock nut
H-2785.29	Base
H-2785.41	Needle valve seat gasket
H-2785.42	Stud
H-2785.DB	Super Pump Assembly
H-2785.55	Gasket replacement kit



H-2785.DB Super Pump Replacement Parts	
Part No.	Description
H-2785.DB1	Valve nut
H-2785.DB2	Valve
H-2785.DB3	Valve O-ring
H-2785.DB4	Pump tube
H-2785.DB5	Pump cap
H-2785.DB6	Stem nut
H-2785.DB7	Pump piston
H-2785.DB9	Pump stem
H-2785.DB10	Pump handle
H-2785.DB12	Stem cap
H-2785.51	Pump piston O-ring
H-2785.53	Pump tube O-ring



Roll-A-Meter Air Indicators

Brass— H-2795 Ship wt. 32 lbs. (14.5kg)

Aluminum— H-2796A Ship wt. 25 lbs. (11.4kg)

Rolling or washout method air indicator for use with any aggregate not exceeding 2" (51mm). Capacity in base section: 130 cu. in. (2130cm³). Easy to handle in the field. Requires no special training or computation. Includes instructions and carrying case. Height: 22" (559mm). Max. OD 8" (203mm). Complies with ASTM C173; AASHTO T196.

Volumetair Air Meter— H-2795P

The Volumetair is used for the rolling method of measuring entrained air in any concrete. This ultra lightweight and easy-to-use instrument is supplied complete with the meter, funnel, syringe, tamper, calibration cup, mallet, strike-off bar and plastic carrying case. The plastic materials used in the construction of this unit not only make it lightweight; but also allow the user to use water for clean-up and small amounts of muriatic acid for periodic cleaning. The sight tube has a range of 0 to 9% and the base volume is 134 cu. in. (2200ml). Complies with ASTM C173.

Ship wt. 15 lbs. (6.8kg)

Chace Concrete Air Indicator Kit— H-2756

(Isopropyl-Alcohol Method) Complete kit for measuring air content of fresh concrete includes H-2755 air indicator, instructions, cleaning brush and plastic squeeze-type bottle for alcohol in plastic storage box. Complies with AASHTO T199. Ship wt. 4 lbs. (1.8kg)

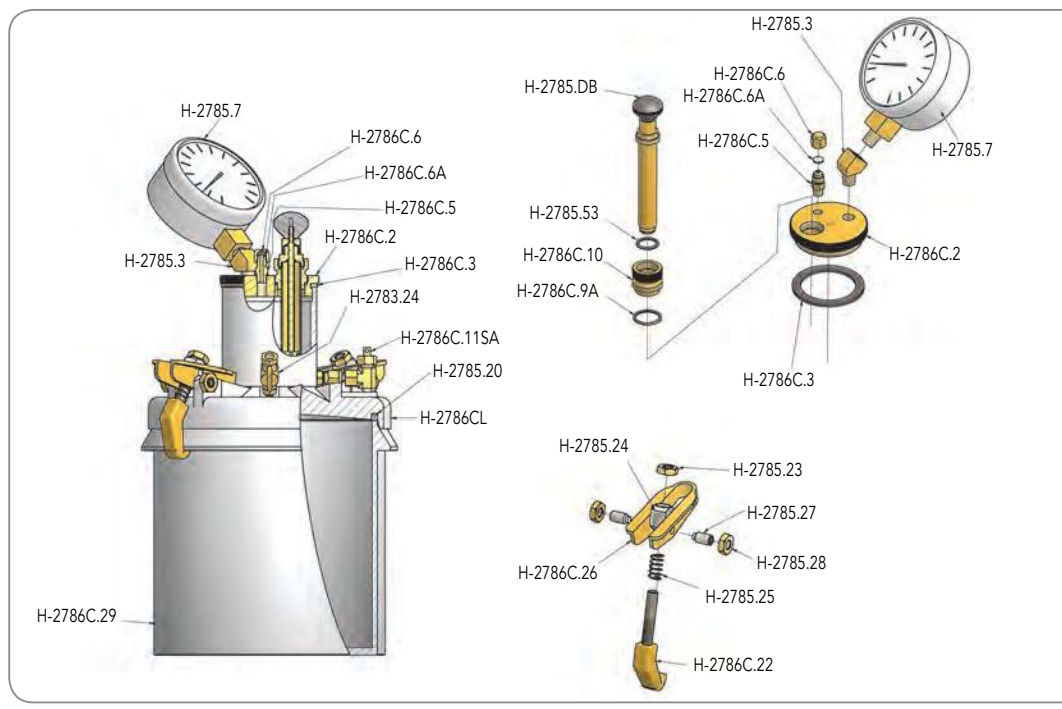
Chace Concrete Air Indicator— H-2755

(Isopropyl-Alcohol Method)
For quick field checks for air content of fresh concrete in about three minutes, pocket-sized unit air meter is furnished with instructions and correlation chart. Unit does not replace conventional 1/4 and 1/2-cu. ft. (.007 and .014m³) air meters. Overall dimensions: 6-1/4 x 1-1/8" dia. (159 x 29mm). Complies with AASHTO T199. Ship wt. 1 lb. (.45kg)

Chace Air Indicator Glass Filter Tube Only— H-2755.2

Ship wt. 1 lb. (.45kg)

Call for Air Indicator and Meter Replacement Parts



H-2786C Air Meter Replacement Parts	
Part No.	Description
H-2786C.2	Pressure chamber cap
H-2785.3	Pressure chamber elbow
H-2786C.3	Pressure chamber gasket
H-2786C.5	Air-release stem
H-2786C.6	Air-release cap
H-2786C.6A	Release cap gasket
H-2785.7	Air meter gauge
H-2786C.11SA	Valve assembly complete
H-2786CL	Cover
H-2785.20	Cover o-ring
H-2783.24	Cover Petcock
H-2786C.22	Clamp
H-2785.23	Clamp nut
H-2785.24	Clamp trunnion
H-2785.25	Clamp spring
H-2786C.26	Clamp toggle
H-2785.27	Clamp toggle set screw
H-2785.28	Clamp toggle lock nut
H-2786C.29	Base
H-2785.DB	Super pump
H-2785.53	Upper o-ring for adapter
H-2786C.10	Super Pump adapter
H-2786C.9A	Lower o-ring for adapter
H-2786C.55	Gasket replacement kit



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



Standard Slump Cone Set— H-3637

The Humboldt, Standard Slump Cone Set provides you with the basic slump test components in an easy-carry configuration. The unique base design allows you to combine the individual components together into a one-piece, portable unit (see photo). The Standard Set includes our H-3636 cast aluminum Base Plate, H-3640 Slump Cone (standard steel), H-3651 Tamping Rod w/ 6" scale on handle. The base includes bolt-on clamps, which hold the slump cone securely during filling and rodding. The integral handle, attached to the base, can be rotated above the specimen once the cone has been removed and used as a guide to measure the slump. Ship wt. 21 lbs. (9.5kg)

Deluxe Slump Cone Test Set— H-3635

The Humboldt, Deluxe Slump Cone Set provides you with the basic slump test components in an easy-carry configuration, plus a scoop and funnel to aid in filling the slump cone. The set also includes a specially-designed "crete-brush" with a 20" handle, which stands up to the harsh acids used to clean slump test equipment. The Deluxe set includes: H-3636 Base Plate, H-3638 Funnel, H-3639.20 Brush, H-3640 Slump Cone (standard steel), H-3651 Tamping Rod w/ 6" scale on handle, and a H-3731 Scoop. Ship wt. 25 lbs. (11.4kg)

Slump Test Set w/ Pan— H-3645

The H-3645 Slump Cone Test Set is designed for those who prefer a traditional pan setup. This Set includes our H-3640 Slump Cone (standard steel), the H-3800 wire-bristle, wooden-handled Brush, a H-3650 Tamping (Puddling) Rod, the H-3725 galvanized-steel, 20" x 20" x 3" Slump Pan, and a H-3760 Trowel. Ship wt. 24 lbs. (10.9kg)

K Slump Tester— H-3643

Provides a fast approximate determination of slump and workability of wet concrete. Can be used to measure slump in buckets, wheelbarrows, ready-mix truck chutes, as well as in-place forms and test molds. The Tester is capable of indicating a fairly accurate correlation to an actual slump test. The Probe can also be used to determine the workability and the degree of compaction of fresh concrete. Includes correlation chart and instructions. Complies with ASTM C1362. Shipping wt. 1 lb. (0.5kg)

Ball Penetration Apparatus (Kelly Ball)— H-3655

Ball Penetration Apparatus (Kelly Ball), 20 lb.— H-3655-20

A test for the consistency of concrete using the penetration of a half sphere; a 1-inch (2.5-centimeter) penetration by the Kelly ball corresponds to about 2 inches (5 centimeters) of slump. Determines depth of penetration of metal weight into plastic concrete. Apparatus consists of 30 lb. (14kg) cylinder with hemispherically shaped bottom and handle. Stirrup or frame guides handle and acts as reference for measuring depth of penetration. Handle is graduated in 1/4" (6.4mm) increments on one side and half-centimeter increments on the other side. Concrete may be tested as placed in the forms prior to any manipulation or in a suitable container. Complies with ASTM C360; AASHTO T183; California Test Method CTM533. Shipping wt. 40 lbs. (18kg)

Ball Penetration Apparatus Carrier— H-3656

Heavy-duty, cast-aluminum design with quick release latches. Provides convenience for the operator and protection to Kelly ball when transporting to and from the job site. Shipping wt. 18 lbs. (8kg)

Concrete Pocket Penetrometer— H-4134

Concrete Pocket Penetrometer, w/ Dial— H-4132

Lightweight, spring-reaction type concrete penetrometer for field and lab evaluation of the initial set of concrete mortar, based on ASTM C403. Penetration plunger has a 1/20 sq. in. tip area. Plunger is steadily pushed into the mortar to a 1 in. depth, as indicated on the shaft, at periodic time intervals. Penetrometer's calibrated range is 0-700 psi. Resistance in psi is indicated on the scale. The term "initial set" is the semi-hardened, partially hydrated condition of the concrete beyond which it can no longer be worked. The point of initial set is reached when the penetration value is 500psi. Complies with ASTM C780.

Penetrometer Foot— H-4134F

For use with masonry mortars to determine board life and initial consistency. Method can be used as a basis for acceptance of mortars. Stainless steel disk, 2.70" (68.58mm) dia. Can be used with H-4134 or H-4132 Penetrometers. Complies with ASTM C780.

Slump Cone Sets comply with ASTM C143, AASHTO T119, BS 1881

SLUMP CONE SET INDIVIDUAL COMPONENTS & ACCESSORIES



Steel Slump Cone— H-3640

Steel slump cone has plated finish to resist rust. Fitted with handles and foot lugs for use with H-3636 base plate. 8" (203mm) dia. at base, 4" (102mm) dia. at top and 12" (305mm) high. Ship wt. 6 lbs. (2.7kg)

Metric Slump Cone— H-3640M

Same as above except with metric dimensions: (200mm) dia. at base, (100mm) dia. at top and (300mm) high. Ship wt. 6 lbs. (2.7kg)

Plastic Slump Cone— H-3640P

Lightweight, plastic slump cone will not dent or rust and can be cleaned with an acid bath. Formed with handles and foot lugs for use with H-3636 base plate. 8" (203mm) dia. at base, 4" (102mm) dia. at top and 12" (305mm) high. Complies with ASTM C143 and AASHTO T119. Ship wt. 3 lbs. (1.4kg)

Scoop— H-3731

One-piece aluminum scoop. Shipping wt. 1 lb. (.5kg)

Funnel— H-3638

Aluminum funnel for use with all slump cones to assist in filling. Shipping wt. 2 lbs. (1kg)

Tamping (Puddling) Rod— H-3650

Round, straight steel rod for use with concrete cylinder molds, slump cones and unit weight measures. Rod measures 5/8" (16mm) dia. x 24" (610mm) long. Both ends rounded to hemispherical tip. Plated for rust resistance. Ship wt. 2 lbs. (0.9kg)

Graduated Tamping Rod— H-3651

Tamping Rod with 6" scale in 1/4" increments engraved on handle for measuring amount of slump when handle of H-3636 base is raised over specimen. Ship wt. 2 lbs. (0.9kg)

Base Plate— H-3636

Cast-aluminum base plate firmly holds all slump cone models, permitting one person to conveniently perform test. Base clamps turn down over cone foot lugs to secure entire assembly. Movable handle raises vertically over specimen (after removal of cone) and slump is easily measured with the 6" scale cut into handle end of H-3651 tamping rod. Ship wt. 10 lbs. (4.5kg)

Galvanized Slump Pan— H-3725

Durable steel pan, 24" x 24" x 3" (610 x 610 x 76mm) Ship wt. 18 lbs. (8.2kg)

Brush— H-3800

Brass Wire with Wood Handle. Ship wt. 2 lbs. (0.9kg)

Trowel— H-3760

Forged Steel with comfort handle, 2-3/4" X 5".

Tape Measure— H-4901

16.4 ft/5m tape measure with rubber grip cover and wrist strap.

Field Testing Video CD— H-0734

Video CD that covers ASTM concrete field testing with presentations and test specific videos that explain and show the step-by-step procedures needed to accomplish each test.

Crete Brush, 8" Handle— H-3639.8

8 inch acid-proof crete brush. Ship wt. 2 lbs. (0.9kg)

Crete Brush, 20" Handle— H-3639.20

20 inch acid-proof crete brush. Ship wt. 2 lbs. (0.9kg)

Self Consolidating Concrete (SCC) Flowability

These tests are used to determine the flowability and passing ability of self-consolidating concrete (SCC), ASTM C1621.

Passing ability refers to the ability of SCC, under its own weight (without vibration), to flow into and completely fill the spaces within intricate framework, containing obstacles such as reinforcement bars.

**J-Ring Test Set, Smooth Rods— H-3652**

Provides a method to measure the distance of lateral flow of Self Consolidating Concrete. Designed for durability, the set includes a slump cone, J-Ring with smooth rods, and steel base plate with engraved rings to measure flow distance. Complies with ASTM standards C1611-09, C1621/1621M-06.

Shipping wt. 65 lbs. (29kg)

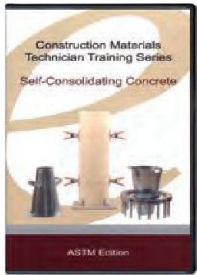
J-Ring Test Set, Rebar Rods— H-3652R

This set includes a slump cone, J-Ring with rebar rods, and steel base plate with engraved rings to measure flow distance.

Shipping wt. 65 lbs. (29kg)

Individual Components

Description	Part No.
J-Ring with Smooth Rods	H-3654
J-Ring with Rebar Rods	H-3654R
Stainless Steel Base Plate, Engraved	H-3653
Slump Cone	H-3640



H-0733

**L-Box Flowability Test— H-3658**

Method used to determine flow rates and passibility of SCC in confined spaces. Test box is comprised of concrete reservoir, slide gate, three obstacles and test basin. Includes metal strike-off bar. Complies with IL TP SCC-4. Ship wt. 27 lbs. (12kg)

V-Funnel Flowability Test— HC-3665

Stainless steel construction with 10L capacity. Upper edge is smooth and reinforced and the outflow orifice is equipped with seal valve. Includes polyethylene box to collect discharge and 900mm long straight edge to level concrete before test.

Ship wt. 53 lbs. (24kg)



HC-3665



HC-3666

Static Segregation Column Mold— HC-3666

Used to determine the potential static segregation of self-consolidating concrete. An easy-to-use clamping and collection system allows the segregation test to be conducted by a single operator. Built with Schedule 40 PVC, the 8" diameter mold has sections of 6.5", 13", and 6.5" in height. The supporting base is 15" x 15". The 2 collection plates are 8.5" wide stainless steel. Complies with C1610

Shipping wt. 24 lbs. (11kg)

Self Consolidating Concrete Video Training CD— H-0733

Use this interactive CD to train your technicians on how to properly test self-consolidating concrete (SCC) in the field and laboratory. The CD covers ASTM C1610– Column Segregation, C1611– Slump Flow, and C1621– Passing Ability, J-Ring. Each test procedure is explained using slide presentations, test specific video demonstrations, glossary of terms, and a step-by-step procedural outline. Comes with a Multi-User license.



ASTM Unit Weight Measures— Machined aluminum cylindrical unit weight measures with handles for determining unit weight of fine, coarse or mixed aggregates. Water-tight with true and even top and bottom. Measures retain form after repeated use. Meet ASTM C29, C138, C192 and AASHTO T19, T121, T158.

Capacity	Inside Dia.	Inside Ht.	Ship Wt.	Model
1/10 cu. ft (2.8 liter)	6" (152mm)	6.1" (155mm)	6 lbs. (2.7kg)	H-3660.1
1/2 cu. ft (14.1 liter)	10" (254mm)	11" (279mm)	16 lbs. (7.2kg)	H-3661.1
1 cu. ft (28.3 liter)	14" (356mm)	11.2" (285mm)	31 lbs. (13.6kg)	H-3662.1
1/3 cu. ft (9.3 liter)	8" (203mm)	11.5" (292mm)	17 lbs. (7.7kg)	H-3663.1
1/4 cu. ft (7.1 liter)	8" (203mm)	8.8" (224mm)	11 lbs. (4.9kg)	H-3664.1

Tamping (Puddling) Rod— H-3650

Round, straight steel rod for use with concrete cylinder molds, slump cones and unit weight measures. Rod measures 5/8" (16mm) dia. x 24" (610mm) long. Both ends rounded to hemispherical tip. Plated for rust resistance. Ship wt. 2 lbs. (0.9kg)



Non-ASTM Unit Weight Measures— Heavy-gauge, seam-welded, water-tight, steel unit weight measures with bail handles. Can be used for concrete or aggregate.

Capacity	Inside Dia.	Inside Ht.	Ship Wt.	Model
1/10 cu. ft (2.8 liter)	6" (152mm)	6.1" (155mm)	7 lbs. (3.2kg)	H-3660
1/2 cu. ft (14.1 liter)	10" (254mm)	11" (279mm)	22 lbs. (10kg)	H-3661
1 cu. ft (28.3 liter)	14" (356mm)	11.2" (285mm)	33 lbs. (15kg)	H-3662
1/3 cu. ft (9.3 liter)	8" (203mm)	11.5" (292mm)	19 lbs. (8.7kg)	H-3663
1/4 cu. ft (7.1 liter)	8" (203mm)	8.8" (224mm)	15 lbs. (6.8kg)	H-3664

Strike-off Plates (Clear Acrylic Plate (5/8" thick))

8" sq. (203mm sq.)	10" sq. (254mm sq.)	12" sq. (305mm sq.)	16" sq. (406mm sq.)
H-3669.1P	H-3669.4P	H-3669.2P	H-3669.3P

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

Scales for Unit Weight Measures



150lb/60kg Low Profile Scale, 120V 60Hz— HB-4931

150lb/60kg Low Profile Scale, 220V 50/60Hz— HB-4931.4F

The HB-4931 is a feature-rich bench scales, combining an ABS plastic indicator with a painted steel base with mounting brackets. It offers a multi-functional indicator with multiple weighing units (kg, g, lb, oz, lb:oz (decimal), metric tonnes and a user-definable unit). Its quick display of results using a large LCD with high-contrast white backlight makes it easy to read and its adjustable non-slip rubber leveling feet and externally visible level indicator provide quick setup. The internal power supply allows the user to use the universal line cord or 6 "C" batteries (80 hr battery life). The base and indicator are connected using a quick-connect plug

Hard Carrying Case for HB-4785 Scale—HB-4785C



165lb (75kg) Portable Scale, 120V 60Hz— HB-4775A

165lb (75kg) Portable Scale, 220V 50/60Hz— HB-4775A.4F

Compact and portable, this scale has a capacity of 165lb (75kg) and a readability of .05lb (.02kg). Pan size is 12.25" x 12" (310 x 305mm). Can be used with AC or batteries and a great, hard carrying case is available. Shipping wt. 10 lbs. (5kg)

Hard Carrying Case for HB-4775 Scale—HB-4775C



H-4137

Mortar Penetration Resistance Apparatus— H-4137

Spring-reaction-type apparatus, graduated from 10 to 130 lbf (45 to 580N) in increments of 2 lbf (9N) for testing rate of hardness of mortars sieved from concrete mixtures. Determines effects of variables such as temperature, cement, mixture proportions, additions and admixtures upon the time of setting and hardening of concrete. Penetration resistance is measured by the downward vertical force exerted to penetrate the mortar 1" (25mm). Pressure reading is measured by a scale with a sliding ring indicator on the handle's stem. Includes these interchangeable mortar penetration resistance needles: 1, 1/2, 1/4, 1/10, 1/20 and 1/40 sq. in (645, 323, 161, 65, 32, 16mm²). Complies with ASTM C403; AASHTO T197. Shipping wt. 20 lbs. (9kg)

Replacement Resistance Needle Set— H-4143

Set of six, screw-on type, replacement needles for use with H-4137 mortar penetration resistance apparatus. Available as set or separately below.

Individual Resistance Needles

Description	Part No.
1 sq. in. (645mm ²)	H-4143.1
1/2 sq. in. (323mm ²)	H-4143.50
1/4 sq. in. (161mm ²)	H-4143.25
1/10 sq. in. (65mm ²)	H-4143.10
1/20 sq. in. (32mm ²)	H-4143.05
1/40 sq. in. (16mm ²)	H-4143.025

Data Sheets, 100/pkg.— H-4133F

"Time of Setting of Concrete Mixtures" data sheets for use with H-4133 and H-4137.



H-4133

H-4133N

Acme Penetrometer— H-4133

Hydraulic reaction-type apparatus for determining the setting time of concrete with slump greater than zero by testing mortar sieved from the concrete mixture. It also determines the effects of variables such as temperature, cement, mixture proportions, additions and admixtures upon the time of setting and hardening of concrete. The penetrometer's design makes it easy to operate, being more efficient, with a longer gear rack. All needles are one length so settings may remain the same. Loads are applied hydraulically with pressures read on a 200 lbf (890N) capacity gauge graduated in 2 lbf divisions. Set of six needles allows multiplication to a maximum reading of 8000 lbf. The Acme penetrometer features cast aluminum base and set of stainless steel penetration needles in a wooden block (bearing area: 1, 1/2, 1/4, 1/10, 1/20 and 1/40 sq. in., (645, 323, 161, 65, 32 and 16mm²). Includes 100 laboratory test data reporting forms. Complies with ASTM C403; AASHTO T197. Shipping wt. 60 lbs. (27kg)

Penetration Needle Set— H-4133N

Set of six, stainless steel needles and holding block for use with the H-4133 Acme Penetrometer Mortar Penetration Resistance Apparatus. Individual needles are listed below. Shipping wt. 7 lbs. (3kg)

Individual Resistance Needles

Description	Part No.
1 sq. in. (645mm ²)	H-4133.15
1/2 sq. in. (323mm ²)	H-4133.16
1/4 sq. in. (161mm ²)	H-4133.17
1/10 sq. in. (65mm ²)	H-4133.18
1/20 sq. in. (32mm ²)	H-4133.19
1/40 sq. in. (16mm ²)	H-4133.20



HC-4972



H-2682

Cementometer, Type-R Moisture Meter— HC-4972

The Cementometer Type R handles normal water/cement ratios between 0.35 to 0.65 water/cement. The unit is calibrated for standard type I, II, and III cements and can also be programmed with up to ten different mix designs by the user. For highest accuracy, the user should program the unit for the material being used. The simple-to-use calibration process rapidly creates user programs without the need for external computing devices. The unit can store over 150 readings complete with time and date for future reference. Data can be recalled via RS-232 interface. Shipping wt. 2 lbs. (1kg)

Multi-Channel Maturity Meter Set— H-2680

Digital unit gives maturity number calculation, instant readout and temperature history. All four channels may be used simultaneously. All information is available on menu-driven alphanumeric display. Datum temperature is programmable from -20° to +60°C. Communications port allows information transfer from meter to meter, printer or computer. Includes four type "T" thermocouple wire, GFE connectors, RS-232 communications cable and plastic carrying case. Dimensions: 8 x 4-3/4 x 3" (203 x 121 x 76mm). Complies with ASTM C1074. Shipping wt. 10 lbs. (5kg)

Rechargeable Multi-Channel Meter Set— H-2682

Same as H-2680 except that a rechargeable nickel-cadmium battery is used. A waterproof battery charge connector enables charging from the 120V charger supplied or run directly off of AC power. This unit provides improved low ambient service temperature performance. Complies with ASTM C1074. Shipping wt. 10 lbs. (5kg)



H-3648



H-3649

Consistency Test, Vibrating Table, 120V 60Hz— H-3648
Consistency Test, Vibrating Table, 220V 60Hz— H-3648.2F
Consistency Test, Vibrating Table, 220V 50Hz— H-3648.5F

Model H-3648 conforms to ASTM C1170 for determining the consistency of stiff to extremely dry concrete mixtures like those used in roller-compacted concrete mixtures. Density of the specimens is determined by determining the mass of the consolidated specimen and dividing by its volume. The unit is comprised of a vibrating table, which can be bolted to a floor or substantial base slab. A swing arm with a guide sleeve for the 50 lb (22.7kg) surcharge weight is attached to the base, which allows the weight to swing out of the way when filling the mold, but allows easy application of the weight to the top of the specimen in the mold prior to vibration. The test mold is 9.5" x 7.75" ID with handles for easy movement and is locked into place on the base with positioning tabs and wing nuts. Shipping wt. 10 lbs. (150kg)

Individual Components

Description	Part No.
Thermocouple Wire, 24 GA, (per foot)	H-2670.1
Thermocouple Wire, 20 GA, Type T (per foot)	H-2670.1T
Thermocouple Wire, 24 GA, Type T, 50 Ft.	H-2670.1.50
Thermocouple Wire, 24 GA, Type T, 100 Ft.	H-2670.1.100
Plug for thermocouple	H-2680P
Printer	H-2684
AC Adapter/Charger	H-2686CH
Serial Cable	H-2686

Cylinder Mold, Vibrating Table Apparatus, 120V 60Hz— H-3649
Cylinder Mold, Vibrating Table Apparatus, 220V 60Hz— H-3649.2F
Cylinder Mold, Vibrating Table Apparatus, 220V 50Hz— H-3649.5F

Model H-3649 conforms to ASTM C1176 for making roller-compacted concrete in cylinder molds using a vibrating table. This practice is used when the standard procedures of rodding and internal vibration are not practicable. The unit is comprised of a vibrating table, which can be bolted to a floor or substantial base slab. A swing arm with guide sleeve for the 20 lb (9kg) surcharge weight is attached to the base, which allows the weight to swing out of the way when filling the mold, but allows easy application of the weight to the top of the specimen in the mold prior to vibration. The test mold is a 6" x 12" mold conforming to ASTM C470 and is locked into place on the base of the unit. Shipping wt. 305 lbs. (138kg)





H-3847




Utility Mixer with Steel Drum


- 1/2HP Electric, 110V 60Hz— H-3847A
- 1/2HP Electric, 220V 60Hz— H-3847A.2F
- 1/2HP Electric, 220V 50Hz— H-3847A.5F
- 3.5HP Gasoline Motor— H-3847A.G

Drum mixing capacity is 3 cu. ft. (85 Liters). Drum size: 5-1/2 cu. ft. (156 Liters). Compact, sturdy, lightweight concrete mixer for concrete, mortar, etc., can be bolted to floor or skid for permanent installation. Convenient drum lock allows the operator to secure the drum in one of five positions. Welded steel frame and heavy bushings for a long dependable life. Precision case, one-piece ring gear provides years of service. Quad-mixing system utilizes a four-piece, replaceable paddle and blade combination that create four different mixing patterns for a more consistent mix.

See below for tow-kit options.

Overall dimensions:
41 x 26 x 55" (1041 x 660 x 1397mm).
Comply with ASTM C192.
Shipping wt. 366 lbs. (166kg) 

Lightweight, Wheelbarrow Mixer


- 1/2HP Electric, 110V 60Hz— H-3846
- Drum mixing capacity is 3,5 cu. ft. (99.1 Liters). Lightweight, portable mixer only weighs 125 lbs. High-torque, 1/2 HP electric motor with on/off switch. Strong polyurethane drum will not crack or rust and is easy to clean. Ring gear is enclosed for safe operation. Transport handles adjust for easy storage. Can clear a 30" (762mm) door opening. Ships unassembled in a box. Not available in 220V configurations.
Shipping Dimensions:
24 x 23 x 30" (610 x 584 x 762mm)
Shipping wt. 121 lbs. (55kg) 

Utility Mixer with Poly Drum

- 1/2HP Electric, 110V 60Hz— H-3849
- 1/2HP Electric, 220V 60Hz— H-3849.2F
- 1/2HP Electric, 220V 50Hz— H-3849.5F
- 3.5HP Gasoline Motor— H-3849.G

Drum mixing capacity is 3 cu. ft. (85 Liters). Drum size: 5-1/2 cu. ft. (156 Liters). Compact, sturdy, lightweight concrete mixer for concrete, mortar, etc., can be bolted to floor or skid for permanent installation. Convenient drum lock allows the operator to secure the drum in one of five positions. Welded steel frame and heavy bushings for a long dependable life. Precision case, one-piece ring gear provides years of service. Non-stick, polyethylene drum provides easy clean-up and is replaceable. Sturdy, in-mold mixing blades.

See below for tow-kit options.

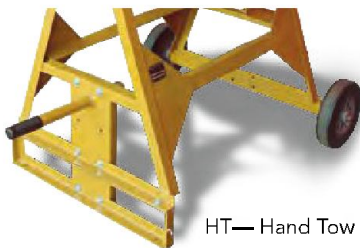
Overall dimensions: 41 x 26 x 55" (1041 x 660 x 1397mm). Comply with ASTM C192.
Shipping wt. 346 lbs. (157kg) 

Poly Drum Replacement— H-3849PL

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

Tow Kit Options for Models H-3847A and H-3849

- Hand Tow Kit with 2.75 x 10" Semi-Pneumatic Tires— use HT Suffix (example: H-3847HT)
- High-Speed Tow Kit with 4.8 x 12" Pneumatic Tires and Hitch— use HS Suffix (example: H-3849HS)



HT— Hand Tow Kit




HS— High-Speed Tow Kit

Concrete Beam Tester—

16" distance, single point, manual pump— H-3030A

18" distance, single point, manual pump— H-3032A

18" distance, three point, manual pump— H-3033



Self-contained shock-proof portable concrete beam tester accurately and easily determines flexural strengths of 6 x 6" cross-section test beams. Hydraulically driven unit uses center-point loading method with continuous readings to the break and retains maximum reading to eliminate lost data. Gauge resets to zero for repeat tests. Lightweight aluminum unit has dual registration of modulus of rupture between 15,000 lbf. and 0–6,700 kgf. Shipping wt. 65 lbs. (29kg) 

H-3030A



Concrete Beam Forms

Reusable. Fast and easy to assemble and use. Easy to strip, clean, knock-down and store. Molds give accurate specimens for center or third-point loading tests. Comply with ASTM C31, C78, C192, C293; AASHTO T23 and T197.

Lightweight, Stamped-Steel		
6" x 6" x 22" (152 x 152 x 559mm)	Lightweight, Stamped-Steel Model Hinge-free, collapsible in to interchangeable parts. Fastened with wing nuts. Shipping wt. 21 lbs (9.5kg)	H-3007
Heavyweight, Machined 3/8" Steel		
6" x 6" x 21" (152 x 152 x 533mm)	Concrete Beam Form, heavyweight, machined 3/8" steel. One-piece sides hinge to base, ends hinge to sides. Fastened with wing nuts. Shipping wt. 59 lbs (26.8kg)	H-3005
6" x 6" x 24" (152 x 152 x 610mm)	Concrete Beam Form, heavyweight, machined 3/8" steel. One-piece sides hinge to base, ends hinge to sides. Fastened with wing nuts. Shipping wt. 67 lbs (30.4kg)	H-3010
6" x 6" x 30" (152 x 152 x 762mm)	Concrete Beam Form, heavyweight, machined 3/8" steel. One-piece sides hinge to base, ends hinge to sides. Fastened with wing nuts. Shipping wt. 82 lbs (37.2kg) 	H-3015
6" x 6" x 36" (152 x 152 x 914mm)	Concrete Beam Form, heavyweight, machined 3/8" steel. One-piece sides hinge to base, ends hinge to sides. Fastened with wing nuts. Shipping wt. 100 lbs (45.4kg) 	H-3020
Plastic Beam Molds		
6" x 6" x 21" (152 x 152 x 533mm)	Single-cavity steel cube mold with base plate is 6 x 6 x 6" (152 x 152 x 152mm). Used for compression testing of concrete cubes and for mortar specimens in the Time of Initial and Final Setting of Concrete. Complies with ASTM C403; AASHTO T197. Shipping wt. 10 lbs. (5kg)	H-3009
Cube Molds		
6" x 6" x 6" (152 x 152 x 152mm)	Single-cavity steel cube mold with base plate is 6 x 6 x 6" (152 x 152 x 152mm). Used for compression testing of concrete cubes and for mortar specimens in the Time of Initial and Final Setting of Concrete. Complies with ASTM C403; AASHTO T197. Shipping wt. 27 lbs. (12kg)	H-2827
150 x 150 x 150mm	Steel metric cube mold, single-cavity	H-2827M
150 x 150 x 150mm	Plastic metric cube mold, single-cavity	H-2827MP



H-3007



H-3005



H-3009



H-2827



H-2827MP



Curing Cover for 21", 22", 24" Beam Molds— H-3021.24

Curing Cover for 30" Beam Molds— H-3021.30

Curing Cover for 36" Beam Molds— H-3021.36

Constructed of heavy-duty rip-stop nylon with removable pad, which can be saturated with water for moisture retention during curing.

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H-2942



H-2950H



H-2934



H-2920



H-3041



H-3037PML



H-3041L



H-3043.6



H-3043.4



H-3037



H-3040



H-3041S

H-3041SMA

Metal Cylinder Molds

Molds are constructed of plated steel for rust resistance and are dimensionally stable under severe use. Molds are split along one side with 2 quick-acting clamps welded to mold. When open, mold springs apart slightly to allow specimen removal. Include detachable base plate. Comply with ASTM C31, C39, C192, C470; and AASHTO T22, T23, T126, T198.

6" x 12" (152 x 305mm)	1/8" (3mm) wall thickness, 1/4" (6mm) base plate. Shipping wt. 18 lbs. (8.2kg)	H-2942
6" x 12" (152 x 305mm)	Similar to above, except 1/4" (6mm) wall thickness. Shipping wt. 31 lbs (14kg)	H-2950
6" x 12" (152 x 305mm)	Similar to H-2950 with built-in carrying handle. Shipping wt. 32 lbs (15kg).	H-2950H
4" x 8" (102 x 203mm)	1/4" (6mm) wall thickness and base plate. Shipping wt. 8 lbs (3.6kg)	H-2934
4" x 8" (102 x 203mm)	1/8" (3mm) wall thickness and 1/4" (6mm) base plate. Shipping wt. 8 lbs (3.6kg)	H-2935
3" x 6" (76 x 152mm)	1/4" (6mm) wall thickness and base plate. Shipping wt. 7 lbs (3.2kg)	H-2931
2" x 4" (51 x 102mm)	3-Gang, split, cast bronze mold has heavy rib reinforcement at top, bottom and sides. Fitted with heavy, quick-acting yoke clamps, bolts and thumbscrews for locking halves. Meet ASTM C31, C39, C192. Shipping wt. 5 lbs (2kg)	H-2920

Plastic, Single-Use Cylinder Molds

Disposable, plastic cylinder molds with flat bottoms. Easily stripped with stripper tools (order separately). Meet ASTM C31, C39, C192, C470, C496; AASHTO T22, T23, T126, T198, M205.

6" x 12" (152 x 305mm)	Reinforcing rib around top opening. Lids not included. Sold in cartons of 36, oversize shipping charges apply.	H-3041
6" Lid (Domed)	6" plastic lid for use with H-3041 mold. Protects specimens from damage. Sold individually.	H-3041L
4" x 8" (102 x 203mm)	Complete with integral, domed plastic lid. Sold in cartons of 36, oversize shipping charges apply.	H-3037PML
3" x 6" (76 x 152mm)	Complete with integral, domed plastic lid. Sold in cartons of 80, oversize shipping charges apply.	H-3038PML
2" x 4" (51 x 102mm)	Complete with integral domed plastic lid. Sold in cartons of 84.	H-3039P

Plastic, Reusable Cylinder Molds

Lightweight, impact resistant construction. Will not crack, rust or deform. Can be reused up to 100 times. Comply with ASTM specifications. 1/4" (6.2mm) wall thickness. Sold individually.

6" x 12" (152 x 305mm)	Meets ASTM specifications. 1/4" (6.2mm) wall thickness. Sold individually.	H-3043.6
4" x 8" (102 x 203mm)	Meets ASTM specifications. 1/4" (6.2mm) wall thickness. Sold individually.	H-3043.4

Cardboard, Single-Use Cylinder Molds

Waxed cardboard molds with flat bottoms. Comply with ASTM C31, C39, C192, C470, C496; and AASHTO T22, T23, T126, T198

6" x 12" (152 x 305mm)	Carton of 24, oversize shipping charges apply	H-3040
4" x 8" (102 x 203mm)	Carton of 50, oversize shipping charges apply	H-3037
3" x 6" (76 x 152mm)	Carton of 50, oversize shipping charges apply	H-3038
2" x 4" (51 x 102mm)	Carton of 50	H-3039

Tamping (Puddling) Rod— H-3650

Round, straight steel rod measures 5/8" (16mm) dia. x 24" (610mm) long. Ship wt. 2 lbs. (0.9kg)

Tamping (Puddling) Rod— H-2905.1

Round, straight steel rod measures 3/8" (9.5mm) dia. x 12" (305mm) long. Ship wt. 2 lbs. (0.9kg)

Mold Strippers

H-3041S— T-Handle-style mold stripper, splits single-use cylinder molds for cylinder removal.

H-3041SMA— Screwdriver-style mold stripper, splits single-use cylinder molds cylinder removal.



Vibrating Table, 115V, 60Hz— H-3755

Vibrating Table, 230V, 60Hz— H-3755.2F

Vibrating Table, 230V, 50Hz— H-3755.5F

Cushioned impact vibrating table with load capacity of 300 lbs. (136.1kg) is used to vibrate beam forms, cylinder molds, concrete products and soil specimens. Table deck is 20 x 20" (508 x 508mm). Table vibrates at 3600 vpm. Amplitude or power of vibration is regulated by means of a rheostat in the electrical control circuit. Not supplied with cord and plug due to high wattage consumption requirements—must be connected through electrical conduit and fittings. Complies with ASTM C31, C192. Shipping wt. 115 lb (52kg).

Vibration Indicator, Tachometer Type— H-3753

Precision tachometer is pen size to allow accurate readings even on hard-to-reach equipment. Scale gives readings from 2,000 to 21,000

Vibration Indicator, Visual Type— H-3754A

Visual indicator gives accurate reading of amplitude of vibration so vibrating table may be adjusted.

Laboratory Vibrator—

115V, 50/60Hz 7 amps 1ph— H-2999

230V, 50/60Hz 3.6 amps 1ph— H-2999.4F

Lightweight square-head model is used for vibrating concrete test cylinders and molds in the laboratory or field. Unit is flexible-shaft type, powered with 3/4 HP electric motor. Shaft is 24" (610mm) long; vibrating head is 1" sq x 13" L (25 x 330mm) with a speed of 10,000 vpm. Complies with ASTM C31, C138, C192. Shipping wt. 12 lbs. (5.5kg)

6" Test Cylinder Transport Rack— H-2970.1

Test Cylinder Transport Rack securely holds (8) 6" x 12" cylinders in a lightweight and durable frame, which can be secured to a truck bed or used in conjunction with the Field Curing Chest listed below. Open center position is available for heater. Will not rot or rust. Rack is 23 1/2" square by 9" high. Shipping wt. 35 lbs. (15.9kg)

4" Test Cylinder Transport Rack— H-2970.2

Test Cylinder Transport Rack similar to above, but securely holds (16) 4" x 8" cylinders. Rack is 23" square by 7" high. Shipping wt. 9 lbs. (4.1kg)

Field Curing Chest— H-2970A

Field Curing Chest offers the user with an affordable approach to store, transport and cure concrete test cylinders. The chest consists of a 24" x 24" x 14" (610 x 610 x 356mm) zipper-sealed polymer and vinyl chest with 1/2" (12.7mm) insulating foam. The unit can accept up to nine 6" x 12" concrete cylinders. Shipping wt. 15 lbs. (6.8kg)

Cylinder Carrying Rack— H-2977C

Carrying rack for 4" x 8" test cylinders. Durable, molded plastic construction with molded handles for easy and safe transportation. Easily Carry 8 cylinders at a time in this plastic carrier, which will not deteriorate or corrode in water. Allows you to keep companion cylinders together in same case for curing. Shipping wt. 4lbs (1.8kg)

Cylinder Curing Racks (6 racks)— H-2977S.6

Cylinder Curing Racks (12 racks)— H-2977S.12

Durable, plastic cylinder curing racks provide a stable and open air flow design for storing cylinders during curing. The racks are manufactured from recycled plastic materials to resist moisture, abrasion, as well as chemical and temperature variations. Each rack has built-in handles for easy carrying. Each rack holds (4) 4" x 8" cylinders and the interlocking racks can be stacked 12 high (58"). Shipping wt. 7lbs (3.1kg)/15 lbs. (6.8kg)



Deluxe Concrete Curing Box, 110V, 50/60Hz— H-2968

Lightweight, portable—74 lbs. (33.6kg)— curing box for concrete cylinders. Plastic construction is rugged, durable and rustproof. Up to 22 standard 6" x 12" (152 x 305mm) test specimens can be stored at 72 ±2°F (22.2 ±1.1°C) over an ambient range of -10 to 100°F (-23 to 37.8°C). Sturdy, 14-gauge steel bottom rack provides optimum water circulation for even curing. Bottom valve for fast drainage. Lockable lid resists tampering. Requires minimum 15 amp circuit. Deluxe model includes recirculating water temperature control unit with temperature set buttons, indicating lights and digital readout for water temperature. Complies with ASTM C192, C511, C31; AASHTO M201, T126, T23.

Not available in 220V 50/60Hz. Shipping wt. 200lb. (90.9kg), Shipping Dimensions L76" x W28" x H29" (193 x 71 x 73.6cm)

Concrete Curing Box, 110V, 50/60Hz— H-2967

Same as above except that it only has heating controls, though cooling can be achieved by cool water recirculation if available. Includes adjustable heating control and dial thermometer.

***Not available in 220V 50/60Hz.** Shipping wt. 120lb (54.5kg) Shipping Dimensions L64" x W28" x H29" (162.5 x 71 x 73.6cm)

Heater/Circulator, 110V, 50/60Hz, 9 amp— H-2988

Heater/Circulator, 220V, 50/60Hz, 5 amp— H-2988.4F

Analog controller with proportional temperature control and low liquid safety. Suitable for use with any tank or jar-style bath to create a highly accurate constant temperature circulating system from 5°C above ambient to 100°C. Minimum immersion depth 3" (8cm), maximum immersion depth 7" (17cm). Clamp-on style fits up to 1-3/16" (3cm) wall thickness, or rod type lab stand. All stainless steel construction. Two-speed (7 or 15 liters/min.) pump minimizes turbulence in small tanks, maintains greater uniformity in large tanks. Adjustable flow director accepts 1/2" (13mm) ID tubing for external circulation. Includes thermometer. 6 x 5 x 13" (152 x 127 x 330mm). Shipping wt. 10 lbs (4.5kg)

Curing Tank Circulator, 110V, 60Hz— H-2985

Curing Tank Circulator, 220V, 50/60Hz— H-2985.4F

Silent submersion pump is 1/160HP (30W) with 120 GPH rating at 1ft. (30cm) height. Circulation from the 1/4" (6.4mm) MNPT discharge may be aimed; simply place the housing on any of five sides. Flow also may be directed using elbow connector (included) or by attaching extension tubing. Working parts are lubricated and sealed for life in glass-filled nylon housing with flush inlet. Features 6ft. (1.8m) grounded cord.

Metal Curing Tanks— H-2961 Series

Useful for curing cylinders, beams and material needing total immersion in laboratory or the field. Tanks are constructed from 20GA. galvanized steel. Tanks have side walls, which are deeply corrugated and made from one piece, having only one side seam. All joints are assembled with elastic packing and rivets. Rolled into the metal at top of the tank is a steel pipe, forming a rigid top that will not break or get out of shape. Larger tanks are supplied with top angle brace. Comply with ASTM C192; AASHTO T127.

Capacity gal (L)	Width ft (m)	Depth ft (m)	Length ft (m)	Weight lbs (kg)	Models
95 (360)	2 (.6)	2 (.6)	4 (1.2)	55 (25)	H-2961
142 (538)	2 (.6)	2 (.6)	6 (1.8)	80 (36.3)	H-2961.1
300 (1136)	3 (.9)	2 (.6)	8 (2.4)	120 (54.4)	H-2961.2

Poly Curing Tank, 3' x 2' x 8'— H-2969.8

Poly Curing Tank, 2' x 2' x 6'— H-2969.6

Poly Curing Tank, 2' x 2' x 4'— H-2969.4

Durable seamless design resists breakage. All round-end tanks have an extra heavy duty, molded rim and an extra -deep sidewall rib design for additional strength. Heavy duty, molded-in aluminum drain fitting and 1-1/4" poly drain plug ensure a long-life. Tested to -20° F, corrosion-free impact resistant and recyclable. Premium UV Protection assures long life and resistance to color fade in outdoor use. Six-foot tank weighs 49lbs, and 4-foot tank weighs 30lbs.

Precision Tank Heater, 110V, 50/60Hz— H-2986A

Precision Tank Heater, 230V, 50/60Hz— H-2986A.4F

Designed for efficient and economical indoor operation with H-2961 series curing tanks where temperature does not fall below 55°F (13°C). Temperature is thermostatically controlled and adjustable. The 1,000W, 8.3 amp, 120V solid-state controlled element will warm to a maximum of 200°F. Heater is Incoloy sheathed to prevent rust and is secured to aluminum base. Base provides protection for heater components from test cylinders in the tank. Overall length: 22-1/2" (57cm). Shipping wt. 6 lbs. (2.7kg)



Fogging Fan, 115V, 50/60Hz— H-2734

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

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

Included with unit is an: adjustable-angle hanging bracket; visual flowmeter panel with strainer, 12 ft. SJO indoor/outdoor, heavy-duty power cord; 20 ft. Poly-Flo water line tubing; 16 ft. water drainage line; 100% stainless steel hardware, and easy-to-follow operator's manual. Shipping wt. 48 lbs. (22kg)

Fogging Fan, 240V 50/60 Hz— H-2735.5F

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

Accessories for H-2734 and H-2735.5F fans

- Economy Mobile Floor Stand— H-2734.1
- Ceiling Support— H-2734.2
- Wall Mount Support— H-2734.3
- 24-Hour Timer Control (110-250 Volt 50/60Hz)— H-2734.4
- Humidistat Control (110-250 Volt 50/60Hz)— H-2734.5

Master Humidifier, 110V, 50/60Hz— H-2914

Unit is recommended for humidifying comparatively large areas, evaporating a maximum of 5 lbs. (approximately 6/10 gal) of water per hour. Reservoir is copper; unit includes adjustable brass water float for operation on variable water pressures up to 75 lbs. (334N). Sealed to protect it from water, motor section drives both disc and pump tube to produce vapor without heat. Overall dimensions: 14-1/2" dia. x 10-1/2" height (368 x 267mm). Shipping wt. 22 lbs. (10kg)

Humidistat Controller, 110V, 50/60Hz— H-2915

Measures moisture in air of room or space in which it is installed. Automatically controls H-2914 Master Humidifier to achieve desired indoor relative humidity. Shipping wt. 2 lbs. (1kg)

Fine Mist, Fogging Fan (Bench-Type), 110V, 50/60Hz— H-2737

Fine Mist, Fogging Fan (Hanging-Type), 110V, 50/60Hz— H-2738

The H-2737 Bench-Type Fogging Fan is a quiet and dependable fogging fan, perfectly suited for the small curing rooms. The H-2737 conveniently sits on flat surfaces or shelves and is extremely easy to set up and operate. The nozzle-free fan can atomize ordinary water supplies into a very fine mist-like-fog, as well as pond water without the risk of clogging. Utilizing high-speed centrifugal force and air flow, these units can propel a misty-fog stream up to 20 feet away. The H-2737 is engineered to withstand humid conditions as high as 100% relative humidity. Units are constructed of impenetrable components like Nema 4 boxes and connections, all 304 stainless steel hardware, UV stabilized polyethylene housing and precision, high strength injection molded polypropylene components. Units also reuse their condensation waste water, eliminating the need of a near by drain. Bench Top units fill automatically by means of an internal float valve and come equipped with a simple garden hose connection. A quarter-turn valve controls the fogging output.

Similar to the H-2737, the H-2738 is a direct-feed, hanging unit, which receives liquid directly through a visual flowmeter control panel. This provides for fine "repeatable" control of the fogging output, as well as enhancing dependability by eliminating sump components. Direct Feed units are well suited for harsher environments or applications where standing water in a sump could become an issue. Each unit is equipped with a 5 GPH (20-300cc/min) flowmeter panel and 12' condensation drainage line. **Not available in 220V 50/60 Hz.**

H-2737 and H-2738 Specifications	
Fogging Capacity	0-3 Gallons per hour
CFM Rating	1,125 Cubic feet per minute
Energy Consumption	1.5 Amps @ 115V
Noise @ 10 ft.	62 dB(A)
Weight	10.5 lbs
Dimensions	16" in Diameter x 16" in length
Voltage	110-128 Volts, 60Hz, 1ph
Coverage	About 500 sq. ft.

Accessories for H-2737 and H-2738 fans

- Economy Mobile Floor Stand— H-2734.1
- Ceiling Support— H-2734.2
- Wall Mount Support— H-2734.3
- Humidistat Control (110-250 Volt 50/60Hz)— H-2737.1
- Thermostat Control (110-250 Volt 50/60Hz)— H-2737.2
- Cycle Timer Control (110-250 Volt 50/60Hz)— H-2737.3
- Mini 360° Oscillator For H-2738, (115 Volt 50/60Hz)— H-2737.4



Temperature/Relative Humidity Logger with Temp./Humidity Probe— H-2732

This temperature and relative humidity data logger is housed in a robust, waterproof (IP68-rated) case, which is designed for use in harsh applications like cylinder curing rooms. This unit features a temperature and relative humidity probe with a 1.5m cable length. The relative humidity probe features a coated RH sensor that shows good resistance to moisture and condensation, ensuring measurement reliability. The H-2732 data logger has a high reading resolution and accuracy, provides a 32,000 readings capacity, a fast off-load speed and a low battery monitor. Data is downloaded to a computer for viewing, reports and archiving. Data stored on the logger will be retained after a battery is replaced. See tables below for specific logger specifications. **Requires H-2736.SW software and a download cable for operation.**

Temperature/Relative Humidity Logger— H-2736

This self-contained, temperature and relative humidity data logger is housed in a robust, waterproof (IP68-rated) case, which is designed for use in harsh applications like cylinder curing rooms. This unit features a coated RH sensor that has good resistance to moisture and condensation, ensuring measurement reliability. The H-2736 data logger has a high reading resolution and accuracy, provides a 32,000 readings capacity, a fast off-load speed and a low battery monitor. Data is downloaded to a computer for viewing, reports and archiving. Data stored on the logger will be retained after a battery is replaced. See tables below for specific logger specifications. **Requires H-2736.SW software and a download cable for operation.**

H-2732 and H-2736 Specifications	
Total Reading Capacity	32,000
Memory Type	Non-volatile 64K memory chip
Reading Types	Actual, Min, Max
Delayed Start	Relative / Absolute (up to 45 days)
Trigger Start	Magnetic Switch (H-2736.3)
Alarms	2, fully programmable
Stop Options	When full, After "n" Readings Never (overwrite oldest data)
Operational Range	-40°C to +85°C (-40°F to +185°F)
Battery	User-replaceable Lithium
Dimensions	Height 34mm / 1.34" Width 57mm / 2.25" Depth 80mm / 3.15"
Weight	110g / 3.9oz

Temperature/Humidity Logger Software— H-2736.SW

Explorer Software for operating H-2736 and H-2732 data loggers. This Windows-based program is simple and intuitive to use, allowing users to easily manage both Tinytag loggers and recorded data. A simple to use launch page that allows easy editing of a data logger's settings, while at the same time summarising them clearly. When offloaded, recorded data is initially presented as a graph but can also be displayed as a table of readings if required. These views are supplemented with an information view, that summarizes details of the data being shown, and a daily minimum/maximum view. Data can easily be exported from all four views into MS Excel and Word, either as a file or by simply copying and pasting. The software supports multiple languages, and there is also a comprehensive, illustrated help file to take the user through the basics of the software, and its more advanced features. Site licences are available for multiple installs.

Download Cable, Serial— H-2736.1

A serial PC download cable for use with H-2736 and H-2732 data logger.

Download Cable, USB— H-2736.2

A USB PC download cable for use with H-2736 and H-2732 data logger.

Trigger Start Magnet— H-2736.3

A magnet for starting loggers that have been set up for a trigger start.

Stevenson-type Screen Enclosure— H-2736.4

The Stevenson type screen, or instrument shelter, shields data loggers against precipitation and direct heat radiation from outside sources, while still allowing air to circulate freely around it.

H-2732 and H-2736 Temperature Specifications	
Sensor Type	10K NTC Thermistor
Reading Range	-13 to 185°F (-25 to 85°C)
Response Time	25 mins to 90% FSD in moving air
Resolution Accuracy	0.01°C or better

H-2732 and H-2736 Relative Humidity Specifications	
Sensor Type	Capacitive
Reading Range	0 to 100% RH
Accuracy	±3.0% at 77°F (25°C)
Reading Resolution	Better than 0.3% RH
Sensor Location	Externally mounted
Response Time	10 seconds to 90%



Thermo Recorder, Temperature/Humidity Logger— H-2743

The Thermo Recorder is a data logger capable of measuring, displaying and recording temperature and humidity. It features one temperature channel and one humidity channel. The measuring accuracy of $\pm 2.5\%RH$ enables more precise measurements and allows for measurement within a wider range. The data recorded into the unit can then be downloaded quickly via USB communication cable to your computer whereby with the exclusive software you can easily process the data into graphs, tables, save to files and/or print it out to help you analyze the data collected.

- Humidity Measuring Range: 0 to 99%RH. The H-2743 with the sensor included in this package can simultaneously measure and record temperature in a range of -30 to 80°C and humidity in a range of 0 to 99% RH.
- Data Recording Capacity: 8,000 readings \times 2 channels. One channel can record and hold up to 8,000 measurement readings. At the longest recording interval of 60 minutes, recording can continue consecutively for one year.
- Low energy consumption design gives you ten months of continuous operation with only one AA alkaline battery. This enables measuring and recording over long periods of time.

Extension Cable for Thermo Logger— H-2743.1

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

Circular Chart Recorder (°F), 120V 60Hz— H-2735F

Circular Chart Recorder (°C), 120V 60Hz— H-2735C

Circular Chart Recorder (°F) 220V 50/60Hz— H-2735F.4F

Circular Chart Recorder (°C) 220V 50/60Hz— H-2735C.4F

This chart recorder provides reliable and rugged trend reporting with the ability to measure 3 different temperature ranges and 4 recording speeds (6 or 24 hr. and 7 or 31 days). Large LED display shows sensor temperature and all controls are located on the front panel. Unit can be free standing or wall mounted. Battery backup provides operation during power interruptions. Comes with 2 cartridge pens and 60 assorted charts. Sensor is not designed to be fully immersible.

Masonry Saw, 230V 60Hz— HC-2970.2F

Masonry Saw, 230V 50Hz— HC-2970.5F

Saw for use in cutting concrete and mortar cylinders and blocks. Blade capacity is 20" (508mm), which allows a cutting depth of 8" (203mm). Capable of cutting 8" x 8" x 16" block. Unit features a 3hp 230 60hz 1ph Baldor motor. The saw has only two pivot points for reduced saw maintenance and longer diamond blade life. The cutting head pivots on bearings, which are sealed and lubricated for life requiring no greasing. Its ergonomically designed steel handle with molded grip bolts securely into place and the Sta-level® blade guard keeps the blade guard parallel to the cutting table for accurate cuts. Height can be controlled with a convenient crank control on foot pedal. Blade not included, order below.

Masonry Saw Blade, 20"— HC-2971

High-quality, 20" fast cutting blade for a variety of materials. Designed for dry or wet cutting. The segment height is .275", segment thickness is .125". Shipping wt. 17 lbs. (8kg)

Silent Runner Saw Blade, 20"— HC-2972

A diamond blade for medium to large jobs and maximum production at a low cost per cut. It features a laminated core for maximum noise reduction. The segment height is .390", segment thickness is .14". Shipping wt. 56 lbs. (25kg)



Charts for Chart Recorder

Description	Range	Model
6" w/display	50 to 120°F, -20 to 50°F, -40 to 30°F	H-2735F
6" w/display	10 to 50°C, -30 to 10°C, -40 to 0°C	H-2735C
6" 7-Day Chart	50 to 120°F	H-2735F.1
6" 24-Hr. Chart	50 to 120°F	H-2735F.5
6" 7-Day Chart	10 to 50°C	H-2735C.1
6" 24-Hr. Chart	10 to 50°C	H-2735C.5
SST Probe w/ lead		H-3185RT.1
Pen for H-2735	one black pen	H-3185.3A



H-2966B



H-2962


Production Cylinder-end Grinder, 120V 60Hz— H-2966B
Production Cylinder-end Grinder, 220V 50Hz— H-2966B.5F

The H-2966B, manually-operated production cylinder-end grinder is designed for medium production laboratories, who need a fast and precise method of preparing cylinders for compression testing. The machine's small footprint makes it perfect for most labs where space is at a premium, and, its virtually maintenance-free operation will be appreciated by the typical busy lab. The H-2966B production grinder is capable of preparing approximately 20 cylinders per hour for testing. It can handle 4" x 8" and 6" x 12" cylinders with equal ease and provide them plane and parallel within ASTM C617 tolerances. The grinder removes material at a rate of 1/32" (0.8mm) per pass, and is capable of quickly handling multiple passes while maintaining its preciseness.

The H-2966B comes complete with a simple and reliable water recirculation system. The machine requires minimal maintenance.

- Grinds the faces of concrete cylinders plane and parallel to within ASTM C617
- One pass of the diamond wheel is usually sufficient
- Compression testing can commence immediately after grinding without the use of capping materials
- Eliminates fumes and waiting time associated with capping compound

Diamond Cutting Wheel Replacement— H-2965.1


H-2966B Specifications	
Sample Size	4" x 8" (102 x 203mm) 6" x 12" (152 x 305mm) cylinders
Cut Precision	Plane and Parallel to within 0.002" (.05 mm)
Cutting Feed	Manual—right hand operation
Cutting Head	Diamond wheel
Cutting Speed	3800 rpm
Dimensions	30" D x 24" H x 22"W (764 x 610 x 559mm)
Shipping wt.	275 lb (125 kg) 

***Automatic Cylinder End Grinde, 120V 60Hzr— H-2962**
Automatic Cylinder End Grinder, 220V 50Hz— H-2962.5F

Our automatic grinder quickly grinds specimen ends plane and parallel. This unit can grind three (3) 4" x 8" (100mm x 200mm) test cylinders or two (2) 6" x 12" (150mm x 300mm) test cylinders simultaneously. The adaptor for 4" x 8" (100mm x 200mm) test cylinders is easy to install on the table and requires no assembly. The machine is mounted on wheels for easy moving. Safe access to components allows for easy maintenance. The grinder's aluminum frame and stainless steel exterior assure both resistance to corrosion and light weight.

- Grinds planeness and parallelism of test cylinder ends in accordance to ASTM standards C31, C39, C192, and C617
- Planeness accuracy: 0.002" (0.05mm)
- Grinding time 90 to 120 seconds per end
- Ready to use for 4" x 8" (100mm x 200mm) test cylinders and 6" x 12" (150mm x 300mm) test cylinders
- Selectable advance speed for 4" or 6" cylinders
- Automatic bi-directional radial displacement of the table
- Aluminum Frame
- Stainless steel outer shell
- Splash guard reduces user exposure to water and dust
- Easy access to water inlet and outlet
- Diamond-grinding wheel included
- **Optional adaptor required for 3" x 6" (75mm x 150mm) test cylinders, order H-2962.2**

Diamond Cutting Wheel Replacement— H-2962.1

H-2962 Specifications	
Sample Size	4" x 8" (102 x 203mm) 6" x 12" (152 x 305mm) cylinders
Cut Precision	Plane and Parallel to within 0.002" (.05 mm)
Cutting Feed	Manual—right hand operation
Cutting Head	Diamond wheel
Cutting Speed	90 to 120 seconds per end
Dimensions	52 1/2" x 24" x 37" (1334 x 610 x 940mm)
Shipping wt.	500 lbs (235kg) 



Concrete Micrometer— H-2938

Designed for accurately measuring diameters of concrete cylinders, micrometer has spindles of hardened steel. Thimble and sleeve sections are chrome finish and have black graduations and numbers. Instrument has a range of 5.5 to 6.5 inches; readings can be made to hundredths or thousandths in decimals. Shipping wt. 3 lbs. (1kg)

Core Length Measuring Device— H-2939

For determining concrete core lengths. Device accommodates either 4" or 6" diameter specimens up to 24" long. Allows measurements to be taken at the center of the specimen's upper end, as well as eight equidistant points along the circumference. Measuring rod has graduations 0.10" (2.5mm) apart. Complies with ASTM C174. Shipping wt. 19 lbs. (8.6kg)

Digital Caliper— HC-2817

This 0-20" (0-508mm) digital caliper has 5.9" long jaw blades for use in measuring cylinders. It features a large, easy-to-read LCD digit, rolling thumb wheel; plus control buttons for zero, on/off and inch/mm functions. It provides digital readout to .0005"/0.01mm for error-free reading and an accuracy of ±.0025". Complies with ASTM C174. Shipping wt. 1 lbs. (.5kg)

Precision Diameter Tape— H-2937

Precision Diameter Tape, Metric— H-2937M

Diameter tapes provide a fast, reliable method for measuring the diameter of concrete, soil and asphalt cores and cylinders. One reading provides round and out-of-round diameters within an accuracy of .001" (.03mm) by means of special graduations and vernier scale. All tapes are made from a stainless alloy and are precision engraved to ensure accuracy. Tape has diameter range of 2" to 12" (50 to 300mm). Includes certificate of calibration. Tapes are calibrated and include a NIST-traceable certification. Complies with ASTM D2166, D2850, D4767, BS 1377:8. Shipping wt. 1 lbs. (.5kg)

Cylinder Carrier (Cradle Type)— H-2945

Steel cylinder carrier is plated to resist rust. Used to carry 6" (152mm) dia. concrete cylinders in field or laboratory.

Cylinder Carrier (Gripper Type)— H-2945G

Employs a hand-grip pincer action to secure standard 6" (152mm) dia. cylinders.

Cylinder Carrier (Gripper Type)— H-2945G-4"

Employs a hand-grip pincer action to secure standard 4" (102mm) dia. cylinders.

4" Concrete Cylinder Wrap— H-2900.4

6" Concrete Cylinder Wrap— H-2900.6

Used to minimize fragment scattering and reduce cleanup time after the compression test. Made of canvas/nylon with Velcro fastening strips.

Sample Cart— H-2944

For use in handling concrete beams and cylinders, plus soil and aggregate samples in the lab or field. Ready to assemble. Cart has pan-type rolled-edge 3-1/2" (89mm) deep steel shelves. Top shelf reverses to flat working surface. Features 5" (127mm) dia. rubber casters; front casters swivel for easy steering. Dimensions: 24" x 36" x 32" (61 x 91 x 81cm). Assembly required. Shipping wt. 43 lbs. (19.5kg)

Welded Sample Cart— H-2943

Premium-grade all-welded cart has 800-lb. capacity. Features 5 x 1-1/4" casters mounted to cross-channel bolster plate for added support, convenient offset handle and 36" x 24" (914 x 609mm) tray size. Smooth finish; no rough edges. Shipped assembled. Shipping wt. 75 lbs. (34kg)



Vertical Cylinder Capper— H-2952

For capping 6" dia. x 12" high (152 x 305mm) concrete test cylinders when making compression tests. Simplifies capping process by assuring plane end surfaces are right angles to the axis of the cylinder. The upright is a guide for positioning the cylinder. Molten capping compound is poured into the mold (plate); then cylinder is placed on the capping material. After the compound is set, the capped cylinder is removed for testing. All types of capping compounds can be used with this apparatus. Capping plate is machined and finish-ground from cold-rolled steel to within .002" (.05mm) planeness. Thickness of the capping plate is 3/4" (19mm), to allow regrinding and refinishing after considerable usage should the plate become gouged. Capping plates are round, allowing circular rotation during use that results in uniform wearing down of contacting surfaces for maximum length of service. The frame is machined from high-strength aluminum alloy. Complies ASTM C31, C39, C192, C617; AASHTO T22, T23, T126, T231. Shipping wt. 27 lbs. (12.3kg)

Capping Plate— H-2952.3

Replacement ring and bottom plate for H-2952 vertical cylinder capper. Shipping wt. 16 lbs. (7.3kg)

Vertical Cylinder Capper— Universal

For 2" dia x 4" (51 x 102mm) Specimens— H-2925A

For 3" dia x 6" (76 x 152mm) Specimens— H-2925B

For 4" dia x 8" (102 x 203mm) Specimens— H-2925C

Base and capping plate are machined from cold-rolled steel. Capping plate is finish-ground within .002" (.05mm) planeness. Guide is machined from high-strength, cast-aluminum alloy. Shipping wt. 18 lbs. (8.1kg)

Capping Plates—

For 2" dia x 4" (51 x 102mm) Specimens— H-2925A.1

For 3" dia x 6" (76 x 152mm) Specimens— H-2925B.1

For 4" dia x 8" (102 x 203mm) Specimens— H-2925C.1

Replacement top and bottom plates for H-2925 vertical cylinder capper.

Durometer Ranges

50 Durometer: 1500 to 2200 psi (10.3 to 15.1MPa)

60 Durometer: 2500 to 7000 psi (17.2 to 48.2MPa)

70 Durometer: 4000 to 12000 psi (27.5 to 82.7MPa)

Econ-o-Cap

Precision-machined high-alloy steel retaining caps hold compression pads that fit over the ends of a concrete cylinder. Compression pads are made from tough elastomeric material that evens out irregularities, distributing the test load uniformly to ensure consistent breaks. Includes (2) caps and (2) pads. Meets ASTM C1231; AASHTO T22, T851.

Econ-o-Cap Cylinder Pad Sets	Part #
2" Econ-o-Cap Set	H-2946A
3" Econ-o-Cap Set	H-2946B
4" Econ-o-Cap Set	H-2946C
6" Econ-o-Cap Set	H-2946D

Includes a set of rings (2) and a set of pads (2).

Individual Econ-o-Cap Cylinder Pads	Part #
2" Pad, 60 Durometer	H-2946ACP60
2" Pad, 70 Durometer	H-2946ACP70
3" Pad, 50 Durometer	H-2946BCP50
3" Pad, 60 Durometer	H-2946BCP60
3" Pad, 70 Durometer	H-2946BCP70
4" Pad, 50 Durometer	H-2946CCP50
4" Pad, 60 Durometer	H-2946CCP60
4" Pad, 70 Durometer	H-2946CCP70
6-1/8" Pad, 50 Durometer	H-2946DCP50
6-1/8" Pad, 60 Durometer	H-2946DCP60
6-1/8" Pad, 70 Durometer	H-2946DCP70
6-3/16" Pad (Old Style), 50 Durometer	H-2946DOCP50
6-3/16" Pad (Old Style), 60 Durometer	H-2946DOCP60
6-3/16" Pad (Old Style), 70 Durometer	H-2946DOCP70

Sold individually

Individual Econ-o-Cap Cylinder Rings	Part #
2" Econ-o-Cap Replacement Ring	H-2946AR
3" Econ-o-Cap Replacement Ring	H-2946BR
4" Econ-o-Cap Replacement Ring	H-2946CR
6" Econ-o-Cap Replacement Ring	H-2946DR

Sold individually





H-2953



H-2951 Kit



H-2959



H-2958



H-0735

Compound Melting Pots

Designed for melting capping compound, paraffin and similar materials, compound melting pots feature adjustable thermostat to deliver close temperature control automatically from 100° to 320°F (37.8 to 160°C). Includes cover, pilot light, 6' (1.8m) 3-conductor grounded cord set. Inner pot is cast aluminum encased in a metal jacket with fiberglass and air insulation, keeping heat loss to a minimum. Replaceable heating elements are securely clamped to the bottom and sides of the crucible for even heat distribution. Complies with ASTM C617; AASHTO T231. Shipping wt. 10-30 lbs. (5-14kg)

Compound Melting Pots

Capacity	Amps	Shipping Wt.	Model
4 qt.	6	13 lbs	H-2953 (120V 60Hz)
3.8L	3	5.9 kg	H-2953.4F (220V 50/60Hz)
8 qt.	10	27 lbs	H-2954 (120V 60Hz)
7.6L	5	12.3 kg	H-2954.4F (220V 50/60Hz)
12 qt.	11	29 lbs	H-2955 (120V 60Hz)
11.4L	5.5	13.2 kg	H-2955.4F (220V 50/60Hz)
20 qt.	12	32 lbs	H-2948 (120V 60Hz)
19L	6	14.5 kg	H-2948.4F (220V 50/60Hz)
28 qt.	15	38 lbs	H-2949 (120V 60Hz)
26.5L	7.5	17.3 kg	H-2949.4F (220V 50/60Hz)

Vertical Cylinder Capping Kit, 120V 60Hz— H-2951

Vertical Cylinder Capping Kit, 220V 50/60Hz— H-2951.4F

Kit provides the basic components for cylinder capping and includes: (1) H-2945 Cylinder Carrier, (1) H-2952 Vertical Cylinder Capper, (1) H-2953 Compound Melting Pot, (1) H-2957 Capping Compound and (1) H-2958 Ladle. See individual components for descriptions. Complies with ASTM C31, C39, C192, C617; AASHTO T22, T23, T126, T231. Shipping wt. 140 lbs. (63.5kg)

Concrete Capping Compound, Flake-Style— H-2959

50 lb bag of Sauereisen No. 600 sulfur-based, flake-form capping compound melts and sets within minutes. Silica-filled compound has 150 psi bond strength, 9000 psi compressive strength and 605 psi tensile strength. Compound pours between 265 and 290°F (129 to 143°C). Over-heated material's viscosity is reinstated by decreasing temperature to 290°F. Complies with ASTM C307, C321, C386, C579, C617, D71. Shipping wt. 52 lbs. (24kg)

Capping Ladle— H-2958

Stainless steel ladle with 4" (102mm) dia. bowl is used in transferring capping compound from melting pot to capping fixture.

Strength Testing Video CD— H-0735

Video CD that covers ASTM concrete strength testing with presentations and test specific videos that explain and show the step-by-step procedures needed to accomplish each test.

**Compressometer-Extensometer**

Combined compressometer and extensometer for 6" dia. x 12"L (152 x 305mm) concrete cylinders is a convenient unbounded device. Apparatus contains a third yoke located halfway between the two compressometer yokes and attached to the specimen at two diametrically opposite points. Middle yoke is hinged to permit rotation of the two segments of the yoke in the horizontal plane. Indicator gives deformation readings. Second indicator is furnished for compressometer section. Unit measures changes in length and diameter. All H-2900 Series Compressometers may be ordered with dial gauges, digital indicators or strain transducers, see charts. Digital Indicators and strain transducers can be used to construct a data acquisition system, see below. Complies with ASTM C469. Shipping wt. 22 lb (10kg).

Compressometer

The Compressometer is used for evaluating deformation and strain characteristics of concrete cylinders while undergoing compression testing. The Compressometer includes two cast aluminum-alloy yokes, mounting and central points, stainless steel control rods. Models are available with a dial gauge— with a range of 0.2" (5.08mm) and minimum graduations of .0001 (.0025mm), as well as with a digital indicator or a LSCT transducer. Digital indicators and LSCT models can be used with data acquisition systems through the use of our MiniLoggers, see below. Complies with ASTM C469. Shipping wt. 22 lb (10kg).

Compressometer / Extensometer	Dial Gauge	Digital Indicator	LSCT
6" x 12" (152 x 305mm) cylinders	H-2912	H-2912D	H-2912L
4" x 8" (102 x 203mm) cylinders	H-2917	H-2917D	H-2917L
3" x 6" (76 x 152mm) cylinders	H-2919	H-2919D	H-2919L

Compressometer	Dial Gauge	Digital Indicator	LSCT
6" x 12" (152 x 305mm) cylinders	H-2911	H-2911D	H-2911L
4" x 8" (102 x 203mm) cylinders	H-2916	H-2916D	H-2916L
3" x 6" (76 x 152mm) cylinders	H-2918	H-2918D	H-2918L



HM-2325A.3F

HM-2330D.3F

Data Acquisition Setups—

You can fully automate your test data collection by using one of these MiniLoggers with any D or L model listed above. The MiniLogger is a simple-to-use, four channel, stand-alone data-logging system, which can collect data generated from digital indicators or LSCT transducers. Use model HM-2325A.3F for LSCTs and HM-2330D.3F for Digital Indicators.

Features include:

- Four channels with real-time data acquisition
- Backlit LCD display
- RS232 interface for computer or printer.
- Nonvolatile test data storage and instrument calibration
- Battery-backed real-time clock
- Auto conversation of calibration between English/Imperial units and SI/Metric units
- View logged test data via the LCD display

Data Cable for Digital Indicator— HM-4469C

Used with HM-2330D.3F MiniLogger and Digital Indicators.

USB Cable for Digital Indicator— HM-4469USB

Data cable to transfer data from digital indicator to computer.

AC Adapter for Digital Indicator— HM-4469AC

Allows digital indicator to run off AC power.



HCM-4000iD machine with floor stand.

All machines feature, quiet-running, continuous-duty hydraulic pumps



HCM-2500DIR machine with optional floor stand.



Choose from three Digital Load Indicators see page to right for information.



HCM-0135 Cylinder Loading Shelf is available for use with HCM-2500 Series machines.

How to Order:

HCM-4000iD.5F

Machine Series | Load Indicating System (DIR, iD, LXI) | Electrical Configuration

Electrical Configuration:
 110V 60Hz use no suffix
 220V 60Hz use .2F suffix
 220V 50Hz use .5F suffix

DIGITAL LOAD INDICATING SYSTEMS



DIR Digital Indicator— This is a basic, easy-to-use, budget-minded load indicator. The DIR model simultaneously displays both live load and rate of load in force units per second during a test and peak load automatically at the end of a test.

The DIR is one of the easiest-to-use digital load indicating systems available, featuring automatic test reset—eliminating the need to zero between tests—and automatic peak-load display at the end of a test through the pre-set sample-break detector function. The digital's face is set on a 60° angle for easier reading of load values, and the display uses 3/8" (9.5 mm) characters protected by a non glare, scratch-resistant window. Users can select from load-value engineering units of lbs., kN, kg, and N. Designed for years of dependable service, the digital's tactile keys have a life cycle of greater than two million uses, and accuracy is $\pm .5\%$ of indicated load from 1% to 100% of machine capacity, exceeding ASTM C39 and E4 requirements. The calibration program is password protected in permanent, non-volatile memory. The DIR digital has no hardcopy test documentation capabilities.

LXI Digital System GaugeSafe Basic Download Software— HCM-0730

Unlock the power of your testing machine with GaugeSafe. The Windows XP/Vista compatible program will communicate with your testing system via a USB flash (thumb) drive or directly through a USB cable. GaugeSafe Basic will allow you to:

- Edit, Store, Upload/Download Test Methods
- Edit, Store, Upload/Download Calibrations
- Store, View, Print, Test Results and export in ASCII delimited format
- Store Raw Test Data and export in ASCII delimited format

LXI Digital System GaugeSafe Plus Download Software— HCM-0732

Allows you to do all Basic functions plus:

- View, Print, Export XY Plots



iD Digital Indicator— This is the system of choice for those demanding accuracy, ease of operation, test documentation and dependability. The iD Indicator combines an accuracy that exceeds ASTM C39 and E4 requirements and in general is better than $\pm .5\%$ of indicated load from 1% to full machine capacity with a construction designed for the harshest of laboratory applications. All information is clearly displayed on the indicators 4.6" w x 3.4" h (116 x 86 mm) back-lit VGA graphic panel display. Its 320 x 240 pixel screen with adjustable contrast is easily readable in both bright and poor lighting conditions.

During a test, the iD simultaneously displays load, stress and rate of load in the time units selected. At the end of a test it automatically displays peak stress and load, and if activated, the average loading rate applied to the specimen during the test. Large alphanumeric characters display test data in any of the selectable engineering units, force units of lb, kN, kg and N, stress units of psi, MPa, kg/cm², Kpa, size units of in, mm, cm, and time units of seconds or minutes.

Its user-friendly setup menu displays all menu option listings simultaneously, allowing the operator to quickly access the required option, and simply press a key to activate it or enter a numeric value to set the test parameter. This display feature eliminates the time consuming method of scrolling through single line menu displays to find an option or set a function. Its sample type menu lists six common specimen types to select from; cylinder, cube, beam third point and center point, cylinder split in tension and cross-sectional area. Just select and set. Test results can be automatically stored for hard copy documentation.

For test documentation the indicator can be set to automatically store test results for downloading via RS-232 or a USB port w/stick drive to a PC, or for printed reports. Up to 500 tests can be stored to memory and printed in a spreadsheet format. Information includes: Test date and time, sample ID number, sample type, specimen area and length, peak load and peak stress. Optional data includes average rate of load applied to a specimen during a test, cylinder correction factor to C39, cylinder break type, cylinder cap type, sample age and weight, and operator ID number.



LXI Digital Indicator— The LXI Digital is the system of choice for both commercial and in house testing laboratories where ease of operation, accuracy and test documentation is required. During a test, the LXI displays load, stress, rate of load or rate of stress in units of time selected— plus the type of specimen and its size, all simultaneously on the indicator's four line display. At the end of a test it automatically displays both peak stress and load, and if activated, the average rate of load applied to the specimen during the test, with an accuracy exceeding ASTM C39 and E4 requirements.

The user-friendly, scroll-through test setup menu allows the operator to simply select a menu option, enter a yes or no command to activate the option or enter a numeric value to set the test parameter field. A pre-set menu lists five common specimen types to select from; cylinder, cube, beam center, beam third point and cross sectional area, allowing you to select, display and document test data.

All test information is easily read on the indicator's back-lit LCD display, consisting of four lines, each having 20 alphanumeric characters .375" (9.5 mm) in height. Test data can be displayed in any of the selectable engineering units of; Load – lbs., kN, N or Kg, Stress – psi, MPa, Kpa or kg/cm², Size – in, mm or cm and Time – seconds or minutes. A durable membrane keypad is used to select and set all menu functions.

Accuracy exceeds ASTM C39 and 4 requirements and in general is better than $\pm .5\%$ of indicated load from 1% to full machine capacity. For hard copy test documentation, up to 1,000 tests can be stored in memory and printed directly on a parallel port printer or transferred to a PC through a standard USB port. The system also features the X-Y plotting of a load. To transfer stored test results to a PC, the optional Wincom or Wincom Plus data communications transfer program is required. The Wincom Plus program includes the added feature of allowing raw X-Y data to be transmitted directly to a PC for generating a Load/ Stress vs. Time graph. Up to 10 individual graphs stored in the PC can be plotted on a single report page.

An optional piston travel speed indicator package is available, that when activated displays travel rates in either in, mm or cm per second or minute.

HCM-2500 Series

- Perfect machine for labs, contractors and even mobile labs
- Accuracy of $\pm 0.5\%$ of indicated load from 2,500–250,000 lbs. (11–1,112 kN)
- Choice of 3 digital load-indicating systems (see page 112)
- Quiet-running, continuous-duty hydraulic pump
- Supplied with platen set for 6" (150 mm) cylinders using unbonded or sulfur-capping method

The HCM-2500 has all the features you look for in a basic compression testing machine: ruggedness, accuracy, compactness, versatility, and dependability, making it the ideal choice for either field trailer or laboratory testing operations. It is well suited for testing 6" x 12" (150 x 300 mm) concrete cylinders with strengths up to 7,000 psi (48.2 Mpa), or with optional platens, low strength beams. The load frame features a wrap-around box construction with each corner fully welded on both the inside and outside crosshead seams, providing the rugged stability needed for accurate and repeatable test results year after year. The machine's eye-level digital indicator, loading-control valve, and hydraulic pump are positioned on the right side of the load frame for easy access, increasing productivity, and safe operation. Featuring superior rate-of load control, its unique quiet-running, continuous-duty hydraulic pump and pressure-compensated loading-control valve are manufactured to ISO 9001 international quality standards. Exceeds ASTM C39, E4 and AASHTO T22 specifications.

Stand is optional, order HCM-0200, if desired.



HCM-3000 Series

- Accuracy and testing range of $\pm 0.5\%$ of indicated load from 1% to full machine capacity
- Quiet-running, continuous-duty hydraulic pumps
- Rigid load frames exceed ACI 363 frame-elongation requirements
- Choice of 3 digital load-indicating systems (see page 112)

The HCM-3000 features a rigid load frame that exceeds ACI 363 frame elongation requirements, a wide accuracy range, easy-to-use digital load indicating systems and increased testing capacity making it one of the most versatile and affordably priced compression testing machines available in its class. Its wide accuracy range allows you to test everything from 9,000 psi (62 MPa) 6" x 12" (150 x 300 mm) cylinders, to standard 6" (150 mm) concrete beams in one machine. The HCM-3000 is built to last. Comparing its many proven design features to those of lighter competitive machines, you will find that the HCM-3000 utilizes a fully-welded, unique, wrap-around frame design with crossheads that are 25% thicker than competitors, as well as a larger diameter piston with a longer stroke plus a dust shield, a thicker lower platen, hardened to HRC 55 or greater and steel fragment guard doors.

Stand is optional, order HCM-0300, if stand is desired.



HCM-4000 Series

- Accuracy and testing range of $\pm 0.5\%$ of indicated load from 1% to full machine capacity
- Quiet-running, continuous-duty hydraulic pumps
- Rigid load frames exceed ACI 363 frame-elongation requirements
- Choice of 3 digital load-indicating systems (see page 112)

Designed to meet the demands of production testing laboratories where day-to-day performance is required, all HCM-4000 series machines exceed both ACI 363 frame elongation requirements and ASTM C-39 and E-4 specifications for accuracy. HCM-4000 series machines are available in three different load frame configurations: Standard model height meeting ASTM C-39 specifications, B-models featuring thicker lower platens meeting ASTM C-140 specification for testing a single full sized concrete block, P-models feature an inside vertical frame opening of 26.750" (68 cm) without upper platen installed and thicker lower platen meeting ASTM C-1314 specification for testing two full size concrete blocks in prism. All three-load frame models will test a full range of specimen types. HCM-4000 models feature thicker crossheads than competing designs and a wrap around frame design that extends the frame side members around the front and back of the crossheads, which are fully welded inside and out forming a solid one piece load frame, providing the frame stability needed for repeatable and accurate test results year after year, even when testing high strength concrete.

For easier operation and loading of specimens, all load frames feature a wide horizontal opening and a large lower compression platen for testing up to 12" (305mm) wide concrete block. The lower platen is hardened to 55 HRC or greater, plated for corrosion resistance and has concentric circles for easier centering of test specimens. A dust shield protects the load frames bottom mounted piston and hydraulic seals. Steel fragment guard doors are mounted on both frame openings for operator protection. **Includes mounting stand.**



HCM-5000 Series

- Rigid load frame exceeds ACI 363 frame-elongation requirements
- Accuracy and testing range of $\pm 0.5\%$ of indicated load from 1% to full machine capacity
- Thicker crossheads and side members than competitors'
- Choice of 3 digital load-indicating systems (see page 112)

High-capacity series compression testing machine features rigid distortion-resistant load frame designed to meet the demands of testing high-performance concrete in a production testing program where accurate and repeatable test results are required.

High-strength frame incorporates thicker crossheads and deeper side members than competitors' models. For easier operation and loading of specimens, the frames feature a wide horizontal opening, large lower platen, bottom-mounted piston with dust shield, heavy-duty load-frame mounting stand that positions the lower platen at a convenient height for loading heavy test specimens, and steel front and rear safety guard doors. The lower platen is through-hardened to 55 HRC or greater, ground plane, plated for corrosion resistance, and has concentric circles for easier centering of test specimens.

Includes mounting stand.

A quick-change platen system is available to assist in fast and easy switching of test platens, order: HCM-0190P.



Humboldt Compression Machine Specifications

	HCM-2500	HCM-3000	HCM-4000	HCM-5000
Maximum Compression Capacity	250,000 lbs (1,112kN)	300,000 lbs (1,334kN)	400,000 lbs (1,780kN)	500,000 lbs (2,224kN)
Vertical Opening	19.375 in. (492mm)	18.5 in. (470mm)	18.375 in. (467mm)	18.375 in. (467mm)
Horizontal Opening	9.25 in. (235mm)	9.5 in. (241mm)	13.312 in. (338mm)	14 in. (356mm)
Piston Stroke	2.5 in (63.5mm)	3 in (76mm)	2.5 in (63.5mm)	2.5 in (63.5mm)
Dimensions W x D x H (w/Opt. Stand)	27 x 17 x 56.312 in. (686 x 432 x 1430mm)	31.5 x 17 x 58.8 in. (800 x 432 x 1486mm)	39.9 x 20 x 61.3 in. (1013 x 508 x 1556mm)	30 x 23.75 x 60.63 in. (762 x 603 x 1540mm)
Lower Platen Dimensions	33.2 sq in. (214 sq mm)	9 x 12 in. (229 x 305mm)	12 x 18 in. (305 x 457mm)	13 x 18 in. (330 x 457mm)
Upper Platen Dimensions	6.5 in. (165mm)	6.5 in. (165mm)	6.5 in. (165mm)	6.5 in. (165mm)
Pump	.5 hp* (.4kw)	.5 hp* (.4kw)	.75 hp (.6kw)	.75 hp (.6kw)
Oil Reserve Capacity	2 gallon (7.6 liter)	2 gallon (7.6 liter)	2 gallon (7.6 liter)	2 gallon (7.6 liter)
Electrical Configuration	110V 60Hz 220V 60Hz 220V 50Hz	110V 60Hz 220V 60Hz 220V 50Hz	110V 60Hz 220V 60Hz 220V 50Hz	110V 60Hz 220V 60Hz 220V 50Hz
Shipping Weight	780 lbs (353kg)	975 lbs (442kg)	1620 lbs (734kg)	2500 lbs (1134kg)

*Optional .75 hp motor available.

Block and Prism Compression Machines

- Test block, masonry prisms, pavers, and wall retainer units
- Testing range from 1% to 100% of machine capacity, with an accuracy of $\pm .5\%$ of indicated load
- Accessories for testing a full range of concrete and cement specimens available.

Block Compression Testing machines are available in two load frame configurations for testing single- or two-block masonry prisms of full-sized block up to 12" (304 mm) wide. The heavy-duty load frames use the same proven design and manufacturing process found in all our machines, with a wide horizontal opening and large lower compression platen for easier loading of test specimens. The machine's mounting stand also places the lower platen at a convenient height for easier loading of heavy specimens. The unique lower dual-platen system features a wear platen through-hardened to 60 HRC or greater and is designed for fast and easy maintenance without the need for expensive rental equipment to remove the platen, unlike the cumbersome singleplate systems used in competitive units. Changing test platens and spacers is quick, easy, and safe with our draw rod, used to adjust the load frame's inside vertical working height, and optional carrier bracket system, which features a heavy-duty arm mounted on the rear left corner of the load frame that pivots on two hinged joints. When the block platen is not being used, it can be conveniently stored on the bracket's arm. Includes mounting stand.



shown with optional quick-change platen system

HCM-5000P

Ships with platens and spacers for 6" x 12" cylinders. Order block platen separately

Draw Rods are provided with all Prism Load Frame model machines. The Draw Rod is used by the operator to quickly and easily mount a wide range of test platens and spacers securely to the machines upper crosshead.



Humboldt Block and Prism Compression Machine Specifications

	HCM-4000B	HCM-4000P	HCM-5000B	HCM-5000P
Maximum Compression Capacity	400,000 lbs (1,780kN)	400,000 lbs (1,780kN)	500,000 lbs (2,224kN)	500,000 lbs (2,224kN)
Vertical Opening	18.375 in. (467mm)	26.750 in. (679mm)	18.375 in. (467mm)	26.750 in. (679mm)
Horizontal Opening	13.312 in. (338mm)	13.312 in. (338mm)	14 in. (356mm)	14 in. (356mm)
Piston Stroke	2.5 in (63.5mm)	2.5 in (63.5mm)	2.5 in (63.5mm)	2.5 in (63.5mm)
Dimensions w/ Opt. Stand (W x D x H)	39.9 x 20 x 63.625 in. (1013 x 508 x 1616mm)	39.9 x 20 x 71.625 in. (1013 x 508 x 1819mm)	30 x 23.75 x 60.63 in. (762 x 603 x 1540mm)	30 x 23.75 x 68.875 in. (762 x 603 x 1749mm)
Lower Platen Dimensions	12 x 16 in. (305 x 407 mm)	12 x 16 in. (305 x 407 mm)	12 x 16 in. (305 x 407 mm)	12 x 16 in. (305 x 407 mm)
Upper Platen Dimensions	6.5 in. (165mm)	6.5 in. (165mm)	6.5 in. (165mm)	6.5 in. (165mm)
Pump	.75 hp (.4kw)	.75 hp (.4kw)	.75 hp (.6kw)	.75 hp (.6kw)
Oil Reserve Capacity	2 gallon (7.6 liter)	2 gallon (7.6 liter)	2 gallon (7.6 liter)	2 gallon (7.6 liter)
Electrical Configuration	110V 60Hz 220V 60Hz 220V 50Hz	110V 60Hz 220V 60Hz 220V 50Hz	110V 60Hz 220V 60Hz 220V 50Hz	110V 60Hz 220V 60Hz 220V 50Hz
Shipping Weight	1700 lbs (771kg)	2375 lbs (1077kg)	2800 lbs (1270kg)	2960 lbs (1342kg)




Shown with Optional HCM-0112 2" Platen Set, order separately. Stand is optional with stand-alone models, order HCM-0200, if desired.

HCM-1000 Series

- Machine custom-configured for 2" cube testing
- Accuracy of $\pm 0.5\%$ of indicated load from 2,500 to 100,000 lbs. (11 to 445kN)
- Choice of 3 digital load-indicating systems (see page 112)
- Quiet-running, continuous-duty hydraulic pump

The HCM-1000 is based on our HCM-2500 machine, custom-configured for use as a cube machine. It has all the features you look for in a basic compression testing machine: accuracy, compactness, portability, versatility, and dependability.

The load frame features a wrap-around box construction with each corner fully welded on both the inside and outside crosshead seams, providing the rugged stability needed for accurate and repeatable test results year after year. The load frame is also protected with a unique baked-on, powder-coated painting process for a durable, long-lasting finish that keeps it looking good for years to come. The machine's eye-level digital indicator, loading-control valve, and hydraulic pump are positioned on the right side of the load frame for easy access, increasing productivity, and safer operation. Featuring superior rate-of load control, its unique quiet-running, continuous-duty hydraulic pump and pressure-compensated loading-control valve are manufactured to ISO 9100 international quality standards. Exceeds ASTM C39, E4 and AASHTO T22 specifications.

	HCM-1000
Maximum Compression Capacity	100,000 lbs (445kN)
Vertical Opening	19.375 in. (492mm)
Horizontal Opening	9.25 in. (235mm)
Piston Stroke	2.5 in (63.5mm)
Dimensions W x D x H (w/Opt. Stand)	27 x 17 x 56.312 in. (686 x 432 x 1430mm)
Lower Platen Dimensions	33.2 sq. in. (214 sq mm)
Upper Platen Dimensions	6.5 in. (165mm)
Pump	.5 hp* (.4kw)
Oil Reserve Capacity	2 gallon (7.6 liter)
Electrical Configuration	115V 60Hz 220V 60Hz 220V 50Hz
Shipping Weight	780 lbs (353kg) 




Shown with Optional Flexural Attachment for Beams, order separately. Stand is optional with stand-alone models, order HCM-0200, if desired.

HCM-0030 Series

- Accuracy of $\pm 0.5\%$ of indicated load from 300–30,000 lbs. (1.3–133.5 kN)
- Choice of 3 digital load-indicating systems (see page 112)
- Compact design requires minimal floor space

The HCM-0030 was developed for testing concrete beams where accuracy and maintaining their required load pacing rate is an essential part of the testing procedure. The load frame incorporates solid steel crossheads and four structural steel side members fully-welded together to form a rigid one-piece load frame. The frame's rigidity is further enhanced by our unique method of mounting the hydraulic cylinder/piston assembly through the center of the top crosshead, fully supporting it and eliminating lateral movement of the piston under load extension, for accurate and repeatable test results, unlike the lighter dual post hollow frames used in competitive units.

The frame features a wide horizontal opening and floor-to-lower crosshead height of 26" (66 cm) when mounted on its stand. Optional accessories include test platen sets, spacers and machine mounting stand. Complies with ASTM C-39, E4 and AASHTO T22 specifications.

	HCM-0030
Maximum Compression Capacity	30,000 lbs (133kN)
Vertical Opening	18.5 in. (467mm)
Horizontal Opening	9.25 in. (235mm)
Piston Stroke	2.125 in (54mm)
Dimensions W x D x H (w/Opt. Stand)	28.625 x 16 x 51.5 in. (727 x 406 x 1308mm)
Pump	.5 hp* (.4kw)
Oil Reserve Capacity	2 gallon (7.6 liter)
Electrical Configuration	115V 60Hz 220V 60Hz 220V 50Hz
Shipping Weight	400 lbs (182kg) 

Auxiliary Machine Configuration— HCM-0030RT

Available as an auxiliary load frame mated to a higher capacity machine. The benefit to this would be the cost savings of utilizing the digital indicator and hydraulic system of the host machine. This model includes the stand.

Cylinders	Item	HCM-2500	HCM-3000	HCM-4000	HCM-5000	Ship Wgt.
6 x 12 in.	Platen	Supplied	Supplied	Supplied	Supplied	39 lb/17.7kg
	Spacer	NR	NR	NR	NR	
4 x 8 in.	Platen	Supplied	Supplied	Supplied	Supplied	39 lb/17.7kg
	Spacer	HCM-0612	HCM-0662	HCM-0653	HCM-0653	12 lb/2.5kg
3 x 6 in.	Platen	HCM-0023L	HCM-0023N	HCM-0023	HCM-0023	12.6 lb/5.7kg
	Spacer	HCM-0612	HCM-0661	HCM-0654	HCM-0654	5.5 lb/2.5kg
2 x 4 in.	Platen	HCM-0023L	HCM-0023N	NR	NR	5.5 lb/2.5kg
	Spacer	HCM-0615	HCM-0666	NR	NR	5.5 lb/2.5kg

Supplied: Item comes with machine, NR: Not required

Cubes	HCM-2500	HCM-3000	HCM-4000	HCM-5000
6 in. Set	HCM-0113	HCM-0111	HCM-0116	HCM-0116
shipping wgt.	118 lb/53.5kg	97 lb/44kg	97 lb/44kg	97 lb/44kg
2 in. Set	HCM-0112	HCM-0114	HCM-0115	HCM-0115
shipping wgt.	48 lb/21kg	46 lb/21g	46 lb/21kg	46 lb/21kg

Set includes platen and pedestal. Cube pedestal (11 in.) only, order HCM-0022

Beams	HCM-2500	HCM-3000	HCM-4000	HCM-5000	Ship Wgt.
Flexural Attachment	HCM-0119	HCM-0117	HCM-0119	HCM-0119	156 lb/71kg

Blocks	HCM-2500	HCM-3000	HCM-4000	HCM-5000
Platen Assembly	HCM-0106	HCM-0106.3	HCM-0107P	HCM-0107P
shipping wgt.	300 lb/136kg	300 lb/136kg	450 lb/204.1kg	450 lb/204.1kg

Block set-ups on HCM-2500 and HCM-3000 do not meet ASTM Specifications

Platen carrier bracket for loading platen into 400K machine: HCM-0190SP

Platen carrier bracket for loading platen into 500K machine: HCM-0190P

Split Cylinders	HCM-2500	HCM-3000	HCM-4000	HCM-5000
Splitter Attachment	HCM-0120	HCM-0124	HCM-0123	HCM-0123
shipping wgt.	120 lb/54.4kg	80 lb/36.2kg	80 lb/36.2kg	80 lb/36.2kg

Platen Carrier Brackets—

Changing block platens and spacers is quick, easy, and safe with the carrier bracket, which features a heavy-duty arm mounted on the rear left corner of the load frame that pivots on two hinged joints. When the block platen is not being used, it can be conveniently stored on the bracket's arm.

400K machine: HCM-0190SP

500K machine: HCM-0190P



HCM-0190SP

Draw Rod Assembly— HCM-0802

Designed for quick and easy installation of test platens and spacers. The Draw Rod is used by the operator to quickly and easily mount a wide range of test platens and spacers securely to the machine's upper crosshead. The assembly incorporates an easy-to-turn handwheel with a ball bearing mounting system and a threaded rod. The hand wheel is used to raise and lower the rod inside the load frame. Spacers used for height adjustments slide over the rod and the rod is then threaded into the test platen and tightened against the crosshead.



HCM-0107P



HCM-0120



HCM-0112



HCM-0119



HCM-0113



HCM-0612

Concrete Test Hammers

We only carry the Proceq Concrete Test Hammers. We have found that the Proceq Schmidt hammers are the most accurate and dependable rebound hammers available. Rebound hammers can be used to determine in-place strength of concrete. All the Schmidt hammers below accurately measure compressive strength, which directly determines the load-bearing capacity and durability of concrete structures.

All Schmidt hammers Comply with
ASTM C805, D5873; BS 1881: Part 202;
ISO/DIS8045; ENV 206; IGJ/T 23-2001



H-2971STN
H-2971U

H-2975

H-2975NR

H-2976

Silver Schmidt Hammer— H-2971STN

The Proceq Silver Schmidt Test Hammer has been redesigned to provide unmatched accuracy, repeatability and easy, intuitive operation. The Silver Schmidt features quicker and more accurate testing while addressing the previous insufficiencies of the traditional hammers. With the Silver Schmidt impact direction no longer has an impact on values; values are not affected by internal friction of the hammer operation, and, loss of accuracy because of seal problems is not affected.

In use, the Silver Schmidt eliminates cocking the hammer for each blow and recording the results, the Silver Schmidt allows you to do all your test blows in rapid succession, while it records the results. These results can then be reviewed. Intuitive User Interface is language independent through the use of easy-to-understand icons. The interface menu structure is similar to a mobile phone's. Practically every command can be activated either directly or via no more than 2 consecutive steps.

All data is automatically saved and may be reviewed via the data list. The memory capacity is dependent of the length of tests in a series, but roughly 400 series with 10 readings each can be accomplished with the Silver Schmidt. The Silver Schmidt hammer includes these standard accessories: battery charger with USB cable, data carrier with software, carrying strap, grinding stone, chalk, documentation and carrying bag. Software provided for performing firmware upgrades and selecting presets only. Ship wt. 5lb. (2.3kg)

Silver Schmidt Hammer with Hammerlink Software— H-2971U

Same as H-2971STN, but includes complete Hammerlink software. Hammerlink software features include: extended memory usage; rapid uniformity assessment with summary view; sorting of data; user-defined conversion curves (polynomial and exponential); user-defined statistical methods; highlighting of mean, median and outliers; carbonation correction; print outs, and export to third party software. Ship wt. 5lb. (2.3kg)

Schmidt Hammer, Type N— H-2975

The Original Schmidt® Hammer, Type N, is designed for non-destructive testing of concrete items 4" (100mm) or more in thickness, or concrete with a maximum particle size less than or equal to 1.25" (32mm). It is designed for testing concrete within a compressive strength range of 1,450 to 10,152 psi (10 to 70 N/mm²) and impact energy of the test is 1.6 ft-lbs (2.207 Nm). The (Type N) Schmidt hammer is pressed against the concrete structure and the rebound values are displayed on a mechanical sliding scale. These values can then be correlated to compressive strength by using the conversion table chart affixed to the hammer. The Original Schmidt Hammer is known for its durability and accuracy. Ship wt. 5lb. (2.3kg)

Schmidt Hammer, Type N (N/mm²)— H-2975M

The Original Schmidt Hammer, Type N with a N/mm² scale instead of psi. Ship wt. 5lb. (2.3kg)

Schmidt Hammer, Type NR— H-2975NR

The H-2975NR hammer utilizes the same mechanism as the H-2975, but includes an integral paper strip recorder, which provides rebound values as a bar chart on a paper strip, providing a hardcopy record of the test data. One roll of paper can document 4,000 test impacts. Ship wt. 8lb. (3.6kg)

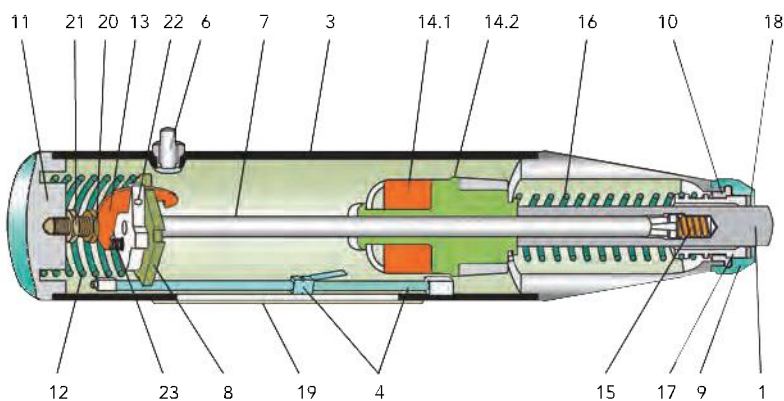
Schmidt Hammer, Type L— H-2975LM

The H-2975L hammer is designed for testing thin-walled structural components with a thickness of less than 4" (100mm) or rock cores. This hammer features an impact of 0.74 Nm, which is 1/3 less energy than Type N hammers and uses a N/mm² scale. Ship wt. 5lb. (2.3kg)

All models include a grinding stone, carrying case and instruction booklet with conversion charts.

H-2975N Replacement Parts

Key	Description	Part#
1	Impact Plunger	H-2975.1
3	Housing, complete	H-2975.3
4	Rider with Guide Rod	H-2975.4
6	Push-button, complete	H-2975.6
7	Hammer Guide Bar	H-2975.7
8	Guide Disk	H-2975.8
9	Cap	H-2975.9
10	Two-part Ring	H-2975.10
11	Rear Cover	H-2975.11
12	Compression Spring	H-2975.12
13	Pawl	H-2975.13
14	Hammer Mass	H-2975.14
15	Retaining Spring	H-2975.15
16	Impact Spring	H-2975.16
17	Guide Sleeve	H-2975.17
18	Felt Washer	H-2975.18
19	Plexiglass Window	H-2975.19
20	Trip Screw	H-2975.20
21	Lock Nut	H-2975.21
22	Pin	H-2975.22
23	Pawl Spring	H-2975.23



Calibration and Repair Services

Humboldt provides complete calibration and repair services for all Concrete Test Hammers. We maintain an extensive inventory of parts for fast turnaround of repairs. Call 1.800.544.7220 for pricing and/or to schedule repairs or calibration.

Digi-Schmidt Concrete Test Hammer— H-2976

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

The hammer is connected to a control and display unit by means of a connecting cable. Strength values are shown digitally as they are taken and also displayed as groups of bars on the 128 x 128 pixel graphic LCD. Mean value and standard deviation for a preset number of measurements are computed and displayed. Via the menu display, the user can select: hammer impact direction (up, down, horizontal, etc.); desired engineering units (psi, MPa, kg/cm², or N/mm²), and indicate the specimen size and type (cylinders, cubes, etc.) for the strength data to be predicted.

The Instrument measuring range is 1,450 to 10,150 psi (10-70 N/mm²) using 2.207 Nm impact energy. Accuracy is ±0.2R with 0.5R reproducibility. Rebound vs. strength correlation curves for 7 and 28 day strengths are installed in memory, or the users own data may be installed via keyboard entry. The Internal memory holds 5000 measurements, each with date and time. Data can be transferred via the RS-232C interface to a PC in Microsoft Excel using the included cable and software. Direct printing is possible.

The Digi-Schmidt consists of the test hammer, control and display unit, connecting cable, PC cable, carrying strap, rubbing stone, instruction manual and a plastic carrying case. Complies with ASTM C805. Ship wt. 12lb. (5.4kg)

Optional Printer Cable— H-2976C

All models include a grinding stone, carrying case and instruction booklet with conversion charts.



Replacement Paper for NR Hammer— H-2975NRP

Five-pack of chart paper used with the Type NR Schmidt Hammers

Grinding Stone— H-2975.27

Replacement grinding stone

Calibration Anvil— H-2972

Calibration anvil ensures continued test accuracy. For use with all test hammers. Hammers should be periodically checked to determine correct performance. Ship wt. 40lb. (18.1kg)

Conversion Chart Label (psi)— H-2975.25

Conversion Chart Label (N/mm²)— H-2975.25N



H-2978

HC-2978

H-3422



HC-2997

HC-2995

Windsor HP Probe System— H-2978

The Windsor HP Probe System is used to evaluate the compressive strength of in-place concrete. This non-destructive test can be used on fresh or mature concrete with equal effectiveness. The system features an electronic measuring device for accuracy and efficiency. Three individual tests can be automatically averaged and displayed on the LCD in compliance with ASTM procedures. The data, together with time and date of the test can be stored in the memory for uploading to a PC. Two probe and power load types are available: silver probes are used for high performance concrete with strengths up to 17,000 psi (110 MPa) and gold probes for test applications on concrete with less than 3,000 psi (19.4 MPa) strength. The system consists of the drive unit, electronic measuring device, templates, measuring caps, gauge plates and carrying case. Complies with ASTM C803 and BS-1881. Shipping wt. 115 lb (52kg).

Probes are not included and must be ordered separately.

Silver Probe Kit— H-2978.01**Gold Probe Kit— H-2978.03**

Each certified probe kit includes 3 probes and 3 matched, nickel-plated power loads. Silver probe kit is for natural stone or coarse aggregate (density greater than 125 lbs/cu ft). Gold probe kit is for lightweight aggregate (less than 125 lbs/cu ft density)

Shipping restrictions prohibit overseas sales.

Windsor HP Pin System— HC-2978

Measures the compressive strength of concrete, mortar and brick in-situ, quickly, accurately. A non-explosive instrument, the Windsor Pin™ System uses a spring-loaded device to drive a steel pin into the concrete or mortar. The depth of penetration of the needle correlates to the compressive strength of the material under test. A removable chuck and a small pin size facilitate the testing of mortar joints; this is the only system for testing the in-place strength of brick mortar joints. Complies with ASTM C803. **Purchase pins separately.**

Steel Pins for Windsor Pin System— HC-2978.1

Box of 40 pins.

Replacement Micrometer— HC-2978.2**Moh's Scale of Hardness of Minerals— H-3422**

Set includes 9 specimens, from talc to Carborundum, to determine mineral hardness by scratch test. Numbered specimens are keyed to descriptions inside box cover. Shipping wt. 2 lb (1kg).

Dyna Z Pull-off Tester, 1350 lbf (6kN)— HC-2995**Dyna Z Pull-off Tester, 3600 lbf (16kN)— HC-2996**

Used to determine the adhesive and tension strength of concrete structures. Testing is carried out directly on the structure and can be measured on any point of the structure. For the determination of the tension strength it is not necessary to install test devices prior to the casting of the concrete. It is ideal for the evaluation of strength in concrete renovation. Does not require power and can be used in any location. Easy-running crank drive provides constant jerk-free load increase. Can also be used to measure the adhesive strength of applied coatings, such as plastic coatings, concrete coats, mortars and plasters, bituminous coats and paint finishes and coatings on metal. Indispensable for diagnosing damage to building structures and checking of completed renovation/repair work. The legs can be moved and/or lengthened on all models to adapt the positioning to the different test situations. Dyna Z models include digital manometer. Manometer battery provides up to 150 hrs. of operation. Standards: ISO 4624, EN 1015-12, EN 1348, BS 1881 Part 207, ASTM C1583, D4541, ACI 503-30, DIN 1048 Part 2. Shipping wt. 26 lb (12kg).

Dyna ZE Pull-off Tester, 1350 lbf (6kN)— HC-2997**Dyna ZE Pull-off Tester, 3600 lbf (16kN)— HC-2998**

DYNA ZE Pull-off Testers include an electronic display device and pressure sensor. The Dyna ZE provides non-volatile memory for 1000 measured values and provides a 128 x 128 pixel graphic LCD display. These units also provide an RS232 port for downloading information to a computer. Integrated software provides transmission of all measured values to a printer or PC. Uses a 1.5V battery for up to 60 hrs. of operation. Shipping wt. 20 lb (9kg).

Model	Tensile force	Resolution	Accuracy	Permissible Stroke
HC-2995 HC-2998	6kN	0.01N/mm ²	<2%	4.0 mm
HC-2996 HC-2997	16 kN	0.01 N/mm ²	<2%	3.5 mm

Test Disks, Aluminum— HC-2995.1

50mm tests disks for use with Dyna Pull-off Testers, set of 10.

Test Disks, Steel— HC-2995.3

50mm tests disks for use with Dyna Pull-off Testers, set of 10.

Replacement Draw Bolt— HC-2995.2

Steel replacement draw bolt for Dyna Pull-off Testers.

Rebar Locators/Covermeters

Humboldt offers a large selection of rebar locators and concrete covermeters, from basic models to the latest in digital technology. We have rebar locators and covermeters to fit almost any application and budget. If you need to know bar size or are concerned with mapping bar orientation or depth of cover over a large area, one of the digital models would be called for. We also have a rebar locator/covermeter that includes the ability to do half cell corrosion detection.



H-2981



H-2974

Profometer 5+— H-2981

The H-2981 Rebar Locator features a universal probe that allows you to measure both shallow and deep ranges at the push of a button. This gauge will locate, size and show bar orientation, as well as indicate concrete cover. In areas where adjacent and parallel bars effect readings, the operation can include a correction to isolate bars for more accurate diameter determinations.

The operator can also include a correction factor for determining cover depth in congested bar arrangements. The H-2981 includes several optical and acoustical locating aids, one of which is a variable tone level that can be heard over the internal loudspeaker or on a headset. Highly accurate measurements and single-probe design makes this rebar locator an easy-to-use workhorse. Includes processing and report generation software. Complies with ACI 318, BS 1881 Part 204. Also see Profometer 5+ ScanLog— H-2982 on page 122

See Accessories on page 122.

MKIII Rebar Locator— H-2974

The H-2974 Rebar Locator is the digital version of a classic rebar locator, rebar finder, which enables the user to locate reinforcement bars and determine their location and size. This gauge uses a single sensor for all depth ranges and can determine bar size with the use of the included spacer block. The unit can statistically analyze data, searching automatically for minimum cover points, and the least cover of a group of points. Cover points can be displayed as a symbolic map of a structure to assist the user in finding problematic areas. Built in memory can store over 80 thousand individual data points for processing and the LCD can be changed to daylight mode for easier viewing in bright sunlight. The optional scan cart and software can be used to graphically display a cross section of the concrete and the location of the metal objects within. With its built in encoder objects can be located with both distance and depth recorded. Basic unit includes: rebar locator, probe with 8 foot cable, spacer block, sizing template, charger, and headphones. Complies with ACI 318, BS 1881 Part 204.

See Accessories on page 122.

	H-2981	H-2974
Range (depends on bar size)	Shallow: up to 3.94" (100mm) Deep: up to 7.28" (185mm)	Standard: up to 3.75" (95mm) Deep: up to 7.00" (180mm) Narrow: up to 3.10" (80mm)
Accuracy	Better than $\pm 0.08"$ (2mm) or $\pm 5\%$ for cover	
Bar Sizing	#3-12 (8-40mm) better than ± 1 bar size	#2-18 (5-50mm) better than ± 1 bar size
Display	LCD w/ backlight	LCD w/backlight
Memory	160,000 objects with 60 measurements	10 linear batches of 1,000 readings each
Data Output	RS232 or USB adapter	RS232 interface
Power Supply	1.5V (6), 45 hr operation; 30 with backlight	7.4V lithium ion, 32 hrs/4 hr charge
Dimensions	16.3 x 19.7 x 4.9" (415 x 500 x 125mm)	9 x 5.1 x 4.9" (230 x 130 x 125mm)
Weight	12 lb (5kg)	45 lb (20kg) (does not include head)



HC-2983A

Profoscope+— HC-2983A

The Profoscope+ is a fully integrated rebar locator, which includes data storage and the ability to download data to a PC through the included ProfoLink software. The HC-2983A is a one-piece instrument that provides quick and accurate location of rebar and is ideally suited for those who are using rebar location for drilling and cutting operations. The unit's unique feature of being able to quickly find the center point between two bars allows operators to quickly locate a drilling location. The unit's memory provides two modes of operation: The manual data storage allows the user to save concrete cover and rebar diameter on individually chosen spots. The automatic data storage is especially designed for surface scans. Every time a rebar is detected, the cover value is stored automatically. The unit provides the storage of 49,500 total measurements. Complies with ACI 318, BS 1881 Part 204. Shipping wt. 13 lb (6kg).



HC-2974

Mini R Rebar Locator— HC-2974

The HC-2974 is a rugged, digital, hand-held field instrument for finding the location and depth of reinforcement bars. The device is light weight and inexpensive, and an easy-to-use unit for locating rebar. Rebar detection of up to 10" (250mm) can be accomplished when locating large diameter rebar. An easy-to-read display and a 4 hr battery life are just a few advantages that make the HC-2974 one of the most advanced hand held units in the field today. The system allows the user to select between Imperial and Metric units, and the data can be saved in the instrument for later uploading to a computer. Data is saved in the unit with the date and time of the record to help identify prior tests. The eddy current sensor provides the ability to not only locate steel reinforcing bars accurately, but also tendons, copper tubing, conduit, and more. Built in memory can store over 150 individual data points for later processing. Complies with ACI 318, BS 1881 Part 204.



H-2982

Profometer 5+ ScanLog— H-2982

The H-2982 ScanLog system takes the H-2981 Profometer 5+ and adds the Cyberscan function used to visualize reinforcing bars on the display, a "measuring with grid" function for grayscale display of concrete cover and the ScanCar probe cart with an integrated path measuring device for scanning. Memory capacity: 120,000 values in function measurement with grid and a total of 60 objects. Complies with ACI 318, BS 1881 Part 204.

Rebar Locator Accessories

H-2981/H-2982/HC-2983A Accessories

Telescopic Extension Rod— H-2981.1

5 ft telescoping rod for use with Profometer probe

Marking Pen— H-2981.2

Pen with three refills, for use with universal probe.

Calibration Test Block— H-2981.3

Test block for ensuring proper operation

Probe Cable— H-2981.4

5 ft. (1.5m) cable for connecting probe

Path Measuring Device Cable— H-2981.5

5 ft. (1.5m) cable for use with ScanCar

ScanLog Upgrade Package— H-2981.7

Probe carriage ScanCar complete with path measuring device cable 5 ft. (1.5m) for H-2981.

H-2974 Accessories

Optional Software— H-2974.1

Scan Cart Upgrade— H-2974.2
Includes the following: scan cart, 2-piece extension rod, 12 ft cable, scanning software. Turns your Basic Unit into a complete system

Replacement Probe— H-2974.3

Standard probe replacement

Probe Cable— H-2974.4

8 ft cable for connecting probe to unit.

Extension Rod— H-2974.5

2-piece extension rod for use with scan car.



H-2981.1

H-2981.2

H-2981.3

H-2981.5

H-2981.7

H-2981.4



H-2974.1



H-2974.2



H-2876A



H-2879



H-2873A



H-2872

CANIN+ with rod electrode— H-2873A

CANIN+ with rod electrode for half-cell corrosion measurement — consisting of: Indicating device Canin+, adjustable, padded carrying strap, protection sleeve for display instrument, transfer cable, USB-serial adapter, operating instructions, carrying case Canin+ Rod Electrode with spare parts, electrode cable 1.5m (4.9 ft.), cable coil 25m (82 ft.), bottle with copper sulphate (CuSO4) 250g, Canin ProVista PC software on memory stick.

CANIN+ w/ Rod & Wheel Electrodes— H-2875A

CANIN+ with rod and wheel electrodes for half-cell corrosion potential measurements — consisting of: Indicating device Canin+, adjustable, padded carrying strap, protection sleeve for indicating device, transfer cable, USB-serial adapter, operating instructions, carrying case Canin+ Rod Electrode with spare parts, electrode cable 1.5m (4.9 ft.), cable coil 25m (82 ft.), bottle with copper sulphate 250g, 1-wheel electrode system, tool kit to wheel electrode system, bottle with citric acid 250g Canin ProVista PC software on memory stick.

CorMap Rebar Corrosion Mapping System— H-2872

The CorMap is a simple and economical instrument for use in identifying areas of probable rebar corrosion. The system consists of the voltmeter, two electrode extensions, reference electrode with copper sulfate reservoir, copper sulfate, wetting agent reservoir, dispensing sponge, 250 ft. (80m) cable reel, and a heavy-duty carrying case. In operation, the high impedance voltmeter is connected between the reinforcing steel and the reference electrode on the concrete surface where a measurement can be made for the half-cell potential. This measurement is then used to determine the probability of corrosion activity. By testing at a fixed distance apart, a grid of half-cell potentials can be developed and areas delineated. Complies with ASTM C876; BS 1881 Part 201.

Copper Sulfate, 8.5 oz (400ml) container— H-2872.1

Resipod Concrete Resistivity Meter, 1-1/2" (38mm)— H-2879

Resipod Concrete Resistivity Meter, 50mm— H-2879.50

The Resipod is the fastest and most accurate concrete surface resistivity meter available. The 38mm (1-1/2") model is the only known meter available commercially to meet the new AASHTO provisional standard TP95-11. Concrete surface resistivity testing is a non-destructive and simple method for on-site evaluation of concrete. The Surface Resistivity (SR) test is a quick, proven method for estimating concrete permeability, and can replace the laborious rapid chloride permeability test. In other applications, measurements can show likelihood of corrosion, estimation of corrosion rate, curing efficiency, and predict structure durability.

Features and Benefits

- DOT tested and field proven through highway department studies
- Shows variations of water/cement ratios within concrete structures
- Identifies areas within a structure most susceptible to chloride penetration.
- Automatically detects a good connection between the instrument and concrete surface, with an alert to the user of a poor connection
- Hold, save and delete functions, with onboard memory
- Supplied with a USB connection and dedicated Resipod Link PC software
- Waterproof and designed to float
- Supplied with a rugged carrying case, test block and documentation

Dimensions: 7.8 x 2.1 x 2.7" (197 x 53 x 69.7mm)

Power Supply: 50+ hours autonomy

Operating Temperature: 32° to 122°F (0° to 50°C)

Shipping Wt. 1 lb. (454g)



H-2854

V-Meter, Ultrasonic System with Software— H-2854S

The V-Meter™ is an advanced ultrasonic, pulse-velocity test system widely used for quality control and evaluation of concrete structures. It can identify non-homogeneous conditions such as voids, cracks, honeycombs and frozen concrete. The V-Meter comes with standard 54kHz transducers, and its large easy-to-read display is perfect for field use. The battery will last up to 10 hrs. on a single charge, and the unit is capable of storing over 1800 readings for later processing. Conforms to ASTM C597, BS1881-203 and other international standards. Frequency Range 24-500 KHz, based on transducers Selected sensitivity 250 micro volts, between 30 KHz and 100 KHz Input impedance approximately 2 M OHMS. Transit Time 0.1 to 6400 microseconds, direct digital display. Accuracy + 0.1 microseconds. Pulse Rate selectable 1, 3 or 10. Transmitter output pulse 1000/500V, 2 microseconds. Display 240 x 64 pixel graphic LCD. Storage 1 K byte Data Transfer RS-232C. Temp. Range 0° to +40°C. Battery NI-CAD batteries, 9 hours operation. Dimensions 7.5" x 4" x 8" 190 x 100 x 203mm. Shipping wt. 6 lb (3kg).

V-Meter, Ultrasonic System without Software— H-2854

The V-Meter comes with standard 54kHz transducers, and its large easy-to-read display is perfect for field use. The battery will last up to 10 hrs. on a single charge. Conforms to ASTM C597, BS1881-203 and other international standards. Frequency Range 24-500 KHz, based on transducers selected. Sensitivity 250 micro volts, between 30 KHz and 100 KHz. Input impedance approximately 2 M OHMS. Transit Time 0.1 to 6400 microseconds, direct digital display. Accuracy + 0.1 microseconds. Pulse Rate selectable 1, 3 or 10. Transmitter output pulse 1000/500V, 2 microseconds. Display 240 x 64 pixel graphic LCD. Storage 1 K byte Data Transfer RS-232C. Temp. Range 0° to +40°C. Battery NI-CAD batteries, 9 hours operation. Dimensions 7.5" x 4" x 8" 190 x 100 x 203mm. Shipping wt. 6 lb (3kg).

V-Meter, Ultrasonic System Software Upgrade— H-2854.1

Software to upgrade H-2854 V-meter to H-2854S V-meter system.



H-2984

Pundit Lab, Ultrasonic Test Device— H-2984

Pundit Lab+, Ultrasonic Test Device— H-2983

Pundit Lab Ultrasonic Testers can be used to detect the presence of cracks, voids and other imperfections in concrete, as well as the determination and monitoring of concrete strength and deterioration of concrete, which may have occurred due to age, fire, frost or chemical attack. Comply with the following standards: EN12504-4 (Europe), ASTM C597-02 (North America), BS 1881 Part 203 (UK), ISO1920-7:2004 (International), IS1311 (India)

Pundit Lab Features:

Measurement performance: Optimized pulse shaping, automated transmission settings and a range of powerful transducers.

Integrated waveform display: Allows analysis of the received signal and manual triggering directly on the instrument.

On-line data acquisition: Full remote control of all transmission parameters, data logging function and functionality that turns your PC into an oscilloscope.

USB interface and data analysis software: Data analysis and export to third party programs through Open Interface such as LabVIEW.

Pundit Lab+ Additional Features:

Integrated gain stage: Removes the need for an external amplifier when using exponential transducers and long cables.

Compressive strength measurement: Conversion curves for strength estimation can be created in the software and uploaded to the instrument to give instant strength estimations on site.

Combined estimates with rebound hammer: SONREB curves may also be uploaded into the Pundit for improved compressive strength estimates in combination with rebound hammer measurements.

Time stamp: A real time clock can record every measurement.

Review list: Saved measurements may be reviewed directly on site without the need for a PC connection.

H-2984 Pundit Lab ships with: Display unit, 2 transducers (54kHz), 2 BNC cables 1.5 m, couplant, calibration rod, battery charger with USB-cable, 4x AA (LR6) batteries, data carrier with software, documentation and carrying case

H-2983 Pundit Lab+ ships with: Display unit, 2 transducers (54kHz), 2 BNC cables 1.5 m, couplant, calibration rod, battery charger with USB-cable, 4x AA (LR6) batteries, data carrier with software, documentation and carrying case

H-2984.1— 24 kHz Transducer (Two required for operation)

H-2984.2— 54 kHz Transducer (Two required for operation)

H-2984.3— 150 kHz Transducer (Two required for operation)

H-2984.4— 250 kHz Transducer (Two required for operation)

H-2984.5— 500 kHz Transducer (Two required for operation)

H-2984.6— (2) 54 kHz Exponential Transducers (include calibration rod)

H-2984.7— (2) 250 kHz, Shear Wave Transducers (include couplant)



H-2878

H-2877

H-2874

H-2877.1

ASR Detect™— H-2878

ASR Detect™ is both a practical and a scientific tool. It's principal application is analyzing existing concrete structures. By identifying ASR deterioration in its earliest stages, ASR Detect facilitates the problem being identified when remediation techniques can be applied; for example, treating the concrete with a lithium-bearing solution to inhibit further deterioration. Where deterioration is advanced, ASR Detect provides a clear picture of the extent and depth of the damage.

As a scientific tool, ASR Detect can be applied to improving the understanding of where, how and why ASR occurs. That understanding is basic to developing ASR preventatives that allow high-alkali cements or poor-quality aggregates to be used in concrete mixes without risking the development of ASR.

To identify Alkali Silica Reaction (ASR) in concrete, two reagents are applied to the broken surface of a concrete core and the excess rinsed off. On contaminated concrete, the resultant stains reveal the presence of ASR. The stains also reveal the extent of the ASR in the concrete and indicate the stage of ASR progression. Yellow indicates that degradation has begun; pink warns that degradation is advancing.

Carbo Detect™— H-2874

Carbo Detect™ is a simple colored dye field test for detecting carbonation. The single reagent is sprayed on the surface to be checked. The reagent will change to pink in uncarbonated concrete and remain colorless when sprayed on carbonated concrete.

The Chlorimeter Chloride Test System— H-2877

A field kit for the determination of chloride ion content in concrete, fresh cement, masonry, most other construction materials, and water. The determination of the chloride ion concentration in concrete is essential in assessing the need for maintenance on, for example, bridge decks and parking structures. The test can also be used to ensure that materials used in new construction are free from potentially harmful chloride ion levels. The Chlorimeter produces results on-site, within minutes that are accurate and comparable to expensive laboratory tests. With this method, the concentration of acid soluble chlorides is measured. In most cases, this is equivalent to total chloride concentration. It measures the electrochemical reaction of a weighted sample placed in an extraction liquid. It automatically shows a temperature compensated reading of percent of chlorides on its digital display. A wide range— from 0.002 to 2% chloride by weight— is covered.

Kit does not include required hand drill or extraction and calibration liquids, which can be ordered below.

Consumables:

Extraction and Calibration Liquid, small kit— H-2877.1
Pack of 12 jars, extraction liquid and calibration liquid

Extraction and Calibration Liquid, large kit— H-2877.2
Pack of 100 jars, extraction liquid and 20 jars of calibration liquid



Concrete RH/Moisture Meter Kit with BluePeg Sensor— HC-3000

Concrete RH/Moisture Meter Kit with BluePeg Sensor Relative Humidity and Moisture Meter Test Kit for concrete slabs provides compliance with ASTM F2170-02 standard. Kit consists of Meter, (1) Reusable RH Blue Peg Sensor, (10) RH sleeves, RH cable and case.

Experts recommend the RH test as the most reliable in-depth measuring method for concrete moisture available today. The RH BluePeg System Measures relative humidity, temperature and dew point. The RH Blue-Peg uses a single microchip, factory calibrated to NIST standards. Each BluePeg comes with a NIST traceable certificate.

In Scan Mode, the Meter has a calibration built-in for comparative readings of concrete and sheetrock. For all other building materials the reference scale can be used to identify moisture.

In RH Mode, this meter can also be connected to the RH BluePeg sensor for in-situ measurements that conform to ASTM F2170.

Scan Mode Properties:

Resolution: 0.1% for entire measuring range

Measuring Depth: 1/4 or 3/4" deep (7mm and 20 mm)

Reference Scale: 0-99 for non-wood building materials, 0-99 for concrete, 0.4-2.0 for gypsum

RH Mode Properties:

RH Range: 0-99%, Temp: 0 to 200 degrees F or -15 to 95 degrees C.

RH BluePeg Sensors, 5-Pack— HC-3000.1

Reusable RH BluePeg Sensors for use with HC-3000 Meter for testing concrete to ASTM F2170, ASTM F2420, BS 5325 and BS 8203 standards.

RH Sleeves, 20 sets— HC-3000.4

RH Sleeves, 20 sets— HC-3000.5

Relative Humidity Sleeves for use with HC-3000 BluePeg Meters. Includes Liner Sleeve and Top Seal Cap.

Moisture /Thermo-Hygrometer—HC-2991

Advanced Moisture/Humidity meter measures the moisture content, relative humidity, temperature and dew point of concrete and gypsum flooring. The meter enables you to carry out four individual tests:

- Moisture content of concrete or gypsum flooring Relative humidity, temperature and dew point of floor environment
- Below surface, In-situ measurements of Relative humidity, temperature and dew point per ASTM F2170
- Relative humidity, temperature and dew point above floor surface using RH hood test method BS 5325-2001 & 8202-2001
- Moisture Mode: Measures concrete from 0 to 7% moisture, 0 to 12 (comparative) for anhydride and gypsum screeds and 0 to 100 reference.

Hygrometer Mode/RH Mode: Measures 5 to 98% RH, 14 to 120°F (-10 to 50°C) and 0.1% RH 1°C/F. Can store 900 readings in 30 files, large LCD display, RS232 port. Power supply is 9 volt PP3 lithium manganese battery. Includes meter, software and PC cable.

RH Probe for HC-2991— HC-2991.3

Relative Humidity Probe for use with HC-2991 Meter for testing concrete to ASTM F2170, ASTM F2420, BS5325 and BS8203 standards.

Moisture/Hygrometer Kit— HC-2992

Kit includes: a HC-2991 Moisture and Humidity Meter with Software and PC Cable, Two Relative Humidity Probes, RH Probe Calibration Check Solution with Sleeve, Pack of twelve RH Sleeves, and optional instant-read Infrared Surface Thermometer. Use to perform ASTM F2170 and ASTM F2420.

Concrete Moisture Meter—HC-2994

The HC-2994 is a digital, upgraded version of the original Concrete Encounter (HC-2990). It measures moisture to 7% and complies with BS Standard BS 5325 and BS 8203 for above surface readings of Relative Humidity. It will also accept a relative humidity probe (HC-2994.1) for compliance with ASTM F2170 readings.

RH Probe for HC-2994— HC-2994.1

Relative Humidity Probe for use with HC-2991 Meter for testing concrete to ASTM F2170, ASTM F2420, BS5325 and BS8203 standards.

RH Sleeves, 12 sets— HC-2991.1

RH Sleeves, 50 sets— HC-2991.2

Relative Humidity Sleeves for use with HC-2991 and HC-2994 Meters. Includes Liner Sleeve, Seals and Stops.

Concrete Encounter (Moisture)—HC-2990

The Concrete Encounter is a hand-held electronic moisture meter, which uses non-destructive impedance measurement to determine moisture levels in concrete floors. The Concrete Encounter will give you an instant reading of moisture content to over 6% for concrete and 0-10 comparative for gypsum floor screeds, enabling you to make an informed decision on when to install floor coverings. Designed to be used on clean, dust-free slabs, just switch on and press the instrument firmly against the floor surface. Readings are the read directly from the analog meter. Coplanar electrodes with spring-loaded contacts enhance signal depth and sensitivity to a depth of .5" (12.5mm).

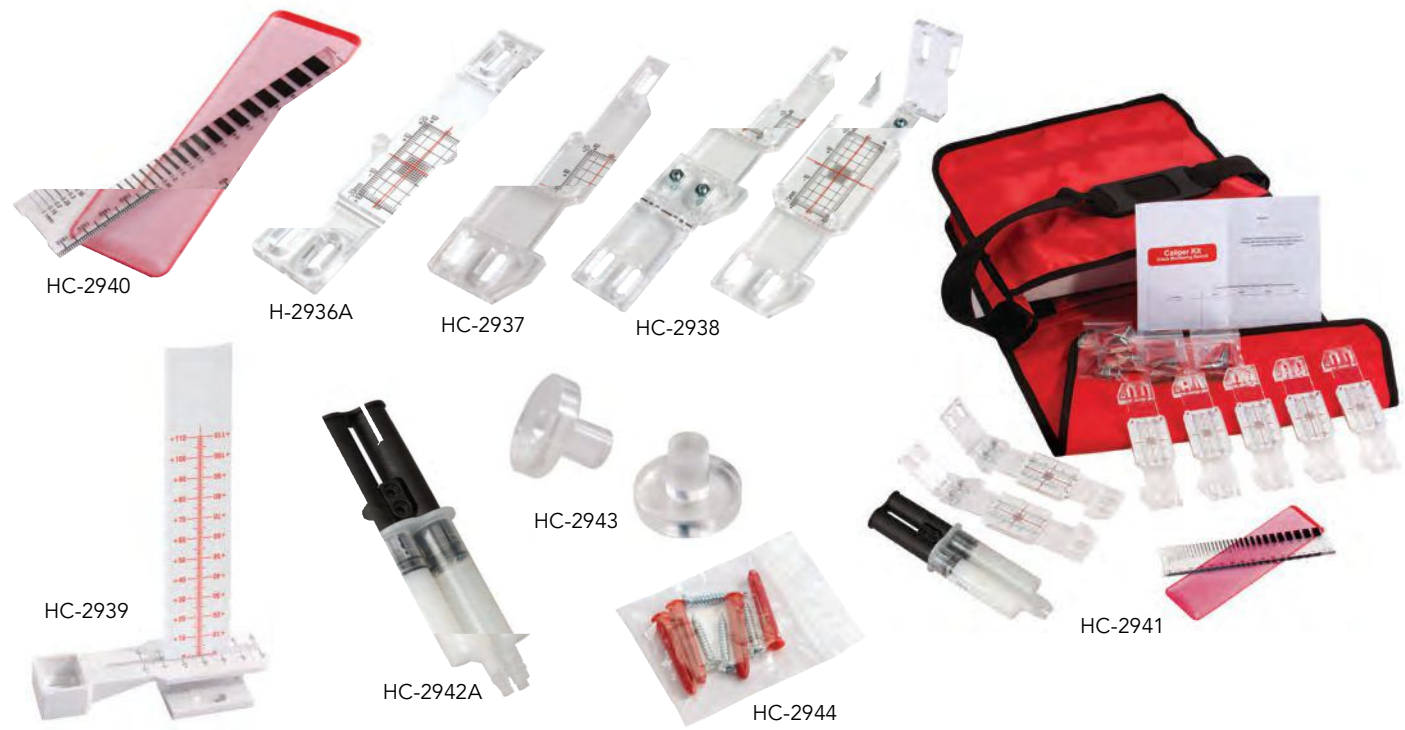
Vapor Emission Test Kit, 12-Pak

(10,000 sq. ft.)— HC-2993B

Vapor Emission Test Kit, 3-Pak

(1,000 sq. ft.)— HC-2993A

Vapor Emission Test Kit, 12-Pak (10,000 sq. ft.) The vapor emission test is used for determining the moisture acceptability for the placement of floor coverings and coatings over concrete slab surfaces. Using this method, users can easily quantify the volume of water vapor emitting from a 1,000 square foot concrete slab over a 24-hour period. Commonly known as the Anhydrous Calcium Chloride Vapor Emission Method, the test is directly specified by the vast majority of the Floor Covering Industry as the primary measure of moisture acceptability for floor covering or coating installations. The kit consists of a calcium chloride container, a specifically designed dome cover with seal and step-by-step instructions. A balance or scale readable to 0.1 grams is required, but must be purchased separately. Complies with ASTM E1907 and F1869 specifications.



Crack Width Gauge— HC-2940

The Crack Width Gauge is designed specifically to measure widths and locations of cracks prior to beginning a monitoring program. The Crack Width Gauge is suitable for internal and external use. It is made of polycarbonate, which has a coefficient of linear thermal expansion of 7.0×10^{-5} cm/cm/°C for ambient temperatures between -30°C and 30°C. The scale is calibrated from the end of the gauge to facilitate measuring cracks in corners. Supplied in protective case. Conforms to BS EN ISO 9001:2000.

Standard Crack Gauge— H-2936A

Crack Gauges can be used to monitor horizontal or vertical movement across a crack on a flat surface. The H-2936A Standard Crack Gauge is a precision device that consists of two plates, which overlap for a part of their length. The bottom plate is transparent and marked with a hairline cursor in the form of a cross. Can be fixed to the surface with screws or adhesive (not included). Supplied with instructions and record sheet.

Crack Gauge Plus— HC-2937

The Crack Gauge Plus can be used to monitor horizontal or vertical movement across a crack on a flat surface. The plus offers to upgrades to the standard design. Rather than presetting the two measuring plates together at zero with tape, the plus uses four small pegs, which ensure alignment during installation and then removed during monitoring. The Plus also provides measuring flats, which allow accurate readings to be taken with calipers during monitoring. Can be fixed to the surface with screws or adhesive (not included). Supplied with instructions and record sheet.

Corner Crack Gauge— HC-2938

The Corner Crack Gauge uses a hinged mounting bracket to allow monitoring of cracks in corners with angles between 70° and 180°. Monitors both internal and external corners. Corner gauges use the design of the plus gauge using four small pegs, which ensure alignment during installation and are then removed during monitoring. The corner gauge also provides measuring flats, which allow accurate readings to be taken with calipers during monitoring. Can be fixed to the surface with screws or adhesive (not included). Supplied with instructions and record sheet.

Displacement Crack Gauge— HC-2939

The Displacement Crack Gauge monitors horizontal and displacement movement where there is a step across a crack due to displacement of "out-of-plane" movement. The gauge consists of a base plate (not calibrated), a top plate (calibrated) and a graduated ruler. The ruler is removed from the gauge when not taking a measurement, but used to measure the relative movement in the plates. Can be fixed to the surface with screws or adhesive (not included). Supplied with instructions and record sheet.

Crack Monitoring Kit— HC-2941

A kit designed to provide all the products needed to set up a crack monitoring program. Supplied with a courier bag with shoulder strap, the kit includes: (1) Crack Width Gauge; (5) Crack Gauge plus (1) pair of Corner Crack Gauges; (7) packs of fixing screws; (1) Crack Monitor Adhesive; instruction booklet and record sheets.

Crack Monitor Adhesive— HC-2942A

Crack Monitor Adhesive is a fast-hardening 2-component Epoxy Adhesive for use in affixing crack monitors to concrete surfaces. Comes in a one ounce dual-tube syringe for easy application.

Caliper Marks— HC-2943

Caliper Marks can be affixed with plastic padding to either side of a crack to be monitored and then used to measure crack movements with a caliper.

Screws and Plugs— HC-2944

Package of (4) four zinc-plated screws and four plastic plugs, suitable for affixing a crack gauge to a flat surface.



Digital Caliper (0-200mm)— H-2816.8

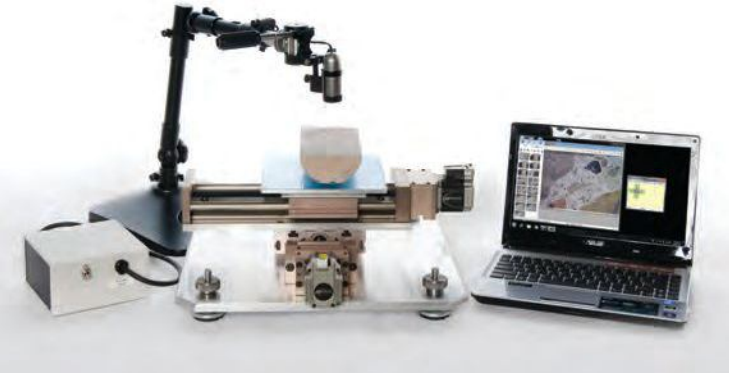
Provides accurate outside, inside, depth and step measurements and features large, easy-to-read LCD digits, rolling thumb wheel; plus control buttons for zero, on/off and inch/mm functions.



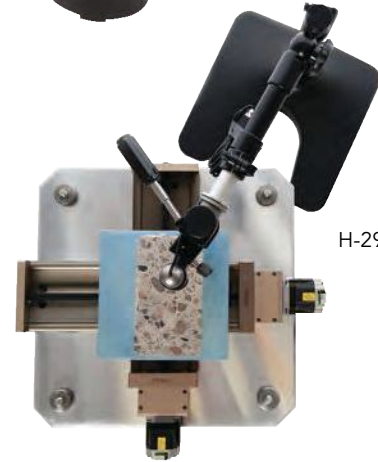
H-3230



H-2851



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



H-2964A

Multi-Length Strain Gauge Set— H-3230**Digital Multi-Length Strain Gauge Set— H-3230D****Metric Multi-Length Strain Gauge Set— H-3231****Digital Metric Multi-Length Strain Gauge Set— H-3231D**

Mechanical gauge is recommended as a substitute for the Whittemore strain gauge for many applications. Designed to measure strain in masonry-type materials, structural components under load, opening or closing of structural cracks, measuring relative structural displacements, rock mechanics testing and drying shrinkage of concrete block testing. Instrument frame is cast aluminum alloy with 5 master settings of 2, 4, 6, 8 and 10 inches, easily set for gauging. Dial indicator has .0001" minimum graduation; effective strain range is 0.3". Maximum linear measurement is 0.4". Set includes: strain gauge, dial indicator, 8 brass inserts, 2 contact seats, 2 mounted contact points, invar master bar, punch bar and one compartmented wood storage case. Metric model has 5, 10, 15, 20 and 25cm settings and dial indicator with 002mm graduations. Complies with ASTM C426.

Linear Traverse Machine (ASTM C457), 120V 60Hz— H-2964A**Linear Traverse Machine (ASTM C457), 220V 50/60Hz— H-2964A.4F**

The Linear Traverse Machine is used to facilitate the counting of microscopic voids in concrete. The H-2964A complies or exceeds ASTM C457 specifications. Computer software controls the motorized specimen table with solid-state positioning motors. The software controls the traverse patterns and distances between measurements based on test sample parameters. The software also provides counting determinations to be made to material-type categories. Test results can be exported to Microsoft Excel for analysis and printing. Printable reports can be configured to M.O.T. or ASTM requirements.

Shipping wt. 99 lb (45kg)

Unit includes:

- Digital microscopic video camera with integral light source.
- Computer-controlled motorized specimen table with solid-state positioning motors.
- Software CD with controller
- Multi-adjustable camera stand.

Computer is not included.

Impact Echo Concrete Test System— H-2851

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

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

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

Other configurations are available, please contact Humboldt for information.



H-3185B



H-3185SD

Rapid, Freeze-Thaw Cabinet—

The Rapid Freeze-Thaw Cabinet is used to measure the resistance of concrete to deterioration caused by repeated cycles of freezing and thawing in water. The system is designed to test up to eighteen 3" x 4" x 16" (76 x 102 x 406cm) concrete specimens simultaneously, with one being a control. Key features of system include:

- Fully automatic operation frees operator to perform other lab duties.
- Allows users to establish field control using correlations between concrete strength and durability
- Permits the evaluation of variables in concrete properties and conditioning.
- Useful in the evaluation of the durability of aggregates, as well as the properties of admixtures.

Up to eight freeze-thaw cycles are possible within a 24-hour period. But the exact number of cycles is dependent upon the time required for the temperature at the center of the control prism to fall from 40 to 0°F (4.4 to -17.8°C) and then back to 40°F (4.4°C). The temperature at the center of the control specimen is cycled by means of a 3/4 HP (0.6KW) refrigeration unit and electric resistance heaters with fully automatic controls. An electric temperature recorder with 24-hour, 7-day week chart is incorporated into the unit to accurately maintain a record of the control specimen temperature throughout the testing period. For corrosion resistance and long service life, the system features a stainless steel, 84" x 34" x 11" (213 x 86 x 30cm) cabinet construction with 3" (76mm) insulation on all sides. The internal test compartment measures 6" x 26" x 74" (15 x 66 x 188cm). A 30-amp circuit is required for operation. Complies with ASTM C666, procedure A; and AASHTO T161, procedure A. Shipping wt. 1200 lbs. (544kg); 29 cu. ft.

Order H-3195 freeze-thaw molds separately, from page 130.

Replace Thermocouple Assemblies	Part #
Thermocouple Replacement for H-3185B	H-3185B.3
Thermocouple Replacement for H-3185SD	H-3185SD.3

Rapid, Freeze-Thaw Cabinet, 120V 60Hz— H-3185B

Rapid, Freeze-Thaw Cabinet, 220V 50/60Hz— H-3185B.4F

The H-3185B uses on/off control of heating and cooling devices to cycle between two temperatures. It can be set to cycle continuously between two temperatures for a finite number of cycles and then stop. When set to run for a finite number of cycles, ramp rate between temperature extremes can be adjusted, as well as soak duration at each extreme.

- Set temperature min/max for cycles
- Select number of cycles
- LCD temperature display
- analog temperature vs. time graph

Rapid, Freeze-Thaw Cabinet, 120V 60Hz— H-3185SD

Rapid, Freeze-Thaw Cabinet, 220V 50/60Hz— H-3185SD.4F

The H-3185SD goes beyond the basic capabilities of the B model above and provides the following capabilities:

- User-created test capabilities are possible, to change freeze time, temperature minimum, temperature maximum and the number of cycles to run.
- Real-time, on-screen testing with graphing, allowing different data views to be chosen.
- Test data can be reviewed after a test is completed, which includes tabulation and graph views.
- Touch-screen interface for easy navigation.
- Export test data to a PC using Humboldt IR Download. This includes report creation for internal or customer usage.
- Connect to the Freeze-Thaw Cabinet remotely for control and/or observation.

**Sonometer, 115V 60Hz— H-3175****Sonometer, 230V 50Hz— H-3175.5F**

The Sonometer (ASTM C215, C666) determines changes in resonant frequency of concrete specimens subjected to alternate cycles of freezing and thawing with the Humboldt Freeze-Thaw Cabinet. This apparatus closely follows design parameters set up over 40 years ago by the Portland Cement Association research laboratories. The original PCA design has been modified by changing to solid state circuitry and addition of a built-in cathode ray oscilloscope. No other resonant frequency system includes an oscilloscope despite being strongly recommended in ASTM C215 paragraph 4.2. Other systems offer an oscilloscope connection. The oscilloscope confirms that peak reading on meter is actual resonance and not a harmonic.

The apparatus consists essentially of a driver and pickup circuit. Electrical power is converted by the driver into mechanical vibrations and these vibrations are imparted to the specimen under test. The amplitude and frequency of vibrations are controllable having respective ranges of 0 to 30 watts power and 400 to 12,000 cycles per second frequency with an accuracy of better than $\pm 2\%$. The actual frequency is displayed on a built-in digital counter. The driver is completely portable and comes with 6' plug-in connecting cable.

Resonant frequency can be determined by watching the voltmeter reach its highest point. The oscilloscope verifies resonance because the meter alone also reaches high points on harmonics. When resonance occurs, the actual number is digitally displayed on the frequency counter.

The H-3175 Sonometer is the only system using a phono-type cartridge as a pickup. All other units use accelerometers, which require intimate contact with the test specimen. Changing accelerometer positions on the test specimen is time consuming. With the pickup and driver mounted on portable stands, it is not necessary to use a test bench, which is mandatory on other apparatus. This allows for greater flexibility in testing.

A very detailed instruction manual accompanies each sonometer. The chassis measures 17 x 14 x 11" (43 x 36 x 28cm). Standard voltage characteristics are 115/60/1. Shipping Weight: 55 lb (25kg); 8 cu. ft.

Freeze-Thaw Replacement Parts

Replacement Heating Element— H-3185SH (Specify 115 or 230V)

7-Day Chart Paper (100/Bx), -20 to +80°F— H-3185.1

7-Day Chart Paper (60/Bx), -30 to +10°C— H-3185.1AC

7-Day Chart Paper (60/Bx), -20 to +50°F— H-3185.1AF

Pen Replacement Kit, (2) per kit— H-3185.3

**E-Meter for Flexural Resonance of Concrete— H-3176**

The E-Meter can determine flexural resonance of concrete under accelerated freezing and thawing cycles and aggressive environments, conforming to ASTM C215 and C666. It determines the resonant frequencies of the three modes of vibration and is the only method of calculating the following material parameters non destructively: such as Youngs Modulus of Elasticity, Modulus of Rigidity, Poissons Ratio and Damping Constant. Frequencies are automatically scanned in one of four ranges. It can handle specimen sizes up to 6 inches (150mm) in cross section and from 1.75 inches (45mm) to 28 inches (711mm) in length. A semi-automatic feature facilitates the fast identification of resonance. Oscillator frequency range: 10 Hz to 100 kHz in 4 switched range Frequency indicator display: 6 digit LED Gate times: 1 sec. or 10 sec. switch selected, LED indicated accuracy: 20 ppm + 1 count over full operating temperature range

**Freeze-Thaw Specimen Mold— H-3195**

For 3 x 4 x 16" (76 x 102 x 406mm) specimens exposed to rapidly repeated freeze-thaw cycles in water or air. Mold is cold-rolled steel with detachable base plate. Complies with ASTM C233, C666; AASHTO T157, T161.

Freeze-Thaw Specimen Mold— H-3198M

Mold for 100 x 100 x 400mm specimens.

Stainless Steel Sample Tray— H-3185T

Tray for 3 x 4 x 16" (76 x 102 x 406mm) specimens.

Stainless Steel Sample Tray— H-3185TM

Tray for 100 x 100 x 400mm specimens.

Stainless Steel Sample Tray with spout— H-3185TS