



# PROCTOR PENETROMETER SET

## General

The Proctor Penetrometer is used in method of test for establishing the moisture penetration resistance relations of fine-grained soils as determined by penetration testing.

The Model H-4139, Proctor Penetrometer is furnished with these interchangeable needles: (in<sup>2</sup> (cm<sup>2</sup>)) 1 (6.45), 3/4 (4.84), 1/2 (3.22), 1/3 (2.15), 1/5 (1.29), 1/10 (.65), 1/20 (0.32), 1/30 (0.22) and 1/40 (0.16). Replacement needles are available.

H-4139 complies with ASTM D1558 for number and sizes of needles required.

The Penetrometer is furnished with a carrying case. To assemble the apparatus, place the handle on the graduated handle shaft and tighten in place with the wing nut. Place the other end of the shaft in the open end of the spring barrel assembly and tighten the large hexagonal nut finger tight. To install the needles of various end areas, screw the needle shanks into the tapped hole provided in the spring barrel assembly.

## Sample Preparation

The sample should be prepared in accordance with either method "A" or method "B" of ASTM D698. After preparation, the fraction passing the #4 sieve (4.75mm) must have at least 20% passing the 3/8" (9.5mm) sieve.

## Test Procedure

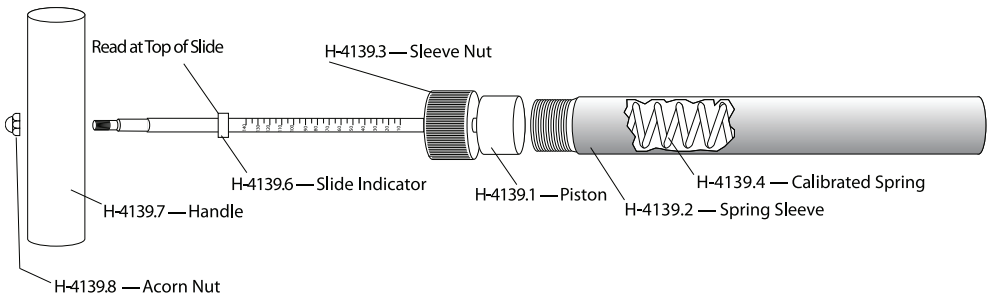
1. Compact the soil in the moisture-density mold in accordance with the procedure described in Section 4 of the ASTM D698.
2. Place the mold containing the soil specimen on a smooth space between the feet of the test operator.
3. The operator must hold the Penetrometer in a vertical position and control the rate of penetration by steadying his arms against his legs and at the same time applying pressure to the Penetrometer handle.
4. Penetrate the soil specimen at the rate of 0.5 inch per second for a distance of not less than three (3) inches. The penetration needle must be placed away from the edge of the mold, near the center and the individual penetrations spaced so as not to interfere with one another.
5. The resistance of the soil to penetration by use of the soil Penetrometer is determined by the use of the attached needle of known end area. The needles shall be of such size that the reading will be between 20 and 80. Take the reading at top as shown in the drawing.
6. Penetrate the soil specimen not less than three times. The average of the readings must be used. Force readings are indicated at the top of the sliding ring.
7. The penetration resistance determination must be made on each molded soil specimen. Penetration resistance determinations cannot be obtained on very dry molded soil specimens or very granular soils.

## Calculation

Divide the average Penetrometer reading by the end area of the penetration needle (the marked needle size) and record the resulting value as the penetration resistance of the soil expressed in pounds (force) per square inch. The moisture content of the soil must be calculated in accordance with ASTM D2216.

## Moisture-Penetration Resistance Relationship

Plot the penetration resistance and the corresponding moisture content as calculated in accordance with the small letters for the series of determinations with the corresponding moisture-density relations data. Plot the penetration resistance determinations as ordinates with their corresponding moisture contents as abscissas. The moisture-penetration resistance relationship curve must be established by not less than three determinations.



### Proctor Penetrometer Needles

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

## Warranty

Humboldt Mfg. Co. warrants its products to be free from defects in material or workmanship. The exclusive remedy for this warranty is Humboldt Mfg. Co., factory replacement of any part or parts of such product, for the warranty of this product please refer to Humboldt Mfg. Co. catalog on Terms and Conditions of Sale. The purchaser is responsible for the transportation charges. Humboldt Mfg. Co. shall not be responsible under this warranty if the goods have been improperly maintained, installed, operated or the goods have been altered or modified so as to adversely affect the operation, use performance or durability or so as to change their intended use. The Humboldt Mfg. Co. liability under the warranty contained in this clause is limited to the repair or replacement of defective goods and making good, defective workmanship.

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Testing Equipment for



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