INSTRUCTIONS

⚠ Keep this sheet for your records.

Pocket Penetrometer & Torsional Vane Shear

No. 77114
Pocket Penetrometer
No. 77116
Adapter Foot for use in sensitive soils
No. 77299
Torsional Vane Shear Tester

POCKET PENETROMETER

The Pocket Penetrometer, weighing less than 5 ounces, reduces the human error in classification of cohesive soils. It can also be used with the Torsional Vane Shear Tester for rapid estimation of the degree of internal friction of soil.

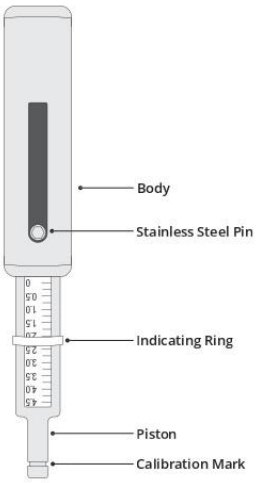
The Pocket Penetrometer is made from hard anodized aluminum, a material tougher than steel, and features an anodized scale which is guaranteed for 1 year by the manufacturer. An allen wrench, used to loosen the stainless steel pin for cleaning, and a carrying case with belt loop are included with the Pocket Penetrometer. The allen wrench is also used to tighten the 1˝ adapter foot.

OPERATION

1. To start test, push the indicating ring to the highest point touching the body.
2. Slowly insert the piston until calibration mark is level with soil.
3. Read soil compaction in tons/ft.2 (kg/cm2) using low side of ring (side closest to piston end); record reading and repeat step 1.
4. For weak soils, use the 1˝ adapter foot (77116, sold separately). Multiply reading by .0625 to obtain actual strength in tons/ft.2 or kg/cm2. Adapter foot attaches to plunger by tightening set screw with allen wrench provided.
5. Readings are only approximations of actual strengths and accuracy of about 1/2 division (.125 tons/ft.2) is possible.

MAINTENANCE

1. To clean interior, unscrew lock pin with allen wrench. Plunger assembly and spring will slide out of housing.
2. Wipe parts clean or wash in warm soapy water, thoroughly rinse and air dry. It should not be necessary to frequently disassemble if carefully used.
3. The stainless steel spring can be checked for calibration on a good quality scale; 4.5 tons/ft.2 equals 17 lbs. If the spring goes out of calibration, it can be easily replaced at a nominal cost.



TORSIONAL VANE SHEAR TESTER

The Torsional Vane Shear Tester is recommended for the rapid determination of shear strength of cohesive soils either in the field or laboratory. It permits the determination of a large number of strength values with different orientation of failure planes. Simple to use with sample trimming eliminated — all that is needed is a reasonably flat surface 25 mm in diameter.

The shear strength of a cohesive soil is dependent upon many factors including rate of loading, progressive failure, orientation of the failure plane and pore water migration during testing. The vane shear tester does not eliminate the effects of any of these variables. However, it does give repeatable values in a homogeneous clay, and extensive laboratory testing indicates excellent agreement between the unconfined compression test and the shear tester. The smallest division on the dial is 0.05 Kg/cm2, permitting visual interpretation to the nearest 0.01 Kg/cm2. Three vanes are provided with ranges of 1, 0.2, and 2.5 Kg/cm2.

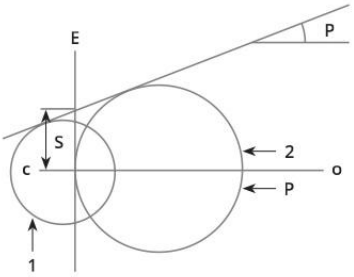
OPERATION

1. Select desired vane size and fit to vane driver.
2. Make sure zero on dial is aligned with index mark on knob. A counter-clockwise rotation of the dial face (while holding onto the vane) brings the zero mark on the dial face back to the index mark.
3. Test surface should be reasonably flat and at least 25 mm in diameter. Press the Torsional Vane Shear Tester into the soil to the depth of the blade and maintain a constant vertical pressure while turning the knob. A rate of rotation such that failure develops in five to ten seconds is recommended.
4. After failure develops, release the remaining spring tension slowly, and the index mark on the knob will indicate the maximum shear value.

SIMULTANEOUS USE OF THE VANE SHEAR TESTER AND POCKET PENETROMETER

The Vane Shear Tester and Pocket Penetrometer indicate respectively shear strength under null load and unconfined compression strength. Taking these two results in a Mohr diagram, the shear test shows an axes origin centered circle whose radius is equal to the measured value. The tangential line common to the two circles is the critical straight line representing the Coulomb statement for the tested soil.

The simultaneous use of a shear tester and a penetrometer allows rapid evaluation of the degree of the internal friction of soil in shear strength, or to determine if the soil is essentially cohesive.



Circle 1: Shear Tester — measured value S
Circle 2: Penetrometer — measured value P