PIL-7 - Point Load Tester

Testing Equipment

DIRECT READING
COMPACT & PORTABLE
PROTECTIVE SHIELD

The PIL-7 is a portable point load tester used for determining the point load strength index for rock strength classification

Description

The PIL-7 point load tester consists of a loading frame, a mounted hydraulic ram and a pressure gauge for maximum load indication. An upper conical platen is fixed on the frame and a lower one on the jack piston. A graduated scale is fixed on the frame and indicates the specimen diameter.

Test Procedure

Three point load test configurations are used depending on the available rock specimens:

Diametrical – Axial – Irregular lump
The diametrical and axial tests use core specimens with length/diameter (L/D) ratios greater than 1.0 in the first case, and between 0.3 and 1.0 in the second case. Rock pieces of suitable irregular shapes are used when cores are not available.

The testing steps are the same for all configurations:
1) The specimen is positioned between the conical platens. The platens are then closed to make contact.
2) The distance “De” between the points of contact is read on the scale.
3) The load is increased such that failure occurs within 10 to 60 sec. and the failure load “P” is read and recorded.

Key Features

- Direct reading of specimen diameter
- Hardened stainless steel ball set into platen point to provide a true 5-mm point radius
- Maximum load indicator
- Extreme rigidity
- Portable

Applications

- Determination of the Point Load strength index for rock strength classification
- Determination of rock anisotropy
- Prediction of other rock strength properties such as uniaxial tensile and compressive strengths

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Specifications

Maximum specimen size	100 mm (low strength rock) 50 mm (high strength rock)
Maximum load	70 kN
Scale minor division	0.5 mm
Pressure gauge	
Range	100 000 kPa
Accuracy	±0.2% F.S.
Load measurement accuracy	1 kN

Height	48 cm
Length	27 cm
Depth	25 cm

Interpretation

The Point Load Tester allows the user to determine an "Uncorrected Point Load Strength Index" (I_s). This index must be corrected to a standard equivalent diameter (D_e) of 50 mm. It then becomes a unique property of the rock tested ($I_{s(50)}$) which is most useful in rock strength classification.
Rock anisotropy is quantified by the "Strength Anisotropy Index" $I_{a(50)}$. This index is the ratio of the greatest to least $I_{s(50)}$ index measured respectively perpendicular and parallel to the existing planes of weakness.
The uniaxial tensile (UTS) and compressive (UCS) strengths can be approximated from the $I_{s(50)}$ index. The UTS is about 1.25 times $I_{s(50)}$ and the UCS is normally between 20 and 25 times the $I_{s(50)}$ index.

I_s is obtained from the following equation:
I_s = P / De2
where: I_s: Uncorrected Point Load Strength Index, in MPa or psi
P: Failure load, in MN or lbf (maximum pressure × jack piston area)
D_e: Equivalent core diameter, in meters or inches (D_e = D for diametral tests)
The ISRM* "Suggested Method for Determining Point Load Strength" size correction procedure is used. $I_{s(50)}$ is obtained either graphically, mathematically or by testing 50 mm (maximum diameter) specimens.

**ISRM: International Society of Rock Mechanics.*

Ordering Information

- The unit includes a carrying box.

Optional Accessories

- Set of spare conical platens
- Spare pressure gauge
- Spare front protective shield
- Spare back protective shield
- Set of optional spherical seats
- Set of optional flat platens
- Optional low pressure gauge (30 000 kPa)
- Calibration Kit

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