

PLT-10

POINT LOAD TESTER

FEATURES

- High pressure 10 ton or 98kN range
- Conical platens conform to ISRM suggested method
- Air driven hydraulic foot pump eliminating manual hand pumping & injury
- Automatic repetitive jacking action producing consistent & improved results
- Easy, reliable testing for large volumes of tests
- Large testing capacity of 0-102mm core samples
- Peak load digital manometer gauge
- Heavy duty with protective shield
- Extreme rigidity & solid heavy base prevents toppling
- Digital RS232 option available to record data on PC
- Logging version available

APPLICATIONS

Used in mining and civil construction this instrument is used to determine point load strength index of rock or concrete core samples.

Point load strength provides a method for establishing rock strength classification. It also indicates rock anisotropy which assists in prediction of rock strength properties such as uniaxial tensile and compressive strengths.

Model PLT-10 is a simple portable apparatus used for testing rock samples or cores.

The PLT-10 has a maximum loading capacity of ten tons and accepts drill cores or rock lumps of different sizes having a maximum length of 102 mm.



The point load strength index obtained from these tests is correlated with the uniaxial compressive strength of the rock tested. Being rapid and simple to perform, the point load test allows the user to easily delineate zones of rock through different strength properties.

For this reason it becomes a most useful tool in large scale mining as well as civil engineering projects when classifying rock types and their strength.

TECHNICAL SPECIFICATIONS

Maximum load	Up to 98 kN or 10 ton
Maximum specimen size	Up to 102mm
Accuracy	<0.2%
Dimensions of PLT-10 Including hard case	45cmx27cmx25cm @ 35kg 78cmx35cmx34cm @ 50kg
Digital pressure gauge range	0-1000 bar
Digital pressure gauge	Max and min pressure displayed
Digital Units	Bar, psi, kPa, MPa, hPa and mbar

Air Hydraulic pump

Max operating pressure	700 bar or 10152 PSI
Air consumption	255 l/min

OPERATING PRINCIPLE

Three point load test configurations are available for core logging.

Diametral test

This test is the most reproducible and is independent of the core length provided that the length/diameter ratio is equal to or greater than 1.0.

Axial test

When only rock discs are available or when discs are produced with the diametric test, the axial test can be performed on core specimens with length/diameter ratios between 0.3 and 1.0. This test is useful to evaluate strength anisotropy.

Irregular lump test

If irregularly shaped rock pieces are the only specimens available, tests can still be performed on lumps having an equivalent core diameter close to 50 mm and an overall approximately cubical shape. In order to fit this requirement, specimens may be prepared from larger pieces by trimming or saw or chisel cutting.

INTERPRETATION

The load at failure is obtained thanks to the following relation:

$$P = L \cdot A_e$$

where P = load at failure in MN
 L = reading of maximum pressure in MPa
 A_e = effective area of the jack piston in m²

Note: The effective area of the jack cylinder piston for model PLT10 is 14.5 cm² (14.5 x 10⁻⁴m²)
The uncorrected point load strength index is calculated using the following relation and the load value previously calculated:

$$I_s = P/D_e^2$$

where I_s = point load strength index in MPa
 P = load at failure in MN
 D_e = equivalent core diameter in m

The index I_s may also be obtained graphically using the nomogram shown below presented by Broch and Franklin (1972). The I_s index varies as a function of the diameter of the core D in the diametral test and as a function of the equivalent diameter D_e in axial, block and irregular lump tests.