

BOREHOLE DILATOMETER

Model PROBEX



APPLICATIONS

The PROBEX dilatometer is a radially expandable borehole probe used to determine in situ the modulus of elasticity of soft and hard rocks. The PROBEX operates in 76 mm (N size) boreholes and has a maximum working pressure of 30 000 kPa. It may also be used to measure the creep properties of materials such as salt or potash. The ease of operation and the reliable method of measurement and interpretation are the direct result of many years of experience with borehole pressuremeters.

DESCRIPTION

The dilatometer test is a loading test run inside a borehole with a radially expandable cylindrical probe.

The PROBEX determines the deformations by measuring the total volume change of the probe. This method is the same well-proven method used with the pressuremeter. It provides a mean modulus value of a large volume of rock, contrary to the use of callipered probes which can be affected by local heterogeneities.

The volume changes of the probe are measured by monitoring the displacement of a piston. This configuration eliminates the parasitic expansion of the tubing and pumping system.

FEATURES

- High capacity
- May be used in deep boreholes
- Test in "N" size boreholes
- Easy to operate

The PROBEX consists of:

- An inflatable membrane mounted on a steel core
- A hydraulic module comprising a dual piston and cylinder assembly, to inflate and deflate the membrane
- A measuring module containing a linear transducer, which monitors the injected volume
- The hydraulic and electrical lead lines
- A hydraulic hand pump and pressure gauge
- A digital readout
- A pressure transducer

TEST AND INTERPRETATION

The leads are threaded inside a B size casing or equivalent that is used to lower the probe to test depth. For tests in stable shallow boreholes, the probe can be set in place using standard drill rods with the leads fastened to the rod string. The tests are stress controlled. Increments of pressure are applied in stages using the hand pump. The compressibility of the probe is determined by calibration tests ran in a thick-wall cylinder.

The method used to interpret the data is the same one used to reduce pressuremeter data. It is based on Lamé's equations and yields a mean modulus of deformation for the rock mass tested.

SPECIFICATIONS

PROBE

Diameter

Minimum (deflated)	73.7 mm
Maximum (inflated)	82.5 mm

Loading

Maximum pressure	30 000 kPa
Effective length	460 mm

READOUT – Model ACCULOG-iX

Function	Volume and pressure indicator
Display	Digital (LCD)
Power Supply	Rechargeable battery pack

RESOLUTION

Diametrical change	0.1 cc
Pressure measurement	0.25 % F.S.

