BIAXIAL STRESSMETER

GEOKON®

MODEL 4350



Model 4350 Biaxial Stressmeter

APPLICATIONS

The Model 4350 Biaxial Stressmeter is designed to measure stress changes in:

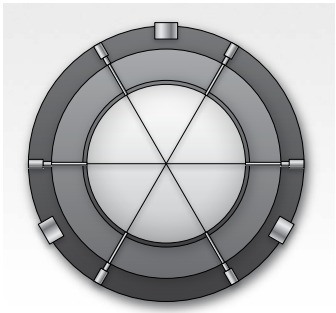
- Rock
- Salt
- Concrete
- Ice

OPERATING PRINCIPLE

The Model 4350 Biaxial Stressmeter is designed to measure compressive stress changes in rock, salt, concrete or ice. Principal stress changes and directions are measured in the plane perpendicular to the stressmeter axis.

The stressmeter consists of a high-strength steel cylinder, which is grouted (or frozen, in the case of ice) into a BX (60 mm) size borehole. Stress changes in the host material cause the cylinder to deform.

The radial deformation of the cylinder is measured by means of three or six vibrating wire sensors spaced at 60° intervals. Changes of stress produce corresponding changes in the resonant frequency of vibration of the sensors. These changes of frequency can be related to stress changes using factory-supplied calibrations.



Model 4350 cross section.

ADVANTAGES & LIMITATIONS

The high rigidity of the stressmeter reduces the effect of host material modulus on the calibration. For instance, a variation by a factor of 10 in the host material modulus changes the calibration by only a factor of two.

Tensile or decreasing compressive stresses could cause decoupling of the stressmeter from the surrounding material yielding unreliable measurements.

Theoretical equations for conversion of the observed readings to biaxial rock stressors are supplied with the sensor.

Temperature sensors can be included within the stressmeter when required.

Stressmeters can be customized to meet your needs. Our staff will work with you throughout the process. Common customizations include cable type and pressure range



GeoNet Vibrating Wire Data Logger.

SYSTEM COMPONENTS

The stressmeter is installed by means of setting rods, which position and orient the stressmeter inside the borehole. Small protrusions on the side of the stressmeter centralize its position within the borehole and also permit grout flow around the cell.

The stressmeter is held in place at the correct orientation by means of a snap-ring retainer, which, when activated by a pull-pin mechanism, expands and grips the walls of the boreholes.

Special expansion grouts are recommended to ensure complete contact between stressmeter and the surrounding medium.

Signals from the stressmeter are transmitted to the readout location by means of a multi-conductor shielded cable.

Data acquisition can be performed via direct readout or autonomously using data loggers that provide automatic data collection at predetermined intervals and wireless data transmission.

TECHNICAL SPECIFICATIONS

Standard Range	70 MPa
Resolution[1]	14–70 kPa
Accuracy[2]	±0.1% F.S.
Temperature Range	–20 °C to +80 °C
Borehole Diameter	BX (60 mm)

[1]Depends on rock modulus.
[2]Accuracy established under laboratory conditions.

ORDERING INFORMATION[1]

4350-1: Vibrating Wire Biaxial Stressmeter, with 3 radial gauges.
04-375V9: Violet PVC Cable, 10 mm (0.375") Ø, 4 twisted pairs, for Model 4350-1.

4350-2: Vibrating Wire Biaxial Stressmeter, with 6 radial gauges, 2 vibrating wire temperature gauges.
06-500V7: Orange PVC Cable, 13 mm (0.500") Ø, 6 twisted pairs, for Model 4350-2.

4351: Vibrating Wire Biaxial Ice gauge.
CAB-541: Black TPR Cable,11 mm (0.437") Ø, 6 twisted pairs, for Model 4351.
5030: Installation kit for installations up to 15.2 m (50 ft.). Includes engagement tool, extension rods & carrying case.

5030-1: Setting rod, 1.8 m (6 ft.) length. Used with installation kit for depths beyond 15.2 m (50 ft.).
07-062G: Galvanized Aircraft Cable, 16 mm (0.625") Ø.

COMPATIBLE READOUTS AND DATA LOGGERS

GK-404: Handheld Readout
GK-406: Vibrating Wire Analyzer

8800 and 8900 Series: GeoNet Wireless Mesh Data Acquisition System
8910 Series: GeoNet Wireless LoRa® Data Acquisition System

8920 and 8921 Series: GeoNet Cellular Data Loggers
8930 Series: GeoNet Wi-Fi Data Loggers

8940 Series: GeoNet Local Data Loggers
8600 Series: Data Loggers

GEOKON | TRUSTED MEASUREMENTS

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