BIAXIAL STRESSMETER

GEOKON®

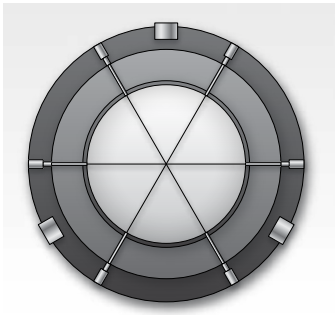
MODEL 4350

Model 4350 Biaxial Stressmeter

APPLICATIONS

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

- Rock
- Salt
- Concrete
- Ice



Model 4350 cross section.

TECHNICAL SPECIFICATIONS

Standard Range	70 MPa
Resolution[1]	14–70 kPa
Accuracy[2]	±0.1% F.S.
Temperature Range[3]	–20 °C to +80 °C
Borehole Diameter	BX (60 mm)

[1]Depends on rock modulus.
[2]Accuracy established under laboratory conditions.
[3]High temperature versions (to 200 °C) available on request.

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.

ADVANTAGES & LIMITATIONS

Longitudinal strain sensors and temperature sensors can also be included within the stressmeter. High temperature (up to 200 °C) and radiation-resistant versions are available.

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 Model 4350 Biaxial Stressmeter Manual.

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. Readout is achieved using the Model GK-404, GK-406 or Model 8600 Series Dataloggers.

For further information, please request the Model 4350 Biaxial Stressmeter instruction manual.

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