Applications

The Model BSIL-P10 NATM Style Shotcrete Stress Cell is designed for the measurement of tangential and radial stresses in shotcrete tunnel linings. Cells of this type are also used for measurements of stress in mass concrete.

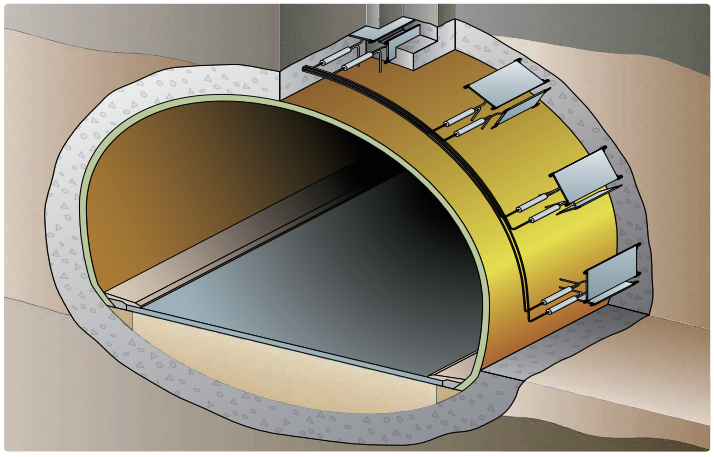
Description

The Vibrating Wire Concrete Stress Cell measures radial and tangential stresses in shotcrete, concrete and rock, usually in tunnel linings. The cells consist of two rectangular steel plates welded together around the periphery with a de-aired fluid occupying the space between the plates. A short tube connects the cell to a vibrating wire pressure transducer. The narrow gap between the plates is filled with hydraulic oil. A prestressing tube is provided for expanding the cell after the concrete has cured.

A Vibrating Wire Pressure Transducer is connected to the cell by a short length of steel tubing, forming a closed hydraulic system.

Key Features

- Accurate, long-term stability
- Robust design and reliable
- Fit for manual or remote reading
- Integral thermistor
- Over-voltage surge arrestor protects against electrical damage
- Measures stress on and within linings of underground excavations
- Compensation tube ofF.S.ets the effects of concrete hydration shrinkage, restoring cell contact pressure



Main Specifications

Model	BSIL-P10
Range (MPa)	0.35/0.5/0.7/1.0/2.0/3.0/5.0
Resolution	0.025% F.S.
Accuracy	±0.1% F.S.
Temperature Range	-20 to +80°C
Over-range Capacity	150% F.S.
Dimensions (L × W × H)	250 x150 x 6 mm

Operation

Both cell and transducer are embedded in the medium to be monitored. As the concrete or shotcrete cures, the cell expands due to the rise in temperature. Each cell consists of two rectangular stainless steel plates welded together around the periphery, with a de-aired fluid occupying the space between the plates. Increasing concrete stresses cause a corresponding rise in the de-aired fluid pressure as the steel plates are squeezed together.

Stress cells installed in concrete or shotcrete will expand if the temperature rises as the concrete cures. On cooling, the cell will contract and leave a gap between it and the surrounding concrete, preventing the concrete stresses from reaching the cell.

To correct this situation, a repressurizing tube (pinch tube) is provided to fully expand the cell after the concrete has cured. This ensures an immediate and accurate response to the onset of increasing concrete stresses.

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