CONCRETE STRESSMETER

GEOKON®

MODEL 4370

Model 4370 Concrete Stressmeter.

APPLICATIONS

The Model 4370 Concrete Stressmeter is designed to measure tensile and compressive stresses in…

- Mass concrete

Model 4370 installation.

OPERATING PRINCIPLE

In essence, the Model 4370 Concrete Stressmeter comprises a short vibrating wire load cell in series with a longer cylinder of concrete. This concrete cylinder has the same properties as the surrounding concrete but is de-bonded from it by means of a smooth-walled, porous plastic tube. It's coupled at its ends to the surrounding concrete by means of two flanges equipped with sections of rebar to provide a better grip. The vibrating wire load cell measures the load imposed on the inner concrete cylinder by stresses in the surrounding concrete. This load, when divided by the cross sectional area of the inner cylinder, gives the stress in the surrounding concrete.

ADVANTAGES AND LIMITATIONS

The Model 4370 is designed to more accurately measure stresses in concrete over more conventional methods, which have some disadvantages: strain gauges can measure strains but the conversion of strains to stress is made difficult due to change of elastic modulus with time, shrinkage and swelling caused by varying moisture content and creep under sustained loads.

The Model 4370 is designed to overcome these problems by making a stressmeter out of concrete.

The resultant stressmeter has the same properties of shrinkage/swelling, modulus variation, temperature dependence, and creep potential as the surrounding concrete.

The moisture content of the surrounding concrete and the inner concrete are practically identical. Hence, the readout of the load cell is not affected so that shrinkage and swelling are the same both inside and out, leading to no net change in the load cell readout.

The presence of the load cell introduces a small measurement error, i.e. the modulus of the stressmeter can be slightly higher or lower than the surrounding concrete.

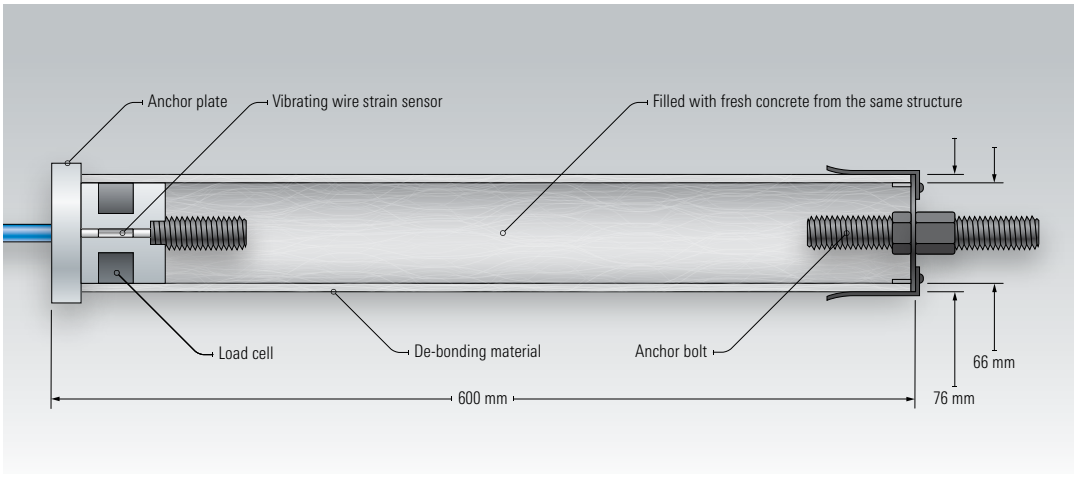
Special procedures and equipment may be required for installation in RCC (Roller Compacted Concrete).

A thermistor is included inside the cell for the measurement of temperatures.

The Model 4370 is suitable for the assessment of tensile stresses, which can occur while the concrete is in the hardening phase.

The Model 4370 was developed in conjunction with the MPA Braunschweig, Germany.

Model 4370 installation.



Model 4370 cross section.

SYSTEM COMPONENTS AND INSTALLATION

The stressmeter is first wrapped in a Tyvek® type material for additional de-bonding. The end of the stressmeter (opposite the load cell) is left open to allow for the packing of concrete when it is poured. Once packed, the end flange is pushed in place and the stressmeter is positioned in-line with the direction of the stress measurement, then tied to the rebar cage using conventional nylon tie-wraps.

TECHNICAL SPECIFICATIONS

Standard Range	–3 MPa to +25 MPa
Resolution	10 kPa
Accuracy[1]	±0.25% F.S.
Temperature Range[2]	–20 °C to +80 °C
Length × Diameter	600 × 76 mm (I.D. 66 mm)

[1]Load cell accuracy.
[2]Other ranges available on request.

GEOKON | TRUSTED MEASUREMENTS

GEOKON
48 Spencer Street
Lebanon, NH 03766 • USA

www.geokon.com
e: info@geokon.com
p: +1 · 603 · 448 · 1562

GEOKON is an
ISO 9001:2015
registered company

Not all models are CE approved. Contact GEOKON for details.