Mecmesin

Shotcrete Penetrometer
Sales brochure

PHYSICAL PROPERTIES TESTERS GROUP

Explore the shotcrete penetrometer

Shotcrete, also known as sprayed concrete, is placed through spraying at high speed and is compacted upon impact with almost immediate hardening. It is widely used in the construction industry, especially for underground tunneling and mining, where wet shotcrete is employed as the primary lining method.

To determine the bond strength of shotcrete during early curing, it's crucial to monitor its consistency to ensure proper strength values are achieved. These allow decisions to be taken by inspectors about the suitability of the mix and determine when tunneling progress can advance.

The benefits of testing shotcrete

Shotcrete accelerators can fast-track the setting time without significantly reducing early strength. The selection of the right accelerator and dosage is based on the desired setting time and may be affected by factors such as cement content, water-to-cement ratio, mix temperature, and application temperature. To ensure the shotcrete meets the required standards, it is important to test its in-situ performance.

Early-age strength is determined by measuring the compressive strength of shotcrete after about an hour and is a common method to evaluate performance. Testing also determines the earliest safe re-entry time for workers after shotcrete application, which is usually based on reaching an adequate strength value.

Test equipment

Mecmesin Shotcrete Penetrometers are ideal for conducting tests as per Method A of EN 14488-2 standard. They are portable and suitable for performing needle penetration tests during the first few hours of shotcrete strength development. The test results provide reliable indications of compressive strength in the range of 0.2 MPa to 1.2 MPa.

Our instruments boast an accuracy of ±1N, surpassing the standard's recommendation. They come with all the necessary accessories to perform compressive tests and calculate strength values on-site, enabling quick results at a crucial phase of shotcrete's strength development. The results help determine if it's safe to re-enter tunnels and resume blasting activities near the shotcrete site.

Test methods

The in-situ testing of fresh shotcrete is typically done following the protocols in EN 14488-2 test standard.

Method A covers needle penetration testing, which is ideal for measuring compressive strength in the range of 0.2 to 1.2 MPa.

Method B involves stud driving and measures pull-out force, suitable for measuring compressive strength between 3 to 16 MPa.

VFG

Touchscreen shotcrete penetrometer

This model features a touchscreen display that provides readings in N and converts them into MPa according to the size of aggregate being tested (as per EN 14488-2). The results are displayed in a table for easy review.

Statistics
Use onboard statistics for readings and analysis onscreen.

Visualisation
Powerful data analysis with live graphing and configurable values.

Touchscreen
Easy to use icons and customisable interfaces - swipe or press and hold.

Penetration needles
1 needle holder and 15 penetration needles are included with both models VFG & AFG.

Battery life
Fast-charging Lithium-ion battery for more testing.

Connectivity
USB-C connectivity for super fast charging on the move.

Expansion
Up to 32GB external storage via Micro-SDHC card.

AFG

Shotcrete penetrometer

This model comes with a membrane keypad and LCD display that displays readings in N or daN. The readings can be converted into MPa by referencing a calibration curve, or they can be stored in memory and later exported to a PC for conversion as per EN 14488-2.

Carry case contents Included with AFG and VFG

- Robust carry case
- Shotcrete penetrometer with dual handle (fitted)
- Penetrometer needle holder
- 15 × Penetration needles
- NiMH batteries (AFG) or Lithium-ion battery (VFG)
- Mains adaptor/charger
- Operating manual
- Calibration certificate

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