

# RHEOCEM<sup>®</sup> 650

Fast setting microfine Portland cement for injection into rock and soil

## Product description

RHEOCEM<sup>®</sup> 650 is a microfine Portland cement for rock and soil injection. Because of RHEOCEM<sup>®</sup> 650's small particle size and a specially adapted admixture system, it penetrates very well into tight joints, fissures and pore spaces to provide a water-tight grouted rock or soil mass.

RHEOCEM<sup>®</sup> 650 is A II-graded cement milled from pure Portland cement clinker with a Blaine value of 650 m<sup>2</sup>/kg.

RHEOCEM<sup>®</sup> 650 achieves initial and final setting faster than normal and microfine cements. This increases productivity in a tunnel grouting operation. The short open time of 1 to 1½ hours and a very short setting time of 2½ hours reduce the waiting time for the next activity to start to a minimum. (At about 20°C).

## Fields of application

- Rock injection: Tunnels, caverns, mines, etc., used for pre and post excavation injection. Ground water sealing and ground stabilisation.
- Soil injection: Ground stabilisation, ground water sealing.
- Prepacked injection
- Contact injection

## Features and benefits

- Standard cement injection equipment can be used.
- Better penetration in tight joints, fissures and pore spaces.
- Greater penetration imparts greater water tightness.

- Fast setting.
- Better working environment and no hazardous components.
- Durable.
- Economical solution.

## Packaging

RHEOCEM<sup>®</sup> 650 is supplied in either 20 kg plastic bags or 1000 kg bags.

## Technical data

Fineness (Blaine)	> 625 m <sup>2</sup> /kg
Particle size distribution:	
<40 micron	100%
<30 micron	98%
<20 micron	97%
<15 micron	94%
<10 micron	77%
< 5 micron	44%
< 2 micron	16%

## Setting Times

The setting times, at a 1:1 Water/Cement ratio (by weight) and at 20°C are as follows:

Initial set: 60-120 min

(Measured by Vicat needle)

Final set: 120-150 min

(1 mm penetration by Vicat needle)

Injection grout properties indicated below, relates to a mix containing 1.5% RHEOBUILD<sup>®</sup> 2000 PF:

Mud balance 1.48 - 1.50 kg/l

Water/cement ratio 1.0

Flow cone 32 - 34 s

Bleeding maximum 1%

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## Application procedure

RHEOCEM<sup>®</sup> 650 shall always be used with RHEOBUILD<sup>®</sup> 2000PF water reducing admixture (1.0 - 2.0 % of cement weight.) Water/cement ratio (by weight) shall normally be between 0.5 - 1.0.

## Mixing

- Fill the mixer with water.
- Add cement. Mix for 2 minutes.
- Add RHEOBUILD<sup>®</sup> 2000PF and mix for another minute.
- Transfer to agitator.

It is very important to use an efficient mixer. Colloidal mixers give the best result.

Minimum rpm. for colloidal mixers 1500 rpm.

NB: Do not over mix. Mixing longer than recommended may cause the grout temperature to increase and set in the pump and hoses.

## Pot life

The mix shall be kept under constant agitation prior to injection. Do not keep grout in agitator longer than 30 – 40 minutes.

## Injection

High-pressure piston pumps are normally used to pump the suspension into the rock. The grout should be injected within 30 -40 minutes after mixing to ensure that it keeps penetrating into the

fissures. Longer open times can be achieved by Delvo<sup>®</sup>crete Stabiliser hydration control admixture. For much longer open times, an alternative is to use RHEOCEM 650 SR,.

## Hardening

RHEOCEM<sup>®</sup> 650 will have set sufficiently after 2 - 2½ hours to allow drilling to commence for control or blast holes.

## Storage

RHEOCEM<sup>®</sup> has a shelf life of 6 months when stored in original closed bags in ventilated dry areas.

## Safety precautions

Any physical contact (e.g. skin or eyes) made with RHEOCEM<sup>®</sup> 650 should be avoided, as it may cause irritation or burns.

If such contact occurs, the affected area should be washed with plenty of clean water. In case of eye contact, seek immediate medical advice.

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