



# Cebex Cable Grout\*

Pre-bagged, non-shrink cementitious grout admixture for post tensioned cables

## Uses

For pumped or free flow grouting, it can be used in a wide range of applications:

- Post tensioned bridge deck ducts
- Prestressed structural element cables ducts
- Slip form silo tendon ducts

## Advantages

- Expansion system compensates for shrinkage and settlement in the plastic state
- Develops high early strength without the use of chlorides
- High ultimate strength and low permeability ensure the durability of the hardened grout
- Compatible with ordinary Portland Cements complying to BS 12 and ASTM C150

## Standards compliance

Cebex Cable Grout complies to BS 8110 Part 1:1985 Sec. 8

## Description

Cebex Cable Grout is supplied as a dry powder requiring only the addition of a controlled amount of clean water and cement to produce a free flowing non-shrink grout. Cebex Cable Grout is an all fines admixture containing expansive cement which impart controlled expansion in the plastic state whilst minimizing water demand. The material is designed to allow uniform mixing, and eliminates unwanted segregation and bleeding.

## Properties

The following properties were achieved using OPC cement at a 0.36 w/c ratio.

<b>Compressive strength BS 8110, Part 1:1985 (flowable consistency)</b>	24 N/mm <sup>2</sup> @ 1 day
	44 N/mm <sup>2</sup> @ 3 days
	60 N/mm <sup>2</sup> @ 7 days
	85 N/mm <sup>2</sup> @ 28 days
<b>Fresh wet density</b>	Approximately 2000 kg/m <sup>3</sup> (Depending on actual consistency used.)
<b>Chloride content</b>	: Nil to BS 5075
<b>Expansion characteristics</b>	: A positive expansion of up to 4%

**Note:** It is recommended that trials be conducted prior to use, to ascertain the best source of OPC for the application.

## Specification

### Performance specification

All grouting, where shown on the drawing, must be carried out with a specialized grout admixture which is iron-free and chloride-free. It shall be mixed with clean water and cement to the required consistency. The plastic grout must not bleed or segregate. A positive volumetric expansion of up to 4% shall occur. The compressive strength of the grout must exceed 44 N/mm<sup>2</sup> at 7 days and 60 N/mm<sup>2</sup> at 28 days. Storage, handling and placement of grout must be in strict accordance with manufacturer's instructions.

### Instructions for use

#### Preparation

Several hours prior to grouting, the area should be flooded with fresh water. Immediately before grouting takes place any free water should be removed. All cable ducts must be thoroughly cleaned. Those ducts formed without metal sheaths should be flushed with water after which all surplus water must be removed. Cable anchorages should be sealed before the duct grouting is carried out.

#### Mixing and placing – Application

##### Mixing

For best results a mechanically powered grout mixer should be used. When quantities of up to 60 kg are used, a slow speed drill fitted with a high shear mixer is suitable. Larger quantities will require a high shear vane mixer. Do not use a colloidal impeller mixer, if sands/aggregates are being utilized. To enable the grouting operation to be carried out continuously, it is essential that sufficient mixing capacity and labour are available. The use of a grout holding tank with provision to gently agitate the grout may be required. 32 - 42 litres of clean water (depending on nature of cement) and 100 kg of cement are required to be added per 6 kg bag to achieve the correct consistency. The water should be accurately measured into the mixer. The total contents of the Cebex Cable Grout bag should be slowly added with the cement and continuous mixing should take place for 5 minutes. This will ensure that the grout has a smooth even consistency.

##### Placing & curing & cleaning

Place the grout within 20 minutes of mixing. This product can be placed in annular gaps of upto 60 mm in thickness. Pumping should be from a single point to eliminate any air or entrapment of water used for pre-soaking. A heavy duty diaphragm pump is recommended for pumping. Screw feed and piston pumps may also be suitable. Any exposed areas should be thoroughly cured. This should be done by using of Concure\*† curing membrane. Cebex Cable Grout should be removed from equipment & tools with clean water immediately after use. Cured material can be removed mechanically, or with Fosroc Acid Etch\*†.

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## Sampling procedure

All sampling procedures for Cebex Cable Grout are to be conducted within the confines of a temperature controlled laboratory.

The reactive agents within Cebex Cable Grout do not permit site sampling and transport. The procedure for sampling is to be as follows:

- 1) A full and unopened bag of Cebex Cable Grout to be selected from the batch allocated for site use and dispatched to the testing laboratory.
- 2) This product shall be mixed in the laboratory following the instructions listed on product data sheet.
- 3) All sampling shall be conducted using 50 mm cube moulds, any other size is not permissible.
- 4) When mixed, the Cebex Cable Grout shall be poured into 50 mm cube moulds, treated with release agent, in two lifts of 25 mm each with a 60 second interval between pours. The Cebex Cable Grout shall not be tamped, but gentle tapping of the cube mould is permitted to promote the release of air.
- 5) Fill three 50 mm cube moulds with the Cebex Cable Grout for each curing time interval specified. Mould filling should be completed within 15 minutes of the end of the mixing cycle. The filled moulds should be stacked three high on top of each other to provide conditions of restraint. The top mould should be restrained either with a weighted metal plate or an empty cube mould.
- 6) The cubes should be stored at  $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$  temperature for 24 hours in the laboratory. After 24 hours the cubes are to be demoulded and placed in a water curing tank maintained at a  $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$  temperature. The cubes are then to be cured in accordance with BS 1881.
- 7) Cubes are to be crushed in calibrated compression testing apparatus with a rate of loading not exceeding 180 KN per minute. Types of cube fracture are to be recorded. 3 cubes are to be crushed for each curing time interval specified. Results are to be calculated and issued as an average.

## Low temperature working

For ambient temperatures below  $10^{\circ}\text{C}$  the formwork should be kept in place for at least 36 hours. When the air or contact surface temperatures are  $5^{\circ}\text{C}$  or below on a falling thermometer, warm water ( $30 - 40^{\circ}\text{C}$ ) is recommended to accelerate strength development. Normal precautions for winter working with cementitious materials should then be adopted.

## High temperature working

It is suggested that, for temperatures above  $35^{\circ}\text{C}$ , the following guidelines are adopted as good working practice:

- a) Store unmixed material in cool environment (preferably temperature controlled), avoiding exposure to direct sunlight.
- b) Keep equipment cool, arranging shade protection if necessary. It is especially important to keep cool those surfaces of the equipment which will come into direct contact with the material itself.
- c) Try to eliminate application during hottest times of day.
- d) Make sufficient material, plant & labour available to ensure that application is a continuous process.
- e) Water (below  $20^{\circ}\text{C}$ ) should be used for mixing the grout prior to placement.

## Estimating

### Supply

**Cebex Cable Grout** : 6 kg bags

### Yield

**Cebex Cable Grout** : Approx. 68 litres when mixed with 100 kg cement & 34 litres of water

**Note:** Allowance should be made for wastage when estimating quantities required.

## Storage

Cebex Cable Grout has a shelf life of 12 months if kept in a dry store in sealed bags. If stored in high temperature and high humidity locations the shelf life will be reduced.

## Precautions

### Health and safety and fire

Cebex Cable Grout is alkaline and should not come into contact with skin and eyes. Avoid inhalation of dust during mixing. Gloves, goggles and dust mask should be worn. If Contact with skin occurs, wash with water. Splashes to eyes should be washed immediately with plenty of clean water and medical advice sought. Cebex Cable Grout is non-flammable.

\* Denotes the trademark of Fosroc International Ltd.

↑ See separate data sheet



### Important note

Fosroc products are guaranteed against defective materials and manufacture and are sold subject to its standard Conditions for the Supply of Goods and Service.

## Fars Iran Limited

No. 9, 25 th St., Khaled Eslamboli (Vozara) Ave., Tehran 15139 - Iran

**telephone:**  
+98 (21) 88719021

**fax:**  
+98 (21) 88721664

**email:**  
iran@fosroc.com

[www.fosroc.com](http://www.fosroc.com)



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