



# Fosroc® 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
- Pre-stressed 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 EN 445 and BS EN 196.

### 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.

### 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 zero or positive volumetric expansion of up to 4% shall occur.

The compressive strength of the grout must exceed 45 N/mm<sup>2</sup> at 7 days and 60 N/mm<sup>2</sup> at 28 days.

The storage, handling and placement of the grout must be in strict accordance with the manufacturer's instructions.

### Supplier specification

All grouting where shown on the drawing must be carried out using Cebex Cable Grout manufactured by Fosroc and used in accordance with the manufacturer's current data sheet.

### Properties

The following properties were achieved using OPC cement at a 0.37 w/c ratio.

<b>Compressive strength BS EN 445</b>	: 25 N/mm <sup>2</sup> @ 1 day 40 N/mm <sup>2</sup> @ 3 day 50 N/mm <sup>2</sup> @ 7 day 60 N/mm <sup>2</sup> @ 28 day
<b>Fresh wet density</b>	: Approximately 1900kg/ m <sup>3</sup> depending on actual consistency used.
<b>Volume change BS EN 445</b>	: A zero to positive expansion of up to 4%
<b>Bleeding BS EN 445</b>	<1% after 3 hours
<b>Fluidity BS EN 445 Cone Method</b>	
<b>Initial</b>	: 18 seconds
<b>Final (After 30 minutes)</b>	: 20 seconds

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

### 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. Do not use a colloidal impeller mixer if sands/ aggregates are being used.

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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.

64 to 78 litres of clean water (depending on nature of cement) and 200 kg of cement are required to be added per 12 kg bag to achieve the correct consistency.

48 to 58 litres of clean water (depending on nature of cement) and 150 kg of cement are required to be added per 9 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

Place the grout within 20 minutes of mixing.

Cebex Cable Grout can be placed in annular gaps of up to 60mm in thickness.

Pumping should be from a single point to eliminate any air or entrapment of water used for presoaking.

A heavy-duty diaphragm pump is recommended for pumping. Screw feed and piston pumps may also be suitable.

## Curing

Any exposed areas should be thoroughly cured. This should be done by the use of Concure curing membrane.

## Cleaning

Cebex Cable Grout should be removed from tools and equipment with clean water immediately after use. Cured material can be removed mechanically, or with Fosroc Acid Etch.

## 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. The Cebex Cable Grout shall be mixed in the laboratory following the instructions listed on the 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 a 20°C+ 2°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°C+ 2°C temperature. The cubes are then to be cured in accordance with BS1881.
7. Cubes are to be crushed in calibrated compression testing apparatus with a rate of loading not exceeding 180KN per minute. Types of cube fracture are to be recorded. Three cubes are to be crushed for each curing time interval specified. Results are to be calculated and issued as an average.

## Limitations

### Low temperature working

For ambient temperatures below 10°C the formwork should be kept in place for at least 36 hours.

When the air or contact surface temperatures are 5°C or below on a falling thermometer, warm water (30-40°C) is recommended to accelerate strength development.

Normal precautions for winter working with cementitious materials should then be adopted.

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## High temperature working

- I. It is suggested that, for temperatures above 35°C, the following guidelines are adopted as good working practice:
- II. Store unmixed material in a cool (preferably temperature controlled) environment, avoiding exposure to direct sunlight.
- III. 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.
- IV. Try to eliminate application during the hottest times of the day.
- V. Make sufficient material, plant and labour available to ensure that application is a continuous process.
- VI. Water (below 20°C) should be used for mixing the grout prior to placement.

## Technical support

Fosroc offers a comprehensive technical support service to specifiers, end users and contractors. It is also able to offer on-site technical assistance, an AutoCAD facility and dedicated specification assistance in locations all over the world.

## Estimating

### Supply

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**Cebex Cable Grout** : 9 kg and 12 kg bags

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### Yield

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**Cebex Cable Grout** : **approx. 150 litres** when mixed with 200 kg cement and 74 litres of water for 12 kg bag  
**approx. 112 litres** when mixed with 150 kg cement and 54 litres of water for 9 kg bag

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**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

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.

### Fire

Cebex Cable Grout is non-flammable.



#### 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 Services, copies of which may be obtained on request. Whilst Fosroc endeavours to ensure that any advice, recommendation, specification of information it may give is accurate and correct, it cannot, because it has no direct or continuous control over where or how its products are applied, accept any liability either directly or indirectly arising from the use of its products, whether or not in accordance with any advice, specification, recommendation of information given by it.

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## Fosroc International

### Malaysia

**Fosroc Sdn. Bhd**  
Tel : +60 3 5102 5660  
Enquiry**malaysia@fosroc.com**

### Thailand

**Fosroc Thailand**  
Tel : +66 2 136 9898  
Enquiry**thailand@fosroc.com**

### Indonesia

**PT. Fosroc Indonesia**  
Tel : +62 21 897 2103  
Enquiry**indonesia@fosroc.com**

### Vietnam

**Fosroc Vietnam**  
Tel : +82 222 3765 971  
Enquiry**vietnam@fosroc.com**

### Singapore

**Fosroc Singapore**  
Tel: +65 6665 3828  
Enquiry**singapore@fosroc.com**

### Rest of Southeast Asia

**Fosroc Construction Chemicals Pte Ltd**  
Tel : +65 6665 3828  
Enquiry**FGTAsia@fosroc.com**