

# Conbextra HF



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Conbextra HF  
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## High flow non-shrink cementitious grout

### Uses

Conbextra HF is used for free flow, non-shrink, cementitious grouting of gap thicknesses 10 to 100 mm. Recommended applications include:

- Large stanchion baseplates
- Joints between pre-cast concrete panels
- Pumped grouting applications
- Grouting applications where pouring access is restricted

### Advantages

- Non-shrink
- Highly flowable
- High strength
- Chloride free
- Suitable for pumping

### Standards compliance

Conbextra HF conforms fully to U.S. Corps of Engineers Specification for non-shrink grout CRD-C621-82A and ASTM C1107-91 (Type C).

When Conbextra HF is specified for use at nuclear sites, it is manufactured and tested in accordance with the AWSI/ASME N45 'Quality Assurance Program Requirements for Nuclear Facilities'.

### Description

Conbextra HF is supplied as a ready to use dry powder. The addition of a controlled amount of clean water produces a free-flowing grout for gap thicknesses up to 100 mm. In addition the low water requirement ensures high early strength and long-term durability.

Conbextra HF is a blend of Portland cements, graded fillers and chemical additives. The filler grading produces a highly flowable grout which will not segregate or bleed.

### Technical support

Fosroc offers a comprehensive range of high performance, high quality construction products. Fosroc offers a technical support package to specifiers and contractors as well as technical advice from staff with unrivalled experience in the industry.

## Properties

The following results were obtained at fluid consistency i.e. 4.8 litres of water per 25 kg bag.

Test method for	Typical result
<b>Compressive strength</b>	
(BS 1881, Part 116: 1983):	25 N/mm <sup>2</sup> @ 1 day 44 N/mm <sup>2</sup> @ 7 days 56 N/mm <sup>2</sup> @ 14 days 64 N/mm <sup>2</sup> @ 28 days 82 N/mm <sup>2</sup> @ 180 days
<b>Flexural strength</b>	
(BS 4551: 1980):	2.5 N/mm <sup>2</sup> @ 1 day 8.0 N/mm <sup>2</sup> @ 7 days 9.5 N/mm <sup>2</sup> @ 14 days 10.0 N/mm <sup>2</sup> @ 28 days 11.0 N/mm <sup>2</sup> @ 180 days
<b>Young's modulus</b>	
(ASTM C-469-83):	29 kN/mm <sup>2</sup>
<b>Flow characteristics</b>	
(Efflux time) CRD-C Cone:	19 to 25 seconds
<b>Setting time</b>	
(BS 4550, Part 3: 1978) —	
Initial set:	5.5 hours
Final set:	7.5 hours
<b>Time for expansion</b>	
<b>Plastic state —</b>	
Start:	15 minutes
Finish:	Initial set
Fresh wet density:	Approximately 2200 kg/m <sup>3</sup> depending on actual consistency used
<b>Expansion characteristics:</b>	
	An expansion of up to 1% when measured according to ASTM C827 overcomes plastic settlement in the unset material

## Specification clauses

### Performance specification

All grouting must be carried out with a pre-packaged, non-shrink cementitious grout manufactured and supplied by a registered firm. The grout shall be chloride free.

It shall be mixed with clean water to the required consistency and not exhibit bleed or segregation.

A volumetric expansion of up to 1% shall occur while the grout is in a plastic state by means of a gaseous system.

The compressive strength of the grout must exceed 40 N/mm<sup>2</sup> at 7 days and 60 N/mm<sup>2</sup> at 28 days.

The grout shall fully conform to the requirements of US Army Corps of Engineers Specification for non-shrink grout CRD-C621-82A.

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

### Supplier specification

All non-shrink cementitious grouting (specify details and areas of application) must be carried out using Conbextra HF manufactured by Fosroc and used in accordance with the manufacturer's data sheet.

## Application instructions

### Preparation

#### Foundation surface

The substrate surface must be free from oil, grease or any loosely adherent material. If the concrete surface is defective or has laitance, it must be cut back to a sound base. Bolt holes or fixing pockets must be blown clean of any dirt or debris.

#### Pre-soaking

For a minimum of 2 hours prior to grouting, the area of cleaned foundation should be flooded with fresh water. Immediately before grouting takes place, any free water should be removed. Particular care should be taken to blow out all bolt holes and pockets. Where water soaking is impossible contact Fosroc Customer Service Department.

#### Base plate

It is essential that this is clean and free from oil, grease or scale. Air pressure relief holes should be provided to allow venting of any isolated high spots.

### Levelling shims

If these are to be removed after the grout has hardened, they should be treated with a thin layer of grease.

### Formwork

The formwork should be constructed to be leakproof as Conbextra HF is a free-flowing grout. This can be achieved by using foam rubber strip or Silicone Sealant 33HM beneath the constructed formwork and between joints.

In some cases it is practical to use a sacrificial semi-dry sand and cement formwork. The formwork should include outlets for the pre-soaking water.

The unrestrained surface area of the grout must be kept to a minimum. Generally the gap width between the perimeter formwork and the plate edge should not exceed 150 mm on the pouring side and 50 mm on the opposite side. There should be no gap at the flank sides.

### Mixing

For best results a mechanically powered grout mixer should be used. For quantities up to 50 kg a Bosch (or equivalent) 1150 watt, 280 to 640 rpm, 110 volt drill, fitted with a Conbextra mixing paddle is suitable. Larger quantities will require a high shear vane mixer. Do not use a colloidal impeller mixer.

It is essential that machine mixing capacity and labour availability is adequate to enable the grouting operation to be carried out continuously. This may require the use of a holding tank with provision for gentle agitation to maintain fluidity.

The selected water content should be accurately measured into the mixer. Slowly add the total contents of the Conbextra HF bag, mix continuously for 5 minutes, ensuring a smooth, even consistency is obtained.

### Consistency of mixed grout

To achieve the consistencies which are defined in CRD-C621-82A, the amount of clean water that is added to a 25 kg bag at 20°C is:

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<b>Flowable:</b>	4.5 litres
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<b>Fluid:</b>	4.8 litres
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## Maximum flow distance at 20°C

The flow distances given below are intended as a guide. Actual flow distances will vary depending on site conditions.

Grout consistency	Maximum flow distance in mm		
	Gap depth mm	100 mm head	250 mm head
<b>Flowable:</b>	10	360	1200
	20	950	2600
	30	1500	3000
	40	2200	3000+
	50	3000	3000+
<b>Fluid:</b>	10	900	2500
	20	1900	3000
	30	3000	3000+
	40	3000+	3000+

## Placing

Place the grout within 20 minutes of mixing to gain the full benefit of the expansion process.

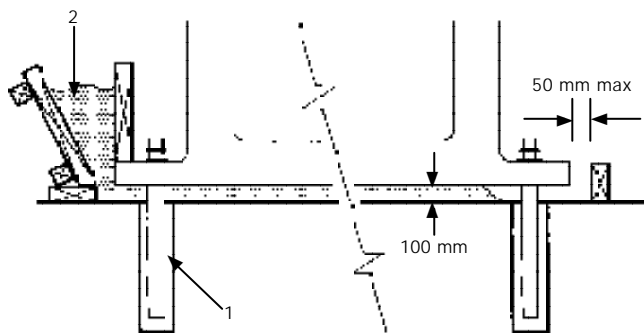
Conbextra HF can be placed in thicknesses up to 100 mm in a single pour.

For thicker sections it is necessary to use Conbextra TS (thick section) grout.

Any bolt pockets must be grouted prior to grouting between the substrate and the base plate.

Continuous grout flow is essential.

Example of a typical hopper system



- 1 Conbextra HF or Lokfix\* (first stage)
- 2 Conbextra HF poured or pumped into removable hopper (second stage)

\* Also available from Fosroc.

Sufficient grout must be available prior to starting and the time taken to pour a batch must be regulated to the time taken to prepare the next one.

The mixed grout should be poured only from one side of the void to eliminate the entrapment of air or surplus pre-soaking water. This is best achieved by pouring the grout across the shortest distance of travel. The grout head must be maintained at all times so that a continuous grout front is achieved.

Where large volumes have to be placed Conbextra HF may be pumped. A heavy duty diaphragm pump is recommended for this purpose. Screw feed and piston pumps may also be suitable.

## Curing

On completion of the grouting operation, exposed areas should be thoroughly cured with Concure WB curing membrane, continuous application of water and/or wet hessian.

## Cleaning

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

## Limitations

### Low temperature working

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

For ambient temperatures below 10°C the grout consistency should be flowable and the formwork should be maintained in place for at least 36 hours.

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

### High temperature working

At ambient temperatures above 35°C the mixed grout should be stored in the shade. Cool water (below 20°C) should be used for mixing the grout.

## Estimating

### Supply

Conbextra HF is supplied in 25 kg moisture resistant bags.

### Yield

Allowance should be made for wastage when estimating quantities required. The approximate yield per 25 kg bag for different consistencies is:

Consistency	Flowable	Fluid
Yield:	13.25 litres	13.5 litres

## Storage

Conbextra HF 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 may be reduced.

## Precautions

### Health and safety

Conbextra HF contains cement powders which, when mixed or become damp, release alkalis which can be harmful to the skin. During use, avoid inhalation of dust and contact with skin and eyes. Wear suitable protective clothing, gloves, eye protection and respiratory protective equipment. The use of barrier creams provide additional skin protection. In case of contact with skin, rinse with plenty of clean water, then cleanse with soap and water. In case of contact with eyes, rinse immediately with plenty of clean water and seek medical advice. If swallowed, seek medical attention immediately — **do not** induce vomiting.

## Fire

Conbextra HF is non-flammable.

For further information see relevant Product Safety Data Sheet.

## Additional Information

As well as joint sealants and ancillary products, Fosroc also manufactures a wide range of complementary products which includes waterstops, waterproofing membranes, grouting, anchoring and specialised flooring materials. In addition, a wide range of products specifically designed for the repair and refurbishment of damaged reinforced concrete is available. This includes hand-placed and spray grade repair mortars, fluid micro-concretes, chemical-resistant epoxy mortars and a comprehensive package of protective coatings.

## 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 or 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 or information given by it.