Fosroc Conbextra HF

constructive solutions

Dual expansion system for shrinkage compensated, highly fluid cementitious precision grout

Uses

Conbextra HF is used for free flow precision grouting in a wide range of heavy duty applications, such as :

- Machine base plates
- Bridge bearings
- Crane rails, Generators, Presses, Milling machines
- Anchor bolts & rods
- Column bases
- Precast elements

Advantages

- Unique non-metallic dual expansion system compensates for shrinkage in both the plastic and hardened states.
- Excellent initial flow and flow retention.
- High early strength facilitates rapid installation and early operation of plant.
- High ultimate strength and low permeability ensure durability of the hardened grout.
- Hydrogen-free gaseous expansion.
- Chloride free.
- Suitable for pumping or pouring over a large range of application consistencies and temperatures.

Standards compliance

Conbextra HF is suitable for use in contact with potable water.

Conbextra HF meets or exceeds the test requirements of ASTM C 1107.

Description

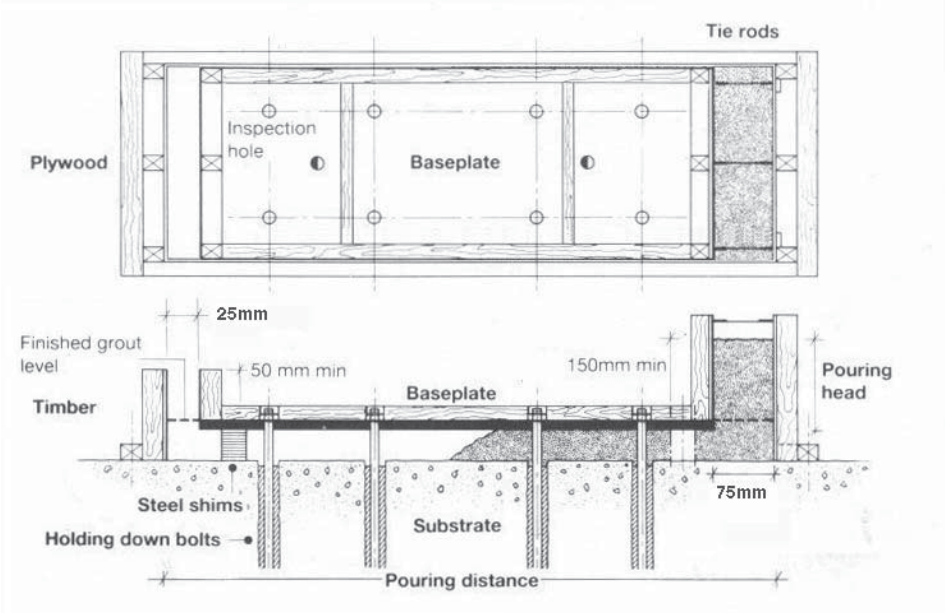
Conbextra HF is supplied as a ready to use pre-bagged dry powder. The addition of a controlled amount of clean water produces a free-flowing precision grout for gap thicknesses from10 to 125 mm. In addition the low water requirement ensures high early strength and long term durability.

Conbextra HF is a blend of Portland cements, graded fillers and chemical additives which impart controlled expansion in both the plastic and hardened states. The filler grading minimises segregation and bleeding over a wide range of application consistencies.

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.

Figure 1 : Typical specification drawing



Properties

The following results were obtained at a water:powder ratio of 0.22 and a temperature of 20°C.

Test method for		Typical result
Compressive strength		
BS 1881 part 116 1983	:	20 N/mm^2 @ 1 day 55 N/mm^2 @ 7 days 68 N/mm^2 @ 28 days
Flow		
ASTM C1437-01	:	Greater than 150%
Setting time		
ASTM C191-01a	:	
Initial set	:	355 minutes @23°C
Final set	:	415 minutes @23°C
Time for expansion		
Plastic state	:	Start 15 minutes Finish initial set
Hardened state	:	Start initial set Finish up to 28 days
Fresh wet density	:	Approx. 2200 kg/m^3
BS 1881:107:1983		
Modulus of elasticity		
ASTM C 469-02	:	>22,000MPa
Expansion characteristics	:	Upto 2% in accordance with ASTM C 940:98a

Specification

Supplier specification

Where mentioned on the contract documents, all precision 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.

Performance specification

All precision grouting (specify details and areas of application) must be carried out with a pre-packaged cement based product, which is non-metallic and 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 2% shall occur while the grout is in a plastic state by means of a gaseous, hydrogen-free system. The grout must also be compensated for shrinkage in the hardened state.

The compressive strength of the grout must exceed 50 N/mm^2 at 7 days and 65 N/mm^2 at 28 days.

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

Instructions for use

Preparation

Concrete 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 and 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 substrste 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.

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 mastic sealant 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.

Unrestrained surface area

This must be kept to a minimum. Generally the gap width between the perimeter formwork and the plate edge should not exceed 75 mm on the pouring side and 25 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 60 kg a slow speed drill fitted with a Fosroc Mixing Paddle (MR3) should be used. 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.

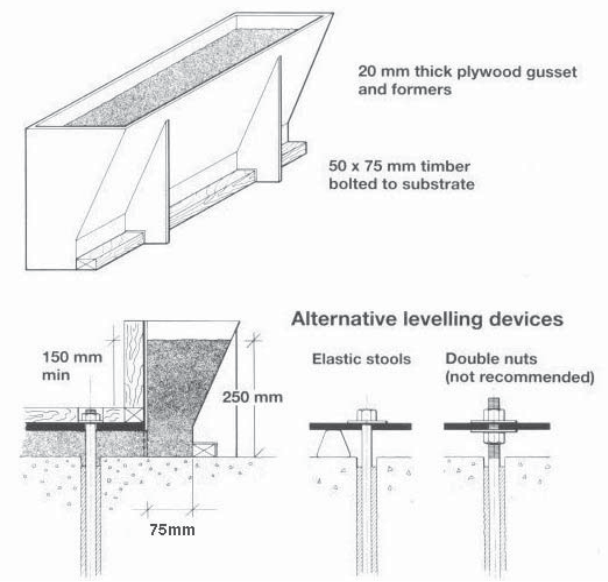
Consistency of mixed grout

To achieve the consistencies the amount of clean water that is added to a 25 kg bag at 20°C is:

Figure 2: Typical hopper system

Flowable	:	5 litres for 25kg bag
Fluid	:	5.5 litres for 25kg bag

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.



Maximum flow distance at 20°C

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

Placing

At 25°C, place the grout within 15 minutes of mixing to gain the full benefit of the expansion process.

Conbextra HF can be placed in thicknesses up to 125 mm in a single pour.

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

Continuous grout flow is essential. 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. This should be done by the use of Concure curing membrane, or 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*†.

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Sampling procedure

Cementitious grouts cannot be tested as concrete. Special sampling procedure are required. Refer to your local Fosroc office for further details.

High temperature working

It is suggested that, for temperatures above 35°C, the following guidelines are adopted as good working practice:

(i) Store unmixed material in a cool (preferably temperature controlled) environment, avoiding exposure to direct sunlight.

(ii) 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.

(iii) Try to eliminate application during the hottest times of the day and in direct sunlight.

(iv) Make sufficient material, plant and labour available to ensure that application is a continuous process.

(v) Water (below 20°C) should be used for mixing the grout prior to placement

Limitations

- In general, grouts should not be placed in any unrestrained situation, i.e. base plate plinths, etc. Failure to comply may lead to crack development in the grout. However they can be used for bolt pockets. In doubt, please consult your local Fosroc offices for more details.

Estimating

Supply

Conbextra HF	:	25 kg bags

Yield

Flowable	:	13.75 litres / 25 kg
Fluid	:	14.25 litres / 25 kg

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

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 will be reduced.

Precautions

Health and safety

Conbextra HF 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

Conbextra HF is non-flammable.

† **See separate data sheet**

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