



Fosroc® HES

High early strength, rapid setting, flowable, cementitious precision grout

Uses

Conbextra HES is used for free flow grouting in a wide range of applications where rapid strength gain is a prerequisite.

Advantages

- Rapid strength gain facilitates rapid installation and operation of plant within a matter of hours
- High strength gain is achievable even at low temperatures
- Excellent initial flow and flow retention
- Unique system compensates for shrinkage in hardened state
- High ultimate strength and low permeability ensure durability of the hardened grout
- Chloride free
- Suitable for pumping or pouring over a large range of application consistencies and temperatures

Description

Conbextra HES, rapid set high strength cementitious precision grout, is supplied as a ready to use powder. The addition of a controlled amount of clean water produces a free-flowing grout for gap thicknesses of 15 - 150 mm. In addition the low water requirement ensures high early strength and long term durability.

Conbextra HES is a blend of cements, graded aggregates and additives which impart controlled expansion in hardened state. The aggregate grading minimises segregation and bleeding over a wide range of application consistencies.

Maximum aggregate size is 5.0 mm.

Technical Support

Parchem offers a comprehensive range of high quality, high performance construction products. In addition, Parchem offers a worldwide technical support and on-site service to specifiers, end-users and contractors.

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Specification Clause

Performance specification

All 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.

The compressive strength of the grout must be at least 35 MPa at 4 hours (Plastic consistency).

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

Application Instructions

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

Several 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.

Base plate

It is essential that this is clean and free from oil, grease, paint 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 HES is a free flowing grout. This can be achieved by using foam rubber strip or Construction Silicone 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.

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 150mm on the pouring side and 50 mm on the opposite side. There should be no gap at the flank sides.

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Properties

Test Method	Standard	Result						
Compressive Strength	AS 1478.2:2005	Consistency	Water Addition	2 hours	4 hours	8 hours	24 hours	28 days
		Plastic	2.0-2.3	30	35	40	42	58
		Flowable	2.3-2.6	25	30	35	37	50
Bond Strength by Pull Off	EN 1542:1999	2.6MPa						
Chloride ion Content	EN 1015-17:2000	0.004%						
Fire Rating	EN 13687-1:2002	Class A1 Non-Combustible						
Flexural Strength (Modulus of Rupture)	AS 1012.11 - 2000	1 Day 7 Days 28 Days	3.0 MPa 4.5 MPa 6.5 MPa					
Indirect Tensile Strength	AS 1012.10.2000	1 Day 7 Days 28 Days	1.5 MPa 2.5 MPa 3.0 MPa					
Setting Time	AS 1012.18:1996	30-40 mins - initial set 50-50 mins - final set						
Fresh Wet Density		2200 kg/m ³ - depending on consistency used						
Alkali reactive particles	Rapid Mortar Bar Test (RTA T363)	Non-reactive						
Flow Characteristics	AS 1478.2:2005	350mm (Flow Trough)						
Minimum Thickness Maximum Thickness		15mm 150mm						

Clarification of property values: The typical properties given above are derived from laboratory testing. Compressive strengths stated above were measured using cube samples. Test results obtained will vary if carried out to an alternative standard or sample dimensions are used.

Note: Compressive strengths stated were measured at bottom end water, eg., the 28 day strength of 50 MPa for flowable consistency was obtained at a water addition of 2.3 litres water per 20kg bag of Conbextra HES.

Test Results to ASTM Specification C1107: 2001

Test Method	Standard	Result	
Flow Consistency	ASTM C1437:2007	136%	
Setting Time	ASTM C191:2008	Initial: Final:	30 minutes 65 minutes
Plastic Volume Change	ASTM C827:2010	+0.38%	
Hardened Volume Change	ASTM C1090:2010	1 day 3 days 14 days 28 days 56 days	0.007% 0.04% 0.03% 0.03% 0.03%

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Note: All tests were carried out at 25°C ± 2°C until the age of the test. All above test results are independent third party results. Copies of these test results are available on request. The tests were carried out at a water addition rate of 2.3L per 20kg.



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Mixing

A forced-action mixer is essential. Mix for 3 to 5 minutes at a slow speed (400/500 rpm) in a suitably sized drum using appropriate equipment such as the Ransom MDR59 140 x 600 M14 Helical mixing paddle (product code: N4020892-UNIT) fitted to a heavy-duty 1600W mixer, such as Ransom RAN160 (product code: NP7AN160-UNIT) or equivalent.

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 HES bag, mix continuously for 5 minutes, ensuring a smooth, even consistency is obtained.

Placing

Place the grout within 10 minutes of mixing.

Conbextra HES can be placed in thicknesses from 15 mm up to 150 mm in a single pour when used as an underplate grout. Where the grouting gap beneath the base plate exceeds the maximum thickness allowed, then the grout can be filled / bulked out with Conbextra Grout Aggregate* to minimise exotherm heat build up. Alternatively Conbextra Deep pour is available for pours up to 500 mm thick.

Filling/bulking out of the grout should not exceed a ratio of 1:1. Please refer to the Conbextra Grout Aggregate TDS for more guidance on bulking out of cement based grouts. 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.

Curing

On completion of the grouting operation, exposed areas should be thoroughly cured. This should be done by the use of a Concure curing

membrane, or the continuous application of water and/or wet hessian.

Important notice

Cleaning

Conbextra HES should be removed from tools and equipment with clean water immediately after use. Cured material can be removed mechanically.

Limitations

Low temperature working

When the air or contact surface temperatures are 15°C or below on a falling thermometer, warm water (30°C) is recommended to accelerate strength development.

For ambient temperatures below 15°C the grout consistency should be flowable and the formwork should be maintained in place for a minimum of 24 hours.

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

High temperature working

Conbextra HES should not be used at ambient temperatures above 35°C as premature setting of the grout may occur making handling and placement very difficult.

Estimating Supply

Conbextra HES 20kg	FC501060-20KG
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Yield per 20kg bag mixed

Plastic consistency	10.0 litres
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Flowable consistency	10.2 litres
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Storage

Conbextra HES has a shelf life of 12 months if kept in a dry store in sealed bags. Refer to the Use by Date indicated on the packaging.

If stored in high temperature and high humidity locations, the shelf life may be reduced.

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This Technical Data Sheet (TDS) summarises our best knowledge of the product, including how to use and apply the product based on the information available at the time. You should read this TDS carefully and consider the information in the context of how the product will be used, including in conjunction with any other product and the type of surfaces to, and the manner in which, the product will be applied. Our responsibility for products sold is subject to our standard terms and conditions of sale. Parchem does not accept any liability either directly or indirectly for any losses suffered in connection with the use or application of the product whether or not in accordance with any advice, specification, recommendation or information given by it.



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