Fosroc®
Conbextra® HES

constructive solutions

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 pre-requisite.

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
- RCS (Respirable Crystalline Silica) Hazard Free
- Non-shrink - according to ASTM C1107:2020

Description

Conbextra HES, rapid set, high strength cementitious 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 15mm to 150mm. 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 (Class C). The aggregate grading minimises segregation and bleeding over a wide range of application consistencies.

Conbextra HES is not hazardous in accordance with Australian Inventory of Industrial Chemicals. Contains <0.1% RCS.

Maximum aggregate size is 5.0mm.

Properties

Test Method	Standard	Result					
Compressive Strength (MPa)	AS 1478.2:2005	Consistency	2 hours	4 hours	8 hours	24 hours	28 days
		Plastic	30	35	40	42	58
		Flowable	25	30	35	37	50
Modulus of Elasticity	AS 1012.17:2000	3 hours	23.4 GPa				
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				
Fresh Wet Density	ASTM C185:2020	2250 kg/m³ - 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. Guidelines for sampling grout on site for compressive strength testing are available on the Fosroc website.

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.

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Test Results to ASTM Specification C1107: 2020

Test Method	Standard	Result	
Flow Consistency:	ASTM C839:2016a	121%	
Setting Time:	ASTM C953:2017	Initial: Final:	30 minutes 45 minutes
Change in Height at Early Age (Setting time):	ASTM C827:2016	+0.30%	
Height Change of Hardened Grout (Moist cure>	ASTM C1090:2015	1 day 3 days 14 days 28 days 28 days + 28 days in air	+0.14% +0.18% +0.17% +0.18% +0.17%
Compressive Strength	ASTM C109:2020b	1 day 3 days 7 days 28 days	45.6 N/mm² 48.3 N/mm² 58.1 N/mm² 71.6 N/mm²

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. Guidelines for sampling grout on site for compressive strength testing are available on the Fosroc website.

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. For maximum bond, surfaces should be abraded or roughened, preferably by mechanical means such as needle gun, grit blasting, grinding. Bolt holes or fixing pockets must be blown clean of any dirt or debris. These may need to be grouted beforehand.

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

Pre-soaking

Pre-soaking the formed grouting area with clean water helps to ensure good adhesion of the grout at the interface of the concrete foundation and improves the flow of the grout during the installation. The area should be filled with clean water for a **minimum 2 hours** before the grouting takes place.

Immediately before grouting takes place, any free water should be removed by draining or vacuum.

Particular care should be taken to blow out any bolt holes and pockets.

Mixing

A forced-action mixer is essential. Mix for 3 to 5 minutes at a slow speed (400/500rpm) in a suitably sized drum using appropriate equipment such as a 140mm helical mixing paddle fitted to a heavy-duty 1600W mixer.

The selected water content should be accurately measured into the mixing bucket. While mixing, slowly add the total contents of the Conbextra HES bag, mix continuously for 3 to 5 minutes, ensuring a smooth, even consistency is obtained. Aways add the powder to the water.

Required Consistency	Litres of water added per 20kg bag	Yield - litres of mixed material
Plastic	2.0 - 2.3	10.0
Flowable	2.3 - 2.6	10.2

Mixing larger volumes

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

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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 bags, 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 15mm up to 150mm 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 filled / bulked out with Conbextra Grout Aggregate* to minimise exotherm heat build up. Alternatively Conbextra Deep Pour is available for pours up to 500mm thick.

Filling/bulking out of the grout should not exceed a ratio of 2:1 grout to aggregate (by weight). 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.

Cleaning

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

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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.

Supply

Conbextra HES is supplied in 20kg moisture resistant plastic bags.

Conbextra HES 20kg:	FC501060-20KG

Yield per 20kg bag mixed	
Plastic consistency	10.0 litres
Flowable consistency	10.2 litres

Storage

Conbextra HES has a shelf life of 18 months from date of manufacture if kept in the original, unopened bags. Refer to the manufacture date indicated on the packaging. Do not use if there are lumps in the product, or a loss of workability (requiring more water to be added) is experienced.