Fosroc® Conbextra UW

constructive solutions

Non-shrink cementitious grout for underwater installation conforming to the requirements of BS EN 1504-3 Class R4.

Uses

Conbextra UW is a free flow or pumped non-shrink, cementitious grout for use underwater or in tidal zones where "wash out" would be a problem with conventional grouts. Recommended applications include:

- Stanchion baseplates
- Bridge columns
- Quay pillars
- Concrete piling
- Slipways

Advantages

- No risk of significant "wash-out" of cement phase when placed under water
- Displaces water effectively
- Gaseous expansion system compensates for shrinkage and settlement in the plastic state
- High early and ultimate strength
- Exceptional resistance to freeze thaw - ensures durability
- Chloride free
- Prepackaged needing only on-site addition of water

Description

Conbextra UW is supplied as a ready to use dry powder. The addition of a controlled amount of clean water produces a free-flowing grout. The grout exhibits exceptional resistance to "washing-out" of the cement phase when placed in stationary or moving water.

Conbextra UW is a blend of Portland cements, graded fillers and chemical additives. The aggregate grading minimises segregation and bleeding whilst assisting flow characteristics.

Specification clause

The grout shall be Conbextra UW a pre-bagged single component cementitious material which conforms with the requirements of BS EN 1504-3 class R4.

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 MPa at 7 days and 60 MPa at 28 days when cured at 20°C.

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

Standards compliance

Conbextra UW complies with classification R4 according to BS EN 1504-3.

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0370-CPR-0845

DoP: UK9-32

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Conbextra UW

EN1504-3 Structural and non structural repair methods 3 and 4

Compressive strength	Class R4 (≥ 45 MPa)
Chloride ion content	≤ 0.05%
Adhesive strength by pull-off test	≥ 2.0 MPa
Thermal compatibility: freeze-thaw cycling with immersion	≥ 2.0 MPa
Carbonation resistance	Passes
Elastic modulus in compression	30.7 GPa
Fire classification	Class A1
Dangerous substances	Complies with 5.4

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Properties

The following results were obtained at a water : powder ratio of 0.18 and a temperature of 20°C unless otherwise stated.

Test method	Standard	EN1504 Requirement	Result
Compressive strength	EN 12190:1999	Class R 4 ≥ 45MPa	@ 1 Day 25 MPa @ 7 Days 50 MPa @ 28 Days 60 MPa
Bond strength by pull off:	EN 1542:1999	Class R4 ≥ 2.0 MPa	2.2 MPa
Chloride ion content:	EN 1015-17:2000	Class R 4 ≤ 0.05%	0.03%
Freeze thaw cycling:	EN 13687-1:2002	Class R 4 ≥ 2.0 MPa	2.1 MPa
Resistance to carbonation d_k	EN 13295:2005	Class R4 ≤ ref concrete	Conforms
Elastic modulus in compression	EN 13412	Class R 4 ≥ 20 GPa	30.7 GPa @ 28 Days
Fire rating	EN 13501-1	-	Class A1 Non-combustible
Setting time	BS 4551 Pt14:1980	-	Initial set: 6 hours
Fresh wet density	-	-	Nominally 2108 kg/m^{-3}
Alkali reactive particles	Method TI-B 52	-	≤ 1.0 vol%
Time for expansion	-	-	Start: 15 minutes Finish: 2 hours
Grout consistency / Water addition	-	-	Flowable: 5.5 litres water / 25kg bag
Minimum thickness Maximum thickness	-	-	10 mm 75mm above water 150mm below water

Clarification of property values: The typical properties given above are derived from laboratory testing. Results derived from field applied samples may vary.

Application instructions

Preparation

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.

Substrates which are permanently immersed should be grit-blasted or cleaned with a high pressure water jet. Non-immersed or intermittently immersed substrates can also be prepared using these techniques. Alternatively scabbling or bush hammering may be appropriate. Non-immersed substrates must be thoroughly soaked prior to grouting for a minimum of 2 hours.

Formwork

The formwork should be constructed to be leakproof as Conbextra UW is a free flowing grout. This can be achieved by using foam rubber strip or Nitoseal MS60 beneath the constructed formwork and between joints.

The unrestrained surface area of the grout should be kept to a minimum.

If the grout is likely to be subjected to moving water before the final set, it should be top shuttered.

Mixing

For best results a mechanically powered grout mixer should be used.

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.

Measure accurately 5.5 litres of water for each 25 kg bag into the mixer. Slowly add the Conbextra UW whilst mixing continuously using a Conbextra (MR3) mixing paddle. When all the powder is added mix continuously for 5 minutes ensuring a smooth even consistency is obtained. (Fluidity will increase with increased mixing.)

Placing

Place the grout within 20 minutes of mixing to gain the full benefit of the expansion process. Continuous grout flow is essential.

The mixed grout should be poured or pumped through a flexible tube, having a minimum diameter of 50 mm, to the lowest point in the form.

Care must be taken at the start of the grouting operation to restrict the grout flow so that water is not entrapped.

The tube may be raised as necessary to reduce any back pressure. It should not be raised above the surface level of the grout.

Conbextra UW can be placed in thicknesses up to 75 mm in one pour when used above water. When used underwater, the heat sink effect in this environment will allow thicknesses of up to 150 mm to be placed.

For thicker sections, up to 200 mm above water and 400 mm underwater, it is necessary to fill out Conbextra UW using a clean rounded well graded aggregate ranging from 2 to 10 mm. The ratio of aggregate added to Conbextra UW should not exceed 1 : 1 by weight. For such mixes a concrete mixer should be used. Unrestrained surface area should be kept to a minimum.

Curing

Curing will not be required in totally submerged situations. However, when cast above water, exposed areas should be thoroughly cured with Concure WB curing membrane, continuous application of water and/or wet hessian.

Cleaning

Because of its water resisting properties, equipment used for Conbextra UW will be difficult to clean. The use of hot water for cleaning purposes will assist. Cured material can be removed mechanically or with Fosroc Acid Etch.

Estimating

Supply

Conbextra UW is supplied in 25 kg bags.

Yield

Allowance should be made for wastage when estimating quantities required. The approximate yield of a 25 kg bag when mixed with 5.5 litres of water is 14.5 litres.

Limitations

Low temperature working

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.

The grout should be protected from freezing conditions up to 48 hours after placing.

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.

Storage

Store in unopened bags in cool dry internal conditions. The product has a shelf life of 12 months from the date of manufacture if kept in a dry storage in the original, unopened bags. If stored at high temperatures and/or high humidity conditions the shelf life may be reduced to less than 6 months.

Precautions

Health and safety

For further information refer to the appropriate Product Safety Data Sheet, available at www.fosroc.com

Fire

Conbextra UW is non-flammable.

Environmental Data (EPD)

GWP Total, A1 – A3: 0.407 kgCO2e per 1kg product.

GWP Total, A1 – D: 0.611 kgCO2e per 1kg product.

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