

Expangrout* UW



CONSTRUCTION CHEMISTRY

Non-shrink cementitious grout for underwater installations

Uses

Expangrout* UW is used for free flow or pumped grouting applications underwater or in tidal zones. There will be no significant 'wash-out' of the cement phase. Applications include bridge columns, quay pillars, concrete piling, slipways and dams.

Advantages

- No risk of significant 'wash-out' of cement phase when placed underwater
- Displaces water effectively Gaseous expansion system compensates for shrinkage and settlement in the plastic state
- High early and ultimate strength and exceptional resistance to freeze-thaw cycling ensure durability of the hardened grout
- Chloride free
- Pre-packaged needing only on-site addition of water

Description

Expangrout* UW is supplied as a ready to use 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.

Expangrout* UW is a blend of cement, graded fine aggregate and chemical additives which impart controlled expansion, water reduction and non 'wash-out' characteristics. The aggregate grading minimizes segregation and bleeding whilst assisting the flow characteristics.

Properties

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

Test method for Typical result

Compressive strength

(BS 4550, Part 3: 1978) —

1 day	: 25 N/mm ²
3 days	: 38 N/mm ²
7 days	: 44 N/mm ²
28 days	: 53 N/mm ²

Setting time

(BS 5075, Part 1: 1982) —

Initial	: 4.5 hours
Final	: 5.5 hours

Density of hardened grout : 2050 kg/m³

Expansion characteristics : Controlled expansion occurs in the unset material to ensure that the grout, when cured, will continue to occupy its original volume within the confines of the void in which it was placed

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 to a sound base. Substrates which are permanently immersed should be sand-blasted or cleaned with a high pressure water jet. Non-immersed or intermittently immersed substrates can be prepared using these techniques. Alternatively scabbling or bush hammering may be appropriate.

Formwork

The formwork should be constructed to be leakproof, as Expangrout* UW is a free flowing grout, using foam rubber strip or mastic sealant beneath the formwork and between joints. Coat all formwork with Expanform* to enable easy formwork release.



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Mixing and placing

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 Expangrout* UW whilst mixing continuously. 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.

Expangrout* 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 Expangrout* UW using a clean rounded well graded aggregate ranging from 2 to 10 mm. The ratio of aggregate added to Expangrout* 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 intermittently or totally submerged situations. However, when cast above water, exposed areas should be thoroughly cured with Expangrout* curing membrane, continuous application of water and/or wet hessian.

Cleaning

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

Limitations

Expangrout* UW must not be applied below 5°C.

Estimating

Supply

Expangrout* UW : 25 kg bags

Yield

Expangrout* UW : Approx 14.5 litres when mixed with 5.5litres of water

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

Storage

Expangrout* UW 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

Expangrout* UW 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

Expangrout* UW is non-flammable.



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* Denotes the trademark registered.

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