

Expanmortar* EPS



CONSTRUCTION CHEMISTRY

High strength, abrasion-resistant epoxy reinstatement mortar

Uses

For fast and permanent patch repair of concrete, particularly where high strength, abrasion and chemical resistance is required. It is ideally suited for:

- Sewage tanks
- Sea walls
- Industrial floors
- Use as a bedding mortar
- Joint arris repairs

Advantages

- High ultimate strength - suitable for structural use.
- Early development of strength minimises disruption.
- Abrasion-resistance: suitable for heavily trafficked areas.
- Highly resistant to a wide range of chemicals.
- Will cure under damp conditions - cured product is highly impermeable to water.
- Pre-weighed components ensure consistency.

Description

Expanmortar* EPS is a three-component material supplied in pre-weighed quantities ready for on-site mixing and use. It is based on a high quality, solvent-free, epoxy resin system; with special aggregates to provide high strength and excellent abrasion resistance.

Specification

High strength epoxy repair mortar

The high strength repair mortar shall be Expanmortar* EPS, a three-component epoxy resin. The cured mortar shall achieve a compressive strength of 70 N/mm², a flexural strength of 20 N/mm² and a tensile strength of 10 N/mm² when tested at 28 days. The water absorption of the cured mortar shall not exceed 0.2%.

Properties

The following results were obtained at a temperature of 20°C unless otherwise specified.

Test method	Typical result	
Compressive strength (BS 6319, Pt 2)	70 N/mm ² @ 7 days	
Flexural strength (BS 6319, Pt 3)	20 N/mm ² @ 7 days	
Tensile strength (BS 6319, Pt 7)	10 N/mm ² @ 7 days	
Water absorption	0.2% (concrete - 2.0 to 2.5%)	
BRE Impact Resistance BS 8204 Part 1: 1987	Category A	
Pot Life	20°C : 45 mins	35°C : 20 mins
Initial hardness	24 hours	16 hours
Full cure	7 days	4 days
Fresh wet density	Approximately 2000 kg/m ³ (fully compacted)	

Fully cured blocks of Expanmortar* EPS were continually immersed at 20°C in a wide range of aggressive chemicals found in industrial environments. Tests were performed by constant immersion over a set period, followed by visual inspection and testing for Shore D hardness.

Acids (m/v)

Citric acid 10%	: Resistant
Tartaric acid 10%	: Resistant
Hydrochloric acid 25%	: Resistant
Sulphuric acid 10%	: Resistant
Phosphoric acid 50%	: Resistant
Lactic acid 10%	: Resistant
Nitric acid 10%	: Resistant

Alkalis (m/v)

Sodium Hydroxide 50%	: Resistant
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Solvents & organics

Diesel fuel/petrol 100%	: Resistant
Hydrocarbons 100%	: Resistant

Aqueous solutions

Sugar solutions (sat.)	: Resistant
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CONSTRUCTION CHEMISTRY

Note: All the above results have been determined by laboratory controlled tests and are in excess of those expected in practice. Nevertheless, success in use will be determined by the implementation of good housekeeping practice.

Instructions for use

Design criteria

Expanmortar* EPS can be applied in sections up to 50 mm thickness in horizontal locations, and 12 mm in vertical locations, in a single application and without the use of form work, dependent upon the repair geometry.

Expanmortar* EPS can be used for emergency repairs where fast strength gain is important. When properly compacted, the mortar is highly impermeable.

In certain instances, Expanmortar* EPS can be used on metal substrates. Contact the local Expanchem Fospak office for advice in this respect.

For fast repairs in vertical and overhead locations where a higher-build, lightweight formulation is required, the use of Expanmortar* HB† is recommended.

Preparation

Clean the surface and remove any dust, unsound material, plaster, oil, paint, grease, corrosion deposits or algae. Roughen the surface and remove any laitence by light scabbling or grit-blasting. Saw cut or cut back the extremities of the repair locations to a depth of at least 5 mm to avoid feather-edging and to provide a square edge. Break out the complete repair area to a minimum depth of 5 mm up to the sawn edge.

Oil and grease deposits should be removed by steam cleaning, detergent scrubbing or the use of a proprietary degreaser. The effectiveness of decontamination should then be assessed by a pull-off test.

Expose fully any corroded steel in the repair area and remove all loose scale and corrosion deposits. Steel should be cleaned to a bright condition paying particular attention to the back of exposed steel bars. Grit-blasting is recommended for this process.

Substrate priming

Horizontal substrates should be primed using Expancote* 25*. Predominantly vertical and metal substrates should be primed using Expancote* Primer Sealer*. In both cases, the primer should be mixed in the proportions supplied, adding the entire contents of the 'hardener' tin to the 'base' tin. The two components should be thoroughly mixed together by hand for 3 minutes.

The mixed primer should be scrubbed well into the prepared substrate, taking care that all imperfections in the surface are properly coated and avoiding 'ponding' in depressions. If the primer is absorbed within 30 minutes, a second coat should be applied before continuing. Expanmortar* EPS can be applied as soon as the primer has started to gel but still has surface 'tack'. This is normally between 30 minutes and 4 hours dependent on the ambient and substrate temperatures. If the primer cures hard, a second application must be made before application of Expanmortar* EPS. The usable life of the mixed primer is approximately 60 minutes at 20°C or 30 minutes at 35°C.

Mixing

Care should be taken to ensure that Expanmortar* EPS is thoroughly mixed to produce a fully homogeneous, trowellable mortar. Expanmortar* EPS must be mixed mechanically. The 'hardener' and 'base' components should be stirred thoroughly in order to disperse any settlement before mixing them together. The entire contents of the 'hardener' container should then be emptied into the 'base' container and manually mixed for 3 minutes, then emptied into a forced action mixer of adequate capacity (e.g. Cretangle or Pennine). Add the aggregate slowly with the mixer running and continue for 2 to 3 minutes until all the components are thoroughly blended. Under no circumstances should part packs be used.

Application

Apply the mixed Expanmortar* EPS to the prepared substrate by wood float, pressing firmly into place to ensure positive adhesion and full compaction. Thoroughly compact the mortar around any exposed reinforcement.

In restricted location, or where exposed reinforcing steel is present, application by gloved hands is an acceptable alternative but, in all cases, the product must be finished to a tight surface with a steel trowel.

Expanmortar* EPS can be applied in sections up to 50 mm thickness in horizontal locations or up to 12 mm thickness in vertical locations in a single application and without the use of form work. Thicker vertical sections may sometimes be possible dependent on the profile of the substrate and the volume of exposed reinforcing steel but should generally be built up in layers.

When larger areas are being rendered, a chequer board application technique is recommended.

Note: the minimum applied thickness of Expanmortar* EPS is 5 mm.



CONSTRUCTION CHEMISTRY

Build-up

Additional build-up can be achieved by application of multiple layers. Exposed steel reinforcing bars should be firmly secured to avoid movement during the application process as this will affect mortar compaction, build and bond.

Where thicker sections are required, the surface of the intermediate applications should be scratch-keyed to provide a suitable surface for subsequent layers. The application of additional layers should follow between 8 and 24 hours (@ 20°C) after the first application. This time should be reduced at higher temperatures. Re-priming and a further application of Expanmortar* EPS may then proceed.

If sagging occurs during application, the Expanmortar* EPS should be completely removed and reapplied at a reduced thickness on to the correctly re-primed substrate.

Finishing

Expanmortar* EPS is finished by the use of a wood float and closed with a steel trowel. The completed surface should not be overworked.

High temperature working

At ambient temperatures above 35°C, Expancote* 25, Expancote* Primer Sealer and Expanmortar* EPS will have shorter pot lives and open working time. The materials should be stored in the shade or in an air conditioned environment and should not be applied in direct sunlight.

Curing

Curing protection is not necessary for Expanmortar* EPS.

Cleaning

Expancote* 25, Expancote* Primer Sealer and Expanmortar* EPS should be removed from tools, equipment and mixers with Expanchem Solvent 102* immediately after use.

Technical support

Expanchem Fospak 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.

Estimating

Supply

Expanmortar* EPS	: 10 litre packs
Expanprime* 25	: 1 & 4 litre packs
Expancote* Primer Sealer	: 1 & 4 litre packs
Expanchem Solvent 102	: 5 litre cans

Coverage

Expanprime* 25	: 4.0 - 5.0 m ² /litre
Expancote* Primer Sealer	: 4.0 - 5.0 m ² /litre

Note : The coverage figures for Expanprime* 25 and Expancote* Primer Sealer are theoretical - due to wastage factors and the variety and nature of possible substrates, practical figures will be reduced.

Storage

Shelf life

All products have a shelf life of 12 months at 20°C if kept in a dry store in the original, unopened bags or packs.

Storage conditions

Store in dry conditions in the original, unopened bags or packs. If stored at high temperatures, the shelf life may be reduced to 4 to 6 months.

Limitations

Expanmortar* EPS should not be used when the temperature is below 5°C and falling. Do not mix part packs under any circumstances. Expanmortar* EPS should not be exposed to moving water during application. Exposure to heavy rainfall prior to the final set may result in surface scour. If any doubts arise concerning temperature or substrate conditions, consult the local Expanchem Fospak office.

The material should not be applied at less than 5 mm thickness. Greater thicknesses than those specified above can be achieved by the application of subsequent layers. Larger areas should be applied in a 'chequer board' fashion.

For higher build characteristics to vertical locations, or for overhead application, Expanmortar* HB is recommended.



CONSTRUCTION CHEMISTRY

Precautions

Health and safety

Expancote* 25, Expancote* Primer Sealer, Expanmortar* EPS and Expanchem Solvent 102 should not come in contact with skin or eyes, or be swallowed. Ensure adequate ventilation and avoid inhalation of vapours. Some people are sensitive to resins, hardeners and solvents. Wear suitable protective clothing, gloves and eye protection. If working in confined areas, suitable respiratory protective equipment must be used.

The use of barrier creams provide additional skin protection. In case of contact with skin, remove immediately with resin removing cream followed by washing with soap and water. Do not use solvent. 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

Expanmortar* EPS and Expancote* Primer Sealer are non-flammable. Expancote* 25 and Expanchem Solvent 102 are flammable. Keep away from sources of ignition.

No smoking. In the event of fire, extinguish with CO₂ or foam. Do not use a water jet.

Flash points

Expancote* 25	:	39°C
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Expanchem Solvent 102	:	33°C
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For further information, refer to the Product Material Safety Data Sheet.

Additional Information

Overcoating with protective/decorative finishes

Expanmortar* EPS is extremely durable and resistant to a wide range of acids, alkalis and industrial chemicals and will provide excellent protection to the concrete and embedded steel reinforcement within the repaired location. The surrounding parts of the structure may benefit from the application of a protective coating, thus bringing them up to the same protective standard as the repair itself. Expanchem Fospak recommends use of the Expancote* range of epoxy resin, chemical-resistant, protective coatings.

For surrounding areas not subjected to chemical attack or physical wear, Expanchem Fospak recommend the use of the Expancote* range of anti-carbonation, anti-chloride protective coatings. These products provide a decorative and uniform appearance as well as protecting areas of the structure which might otherwise be at risk from the environment.

Expancote* epoxy resin protective coatings should be applied within 24 hours. Expancote* products should not be applied until the Expanmortar* EPS is at least 3 days old. For further advice, consult the local Expanchem Fospak office

* Denotes the trademark registered.

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