

Fosroc® Guncrete E

High strength, low shrinkage, high build dry-spray applied repair mortar

Uses

For the reinstatement of large areas of concrete and for small, localised patch repairs in areas such as sea walls bridge decks and piers, tunnels, sewer pipes, etc.

Advantages

- High build
- High early strength
- Low drying shrinkage values
- Low rebound
- Chloride free

Description

Guncrete E is supplied as a ready to use dry powder for use with standard dry spray gunite or shotcrete equipment. The material is formulated to produce a high build, material which can be applied by standard dry-spraying techniques.

Technical Support

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

Design Criteria

Guncrete E is designed for vertical, overhead or horizontal applications. It can be applied in sections from 10 mm up to 150 mm depending on substrate geometry. The material should not be applied at less than 10 mm thickness.

Specification Clauses

Steel reinforcement primer

The steel reinforcement primer shall be Nitoprime Zincrich, a single component zinc-rich epoxy resin. The primer shall be an 'active' type, capable of avoiding the generation of incipient anodes in the immediately adjacent locations.

Repair mortar

The shrinkage-compensated reinstatement mortar shall be Guncrete E, a single component cement-based blend of powders to which only the site-addition of clean water shall be permitted. The cured mortar shall achieve >45 MPa compressive strength at 28 days. Drying shrinkage measured to ASTM modified 23°C / 50%RH shall be not greater than 500 microstrain at 7 days and 700 microstrain at 28 days.

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Properties

The following results were obtained at a water:powder ratio of 0.1 and temperature of 20°C unless otherwise stated.

Test Method	Standard	EN 1504 R4 Requirement	Test Result
Compressive Strength	EN 2190:1999 AS 1478.2 - 2005	≥ 45 MPa -	84.0 MPa @28 days 35 MPa @ 1 day 60 MPa @ 7 days 70 MPa @ 28 days
Bond strength by pull off	EN 1542:1999	≥ 2.0 MPa	Without primer (pre-soak) 3.2 MPa
Chloride ion Content	EN 1015-17:2000	≤ 0.05%	0.003%
Capillary Absorption	EN 1307:2002	≤ 0.5 Kg/(m ² x h ^{0.5})	0.1 Kg/(m ² x h ^{0.5})
Carbonation Resistance	EN 13295:2005	d ≤ ref concrete	Conform
Coefficient of thermal expansion	EN 1770:1990	Declared Value	16.3 x 10 ⁻⁶ /°C
Shrinkage and Expansion	EN 12617-4:2002	> 2.0 MPa	Shrinkage: 2.7 MPa Expansion: 2.8 MPa
Elastic Modulus	EN 13412:2008	> 20 GPa	52.8 GPa
Chloride Diffusion	Nordtest NT Build 443	-	D _e : 1.0 x 10 ⁻¹² m ² /sec
Flexural Strength	AS 1012.11 - 2000	-	10.1 MPa @ 28 days
Tensile Strength	AS 1012.10 - 2000	-	5.5 MPa @ 28 days
Setting Time	AS 1012.18 - 1996	-	Initial Set: 4.5 hours Final Set: 10 hours
Fresh Wet Density		-	2160 Kg/m ³
Drying Shrinkage	AS 1012.13 - 1992	-	< 500 microstrains @ 7 days < 600 microstrains @ 56 days
Alkali reactive particles	RTA Rapid Mortar Bar Test RTA T363	-	<0.1% (Non-Reactive)
Resistivity	Taywood-Werner 4 Probe	-	3600 Ω cm @ 7 days 25,300 Ω cm @ 28 days <50,000 Ω @ 56 days

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

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Application Instructions

Preparation

Saw cut or cut back the extremities of the repair locations to a depth of at least 10 mm to avoid feather-edging and to provide a square edge. Break out the complete repair area to a minimum depth of 10 mm up to the sawn edge.

Clean the surface and remove any dust, unsound or contaminated material, plaster, oil, paint, grease, corrosion deposits or algae. Where breaking out is not required, roughen the surface and remove any laitance by light scabbling or grit-blasting.

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.

Where corrosion has occurred due to the presence of chlorides, the steel should be high-pressure washed with clean water immediately after grit-blasting to remove corrosion products from pits and imperfections within its surface.

Reinforcing steel priming

Apply one full coat of Nitoprime Zincrich and allow to dry before continuing. If any doubt exists about having achieved an unbroken coating, a second application should be made and, again, allowed to dry before continuing.

Application

Exposed steel reinforcing bars should be firmly secured to avoid movement during the application process as this will affect mortar compaction, build and bond.

The substrate should be thoroughly washed with clean water and any excess water removed prior to the spray application of the Guncrete E.

Apply the Guncrete E to the prepared substrate using suitable gunning or shotcreting equipment. Ensure thorough compaction of the mortar around the exposed reinforcement. Guncrete E can be applied in sections from 10 mm up to 150 mm in one pass depending on substrate geometry.

If sagging occurs during application to vertical surfaces, the Guncrete E should be completely removed and reapplied at a reduced thickness on to the substrate.

Note: the minimum applied thickness of Guncrete E is 10 mm.

Finishing

Guncrete E is finished by striking off with a straight edge and closing with a steel float. Wooden or plastic floats, or damp sponges may be used to achieve the desired surface texture. The completed surface should not be overworked.

Guncrete E's aggregate composition provides for a textured finish affect. If a smooth, closed render appearance is required, the subsequent application of Renderoc FC is necessary.

Low temperature working

In cold conditions the material should not be applied when the substrate and/or air temperature is 5°C and falling. At 5°C static temperature or at 5°C and rising, the application may proceed.

High temperature working

At ambient temperatures above 35°C, the material should not be used as this will cause premature setting.

Curing

Guncrete E is a cement-based repair mortar. In common with all cementitious materials, Guncrete E must be cured immediately after finishing in accordance with good concrete practice. The use of Nitobond AR, sprayed on to the surface of the finished Guncrete E in a continuous film, is recommended. Large areas should be cured as trowelling progresses (0.5m² at a time) without waiting for completion of the entire area. In fast drying conditions, supplementary curing with polythene sheeting taped down at the edges must be used. In cold conditions, the finished repair must be protected from freezing.

Overcoating with protective decorative finishes

Guncrete E is extremely durable and will provide excellent protection to the embedded steel reinforcement within the repaired locations. The surrounding parts of the structure will generally benefit from the application of a protective barrier/decorative coating to limit the advance of chlorides and carbon dioxide, thus bringing them up to the same protective standard as the repair itself. Parchem recommend the use of the Emer-Clad and Dekguard range of protective, anti-carbonation 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. Where appropriate, Emer-Clad and Dekguard products may be applied over the repair area without prior removal of the Nitobond AR curing membrane. Other curing membranes must be removed prior to the application of Emer-Clad or Dekguard products.

Cleaning

Nitobond AR and Guncrete E should be removed from tools, equipment and mixers with clean water immediately after use. Cured material can only be removed mechanically.

Equipment used with Nitoprime Zincrich should be cleaned with Solvent 10.

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Limitations

Guncrete E should not be used when the temperature is below 5°C and falling. Do not mix part bags. The product 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 your local Parchem sales office.

The degree of rebound with any spray applied cementitious product is heavily influenced by the skill and experience of the spray nozzle operator. Overhead applications will produce higher rebound results.

Estimating

Supply

Guncrete E:	20 kg bag (PC: 302060)
Nitoprime Zincrich:	1 litre can
Nitobond AR:	5 and 20 litre containers
Solvent 10:	4 and 20 litre cans

Coverage and yield

Guncrete E:	Approx 10.0 litres / 20 kg bag
Nitoprime Zincrich:	7m ² /litre (approx.)
Nitobond AR:	6 - 8m ² /litre

Note: the actual yield per bag of Guncrete E will depend on the consistency used.

Storage

Shelf life

Guncrete E has a shelf life of 12 months from date of manufacture if kept in a dry store in the original, unopened bags or packs. Refer to the Use by Date indicated on the packaging.

Storage conditions

Store in dry conditions in the original, unopened bags or packs. If stored at high temperatures and/or high humidity conditions the shelf life of Guncrete E may be reduced to 4 - 6 months. Nitobond AR should be protected from frost.

Important notice

A Safety Data Sheet (SDS) and Technical Data Sheet (TDS) are available from the Parchem website or upon request from the nearest Parchem sales office. Read the SDS and TDS carefully prior to use as application or performance data may change from time to time. In emergency, contact any Poisons Information Centre (phone 13 11 26 within Australia) or a doctor for advice.

Product disclaimer

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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