

Fosroc®

Renderoc ST 05



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CI/SfB:
January 2012

constructive solutions

Protective cementitious coating and levelling mortar for applications from feather edge to 5mm conforming to the requirements of BS EN 1504-3 Class R4

Uses

For application in thin layers, the filling of blow-holes or imperfections in concrete to produce a smooth surface.

Providing a chloride and carbonation barrier. It can be left as a fair-face finish or overcoated.

It can be used as a scrape-coat, brush or trowel applied, placed in thicknesses from 0-5 mm.

Renderoc ST 05 is suitable for repair methods: 1.3, 2.2, 5.1, 6.1 and 8.2 as defined by BS EN 1504-2: 3.1, 7.1 and 7.2 as defined by BS EN 1504-3

Advantages

- Easy to mix and apply
- Vertical and horizontal applications
- Excellent bond to concrete without priming
- Formulated blow hole filler
- Carbonation barrier
- Chloride barrier
- High frost resistance
- High compressive strength

Description

Renderoc ST 05 consists of powder and polymer components. The powder is added to the liquid, the mixing ratio depends on the required consistency and use.

The powder consists of a blend of cements, graded aggregates and chemical additives, with a maximum grain sizes of 0.5 mm

The liquid component, based on modified acrylic polymers, gives Renderoc ST 05 a creamy consistency with extremely good application and barrier characteristics.

The product exhibits excellent thermal compatibility with concrete and is fully compatible with other Renderoc mortars and Dekguard coatings.

Exposure to rainfall prior to the final set may result in water uptake and severe reduction in the performance of the hardened product. Exposure to mist or high humidity prior to sufficient hardening may result in discolouration of the surfaces. These white discolourations will decrease with time.

Standards Compliance

Renderoc ST 05 complies with repair principles 1.3, 2.2, 5.1, 6.1 and 8.2 as defined by BS EN 1504-2

Renderoc ST 05 complies with Class R4 according to BS EN 1504-3, repair principles 3.1, 7.1, 7.2.

| | |
|--|---|
| CE | |
| Fosroc Ltd, Drayton Manor Business Park, Coleshill Road, Tamworth, Staffs, B78 3TL | |
| 09 | |
| 0370-CPD-0845 | |
| EN 1504-2-3 Surface protection systems Concrete repair products for structural repair PCC mortar (based on polymer modified hydraulic cement) | |
| Compressive strength | Class R4 (> 45 MPa) |
| Chloride ion content | < 0.05 % |
| Adhesive bond strength | > 2.0 MPa |
| Adhesive bond strength after freeze thaw thermal cycling | > 2.0 MPa |
| Carbonation resistance | $d_k < \text{control concrete}$ |
| Reaction to fire | Class A2 s1 d0 |
| Dangerous substances | Complies with 5.4 |
| Abrasion resistance | weight loss < 3000 mg |
| Impact resistance | Class III |
| Permeability to CO ₂ | sd > 50 m |
| Permeability to water vapour | Class I |
| Liquid water transmission rate | w < 0.1 kg/m ² h ^{-0.5} |

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Properties

Material tested at liquid : powder ratio of 0.22 and temperature at 20°C

| Test method | Standard | EN 1504 Requirement | Test result |
|--|-------------------|---|--|
| Compressive Strength | EN 12190:1999 | ≥ 45 MPa | @ 1 Day 13 MPa @ 3 Days 26 MPa @ 7 Days 37 MPa @ 28 Days 50 MPa |
| Bond strength by pull off: | EN 1542:1999 | ≥ 2.0 MPa | 2.8 MPa |
| Chloride ion content: | EN 1015-17:2000 | ≤ 0.05 % | 0.01% |
| Freeze thaw cycling: | EN 13687-1:2002 | ≥ 2.0 MPa | 2.7 MPa |
| Resistance to carbonation d_k | EN 13295:2005 | ≤ ref concrete | Complies |
| Fire rating | EN 13505-1 | - | Class A2 S1 d0 (Non-Combustible) |
| Flexural strength | BS 6319 Pt 3:1990 | - | 11 MPa @ 28 days |
| Initial set at 20°C Final set at 20°C | - | - | 5 1/2 hours 6 hours |
| Fresh wet density | - | - | Nominally 1950 kg/m ³ |
| Alkali reactive particles | Method TI-B 52 | - | ≤ 1% vol% |
| Resistance to severe chemical attack | EN 13529 | Hardness reduction < 50% Class III - 28 days with pressure | Class III in groups 3,10,11,12,14a |
| Capillary absorption | EN 13057 | ≤ 0.5 kg/m ² h ^{-0.5} | 0.2 kg/m ² h ^{-0.5} |
| Application of repair mortar overhead | EN 13395-4 | ≥ 2 MPa | 2.8 MPa |
| Permeability to water vapour | EN ISO 7783-2 | - | Sd 0.48m (Class I) |
| Determination of liquid water transmission | EN 1062-3 | ≤ 0.1 kg/m ² h ^{-0.5} | 0.08 kg/m ² h ^{-0.5} |
| Permeability to CO ₂ | EN 1062-6 | Sd > 50 m | Sd = 57 m |
| Abrasion resistance | EN ISO 5470 -1 | Weight loss < 3000 mg | 2785 mg |
| Impact resistance | EN ISO 6272-1 | Class III ≥ 20 Nm | 24.5 Nm |
| Chloride ion ingress | EN 13396 | - | 0.171% after 6 months in 3% NaCl solution at 4-6 mm depth |
| Chloride penetration (w/c 0.45) | NT Build 443 | - | 1 mm of Renderoc ST 05 is equivalent to 13mm of concrete with a 0.45 w/c ratio |
| Carbonation Barrier Properties | NT Build 357 | - | <R(b) = 21 mm for a 2 mm thickness of Renderoc ST 05 |

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

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| Build characteristics | Thickness | Volume of liquid per 20kg bag of powder | Coverage per pack (Coverage can vary due to substrate) |
|---|------------------------------|--|--|
| Vertical applications: Brush/roller Trowel Trowel blow hole filler | 1 mm 2 mm Skim applied | 4.5 - 5.0 litres 4.0 - 4.5 litres 5 litres | 11.5 - 12 m ² @ 1 mm 5.5 - 5.75 m ² @ 2 mm Circa 12m ² dependent on surface |
| Horizontal applications: Trowel / screed Brush / roller | 4 mm 4 mm | 4.5 - 5 litres 5 litres | 2.8 - 3.0 m ² @ 4 mm 3.0 m ² @ 4 mm |

Preparation

Surfaces must be clean and sound, with no traces of loose material, cement paste, laitance, dust, plaster, oil, grease, corrosion deposits or algae.

Prepare the surfaces by abrasive grit blasting or light scabbling. Remove oil and grease with suitable detergent. Finally the cleaned surfaces should be blown clean with oil free compressed air before continuing.

On floors, large pockets greater than 4 mm depth should be filled with Fosroc XR90, finished with a scratched surface. Allow one hour to cure before application of Renderoc ST 05.

Pre-soaking

All prepared areas should be thoroughly soaked with clean water prior to application of Renderoc ST 05, to achieve a saturated surface dry condition. Any residual surface water should be removed prior to application.

Priming

Under normal circumstances priming is not required. However, porous substrates may require sealing with Nitobond AR. This is scrubbed onto the pre-wetted substrate and allowed to become tacky before applying Renderoc ST 05.

Mixing

Renderoc ST 05 should be mixed in a forced action mixer of adequate capacity. Mixing in a suitable sized drum using a Conbextra paddle with a slow speed (500 rpm) heavy-duty drill is acceptable.

Place the required amount of Renderoc ST 05 liquid component - see table - in the mixer and add the full bag of Renderoc ST 05 powder. Mix for 5 minutes until fully homogeneous. Let the mix rest for 5-10 minutes and adjust the consistency, if necessary by addition of additional liquid component. Mix for another minute until the required consistency is obtained. Polymer level can be varied to application method.

Mixing ratios:

- Brush coating - 5.0 ltrs liquid : 20 kg powder
- Fairing coat - 4.0 ltrs liquid : 20 kg powder

The above mixing ratios can be used as guidelines. Part packs can be mixed provided mix ratios are maintained.

Application

Renderoc ST 05 can be applied by brush, roller or trowel depending on consistency and application. See table.

The surface finish of the final coat can be obtained in the following ways:

- I) Smooth surface: Finish with a sponge.
- II) Rough, granulated surface: Finish with a roller.
- III) Skid resistant surface: Sprinkle dry quartz sand in the wet surface or brush finish.

Multiple layers

When applying multiple layers, allow the first application to dry for between 2-4 hours (at 20°C). Lightly scratch and dampen surface between layers. Patches at 300 mm² or less can be applied up to 5mm in one application when cured.

Low temperature working

Normal precautions for winter working with cementitious materials should be adopted. In cold conditions down to +5°C, both components should be kept at +15°C to +25°C. Protect applied product from freezing for the first 24 hours.

Note: working time and time taken to gain strength will be increased at lower temperatures.

High temperature working

At ambient temperatures above 35°C both components should be stored in the shade. Note working times will be reduced at elevated temperatures.

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Curing

Renderoc ST 05 is a cement-based repair mortar. In common with all cementitious materials, it 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 mortar in a continuous film, is recommended. A low pressure atomising sprayer is essential for applying the Nitobond AR. Any excessive run-off on verticals or drips on soffits should be removed by brush before they harden.

Large areas should be cured as trowelling progresses (0.5 m² at a time) without waiting for completion of the entire area.

Overcoating with protective decorative finishes

Renderoc ST 05 is extremely durable and will provide long-term protection to the embedded steel reinforcement within the repaired locations. The surrounding parts of the structure will benefit from the application of a barrier/decorative coating to limit the advance of chlorides and carbon dioxide, bringing them to the same protective standard as the repair itself. Fosroc recommend the use of the 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. 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 Dekguard products.

Cleaning

Renderoc ST 05 should be removed from tools, equipment and mixers with clean water immediately after use. Cured material can only be removed mechanically.

Estimating

Supply

Renderoc ST 05 is supplied in 20kg bags of powder and 5.0 litres of liquid.

Coverage and yield

Approximately 12 litres per pack depending on mix ratio - see table for coverage.

Limitations

Renderoc ST 05 should not be applied when the substrate and/or air temperature is below +5°C and falling.

Application at high humidity and/or on a falling thermometer may result in a white surface discolouration. This will not affect product performance and should decrease with time.

Not suitable for heavily trafficked floors.

Storage

Renderoc ST 05 Powder has a shelf life of 12 months if kept in a dry store in the original, unopened packaging.

If stored at high temperatures and/or high humidity conditions the shelf life may be reduced.

Renderoc ST 05 Liquid should be stored at +5°C indoors and protected against frost. If the product has been exposed to frost and the liquid component becomes grainy, it should not be used.

Precautions

Health and safety

For further information refer to the Safety Data Sheets available at www.fosroc.com.

Fire

Renderoc ST 05 is non-flammable.

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Important note

Fosroc products are guaranteed against defective materials and manufacture and are sold subject to its standard Conditions for the Supply of Goods and Services, copies of which may be obtained on request. Whilst Fosroc endeavours to ensure that any advice, recommendation, specification of information it may give is accurate and correct, it cannot, because it has no direct or continuous control over where or how its products are applied, accept any liability either directly or indirectly arising from the use of its products, whether or not in accordance with any advice, specification, recommendation of information given by it.

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