

Renderoc TG

Single component medium-weight concrete and masonry reinstatement mortar for use in hot climates

Uses

Renderoc TG is suitable for a wide range of concrete and masonry repairs, particularly in vertical and overhead locations without the use of formwork. The mortar is formulated for use in hot climates and is suitable for all types of patch repair and for use on large areas as a render. The mortar is suitable where superior chloride and carbon dioxide resistance is required.

Advantages

- High build achievable without formwork - saving time and expense of multiple applications
- Formulated for use in hot climates
- Can be applied by the wet and dry spray process for fast, exceptionally high build repairs with enhanced characteristics
- Low permeability provides good protection against carbon dioxide and chlorides
- Excellent bond to the concrete substrate
- Shrinkage compensated
- Contains no chloride admixtures

Description

Renderoc TG is supplied as a ready to use blend of dry powders which requires only the site addition of clean water to produce a highly consistent, medium-weight repair mortar for general purpose concrete and masonry repairs. The material is based on Portland cements, graded aggregates, special fillers and chemical additives, modified by anti-desiccation additives, to provide a mortar suitable for use in hot climates. It maintains good handling characteristics while minimising water demand. The product exhibits excellent thermal compatibility with concrete and good water repellent properties. The low water requirement ensures fast strength gain and long-term durability.

Technical support

Fosroc offers a comprehensive range of high performance, high quality construction products. In addition, Fosroc offers a technical support service to specifiers, end-users and contractors, as well as on-site technical assistance in locations all over the world.

Design criteria

Renderoc TG is designed for vertical, overhead or horizontal use without the use of formwork. It can be applied up to

20 mm thickness in large sections overhead and up to 50 mm thickness in large vertical sections. Up to 100 mm thickness can be achieved in small pockets or by the use of formwork. In horizontal locations, Renderoc TG can be applied up to 100 mm thickness. Thicker sections can be built up in layers using a wet-on-wet technique. The material should not be applied at less than 10 mm thickness. Thicknesses greater than 20 mm overhead and 50 mm vertically in large areas can be achieved by spray application. Consult the local Fosroc office for further information.

Properties

The following typical results were obtained at a water/powder ratio of 0.18 and temperature of 20°C.

Test method	Typical result
Compressive strength (BS 4550, Pt 3, Section 3.4: 1978) - @ 20°C:	15 N/mm ² @ 24 hours 34 N/mm ² @ 28 days
Flexural strength (BS 4551:1980):	6 N/mm ² @ 28 days
Tensile strength (ASTM C-190):	2 N/mm ² @ 28 days
Slant shear bond strength to concrete (BS 6319 Pt 4:1984);	25 N/mm ² @ 28 days
Water absorption ISAT (BS1881 Pt5:1970)-	
10 minutes:	0.18 ml/m ² /sec
2 hours:	0.06 ml/m ² /sec
Coefficient of thermal expansion:	7 to 12 x 10 ⁻⁶ per °C
Setting time (BS 5075, Pt 3, Section 3.6:1978):	Typically 2 to 4 hours (dependent on temperature and water content)
Fresh wet density:	1750 kg/m ³ at 0.18 water/powder ratio
Chemical resistance:	The low permeability of Renderoc TG retards chemical attack in aggressive environments. The cured mortar is resistant to acid gases, chloride ions, oxygen and water. For specific data regarding chemical resistance, contact the local Fosroc office.

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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. It shall be fully compatible with the Renderoc system of concrete repair.

Repair mortar

The high-build reinstatement mortar shall be Renderoc TG, a single component cement-based blend of powders to which only the site-addition of clean water shall be permitted. The cured mortar shall be formulated for use in hot climates and shall have a minimum compressive strength of 30 N/mm² at 28 days when tested in accordance with BS 4550, Pt 3, Section 3.4:1978. The cured mortar shall have a minimum flexural strength of 7 N/mm² when tested in accordance with BS 4551:1980.

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 where concrete is sound and of good quality but cover is to be increased, roughen the surface and remove any laitance by light scabbling or grit-blasting. It will still be necessary to cut back the perimeter to a depth of 10 mm so that the repair patch may be 'toed-in' and finished flush with the surrounding concrete.

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.

Substrate priming

The substrate should be thoroughly soaked with clean water and any excess removed prior to applying one coat of Nitobond AR primer. The primer should be scrubbed well into the surface. Renderoc TG can be applied as soon as the primer becomes tacky. If the Nitobond primer is too wet, vertical and overhead build up of the Renderoc TG mortar may be difficult.

In exceptional circumstances, e.g. where a substrate/repair barrier is required or where the substrate is wet or likely to remain permanently damp, Nitobond EP epoxy bonding aid should be used. Contact the local Fosroc office for further information.

Mixing

Care should be taken to ensure that Renderoc TG is thoroughly mixed. A forced-action mixer is essential. Mixing in a suitably sized drum using an approved spiral paddle in a slow speed (400/500 rpm) heavy-duty drill is acceptable for single bag mixes. Free-fall mixers must not be used. Mixing of part bags should never be attempted.

For normal applications, place 4.0 to 5.0 litres of drinking quality water into the mixer and, with the machine in operation, add one full 25 kg bag of Renderoc TG and mix for 3 to 5 minutes until fully homogeneous. Note that powder must always be added to water. Dependent on the ambient temperature and the desired consistency, the amount of water required may vary slightly but should not exceed 5.0 litres per 25 kg bag of Renderoc TG.

Note that the temperature of the mixed mortar should not exceed 30°C.

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.

Apply the mixed Renderoc TG to the prepared substrate by gloved hand or trowel. Thoroughly compact the mortar on to the primed substrate and around the exposed reinforcement. Renderoc TG can be applied up to 20 mm thickness in large sections overhead, 50 mm thickness in large vertical sections but up to 100 mm thickness in smaller pockets or with the use of formwork. If formwork is used, it should have properly sealed



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faces to ensure that no water is absorbed from the repair material. In horizontal locations, Renderoc TG can be applied up to 100 mm thickness.

If sagging occurs during application to vertical surfaces, the Renderoc TG should be completely removed and reapplied at a reduced thickness on to the correctly reprimed substrate.

Note: the minimum applied thickness of Renderoc TG is 10mm.

Build-up

Additional build-up can be achieved by a wet-on-wet application technique or by the application of multiple layers. The final thickness is dependent on the material consistency and substrate profile.

Where multiple layers will be applied by hand or trowel, the surface of the intermediate layers should be scratch-keyed and cured with Nitobond AR. Repriming with Nitobond AR and a further application of Renderoc TG may proceed as soon as this layer has set.

Spray application

Renderoc TG can be applied by the wet or dry spray techniques. In circumstances where large areas of repair are required, the rapid placement and higher build attainable by these methods offer economic advantages over hand-trowelling. The resultant repair also offers a generally more dense compound with greatly enhanced mortar/ substrate bond characteristics. For further details on the wet and dry spray techniques, including selection of spraying machines and nozzles, consult Fosroc's Wet or Dry Spray Application Guides or the local Fosroc office.

Finishing

Renderoc TG 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.

Low temperature working

Although formulated for use in hot climates, Renderoc TG can be used in more moderate locations. In cold conditions down to 5°C, the use of warm water (up to 30°C) is advisable to accelerate strength development. Normal precautions for winter working with cementitious materials should then be adopted. 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 be stored in the shade and cool water used for mixing. Note that the temperature of the mixed mortar should not exceed 30°C.

Curing

Renderoc TG is a cement-based repair mortar. In common with all cementitious materials, Renderoc TG 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 Renderoc in a continuous film, is recommended. Large areas should be cured as trowelling progresses (0.5 m² 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. If used in cold conditions, the finished repair must be protected from freezing.

Overcoating with protective decorative finishes

Renderoc TG 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 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. Fosroc recommend the use of the Dekguard range of protective, anti-chloride and 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

Nitobond AR and Renderoc TG 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 and Nitobond EP should be cleaned with Fosroc Solvent 102.

Limitations

Renderoc TG 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. The product should not be applied in windy conditions as rapid surface drying will occur and may result



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in surface crazing or cracking of the repair. If any doubts arise concerning temperature, application or substrate conditions, consult the local Fosroc office.

Estimating

Supply

Renderoc TG:	25 kg bag
Nitoprime Zincrich:	1 litre can
Nitobond AR:	20 litre pail
Nitobond EP:	4.5 kg pack
Fosroc Solvent 102:	5 litre can

Coverage and yield

Renderoc TG:	Approximately 16.5 litres/25 kg bag (1.65m ² at 10 mm thickness)
Nitoprime Zincrich:	7.4 m ² /litre
Nitobond AR:	6 to 8 m ² /litre
Nitobond EP:	10 to 11.5m ² /pack

Notes; The actual yield per bag of Renderoc TG will depend on the consistency used. The yield will be reduced if the material is applied by a spray technique. The coverage figures for liquid products are theoretical - due to wastage factors and the variety and nature of possible substrates, practical coverage figures will be reduced.

Storage

Shelf life

All products have a shelf life of 12 months 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 in high humidity conditions the shelf life may be reduced



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Important note

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to 4 to 6 months. Nitobond AR should be protected from frost.

Precautions

Health and safety

Renderoc TG 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. Nitoprime Zincrich, Nitobond products and Fosroc Solvent 102 should not come in contact with the skin and 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, rinse with plenty of clean water, then cleanse with soap and water. In case of skin contact with Nitoprime Zincrich and Nitobond EP, 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

Renderoc TG, Nitobond AR and Nitobond EP are non-flammable.

Nitoprime Zincrich and Fosroc 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.