

# Fosroc® Patchroc GP

**Fast setting emergency patching mortar for concrete pavements and floors conforming to the requirements of BS EN 1504-3 Class R4**

## Uses

For rapid and permanent reinstatement of localised patches in concrete pavements, airport aprons, access ramps and floors. It is particularly useful when interruption of traffic must be minimised.

Patchroc GP may be used internally and externally including areas subject to heavy trafficking.

For the reinstatement of large areas of concrete pavements and floors, the use of Paveroc is recommended.

Patchroc GP is suitable for repair methods 3.1, 3.2, 4.4, 7.1 and 7.2, as defined by BS EN 1504-3.

## Advantages

- Rapid strength gain — will generally accept traffic in 2 hours.
- High strength, abrasion and weather resistance
- One component, pre-bagged to overcome site-batched variations requires only the site addition of clean water
- Excellent bond to the concrete substrate
- Shrinkage compensated
- Contains no chloride admixtures
- Shade can be varied with Renderoc Lightener / Darkener\*

## Description

Patchroc GP is designed for horizontal use. It may be applied up to a maximum thickness of 100 mm. Thicker sections can be built up in layers or by use of Patchroc 250. Material should not be applied at less than 12 mm thickness. Individual bay sizes should not exceed 4m<sup>2</sup>. Consult the local Fosroc office for further information.

Patchroc GP 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 repair mortar. It is based on Portland cements, graded aggregates, and chemical additives providing a mortar with good handling characteristics while minimising water demand. The low water requirement ensures good strength gain and long-term durability.

The product is alkaline in nature and will protect embedded steel reinforcement.

## Specification Clause

The repair mortar shall be Patchroc GP, a one component patching rapid strength gain mortar conforming to the requirements of BS EN 1504-3 Class R4 suitable for thicknesses between 12mm and 100mm generally. The cured material shall be able to achieve a compressive strength of 20 MPa at 2 hours, 50MPa at 24 hours and a drying shrinkage of <300 micro-strain at 7 days. The product shall be mixed, applied and cured in accordance with the manufacturer's written instructions to a correctly prepared substrate.



## Standards compliance

Patchroc GP complies with the classification R4 according to BS EN 1504-3, repair methods 3.1, 3.2, 4.4, 7.1 and 7.2

Patchroc GP complies with LU Standard 1-085 'Fire Safety Performance of Materials'.

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<b>Patchroc GP</b>	
BS EN 1504-3 Structural and non-structural repair methods 3, 4 and 7	
Compressive strength	Class R4 (> 45 MPa)
Chloride ion content	≤ 0.05 %
Adhesive strength by pull-off test	≥ 2.0 MPa
Thermal compatibility: freeze-thaw cycling with immersion	≥ 2.0 MPa
Carbonation resistance	Pass
Elastic modulus in compression	>20 GPa
Skid resistance	Class III: >55 units wet tested
Reaction to fire	Euroclass A1
Dangerous substances	Complies with 5.4

\*Refer to separate datasheet

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## Properties

The following results were obtained at a water : powder ratio of 0.11 and a temperature of 20°C unless otherwise stated.

Test method	Standard	BS EN 1504 R4 Requirement	Test result
Compressive Strength	EN 12190:1999	≥ 45 MPa	@ 2 hours 20 MPa @ 1 day 50 MPa @ 7 days 55 MPa @ 28 days 65 MPa
Bond strength by pull off	EN 1542:1999	≥ 2.0 MPa	2.2 MPa
Chloride ion content	EN 1015-17:2000	≤ 0.05 %	0.02 %
Freeze thaw cycling	EN 13687-1:2002	≥ 2.0 MPa	2.0 MPa
Resistance to carbonation $d_k$	EN 13295:2005	$d_k \leq$ ref concrete	Pass
Elastic modulus in Compression	EN 13412	≥ 20 GPa	29 GPa @ 28 days
Skid Resistance	EN 13036-4	Class III > 55 wet	Class III
Fire rating	EN 1504-3 cl. 5.5	-	Euroclass A1 Non-Combustible
Setting time	BS 4551 Pt14:1980	-	Initial set: 40 mins Final set: 60 mins
Working life	-	-	@ 10°C @ 20°C 60 mins 30 mins
Traffic time - Pedestrian: Light Vehicular: Heavy Vehicular:	-	-	@ 10°C @ 20°C 3 hrs 90mins 4 hrs 2 hrs 5 hrs 3 hrs
Chemical resistance	-	-	The low permeability of Patchroc GP severely retards chemical attack in aggressive environments. The cured mortar is impermeable to acid gases, waterborne chloride ions and oxygen.
Build Characteristics (hand applied) - Minimum thickness: Maximum thickness: Maximum bay area:	- - - -	- - - -	12 mm 100 mm 4 m <sup>2</sup>

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

## Application instructions

### Preparation

\*Angle form the edges of the repair to provide a defined straight edge to a depth of at least 12mm, feather edging must be avoided.

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 abrasive-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. Abrasive blasting, hydrodem equipment, powered mechanical scraping or other suitable means 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 abrasive-blasting to remove corrosion products from pits and imperfections within its surface.

\*(Refer to HSE information sheet CIS36 regarding control of exposure to construction dust, available at [www.hse.gov.uk](http://www.hse.gov.uk))



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## Reinforcing steel priming

Apply one full coat of Nitoprime Zincrich Plus 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.

## Concrete Priming

### Pedestrian traffic

The concrete substrate should be saturated surface dry immediately before the application of the primer i.e. it should be thoroughly saturated with clean water and any residual surface water removed prior to applying Renderoc Primer.

Under severe drying conditions repeated soaking may be necessary to ensure the substrate is still saturated at the time of application of the primer.

Add 3 parts by volume of Renderoc Primer Part A to 1 part by volume Renderoc Primer Part B (4 to 1 by weight) in a clean mixing vessel and mix with a spatula or slow speed drill until a homogeneous smooth paste is produced.

Scrub Renderoc Primer slurry into the surface.

Patchroc GP can be applied immediately to the primed surface. If the primer dries apply another coat of primer before continuing.

Open bags of Renderoc Primer Part A should be sealed and stored in a dry area. Use within 14 days.

### Vehicular traffic

Prime using Nitobond EP. Thoroughly stir the individual components to disperse any settlement. Add the entire contents of the hardener to the base container and mix thoroughly for at least 3 minutes until a uniform colour is obtained, taking particular care to scrape the sides and bottom of the container. It is recommended that mechanical mixing be employed, using a heavy duty, slow speed electric drill and suitable paddle (e.g. Fosroc Sealant Mixing Paddle).

The mixed product should be applied with a suitable stiff nylon-type brush and firmly scrubbed into the surface, ensuring an even coating. The Patchroc GP should be applied to Nitobond EP standard within 1½ hours at 20°C. See separate product data sheet for further details.

## Mixing

Care should be taken to ensure that Patchroc GP is thoroughly mixed. A forced-action mixer is essential. Mixing in a suitably sized drum using an approved Renderoc Mixing Paddle (MR4) with a slow speed (400/500 rpm) heavy-duty drill is acceptable for the occasional one-bag mix.

Free-fall mixers must not be used. Mixing of part bags should never be attempted.

For normal applications, place 2.4 to 2.8 litres of drinking quality water into the mixer.

With the machine in operation, add one full bag of Patchroc GP and mix, for a minimum of 3 minutes and a maximum of 5 minutes, until fully homogeneous.

The consistency may be adjusted by the addition of small amounts of water up to the maximum total water content of 2.8 litres.

Note that the powder must always be added to the water.

## Mixing warning

As with other 'one pack' repair mortars, Patchroc GP may exhibit satisfactory handling characteristics even though inadequately mixed. This will result in a significantly lower level of performance or possible failure. It is therefore essential that mixing instructions are strictly adhered to with particular emphasis on the quantity of water used and the time of the mixing operation.

## Application

Exposed steel reinforcing bars should be firmly secured to prevent movement during application.

While the Renderoc Primer/Nitobond EP is still tacky, apply the mixed Patchroc GP evenly by trowel and tamp in place with a wood float to ensure complete compaction. Thoroughly compact the mortar around any exposed steel reinforcement. Patchroc GP can be applied up to 100 mm in a single application.

Patchroc GP should be struck off to the correct level and finished with a steel trowel to a fully closed surface. A textured surface can be achieved with a suitable roller or brush. The finished surface should not be overworked.

## Build-up

Additional build-up can be achieved by application of multiple layers.

The surface of the intermediate layers should be comb scratch-keyed. A further application of Patchroc GP may proceed as soon as this layer has set.

Reprime with Renderoc Primer or Nitobond EP and apply further Patchroc GP as described above.

## Low temperature working

In cold conditions down to 5°C, the use of warm mixing 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.

## Curing

Patchroc GP 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 Concure WB, sprayed on to the surface of the



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finished mortar in a continuous film, is recommended. A low pressure atomising sprayer is essential for applying the Concure WB

Large areas should be cured as trowelling progresses (0.5 m<sup>2</sup> 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

Patchroc GP is extremely durable and will provide an excellent hard wearing surface to the repaired locations. Surrounding floor areas may benefit from the application of an abrasion or chemical-resistant protective coating. For internal locations, Fosroc recommend the use of the Nitoflor FC range of protective coatings.

These products provide a decorative and uniform appearance as well as protecting areas of the floor which might otherwise be at risk. Nitoflor FC products may be applied over the repair area after prior removal of the curing membrane; generally after 3 days. The local Fosroc office should be contacted for advice about external protective overlayments.

## Cleaning

Patchroc GP should be removed from tools, equipment and mixers with clean water immediately after use. Cured material can only be removed mechanically. Clean tools used with Nitoprime Zincrich Plus and Nitobond EP before curing, with Fosroc Solvent 102.

## Estimating

### Supply

Patchroc GP:	25 kg bags
Nitoprime Zincrich Plus:	1.9 litre and 800 ml cans
Nitobond EP:	2.5 and 4.5 Kg packs
Renderoc Primer:	20 Kg Part A + 5 litres part B
Handy pack:	4 Kg Part A + 1 litre Part B
Concure WB:	20 and 200 litre drums
Fosroc Solvent 102:	5 and 25 litre tins

### Coverage and yield

Patchroc GP:	Approximately 12 litres / 25kg bag (approximately 1.0 m <sup>2</sup> at 12 mm thickness)
Nitoprime Zincrich Plus:	8 m <sup>2</sup> /litre

Nitobond EP:	Approximately 2 m <sup>2</sup> / kg
Renderoc Primer:	Approximately 13 litres - 2m <sup>2</sup> / litre
Handy pack:	2.5 litres - 2m <sup>2</sup> / litre
Concure WB:	5 m <sup>2</sup> / litre

Notes: the actual yield per bag of Patchroc GP will depend on the consistency used.

## Limitations

Where the reinstatement of large areas of concrete pavements and floors is required, the use of Paveroc may be considered instead. Patchroc GP should not be used when the temperature is below 5°C and falling. Do not mix part bags.

Patchroc GP 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 Fosroc office.

## Storage

The product has a shelf life of 12 months from the date of manufacture if kept in dry storage in the original, unopened bags. If stored at high temperatures and/or high humidity the shelf life may be reduced to less than 6 months.

## Precautions

### Health and safety

For further information refer to the appropriate Safety Data Sheets available at [www.fosroc.com](http://www.fosroc.com).

### Fire

Patchroc GP, Nitobond EP and Renderoc Primer are non-flammable.

Nitoprime Zincrich Plus and Fosroc Solvent 102: are flammable. Keep away from sources of ignition. No Smoking. In the event of fire, extinguish with CO<sub>2</sub> or foam. Do not use a water jet.

### Flash points

Nitoprime Zincrich Plus:	41°C
Fosroc Solvent 102:	33°C

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#### Important note

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