Patchroc RSP

constructive solutions

Rapid-setting patch repair concrete for pavements and floors

Uses

For the emergency reinstatement of damaged or deteriorated concrete. The material is particularly suitable for repairs to airport runways, aprons and areas where wheeled traffic requires fast return to service. It may be used internally and externally.

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

Advantages

- Rapid strength gain, accept vehicular traffic within hours with high strength, abrasion and weather resistance.
- Pre-bag supply contain selected coarse aggregate
- Economical - can be 'bulked-out' with graded aggregate in some locations.
- Self-compacting-eliminates honeycomb and voids.

Description

PATCHROC RSP is supplied as a ready to use blend of dry powders and graded aggregates which requires only the site addition of clean water to produce a highly consistent, high strength, free-flowing repair concrete which self-compacts.

The material is a blend of inorganic cements, special filler and chemical additives to control the rate of strength gain to provide a fluid micro-concrete with good handling characteristics. PATCHROC RSP exhibits excellent thermal compatibility with concrete.

Technical Support

Fosroc offers a comprehensive range of high quality, high performance concrete repair and construction products. In addition, Fosroc offers a worldwide technical support and on-site service to specifies, end-users and contractors.

Design Criteria

PATCHROC RSP is designed for horizontal use but can also be used vertically the aid of formwork. It is suitable for use at nominal thickness of 100 mm. Thicker sections up to 250 mm may be applied by the addition of graded silt-free coarse aggregate.

The material should not be applied at less than 20mm thickness. Aggregate should not be added at applied thickness between 20mm and 100mm without specific advice from fosroc. Horizontal surface areas should be restricted to bay sizes not exceeding 4m^2. Consult the local Fosroc office for further information.

Typical Properties

The following results were obtained at water:powder ratio of 0.167 and temperature of 25+/-2°C.

Compressive strength	20 N/mm^2 @ 1 hour
BS EN 12190	30 N/mm2 @ 2 hours
Cube10x10x10cm	40 N/mm^2 @ 1 day
Tolerance +/- 10%	50 N/mm^2 @ 7 days
	60 N/mm^2 @ 28 days
Setting time	
Initial set	10-15 mins
Final set	30-40 mins
Traffic time	
Pedestrian	1 hour
Vehicular	2 hours
Flexural Strength	10 N/mm2 @ 28 days

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Application instructions

Preparation

Saw cut or cut back the extremities of the repair locations to a depth of at least 20mm to avoid feather edging and to provide a square edge. Break out the complete repair area to a minimum depth of 20mm 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 scrabble 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.

The prepared area should be blown clean with oil-free compressed air. Temporary formwork should be fitted tightly into all existing pavement and floor joints which about the repair zone in order to prevent loss during the repair process.

Substrate priming

Prior to placing, the prepared concrete substrate should be saturated by flooding with clean water. Immediately prior to the application of PATCHROC RSP, the water should be removed leaving the substrate fully saturated. Providing the substrate has been properly soaked, further priming is not normally necessary. Where soaking is not possible, the following procedure should be used. The substrate should be well soaked with clean water for as long as possible and any excess removed.

NITOBOND AR or NITOBOND SBR primer should then be scrubbed well into the surface. PATCHROC RSP may be applied as soon as the primer becomes tacky. Note: If the primer dries before PATCHROC RSP is applied, re-priming should take place exactly as described above before continuing.

Mixing

Care should be taken to ensure that PATCHROC RSP 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. Free-fall mixers must not be used. **Mixing of part bags should never be attempted.**

It is essential that machine mixing capacity and labor availability is adequate to enable the placing operation to be carried out continuously.

Measure 5 to 5.5 liters of COLD drinking quality water and pour +/- 75% quantity into the mixer. With the machine in operation, add one full 30 kg bag of PATCHROC RSP and mix for 1 minute before adding the rest of the water.

Mix for further 3 to 4 minutes until a smooth even consistency is obtained. Note that powder must always be added to water. The quantities mixed may be scaled up as required.

When the drill and paddle mixing method is used, the complete measured volume of water should be placed in the mixing drum. With the paddle rotating, add one full 30kg bag of PATCHROC RSP and mix for 3 to 5 minutes until a smooth even consistency is obtained.

It is recommended that the mixed product be passed through a suitable coarse metal screen prior to placing or pumping to highlight any unmixed material.

Placing

The mixed material should be placed within 10 minutes of mixing in order to gain the full benefit of fluidity. Each repair should be poured or pumped in a single continuous operation. Repair may be surface finished using a trowel or wood float. If a textured surface is required, this can be achieved using a suitable roller or brush as the material begins to stiffen. The completed surface should not be overworked.

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PATCHROC RSP can be applied up to 100mm thickness in a single application. For repair section deeper than 100mm, it will be necessary to 'fill-out' PATCHROC RSP with suitable and property graded aggregate in order to minimize temperature rise.

Aggregate should be in a saturated surface dry condition. The quantity of aggregate required will vary dependent on the nature and configuration of the repair location. Generally, for sections between 100mm and 250mm deep, the following mix design should be considered:

30 kg PATCHROC RSP
4.7-5.2 liter clean water
12.5 kg of 8-12mm aggregate
7.5 kg zone 2 sand

Adding above materials can influence the Compressive and Flexural strength result. Site trial is needed to check the result.

The water demand may vary dependent on the condition of the aggregate.

To place the filled PATCHROC RSP at the lower water content, the use of a vibrating poker is desirable, to aid compaction. The quantity of aggregate should never exceed 1 part aggregate to 1 part PATCHROC RSP (by dry weight). Trial mixes should be made in order to ensure the optimum addition of both water and aggregate.

Note the minimum applied thickness of PATCHROC RSP is 20mm. Aggregate should not be added at applied thickness between 20mm and 100mm.

Low temperature working

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 below 5°C.

High temperature working

At ambient temperature above 30°C, the material should be stored in the shade and cool water used for mixing. The best application is during nighttime to avoid over evaporation of water that can cause cracking.

Curing

PATCHROC RSP is a cement-based product. In common with all cementitious materials, PATCHROC RSP must be cured immediately after finishing in accordance with good concrete practice. The use of CONCURE series like Concure P, sprayed on to the surface of the finished mortar in a continuous film, is recommended. In fast drying conditions or hot condition, supplementary curing with polythene sheeting tape down at the edges must be used. In cold conditions, the finished repair must be protected from freezing.

Cleaning

PATCHROC RSP and primer should be removed from tools, equipment and mixers with clean water immediately after use. Cured material can only be removed mechanically.

Limitations

- PATCHROC RSP should not be used when the temperature is bellow 5°C.
- 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.

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Estimating

Supply

Patchroc RSP	30 kg bags
Nitobond AR or SBR	5L and 20L
Concure P	20L and 210L

Coverage and Yield

Patchroc RSP	approx. 15.5 L / 30kg bag (0.76m^2 at 20 mm thickness)
Nitobond	6 to 8 m^2 liter
Concure	3 to 5 m^2 liter

Note: The actual yield per bag of PATCHROC RSP will depend on the consistency used. 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 6 months if kept in a dry store in the original, unopened bags or packs, indoor with good ventilation, T: 25–35ºC, RH <55%.
If stored at high temperatures and/or high humidity conditions the self-life can be reduced.

Precautions

Health and safety

PATCHROC RSP contains cement powder which, when mixed or become damp, release alkalis which can be harmful to the skin. During use, avoid inhalation of dust and contact with the 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 and seek medical advice. If swallowed, seek medical attention immediately-do not induce vomiting. Nitobond, Concure series should not come in contact with the skin and eyes, or be swallowed.

Ensure adequate ventilation. Wear suitable protective clothing, gloves, and eye protection. If working in confined areas, suitable respiratory protective equipment must be used.

Fire

PATCHROC RSP and NITOBOND AR, NITOBOND SBR are non-flammable. For further information, refer to the Safety Data Sheet.