

Polymer bonding aid and additive for mortars, screeds and renders

Uses

For improving the physical properties of cementitious mixes. Typical uses include, but are not limited to, the following :

- Bonding concrete repair mortars
- Floor toppings and screeds
- Waterproof renders and cementitious slurries
- Bonding agent for slip bricks, ceramic tiles, etc.

Advantages

- Single component liquid can be easily gauged as required
- Improves cohesion and workability
- Improves mortars to provide waterproof repairs, renders and toppings which are highly resistant to freeze/thaw cycling
- Improved tensile and flexural properties allow thin applications
- Excellent bond to concrete, masonry, stonework, plaster and blockboard
- Contains no chloride admixtures

Specification

Polymer bonding aid and mortar additive

The polymer bonding aid and site-batched mortar shall be modified by the use of Johnberg SBR a single component styrene butadiene rubber emulsion.

Description

Johnberg SBR is a modified styrene butadiene rubber emulsion which is supplied as a ready to use white liquid. It is designed to improve the quality of site-batched cementitious mortars and slurries. Being resistant to hydrolysis, it is ideal for internal and external applications in conjunction with cement.

Properties

The results listed below were achieved by assessing the mechanical properties of a 3:1 sand:cement mortar containing Johnberg SBR in the proportions 10 litres per 50 kg cement against a 3:1 sand:cement control mortar. The test methods used were in full accordance with BS 6319 at 28 days - air cured.

| Test method | Typical result | Control |
|---|---|-----------------------|
| Compressive strength (BS 6319, Pt 2) | : 35 N/mm ² | 28 N/mm ² |
| Tensile strength (ASTM C-190) | : 5.5 N/mm ² | 2.7 N/mm ² |
| Flexural strength (BS 6319, Pt 3) | : 11.5 N/mm ² | 7.9 N/mm ² |
| Slant shear bond (BS 6319, Pt 4) | : 38 N/mm ² | 2.6 N/mm ² |
| Chemical resistance | : Cementitious materials have limited chemical resistance. The addition of Johnberg SBR to cement mortars reduces permeability and therefore helps reduce the rate of attack by aggressive chemicals, acid gases and water. | |

Design criteria

The application parameters for mortars modified by the use of Johnberg SBR will differ depending on the actual mix design used, but should always be subject to a minimum applied thickness of 6 mm.

Johnberg SBR-modified mortars can generally be applied in sections of up to 40 mm thickness in horizontal locations and 15 mm in vertical locations, without the use of formwork.

In overhead locations the thickness achievable without the use of formwork is largely dependent on the profile of the substrate.

Johnberg SBR

Instructions for use

Preparation

Form the extremities of the application area to a depth of at least 10 mm to avoid feather-edging and to provide a square edge. Ensure a minimum depth of 6 mm is observed in the remaining area, up to the previously formed edge.

Clean the surface and remove any dust, unsound or contaminated material, plaster, oil, paint, grease, corrosion deposits or algae. Oil and grease deposits should be removed by steam cleaning, detergent scrubbing or the use of a proprietary degreaser.

Where breaking out is not required, roughen the surface and remove any laitance by light scabbling or grit-blasting. The effectiveness of decontamination should then be assessed by a pull-off test.

Substrate priming

The substrate should be thoroughly soaked with clean water and any excess removed prior to commencement. A slurry primer should be prepared consisting of 1 volume Johnberg SBR to 1 volume clean water to 3 volumes fresh cement. To obtain a smooth consistency, the cement should be blended slowly into the premixed liquids. The slurry primer should be stirred frequently during use to offset settlement.

The slurry primer should be scrubbed well into the surface of the substrate, being careful to avoid 'ponding'. The repair mortar, topping or render must be applied on to the wet slurry primer. If the slurry primer dries before application of the mortar, it must be removed and the area reprimed before continuing.

Preparation of reinforcement (repairs only)

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 Johnberg Primer to any exposed steel reinforcement 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.

Mix designs

A wide range of mix designs is achievable using Johnberg SBR.

Mixing

Care should be taken to ensure that Johnberg SBR mortars are thoroughly mixed. A forced-action mixer is essential for large volume applications. Mixing in a suitably sized drum using an approved spiral paddle in a slow speed (400/500 rpm) heavy-duty drill is acceptable for minor areas.

Weigh the cement, sand and, where required, aggregate into the mixer and dry blend together for one minute. With the machine in operation, add the pre-mixed Johnberg SBR and clean water. Continue mixing for 3 minutes to ensure complete dispersal into the sand and cement.

Make any small adjustment to the quantity of clean water but do not significantly exceed the literage shown above, additional water should be kept to a minimum.

Continue mixing up to a maximum of 5 minutes until a smooth and fully homogeneous consistency is achieved with the required workability and application properties. It is critical that allowance is made for the moisture content of the sand and aggregate, particularly where stored on site.

Application

For application to all surfaces, Johnberg SBR mortars, toppings and renders must be well-compacted on to the primed substrate by trowel. It is frequently beneficial to work a thin layer of the mortar into the slurry primer and then build the mortar on to this layer. Exposed steel reinforcement should be completely encapsulated by the mortar.

Johnberg SBR mortars can be applied at a minimum thickness of 6 mm and up to 40 mm thickness, dependent on the location and configuration of the repair zone. Refer to the recommended thicknesses shown in the 'Mix design' section above.

If the recommended thickness is exceeded and sagging occurs, the affected section must be completely removed and reapplied in accordance with the procedure described above. The use of formwork may facilitate achieving the required build. If formwork is used, it should have properly sealed faces to ensure that no water is absorbed from the repair material.

Where thicker sections (up to a total thickness of 40 mm) are to be built up by hand or trowel application, the surface of the intermediate layers should be scratch-keyed and cured with Johnberg Application of the slurry primer and a further application of Johnberg SBR mortar may proceed as soon as this layer has set.

Johnberg SBR

Finishing

Johnberg SBR mortars can be finished with a steel, plastic or wood float, or by a damp sponge technique, to achieve the desired surface texture. The completed surface should not be overworked.

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.

High temperature working

At ambient temperatures above 35°C, the material should be stored in the shade and cool water used for mixing.

Curing

Johnberg SBR mortars, toppings and renders are cement-based. In common with all cementitious materials, they must be cured immediately after finishing in accordance with good concrete practice.

The use of Johnberg Primer, sprayed on to the surface of the finished mortar in a continuous film, is recommended. In harsh drying conditions, supplementary curing with polythene sheeting must be used.

Overcoating with protective decorative finishes

Johnberg SBR mortar repairs are 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.

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.

Johnberg products may be applied over the repair area without prior removal of the Johnberg Primer curing membrane. Johnberg curing membrane must be removed prior to the application of Johnberg products. This is best achieved by light grit or sand-blasting.

Cleaning

Johnberg SBR and Johnberg Primers should be removed from tools, equipment and mixers with clean water immediately after use. Cured material can only be removed mechanically.

Limitations

- Johnberg SBR mortars, toppings and renders should not be applied when the temperature is below 5°C and falling.
- Johnberg SBR mortars 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 Customer Care Number.

Note: The actual usage of Johnberg SBR will depend on the mix design used. The coverage figures for liquid products including the Johnberg SBR slurry primer are theoretical - due to wastage factors and the variety and nature of possible substrates, practical coverage figures will be reduced.

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