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FEBOND SBR

A Bonding And Waterproofing Admixture

Description of Product

FEBOND SBR is a styrene-butadiene co-polymer latex specifically designed for use with cementitious mixes.

It is used in mortar and concrete as an admixture to increase water and abrasion resistance and durability.

It is used with cement as a reliable water resistant bonding agent.

Fields of Application

- Concrete repair
- Floor screeds and toppings
- External rendering
- Waterproofing and tanking
- Fixing brick slips and tiles
- Corrosion protection of steel
- Silage pit lining and protection

Features and Benefits

FEBOND SBR modified cement based mixes have the following advantages:

- Greatly increased flexural strength
- Tensile strength increased
- Greatly reduced shrinkage (with appropriate aggregate)
- Prevents bleeding
- Lower water-cement ratio
- Increased durability and toughness, improved abrasion resistance. Good frost, abrasion resistance and resistance to water-borne salt penetration
- Resistant to many chemicals and to mineral oils
- Excellent adhesion to steel and concrete. Sticks well to brick, glass, asphalt, wood, expanded polystyrene and most building materials.
- Enhanced corrosion protection
- Proven performance
- Similar thermal expansion and modulus properties to concrete
- Can be used with potable water (WRC approved)

Technical Data/Typical Properties

Typical properties of a FEBOND SBR modified cement and sand mix are given below.

Unless otherwise stated, these are based on a '3 parts sand to 1 part cement by weight' mix in which 10 litres of FEBOND SBR per 50kg of OPC have been incorporated.

Appearance	Milky white liquid
Composition	Styrene-butadiene co-polymer latex
Compressive strength	45 to 50N/mm²†
Tensile strength	Up to 6.5N/mm²†
Flexural strength	Up to 13N/mm²†
Freeze thaw resistance	Excellent
Water vapour permeability	Less than 4g/m²/24 hour through an 11mm thick test piece*
Adhesion	Excellent to concrete, steel, brick, glass, etc.
Coefficient of Thermal Expansion -20°C to +20°C -20°C to +60°C	 $12.8 \times 10.^{6}$ $12.9 \times 10.^{6}$
Chemical resistance	Resists mild acids, alkalis, sulphates, chlorides, urine, dung, lactic acid, sugar, etc.
Shrinkage during cure	0.01% to 0.02%†
Resistance to water pressure - 30m head	Excellent - no water penetration through a 15mm thick test piece*

For further details of properties - refer to the MBT Feb booklet 'Guideline and Recommendations using Febond SBR.'

† Indicated results are typical. Variations in cement used and workability can cause differences.

* FEBOND SBR added at 15 litres/50kg cement used.

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Master Builders Technologies

Application Procedure

Preparation of Substrate

Surfaces to which FEBOND SBR mixes are to be applied should be clean, sound and free of deleterious substances.

Remove all laitance, oil, grease, mould oil or curing compound from concrete surfaces using wire brush, bush hammer, scabbler or other plant as appropriate.

Ensure that reinforcing steel is clean, free from grease or oil; remove scale and rust.

When repairing spalled or damaged concrete, ensure that the concrete has been cut back to thoroughly sound material. Always lay to a minimum 6mm deep saw cut edge, depending upon application. Avoid 'feather edging'.

For advice on preparation of concrete prior to repair - refer to the booklet 'Febond SBR Guideline and Recommendations for use.'

Bonding Slurry

Wet down absorbent surfaces, such as concrete and brick, so that they are damp but surface dry when the bonding slurry is applied. Prepare a bonding slurry of approximately 1.5 parts of OPC to 1 part of FEBOND SBR by volume. These proportions can be adjusted to obtain a suitable mix consistency for any particular application, within the range 1:1 to 1:2 FEBOND SBR cement.

Mix the FEBOND SBR and cement together by using a paddle fitted into a slow-speed electric drill, to form a smoother lump-free mix.

The normal method of application is by stiff brush scrubbing well into the surface, taking care to ensure complete coverage.

A typical single slurry coat has an average thickness of 0.3 to 0.5mm and thickness' significantly above this should be avoided. If a second coat is necessary it should be applied at right angles to the first. Never apply more than can be comfortably over-screeded/rendered within 15 minutes.

Materials for FEBOND SBR Modified Mixes

Sand

Sand should be sharp, washed, well graded and free from excessive fines. For general use select a BS.882 C & M (previously Zone 2) sand. For rendering select a washed sand complying with BS.1199 Table 1, or equivalents to local published standards.

Cement

FEBOND SBR is compatible with all types of OPC, sulphate resisting and high alumina cements. However with high alumina cements hardening will be delayed. (For use with other cements, contact MBT Feb Technical Services Department for advice).

Water

The strong plasticising action of FEBOND SBR greatly reduces the water requirements for any given workability.

Mixing

Mixing should preferably be carried out in a forced action mixer, a Creteangle is recommended. Hand batching is only permissible when the total weight of the mix is less than 25kg.

Charge the mixer with the required quantity of sand and cement and pre-mix for approximately one minute. Pour the desired quantity of FEBOND SBR and mix for about 30 seconds only, to minimise air entrainment. Slowly add water, whilst still mixing, until required consistency is obtained. (Stop mixer when testing consistency).

The total mixing time after adding the FEBOND SBR should not exceed two minutes.

Owing to the strong plasticising properties of FEBOND SBR, rapid thinning can occur - avoid adding excessive water.

Application

Rendering to vertical surfaces

Apply the bonding slurry to the prepared surface and apply the render while the bonding slurry is still wet or tacky, generally within 15 minutes.

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It is preferable to apply FEBOND SBR modified mortars in coats to a maximum thickness of 6mm per coat, as greater thickness' can lead to slumping, however, several coats can be applied in fairly rapid succession, usually within 15 to 30 minutes. Thicker coatings can be applied providing suitable formwork is used. Close the surface using a wooden float or steel trowel.

Alternatively, scratch the first coat of render after application and allow to dry overnight before applying the second coat. This technique is preferred for rendering where the drying rate is low but not recommended when waterproofing. Another method is to allow the first coat of render to dry overnight, and then apply a further slurry coat before applying the second coat of render.

Screeds and toppings, applied to horizontal surfaces
Screeds, patches, etc., based on FEBOND SBR modified cements, can be laid to any thickness from 40mm down to 6mm minimum. After mixing, the FEBOND SBR modified mix should be placed over the still wet bonding slurry, well compacted and struck off to level. It may then be trowelled to the required finish using a wooden float or steel trowel.

Note: Whenever screeds are being laid over existing concrete surfaces, it is important that expansion joints in the sub-floor are carried through the FEBOND SBR modified mix. This can be done by fitting a temporary timber batten wrapped in a layer of polythene.

Coverage
When using as a bonding coat 1 litre of FEBOND SBR will typically produce enough slurry to coat 3 square metres of substrate dependent on surface texture and thickness applied.

For all normal use the standard dose of 10 litres of FEBOND SBR per 50 kg Portland Cement is adequate.

For extreme conditions and/or where adhesion, waterproofing, water vapour resistance or chemical resistance are critical, the dosage should be increased to 15 litres of FEBOND SBR per 50kg Portland Cement. For this higher dosage, the extra water addition required is low and, therefore, use of wet aggregate may result in excessive workability.

Curing/After Treatment
Correct curing of FEBOND SBR modified mixes is important Moisture cure for at least one day and then allow to dry out slowly. Initial curing is necessary to ensure hydration of the Portland Cement. The latex mortar must then be allowed to dry out to permit the latex particles to join together to form continuous films and strands.

Specific recommendations for use in
- **Concrete Repair**
- **Waterproof Tanking**
- **Fixing Brick Slips, Tiles, etc.**
- **Flooring**
- **Substrate Preparation**

Refer to the booklet 'Febond SBR Guidelines and Recommendations using Febond SBR'.

Cleaning
All tools should be cleaned with water immediately after use. If delayed, use of soap and coarse wire wool may help. Solvents such as white spirit or Feb Cleaning Solvent can be useful in removing partially hardened mortar should this be necessary.

Packaging
FEBOND SBR is supplied in 5, 25 and 205 litre containers.

Storage
Stir before use. Protect from frost, FEBOND SBR may be permanently damaged by freezing, particularly if thawed quickly.

Shelf Life
Up to one year when stored under normal conditions and temperatures (5°C - 20°C)

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Watchpoints

- Always use fresh, cool cement and sharp, clean, well graded aggregate, free of excessive fines.
- Keep mixing time to a minimum - see above recommendations.
- Until the user becomes familiar with its workability the appearance of FEBOND SBR modified mix is deceptive; when of correct it may appear to be too dry. However, it will be found that it can be compacted and trowelled satisfactorily. Avoid using excess water.
- Never apply FEBOND SBR modified mixes or concrete to a bonding slurry that has been allowed to dry out.
- Trowelling should proceed with the work. Do not over trowel and avoid re-trowelling. Protect from too rapid drying out prior to trowelling.
- Rapid hardening cement should be used in cold weather conditions and normal precautions must be taken. Applications can continue down to 2°C, provided the mortar temperature is not allowed to drop below 4°C until thoroughly hard.
- Protect new work from frost until a compressive strength of at least 5N/mm² has been reached.
- FEBOND SBR mixes may be slightly darker in appearance than corresponding unmodified mixes.

Health and Safety
*For full information on Health and Safety matters regarding this product the relevant Health and Safety Data Sheet should be consulted.

The following general comments apply to all products.

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs, (which may also be tainted with vapour until the product is fully cured and dried). Treat splashes to eyes and skin immediately. If accidentally ingested, seek medical attention. Keep away from children and animals. Reseal containers after use.

Solvent Based Products
Use in well ventilated areas; avoid inhaling. Suitable respiratory equipment may be needed, eg when spraying. Can cause skin, eye irritation. Wear protective eye shields and gloves during use. Do not smoke or allow sparks or naked lights when stored or in use.

Powder Products
Should be handled to minimise dust formation; use light mask if excessive dust unavoidable. Cement powders when wet or moistened can cause burns to skin and eyes which should be protected during use.

Resin Products
Can cause irritation, dermatitis or allergic reaction. Use protective equipment particularly for skin and eyes. Use only in well ventilated areas.

Spillage
Chemical products can cause damage; clean spillage immediately.

Disclaimer:
This information and all further technical advice is based on our present knowledge and experience. However, it implies no liability or other legal responsibility on our part, including with regard to existing third party intellectual property rights, especially patent rights. In particular, no warranty, whether express or implied, or guarantee of product properties in the legal sense is intended or implied. We reserve the right to make any changes according to technological progress or further developments. The customer is not released from the obligation to conduct careful inspection and testing of incoming goods. Performance of the product described herein should be verified by testing, which should be carried out only by qualified experts in the sole responsibility of a customer. Reference to trade names used by other companies is neither a recommendation, nor does it imply that similar products could not be used.

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