



29Y40 Concrete Modifier

Technical Data Sheet

DESCRIPTION:

Araplex SBR has been used extensively over the last 30 years by the construction industry as an admixture for cement and concrete applications, including repair and renovation, surfacing of floors and bonding generally. Important application areas include patching, terrazzo flooring spray and fill coats, precast architectural concrete panels, stucco, industrial cement floors and highway and bridge repairs. Cementitious mixes containing Araplex SBR have the following advantages:

- Greatly improved adhesion to a wide range of substrates including:- dense concrete, glass, steel, tiles etc.
- Mixes may be applied in much thinner sections.
- A high level of resistance to salt permeation/carbonation.
- Reduced surface dusting of concrete.
- Reduced water : cement ratio for equivalent workability.
- Increased crack resistance.
- Excellent resistance to water and water vapour.
- Much improved toughness and flexibility.
- Greatly improved resistance to many chemicals.
- Improved frost resistance.

In addition, Araplex SBR has the advantage over PVA bonding aids in that it is not adversely affected in wet condition and is therefore recommended for exterior use.

Latex content will vary subject to application, but typically it will be in the range 20-40% on cement weight (10-20 litres on 50kg cement). The higher level of addition is used for thin screeds where maximum performance is required, or for renders etc with high water resistance. Levels lower or higher than these may be needed in special circumstances.

The colour of latex modified compositions may be a little darker than that of ordinary mixes. If this is undesirable it can be overcome by the inclusion of a small quantity of white cement.

TYPICAL PROPERTIES:

| | |
|-----------------------------------|--|
| Composition | Carboxylated styrene/butadiene co polymer emulsion containing non-staining antioxidants. |
| Minimum Film Forming Temperature: | +10°C |
| Freeze Thaw Stability: | Good |
| PH: | 10 |
| Appearance: | White Milky Liquid |

SURFACE PREPARATION:

Carry out standard concrete floor preparation to the existing concrete slab.

Remove all dust, dirt, laitance (cure or release agents) and any unsound areas of materials that will impede the adhesion of the polymer modified screed.

Abrade surfaces by shot/grit blasting ,coarse grinding, acid etch or other suitable methods or as appropriate.

Check for contaminants by wetting with water. If the water beads or does not rapidly absorb into the concrete, re-prepare as per above.

Ensure substrate is stable, solid and control/relief joints are properly designed and installed.

Priming (Concrete):

Saturate the prepared concrete with clean water (at least 1 hour prior to the application of the primer).

Squeegee off excess water and apply one full coat of primer consisting of one part by volume of Araplex SBR admixture to 2 parts cement mixed to a thin slurry. Work this slurry well into the prepared surface using a stiff bristle brush or broom.

Do not allow this to dry prior to application of the Araplex SBR modified render

Apply Araplex SBR modified cement screed to the wet primer (as required).



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Priming (Concrete): For water- resistant renders

Where water-resistant renders are required, a different technique for priming is necessary.

Saturate the prepared concrete with clean water (at least 1 hour prior to the application of the primer).

Squeegee off excess water and apply one full coat of primer consisting of one part by volume of Araplex SBR admixture to 2 parts cement mixed to a thin slurry.

Work this slurry well into the prepared surface using a stiff bristle brush or broom.

A second priming or sealing coat (2 parts OPC to 1-part Araplex SBR) should be brushed on as soon as the first coat is touch-dry, i.e.: after approximately 20-30 minutes.

To ensure complete coverage these coats should be applied at right angles across each other.

Maximum thickness of the sealing coats should be 1.6mm otherwise crazing may occur.

These two coats must be allowed to fully dry out for e.g.; at least 48 hours.

A further coat of the slurry is then brushed on and the render applied while this coat is still wet.

APPLICATION OF RENDERS:

WALLS

The thickness of latex-modified renders should not exceed 6mm for each coat. Thicker coats can result in sagging, or in the case of soffits actual fall-off. However, several coats may be applied in fairly quick succession, allowing each coat time to set-off before the next one is applied. This is usually between 15-30 minutes.

A single trowelling technique is normally sufficient to achieve a moderately smooth finish. If a smoother surface is required, the rendering should be floated using a clean steel, or preferably, wooden float after a suitable interval has elapsed.

This interval is about 30 minutes to 1 hour but is best found by experience.

STANDARD RENDER OVER MODERATELY STRONG STABLE BACKGROUNDS

| Material | Volume |
|-------------------|-----------------------------------|
| Portland Cement | 1 part by volume (uncompacted) |
| Moist Sand | 4.5 parts by volume (uncompacted) |
| Araplex SBR | 0.2 parts by volume |
| Water As required | As required |

WATERPROOF RENDERS ABOVE GROUND OVER STRONG STABLE BACKGROUNDS – ALSO FOR CARBINATION PROTECTION

| Material | Volume |
|--|-----------------------------------|
| Portland Cement | 1 part by volume (uncompacted) |
| Moist Sand | 4.5 parts by volume (uncompacted) |
| Araplex SBR | 0.2 parts by volume |
| Water | As required |
| Note: Refer to priming (waterproof renders) | |

STEEL PROTECTION:

| Material | Weight | Ratio |
|-----------------|-------------------------|-------|
| Portland Cement | 50kg | 1 |
| Sand | 125kg | 2.5 |
| Araplex SBR | 15kg | 0.3 |
| Water | As required | |
| | Yield 0.1m ³ | |

Remove loose rust and scale from steel surface.

Prime the steel and allow to dry.

Damp surrounding masonry and apply full coat of primer to both masonry and steel. Whilst still wet apply the above mix.

Note well: Cement containing calcium chloride must not be used over bare steel.

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THIN SECTION MORTARS FOR REPAIRING CONCRETE:

| Material | Weight | Ratio |
|-----------------|-------------------------|-------|
| Portland Cement | 50kg | 1 |
| Sand | 125kg | 2.5 |
| Araplex SBR | 15kg | 0.3 |
| Water | As required | |
| | Yield 0.1m ³ | |

Damp and prime surface (unnecessary when repointing).

FLOORS - Toppings

General purpose screeds based on Araplex SBR can be laid to any thickness, down to a feather edge if necessary, providing that a sufficiently fine grade of sand or aggregate is used.

Heavy duty flooring compositions are normally laid as 12mm or greater thickness toppings.

Because Araplex SBR allows "feather-edging" of suitable mortar compositions, it is therefore possible to patch up only the damaged portions of existing concrete floors. These portions must of course be prepared and primed as previously described.

Note: Feathered edges are more vulnerable to damage in industrial/heavy duty applications i.e. wheeled traffic and are not recommended in these situations.

After mixing, the Araplex mortar should be poured over the still wet priming coat, and screed to achieve required surface finish tolerances. It may then be trowelled to the required finish. An experienced floor layer will readily achieve a finish of satisfactory smoothness without having to do any further trowelling.

However, as an alternative procedure, it is possible with care to carry further trowelling after a suitable interval, when initial stiffening of the mortar has commenced. A clean steel trowel is recommended for this operation.

With a little experience, the correct timing at which this re- trowelling should be carried out will be properly judged. If sufficient time has been allowed to elapse, a thin surface skin will be present over soft unset material and the skin will be torn giving surface cracking. Too great a time interval on the other hand would result in the mortar having set too much to be smoothed. The whole surface should be trowelled, not just sections of it, to avoid variations in shade, texture, etc.

HEAVY DUTY FLOORING:

Granolithic over 12 -25mm

| Material | Weight | Ratio |
|----------------------|-------------------------|-------|
| Portland Cement | 50kg | 1 |
| Zone 2 Sand | 62.5kg | 1.25 |
| Granite Chip (3-6mm) | 62.5kg | 1.25 |
| Araplex SBR | 10kg | 0.02 |
| Water | As required | |
| | Yield 0.1m ³ | |

HEAVY DUTY FLOORING:

Granolithic over 25mm

| Material | Weight |
|--|-----------------------|
| Chipped Greywacke, Granite 10mm in size or other suitable stone chip | 800kg |
| Pap 6 Stone Chip | 500kg |
| Graded fine washed river sand | 600kg |
| Portland Cement | 300kg |
| Araplex SBR | 60kg |
| Water | As required |
| Defoamer | As required |
| | Yield 1m ³ |



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HEAVY DUTY FLOORING:

Granolithic over 50mm

| Material | Weight |
|-------------------------------|-----------------------|
| BM20 blended sand / aggregate | 2000kg |
| Portland Cement | 600kg |
| Araplex SBR | 300kg |
| Water | 60kg |
| Defoamer | As required |
| | As required |
| | Yield 1m ³ |

PRODUCT PROPERTIES:

| | | |
|----------------------|--|----------|
| Light Traffic | 25°C | 48 hours |
| Medium Traffic | 25°C | 7 days |
| Full Strength | 25°C | 28 days |
| SG kg/litre | 1.01 kgs / litre | |
| Solid Content | 47% | |
| Clean up | All tools should be cleaned immediately after use because hardened Araplex-modified mortars and concretes have excellent adhesion and are therefore difficult to remove. Solvents such as white spirit, solvent naphtha or preferably toluene can be useful in removing hardened mortar. | |
| Dangerous Good Class | Not Applicable | |
| Packaging | 20 litre Plastic Pail 200 litre Drum | |
| Storage | Araplex SBR is best stored at moderate temperatures to avoid the possibility of permanent damage occurring due to prolonged heat or excessive cold. However if frozen, the latex should be thawed slowly. Araplex SBR should preferably be stirred before use. | |
| Shelf life | 24 months in unopened containers (After this period consult with allnex) | |

CONTROL OF RELIEF JOINTS ETC:

Standard recommended control of relief cuts (to accommodate concrete shrinkage) are to be cut in the Araplex modified renders or toppings as per standard concrete masonry recommendations or grids no greater than 5m x 5m.

If there are existing Control or Relief joints in a concrete substrate then these must be transferred through the Araplex SBR topping.

SELECTION OF MATERIALS

To obtain maximum strength from mixes modified with Araplex SBR is important that attention is paid to the quality of the other materials used. Variation in these can have a marked effect on performance.

Sand should be clean, sharp and free from excessive fines. Where a very smooth surface is required a fine sand may be used, but no ultra-fine clay-like material should be present, and not more than 0.5% should pass a 75-micron sieve.

Portland, High Alumina and certain fast setting cements are compatible with Araplex SBR. Cements containing calcium chloride should not be used in applications over bare steel due to their corrosive nature.

A wide range of aggregates can be incorporated in mixes depending on application and properties required. They should be clean and dust free.

If any special additives are to be considered in latex modified mortars brief tests should be conducted to ensure no adverse effect is produced before introducing for site use.

MIXING CONDITIONS:

Mixing procedure for mortars or concretes containing Araplex SBR is similar to that used for conventional compositions, with gauging water being either partly or completely replaced by Araplex SBR.

Mixing should preferably be carried out in a pan-type mixer, but normal concrete mixers are often used. For small batches, e.g.: not exceeding 50kgs, it is possible to hand-mix. The usual procedure is to pre-mix sand and cement in the mixer, pour in the Araplex SBR, mix for e.g.: 2-3 minutes, and finally slowly add water to the required consistency.

NB - Over addition of water causes rapid thinning of latex modified mortars owing to the plasticising effect of the latex.



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WATER | CEMENT RATIO WORKABILITY:

Because of its plasticising action the addition of Araplex SBR to a mortar mix will enable the water: cement ratio to be reduced for a given workability. Typically, if water: cement ratio of 0.5 applies to an unmodified mortar, this could be reduced to 0.28-0.35 depending on the level of Araplex SBR, allowance being made for the water content of the latex (53%).

The workability time is generally increased slightly by the addition of Araplex SBR. As working temperature increases, so workability time is shortened. Araplex-modified mortars have been shown to give practical workability times at temperatures ranging from about 30°C down to 2°C. However, if applying latex modified mortar to porous substrates at elevated temperatures the loss of water into the substrate due to suction may lead to difficulties with trowelling and poor adhesion.

The British Standard Code of Practice CP114: Part 2:1969 recommends that concreting should not be carried out unless "the concrete has a temperature of at least 4°C and that the temperature of the concrete is maintained above 2°C until it has thoroughly hardened". These recommendations remain valid for latex modified mortars and concretes.

When applying Araplex modified mortar or concrete at temperatures between 2°C and 10°C it is desirable to use a rapid or extra rapid hardening cement. Alternatively, OPC may be used in conjunction with 2%-4% of calcium chloride (expressed on cement weight); the calcium chloride should be added as a 50% solution in water to the mix.

AIR ENTRAPMENT.

Latex modified mortars tend to entrain higher levels of air than unmodified mortars. To achieve optimum performances from the modified mortar it is therefore important that care is taken at the mixing stage to minimise this effect.

Araplex SBR contains an antifoam which under most circumstances will give the required detraining properties, but it may be necessary for critical applications to make a further on-site addition of a suitable antifoam.

Addition levels in the range 0.25-0.5 on Araplex SBR are suggested.

Optimal entrained air is approximately 4%.

CURING CONDITIONS:

Generally, unmodified mortars develop maximum strength properties when cured wet. With Araplex SBR modified mortars however it is necessary for the mortar to dry out at some stage to allow the latex particles to coalesce and so form an interpenetrating lattice of polymer. Subsequent immersion will not re-disperse the polymer. Where possible it is recommended that cure comprises an initial wet cure, e.g.: 24 hours, followed by dry cure.

CURE TIMES:

Although Araplex SBR improves adhesion and flexural strength, the cure time of mixes using Araplex SBR remain the same as normal concrete.