BASF
The Chemical Company

EMACO® R101

Single component, shrinkage compensated polymer modified cementitious repair mortar

Description

EMACO® R101 is a single component, polymer modified, cementitious repair mortar. It consists of a pre-packed grey powder in sealed bags containing cement, filler and polymer.

When mixed with the specified amount of water a grey trowellable mortar results that is ideally suited for interior or exterior high build application on vertical or overhead work.

Material can be applied up to 50mm thick in one pass without formwork; greater thicknesses can be achieved depending upon the geometry of the repair or by the use of temporary formwork. EMACO® R101 is specially formulated to produce a shrinkage compensating mortar giving a smooth finish with excellent adhesion and exceptional water resistance.

Primary uses

- Repair of damaged, decayed, weak or debonded concrete.
- Replacement of concrete that has spalled, chipped or cracked.
- Replacement of concrete suffering from attack as a result of carbonation or ingress of chloride ions.
- Repair of vertical and overhead surfaces.
- Filling of honeycombs in new or old construction.
- Reprofiling of concrete or masonry.

Advantages

- Pre-packed, easy to use material, requiring only the simple addition of water.
- Precision made, consistent results.
- Shrinkage compensating.
- High build, non-slump.
- Durable, low permeability and weatherproof.
- Excellent compressive strength.
- Primer gives high bond strength to prepared surfaces.
- Resistant to aggressive media.

Packaging

EMACO® R101 is supplied in 25kg bags.

Typical properties

Properties listed are only for guidance and are not a guarantee of performance

Appearance:	Granular grey powder
Density:	1750kg/m³
Compressive strength (BS 1881 Pt. 116):	>11 N/mm² at 1 day >30 N/mm² at 28 days
Water absorption (BS 1881 Pt. 122):	<1.7%
Initial surface absorption (I.S.A.T.) (BS 1881 Pt. 208):	60 min < 0.03ml/m²/s
Workability at 25°C:	> 30 mins
Minimum application temperature:	5°C
Recommended application thickness, dependent upon substrate:	min. - 10mm per layer max. - approx. 50mm per layer over-head - approx. 25 - 40mm per layer

Standards

EMACO® R101 has been specially formulated to meet the requirements of the following test methods:

ASTM C387: 04 Type 1.1.2.2 and 1.1.3

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Application procedures

Preparation:

It is essential that the surface of the concrete to be repaired is sound, clean and uncontaminated.

The decayed or damaged areas should be identified and clearly marked. The perimeter of the area should be saw - cut (or cut neatly keeping the sides of the area as square as possible). Feather-edging must be avoided, and a full 10mm minimum thickness at the edges of the repair must be maintained. Breaking out should be undertaken using high pressure water jetting or pointed mechanical chisels. The use of scabbling equipment that can fracture aggregate but leave it in place should not be permitted.

Bush hammering / scabbling crushes the aggregate causing a weak surface to bond too. The force applied must not be such that damage to sound adjoining material may occur.

If unsound concrete or corroded reinforcement is found to extend beyond the pre-marked area, extend the cutting as necessary treating the edges as above. If the reinforcement is corroded ensure that the back of the steel is exposed. The prepared surface should be lightly textured but firm. Test the surface for soundness, remove all loose debris, dust and free water. An air lance (using oil free compressed air) or an industrial vacuum, aids thorough cleaning.

Reinforcement should have all traces of rust removed by the use of power tools, abrasive blasting or water jetting. Reinforcing steel should be exposed and cleaned around its full circumference. Clean the steel to a bright metal condition. (SA 2½ of Swedish Standard SIS 05-900: 1967 or BS 4232 Ref. 24 Second Quality. Alternative methods of cleaning reinforcement will be at the Engineer's discretion).

Priming:

Reinforcing steel:

Immediately after completion of cleaning, brush apply in a continuous film, a coat of CONCRESIVE ZR to the dry steel. A second coat may be applied after 5 hours at 20°C. See separate datasheet for further information.

The priming system to be used on the concrete substrate will depend on the cause of the damage.

Chloride induced corrosion:

If there are residual chlorides left in the host concrete it is recommended that CONCRESIVE 1414, an epoxy resin is brush applied as a bonding agent. CONCRESIVE 1414 has a tack free time of 7 hours at 30°C and the EMACO® R101 should be applied within this time. If the CONCRESIVE 1414 dries, then it should be overcoated before application proceeds.

Allow 45 minutes standing time between the application of the CONCRESIVE 1414 and the subsequent application of EMACO® R101.

Non-chloride induced corrosion:

The concrete should be thoroughly dampened with clean, fresh water, however, the surface should be free of standing water. Brush apply EMACO® BONDING AGENT in a thin, continuous film. Avoid ponding.

For the EMACO® R101 to achieve optimum bond, in the fresh and cured states, it should be applied to BONDING AGENT that is tacky.

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Mortar preparation:

Mixing:

Slowly add the EMACO® R101 powder to clean gauging water, working well to produce a smooth mortar. The consistency of the mix can be adjusted by the addition of more powder or water as necessary.

When mechanical mixing, best results are obtained using a forced action mixer. Again, add the powder to the water and mix for 3 minutes.

Mixing water should be added to EMACO® R101 at the rate of 4.10 to 4.75 litres of water per 25kg of EMACO® R101 powder. The addition rate of water is dependent on the workability required. Higher temperatures would generally require more water.

Placing and finishing:

Whilst the primer (CONCRESIVE 1414 or EMACO® Bonding Agent) - is still tacky apply the EMACO® R101 carefully and fully compact it. Application can be by trowel or by a rubber gloved hand to force the plastic mortar into place. The method chosen will be dictated by the size and situation of the repair.

EMACO® R101 can be applied at thicknesses in excess of 50mm at one pass on vertical surfaces and up to 40mm when used in overhead work. Application thickness is dependent on repair size and geometry. Higher build applications can be achieved using temporary formwork.

Where necessary to achieve a desired thickness, the previous layer of EMACO® R101 mortar should be lightly cross hatched and allowed to take up its initial set prior to the application of the final finishing layer. Trowel the surface to give a smooth finish matching the surrounding concrete.

Always give the applied EMACO® R101 a final firm finish with a steel, wood or plastic float prior to the start of the curing regime.

Curing:

EMACO® R101 should be cured in accordance with good concrete practice by application of a suitable curing membrane or by covering the work with properly secured plastic sheeting. Protection against rapid drying from wind, sun or excessive heat is necessary.

Curing should begin as soon as the final finish is achieved.

Chloride contaminated environments:

In cases of severe contamination, direct contact with water borne salts and saline solutions, highway structures where de-icing salts are in use and spray can reach the repair, cure with one of the MASTERKURE range of products.

If it is desired to change the appearance of the structure and to hide the "patchwork" appearance of multiple repairs, a pigmented protective coating such as MASTERSEAL 300H applied on to a primer coat of MASTERKURE 181 should be used. MASTERKURE 181 a curing membrane that does not break down, acts as a primer for subsequent applications of certain protective coatings.

Note: In addition to shrinkage compensation, this product has been designed to develop tensile strength sufficient to withstand the internal stress generated by volume change to reduce the incidence of drying shrinkage cracking.

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Coverage

Priming steel:	CONCRESIVE ZR	165m of 16mm diameter bar / litre
Priming concrete:	CONCRESIVE 1414	2-2.7m²/kg
Priming concrete:	EMACO® BONDING AGENT	5 to 8 m² / litre

Yield

Approx. 17.5 litres/25kg bag at average water addition.

Watchpoints

- All existing expansion joints should be carried through the repair from the substrate.
- It is recommended that exposed concrete is protected with a protective coating from the BASF range as an integral part of the overall concrete repair and protection operation.

Equipment care

Tools should be washed with water immediately after use.

Storage

Store out of direct sunlight, clear of the ground on pallets protected from rainfall. Avoid excessive compaction. Shelf life is one year minimum when stored as above.

Failure to comply with the recommended storage conditions may result in premature deterioration of the product or packaging. For specific storage advice consult BASF's Technical Services Department.

Safety precautions

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs. Treat splashes to eyes and skin immediately. If accidentally ingested, seek medical attention. Use in well ventilated areas and avoid inhalation. For further information refer to the material safety data sheet.

Note

Field service, where provided, does not constitute supervisory responsibility. For additional information contact your local BASF representative.

BASF reserves the right to have the true cause of any difficulty determined by accepted test methods.

Quality and care

All products originating from BASF's Dubai, UAE facility are manufactured under a management system independently certified to conform to the requirements of the quality, environmental and occupational health & safety standards ISO 9001, ISO 14001 and OHSAS 18001.

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