

# EMACO<sup>®</sup> S103

## Pre-Mixed, Non-Reactive, Low Alkali, Shrinkage Compensated Flowable Replacement Concrete and Thick Section Grout

### Description of Product

EMACO<sup>®</sup> S103 is a blend of Portland Cements and ground granulated blast furnace slag, to BS12 and BS6699 respectively, non reactive high grade limestone aggregates and additives which impart controlled expansion in the plastic and hardened states whilst providing maximum workability with minimum water demand.

It is non oxidising and does not contain chlorides, nitrates or other added accelerating chemicals.

EMACO<sup>®</sup> S103 complies with Department of Transport Model Specification BD 27/86 Pt. 3 and 4: and the Department of Transport Specification for Highway Works, Series 1700 (Structural Concrete, Clause 1704, 1993.)

It is supplied ready to use requiring only the addition of potable water to produce a shrinkage compensating, free flowing concrete suitable for placing in nominal thickness' in excess of 25mm.

When used as a thick section grout we recommend EMACO<sup>®</sup> S103 is applied between 75 mm - 500mm in depth.

All BASF Construction Chemicals (UK) Ltd's Concrete Repair System products are manufactured under procedures independently accredited to BS EN ISO 9001 (International Standard).

### Fields of Application

- To replace damaged, defective or deteriorated concrete.
- Situations where a self compacting flowable shrinkage compensating concrete would be used due to restricted access, steel congestion etc.
- Thick section grout applications to limit exothermic heat generation and reduce the risk of thermal cracking common in grout thicknesses exceeding 100mm in depth.

### Features and Benefits

- Non- reactive aggregate and low sodium oxide content-complies with DOT requirements.
- Shrinkage compensated in both plastic and hardened state.
- Good durability due to low water/cement ratio, high ultimate strength and low permeability.
- Excellent workability.
- Cohesive mix with no segregation.
- Low exotherm during curing.

### Technical Data/Typical Properties

Appearance	White granular powder
Maximum aggregate size	6mm
Plastic density	2260 kg/m <sup>3</sup>
Stiffening	Initial set Final set
	3 hours 30 mins @20°C 5 hours @ 20°C
Compressive Strength @ 20°C (BS 1881 Pt 108):(100mm cubes)	>12 N/mm <sup>2</sup> @ 24 hours >32 N/mm <sup>2</sup> @ 3 days >46 N/mm <sup>2</sup> @ 7 days >55 N/mm <sup>2</sup> @ 14 days >60 N/mm <sup>2</sup> @ 28 days
Cement Content	Min 400 kg/m <sup>3</sup>
Max. Free W/C Ratio	0.39
Alkali content	Complies with DOT Model specification BD 27/86 Pt 4
Expansion ASTM C827:	0.55% @ 24 hours
Chloride ion content - per total weight of cement:	<0.1%
Initial surface absorption (ISAT) (BS. 1881 Pt 5)	10 mins: 0.015 ml/m <sup>2</sup> /sec 30 mins: 0.006ml/m <sup>2</sup> /sec 60 mins: 0.001ml/m <sup>2</sup> /sec
Flow (DTp Flow Trough)	680mm
Flow through Horizontal Surfaces BD 27/86 Fig 2:	Complies
Water absorption BS 3921: (100mm Cubes)	24 hours Immersion: 6.3% 5 hours boiling: 6.1%



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#### Application Procedure

##### Preparation of Substrate

All surfaces in contact with the EMACO® S103 should be sound, dense and clean. All laitance and unsound material must be removed. To ensure a sound, uniform edge to the repair it is recommended to saw cut the edges to a minimum depth of 15mm.

##### Steel Reinforcement

Reinforcement should have all traces of rust removed by the use of power tools, abrasive blasting or water jetting, taking care to ensure that the full circumference is cleaned. (SA2½ of Swedish Standard SIS 05-900:1967 or BS4232 ref. 24 Second Quality refer).

##### Priming

**Reinforcement.** If required, extra protection to the reinforcement can be provided by use of EMACO NANOCRETE® AP dependant upon the circumstances of use and the requirements of the client.

**Concrete.** Priming is not required but it is essential to pre-soak the repair area before application of EMACO® S103.

##### Formwork

Should be sound and watertight. Use a light application of RHEOFINISH® Chemical Release Agent to the face of the formwork. When repairs are to be carried out on undersides of soffits provisions must be made for draining of pre-soaking water and air venting during placement.

For thick section grouting applications forms should facilitate rapid, continuous and complete filling of the space to be grouted.

Build strong, well braced forms and caulk.

On the grout placing side, slant the form at approximately 45° outward and extend this form to provide an adequate head of grout during placement.

##### Mixing

The EMACO® S103 must be mixed in a forced action paddle mixer (e.g. Cretangle etc.) to ensure a homogeneous mix. The mixing water should be accurately measured into the mixer and with the mixer running, the contents of the bag should be added and mixed for a minimum of three minutes to achieve a smooth consistency. 3.5 litres of water per 25kg will produce a flowable concrete.

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

##### Placing

EMACO® S103 should be placed as soon as possible after mixing and within 30 minutes to gain the full benefit of the expansion process in the plastic state. It is recommended if placing by pump that standard concrete pumping practices should be observed. A minimum pump line internal diameter of 50 mm is recommended.

For thick section grouting applications, the EMACO® S103 should be poured directly on the sloped form to minimise entrapment of air during placement.

Use method of forming that will allow the EMACO® S103 to flow by gravity between the plate and the foundation and keep the grout in full contact with these surfaces until it has hardened.

##### Coverage

The yield from one 25kg bag of EMACO® S103 at flowable consistency (3.5 litres added water) is 0.0126 cubic metres (12.6 litres).

##### Curing/After Treatment

Good curing practice is essential. Particular care is required in hot or windy conditions. Curing can be by the application of a single coat of MASTERKURE® 181 curing membrane which is compatible with most subsequent protective coatings, or by covering the work with a properly secured plastic sheeting.

##### Cleaning

Treat as normal concrete and clean all tools and equipment with water immediately after use.

##### Packaging

EMACO® S103 is supplied in 25kg bags.

##### Storage

Store as cement in cool, dry conditions.

##### Shelf Life

Minimum 12 months when stored as recommended in unopened containers.

##### Watchpoints

**Cold weather work:** placing should not take place at temperatures below 5°C.

At temperatures below 8°C it is essential to heat and warm the area prior to starting work and subsequently maintain the concrete at a minimum 8°C.

Warm water may be used to a maximum 25°C temperature.

**Hot weather work:** keep all ingredients protected from the sun. Use cold water with added ice if necessary. Proper curing is essential.



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#### **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.

#### **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.

#### **Spillage**

Chemical products can cause damage; clean spillage immediately.

#### **Disclaimer:**

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