

## PRODUCT DATA SHEET

# SikaEmaco® S 5400

(formerly MEmaco S 5400)

Extra high-strength, shrinkage compensated, fibre reinforced, thixotropic structural repair mortar, class R4 acc. to EN 1504-3; 5 to 50 mm application thickness

### DESCRIPTION

SikaEmaco® S 5400 is a single component, extra high strength, high modulus, shrinkage compensated structural repair mortar that meets the requirements of class R4 according to EN 1504 part 3.

SikaEmaco® S 5400 is a ready-to-use material that contains sulphate resistant Portland cement (HSR LA), hydraulic binders, well graded sands, selected polymer fibres (PAN – polyacrylonitril) and special additives to significantly reduce the risk and incidence of shrinkage cracking.

When mixed with water, SikaEmaco® S 5400 forms a highly thixotropic mortar that can easily be spray or trowel applied.

### USES

SikaEmaco® S 5400 is used for the structural repair of concrete elements such as:

- Columns, piers and cross beams of all bridges
- Cooling towers and chimneys and other industrial environments
- Water treatment and sewerage facilities
- Tunnels, pipes, outfalls and all below ground construction especially in harsh ground conditions
- Marine structures

### FEATURES

- Can be applied inside and outside, on vertical and overhead surfaces, in dry and wet environments.
- Formulated with nanotechnology, shrinkage compensation systems and fibre reinforcement (polyacrylonitril fibres) to minimise crack tendency.
- Highly thixotropic - can be applied up to 50 mm without the need of secondary reinforcement.
- High early and ultimate strengths.
- Outstanding workability for easy placing and finishing.
- High modulus and excellent adhesion to host concrete ensuring load transfer.
- Excellent freeze/thaw resistance.
- High carbonation resistance.
- Sulphate resistant.
- Very low permeability to water and chlorides.

## PRODUCT INFORMATION

Packaging	SikaEmaco® S 5400 is available in 25 kg paper bags.	
Appearance and colour	grey powder	
Shelf life	12 months from production date if stored at below mentioned conditions	
Storage conditions	Store at ambient temperatures, out of direct sunlight, in cool, dry warehouse conditions and clear of the ground on pallets protected from rainfall prior to application. No permanent storage over +30 °C.	
Maximum grain size	1.4 mm	
Total chloride ion content	≤ 0.02 %	(EN 1015-17)

## TECHNICAL INFORMATION

Compressive strength	1 day	≥ 20 N/mm <sup>2</sup>	
	7 days	≥ 40 N/mm <sup>2</sup>	
	28 days	≥ 60 N/mm <sup>2</sup>	
	(EN 12190)		
Modulus of elasticity in compression	≥ 29,000 N/mm <sup>2</sup>	(EN 13412)	
Pull-out resistance	Concrete	28 days	≥ 2.6 N/mm <sup>2</sup>
	Concrete after Freeze-Thaw (50 cycles with salt)	28 days	≥ 3.2 N/mm <sup>2</sup>
	Concrete after Thunder-Shower (50 cycles)	28 days	≥ 3.5 N/mm <sup>2</sup>
	Concrete after Dry Cycling (50 cycles)	28 days	≥ 3.5 N/mm <sup>2</sup>
	(EN 1542) (EN 13687-1) (EN 13687-2) (EN 13687-4)		
Shrinkage	Cracking Tendency in DIN type V-channel	no cracking up to 180 days	
Capillary absorption	≤ 0.5 kg·m <sup>-2</sup> ·h <sup>-0.5</sup>	(EN 13057)	
Carbonation resistance	dk ≤ Reference Concrete	(EN 13295)	
Service temperature	-30 to +80 °C		
Ring test	Coutinho Ring	no cracking up to 180 days	

## APPLICATION INFORMATION

Fresh mortar density	approx. 2.1 g/cm <sup>3</sup>
Consumption	Approx. 1,900 kg powder is needed to prepare 1 m <sup>3</sup> of fresh mortar. 25 kg powder will yield approximately 13.4 litres of mortar, when mixed with 4 litres water/bag.
Layer thickness	5 to 50 mm
Ambient air temperature	+5 to +30 °C
Mixing ratio	Approx. 3.8 – 4.2 l Mixing Water for 25 kg
Substrate temperature	+5 to +30 °C
Pot Life	45 – 60 Minutes (at 21±2 °C and 60±10 % relative humidity. Higher temperatures will reduce these times and lower temperatures will extend them.

## BASIS OF PRODUCT DATA

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

## IMPORTANT CONSIDERATIONS

- Do not apply SikaEmaco® S 5400 at temperatures below +5°C nor above +30°C.
- Do not add cement, sand or other substances that could affect the properties of SikaEmaco® S 5400.
- Never add water or fresh mortar to a mortar mix which has already begun to set.
- Keep the mixing water ratio between the recommended limits.

## ECOLOGY, HEALTH AND SAFETY

This product is an article as defined in article 3 of regulation (EC) No 1907/2006 (REACH). It contains no substances which are intended to be released from the article under normal or reasonably foreseeable conditions of use. A safety data sheet following article 31 of the same regulation is not needed to bring the product to the market, to transport or to use it. For safe use follow the instructions given in this product data sheet. Based on our current knowledge, this product does not contain SVHC (substances of very high concern) as listed in Annex XIV of the REACH regulation or on the candidate list published by the European Chemicals Agency in concentrations above 0.1 % (w/w)

## APPLICATION INSTRUCTIONS

### SUBSTRATE QUALITY

Hardness and durability of concrete are increasingly important parameters for the preparation of the support. This is particularly valid for repair and/or protection of concrete formulated according to the most recent concrete technology. It is therefore recommended to determine a diagnosis in advance, in order to adapt choices and the way how to prepare the support to these parameters. Consult your local Sika representative for additional information.

### SUBSTRATE PREPARATION

Concrete must be fully cured, clean and sound to ensure good adhesion. All loose traces of concrete or mortar, dust, grease oil, etc. must be removed. Concrete must have a minimum direct tensile strength of 1.5 N/mm<sup>2</sup>.

Damaged or contaminated concrete should be removed to obtain a keyed surface. Non-impact/vibrating cleaning methods, e.g. shot blasting, sandblasting or high-pressure water jetting are recommended. Aggregate should be clearly visible on the surface of the concrete structure after surface preparation. Cut the edges of the repair vertically to a minimum depth of 5 mm.

If reinforcing steel is visible, clean to a minimum grade of Sa 2 according to ISO 8501-1 / ISO 12944-4. Ensure back of rebar is also clean. Only in case of chloride contamination of the concrete or when depth of cover is less than 10 mm, should the reinforcement be protected by using SikaEmaco® P 5000 AP.

For hand applications we advise to apply a brushable bonding layer of SikaEmaco® S 5400. For spray applications it is not necessary to apply a bonding layer.

### MIXING

Open the bags a short time before the mixing is started. Damaged or opened sacks should not be used. Pour the minimum amount of mixing water into a clean vessel. Only use clean uncontaminated water. Mixing water needed: 3.8 to 4.2 litres per 25 kg bag depending upon consistency required. Add the SikaEmaco® S 5400 powder rapidly and continuously and mix with a suitable paddle attached to a powerful, slow speed electric drill (max. 400 rpm) for 3 minutes until plastic consistency is achieved without any lump in the mortar.

Allow the mortar to rest for 2 - 3 minutes and then remix briefly, adjusting the consistency when required. Note: Add water if necessary but never exceed the maximum water demand!

### APPLICATION

The prepared substrate should be pre-soaked, preferably for 24 hours, but at least 2 hours before applying SikaEmaco® S 5400. The surface must be mat-damp, but without standing water.

For optimum curing of the product the temperatures during application of SikaEmaco® S 5400 are between +5°C and +30°C.

In case of hand application, apply a thin scrape coat or contact layer. Then apply the mixed SikaEmaco® S 5400 directly wet-on-wet onto the primed surface in the desired thickness between 5 and 50 mm using a screeding beam, trowel or wooden board.

In case of application by spray machine, first spray-apply a thin contact layer, then apply multiple layers of SikaEmaco® S 5400 until the required layer thickness is obtained. Spraying with the necessary pressure will improve the adhesion of SikaEmaco® S 5400.

The surface can be finished with a sponge, wooden float or plastic float when the mortar has initially set (approx. 45 - 60 minutes after the application at +20°C). At lower temperatures and/or higher humidity these times will be extended.

### CURING TREATMENT

Immediately after SikaEmaco® S 5400 is placed, cover all exposed mortar with clean wet hessian and keep moist by covering with polythene between 1 to 7 days depending on the weather conditions. To maintain effective curing the use of an approved Sika curing compound is recommended.

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## CLEANING OF EQUIPMENT

Tools and mixer must be cleaned immediately after use with water. Cured material can only be removed mechanically.

## LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the declared data for this product may vary from country to country. Please consult the local Product Data Sheet for the exact product data.

## LEGAL NOTES

Any information or suggestions for use concerning Sika's products, which we either in writing or orally have given buyers or end-users of the product, have been given in good faith based on our own experiences and based on approved praxis and the technological and scientific knowledge on the time of giving such suggestions and information, which are given without any type of guarantees, and which do not lead to any further responsibility from Sika Danmark A/S, besides what is stated in the sales agreement in question. The buyer or end-user should themselves investigate or otherwise make sure, that our products are suitable for the use in question and further make sure that the products are kept and used correct and in agreement with the published rules and considering the actual conditions in order to avoid damages or less satisfactory results. Any order is accepted and any deliverance is affected according to the general terms of sales and delivery from Sika Danmark A/S, which are considered known and accepted, and which could be handed out when asked for. Our catalogues are not up-dated automatically. The present product data sheet is only for use in Denmark. Values stated in the present product data sheet should be seen as recommended, unless stated otherwise.

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