

## 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

### PRODUCT DESCRIPTION

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

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 (polyacrylonitril or PAN) 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 sewage facilities.
- Tunnels, pipes, outfalls, and all below ground construction especially in harsh ground conditions.
- Marine structures.

### CHARACTERISTICS / ADVANTAGES

- 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.		
Shelf Life	12 months if stored in the correct storage 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. Storage temperature should not exceed +30 °C.		
Appearance / Colour	Grey powder		
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>	(EN 12190)
	7 days	≥ 40 N/mm <sup>2</sup>	
	28 days	≥ 60 N/mm <sup>2</sup>	
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> (EN 1542)
	Concrete after Freeze-Thaw (50 cycles with salt)	28 days	≥ 3.2 N/mm <sup>2</sup> (EN 13687-1)
	Concrete after Thunder-Shower (50 cycles)	28 days	≥ 3.5 N/mm <sup>2</sup> (EN 13687-2)
	Concrete after Dry Cycling (50 cycles)	28 days	≥ 3.5 N/mm <sup>2</sup> (EN 13687-4)
Shrinkage	Cracking Tendency in DIN type V-channel	No cracking up to 180 days	
Ring test	Coutinho Ring	No cracking up to 180 days	
Service Temperature	-30 to +80 °C		
Capillary Absorption	≤ 0.5 kg·m <sup>-2</sup> ·h <sup>-0.5</sup>		(EN 13057)
Carbonation Resistance	dk ≤ Reference Concrete		(EN 13295)

## APPLICATION INFORMATION

Fresh mortar density	~2.1 g/cm <sup>3</sup>
Consumption	~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 of water per 25 kg bag.
Layer Thickness	5 to 50 mm
Ambient Air Temperature	+5 to +30 °C
Mixing Ratio	3.8 to 4.2 litres of water per 25 kg bag
Substrate Temperature	+5 to +30 °C
Pot Life	45 to 60 Minutes (at +21 ± 2 °C and 60 ± 10 % relative humidity). Higher temperatures will reduce these times and lower temperatures will extend

## VALUE BASE

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.

## LIMITATIONS

- 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

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

## APPLICATION INSTRUCTIONS

### SUBSTRATE QUALITY

Hardness and durability of concrete are increasingly important parameters for the preparation of any works. This is particularly valid for repair and / or protection of concrete formulated according to the most recent concrete technologies. It is therefore recommended to determine a diagnosis in advance, in order to adapt choices and to offer the most suitable products to support 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 (bond 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 the back of rebars are 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 applying 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 mixing. Damaged or opened sacks should not be used.

Pour the minimum amount of mixing water into a clean vessel. Only use clean, uncontaminated, potable 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 (maximum 400 rpm) for 3 minutes until plastic consistency is achieved without any lumps in the mortar.

Allow the mortar to rest for 2 to 3 minutes and then remix briefly, adjusting the consistency if 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 matt-damp, but without standing water (i.e. saturated surface dry).

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

In case of hand application, apply a thin scrape or scratch 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 (approximately 45 to 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 (however, curing compounds

shall not be used if subsequently covering or coating as these may impair adhesion).

## CLEANING OF TOOLS

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 performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

## LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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Product Data Sheet  
SikaEmaco® S 5400  
September 2024, Version 02.01  
02030200000002119

SikaEmacoS5400-en-GB-(09-2024)-2-1.pdf