

PRODUCT DATA SHEET

SikaEmaco® S 5440 RS

(formerly MEmaco S 5440RS)

Rapid setting, high-strength, shrinkage compensated, fibre reinforced, tixotropic, structural concrete repair mortar with integrated corrosion inhibitor

DESCRIPTION

SikaEmaco® S 5440 RS is a one component, rapid setting, high strength, high modulus, shrinkage compensated concrete repair mortar that meets the class R4 requirements of EN 1504-3.

SikaEmaco® S 5440 RS is a ready-to-use material that contains special hydraulic binders, well graded sands, specifically selected polymer fibres and an integrated corrosion inhibitor.

When mixed with water, SikaEmaco® S 5440 RS forms a fast-setting and highly tixotropic mortar that can easily be hand-applied in 5 to 50 mm thickness.

USES

SikaEmaco® S 5440 RS is suitable for exposure classes XC 1-4, XF 1-4, XD 1-3, XS 1-3, XA 1-3 and XM1 as described in EN 206. It can be used for fast structural repair of concrete elements such as:

- Columns, piers and cross beams.
- Structures in industrial environments where a fast return to service is required.
- Preparation of surfaces in water treatment and sewerage facilities.
- Tunnels, pipes, outfalls and all below ground construction especially in harsh ground conditions.
- Marine structures, especially if repair needs to follow tidal timing.

FEATURES

- Fast-setting, allows quick return to service.
- Low temperature curing, can be used down to 0° C – prolongs the construction season in autumn and spring.
- Universal use: can be applied inside and outside, on vertical and overhead surfaces, in dry and wet environments.
- Highly tixotropic - can be applied up to 50 mm without the need of secondary reinforcement.
- High early and ultimate strengths.
- Excellent workability for easy placing and finishing.
- High modulus and excellent adhesion to host concrete ensuring load transfer.
- Weatherproof: proven freeze/thaw and carbonation resistance.
- Sulphate resistant.
- Meets requirements of exposure class XWW3 according to DIN 19573 (Mortar for construction and rehabilitation of drains and sewers outside buildings).
- Very low permeability to water and chlorides.
- Protection of repaired concrete by integrated corrosion inhibitor.

CERTIFICATES AND TEST REPORTS

- CE-Certification according to EN 1504-3, Class R4
- Chlorideindrigung nach BAW-Merkblatt
- Werksbescheinigung Expositionsklasse XM1

PRODUCT INFORMATION

Packaging	SikaEmaco® S 5440 RS is available in 25 kg paper bags.
Appearance and colour	Grey powder
Shelf life	12 months after date of production if stored at below mentioned 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. No permanent storage over +30 °C.	
Maximum grain size	1.2 mm	
Total chloride ion content	≤ 0.02 %	(EN 1015-17)

TECHNICAL INFORMATION

Abrasion resistance	Abrasion according to Böhme	Class A12	(EN 13892-3)
Compressive strength	2h	≥ 20 N/mm ²	(EN 12190)
	3h	≥ 25 N/mm ²	
	4h	≥ 30 N/mm ²	
	1 day	≥ 40 N/mm ²	
	7 days	≥ 60 N/mm ²	
	28 days	≥ 70 N/mm ²	
	Data determined at +23 °C		
	Low temperature performance:		
	1 day	≥ 30 N/mm ²	(EN 12190)
	28 days	≥ 60 N/mm ²	
	Data determined at +1 °C		
Modulus of elasticity in compression	≥ 30.000 N/mm ²		(EN 13412)
Flexural-strength	28 days	≥ 8 N/mm ²	(EN 12190)
Pull-out resistance	Adhesion to Concrete after 28 days	≥ 2.0 N/mm ²	(EN 1542)
	Adhesion to Concrete after Freeze-Thaw (50 cycles with salt)	≥ 3.0 N/mm ²	(EN 13687-1)
Reaction to fire	Class A1		(EN 13501-1)
Chemical resistance	Depth of deterioration at pH 4 after 4000 h	0.73 mm	(DIN 19573)
Freeze thaw de-icing salt resistance	CDF Testing	37 g/m ²	(CEN/TS 12390-9)
Sulfate resistance	Dimensional change after 120 days of storage in 10% Na ₂ SO ₄ -solution (Wittekindt method)	< 0.2 mm/m	
Capillary absorption	≤ 0.5 kg·m ⁻² ·h ^{-0.5}		(EN 13057)
Carbonation resistance	dk ≤ reference concrete (after 28 days)		(EN 13295)
Service temperature	-30 °C to + 80 °C		
Chloride diffusion coefficient	0.3·10 ⁻¹² m ² /s		(BAW Merkblatt Chlorideindringung)
Chloride ion permeability	Dimensional change after 120 days of storage in 10% NaCl-solution	< 0.2 mm/m	(internal measurement based on Wittekindt method)

APPLICATION INFORMATION

Mixing ratio	3.3 to 3.5 l water per 25kg bag.
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Consumption	Approx. 1,900 kg powder is needed to prepare 1 m ³ of fresh mortar. One 25 kg bag will yield approximately 13 litres of mortar.
Layer thickness	5 to 50 mm
Material temperature	+5 °C to +30 °C
Ambient air temperature	0 °C to +30 °C
Substrate temperature	0 °C to +30 °C
Pot Life	15 to 20 minutes at 21±2 °C and 60±10 % relative humidity. Higher temperatures will reduce this time and lower temperature will extend it.
Waiting time to overcoating	SikaEmaco® S 5440 RS can be overcoated with vapour-open coatings after 2 hours at 21±2 °C and 60±10 % relative humidity. Higher temperatures will reduce this time and lower temperature will extend it.
Setting time	Approx. 30 to 40 minutes at 21±2 °C and 60±10 % relative humidity. Higher temperatures will reduce these times and lower temperature will extend them.
Fresh mortar density	approx. 2.1 kg/l

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 5440 RS at temperatures below 0 °C nor above +30 °C.
- Mix only that amount of SikaEmaco® S 5440 RS that can be used within its pot life.
- Do not add cement, sand or other substances that could affect the properties of SikaEmaco® S 5440 RS.
- 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 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/mm².

Damaged or contaminated concrete must 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. In case of chloride contamination of the concrete or when depth of cover is less than 10 mm, the reinforcement should be protected by using SikaEmaco® P 5000 AP.

The prepared substrate should be saturated with water, preferably for 12 hours, but at least 2 hours before applying SikaEmaco® S 5440 RS. Before starting the application, the surface must be mat-damp, but without standing water.

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. Mixing water needed: 3.3 to 3.5 litres per 25 kg bag depending upon consistency required. Only use clean, uncontaminated water. Add the SikaEmaco® S 5440 RS 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 re-mix briefly, adjusting the consistency when required.

Note: Add water if necessary but never exceed the maximum water demand!

APPLICATION

Temperatures during application and for the next 12 hours have to be between 0 °C and +30 °C.

First apply a thin scrape coat or contact layer to the prepared damp substrate. Then apply SikaEmaco® S 5440 RS using a screeding beam, trowel or wooden board in the desired thickness between 5 to 50 mm directly onto the primed surface.

Smoothing with a trowel or finishing by float or sponge can be done as soon as the mortar has begun to stiffen (typically after around 30 to 45 minutes at +20 °C). At lower temperatures and/or higher humidity these times will be extended.

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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