

## PRODUCT DATA SHEET

# Sika MonoTop®-412 MM

## STRUCTURAL REPAIR MORTAR FOR HAND PLACED / WET SPRAY REPAIR MORTAR

### DESCRIPTION

Sika MonoTop®-412 MM is a single component, fibre reinforced, low shrinkage structural repair mortar. Fast repairs to overhead, horizontal or vertical concrete or mortar surfaces above and below ground level.

### USES

- Fast repairs to overhead, horizontal or vertical concrete or mortar surfaces above and below ground level.
- Suitable for restoration work. Repair of spalling and damaged concrete in buildings, bridges, infrastructure and superstructure works
- Suitable for structural strengthening. Increasing the bearing capacity of the concrete structure by adding mortar
- Suitable for preserving or restoring passivity. Increase cover with additional mortar and replace contaminated or carbonated concrete

### FEATURES

- Superior workability
- Suitable for hand and machine application
- Can be applied up to 50 mm thick per application layer
- Structural repair
- Very low shrinkage behaviour
- Does not require a bonding primer even when manually applied (for static load only)
- Low permeability

### CERTIFICATES AND TEST REPORTS

Sika MonoTop®-412 MM complies with R4 class specifications according to EN 1504-3 that are relevant for tropical countries. Test report No. MIS 080/13/R 0753

### PRODUCT INFORMATION

Packaging	25 kg bag
Shelf life	6 months from date of production
Storage conditions	Store properly in undamaged original sealed packaging, in dry conditions. Protect from moisture and rain.
Appearance and colour	Grey powder
Maximum grain size	2.0 mm
Soluble chloride ion content	~0.011 % (EN 1015-17)

## TECHNICAL INFORMATION

Compressive strength	1 day	~ 15 N/mm <sup>2</sup>	(EN 12190)
	7 days	~ 40 N/mm <sup>2</sup>	
	28 days *	~ 50 N/mm <sup>2</sup>	
	* Class R4 requirement: ≥ 45 N/mm <sup>2</sup> (EN 12190)		
Modulus of elasticity in compression	~24.9 GPa		(EN 13412)
Flexural-strength	1 day	~ 4 N/mm <sup>2</sup>	(EN 12190)
	7 days	~ 7 N/mm <sup>2</sup>	
	28 days	~ 9 N/mm <sup>2</sup>	
Tensile adhesion strength	~ 2.8 N/mm <sup>2</sup>		(EN 1542)
Restrained shrinkage / expansion	Control Value	~2.65 N/mm <sup>2</sup>	(EN 12617-4, clause 7)
	Restrained Drying	~2.38 N/mm <sup>2</sup>	
	Shrinkage		
	Restrained Expansion	~2.31 N/mm <sup>2</sup>	
Baenziger block	No cracks with Baenziger Block Test		
Thermal conductivity	Control Value	~2.74 N/mm <sup>2</sup>	(EN 13687-2)
	Thunder Shower for 10 cycles	~2.19 N/mm <sup>2</sup>	
	Thunder Shower for 30 cycles	~2.07 N/mm <sup>2</sup>	
Capillary absorption	0.271 kg/m <sup>2</sup> .h <sup>0.5</sup>		(EN 13057)
Carbonation resistance	dk ≤ control concrete (Mortar concrete (0.45))		(EN 13295-17)

## SYSTEM INFORMATION

System structure	Sika MonoTop®-412 MM complies with the R4 class specifications according to EN 1504-3 that are relevant for tropical countries (tests carried out at 25–30 °C).		
	Sika MonoTop®-412 MM is part of the range of Sika mortars comprising of:		
	Bonding primer / corrosion protection	Sika MonoTop®-610 MM	Normal use
	Bonding primer / corrosion protection	SikaTop® Armatec®-110 EpoCem®	Demanding requirements
	Repair mortar	Sika MonoTop®-412 MM	Structural hand & machine applied repair mortar
	Fairing coat	Sika MonoTop®-620 MY	Pore sealer and smoothing mortar

## APPLICATION INFORMATION

Mixing ratio	3.75–4.25 L of water for 25 kg powder
Fresh mortar density	~2.10 kg/l
Consumption	Depends on the substrate roughness and thickness of layer applied. As a guide, ~19 kg of powder per cm thick per m <sup>2</sup>
Yield	1 bag yields approximately 13.7 L of mortar
Layer thickness	6 mm min. / 50 mm max.
Ambient air temperature	+6 °C min. / +40 °C max.
Substrate temperature	+6 °C min. / +40 °C max.

## BASIS OF PRODUCT DATA

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

## LIMITATIONS

- Refer to the Method Statement for Concrete Repair using Sika MonoTop® system for more information regarding substrate preparation
- Avoid application under direct sun and/or strong wind
- Do not add additional water than recommended when mixing Sika MonoTop®-412 MM
- Apply only to sound and well prepared substrate
- Do not add additional water during the surface finishing phase as this will cause discoloration and cracking
- Protect freshly applied material from freezing

## ECOLOGY, HEALTH AND SAFETY

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Safety Data Sheet (SDS) containing physical, ecological, toxicological and other safety-related data.

## APPLICATION INSTRUCTIONS

### SUBSTRATE QUALITY / PRE-TREATMENT

#### Concrete

The concrete shall be free from dust, loose material, surface contamination and materials which reduce bond or prevent suction or wetting by repair materials. Delaminated, weak, damaged and deteriorated concrete and where necessary sound concrete shall be removed by suitable means.

#### Steel reinforcement

Rust, scale, mortar, concrete, dust and other loose and deleterious material which reduces bond or contributes to corrosion shall be removed. Surfaces shall be prepared using abrasive blast cleaning techniques or high pressure water-blasting to SA 2 (ISO 8501-1).

#### Bonding primer

On a well prepared and roughened substrate a bonding primer is generally not required. When a bonding primer is not required pre-wet the substrate to saturated-surface-dry condition. The surface shall not be allowed to dry before application of the concrete repair mortar. The surface shall achieve a dark matt appearance without glistening and surface pores and pits shall not contain water.

When a bonding primer is necessary apply Sika MonoTop®-610 MM (refer to the relevant Product Data Sheet) or other equivalent product from Sika. The bonding primer shall be applied well into the concrete substrate with a stiff brush.

#### Reinforcement coating

Where a reinforcement coating is required as a barrier (e.g. in the case of insufficient concrete cover), apply two coats of Sika MonoTop®-610 MM (Refer to the relevant Product Data Sheet) to the entire exposed circumference of the reinforcement.

#### MIXING

Sika MonoTop®-412 MM can be mixed with a low speed (< 500 rpm) hand-drill mixer fixed to a mixing paddle or using a force-action mixer, 2 to 3 bags or more at once depending the type and size of mixer. In small quantity, Sika MonoTop®-412 MM can also be mixed manually using a trowel or scrapper in a clean container.

Pour the water in the correct proportion into a clean mixing container. While stirring slowly, add the powder to the water. Mixed thoroughly for a minimum of 3 minutes, until the required consistency.

#### APPLICATION

Sika MonoTop®-412 MM can be applied either manually using traditional techniques or mechanically using wet spray equipment.

When a bonding primer is required, ensure it is still tacky when the repair material is applied (wet on wet technique). When applied manually, pressed the repair mortar with a trowel, working it well into the substrate.

Finishing for both hand and machine application can be done with the relevant roughcast as soon as the mortar has started to stiffen.

#### CURING TREATMENT

Protect the fresh mortar immediately from early hydration using a curing compound or wet-hessian.

#### CLEANING OF EQUIPMENT

Clean all tools and application equipment with water immediately after use. Hardened material can only be mechanically removed.

## LOCAL RESTRICTIONS

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for exact product data and uses.

## 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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