

# PRODUCT DATA SHEET

## Sika MonoTop®-412 N

### DESCRIPTION

Sika MonoTop®-412 N is a 1-component, fibre reinforced, low shrinkage repair mortar meeting the requirement of class-R4 of EN 1504-3.

### USES

- Suitable for restoration work (Principle 3, method 3.1 & 3.3 of EN 1504-9). Repair of spalling and damaged concrete in buildings, bridges, infrastructure and superstructure works.
- Suitable for structural strengthening (principle 4, method 4.4 of EN 1504-9). Increasing the bearing capacity of the concrete structure by adding mortar.
- Suitable for preserving or restoring passivity (principle 7, method 7.1 and 7.2 of EN 1504-9). Increasing cover with additional mortar and replacing contaminated or carbonated concrete.
- Tested application under live dynamic loading

### CHARACTERISTICS / ADVANTAGES

- Class R4 of EN 1504-3
- Sulphate resistant
- For hand or machine application
- Easy to apply
- Application up to 50 mm in 1 layer
- Very low shrinkage behaviour
- Does not require a bonding primer even when manually applied
- Low permeability
- A1 fire rating

### APPROVALS / STANDARDS

- (BAM) Bundesanstalt für Materialforschung und –prüfung - Prüfung von Instandsetzungs mortel nr. VII.1/126904/1 dated 1 July 2008
- Measurement of Specific Electrical Mortar Resistance report, Hochschule für Technik Rapperswil, Switzerland dated 14th April 2010

### PRODUCT INFORMATION

<b>Chemical Base</b>	Sulphate resistant cement, selected aggregates and additives
<b>Packaging</b>	25 kg bags
<b>Appearance / Colour</b>	Grey powder
<b>Shelf Life</b>	12 months
<b>Storage Conditions</b>	Store properly in undamaged original sealed packaging, in dry cool conditions.
<b>Density</b>	Fresh mortar density ~2.1 kg/l
<b>Maximum Grain Size</b>	D <sub>max</sub> : 2 mm
<b>Soluble Chloride Ion Content</b>	≤ 0.05% (EN 1015-17)

## TECHNICAL INFORMATION

<b>Compressive Strength</b>	Class R4			
	<b>1 day</b> ~17 MPa	<b>7 days</b> ~40 MPa	<b>28 days</b> ~55 MPa	(EN 12190)
<b>Modulus of Elasticity in Compression</b>	≥ 20 GPa			(EN 13412)
<b>Flexural Strength</b>	<b>1 day</b> ~4 MPa	<b>7 days</b> ~6 MPa	<b>28 days</b> ~8 MPa	(EN 12190)
<b>Tensile Adhesion Strength</b>	≥ 2.0 MPa			(EN 1542)
<b>Shrinkage</b>	~500 µm/m @ 20°C / 65% relative humidity at 28 days			(EN 12617-4)
<b>Restrained Shrinkage / Expansion</b>	≥ 2.0 MPa			(EN 12617-4)
<b>Thermal Compatibility</b>	≥ 2.0 MPa (Part 1- Freeze-Thaw)			(EN 13687-1)
<b>Coefficient of Thermal Expansion</b>	~10.5 x 10 <sup>-6</sup> 1/K			(EN 1770)
<b>Reaction to Fire</b>	Euro class A1			(EN 1504-3 cl 5.5)
<b>Capillary Absorption</b>	≤ 0.5 kg/(m <sup>2</sup> .h <sup>0.5</sup> )			(EN 13057)
<b>Chloride Ion Diffusion Resistance</b>	Low - < 2000 coulombs			(ASTM C1202)
<b>Carbonation Resistance</b>	dk ≤ control concrete (MC(0.45))			(EN 13295)
<b>Electrical Resistivity</b>	< 100 kΩ.cm			(EN 12696)

## SYSTEM INFORMATION

<b>System Structure</b>	Sika MonoTop®-412 N is part of the range of Sika mortars complying with the relevant part of European Standard EN 1504 and comprising of:		
	<b>Bonding Primer / Reinforcement</b>		
	<b>Corrosion Protection</b>		
	Sika MonoTop®-910 N		Normal Use
	SikaTop® Armatec® 110 EpoCem®		Demanding requirements
	<b>Repair Mortar</b>		
	Sika MonoTop®-412 N		Class R4 concrete repair hand and & machine applied
	<b>Levelling Mortar</b>		
	Sika MonoTop®-723 N		Normal use
	Sikagard®-720 EpoCem®		Demanding requirements

## APPLICATION INFORMATION

<b>Mixing Ratio</b>	3.6 to 3.9 litres of water for 25 kg powder
<b>Consumption</b>	This 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>
<b>Yield</b>	25 kg of powder yields approximately 13.7 litres of mortar
<b>Layer Thickness</b>	min. 6 mm / max. 50 mm
<b>Ambient Air Temperature</b>	+5 °C minimum; +30 °C maximum
<b>Substrate Temperature</b>	+5 °C minimum; +30 °C maximum
<b>Pot Life</b>	~40 minutes at +20°C

# APPLICATION INSTRUCTIONS

## SUBSTRATE QUALITY / PRE-TREATMENT

### Concrete:

The concrete shall be thoroughly clean, free from dust, loose material, surface contamination and materials which reduce bond or prevent suction or wetting by repair materials. De-laminated, 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) Reference shall be made to EN1504-10 for specific requirements.

## MIXING

Sika MonoTop®-412 N can be mixed with a low speed (< 500 rpm) hand drill mixer or for machine application, 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 N can also be manually mixed.

Pour the recommended water in a suitable mixing container. While stirring slowly, add the powder to the water and mix thoroughly at least for 3 minutes adding additional water during the mixing time if necessary to the maximum specified amount and adjust to the required consistency.

## APPLICATION

### Bonding Primer:

On a well prepared and roughened substrate a bonding primer is generally not required for this product. When a bonding primer is required, refer to the **System Information** above for compatible Sika products and refer to the relevant Product Data Sheet for instructions. All small amount of Sika MonoTop®-412 N can also be mixed slightly wetter than normal and used as a scratch coat to promote adhesion of the repair mortar to the substrate. Any bonding primer shall be applied on a pre-wet substrate and subsequent application of the repair mortar shall be applied wet on wet with the bonding primer.

### Reinforcement Corrosion Protection:

Where a reinforcement coating is required the application of a repair mortar shall be applied wet on dry with the reinforcement corrosion protection. Refer to the **System Information** above for compatible Sika products and refer to the relevant Product Data Sheet for more detailed information about the reinforcement corrosion product.

Sika MonoTop®-412 N can be applied either manually using traditional techniques or mechanically using wet spray equipment. Thoroughly pre-wet the prepared substrate a recommended 2 hours before application. Keep the surface wet and do not allow to dry. Before application remove excess water e.g. with a clean sponge. The surface shall appear a dark matt appearance without glistening and surface pores and pits shall not contain water.

When manually applying first make a scratch coat by firmly scrapping the repair mortar over the substrate surface to form a thin layer and fill any pores or pits in the surface. Ensure the whole surface to be repaired is covered by the scratch coat. Build up layers from bottom to top by pressing mortar well into the repair area. The surface can be finished according to the requirements using a float while wet or with a relevant rough-cast tool as soon as the mortar has started to stiffen.

## CURING TREATMENT

Protect the fresh mortar immediately from premature drying using an appropriate curing method e.g. curing compound, moist geotextile membrane, polythene sheet etc.

## CLEANING OF TOOLS

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

## LIMITATIONS

- Refer to the Method Statement for Concrete Repair using Sika MonoTop® system for more information regarding substrate preparation or refer to the recommendations provided in EN 1504-10
- Avoid application in direct sun and/or strong wind.
- Do not add water over recommended dosage
- Apply only to sound, prepared substrate
- Do not add additional water during the surface finishing as this will cause discolouration and cracking
- Protect freshly applied material from freezing

## 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.

## 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.

## 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.

## 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. It may be necessary to adapt the above disclaimer to specific local laws and regulations. Any changes to this disclaimer may only be implemented with permission of Sika® Corporate Legal in Baar.

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