

PRODUCT DATA SHEET

Sika MonoTop®-441 Unika

FIBRE-REINFORCED MORTAR WITH ADJUSTABLE SETTING, COMPENSATED SHRINKAGE, FOR STRUCTURAL CONCRETE REPAIR IN CLASS R4, CONCRETE AND REBAR PROTECTION



DESCRIPTION

Sika MonoTop®-441 Unika is a one-component mortar for structural repair, concrete protection and corrosion protection of reinforcement steel, with adjustable setting, ready to use, added with polymers, high thixotropy, combined with a very low shrinkage. It contains modified cements with synthetic polymers, silica fume, selected aggregates and synthetic fibres. It is suitable for repairs with thickness from 5 mm to 60 mm in one layer.

USES

- Structural restoration mortar PCC, class R4 (EN 1504-3), corrosion protection of the steel reinforcement (EN 1504-3) and concrete protection (Principle MC-IR EN 1504-2);
- Suitable for restoration work (Principle 3, method 3.1 & 3.3 of EN 1504-9:2008) on degraded concrete, in detachment or with gravel nests;
- Suitable for structural strengthening (Principle 4, Method 4.4 of 1504-9:2008); increasing the bearing capacity of the concrete structure by adding mortar;
- Suitable for preserving or restoring passivity (Principle 7, Method 7.1 & 7.2 of 1504-9:2008);
- Suitable for surface concrete protection, (Principle 2, Method 2.3 and Principle 8, Method 8.3 according EN 1504-9:2008);
- Suitable for control of anodic areas, (Principle 11, Method 11.1 according EN 1504-9:2008)
- Ideal for the restoration, repair, reprofiling and levelling of structural elements (beams, pillars, floors, etc.);
- Restoration, repair and levelling of concrete (Balconies fronts, cornices, etc);
- Restoration and finishing on prefabricated elements.

CHARACTERISTICS / ADVANTAGES

Sika MonoTop®-441 Unika is a versatile and universal product:

- It allows to adjust setting time according to job needs, using a water and Sika MonoTop® Modulo Unika mixture;
- It can be used as a normal setting mortar (mixed with only water) and as an accelerated setting mortar (mixed with water and Sika MonoTop® Modulo Unika);
- Suitable for all repair work in low thickness (min 5 mm) and in high thickness (max 60 mm);
- Useful both in the presence of high temperatures and low temperatures;
- It allows to realize repair, concrete and rebar protection in a single hand, on concrete structural elements, allowing to reduce significantly the execution time;
- Excellent workability, easy to apply even overhead;
- Compensated shrinkage;
- Good mechanical and good adhesion on the most commonly used building materials (cement, stone, bricks, etc.)

SUSTAINABILITY

Sika MonoTop®-441 Unika fulfills:

- LEED v4 MRc 2 (Opz. 1) Building product disclosure and optimization – Environmental Product Declaration (EPD).
- LEED v4 MRc 4 (Opz. 2) Building product disclosure and optimization – Components

APPROVALS / CERTIFICATES

- Sika MonoTop®-441 Unika fulfills the minimum performance requirements of EN 1504-2: 2004: Principle 2: Moisture control (Method 2.3 - coating); Principle 8: increase in resistivity (Method 8.3 - coating) and

- provided with CE marking;
- Sika MonoTop®-441 Unika fulfills the minimum performance requirements of EN 1504-3: 2005, class R4, and provided with CE marking.
- Sika MonoTop®-441 Unika fulfills the minimum performance requirements of EN 1504-7: 2008: Principle 11: Control of anodic areas (Method 11.1 Active coating of the reinforcement) and provided with CE marking.

PRODUCT INFORMATION

Composition	Portland cement, selected aggregates, fibres and additives	
Packaging	25 kg bags	
Appearance / Colour	Grey powder	
Shelf life	12 months from date of production	
Storage conditions	The product must be stored properly in undamaged original sealed packaging, in dry and cool conditions.	
Density	~ 2.00 kg/l (fresh mortar)	
Maximum Grain Size	Dmax 1.2 mm	
Soluble Chloride Ion Content	~ 0,002%	(EN 1015-17)

TECHNICAL INFORMATION

Compressive Strength	Class R4	(EN 1504-3)
	~ 50 MPa	(EN 12190)
	<u>1 day</u>	<u>7 days</u>
	~ 20 MPa	~ 38 MPa
Modulus of Elasticity in Compression	> 20 GPa	(EN 13412)
Tensile Strength in Flexure	~ 8.50 MPa at 28 days	(EN 196-1)
Tensile Adhesion Strength	~ 2.70 MPa	(EN 1015-17)
Thermal Compatibility	Freeze and thaw (50 cycles) ~ 2.90 MPa	(EN 13687-1)
Reaction to Fire	Euroclass A1	(EN 13501-1)
Freeze Thaw De-icing Salt Resistance	~ 2.90 MPa	(EN 13687-1)
Permeability to Water Vapour	Class I (permeable) ~ 1.40 m	(EN 1504-2) (EN ISO 7783-1-2)
Water Absorption	~ 0.06 kg m ² h ^{0,5}	(EN 13057)
Capillary Absorption	~ 0.30 kg m ² h ^{0,5}	(EN 13057)
Chloride Ion Ingress	~ 0.05%* * This value was gotten after 6 months at 10 mm depth.	(EN 13396)
Carbonation Resistance	Pass	(EN 13295)
Corrosion Test	Pass	(EN 1504-7))
	No corrosion	(EN 15183)

APPLICATION INFORMATION

Mixing Ratio	~ 4.0 - 4.5 l of water* for 25 kg powder bag (16-18% in weight) * It is possible to use Sika MonoTop® Modulo Unika mixed with water, in order to reduce setting time. Please refer to the respective Product Data Sheet for allowed dosage.
Consumption	~ 1.80 kg/m ² /mm, depending on the substrate roughness.
Yield	~ 14.3 L of mortar with 25 kg bag
Layer Thickness	Min. 5 mm, max. 60 mm. Higher thicknesses can be obtained overlapping layers, when the mortar starts setting (tack free).
Ambient Air Temperature	+ 5°C min. / + 35°C max.
Substrate Temperature	+ 5°C min. / + 35°C max.
Pot Life	~ 60 min at + 20°C

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY / PRE-TREATMENT

Concrete:

The substrate must be structurally sound and free from dust, dirt, loose material, surface contamination as oil or grease, cement laitance. The concrete "Pull off" (tensile) strength must be > 1.5 MPa.

The substrate should be prepared by suitable mechanical preparation techniques, such as high water pressure or grit blasting, mechanical or manual breakers. Non impact/vibrating cleaning methods are preferred. Aggregates should be clearly visible on the surface of the prepared area. Finish the repair area with sharp edge (90° degree angle) with minimum depth of 5 mm. The surface must be dampened up to saturation, avoiding standing water.

Steel reinforcement:

Steel surface must be clean from rust products, oil, grease, dust and other loose materials which may reduce bond or may contribute to Corrosion. Surfaces must be prepared using approved abrasive blast cleaning techniques, to a minimum standard of SA 2½. When the reinforcement is contaminated by chlorides or other materials which may cause corrosion, the reinforcement shall be cleaned by low pressure water-blasting.

Priming on concrete:

On a well prepared and roughened substrate a bonding primer is generally not required.

Reinforcement coating:

Sika MonoTop®-441 Unika fulfills the performance requirements for corrosion protection of the steel reinforcement according to EN 1504-7 with a layer thickness around the rebar ≥ 10 mm. In order to reach a suitable durability level of the repair work (especially in case of moderate or high aggressive environmental exposures, chloride ion contamination, or exposure to dry-wet cycles) is always recommended to apply around the whole exposed circumference two coats of Sika MonoTop®-610 New (refer to the relevant Product Data Sheet).

MIXING

Sika MonoTop®-441 Unika must be mixed with a low speed (~ 500 r.p.m.) electric stirrer. For small quantities,

the mortar can also be manually mixed.

Pour the water (or if needed the water + Sika MonoTop® Modulo Unika) in the correct dosage in a suitable container for mixing. Add the powder to the liquid part, continuing to mix with slow and steady speed. Mix carefully for at least 3 minutes, until a homogeneous, lump-free mixture of the appropriate consistency is obtained.

APPLICATION

Sika MonoTop®-441 Unika can be applied either manually using traditional techniques, or mechanically using wet spray equipment.

Apply Sika MonoTop®-441 Unika using a trowel onto the substrate dampened up to saturation, applying a good pressure and compacting well the subgrade. It is recommended not to exceed the maximum thicknesses indicated for each single layer.

The application can be carried on using standard spraying mortar machines (e.g. Turbosol, Putzmeister) to coat large surfaces. A good surface finishing can be achieved using a plastering trowel or timber float, as soon as the mortar has started to set.

CURING TREATMENT

Protect the fresh mortar from premature drying by following the appropriate precautions for seasoning.

Protect the newly applied material from freezing and rain.

Avoid application in direct sunlight or strong wind.

CLEANING OF EQUIPMENT

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

IMPORTANT CONSIDERATIONS

- Do not exceed the recommended maximum dosage of Sika MonoTop® Modulo Unika (refer to the relevant Product Data Sheet);
- Do not add water over the recommended dosage;
- Do not add cement or other substances that could affect the mortar properties;
- Do not add fresh water or mortar to the mixture

- after setting process starting;
- Apply only on a properly prepared solid substrate.

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.

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Product Data Sheet
Sika MonoTop®-441 Unika
February 2020, Version 02.01
020302040030000298

SikaMonoTop-441Unika-en-IT-(02-2020)-2-1.pdf

