BUILDING TRUST

PRODUCT DATA SHEET

Sika MonoTop®-4052

High-performance structural concrete repair mortar and screed with improved sustainability, designed for horizontal surfaces

PRODUCT DESCRIPTION

Sika MonoTop®-4052 is a one-part, cementitious, fibre-reinforced concrete repair mortar and screed. It contains recycled supplementary cementitious materials and can therefore contribute to reducing the carbon footprint of the application.

USES

Sika MonoTop®-4052 may only be used by experienced professionals.

The Product is used to repair all types of reinforced concrete structures and components for:
- Buildings
- Car park decks
- Civil engineering structures
- Dams and bridges
- Marine structures

Sika MonoTop®-4052 is used for:
- Restoration work (Principle 3, method 3.1 and 3.3 of EN 1504-9). Repair of spalling and damaged concrete in infrastructure and superstructure works.
- Structural strengthening (Principle 4, method 4.4 of EN 1504-9). Increasing the bearing capacity of the concrete structure by adding mortar.
- 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.

CHARACTERISTICS / ADVANTAGES

- Uses recycled raw materials.
- Layer thickness 6 to 120 mm.
- Low drying shrinkage and very low sensitivity to cracking (can be applied up to 300 m² without joints).
- Sulphate-resistant.
- Suitable for internal and external applications.
- Contains corrosion inhibitors.
- Compatible with cathodic protection systems.
- Application by hand, or by machine.
- Easy to apply - effortlessly levels when worked, ideal pot life and smooth finishing.
- High abrasion resistance (when used with Sikafloor®-140 W Troweling Primer).
- Dust-reduced for cleaner, healthier environment.
- Good resistance to sea water.
- Low permeability.
- Excellent freeze-thaw resistance.
- EuroClass A1 reaction to fire rating.
- Class R4 of EN 1504-3.
- Class CT-C60-F8-A9 of EN 13813.
- Early troweling after 3 hours at +20 °C.
- Overcoatable with epoxy after only 24 hours (when Sikafloor®-140 W Troweling Primer is used and the Product is maintained at >+10°C).
- Can be trafficked directly when installed with Sikafloor®-140 W Troweling Primer (it is recommended that the surface is sealed with a Product from the Sikafloor® ProSeal Range to prevent staining, which can also act as a curing agent if not overcoating).

ENVIRONMENTAL INFORMATION

- Contributes towards satisfying Materials and Resources (MR) Credit: Building Product Disclosure and Optimization — Material Ingredients under LEED® v4.
- Contributes towards satisfying Materials and Resources (MR) Credit: Building Product Disclosure and Optimization — Sourcing of Raw Materials under LEED® v4.
- Environmental Product Declaration (EPD) in accordance with EN 15804. EPD independently verified by Institut für Bauen und Umwelt e.V. (IBU).
- VOC emission classification GEV Emicode $EC1_{plus}$.

APPROVALS / STANDARDS

- CE marking and declaration of performance based on EN 13813 Screed material and floor screeds — Screed material — Properties and requirements — Cementitious screed material.
- CE marking and declaration of performance based on EN 1504-3 Products and systems for the protection and repair of concrete structures — Structural and non-structural repair.
- CE marking and declaration of performance based on EN 1504-7 Products and systems for the protection and repair of concrete structures — Reinforcement corrosion protection.

PRODUCT INFORMATION

Chemical Base	Selected cement, aggregates and additives
Packaging	25 kg
Shelf Life	9 months from date of production
Storage Conditions	The Product must be stored in original, unopened and undamaged packaging in dry conditions at temperatures between +5 °C and +35 °C. Always refer to the packaging. Refer to the current Safety Data Sheet for information on safe handling and storage.
Appearance / Colour	Light grey powder
Maximum Grain Size	≤1.8 mm
Soluble Chloride Ion Content	≤0.05 % (EN 1015-17)

TECHNICAL INFORMATION

Compressive Strength	Cured 24 hours at +21 °C	~35 MPa	(EN 12190)
	Cured 7 days at +21 °C	~55 MPa	
	Cured 28 days at +21 °C	~60 MPa	
Modulus of Elasticity in Compression	Cured 28 days at +21 °C	≥20 GPa	(EN 13412)
Flexural Strength	Conditioned 24 hours at +20 °C	~6 MPa	(EN 196-1)
	Conditioned 7 days at +20 °C	~7 MPa	
	Conditioned 28 days at +20 °C	~8 MPa	
Tensile adhesion strength	≥2.0 MPa		(EN 1542)
Shrinkage	Cured at +20 °C and 60% relative humidity for 28 days	600 µm/m	(EN 12617-4)
Restrained Shrinkage / Expansion	≥2.0 MPa		(EN 12617-4)
Coefficient of Thermal Expansion	3.2×10^{-5} 1/K		(EN 1770)
Electrical Resistivity	Tested at 60% relative humidity	≤20 kΩ·cm	(ISO 12696)
	Tested at 100% relative humidity	≤40 kΩ·cm	
Thermal Compatibility	Part 1 - Freeze-Thaw	≥2.0 MPa	(EN 13687-1)
Capillary Absorption	≤0.15 $kg \cdot m^{-2} \cdot h^{-0.5}$		(EN 13057)

Permeability to CO2	Sd	30.8 m	(EN 1062-6)
	μ	3.056	
Chloride Ion Diffusion Resistance	$2.4 \times 10^{-12} m^2/s$		(EN 12390-11)
Carbonation Resistance	dk ≤ control concrete MC (0.45)		(EN 13295)
Reaction to Fire	EuroClass A1		(EN 13501-1)

SYSTEM INFORMATION

System Structure

Layer	Product	Consumption
Bonding Primer / Reinforcement Corrosion Protection*	Sika MonoTop®-1010 (normal applications) SikaTop® Armatec®-110 EpoCem® (demanding applications, such as high chloride exposure)	~1.5 to 2.0 kg/m²
Concrete Repair Mortar	Sika MonoTop®-4052	~1.9 kg/m² per mm of thickness
Troweling Primer	Sikafloor®-140 W Troweling Primer	~0.2 to 0.3 kg/m²
Primer for Wearing Layer**	Sikafloor®-151 with optional Sikafloor®-54 Booster broadcast with Sika Quartz Sand 0.3 to 0.8 mm	~0.7 to 0.9 kg/m²
Wearing Layer**	Sikafloor® epoxy and polyurethane coatings (e.g. Sikafloor®-390 N).	Consult latest System Data Sheet for build-up and consumption information.

* For very demanding applications (e.g. HGV trafficking) Sikadur®-32+ can be used as a bonding primer (Sika MonoTop®-4052 applied 'wet-on-wet').
** If required. Sika MonoTop®-4052 can be left exposed and trafficked directly if installed with Sikafloor®-140 W Troweling Primer and cured for a minimum period of 48 hours. To prevent staining, it is recommended the surface is sealed with a Product from the Sikafloor® ProSeal Range (which can also act as a curing agent if not overcoating).
NOTE: The Product must be kept ≥+10°C for a minimum period of 24 hours to enable fast epoxy overcoating.

APPLICATION INFORMATION

Fresh mortar density	~2.2 kg/l	
Consumption	~1.9 kg/m² of powder per mm of thickness (i.e. one 25 kg bag will cover ~2.2 m² when applied at 6 mm). **NOTE:** Consumption data is theoretical and does not allow for any additional material due to surface porosity, surface profile, variations in level, wastage, or any other variations. Apply the Product to a test area to calculate the exact consumption for the specific substrate conditions and proposed application equipment.	
Yield	~13 Litres of mortar per 25 kg bag	
Layer Thickness	Maximum	120 mm
	Minimum	6 mm
Product Temperature	Maximum	+30 °C
	Minimum	+5 °C

Ambient Air Temperature	Maximum	+30 °C
	Minimum	+5 °C
Mixing Ratio	Per 25 kg bag	3.4 to 3.6 Litres
Substrate Temperature	Maximum	+30 °C
	Minimum	+5 °C
Pot Life	At +20 °C	~30 minutes

Pot life depends on temperature.
NOTE: Pot life will be shorter at higher temperatures. Pot life will be longer at lower temperatures.

Waiting Time / Overcoating

Layer	Product	Waiting Times (at +20 °C)
Bonding Primer / Reinforcement Corrosion Protection*	Sika MonoTop®-1010 (normal applications) SikaTop® Armatec®-110 EpoCem® (demanding applications, such as high chloride exposure)	Pre-wet substrate for at least 2 hours to achieve saturated surface dry (SSD) condition before applying Bonding Primer.
Concrete Repair Mortar	Sika MonoTop®-4052	Apply 'wet-on-wet' onto Bonding Primer.
Troweling Primer	Sikafloor®-140 W Troweling Primer	When walkable (~2 to 4 hours), apply troweling primer and start troweling within 10 minutes.
Wearing Course Primer**	Sikafloor®-151 (with or without Sikafloor®-54 Booster)	24 hours to 5 days*** after troweling (remove polythene curing sheets 30 to 60 minutes before application).
Wearing Course / Coating**	Sikafloor® epoxy and polyurethane coatings (e.g. Sikafloor®-390 N)	After hardening of the Epoxy Primer.

* For very demanding applications (e.g. HGV trafficking) Sikadur®-32+ can be used as a bonding primer (Sika MonoTop®-4052 applied 'wet-on-wet').
** If required. Sika MonoTop®-4052 can be left exposed and trafficked directly if installed with Sikafloor®-140 W Troweling Primer and cured for a minimum period of 48 hours. To prevent staining, it is recommended the surface is sealed with a Product from the Sikafloor® ProSeal Range (which can also act as a curing agent if not overcoating).
*** If the Epoxy Primer is not applied within 5 days, the surface of Sika MonoTop®-4052 must be prepared mechanically using suitable means to remove cement laitance, coatings or other surface treatments, and achieve an open textured, gripping surface.
NOTE: The above information is based on a temperature of +20 °C. The Product must be kept ≥+10 °C for a minimum period of 24 hours to enable fast epoxy overcoating.
NOTE: The above is a guide. Always refer to individual Product Data Sheets.

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.

FURTHER DOCUMENTS

- Concrete repair site handbook.
- Method Statement MS 850-32-01 Repairing Concrete Using Sika Ready To Use Mortars.

LIMITATIONS

- Strictly follow installation procedures as defined in Method Statements, application manuals and working instructions, which must always be adjusted to the actual site conditions.
- Protect freshly applied material from freezing and frost.
- Do not apply the Product in direct sun and / or strong winds.
- Ensure full surface saturation prior to application.
- Do not over work mortar, or add additional water during surface finishing.
- Do not use heavy ride-on trowelling machines.
- If trafficked directly, to ensure sufficient abrasion resistance, installion should be with Sikafloor®-140 W Troweling Primer.
- If left exposed and trafficked directly, to prevent surface staining, the surface should be sealed with a Product from the Sikafloor® ProSeal Range (which can also act as a curing agent if not overcoating).

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

EQUIPMENT

Select the most appropriate equipment required for the project:
SUBSTRATE PREPARATION EQUIPMENT
- Mechanical handheld tools for small / spot repairs.
- Abrasive blast cleaning, planing or scarifying equipment.
- High or ultra-high pressure water blasting equipment.

STEEL REINFORCEMENT PREPARATION EQUIPMENT
- Abrasive blast cleaning equipment.
- High pressure water blasting equipment.

MIXING EQUIPMENT
- Clean mixing containers.
- Small quantities: low-speed electric single or double-paddle mixer (< 500 rpm).
- Large quantities: forced action mixer to suit application (e.g. continuous mortar mixer and integral delivery pump with associated hoses, such as inoCOMB Cabrio 0.2 or M-Tec Duo Mix 2000).

APPLICATION EQUIPMENT
- If necessary, mixed material carriers and carts (e.g. wheelbarrows).
- Spreading equipment.
- Height levelling equipment.
- Dapple bar for larger areas.
- Hand applied: Plasterer's hawk, trowel.
- Mechanically applied: All-in-one mixing and pumping machine, or separate pumping equipment and all associated ancilliary equipment to suit application volumes.

FINISHING EQUIPMENT
- Trowel (PVC or wooden).
- Sponge.
- Light power float machine(s).
- Finishing brooms.
- Grinding equipment.

CURING EQUIPMENT
- Polythene sheeting.
- Tape to secure polythene sheeting.

Also refer to Site Handbook 'Repair of Concrete Structures – Patch Repair and Spray Applications' and Method Statement MS 850-32-01 'Repairing Concrete Using Sika Ready To Use Mortars'.

SUBSTRATE QUALITY

CONCRETE
Cementitious substrates must be structurally sound and of sufficient compressive strength (minimum 25 N/mm^2) with a minimum tensile strength of 1.5 N/mm^2.

SUBSTRATE PREPARATION

TREATMENT OF CRACKS AND JOINTS
IMPORTANT
Reduced service life due to incorrect treatment of cracks
The incorrect assessment and treatment of cracks may lead to a reduced service life and reflective cracking.
1. For static cracks, ensure the width is suitable for overcoating with Sika MonoTop®-4052.
2. Use Sikadur® or Sikafloor® resins to fill all construction joints and existing static surface cracks in the substrate before full layer application.
3. For dynamic cracks, ensure the movement is within the movement capacity of Sika MonoTop®-4052.
4. Continue existing movement joints into the new floor screed, sealing with an appropriate Product from the Sikaflex® Range.

CONCRETE
1. Clean the substrate thoroughly so it is free from dust, loose material, surface contamination and material which reduces adhesion, prevents suction or wetting by the repair materials.
2. Remove delaminated, weak, damaged and deteriorated concrete and, where necessary, sound concrete. Remove using mechanical handheld tools, high or ultra-high-pressure water blasting equipment or scarifying equipment with subsequent abrasive blasting.
3. Remove sufficient concrete from around corroded reinforcement to allow cleaning, application of a corrosion protection coating (where required) and compaction of the concrete repair mortar.
4. Prepare repair surface areas in simple square or rectangular layouts to avoid shrinkage stress concentrations and cracking while the repair material cures. This can also avoid structural stress concentrations from thermal movement and loading during the service life.

Prepare concrete and cementitious substrates to a minimum substrate roughness of 2.0 mm according to EN 1766.
STEEL REINFORCEMENT

1. Remove rust, scale, mortar, concrete, dust and other loose and deleterious material which reduces bond or contributes to corrosion.
2. Prepare surfaces to bright steel, minimum Sa 2.5 (as per ISO 8501-1), using abrasive blast cleaning or high-pressure water blasting equipment.

SUBSTRATE QUALITY / PRE-TREATMENT

1. Only apply the Product to stable, prepared substrates.
2. Thoroughly pre-wet the prepared substrate for a minimum of 2 hours before application.
3. Keep the surface wet and do not allow to dry.
4. The final pre-wetted surface must achieve a dark matt appearance (i.e. saturated surface dry).
5. Remove excess water from within the surface pores and cavities with a clean sponge prior to application of bonding primer or scratch coat.

MIXING

1. Pour the minimum amount of water into a suitable clean mixing container or equipment.
2. Gradually add the powder to the water while stirring slowly.
3. Mix thoroughly for at least for 3 minutes, add additional water if necessary. **Note:** Do not add more water than the maximum specified amount.
4. Adjust to the required consistency to achieve a smooth consistent mix.
5. Check the consistency after every mix.

APPLICATION

IMPORTANT
Strictly follow installation procedures
Strictly follow installation procedures as defined in Method Statements, application manuals and working instructions, which must always be adjusted to the actual site conditions.
IMPORTANT
Risk of cracking due to exposure to frost
1. Protect freshly applied material from freezing and frost.

IMPORTANT
Risk of cracking due to application in direct sun or strong winds
1. Do not apply the Product in direct sun, strong winds or both.

IMPORTANT
Poor Product performance due to insufficient substrate pre-wetting
Insufficient substrate saturation prior to application will cause the mortar to not gain its full mechanical properties.
1. Only apply the Product to stable, prepared substrates.
2. Thoroughly pre-wet the prepared substrate for a minimum of 2 hours before application.
3. Keep the surface wet and do not allow to dry.
4. The final pre-wetted surface must achieve a dark matt appearance (i.e. saturated surface dry).

BONDING PRIMER
1. Apply Sika MonoTop®-1010 (or SikaTop® Armatec®-110 EpoCem® for demanding applications) to the prepared substrate as a bonding primer.
2. Apply the subsequent layer of repair mortar 'wet-on-wet'.

REPAIR MORTAR APPLICATION FOR PATCH REPAIRS
1. For small / spot repairs, remove excess water from within the surface pores and cavities with a clean sponge.
2. Make a scratch coat using the repair mortar at the higher water level (i.e. 3.6 litres of water per 25kg bag).
3. Apply the scratch coat over the complete substrate surface to form a thin layer to fill surface pores or cavities.
4. Apply the repair mortar onto the scratch coat ‘wet-on-wet’ between the minimum and maximum layer thicknesses without the formation of voids. Do not work to a 'feather edge'. If required, to maintain the minimum layer thickness, a chase should be cut into the substrate.

LARGER SCALE APPLICATIONS
1. Mechanical mixing and pumping is often preferable for larger scale applications to prevent cold joints from forming.
2. Apply Sika MonoTop®-1010 (or SikaTop® Armatec®-110 EpoCem® for demanding applications) to the prepared substrate as a bonding primer.
3. Apply Sika MonoTop®-4052 'wet-on-wet'. Refer to the individual Product Data Sheets.
4. When sufficient Product has been applied to a particular area to meet the desired layer thickness (between the minimum and maximum layer thicknesses), use a dapple bar (also called a tamping bar) to level and help remove any entrapped air. Use in one direction and then complete a second pass perpendicular to the first.
5. Do not 'feather edge'. If required, to maintain the minimum layer thickness, a chase should be cut into the substrate.

SURFACE FINISHING
IMPORTANT
Risk of discolouration and cracking due to adding water during surface finishing
Do not add water during the surface finishing to prevent discolouration and cracking.
IMPORTANT
Surface cracking due to rapid moisture loss
In draughty areas, open spaces, in temperatures greater than +20 °C, or in very dry climates, early plastic shrinkage cracks may occur.
1. Confirm substrate moisture content, Product, substrate and air temperatures prior to application.
2. Allow mortar to surface harden.
3. Surface finish to the required surface texture using a stainless steel, steel, PVC or wooden float.

COLD WEATHER WORKING
Store bags in a warm environment and use warm water to assist with achieving strength gain and maintaining physical properties. Protect freshly applied Product from freezing and frost.
HOT WEATHER WORKING
Store bags in a cool environment and use cold water to assist with controlling the exothermic reaction to reduce cracking and maintaining physical properties. In draughty areas, open spaces, at higher or lower temperatures, or in very dry environments, early plastic shrinkage cracks may occur. Do not apply the

Product in direct sun and / or strong winds.
Always confirm Product, substrate and ambient air temperatures are suitable prior to application.
SURFACE FINISHING USING POWER FLOAT EQUIPMENT

1. IMPORTANT: Do not use heavy ride-on trowelling machines and do not spray water onto the surface while finishing. Finish the Product with suitable equipment such as trowels or walk-behind power floats with discs.
2. Start finishing or smoothing (2 to 4 hours after mixing at +20 °C), when the surface is trafficable by foot leaving small imprints (depth 1 to 2 mm).
3. Always use Sikafloor®-140 W Troweling Primer as a troweling aid when machine trowelling. Spray 0.2 to 0.3 kg/m² when walkable (maximum 15 minutes before the start of troweling) onto the surface, and trowel once or twice with the disc to a slightly rough surface for early coating without substrate preparation. **Note:** Troweling with blades to a monolithic, smooth, dense surface requires experienced applicators and a rapid switch from disc to blades (two machines are usually necessary).

CURING TREATMENT

CURING BEFORE RESIN COATING APPLICATION

1. Immediately start curing after the last finishing operation with polythene sheets taped down at the edges for at least 48 hours (24 hours when using Sikafloor®-140 W Troweling Primer and maintaining Product ≥+10°C) to ensure full cement hydration and to minimise cracking.
2. Do not contaminate the surface!
3. Mechanically prepare the surface using a suitable method for the subsequent layer.

CURING WHEN OVERCOATING WITHOUT ADDITIONAL SURFACE PREPARATION, BETWEEN 24 HOURS AND 5 DAYS

1. Immediately start curing after the last finishing operation.
2. Cure the Product with polythene sheets taped down at the edges.
3. Apply the epoxy primer at the appropriate rate to the surface of the Product within 24 hours and 5 days of completing the surface finishing process. **Note:** Sikafloor®-140 W Troweling Primer must be used and the Product must be kept ≥+10°C for a minimum period of 24 hours to enable fast epoxy overcoating.
4. Remove polythene sheets 1 hour prior to applying the epoxy resin primer to allow drying of the surface to a light grey colour.
5. Broadcast the surface of the resin with 0.3 to 0.8 mm or 0.6 to 1.2 mm Sika Quartz Sand.

CURING WHEN NOT OVERCOATING (DIRECTLY TRAFFICKED), OR OVERCOATING WITH NON-RESIN COATINGS

1. Always use Sikafloor®-140 W Troweling Primer.
2. Immediately start curing after the last finishing operation.
3. Cure the Product with polythene sheets taped down at the edges for at least 48 hours, or (if not overcoating) use a Product from the Sikafloor® ProSeal Range.
4. If using polythene sheets and trafficking directly, to avoid staining, it is recommended to seal the surface with a Product from the Sikafloor® ProSeal Range.

NOTE: Curing compounds can adversely affect subsequently applied Products and systems - use polythene sheets only, unless the product is being exposed to traffic and not overcoated, in which case a Product from the Sikafloor® ProSeal Range can be used (which will also seal the surface to resist staining).
Reference shall also be made to EN 1504-10 for specific requirements.

IMPORTANT
Loss of coating adhesion due to contaminated surfaces
If applicable, after curing, protect against contamination using polythene sheeting before the application of any subsequent surface treatment.

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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