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

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 pf 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.

Please note:
- The Product may only be used by experienced professionals.

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.
- Compatible with cathodic protection systems.
- Application by hand, or by machine.
- Easy to apply - pourable consistency, ideal pot life and smooth finishing.
- High abrasion resistance.
- Dust-reduced for a 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).

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 EC1plus.

APPROVALS / STANDARDS

- CE marking and declaration of performance based on EN 1504-3:2005 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 1504-7:2006 Products and systems for the protection and repair of concrete structures — Rein-

forcement corrosion protection.
- CE marking and declaration of performance based on EN 13813:2002 Screed material and floor screeds — Screed material — Properties and requirements — Cementitious screed material.

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	
		Class R4	
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 at 28 days	600 µm/m	(EN 12617-4)
Restrained Shrinkage / Expansion	≥2.0 MPa		(EN 12617-4)
Coefficient of Thermal Expansion	alpha = 3.2 x 10^{-5} 1/k		(EN 1770)
Electrical Resistivity	≤20 kΩ·cm at 100% relative humidity ≤40 kΩ·cm at 60% relative humidity		(ISO 12696)
Thermal Compatibility	Part 1 - Freeze-Thaw	≥2.0 MPa	(EN 13687-1)
Capillary Absorption	≤0.15 kg·m^{-2}·$h^{-0.5}$		(EN 13057)
Permeability to CO2	Sd = 30.8 m; u = 3.056		(EN 1062-6)
Chloride Ion Diffusion Resistance	2.4 x 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
Bonding Primer / Reinforcement Corrosion Protection	Sika MonoTop®-1010 (normal applications) or SikaTop® Armatec®-110 EpoCem® (demanding applications, such as high chloride exposure). Apply ~1.5 to 2.0 kg/m².
Concrete Repair Mortar	Sika MonoTop®-4052. Consumption is ~1.9kg/m²/mm.
Primer	Sikafloor®-151 with optional Sikafloor®-54 Booster (applied ~0.7 to 0.9 kg/m²), fully broadcast with Sika® Quartz Sand 0.3 - 0.8 mm or 0.6 - 1.2 mm to excess. Sikafloor®-140 W Troweling Primer applied at ~0.2 to 0.3 kg/m² (enables fast epoxy overcoating after 24 hours*).
Wearing Layer	Sikafloor® epoxy and polyurethane coatings (e.g. Sikafloor®-390 N). Consult latest System Data Sheet for build-up and consumption information.

* = The Product must be kept ≥+10°C for 24 hours to enable fast epoxy overcoating.

APPLICATION INFORMATION

Mixing Ratio

Fluid consistency	3.4 Litres to 3.6 Litres

Fresh mortar density

~2.2 kg/l

Consumption

~1.9 kg of powder / m² 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

Substrate Temperature

Maximum	+30°C
Minimum	+5°C

Pot Life

~30 minutes at +20°C.
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 use) SikaTop® Armatec®-110 EpoCem® (demanding use)	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.
Epoxy 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).
Coating	Sikafloor® epoxy and polyurethane coatings (e.g. Sikafloor®-390 N).	After hardening of the Epoxy Primer.

* = If the Epoxy Primer is not applied within 5 days, the surface of Sika MonoTop®-4052 must be prepared mechanically using suitable mechanical means to remove cement laitance, coatings or other surface treatments, and achieve an open textured, gripping surface.
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 troweling machines.

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.
- Finishing brooms.
- Grinding equipment.

CURING
- 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 PREPARATION

TREATMENT OF CRACKS AND JOINTS
The incorrect assessment and treatment of cracks may lead to reduced service life and reflective cracking.
1. Use appropriate Sikadur® or Sikafloor® Products to fill all construction joints and existing static surface cracks in the substrate prior to application.
2. Continue any existing movement joints into Sika MonoTop®-4052.

CONCRETE
Cementitious substrates must be structurally sound and of sufficient compressive strength (≥25 MPa), with a minimum tensile adhesion / bond strength of 1.5 MPa.
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 / milling 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 in accordance with 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, Sa 2 (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 vessel.
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

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.

REPAIR MORTAR APPLICATION FOR PATCH REPAIR
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

Rapid moisture loss must be controlled to avoid surface cracking.

To avoid discolouration and cracking, do not add water during surface finishing, and do not overwork the Product.

1. Allow mortar surface to harden sufficiently.
2. Finish surface to the required texture using a stainless steel, steel, PVC or wooden float, or finishing broom.

SURFACE FINISHING USING LIGHT POWER FLOATING EQUIPMENT

Do not spray water onto the surface whilst finishing.
Finish the Product with suitable equipment, such as trowels or walk-behind power floats with discs.
Start finishing or smoothing between 2 and 4 hours after mixing at 20°C, when walkable with minor imprints (i.e. 1 to 2mm).
Always use Sikafloor®-140 W Troweling Primer as a troweling aid when machine troweling. 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

WHEN OVERCOATING WITH RESIN COATINGS
Immediately start curing with a polythene sheets taped down at the edges once finishing has been completed, for at least 2 days (1 day when using Sikafloor®-140 W Troweling Primer and maintaining Product ≥+10°C) to ensure full cement hydration and to minimise cracking. Do not contaminate the surface!
OVERCOATING WITHOUT ADDITIONAL SURFACE PREPARATION, BETWEEN 24 HOURS AND 5 DAYS
Remove polythene sheet 1 hour prior to applying Sikafloor®-151 to allow drying of the surface to a light grey colour.
Apply the resin using a roller at a rate of 0.5 to 0.7 kg/m². Fully broadcast the resin to excess with 0.3 - 0.8 mm or 0.6 - 1.2 mm Sika® Quartz Sand.
WHEN NOT OVERCOATING, OR OVERCOATING WITH NON-RESIN COATINGS
Immediately start curing with a polythene sheets taped down at the edges once finishing has been completed, for at least 2 days to ensure full cement hydration and to minimise cracking. Curing compounds shall not be used as they can adversely affect subsequently applied products and systems - use polythene sheets only. Reference shall also be made to EN 1504-10 for specific requirements.

CLEANING OF TOOLS

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

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.

SIKA LIMITED
Watchmead
Welwyn Garden City
Hertfordshire, AL7 1BQ
Tel: 01707 394444
Web: www.sika.co.uk
Twitter: @SikaLimited