BUILDING TRUST

PRODUCT DATA SHEET

Sikacrete®-301 Premium

High Performance Class R4 Dry Sprayed Micro-Concrete for Large Volume Repairs

PRODUCT DESCRIPTION

Sikacrete®-301 Premium (formerly SikaCem®-133 S Gunite) is a cement based, polymer modified, one-component repair micro-concrete containing silica fume and high range water-reducing agents, meeting the requirements of EN 1504-3 Class R4. Formulated for machine applications using the dry process without set accelerators, repairs may be profiled and trowel finished easily where necessary.

USES

- Large volume repairs.
- Highways works.
- Bridges (columns, piers, sofits, beams, parapets, abutments, etc.).
- Marine structures (quays, piers, jetties, sea walls, docks, dry docks, marinas, offshore platforms, coffer-dams, caissons, etc.).
- Water facilities (reservoirs, dams, tanks, buildings, treatment works, etc.).
- Tunnels.
- Façades.
- For exterior and interior use.
- In place of Class R1, R2 and R3 mortars.
- Low resistivity - can be used with cathodic protection systems.

CHARACTERISTICS / ADVANTAGES

- One component, ready to use.
- Non-silica aggregates, so no risk of alkali silica reactivity (ASR).
- Easy and quick to set up.
- Low rebound losses and dust formation during the spraying process.
- High build - layer thicknesses in one application overhead up to 150mm are possible without any additional mesh reinforcement.
- Rapid strength gain without set accelerators.
- Very low shrinkage.
- Can be finished easily to a high standard.
- Overcoatable with Sika® reprofiling / levelling / smoothing mortars and coatings.
- EN 1504-3 Class R4.
- Low resistivity - can be used with cathodic protection systems.
- Suitable for use in contact with potable water.

APPROVALS / STANDARDS

- Resistivity: Mott MacDonald Report No. 37423/DA/001.Rev A.
- 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.

PRODUCT INFORMATION

Chemical Base	Portland cement, polymers, selected aggregates, silica fume and additives.
Packaging	25 kg bag
Shelf Life	6 months
Storage Conditions	Store properly in original unopened, sealed and undamaged packaging in dry and cool conditions.
Maximum Grain Size	D_{max}: 3.0 mm

Density	~2230 kg/m³ after 28 days		(BS EN 12390-7)
Soluble Chloride Ion Content	≤0.007%		
Compressive Strength	1 Day	~15 MPa	(BS EN 12504-1)
	7 Days	~35 MPa	
	14 Days	~50 MPa	
	28 Days	~60 MPa	
Modulus of Elasticity in Compression	~23 GPa		(EN 13412)
Flexural Strength	28 Days	~10 MPa	(EN 12190)
Tensile Strength	~2.5 MPa		(EN 1542)
Shear Strength	μ = 60,000		
Coefficient of Thermal Expansion	8 x 10^{-6} m/m °C		
Electrical Resistivity	~14.4 kΩcm		(Socotec In-House Method DIHM 406)
Capillary Absorption	0.14 kg.m^{-2}.$h^{-0.5}$		(EN 13057)
Diffusion Resistance to Water Vapour	μ = 1,000		
Chloride Ion Diffusion Resistance	600 – 700 x 10^{-15} m^2/s		
Freeze Thaw De-Icing Salt Resistance	106% - good resistance with no visible change after 400 cycles. NOTE: Determined in accordance with SN 640461 - Resistivity factor WFT-L.		

System Structure

Layer	Product	Function
Bonding Primer / Reinforcement Corrosion Protection	Sika® MonoTop®-1010	Normal use
	SikaTop® Armatec®-110 EpoCem®	Demanding requirements
Concrete Repair Mortar	Sikacrete®-301 Premium	High performance requirements
Levellling / Smoothing Mortar	Sika® MonoTop®-3020	Normal use
	Sikagard®-720 EpoCem®	Demanding requirements

Fresh mortar density	~2.2 kg/l
Consumption	This depends on the substrate roughness and thickness of layer applied. As a guide, ~2.2 kg/m²/mm.
Layer Thickness	10 mm minimum / 150 mm maximum
Ambient Air Temperature	+3°C minimum / +30°C maximum
Substrate Temperature	+3°C minimum / +30°C maximum

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.

LIMITATIONS

- Refer to recommendations provided in EN 1504-10.
- Avoid application in direct sun and / or strong wind and / or rain.
- Do not add water over recommended dosage.
- Apply only to sound, prepared substrates.
- Do not add additional water during the surface finishing as this will cause discoloration and / or cracking.
- Protect freshly applied material from freezing.
- Do not overwork final finish as this can cause surface cracking.
- Rebound, slump and overhead layer thickness will be

affected by the water:cement ratio, type of spraying equipment, presence of reinforcement, and air pressure used to convey material to the nozzle. A balance should be achieved to optimise material usage by adjusting water and air pressure and number of passes to achieve thickness build up relevant to the repair size.

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

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. Delaminated, weak, damaged and deteriorated concrete, and where necessary sound concrete, shall be removed by suitable mechanical, or very high pressure water blasting, techniques. Tying wire fragments, nails and other metal debris embedded in the concrete should be removed where possible. The edges where concrete is removed should be cut at a minimum angle of 90° to avoid undercutting and a maximum angle of 135° to reduce the possibility of debonding with the top surface of the adjacent sound concrete and should be roughened sufficiently to provide a mechanical key between the original material and Sikacrete®-301 Premium.
Ensure sufficient concrete is removed from around the full circumference of the reinforcement to allow application of the reinforcement corrosion protection coating (if required) and application of the repair material.
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 or high pressure water blasting techniques to a minimum standard of Sa 2 (in accodance with ISO 8501-1). If these types of techniques are not permissble, contact Sika® Technical Services for alternative options using hand preparation techniques and Galvanic Anodes. Where exposed reinforcement is contaminated with chloride or other material which may cause corrosion, the reinforcement shall be cleaned by low pressure water blasting. Reference shall be made to EN 1504-10 for specific requirements.

MIXING

Sikacrete®-301 Premium is fed into the dry process spraying machine which should be of suitable size for the repair areas to reduce wastage and rebound. The amount of water added is controlled by the nozzleman at the nozzle and should be sufficient to prevent slump and dust. Rebound will be increased with unsuitably sized spraying machines, compressors, nozzle types, dry mixtures and thin layers.

APPLICATION

Reinforcement Corrosion Protection:
Where a reinforcement coating is required, the application of the repair mortar shall be applied when the the reinforcement coating has cured (at least 'finger nail hard'). 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. The sprayed repair mortar shall be placed onto the pre-wetted substrate between the minimum and maximum layer thicknesses without the formation of voids and loose rebound material. Where layers are to be built up, to prevent sagging or slumping, each layer should be allowed to stiffen before applying subsequent layers 'wet-on-wet'. When layers cannot be applied 'wet-on-wet', pre-wet the surface and allow to surface dry to a dark matt appearance.
Sikacrete®-301 Premium is finished by leaving ‘as shot’, or striking off with a straight edge and closing the surface with a wooden / plastic / steel float or damp sponge to achieve the desired surface texture. Reference shall be made to EN 1504-10 for specific requirements, the Code of Practice for sprayed concrete issued by the Concrete Society, and any other guidelines that are specific to the structure.

CURING TREATMENT

It is essential to cure the repair mortar immediately after application for a minimum of 3 days to ensure full cement hydration and to minimise cracking. Use polythene sheeting taped down at the edges, or another approved method. Curing compounds shall not be used when they adversely impact subsequently applied products and systems. 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 / cured 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.

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