BUILDING TRUST

PRODUCT DATA SHEET

SikaRep®-400 Extra

Fibre reinforced, one component, cementitious mortar for concrete structural repairs, Class R4

CE

DESCRIPTION

SikaRep®-400 Extra is a ready to use, fibre reinforced, cement mortar for regular concrete repair works of high thickness, meeting the requirements of class R4 of EN 1504-3.

USES

- Concrete repair and reprofiling / resurfacing of damaged areas on vertical or horizontal surfaces
- Honey comb fillings, pore, small defects, edges and joint side filling, forming and finishing of joints and coverings
- Suitable for restoration works (Principle 3, method 3.1 of EN 1504-9). Repair of spalling and damaged concrete in buildings, infrastructure and superstructure projects
- Concrete repair and reprofilling (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 & 7.2 of 1504-9). Increasing cover with additional mortar or concrete or replacing contaminated or carbonated concrete.

FEATURES

- Class R4 according to EN 1504-3
- For application thickness of between 5 mm and 50 mm by hand application (per layer)
- Excellent workability, high thixotropy
- Easy to handle and work with
- Good adhesion to most common building materials (concrete, steel)
- Good dimension stability
- Suitable for repair works of medium to high concrete strength class, due to similar elastic modulus
- High compression, flexural and tensile strengths
- Very good final aspect

CERTIFICATES AND TEST REPORTS

Repair mortar CC for structural repair of concrete structures in buildings and civil engineering works, Class R4 according to EN1504-3:2005. Principles 3, 4 & 7, Methods 3.1, 4.4, 7.1 & 7.2 according to EN1504-9:2008. Declaration of Performance 10259644, and provided with the CE-mark.

PRODUCT INFORMATION

Composition	Portland cement, selected aggregates, silica fume and additives
Packaging	25 kg bags
Appearance and colour	Grey powder with fibers
Shelf life	12 months from date of production
Storage conditions	Store properly in original unopened, sealed and undamaged packaging in dry conditions, at temperatures between +5°C and +30°C. Protect from moisture
Density	Fresh mortar density: ~2.15 kg/lt

Maximum grain size	~1.8 mm	
Soluble chloride ion content	≤ 0.05 %	(EN 1015-17)

TECHNICAL INFORMATION

Compressive strength	**1 day**	**7 days**	**28 days**	**Requirements Class R4 @ 28 d**	(EN 12190)
	≥25 MPa	≥40 MPa	≥50 MPa	≥45 MPa	

Modulus of elasticity in compression	**Results**	**Requirements Class R4**	(EN 13412)
	25 GPa	≥20 GPa	

Flexural-strength	**1 day**	**7 days**	**28 days**	(EN 196-1)
	≥4.0 MPa	≥5.5 MPa	≥8.0 MPa	

Restrained shrinkage / expansion	≥2.0 MPa	(EN 12617-4)

Tensile adhesion strength	**Results**	**Requirements Class R4**	(EN 1542)
	≥2.5 MPa	≥2.0 MPa	

Thermal compatibility	≥2.0 MPa	(EN 13687-1)
Reaction to fire	Euroclass A1	
Capillary absorption	≤0.5 kg/m² x √h	(EN 13057)
Carbonation resistance	d_k ≤ control concrete (MC (0.45))	(EN 13295)

APPLICATION INFORMATION

Mixing ratio	4.0 – 4.5 lt of water per 25 kg bag, depending on the desired workability	
Consumption	~1.8 kg/ m² per mm of thickness depending on the substrate's roughness	
Layer thickness	Min.	5 mm
	Max.	50 mm
Ambient air temperature	Min. 5 °C / Max. +35 °C	
Substrate temperature	Min. +5 °C / Max. +35 °C	
Pot Life	~45 minutes (at +20 °C)	

SYSTEM INFORMATION

System structure	SikaRep®-400 Extra is part of the range of Sika® mortars complying with the relevant part of European Standard EN 1504 and comprising of:	
	Bonding primer and reinforcement corrosion protection:	
	Sika® MonoTop®-1010 ES or Sika MonoTop®-1010:	Normal use (EN 1504-7)
	SikaTop® Armatec®-110 EpoCem®:	Demanding requirements (EN 1504-7)
	Repair mortar:	
	SikaRep®-400 Extra:	Class R4, structural, trowel & hand applied repair mortar
	Fairing coat / Levelling mortar:	
	Sika MonoTop®-723 Finiro:	Normal use (EN 1504-2)
	Sikagard®-720 EpoCem®:	Demanding requirements (EN 1504-2 & EN 1504-3)

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.

IMPORTANT CONSIDERATIONS

- Refer to the Sika Method of Statement for "Repairing Concrete Using Sika® Ready to use Mortars" (Ref. 8503201) for more information regarding repair system application, substrate preparation and/or refer to the recommendations provided in EN 1504-10
- Do not add water over the recommended dosage
- Do not add cement or other substances that could affect the properties of the mortar
- Do not add water or fresh mortar to a mortar mix which has already started setting
- Avoid application in direct sun and/or strong wind
- Apply only to sound, prepared substrate
- Protect freshly applied material from freezing and from rain
- Do not add additional water during the surface finishing as this will cause discolouration and cracking
- For overhead applications, do not exceed layer thickness of 25 mm per layer for hand application
- Record ambient and substrate temperatures before and during application

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.

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY / PRE-TREATMENT

Concrete:
The substrate must be structurally sound, thoroughly clean and free from dust, dirt, and loose material, surface contamination such as oil or grease, cement laitance which reduce bond or prevent suction or wetting. The concrete tensile strength (pull off) shall be > 1.5 MPa.
Delaminated, weak, damaged and deteriorated concrete and where necessary sound concrete shall be removed by suitable means.
The substrate should be prepared by suitable mechanical preparation techniques, such as high water pressure or grind blasting, mechanical or manual breakers. Non impact / vibrating cleaning methods are preferred. Aggregates should be clearly visible on the surface of the prepared area. The edges of the repair area must be cut vertically (90^{o} degree angle) to a minimum depth of 5 mm.
Steel Reinforcement:
Steel surface must be clean from rust products, mill scale, mortar, concrete residues, oil, grease, dust and other loose materials which may reduce bond or may contribute to corrosion.
In case of rust, clean uniformly the whole circumference of the steel bars (where applicable) using abrasive blast cleaning techniques or high pressure water-blasting to a minimum Sa 2 ½ in accordance with ISO 8501-1
If required, apply around the whole exposed circumference two coats of corrosion inhibitor, such as Sika® MonoTop®-1010 or SikaTop® Armatec®-110 EpoCem® (please refer to the Product Data Sheet).
Protect cleaned bars from further contamination, prior to application of the mortar
Reference should also be made to EN1504-10 for specific requirements.

MIXING

SikaRep®-400 Extra can be mixed with a low speed (~500 r.p.m.) electrical hand drill mixer or using a force action pan mixer for large volumes. Pour the water in the correct desired proportion into 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 up to the maximum specified amount, until a homogeneous lump-free required consistency is reached. Mix full bags for best results.
25 kg of SikaRep®-400 Extra powder is mixed with 4.0 – 4.5 lt of water, depending on the required consistency.

APPLICATION

Application of SikaRep®-400 Extra can be carried out by trowel or by hand (for concrete repairs, decorations, balconies, pillar edges, etc.) on the well prepared substrate. Thoroughly pre-wet the prepared substrate, recommended 2 hours before applying SikaRep®-400 Extra.
Keep the surface wet and do not allow drying. 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.
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.Then, apply the product excerting good pressure and compacting well the product on the area.
When a bonding primer is required (especially when reinforcement rebars need treatment against corrosion), ensure it is still tacky when the repair material is pressed on (wet on wet technique). Refer to the System Information for compatible Sika products and to the relevant Product Data Sheet for more detailed information (e.g. Sika MonoTop® -1010 or SikaTop®, Armatec®-110 EpoCem®).
The application thickness of layers must be between 0.5 and 5.0 cm. Higher thicknesses must be built in subsequent layers when the mortar starts to set (tack free). Do not smooth the first layer before applying a second layer.
The surface can be finished according to the requirements using a float or a plastering trowel (sponge trowel) while wet or with a relevant rough-cast tool as soon as the mortar has started to stiffen. Do not over

work the finished surface. In strong sunlight or wind, the mortar must be protected by appropriate measures not to dry out too quickly.

CURING TREATMENT

Protect the freshly applied mortar from early dehydration and/or premature drying by using the relevant curing methods (at least for 24 hours), e.g. curing compound such as Sika® Antisol® or Sikafloor® Proseal once surface water has evaporated.

CLEANING OF EQUIPMENT

Removal of fresh remnants from tools and application equipment can be carried out using 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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