

PRODUCT DATA SHEET

SikaShield®-501 Primer Pro

EPOXY RESIN BASED PRIMER IN ACCORDANCE TO ZTV-ING FOR CONCRETE DECKS ON BRIDGES AND ENGINEERING STRUCTURES.

DESCRIPTION

2-component, epoxy resin based, reactive polymer primer for the methods defined in ZTV-ING 6-1.

USES

SikaShield®-501 Primer Pro is used for the priming of concrete decks in engineering structures such as bridges and multi-storey parking structures and as a component of the waterproofing system. It is also used as a sealing coat or by adding fine graded aggregates - as a surface filling- and levelling mortar.

FEATURES

- Tested product, externally monitored production
- Can be used on green - only 7 days old - concrete
- Excellent adhesion
- Hardens at low temperatures down to 8°C
- Heat resistant for installation of heat-welded bitumen sheets

PRODUCT INFORMATION

Composition	Solvent-free epoxy resin
Packaging	30 kg units
Colour	Red brown
Shelf life	12 months from date of production
Storage conditions	In undamaged, unopened, original sealed packaging in cool and dry conditions, not lower than + 8°C. The material must not be used if the resin component crystallizes i.e. due to inadequate storage or transport at low temperatures; as curing problems can occur. Such crystallization can be reversed by heating the material in a water bath at 60°C.
Density	Binder (Component A+B) approx. 1.1 kg/l Filling- /levelling mortar approx. 2.0 kg/l
Viscosity	Components A + B mixed viscosity (+23°C): approx. XXX mPas
Solid content by mass	approx. 100%
Solid content by volume	approx. 100%

TECHNICAL INFORMATION

Chemical resistance	SikaShield®-501 Primer Pro is resistant to water, de-icing salt solutions and mineral fuels and lubricants and many other substances that are aggressive to concrete.
Temperature resistance	Naked flame test passed (simulation of welding operation with a 7-flame burner).

APPLICATION INFORMATION

Mixing ratio	Component A : Component B = XX : XX (parts by weight)			
Consumption	The consumption of SikaShield®-501 Primer Pro depends on the different variants of application. See ZTV-ING 6-1 and DIN EN 18532-2.			
Ambient air temperature	Minimum + 8°C Maximum + 40°C			
Relative air humidity	Maximum 85%			
Dew point	During application and hardening, the substrate temperature must be min. +3°C above dew point. Protect from condensation before, during and after application until cured.			
Substrate temperature	Minimum + 8°C Maximum + 40°C			
Substrate moisture content	Concrete bridge decks: Substrate moisture content according to ZTV-ING 6-1 "Hot air blower" or "Hairdryer" test. For other structures: < 4% moisture by weight (measured with a CM meter) if specific ZTV-ING requirement are not applicable.			
Pot Life	Ambient temperature	+10°C	+20°C	+30°C
	SikaShield®-501 Primer Pro	approx. XX minutes	approx. XX minutes	approx. XX minutes
Waiting time to overcoating	Substrate temperature	+10°C	+20°C	+30°C
	Before any access	approx. XX hours	approx. XX hours	approx. XX hours
	Before sealing the broadcast primer	As soon as the setting conditions of this layer allow	As soon as the setting conditions of this layer allow	As soon as the setting conditions of this layer allow
	Until installation of the bitumen sheet	min. XX hours	min. XX hours	min. XX hours

SYSTEM INFORMATION

Systems	The waterproofing system consists of the epoxy resin SikaShield®-501 Primer Pro and the bitumen sheet SikaShield Ergobit Pro and the protection layer mastic asphalt. Basis of this system are the standards ZTV-ING 6-1 (concrete bridge decks) and DIN EN 18532-2 (concrete car parks).
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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.

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) con-

taining physical, ecological, toxicological and other safety-related data.

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

The substrate must comply with the requirements of ZTV-ING 6-1; its preparation and condition are described in the section "Substrate preparation".

SUBSTRATE PREPARATION

The adhesion of the SikaShield®-501 Primer Pro on the cementitious substrates is formed by a mechanical connection over the surface profile (roughness) and a good penetration into the substrate.

High strength concrete, vacuum formed surfaces and other extremely smooth and very dense concrete substrates need more intensive mechanical preparation.

After surface preparation the embedded aggregates in the concrete must still be visible. In some cases a sample area should be prepared. Therefore abrasive substrate preparation (e.g. blastcleaning) is always required.

All concrete surfaces or concrete replacement / repair mortars to be coated must be sound, dry and free from any cement laitance, loose or friable particles, oils and grease, or any other dirt and contaminants.

Prepare the substrate by blastcleaning (grit or shot blasting), suitable mechanical scabbling / grinding / milling etc. This is also essential on PCC I mortars.

The average surface pull-off strength of the substrate must be minimum 1.5 N/mm². For the moisture content of concrete bridges the regulations of the ZTV ING are applicable.

On other engineering structures ensure that the concrete moisture content is less than 4% by weight (measured with a suitable CM meter).

MIXING

Binder:

SikaShield®-501 Primer Pro is supplied in 2 components (component A = resin and component B = hardener) pre-batched in the correct mixing ratio (except for bulk packaging which must be dosed on site). Prior to application, thoroughly mix components A + B together in the specified mixing ratio. To prevent the liquid splashing or spilling from the mixing container, mix the components briefly with a continuously adjustable electric mixer at low speed.

Then slowly increase the speed to maximum 300 rpm to mix the materials thoroughly. The minimum mixing time is 3 minutes until a fully homogeneous mix is obtained. Decant the mixed material into a clean container and mix briefly again as described above.

2-component epoxy resins generate heat when react-

ing (exothermic reaction). After mixing both components together the material must not remain in the mixing container longer than the stated pot life and must be used immediately as stated in the application instructions, otherwise heat and smoke may develop and in extreme cases this could even cause a fire.

Aggregates for mortars:

Premix the graded aggregates in a compulsory / paddle mixer. While the mixer is still running, add the freshly mixed SikaShield®-501 Primer Pro binder and continue to mix until fully homogeneous.

When using premixed sand/aggregate mixes only use the complete content of each bag as the aggregates tend to settle and separate during transport and storage.

Filling ratio for levelling - / surface filling mortar:

1 part by weight mixed SikaShield®-501 Primer Pro: + 3-4 parts by weight aggregate (e.g. Sika Aggregate KR); tested premixed aggregates in 25 kg bags

Alternatively use the following blend of aggregate / sand fractions:

- 20% by weight fine quartz powder
- 25% by weight quartz sand 0.1 - 0.5 mm
- 55% by weight quartz sand 1.0 - 2.0 mm

Filling ratio for repair mortars:

1 part by weight mixed SikaShield®-501 Primer Pro: 10 parts by weight aggregates in the following blend of aggregate / sand fractions:

- 20% by weight quartz sand 0.1 - 0.4 mm
- 25% by weight quartz sand 0.2 - 0.7 mm
- 30% by weight quartz sand 0.7 - 1.2 mm
- 25% by weight quartz sand 2.0 - 3.0 mm

Hints on filling ratio:

The possible filling ratio of the SikaShield®-501 Primer Pro depends on the temperature. The ratios given here refer to a material-, substrate- and ambient temperature of 20°C. Higher or lower temperatures will lead to a different filling ratio.

Mixing Equipment:

SikaShield®-501 Primer Pro binder is mixed with an electric mixer at max. 300 rpm.

APPLICATION

Primer application on concrete:

It is best to 'flood-apply' the mixed SikaShield®-501 Primer Pro onto prepared concrete surfaces in one coat at a consumption of approx. 300 - 500 g/m², to distribute it with a rubber squeegee and to roll it in evenly with a lambswool roller. Spread the material in order to avoid formation of material puddles.

Broadcast kiln-dried quartz sand (0.2 - 0.7 mm at max. 800 g/m²) onto the wet primer. Avoid excessive broadcasting of sand (no surplus).

Sealing coat application on concrete:

System according to ZTV-ING 6-1

In a first operation apply the SikaShield®-501 Primer Pro binder at a minimum consumption of approx. 400 g/m².

Immediately after rolling, dry quartz sand (0.7-1.2 mm) must be broadcast to excess onto this layer. Remove any loose material by brush and/or vacuum as soon as the material has hardened sufficiently.

In a second operation evenly apply the SikaShield®-501 Primer Pro binder at a minimum consumption of approx. 600 g/m² and distribute by squeegee / roller to avoid any formation of material puddles; ensure that the previously broadcast surface is evenly 'wetted' and a uniformly coarse and closed-looking surface is obtained. This layer must not be broadcast with additional sand.

Surface levelling / filling mortar application on concrete:

Voids and defects in the surface of up to 0.5 cm depth should be filled by applying layers of SikaShield®-501 Primer Pro mixed with Sika Aggregate KR, or graded kiln-dried quartz sand, as above. Before application, prime the concrete surface with approx. 400 g/m² SikaShield®-501 Primer Pro binder and then apply the levelling / filling mortar 'wet on wet' (see ZTV-ING 6-1).

For certain specific site conditions and requirements, it is also possible to broadcast 0.2 - 0.7 mm quartz sand onto the primer and to apply the levelling / filling mortar later (please refer to ZTV-ING). Broadcast the 0.2 - 0.7 mm kiln-dried quartz sand onto the fresh filling layer and avoid excessive broadcasting of sand (no surplus), again remove any loose material when this layer has hardened sufficiently.

Application onto green (minimum 7 day old) concrete:
The concrete surface must be dry. Use a hot air blower or localized heating to confirm suitability - Damp concrete turns much lighter when heated in this way.

Seal the green concrete surface according to ZTV-ING in two coats, as follows:

Apply the first coat of SikaShield®-501 Primer Pro binder at a minimum consumption of approx. 400 g/m². Spread the epoxy resin evenly with a lambskin roller to avoid formation of material puddles. Broadcast kiln-dried quartz sand of 0.7 - 1.2 mm in excess onto this first coat 'wet on wet'. Removing any loose excess material by brush and/or vacuum as soon as the layer has hardened sufficiently.

In a second operation evenly apply the reactive resin

in a minimum quantity of approx. 600 g/m² and spread evenly to avoid puddles so that the broadcast material is evenly wetted and a uniformly coarse and closed looking surface is obtained. This surface is not broadcast with sand.

Application as a repair mortar on concrete:

Levelling with a thicker layer repair mortar is necessary where voids and defects are deeper. The construction time available will determine whether a SikaShield®-501 Primer Pro resin (faster setting) or a cementbased mortar (PCC I) requiring extended curing time shall be used.

SikaShield®-501 Primer Pro resin mortar:

SikaShield®-501 Primer Pro binder is applied first as a bonding bridge onto the prepared concrete surface, e.g. with a brush or roller. The SikaShield®-501 Primer Pro repair mortar mix is then applied into this 'wet on wet' and levelled to the specified layer thickness with a trowel or screed batten / bar. The mortar must then be compacted, either manually with a smoothening trowel or with a helicopter. Broadcast kiln-dried quartz sand of 0.2 - 0.7 mm onto the fresh repair mortar and avoid excessive broadcasting of sand (no surplus).

Hydraulic setting, cement-based and polymer-modified ready-mixed mortars:

Concrete replacement and filling of voids and defects in a layer thickness of ca. 1 - 10 cm are usually carried out with a PCC I concrete replacement system (cement mortar with polymer additive), which are also available from Sika.

General important application notes:

Loose broadcast material must always be brushed and/or vacuumed off after hardening of the primer or surface filling layers. White discolouration, possibly combined with tackiness directly on the surface may occur due to the effects of exposure to moisture (rain, dew, high humidity).

However the material underneath hardens normally. Such white discolouration and tackiness will considerably reduces the adhesion of subsequent layers as e.g. the bitumen sheets and must therefore imperatively removed.

CLEANING OF EQUIPMENT

With Sika Thinner C.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the declared data for this product may vary from country to country. Please consult the local Product Data Sheet for the exact product data.

LEGAL NOTES

Any information or suggestions for use concerning Sika's products, which we either in writing or orally have given buyers or end-users of the product, have been given in good faith based on our own experiences and based on approved praxis and the technological and scientific knowledge on the time of giving such suggestions and information, which are given without any type of guarantees, and which do not lead to any further responsibility from Sika Danmark A/S, besides what is stated in the sales agreement in question. The buyer or end-user should themselves investigate or otherwise make sure, that our products are suitable for the use in question and further make sure that the products are kept and used correct and in agreement with the published rules and considering the actual conditions in order to avoid damages or less satisfactory results. Any order is accepted and any delivery is affected according to the general terms of sales and delivery from Sika Danmark A/S, which are considered known and accepted, and which could be handed out when asked for. Our catalogues are not up-dated automatically. The present product data sheet is only for use in Denmark. Values stated in the present product data sheet should be seen as recommended, unless stated otherwise.

Sika Danmark A/S
Hirsemarken 5
3520 Farum
Tlf. +45 48 18 85 85
www.sika.dk



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