Construction

Sikadur®-330

2-part epoxy impregnation resin

Product Description

Sikadur®-330 is a two part, thixotropic epoxy based impregnating resin / adhesive.

Uses

- Impregnation resin for SikaWrap® fabric reinforcement for the dry application method
- Primer resin for the wet application system
- Structural adhesive for bonding Sika® CarboDur® plates to even surfaces

Characteristics / Advantages

- Easy mix and application by trowel and impregnation roller
- Manufactured for manual saturation methods
- Excellent application behaviour to vertical and overhead surfaces
- Good adhesion to many substrates
- High mechanical properties
- No separate primer required

Tests

Approval / Standards

Conforms to the requirements of:

- SOCOTEC (France): Cahier des charges Sika® CarboDur, SikaWrap®.
- Road and Bridges Research Institute (Poland): IBDiM No AT/2003-04-336.

Testing according to EN 1504-4

Product Data

Form

Appearance / Colours

Resin part. A:	paste
Hardener part B:	paste

Colour:

Part A:	white
Part B:	grey
Part A+B mixed:	light grey

Packaging

30 kg (A+B) sets

Part A:	24 kg pails
Part B:	6 kg pails

Storage

Storage Conditions / Shelf life	24 months from date of production if stored properly in original unopened, sealed and undamaged packaging in dry conditions at temperatures between +5°C and +25°C. Protect from direct sunlight.

Technical Data

Chemical Base	Epoxy resin.
Density	1.30 kg/l ± 0.1 kg/l (parts A+B mixed) (at +23°C)
Viscosity	Shear rate: 50 /s

Temperature	Viscosity
+10°C	~ 10'000 mPas
+23°C	~ 6'000 mPas
+35°C	~ 5'000 mPas

Thermal Expansion Coefficient	4.5×10^{-5} per °C (-10°C to +40°C)
Thermal Stability	Heat Distortion Temperature (HDT) (ASTM D648)

Curing	Temperature	HDT
7 days	+10°C	+36°C
7 days	+23°C	+47°C
7 days	+35°C	+53°C
7 days, +10°C plus 7 days, +23°C	-	+43°C

Service Temperature	-40°C to +45°C

Mechanical / Physical Properties

Tensile Strength	30 N/mm^2 (7 days at +23°C)	(DIN 53455)
Bond Strength	Concrete fracture (> 4 N/mm^2) on sandblasted substrate: > 1 day	(EN 24624)
E-Modulus	Flexural: 3800 N/mm^2 (7 days at +23°C)	(DIN 53452)
	Tensile: 4500 N/mm^2 (7 days at +23°C)	(DIN 53455)
Elongation at Break	0.9% (7 days at +23°C)	(DIN 53455)

Resistance

Chemical Resistance	The product is not suitable for chemical exposure.
Thermal Resistance	Continuous exposure +45°C.

System Information

System Structure	Substrate primer - Sikadur®-330. Impregnating / laminating resin - Sikadur®-330. Structural strengthening fabric - SikaWrap® type to suit requirements.

Application Details

Consumption	This will be dependant on the roughness of the substrate and the type of SikaWrap® fabric to be impregnated. See respective SikaWrap® fabric Product Data Sheet. Guide: 0.7 - 1.5 kg/m^2
Substrate Quality	The substrate must be sound and of sufficient tensile strength to provide a minimum pull off strength of 1.0 N/mm^2 or as per the requirements of the design specification. The surface must be dry and free of all contaminants such as oil, grease, coatings and surface treatments etc. The surface to be bonded must be level (max. deviation 2 mm per 0.3 m length), with steps and formwork marks not greater than 0.5 mm. High spots can be removed by abrasive blasting or grinding. Wrapped corners must be rounded to a minimum radius of 20 mm (depending on the SikaWrap® fabric type) or as per the design specification. This can be achieved by grinding edges or by building up with Sikadur® mortars.
Substrate Preparation	Concrete and masonry substrates must be prepared mechanically using abrasive blast cleaning or grinding equipment, to remove cement laitance, loose and friable material to achieve a profiled open textured surface. Timber substrates must be planed or sanded. All dust, loose and friable material must be completely removed from all surfaces before application of the Sikadur®-330 preferably by brush and industrial vacuum cleaner. Weak concrete/masonry must be removed and surface defects such as honeycombed areas, blowholes and voids must be fully exposed. Repairs to substrate, filling of blowholes/voids and surface levelling must be carried out using Sikadur®-41 or a mixture of Sikadur®-30 and Sikadur®-501 quartz sand (mix ratio 1 : 1 max parts by weight). Bond tests must be carried out to ensure substrate preparation is adequate. Inject cracks wider than 0.25 mm with Sikadur®-52 or other suitable Sikadur® injection resin.

Application Conditions / Limitations

Substrate Temperature	+10°C min. / +35°C max.
Ambient Temperature	+10°C min. / +35°C max.
Substrate Moisture Content	$\leq$ 4% pbw. Test method: Sika-Tramex meter.
Dew Point	Beware of condensation! Substrate temperature during application must be at least 3°C above dew point.

Application Instructions

Mixing	Part A : part B = 4 : 1 by weight When using bulk material the exact mixing ratio must be safeguarded by accurately weighing and dosing each component.

Mixing Time

Pre-batched units:
Mix parts A+B together for at least 3 minutes with a mixing spindle attached to a slow speed electric drill (max. 600 rpm) until the material becomes smooth in consistency and a uniform grey colour. Avoid aeration while mixing. Then, pour the whole mix into a clean container and stir again for approx. 1 more minute at low speed to keep air entrapment at a minimum. Mix only that quantity which can be used within its potlife.

Bulk packing, not pre-batched:
First, stir each part thoroughly. Add the parts in the correct proportions into a suitable mixing pail and stir correctly using an electric low speed mixer as above for pre-batched units.

Application Method / Tools

Preparation:
Prior to application confirm substrate moisture content, relative humidity and dew point.

Cut the specified SikaWrap® fabric to the desired dimensions.

Resin Application:
Apply the Sikadur®-330 to the prepared substrate using a trowel, roller or brush.

Fabric Placement and Laminating:
Place the SikaWrap® fabric in the required direction onto the Sikadur®-330. Carefully work the fabric into the resin with the Sika plastic impregnation roller parallel to the fiber direction until the resin is squeezed out between and through the fiber strands and distributed evenly over the whole fabric surface. Avoid excessive force when laminating to prevent folding or creasing of the SikaWrap® fabric.

Additional Fabric Layers:
For additional layers of SikaWrap® fabric, apply Sikadur®-330 to previous applied layer wet on wet within 60 minutes (at +23°C) after application of the previous layer and repeat laminating procedure.

If it is not possible to apply within 60 minutes, a waiting time of at least 12 hours must be observed before application of next layer.

Overlays:
If a cementitious overlay is to be applied over SikaWrap® fabric an additional Sikadur-330 resin layer must be applied over final layer at a max. 0.5 kg/m^2. Broadcast with quartz sand while wet which will serve as a key for the overlay.

If a coloured coating is to be applied the wet Sikadur®-330 surface can be smoothed with a brush.

Overlaps

Fiber Direction:

- Overlapping of the SikaWrap® fabric must be at least 100 mm (depending on the SikaWrap® fabric type) or as specified in the strengthening design.

Side by Side:

- Unidirectional fabrics: when placing several unidirectional SikaWrap® fabrics side by side no overlapping is required unless specified in the strengthening design.

- Multi-directional fabrics: overlapping in the weft direction must be at least 100 mm (depending on the SikaWrap fabric type) or as specified in the strengthening design.

Cleaning of Tools

Clean all equipment immediately with Sika® Colma Cleaner. Cured material can only be mechanically removed.

Potlife

Potlife:

Temperature	Time
+10°C	90 minutes (5 kg)
+35°C	30 minutes (5 kg)

Potlife starts with the mixing of both parts (resin and hardener). At low ambient temperature pot life will be extended, at elevated temperatures this will be reduced. The higher the quantity of material mixed, the shorter the potlife. To achieve a longer potlife at high temperatures the mixed material may be divided into smaller units or both parts may be cooled before mixing.

Open time:

Temperature	Time
+10°C	60 minutes
+35°C	30 minutes

Waiting Time / Overcoating

To (pre-) cured resin:

Products	Substrate temperature	Minimum	Maximum
Sikadur®-330 Sikadur®-330	+10°C	24 hours	Cured resin older than 7 days has to be degreased with Sika® Colma Cleaner and gently grinded with a sandpaper before coating.
	+23°C	12 hours	
	+35°C	6 hours	

Products	Substrate temperature	Minimum	Maximum
Sikadur®-330 Sikagard®-coloured coatings	+10°C	5 days	Cured resin older than 7 days has to be degreased with Sika® Colma Cleaner and gently grinded with a sandpaper before coating.
	+23°C	3 days	
	+35°C	1 day	

Times are approximate and will be affected by changing ambient conditions.

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Notes on Application / Limitations

This product may only be used by experienced professionals.

The Sikadur®-330 must be protected from rain for at least 24 hours after application.

Ensure placement of fabric and laminating with roller takes place within open time.

The SikaWrap® fabric must be coated with a cementitious overlay or coating for aesthetic and/or protective purposes. Selection will be dependent on exposure requirements. For basic UV protection use Sikagard®-550W Elastic, Sikagard® ElastoColor-675W or Sikagard®-680S.

At low temperatures and / or high relative humidity, a tacky residue (blush) may form on the surface of the cured Sikadur-330 epoxy. If an additional layer of fabric, or a coating is to be applied onto the cured epoxy, this residue must first be removed to ensure adequate bond. The residue can be removed with water. In both cases, the surface must be wiped dry prior to application of the next layer or coating.

For application in cold or hot conditions, pre-condition material for 24 hours in temperature controlled storage facilities to improve mixing, application and pot life limits.

The number of additional fabric layers applied wet on wet must be closely controlled to avoid creeping, creasing or slippage of the fabric during curing of the Sikadur®-330. The number of layers will be dependent on the type of SikaWrap® fabric used and the ambient climate conditions.

Sikadur® resins are formulated to have low creep under permanent loading. However due to the creep behaviour of all polymer materials under load, the long term structural design load must account for creep. Generally the long term structural design load must be lower than 20-25% of the failure load. Please consult a structural engineer for load calculations for your specific application.

Curing Details

Applied Product ready for use

Temperature	Full cure
+10°C	7 days
+23°C	5 days
+35°C	2 days

All cure times are approximate and will be affected by changing ambient conditions.

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.

Health and Safety Information

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.

Legal Notes

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