ANNEXURES

ANNEXURE A – SIKA CABODUR S PLATES (PRODUCT DATA SHEET)
ANNEXURE B – SIKADUR-30 LP (PRODUCT DATA SHEET)
ANNEXURE C – SIKADUR-330 (PRODUCT DATA SHEET)
PRODUCT DATA SHEET

Sika® CarboDur® S

PULTRUDED CARBON FIBRE PLATES FOR STRUCTURAL STRENGTHENING AS PART OF THE Sika® CARBODUR® SYSTEM

DESCRIPTION

Sika® CarboDur® plates are pultruded carbon fibre reinforced polymer (CFRP) laminates, designed for strengthening concrete, timber, masonry, steel and fibre reinforced polymer structures.

Sika® CarboDur® plates are bonded onto the structure as externally bonded reinforcement using Sikadur®-30 epoxy resin based adhesive for normal, or Sikadur®-30 LP epoxy resin based adhesive for elevated temperatures during application and / or service. Please refer to the relevant Product Data Sheet for more detailed information about each of these adhesives. Suitable for use in hot and tropical climate conditions.

USES

Sika® CarboDur® S may only be used by experienced professionals.

Sika® CarboDur® systems are used to improve, increase or repair the performance and resistance of structures for:

- **Increased Load Carrying Capacity:**
  - Increasing the load capacity of floor slabs, beams and bridge sections
  - For the installation of heavier machinery
  - To stabilise vibrating structures
  - For changes in building use

- **Damage to structural elements due to:**
  - Deterioration of the original construction materials
  - Steel reinforcement corrosion
  - Accidents (Vehicle impact, earthquakes, fire)

- **Improvement of serviceability and durability:**
  - Reduced deflection and crack width
  - Stress reduction in the steel reinforcement
  - Improved fatigue resistance

- **Change of the structural system:**
  - Removal of walls and / or columns
  - Removal of floor and wall sections to create access / openings

- **Resistance to possible events:**
  - Increased resistance to earthquakes, impact or explosion etc.
  - To repair design or construction defects such as:
    - Insufficient / inadequate reinforcement
    - Insufficient / inadequate structural depth

CHARACTERISTICS / ADVANTAGES

- Non-corroding
- Very high strength
- Excellent durability and fatigue resistance
- Unlimited lengths, no joints required
- Low system thickness, simple execution of plate intersections or crossings
- Easy transportation (rolls)
- Lightweight, very easy to install, especially overhead (without temporary support)
- Minimum preparation of plate, applicable in several layers
- Smooth edges without exposed fibres as result of production by pultrusion
- Extensive Testing and Approvals available from many countries worldwide

APPROVALS / CERTIFICATES

- Slovakia: TSUS, Building Testing and research institutes,
- Poland: Technical Approval IBDiM Nr AT/2008-03-0336/1 Plaskowniki. pręty, kształtki i maty kompozytowe do wzmocniania betonu o nazwie handlowej: Zestaw materiałów Sika® CarboDur® do wzmocnienia konstrukcji obiektów mostowych
- USA: ACI 440.2R-08, Guide for the Design and con-
- Switzerland: SIA 166:2004 Klebebewehrungen

PRODUCT INFORMATION

Packaging
Cut to size as follows in non-returnable cardboard packaging.
Supplied in rolls of 100 m in nonreturnable cardboard boxes.

Appearance / Colour
Carbon fibre reinforced polymer with an epoxy matrix, black.

Shelf life
Unlimited, provided the storage conditions are met.

Storage conditions
Store in original, unopened, sealed and undamaged packaging in dry conditions at temperatures of maximum +50 °C. Protect from direct sunlight. Transportation: only in the original packaging, or otherwise adequately protected against any mechanical damage.

Density
1.60 g/cm³

Dimensions

<table>
<thead>
<tr>
<th>Type Sika® CarboDur® S</th>
<th>Width</th>
<th>Thickness</th>
<th>Cross section area</th>
</tr>
</thead>
<tbody>
<tr>
<td>512</td>
<td>50 mm</td>
<td>1.2 mm</td>
<td>60 mm²</td>
</tr>
<tr>
<td>514</td>
<td>50 mm</td>
<td>1.4 mm</td>
<td>70 mm²</td>
</tr>
<tr>
<td>614</td>
<td>60 mm</td>
<td>1.4 mm</td>
<td>84 mm²</td>
</tr>
<tr>
<td>626</td>
<td>60 mm</td>
<td>2.6 mm</td>
<td>156 mm²</td>
</tr>
<tr>
<td>812</td>
<td>80 mm</td>
<td>1.2 mm</td>
<td>96 mm²</td>
</tr>
<tr>
<td>814</td>
<td>80 mm</td>
<td>1.4 mm</td>
<td>112 mm²</td>
</tr>
<tr>
<td>914</td>
<td>90 mm</td>
<td>1.4 mm</td>
<td>126 mm²</td>
</tr>
<tr>
<td>1012</td>
<td>100 mm</td>
<td>1.2 mm</td>
<td>120 mm²</td>
</tr>
<tr>
<td>1014</td>
<td>100 mm</td>
<td>1.4 mm</td>
<td>140 mm²</td>
</tr>
<tr>
<td>1214</td>
<td>120 mm</td>
<td>1.4 mm</td>
<td>168 mm²</td>
</tr>
<tr>
<td>1512</td>
<td>150 mm</td>
<td>1.2 mm</td>
<td>180 mm²</td>
</tr>
</tbody>
</table>

Select dimensions according to local Sika product range

Fibre Volume Content
> 68 %

TECHNICAL INFORMATION

Laminate Tensile Strength
Mean value 3,100 N/mm² (EN 2561)
5% fractile-value 2,900 N/mm²
Values in the longitudinal direction of the fibres

Laminate Modulus of Elasticity in Tension
Mean value 170,000 N/mm² (EN 2561)
5% Fractile-value 165,000 N/mm²
Values in the longitudinal direction of the fibres

Laminate Elongation at Break in Tension
Mean value 1.80 % (EN 2561)
Values in the longitudinal direction of the fibres

Glass Transition Temperature
> 100 °C (EN 61006)
SYSTEMS

System Structure
The system build-up and configuration as described must be fully complied with and may not be changed.
Resin adhesive - Sikadur®-30 or Sikadur®-30 LP.
Structural strengthening Carbon plates – Sika® CarboDur® S.
For detailed information on Sikadur®-30 and Sikadur®-30 LP, together with the application details, please refer to the Sikadur®-30 or Sikadur®-30 LP Product Data Sheet and the “Method Statement Sika® CarboDur® Externally Bonded Reinforcement”.

APPLICATION INFORMATION

<table>
<thead>
<tr>
<th>Consumption</th>
<th>Width of Sika® CarboDur® S plate</th>
<th>Typical consumption of Sikadur®-30*</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mm</td>
<td>0.20 – 0.28 kg/m</td>
<td></td>
</tr>
<tr>
<td>60 mm</td>
<td>0.24 – 0.32 kg/m</td>
<td></td>
</tr>
<tr>
<td>80 mm</td>
<td>0.32 – 0.44 kg/m</td>
<td></td>
</tr>
<tr>
<td>90 mm</td>
<td>0.40 – 0.56 kg/m</td>
<td></td>
</tr>
<tr>
<td>100 mm</td>
<td>0.44 – 0.64 kg/m</td>
<td></td>
</tr>
<tr>
<td>120 mm</td>
<td>0.45 – 0.80 kg/m</td>
<td></td>
</tr>
<tr>
<td>150 mm</td>
<td>0.68 – 1.00 kg/m</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Consumption is for standard application only. Rough or uneven substrate surfaces, plate crossings, loss and wastage can lead to a higher adhesive consumption of up to 20 %.

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY
Sika® CarboDur® plates externally bonded to the con-crete surface
Recommended minimum concrete pull-off strength after surface preparation:
- Mean: 2.0 N/mm²
- Minimum: 1.5 N/mm²
The effective concrete pull-off strength after surface preparation has to be verified.
If concrete pull-off strength is below the stated minimum requirements, alternative Sika solutions are available:
- CarboDur® applied in slots as near surface mounted (NSM) reinforcement
- SikaWrap® fabrics: Please refer to the Product Data Sheet for the SikaWrap® fabrics
Concrete must generally be older than 28 days (dependent on curing conditions and the type of concrete etc.)

Sika® CarboDur® externally bonded to other sub-strates
For application of CarboDur® plates to all other substrates (brick, stone, steel, wood, fibre reinforced polymer etc.) please refer to the “Method Statement for Sika® CarboDur® Externally Bonded Reinforcement”. Contact Sika Technical Department for detailed advice.

SUBSTRATE PREPARATION
Concrete must be cleaned and prepared to achieve a laitance and contaminant free, open textured surface. Please also refer to the “Method Statement Sika® CarboDur® Externally Bonded Reinforcement”.

APPLICATION METHOD / TOOLS
Please refer to the relevant Product Data Sheet:
- Sikadur®-30
- Sikadur®-30 LP

LIMITATIONS
Please refer to the relevant Product Data Sheet of Sikadur® epoxy adhesive:
- Sikadur®-30
- Sikadur®-30 LP

A suitably qualified Structural Engineer must be responsible for the design of the strengthening works. Additionally as this application is structural, great care must also be taken in selecting suitably experienced and trained specialist contractors.
Sika® CarboDur® strengthening systems with Sika® CarboDur® plates must be protected from permanent exposure to direct sunlight, moisture and/or water. Please refer to the relevant Method Statement and Product Data Sheets for the selection of suitable over coating materials, in situations where systems will be fully or partially exposed.
Maximum permissible continuous service temperature is approx. +50 °C.
Note: When using the Sika CarboHeater for curing Sikadur®-30 LP to be used at elevated temperatures, the maximum continuous service temperature can be increased to max. +80 °C. Please also refer to the relevant Method Statements for further limitations and guidelines: “Method Statement Sika CarboDur® Externally Bonded Reinforcement”. Contact Sika Technical Department for detailed advice.
BASIS OF PRODUCT DATA

All technical data stated in this Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LOCAL RESTRICTIONS

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for the exact product data and uses.

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.

REGULATION (EC) NO 1907/2006 - REACH

This product is an article as defined in article 3 of regulation (EC) No 1907/2006 (REACH). It contains no substances which are intended to be released from the article under normal or reasonably foreseeable conditions of use. A safety data sheet following article 31 of the same regulation is not needed to bring the product to the market, to transport or to use it. For safe use follow the instructions given in this product data sheet. Based on our current knowledge, this product does not contain SVHC (substances of very high concern) as listed in Annex XIV of the REACH regulation or on the candidate list published by the European Chemicals Agency in concentrations above 0.1 % (w/w)

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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Web: http://www.pak.sika.com
PRODUCT DATA SHEET
Sikadur®-30 LP

THIXOTROPIC ADHESIVE FOR BONDING REINFORCEMENT

DESCRIPTION
Sikadur®-30 LP is a thixotropic, structural 2-component adhesive, based on a combination of epoxy resins and especially designed for use at higher temperatures between +25 °C and +55 °C. Suitable for use in hot and tropical climatic conditions.

USES
Sikadur®-30 LP may only be used by experienced professionals. Adhesive for bonding structural reinforcement, particularly in structural strengthening works. Especially for the following uses:
- Sikadur® CarboDur® Plates to concrete, brickwork, timber and steel (for details see the Sika® CarboDur® Product Data Sheet, the “Method Statement for Sikadur® CarboDur® Externally Bonded Reinforcement” and the “Method Statement for Sikadur® CarboDur® Near Surface Mounted Reinforcement”).
- Steel plates to concrete (for details see the relevant Sika Technical information).

CHARACTERISTICS / ADVANTAGES
Sikadur®-30 LP has the following advantages:
- Long pot life
- High temperature resistance at elevated curing temperatures
- Easy to mix and apply
- No primer needed
- High creep resistance under permanent load
- Very good adhesion to concrete, masonry, stone-work, steel, cast iron, aluminium, timber and Sikadur® CarboDur® Plates
- Hardening is not affected by high humidity
- High strength adhesive
- Thixotropic: non-sag in vertical and overhead applications
- Hardens without shrinkage
- Different coloured components (for mixing control)
- High initial and ultimate mechanical resistance
- High abrasion and shock resistance
- Impermeable to liquids and water vapour

APPROVALS / STANDARDS
- Adhesive for structural bonding tested according to EN 1504-4.

PRODUCT INFORMATION

<table>
<thead>
<tr>
<th>Chemical base</th>
<th>Epoxy resin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaging</td>
<td>6 kg (A + B) Pre-batched unit</td>
</tr>
</tbody>
</table>
| Colour        | Component A: white
|               | Component B: black
|               | Component A + B: light grey |
| Shelf life    | 24 months from date of production |
| Storage conditions | Store in original, unopened, sealed and undamaged packaging in dry conditions at temperatures between +5 °C and +30 °C. Protect from direct sunlight. |

Product Data Sheet
Sikadur®-30 LP
March 2017, Version 03.01
02020604001000003
### TECHNICAL INFORMATION

<table>
<thead>
<tr>
<th>Compressive Strength</th>
<th>Curing time</th>
<th>Curing temperature</th>
<th>(DIN EN 196)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12 h</td>
<td>+25 °C</td>
<td>~90 N/mm²</td>
</tr>
<tr>
<td></td>
<td>1 d</td>
<td>&gt; 75 N/mm²</td>
<td>~100 N/mm²</td>
</tr>
<tr>
<td></td>
<td>3 d</td>
<td>&gt; 85 N/mm²</td>
<td>~110 N/mm²</td>
</tr>
</tbody>
</table>

| Modulus of Elasticity in Compression | ~10 000 N/mm² (+25 °C) | (ASTM D 695) |

<table>
<thead>
<tr>
<th>Tensile Strength in Flexure</th>
<th>Curing time</th>
<th>Curing temperature</th>
<th>(DIN EN 196)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 d</td>
<td>&gt; 12 N/mm²</td>
<td>~38 N/mm²</td>
</tr>
<tr>
<td></td>
<td>3 d</td>
<td>&gt; 20 N/mm²</td>
<td>~40 N/mm²</td>
</tr>
<tr>
<td></td>
<td>7 d</td>
<td>&gt; 25 N/mm²</td>
<td>~42 N/mm²</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tensile Strength</th>
<th>Curing time</th>
<th>Curing temperature</th>
<th>(ISO 527)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 d</td>
<td>+25 °C</td>
<td>~26 N/mm²</td>
</tr>
<tr>
<td></td>
<td>3 d</td>
<td>~14 N/mm²</td>
<td>~28 N/mm²</td>
</tr>
<tr>
<td></td>
<td>7 d</td>
<td>~17 N/mm²</td>
<td>~28 N/mm²</td>
</tr>
</tbody>
</table>

| Modulus of Elasticity in Tension | ~10 000 N/mm² (+25 °C) | (ISO 527) |

<table>
<thead>
<tr>
<th>Shear Strength</th>
<th>Curing time</th>
<th>Curing temperature</th>
<th>(FIP 5.15: Fédération Internationale de la Précontrainte)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 1 h</td>
<td>+44 – 55 °C</td>
<td>+80 °C</td>
<td>~17 N/mm²</td>
</tr>
<tr>
<td>7 d</td>
<td>~7 N/mm²</td>
<td>~19 N/mm²</td>
<td>-</td>
</tr>
</tbody>
</table>

| Shrinkage     | ~0.04 %     | (FIP: Fédération Internationale de la Précontrainte) |

<table>
<thead>
<tr>
<th>Tensile Adhesion Strength</th>
<th>Curing time</th>
<th>Substrate</th>
<th>Curing temperature</th>
<th>(EN ISO 4624)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 d Concrete</td>
<td></td>
<td>+25 °C</td>
<td>+55 °C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt; 4 N/mm²</td>
<td>&gt; 4 N/mm²</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Concrete fracture)</td>
<td>(Concrete fracture)</td>
</tr>
<tr>
<td></td>
<td>1 d Steel</td>
<td></td>
<td>~15 N/mm²</td>
<td>~25 N/mm²</td>
</tr>
<tr>
<td></td>
<td>3 d Steel</td>
<td></td>
<td>~22 N/mm²</td>
<td>~28 N/mm²</td>
</tr>
</tbody>
</table>

| Coefficient of Thermal Expansion | 2.5 x 10⁻⁵ per °C (Temperature range: -20 °C min. / +40 °C max.) | (EN 1770) |

<table>
<thead>
<tr>
<th>Glass Transition Temperature</th>
<th>Curing time</th>
<th>Curing temperature</th>
<th>TG</th>
<th>(EN 12614)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 d / 1 d</td>
<td>+23°C / +80 °C</td>
<td>+90 °C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 d / 1 d</td>
<td>+23°C / +50 °C</td>
<td>+80 °C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30 d</td>
<td>+30 °C</td>
<td>+70 °C</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Heat Deflection Temperature</th>
<th>Curing time</th>
<th>Curing temperature</th>
<th>HDT</th>
<th>(FIP 5.10: Fédération Internationale de la Précontrainte, ASTM D 648)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 h</td>
<td>+80 °C</td>
<td>+84 °C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 d</td>
<td>+55 °C</td>
<td>+82 °C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 d</td>
<td>+23 °C</td>
<td>+55 °C</td>
<td></td>
</tr>
</tbody>
</table>

| Service Temperature | -40 °C min. / +45 °C max. (when cured at > +23 °C) |
|                    | -40 °C min. / +72 °C max. (when cured > 2 h at +80 °C within 7 d) |
SYSTEMS

System Structure
Sika® CarboDur® System: For Application Details of Sika® CarboDur® plates with Sikadur®-30 LP, see the “Method Statement for Sika® CarboDur® Externally Bonded Reinforcement” and the “Method Statement for Sika® CarboDur® Near Surface Mounted Reinforcement”.

APPLICATION INFORMATION

Mixing ratio
Component A : Component B = 3 : 1 (by weight or volume)
Only mix complete pre-batched units of Sikadur®-30 LP.

Layer Thickness
30 mm max.

Sag Flow
On vertical surfaces it is non-sag up to 3 – 5 mm thickness at +55 °C.

Squeezability
5 500 mm² at +25 °C at 15 kg (FIP: Fédération Internationale de la Précontrainte)

Product Temperature
Sikadur®-30 LP must be applied at temperatures between +20 °C and +40 °C.

Ambient Air Temperature
+25 °C min. / +55 °C max.

Dew Point
Beware of condensation.
Substrate temperature during application must be at least 3 °C above dew point.

Substrate Temperature
+25 °C min. / +55 °C max.

Substrate Moisture Content
Maximum 4 % pbw
When applied to mat damp concrete, brush the adhesive well into the substrate.

Pot Life

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Pot life</th>
<th>Open time</th>
</tr>
</thead>
<tbody>
<tr>
<td>+25 °C</td>
<td>~60 min</td>
<td>~90 min</td>
</tr>
<tr>
<td>+55 °C</td>
<td>~30 min</td>
<td>~60 min</td>
</tr>
</tbody>
</table>

The potlife begins when the resin and hardener are mixed. It is shorter at high temperatures and longer at low temperatures. The greater the quantity mixed, the shorter the potlife. To obtain longer workability at high temperatures, the mixed adhesive may be divided into portions. Another method is to chill components A and B before mixing them (not below 5 °C).

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

See the Product Data Sheet of Sika® CarboDur® Plates and Sika® CarboDur® BC rods.

SUBSTRATE PREPARATION

See the “Method Statement for Sika CarboDur® Externally Bonded Reinforcement” and the “Method Statement for Sika CarboDur® Near Surface Mounted Reinforcement”.

MIXING

Pre-batched units:
Mix components A and B together for at least 3 minutes with a mixing spindle attached to a slow speed electric drill (maximum 300 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 approximately 1 more minute at low speed to keep air entrapment at a minimum. Mix only that quantity which can be used within its potlife.

APPLICATION METHOD / TOOLS

See the “Method Statement for Sika® CarboDur® Externally Bonded Reinforcement” and the “Method Statement for Sika® CarboDur® Near Surface Mounted Reinforcement”.

Product Data Sheet
Sikadur®-30 LP
March 2017, Version 03.01
02020604001000003

BUILDING TRUST
CLEANING OF TOOLS

Clean all tools and application equipment with Sika® Colma Cleaner immediately after use. Hardened / cured material can only be mechanically removed.

LIMITATIONS

Sikadur® resins are formulated to have low creep under permanent loading. However, due to the creep behavior 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.

A structural engineer must be consulted for load calculations for the specific application.

BASIS OF PRODUCT DATA

All technical data stated in this Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LOCAL RESTRICTIONS

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

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.

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.
PRODUCT DATA SHEET
Sikadur®-330

2-COMPONENT EPOXY IMPREGNATION RESIN

DESCRIPTION
Sikadur®-330 is a 2-component, thixotropic epoxy based impregnating resin and adhesive. Suitable for use in hot and tropical climatic conditions.

USES
Sikadur®-330 may only be used by experienced professionals.
Sikadur®-330 is used as:
- 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 into slits

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

SUSTAINABILITY
Sikadur®-330 is certified according "Low Emitting Materials as per Al Sa'fat - Dubai Green Building Evaluation System" by Dubai Central Laboratory (DCL) certificate No. CL17020432

APPROVALS / CERTIFICATES
- Avis Technique N° 3/10-669 (annule et remplace N° 3/07-502) Sika® CarboDur®, SikaWrap®
- Road and Bridges Research Institute (Poland): IBDiM No AT/2008-03-336/1
- Adhesive for structural bonding tested according to EN 1504-4

PRODUCT INFORMATION

<table>
<thead>
<tr>
<th>Composition</th>
<th>Epoxy resin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaging</td>
<td></td>
</tr>
<tr>
<td>5 kg (A+B)</td>
<td>Pre-batched unit</td>
</tr>
</tbody>
</table>

Not pre-dosed industrial packaging:

Component A | 24 kg pails
Component B | 6 kg pails

Note: Refer to mixing ratio and mixing clause in this Product Data Sheet.

Colour
Component A: white paste
Component B: grey paste
Components A + B: light grey paste

Shelf life
24 months from date of production

Product Data Sheet
Sikadur®-330
April 2019, Version 03.01
0202060001000004
Storage conditions

Store in original, unopened, sealed and undamaged packaging in dry conditions at temperatures between +5 °C and +30 °C. Protect from direct sunlight.

Density

~1.30 kg/l (mixed component A + B mixed) (+23 °C)

Viscosity

Shear rate: 50/s

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Viscosity</th>
</tr>
</thead>
<tbody>
<tr>
<td>+10 °C</td>
<td>~10 000 mPas</td>
</tr>
<tr>
<td>+23 °C</td>
<td>~6 000 mPas</td>
</tr>
<tr>
<td>+35 °C</td>
<td>~5 000 mPas</td>
</tr>
</tbody>
</table>

TECHNICAL INFORMATION

Modulus of Elasticity in Flexure

~3 800 N/mm² (7 d, +23 °C) (DIN EN 1465)

Tensile Strength

~30 N/mm² (7 d, +23 °C) (ISO 527)

Modulus of Elasticity in Tension

~4 500 N/mm² (7 d, +23 °C) (ISO 527)

Elongation at Break

~0.9 % (7 d, +23 °C) (ISO 527)

Tensile Adhesion Strength

Concrete fracture (> 4 N/mm²) on sandblasted substrate (EN ISO 4624)

Coefficient of Thermal Expansion

4.5 × 10⁻⁵ 1/K (Temperature range -10 °C min. / +40 °C max.) (EN 1770)

Glass Transition Temperature

Curing time 

Curing temperature | TG

| 30 d | +30 °C | +58 °C |

Heat Deflection Temperature

Curing time 

Curing temperature | HDT

| 7 d | +10 °C | +36 °C |
| 7 d | +23 °C | +47 °C |
| 7 d | +35 °C | +53 °C |

Resistant to continuous exposure up to +45 °C.

Service Temperature

-40 °C min. / +45 °C max.

SYSTEMS

System Structure

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

APPLICATION INFORMATION

Mixing Ratio

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

Consumption

See the "Method Statement for SikaWrap® manual dry application" Ref: 850 41 02.
Guide: 0.7 - 1.5 kg/m²

Ambient Air Temperature

+10 °C min. / +35 °C max.

Dew Point

Beware of condensation.
Substrate temperature during application must be at least 3 °C above dew point.

Substrate Temperature

+10 °C min. / +35 °C max.

Substrate Moisture Content

< 4 % pbw
<table>
<thead>
<tr>
<th>Temperature</th>
<th>Pot Life</th>
<th>Open Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>+10 °C</td>
<td>~90 min (5 kg)</td>
<td>~90 min</td>
</tr>
<tr>
<td>+23 °C</td>
<td>~60 min (5 kg)</td>
<td>~60 min</td>
</tr>
<tr>
<td>+35 °C</td>
<td>~30 min (5 kg)</td>
<td>~30 min</td>
</tr>
</tbody>
</table>

The pot life begins when the resin and hardener are mixed. It is shorter at high temperatures and longer at low temperatures. The greater the quantity mixed, the shorter the pot life. To obtain longer workability at high temperatures, the mixed adhesive may be divided into portions. Another method is to chill components A and B before mixing them (not below +5 °C).

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

Substrate must be sound and of sufficient tensile strength to provide a minimum pull off strength of 1.0 N/mm² or as per the requirements of the design specification.

See also the "Method Statement for SikaWrap® manual dry application" Ref: 850 41 02.

SUBSTRATE PREPARATION

See the "Method Statement for SikaWrap® manual dry application" Ref: 850 41 02.

MIXING

Pre-batched units:
Mix components A+B together for at least 3 minutes with a mixing spindle attached to a slow speed electric drill (maximum 300 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 approximately 1 more minute at low speed to keep air entrapped at a minimum. Mix only that quantity which can be used within its pot life.

Bulk packing, not pre-batched:
First, stir each component thoroughly. Add the components 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

See the "Method Statement for SikaWrap® manual dry application" Ref: 850 41 02.

CLEANING OF EQUIPMENT

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

IMPORTANT CONSIDERATIONS

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.
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 with warm, soapy water to ensure adequate bond. In any case, 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.
For further information on over coating, number of layers or creep, please consult a structural engineer for calculations and see also the "Method Statement for SikaWrap® manual dry application".
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 to 25 % of the failure load. Please consult a structural engineer for load calculations for the specific application.
BASIS OF PRODUCT DATA

All technical data stated in this Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LOCAL RESTRICTIONS

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for the exact product data and uses.

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.

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.