

## PRODUCT DATA SHEET

# Sikadur<sup>®</sup>-31 SBA S-07

## SEGMENTAL BRIDGE ADHESIVE FOR USE AT VERY LOW AMBIENT TEMPERATURE

### DESCRIPTION

Sikadur<sup>®</sup>-31 SBA S-07 is a thixotropic, structural two component adhesive especially formulated for segmental bridge construction.

### USES

Sikadur<sup>®</sup>-31 SBA S-07 may only be used by experienced professionals.  
Segmental bridge adhesive for use on substrate temperatures of +5 °C to +10 °C

### CHARACTERISTICS / ADVANTAGES

Sikadur<sup>®</sup>-31 SBA S-07 has the following advantages:

- Meets and / or exceeds International and National Standards (FIP, BS, ASTM etc.)
- Complies with both ASTM C-881 and AASHTO M-235 for Type VI
- Lubricates the surfaces and makes location of the shear keys easier
- High strength and high modulus of elasticity
- High initial and ultimate strengths
- Impermeable to liquids and water vapour
- Minimal water absorption
- Suitable for dry and damp concrete surfaces (moisture) tolerant
- Hardening is not affected by humidity
- Thixotropic: non-sag in vertical and overhead applications
- Hardens without shrinkage
- Different coloured components (for mixing control)
- No primer needed
- Good mechanical resistance

Note: There are at least 5 types of Sikadur<sup>®</sup>-31 SBA available for substrate temperatures of +5 °C to 60 °C. Please consult our technical department.

## PRODUCT INFORMATION

|                            |   |  |            |
|----------------------------|---|--|------------|
| <b>Composition</b>         | Epoxy resin   |  |            |
| <b>Packaging</b>           | Pre-batched unit: 6 kg (A+B) , pallets of 480 kg (80 × 6 kg)  |  |            |
| <b>Colour</b>              | Component A   | white  | (FIP 5.11) |
|                            | Component B   | black  |            |
|                            | Component A+B mixed   | concrete grey  |            |
| <b>Shelf life</b>          | 24 months from date of production   |  |            |
| <b>Storage conditions</b>  | Stored properly in original, unopened, sealed and undamaged packaging in dry conditions at temperatures between +5 °C and +30 °C. Protect from direct sunlight. |  |            |
| <b>Density</b>             | 1.75 kg/l ± 0.1 kg/l (component A+B mixed) (at +20 °C)  |  |            |
| <b>Product Declaration</b> | Declaration according to FIP / fib 9/2 Proposal for a standard for acceptance tests and verification of epoxy bonding agents for segmental construction         |  |            |
|                            | <b>FIP Performance / Characteristics</b>  | <b>Requirements and Criteria</b>                               |            |
|                            | 5.1 Pot Life  | ≥ 20 min at upper limit of temperature range                   |            |
|                            | 5.2 Open Time   | ≥ 60 min at upper limit of temperature range, concrete failure |            |
|                            | 5.3 Thixotropy  | Non sagging at 3 mm thickness                                  |            |
|                            | 5.4 Squeezability   | with 15 kg load: ≥ 3 000 mm <sup>2</sup>                       |            |
|                            |   | with 200 kg load: ≥ 7 500 mm <sup>2</sup>                      |            |
|                            |   | with 400 kg load: ≥ 10 000 mm <sup>2</sup>                     |            |
|                            | 5.5 Bond strength on concrete   | 100 % concrete failure   |            |
|                            | 5.6 Curing rate   | Compressive strength   |            |
|                            |   | 12 hours: ≥ 20 N/mm <sup>2</sup>                               |            |
|                            |   | 24 hours: ≥ 40 N/mm <sup>2</sup>                               |            |
|                            |   | 7 days: ≥ 75 N/mm <sup>2</sup>                                 |            |
|                            | 5.7 Shrinkage   | ≤ 0.4 % after 7 days   |            |
|                            | 5.8 Creep   | Deferred modulus in compression:                               |            |
|                            |   | after 1 hour: ≥ 6 000 N/mm <sup>2</sup>                        |            |
|                            |   | Deferred modulus in shear:                                     |            |
|                            | after 1 hour: ≥ 1 200 N/mm <sup>2</sup>   |  |            |
| 5.9 Water absorption       | Water absorption ≤ 0.5 %  |  |            |
|                            | Solvability ≤ 0.1 %   |  |            |
| 5.10 Heat resistance       | ≥ 50 °C   |  |            |
| 5.11 Colour                | Same as concrete  |  |            |
| 5.12 Compressive strength  | At lower temperature limit  |  |            |
|                            | after 24 hours: ≥ 60 N/mm <sup>2</sup>  |  |            |
|                            | after 7 days: ≥ 75 N/mm <sup>2</sup>  |  |            |
| 5.13 E-Modulus Compressive | ≥ 8 000 N/mm <sup>2</sup>   |  |            |
| 5.14 Tensile bending       | 100 % concrete failure  |  |            |
| 5.15 Shear strength        | ≥ 12 N/mm <sup>2</sup>  |  |            |
| 5.16 E-Modulus Shear       | ≥ 1 500 N/mm <sup>2</sup>   |  |            |

## TECHNICAL INFORMATION

|   |                          |                           |                             |            |
|---|--------------------------|---------------------------|-----------------------------|------------|
| <b>Compressive Strength</b>                 | <b>Curing time</b>       | <b>Curing temperature</b> | <b>Compressive strength</b> | (EN 196)   |
|   |                          |                           |                             | (EN 12190) |
|   | 24 hours                 | +5 °C                     | ~45 N/mm <sup>2</sup>       | (FIP 5.12) |
|   | 24 hours                 | +10 °C                    | ~55 N/mm <sup>2</sup>       |            |
|   | 24 hours                 | +15 °C                    | ~80 N/mm <sup>2</sup>       |            |
|   | 7 days                   | +5 °C                     | ~85 N/mm <sup>2</sup>       |            |
| <b>Modulus of Elasticity in Compression</b> | ~8 400 N/mm <sup>2</sup> | (Instantaneous Modulus)   |                             | (EN 13412) |
|   |                          |                           |                             | (FIP 5.13) |

|                                       |  |                                   |              |
|---------------------------------------|--|-----------------------------------|--------------|
| <b>Tensile Adhesion Strength</b>      | Bond strength on dry concrete                                | 100 % concrete failure            | (FIP 5.5)    |
|                                       | Bond strength on wet concrete                                | 100 % concrete failure            |              |
|                                       | Tensile bending on dry concrete                              | 100 % concrete failure            | (FIP 5.14)   |
|                                       | Tensile bending on wet concrete                              | *                                 |              |
| * not recommended at +5 °C            |  |                                   |              |
| <b>Shear Strength</b>                 | <b>Temperature</b>   | <b>Shear strength<sup>1</sup></b> | (FIP 5.15)   |
|                                       | +5 °C  | ~15 N/mm <sup>2</sup>             |              |
|                                       | +10 °C   | ~15 N/mm <sup>2</sup>             |              |
|                                       | +15 °C   | ~15 N/mm <sup>2</sup>             |              |
| 1 Slant shear cylinder test           |  |                                   |              |
| <b>Modulus of Elasticity in Shear</b> | ~4 500 N/mm <sup>2</sup>                                     | (Instantaneous Modulus)           | (FIP 5.16)   |
| <b>Shrinkage</b>                      | Hardens without shrinkage<br>~0.06 % (after 7 days)          |                                   | (FIP 5.7)    |
| <b>Creep</b>                          | Deferred modulus in compression (1 hour)                     | ~7 500 N/mm <sup>2</sup>          | (FIP 5.8)    |
| <b>Temperature Resistance</b>         | Meets the requirements of FIP 5.10, DIN 53458 and ASTM D648. |                                   |              |
|                                       | <b>Curing Conditions</b>                                     | <b>Heat Resistance</b>            | (FIP 5.10)   |
|                                       | 10 °C  | +37 °C                            |              |
|                                       | 23 °C  | +46 °C                            |              |
| <b>Heat Deflection Temperature</b>    | <b>Curing conditions</b>                                     | <b>HDT</b>                        | (ASTM D 648) |
|                                       | 7 days / +10 °C  | +37 °C                            |              |
|                                       | 7 days / +23 °C  | +46 °C                            |              |
| <b>Water Absorption</b>               | Water absorption   | ~1.383 %                          | (FIP 5.9)    |
|                                       | Solvability  | ~ -3.75 %                         |              |

## APPLICATION INFORMATION

|                                |  |                         |                           |
|--------------------------------|--|-------------------------|---------------------------|
| <b>Mixing Ratio</b>            | Component A : component B = 2 : 1 by weight or volume  |                         |                           |
| <b>Layer Thickness</b>         | 30 mm max.<br>When using multiple units, one after the other. Do not mix the following unit until the previous one has been used in order to avoid a reduction in handling time. |                         |                           |
| <b>Sag Flow</b>                | Flow at 5 mm   |                         | (ASTM D2730)<br>(EN 1799) |
|                                | up to 5 mm (Thixotropy)  |                         | (FIP 5.3)                 |
| <b>Squeezability</b>           | <b>Squeeze load</b>  | <b>Squeeze area</b>     | (FIP 5.4)                 |
|                                | 15 kg  | ~7 500 mm <sup>2</sup>  |                           |
|                                | 200 kg   | ~1 200 mm <sup>2</sup>  |                           |
|                                | 400 kg   | ~12 800 mm <sup>2</sup> |                           |
| <b>Product Temperature</b>     | Sikadur®-31 SBA S-07 must be at a temperature of between +5 °C and +30 °C for application.   |                         |                           |
| <b>Ambient Air Temperature</b> | +5 °C min. / +10 °C max.   |                         |                           |

|                                   |  |                             |            |
|-----------------------------------|--|-----------------------------|------------|
| <b>Dew Point</b>                  | Beware of condensation.<br>Substrate temperature during application must be at least 3 °C above dew point.   |                             |            |
| <b>Substrate Temperature</b>      | +5 °C min. / +10 °C max.   |                             |            |
| <b>Substrate Moisture Content</b> | When applied to mat moisture concrete, brush the adhesive well into substrate.   |                             |            |
| <b>Pot Life</b>                   | Quantity: 1 liter (~1.75 kg)   |                             |            |
|                                   | <b>Temperature</b>   | <b>Pot Life</b>             | (ISO 9514) |
|                                   | +5 °C  | ~75 minutes                 | (FIP 5.1)  |
|                                   | +10 °C   | ~50 minutes                 |            |
|                                   | The pot life starts when the resin and hardener are mixed. It is shorter at high temperatures and longer at low temperatures. The larger the quantity mixed, the shorter the pot life. |                             |            |
| <b>Open Time</b>                  | <b>Temperature</b>   | <b>Open time</b>            | (ISO 9514) |
|                                   | +5 °C  | ~75 minutes                 | (FIP 5.2)  |
|                                   | +10 °C   | ~60 minutes                 |            |
| <b>Curing Rate</b>                | <b>Time</b>  | <b>Compressive Strength</b> | (FIP 5.6)  |
|                                   | 12 hours   | ~23 MPa                     |            |
|                                   | 24 hours   | ~45 MPa                     |            |
|                                   | 7 days   | ~85 MPa                     |            |
|                                   | all values at +5 °C  |                             |            |

## APPLICATION INSTRUCTIONS

### SUBSTRATE QUALITY

Concrete should be cured for at least 28 days, (depends on minimal requirement of strengths) and have an open textured profile. Any cement laitance should be removed.

Substrate must be sound and free of all loose or friable particles with a minimum compressive strength 25 N/mm<sup>2</sup> and a minimum pull off 1.5 N/mm<sup>2</sup>.

Substrate must be clean and free of all contaminants such as dirt, oils and grease, surface treatments or coatings etc.

Substrate must be dry or mat damp and free from any standing water, ice etc.

### SUBSTRATE PREPARATION

Concrete:

The surfaces must be cleaned and mechanically prepared to achieve the desired substrate quality.

### 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 (max. 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 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.

### APPLICATION METHOD / TOOLS

Apply the mixed adhesive to the prepared surface with

a spatula, trowel, notched trowel, or with hands protected by gloves.

### CLEANING OF EQUIPMENT

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

## IMPORTANT CONSIDERATIONS

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.

## 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

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 deliverance 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.