

## PRODUCT DATA SHEET

# Sikadur<sup>®</sup>-42+ HE Cold Climate

High-performance epoxy grout for cold climates

### DESCRIPTION

Sikadur<sup>®</sup>-42+ HE Cold Climate is a three-part, high-performance, moisture-tolerant epoxy grout which develops high early strength. It is suitable for many static or dynamic precision grouting applications. It has a layer thickness of 10 mm to 150 mm and an application temperature range of +5 °C to +30 °C.

### USES

Sikadur<sup>®</sup>-42+ HE Cold Climate may only be used by experienced professionals.

Sikadur<sup>®</sup>-42+ HE Cold Climate is used for high-strength grouting and fixing of the following elements:

- Starter bars
- Anchors
- Tie rods
- Fasteners
- Crash barrier posts
- Fence and railing posts

Sikadur<sup>®</sup>-42+ HE Cold Climate is used for precision undergrouting and bedding of the following elements:

- Machine bases, base plates for light and heavy machinery including heavy-impact and vibratory machinery, reciprocating engines, compressors, pumps and presses
- Bridge bearings

Sikadur<sup>®</sup>-42+ HE Cold Climate is used for repairing the following concrete elements:

- Spalled concrete structures (not EN 1504-3 compliant)
- Industrial floor slabs
- Hole and void filling
- Runways
- Hardstandings
- Car park decks

Sikadur<sup>®</sup>-42+ HE Cold Climate is used for interior and exterior applications.

### FEATURES

- High compressive strength
- Ready-to-mix, pre-batched units
- Good flowability
- Moisture-tolerant
- Good mechanical resistance
- Very low shrinkage
- Low coefficient of thermal expansion
- Good creep resistance
- Good resistance to vibration
- High reactivity for low temperature application (+5 °C) and fast strength gain
- Impermeable to most liquids and water vapour
- Pumpable

### SUSTAINABILITY

- Contributes towards satisfying Materials and Resources (MR) Credit: Building product disclosure and optimization — Environmental Product Declarations under LEED<sup>®</sup> v4 — 1 point
- Contributes towards satisfying Materials and Resources (MR) Credit: Building Product Disclosure and Optimization — Material Ingredients under LEED<sup>®</sup> v4 — 1 point
- Environmental Product Declaration (EPD) in accordance with EN 15804. EPD independently verified by Institut für Bauen und Umwelt e.V. (IBU)

### CERTIFICATES AND TEST REPORTS

- CE marking and declaration of performance based on EN 1504-6:2004 Products and systems for the protection and repair of concrete structures — Anchoring reinforcing steel bar

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Sikadur<sup>®</sup>-42+ HE Cold Climate

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## PRODUCT INFORMATION

<b>Composition</b>	Epoxy resin and selected fillers and aggregates	
<b>Packaging</b>	Prebatched unit Part A + Part B + Part C	5.1 kg
	Prebatched units per pallet	44 x 5.1 kg (224.4 kg)
	Prebatched unit Part A + Part B + Part C	20.4 kg
	Prebatched units per pallet	12 x 20.4 kg (244.8 kg)
	Bulk Part A + Part B + Part C	142.5 kg
	Bag Part C sold separately	17.65 kg
	Refer to the current price list for available packaging variations.	
<b>Colour</b>	Grey	
<b>Shelf life</b>	24 months from date of production	
<b>Storage conditions</b>	The Product must be stored in original, unopened and undamaged sealed packaging in dry conditions at temperatures between +5 °C and +30 °C. Always refer to the packaging. Refer to the current Safety Data Sheet for information on safe handling and storage.	
<b>Density</b>	Part A+B+C mixed	2 300 kg/m <sup>3</sup>
<b>Appearance</b>	Part A	Liquid
	Part B	Liquid
	Part C	Powder

## TECHNICAL INFORMATION

<b>Compressive strength</b>	<b>Curing time</b>	<b>+5 °C curing temperature</b>	<b>+15 °C curing temperature</b>	<b>+23 °C curing temperature</b>	(ASTM C579)
	1 day	15 N/mm <sup>2</sup>	73 N/mm <sup>2</sup>	89 N/mm <sup>2</sup>	
	3 days	78 N/mm <sup>2</sup>	82 N/mm <sup>2</sup>	98 N/mm <sup>2</sup>	
	7 days	91 N/mm <sup>2</sup>	101 N/mm <sup>2</sup>	105 N/mm <sup>2</sup>	
	28 days	92 N/mm <sup>2</sup>	105 N/mm <sup>2</sup>	110 N/mm <sup>2</sup>	
<b>Modulus of elasticity in compression</b>	21 000 N/mm <sup>2</sup>			(EN 196-1)	
<b>Effective bearing area</b>	> 85 %			(ASTM C1339)	
<b>Flexural-strength</b>	30 N/mm <sup>2</sup>			(ISO 178)	
	27 N/mm <sup>2</sup>			(ASTM C580)	
<b>Modulus of elasticity in flexure</b>	18 000 N/mm <sup>2</sup>			(ASTM C580)	
<b>Tensile strength</b>	15 N/mm <sup>2</sup>			(EN ISO 527-2)	
	12 N/mm <sup>2</sup>			(ASTM C307)	
<b>Pull-out resistance</b>	> 75 kN			(EN 1881)	
<b>Shrinkage</b>	-0.018 %			(DIN 52450)	
<b>Creep</b>	at 4.14 N/mm <sup>2</sup> (600 psi) and +60 °C	0.98 %		(ASTM C1181)	
	at 2.76 N/mm <sup>2</sup> (400 psi) and +60 °C	0.81 %			

<b>Tensile adhesion strength</b>	Slant shear	> 19 N/mm <sup>2</sup> (concrete failure)	(ASTM C882)
	On steel	8.5 N/mm <sup>2</sup>	(EN 1542)
	On concrete	4 N/mm <sup>2</sup> (concrete failure)	
<b>Coefficient of thermal expansion</b>	-30 °C to 0 °C	2.01 × 10 <sup>-5</sup> 1/K	(EN 1770)
	0 °C to +30 °C	2.38 × 10 <sup>-5</sup> 1/K	
	+30 °C to +60 °C	2.05 × 10 <sup>-5</sup> 1/K	
<b>Service temperature</b>	Maximum	+60 °C	
	Minimum	-40 °C	
<b>Heat deflection temperature</b>	Cured for 7 days at +23 °C	+53 °C	(ASTM D648)
<b>Water absorption</b>	Coefficient W, cured 7 days	0.018 %	(ASTM C413)
<b>Elongation at break</b>	0.1 %		(EN ISO 527-2)

## APPLICATION INFORMATION

<b>Mixing ratio</b>	Part A : B : C	4 : 1 : 32.5 (by weight)	
	Liquid (A+B) : solid (C)	1 : 6.5 (by weight)	
	Depending on the project, the amount of Part C can be increased as follows:		
	Part A : B : C	4 : 1 : 37.5 (by weight)	
	Liquid (A+B) : solid (C)	1 : 7.5 (by weight)	
For further information contact Sika Technical Services.			
<b>Consumption</b>	~2.3 kg/m <sup>2</sup> per 1 mm layer thickness. NOTE: Consumption data is theoretical and does not allow for any additional material due to surface porosity, surface profile, variations in level, wastage or any other variations. Apply product to a test area to calculate the exact consumption for the specific substrate conditions and proposed application equipment.		
<b>Yield</b>	Each 20.4kg kit will yield ~8.85 litres of mixed material.		
<b>Layer thickness</b>	Maximum	150 mm	
	Minimum	10 mm	
<b>Peak exotherm</b>	Tested at + 23 °C	+45 °C	(ASTM D2471)
<b>Material temperature</b>	Maximum	+30 °C	
	Minimum	+5 °C	
<b>Ambient air temperature</b>	Maximum	+30 °C	
	Minimum	+5 °C	
<b>Dew point</b>	Beware of condensation. Substrate temperature during application must be at least +3 °C above dew point.		
<b>Substrate temperature</b>	Maximum	+30 °C	
	Minimum	+5 °C	
<b>Substrate moisture content</b>	<b>Substrate</b>	<b>Test method</b>	<b>Moisture content</b>
	Cementitious substrates	Calcium carbide method (CM method)	≤ 4 %
	No rising moisture (ASTM D4263, polyethylene sheet)		

## Pot Life

Temperature	Time
+5 °C	100 minutes
+15 °C	80 minutes
+23 °C	60 minutes

Note: Pot life begins when the resin and hardener are mixed.

Note: Pot life is shorter at high temperatures and longer at low temperatures.

Note: The greater the quantity of product mixed, the shorter the pot life.

Note: Apply the following methods for obtaining a longer pot life at high temperatures:

1. Divide the mixed product into smaller quantities.
2. Cool down parts A and B before mixing. Do not cool below +5 °C.

<b>Flowability</b>	Slump test, 90 min at +23 °C	280 mm	(EN 13395-1)
	Flow channel, 5 min at +23 °C	165 mm	(EN 13395-2)
	Flow channel, 90 min at +23 °C	560 mm	
	Flow time	6 seconds	(ASTM C1339)
	Fill time	15 seconds	

## 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.

## FURTHER DOCUMENTATION

Refer to the following method statement: Sikadur®-42 Epoxy resin based grout. Contact Sika Technical Services for specific bolt grouting applications and for control joint spacing on large base plate grouting projects.

## 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 PREPARATION

#### IMPORTANT

#### Reduced adhesion due to surface contamination

Surface contaminants such as dust and loose material, including the contaminants generated during substrate preparation, can reduce the Product's performance.

1. Before applying the Product, thoroughly clean all substrate surfaces using vacuum or dust removal equipment.

#### IMPORTANT

#### Damage to the substrate or equipment due to vibration

For optimum results when grouting critical equipment, follow the surface preparation requirements of the latest edition of the American Petroleum Institute Recommended Practice 686 "Machinery Installation and Installation Design", Chapter 5.

Verify the substrate strength to ensure design strengths are achieved.

#### CONCRETE

Substrates must be sound, clean, dry or matt damp but free of standing water. Substrates must be free of contaminants such as ice, dirt, oil, grease, coatings, laitance, efflorescence, surface treatments and loose friable material.

Concrete must be at least 28 days old.

Suitable techniques for substrate preparation include the following:

- Hand-chiselling
- Abrasive blast cleaning
- Grinding
- Light scabbling
- Needle gunning
- Bush hammering
- High-pressure water blasting

1. Prepare the substrate mechanically using a suitable technique.
2. Remove any debris from pockets or holes for structural fixings.

The substrate has an open-textured, gripping surface profile.

## STEEL

Surfaces must be cleaned and prepared thoroughly to a quality standard equivalent to SA 2.5 (bright metal) with a surface profile to satisfy the necessary tensile adhesion strength requirement.

Surfaces must be sound, clean, and free of contaminants such as dirt, oil, grease, coatings, rust and loose friable material.

For best results, the substrate must be dry.

1. **IMPORTANT** Avoid dew point conditions. Prepare the substrate mechanically using a suitable technique such as blast-cleaning or grinding.
2. Remove any debris, for example by vacuum equipment.
3. Apply the Product immediately to prevent re-oxidizing and rust formation.

## MIXING

### IMPORTANT

#### **Poor workability and unfavourable handling time due to wrong mixing**

1. When using multiple units during application, do not mix the following unit until the previous unit has been used.

### IMPORTANT

#### **Change in properties caused by addition of solvents**

Solvents can prevent proper curing and change mechanical properties.

1. Do not thin with solvents.

### IMPORTANT

#### **Excess heat due to delay in adding Part C**

Mixing Part A and Part B causes an exothermic reaction to take place. Excess heat and smoke is generated if there is a delay in adding Part C.

1. Adding Part C helps to reduce the heat from the exothermic reaction because some of the heat is absorbed by the aggregate.
2. Add Part C as soon as Parts A + B are sufficiently mixed.

### PRE-BATCHED UNITS

1. **IMPORTANT** Mix full units only. Prior to mixing all parts, mix Part A (resin) and Part B (hardener) briefly using a mixing spindle attached to a slow speed electric mixer (max. 300 rpm).
2. Add Part B (hardener) to Part A.
3. Mix Parts A + B continuously for at least 3 minutes until a uniformly coloured mix with a smooth consistency has been achieved.
4. Pour the mixture into a suitable mixing container.
5. While mixing Parts A + B, gradually add Part C (aggregate).
6. **IMPORTANT** Do not mix excessively. Mix until a uniform mix is achieved.

### BULK PACKAGING

1. Prior to mixing all parts, mix Part A (resin) and Part B (hardener) briefly using a mixing spindle attached to a slow speed electric mixer (max. 300 rpm).
2. Add Parts A + B in the correct proportions into a mixing container.
3. Mix Parts A + B continuously for at least 3 minutes until a uniformly coloured mix with a smooth consistency has been achieved.
4. While mixing Parts A + B, gradually add the correct proportion of Part C (aggregate).
5. **IMPORTANT** Do not mix excessively. Mix until a uni-

form mix is achieved.

## APPLICATION

### IMPORTANT

#### **Damage due to excessive long-term load**

Sikadur® resins are formulated to have low creep under long-term load. However, due to the creep behaviour of all polymer materials under load, the long-term structural design load must account for creep.

1. Ensure that the long-term structural design load is lower than  $\frac{1}{4}$  to  $\frac{1}{5}$  of the short-term failure load.
2. Consult a structural engineer for calculating the admissible load for the specific application.

### FORMWORK

1. Select suitable formwork (permanent or temporary) to contain the grout around areas such as base plates.
2. Ensure all edges and joints of the formwork are sealed tightly to prevent leakage or seepage of the grout.
3. Coat all surfaces of the formwork that will come into contact with the grout with polyethylene film or wax to prevent adhesion.
4. Arrange the formwork to maintain a liquid head of more than 100 mm to facilitate the placement of the grout.
5. Attach a grout box with an inclined trough to the formwork to enhance grout flow and minimize air encapsulation.

### GROUTING WITH FORMWORK

1. **IMPORTANT** Maintain a 100 mm grout head to avoid trapping air. Ensure continuous grout flow during the complete grouting operation. Pour the mixed grout into the formwork from one or two sides only.
2. Place sufficient grout in the formwork to rise slightly above the underside (3 mm) of the base plate.
3. Where the void beneath the base plate is greater than the maximum allowable grout thickness (see Layer thickness), place the grout in successive lifts once the preceding lift has hardened and cooled.
4. Keep the last lift to maximum 50 mm.
5. Once hardened, check the adhesion by tapping with a hammer.

## CLEANING OF EQUIPMENT

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

## 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.

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## 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.

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