BUILDING TRUST

PRODUCT DATA SHEET

Sikadur®-42+ HE Cold Climate

High-performance epoxy grout for cold climates

PRODUCT DESCRIPTION

Sikadur®-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®-42+ HE Cold Climate installation works to be carried out only by Sika Approved Contractors. Please observe information given by Product Data Sheets.

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

CHARACTERISTICS / ADVANTAGES

- 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

ENVIRONMENTAL INFORMATION

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

APPROVALS / STANDARDS

- 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

PRODUCT INFORMATION

Chemical Base	Epoxy resin and selected fillers and aggregates	
Packaging	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.	
Colour	Grey	
Shelf Life	24 months from date of production	
Storage Conditions	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.	
Density	Part A+B+C mixed	2 300 kg/m³
Colour	Part A	Liquid
	Part B	Liquid
	Part C	Powder

TECHNICAL INFORMATION

Compressive Strength	**Curing time**	**+5 °C curing temperature**	**+15 °C curing temperature**	**+23 °C curing temperature**	(ASTM C579)
	1 day	15 N/mm²	73 N/mm²	89 N/mm²	
	3 days	78 N/mm²	82 N/mm²	98 N/mm²	
	7 days	91 N/mm²	101 N/mm²	105 N/mm²	
	28 days	92 N/mm²	105 N/mm²	110 N/mm²	
Modulus of Elasticity in Compression	21 000 N/mm²				(EN 196-1)
Effective Bearing Area	> 85 %				(ASTM C1339)
Flexural Strength	30 N/mm²				(ISO 178)
	27 N/mm²				(ASTM C580)
Flexural E-Modulus	18 000 N/mm²				(ASTM C580)
Tensile Strength	15 N/mm²				(EN ISO 527-2)
	12 N/mm²				(ASTM C307)
Pull-Out Resistance	> 75 kN				(EN 1881)
Shrinkage	-0.018 %				(DIN 52450)
Creep	at 4.14 N/mm² (600 psi) and +60 °C	0.98 %			(ASTM C1181)
	at 2.76 N/mm² (400 psi) and +60 °C	0.81 %			

Tensile adhesion strength	Slant shear	> 19 N/mm² (concrete failure)	(ASTM C882)
	On steel	8.5 N/mm²	(EN 1542)
	On concrete	4 N/mm² (concrete failure)	
Coefficient of Thermal Expansion	-30 °C to 0 °C	2.01×10^{-5} 1/K	(EN 1770)
	0°C to +30 °C	2.38×10^{-5} 1/K	
	+30 °C to +60 °C	2.05×10^{-5} 1/K	
Service Temperature	Maximum	+60 °C	
	Minimum	-40 °C	
Heat deflection temperature	Cured for 7 days at +23 °C	+53 °C	(ASTM D648)
Water Absorption	Coefficient W, cured 7 days	0.018 %	(ASTM C413)
Elongation at break	0.1 %		(EN ISO 527-2)

APPLICATION INFORMATION

Mixing Ratio	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.	
Layer Thickness	Maximum	150 mm
	Minimum	10 mm
Peak Exotherm	Tested at + 23 °C	+45 °C (ASTM D2471)
Product Temperature	Maximum	+30 °C
	Minimum	+5 °C
Ambient Air Temperature	Maximum	+30 °C
	Minimum	+5 °C
Dew Point	Beware of condensation. Substrate temperature during application must be at least +3 °C above dew point.	
Substrate Temperature	Maximum	+30 °C
	Minimum	+5 °C

Substrate Moisture Content

Substrate	Test method	Moisture content
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.

Flowability

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	

VALUE BASE

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

FURTHER DOCUMENTS

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

Local safety regulations must be observed and it advisable to wear PPI when working with this product with particular attention paid to cutting and handling.
Transportation Class: The product is not classified as hazardous good for transport. Disposal: The material is recyclable. Disposal must be according to local regulations. Please contact your local Sika sales organisation for more information.

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 uniform 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 ¼ to ⅕ 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 TOOLS

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

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.

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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