

PRODUCT DATA SHEET

Sikadur®-42 HE

3-PART, HIGH PERFORMANCE EPOXY GROUTING SYSTEM

DESCRIPTION

Sikadur®-42 HE is a three-component, high performance, high precision, moisture tolerant, epoxy grouting system. For use at temperatures between +5 °C and +30 °C.

USES

Sikadur®-42 HE may only be used by experienced professionals.

Sikadur®-42 HE is used for:

High-strength grouting and fixing of:

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

Under-grouting and bedding of:

- Precision seating of base plates
- Machine bases, seat base-plates for light and heavy machinery including heavy impact and vibratory machinery, reciprocating engines, compressors, pumps, presses, etc.
- Bridge bearings
- Mechanical joints (i.e. road/bridge/deck types etc.)

Sleeper-less, direct rail fixing:

- Crane tracks
- Light rail and permanent way in tunnels
- Light rail and permanent way over bridges

CHARACTERISTICS / ADVANTAGES

- High early strength and fast curing
- Also applicable at low temperatures
- Ready-to-mix, pre-batched units
- Moisture tolerant
- Non-shrink
- Corrosion and chemically resistant
- Stress and impact resistant
- High compressive strength
- High vibration resistance
- Low coefficient of thermal expansion
- Good creep resistance

APPROVALS / STANDARDS

- Anchoring product for reinforcing steel bar according to EN 1504-6:2006, provided with the CE mark.

PRODUCT INFORMATION

Chemical Base	Epoxy resin
Packaging	Pre-batched unit: 12 kg (A+B+C), pallets of 252 kg (21 x 12 kg)
Colour	Concrete Grey
Shelf Life	24 months from date of production

Storage Conditions

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

Density ~2 140 kg/m³ (A+B+C)

TECHNICAL INFORMATION

Compressive Strength	Curing time	Curing temperature			(ASTM C579)
		+5 °C	+23 °C	+30 °C	
	1 day	—	~ 87 N/mm ²	~ 90 N/mm ²	
	3 days	~ 72 N/mm ²	~ 91 N/mm ²	~ 98 N/mm ²	
	7 days	~ 87 N/mm ²	~ 95 N/mm ²	~ 99 N/mm ²	
	28 days	~ 90 N/mm ²	~100N/mm ²	~105N/mm ²	

Product cured and tested at temperatures indicated.
Test specimen size: 50 * 50 * 50 mm

	Curing time	Curing temperature			(ASTM D695-96)
		+5 °C	+23 °C	+30 °C	
	6 hours	—	—	~ 43 N/mm ²	
	12 hours	—	~ 44 N/mm ²	~ 77 N/mm ²	
	1 day	—	~ 58 N/mm ²	~ 80 N/mm ²	
	3 days	~ 32 N/mm ²	~ 59 N/mm ²	~ 82 N/mm ²	
	7 days	~ 72 N/mm ²	~ 77 N/mm ²	~ 85 N/mm ²	
	28 days	~ 81 N/mm ²	~ 90 N/mm ²	~ 95 N/mm ²	

Product cured and tested at temperatures indicated.
Test specimen size: 12.7 * 12.7 * 25.4mm

Modulus of Elasticity in Compression ~ 18 000 N/mm² (ASTM D695-96)

Effective Bearing Area >90% (ASTM C1339)

Tensile Strength in Flexure ~ 42 N/mm² (ASTM C580)
~ 35 N/mm² (EN 53452)

Modulus of Elasticity in Flexure ~ 15 000 N/mm² (EN 53452)

Tensile Strength ~ 15 N/mm² (ASTM D638)
~ 15 N/mm² (ISO 527)
~ 12 N/mm² (ASTM C 307)

Modulus of Elasticity in Tension ~ 12 000 N/mm² (ASTM C580)

Elongation at Break ~ 1.4% (ASTM D638)
0.1 ± 0.05% (7 days at +23 °C) (ISO 75)

Shrinkage -0.012% (ASTM C531)
-0.01% (EN 52450)

Creep 0.50% at 4.14 N/mm² (600 psi) / 31 500 N (+60 °C) (ASTM C1181)
0.14% at 2.76 N/mm² (400 psi) / 21 000 N (+60 °C)
API requirements: 0.5% with 2.76 N/mm² load

Tensile Adhesion Strength > 35 N/mm² (concrete failure) (slant shear) (ASTM C882)
~ 11 N/mm² (on steel) (ISO 4624, EN 1542, EN 12188)
> 3.5 N/mm² (concrete failure)

Thermal Compatibility No delamination / pass (ASTM C884)

Coefficient of Thermal Expansion	$2.2 \times 10^{-5} 1/K$	$-30\text{ °C} - +30\text{ °C}$	(ASTM C531)
	$3.8 \times 10^{-5} 1/K$	$+24\text{ °C} - +100\text{ °C}$	
	$1.9 \times 10^{-5} 1/K$	$+23\text{ °C} - +60\text{ °C}$	(EN 1770)
Heat Deflection Temperature	+54 °C (7 days / +23 °C)		(ISO 75)
Water Absorption	0.12% (7 days)		(ASTM C413)

APPLICATION INFORMATION

Mixing Ratio	Component A : B : C = 6 : 1 : (28–35) by weight Solid / liquid = (4–5) : 1 by weight		
Layer Thickness	Minimum grout depth: 10 mm Maximum grout depth: 50 mm		
	Temperature	Layer thickness max.	
	5 °–15 °C	50 mm	
15 °–30 °C	50 mm*		
* no reduction of fillers; apply only with Mixing Ratio A : B : C = 6 : 1 : 35			
Peak Exotherm	64 °C (at +23 °C)		(ASTM D 2471)
Product Temperature	Sikadur®-42 HE must be applied at temperatures between +5 °C and +30 °C. Condition the material by also storing at this temperature for 48 hours before use.		
Ambient Air Temperature	+5 °C min. / +30 °C max.		
Dew Point	Substrate temperature during application must be at least 3 °C above dew point to avoid condensation.		
Substrate Temperature	+5 °C min. / +30 °C max.		
Substrate Moisture Content	≤ 4% pbw		
Pot Life	(200 g, adiabatic testing)		
		+20 °C	+30 °C
	6 : 1 : 35	80 minutes	55 minutes
The pot life begins 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. To obtain longer workability at high temperatures, the mixed adhesive may be divided into portions. Another method is to chill components A+B and C before mixing them (i.e. only when application temperatures are above +20 °C).			

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

Mortar and concrete must be older than 28 days (dependent on minimum strength requirements). Verify the substrate strength (concrete, natural stone etc.).
The substrate surface (all types) must be clean, dry and free from contaminants such as dirt, oil, grease, existing surface treatments and coatings etc.
Steel substrates must be de-rusted to a standard equivalent to Sa 2.5.
The substrate must be sound and all loose particles must be removed.
Substrate must be dry or mat damp and free from any standing water, ice etc.

SUBSTRATE PREPARATION

Concrete, mortar, stone:
Substrates must be sound, dry, clean and free from laitance, ice, standing water, grease, oils, old surface treatments or coatings and all loose or friable particles must be removed to achieve a laitance and contaminant free, open textured surface.
Steel:
Must be cleaned and prepared thoroughly to an acceptable quality standard equivalent to SA 2.5 i.e. by blast cleaning and vacuum. Avoid dew point conditions.
Surface and base plate contact area must be clean and sound. For best results, the substrate shall be dry. Remove dust, laitance, oils, grease, curing compounds, impregnations, waxes, foreign particles, coatings, and disintegrated materials by mechanical means, i.e. chipping with a chisel, blast cleaning etc.

All anchor pockets or sleeves must be free of water. Apply grout immediately to prevent re-oxidizing / rust formation.

For optimum results:

When grouting areas or equipment that is sensitive to vibration, it is recommended that the contact surfaces are prepared according to the latest edition of the American Petroleum Institute's Recommended Practice 686 "Machinery Installation and Installation Design", Chapter 5.

MIXING

Pre-batched units:

Mix components A and B in the component A pail for approx. 30–60 seconds with a paddle attached to a low speed drill (300–450 rpm). Avoid aeration while mixing until the material becomes uniformly blended in colour and viscosity. Place the mixed epoxy into an appropriate mixing vessel. Slowly add the contents of component C (to keep air entrapment at a minimum) dependent on flow requirements (observe the correct mixing ratio) and mix until uniform and homogeneous. (approx. 3 min)

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. Mix the components. Use an electric low speed mixer etc. as above for the pre-batched units. Never mix component A and B without adding component C (as the exothermic reaction between A and B alone generates excess heat)

Leave Sikadur®-42 HE to stand in the mixing vessel until the majority of entrained air bubbles have dispersed.

APPLICATION METHOD / TOOLS

Forming:

The consistency of the Sikadur®-42 HE epoxy grout system requires the use of permanent or temporary forms to contain the material around base plates, for example. In order to prevent leakage or seepage, all of these formers must be sealed. Apply polyethylene film or wax to all forms to prevent adhesion of the grout. Prepare the formwork to maintain more than 100 mm liquid head to facilitate placement. A grout box equipped with an inclined trough attached to the form will enhance the grout flow and minimize air encapsulation.

Pour the mixed grout into the prepared forms from one or two sides only, to eliminate air entrapment. Maintain the liquid head to ensure intimate contact to the base plate. Place sufficient epoxy grout in the forms to rise slightly above the underside (3 mm) of the base plate. The minimum void depth beneath the baseplate shall be 12 mm. Where the void beneath the base plate is greater than 50 mm, place the epoxy grout in successive 50 mm lifts or less, once the preceding lift has cooled.

Once hardened check the adhesion by tapping with a hammer.

Please refer also to the "Method Statement Sikadur®-42" Ref: 850 42 01

CLEANING OF TOOLS

Sweep excess grout into appropriate containers for disposal before it has hardened.

Dispose of in accordance with applicable local regulations. Uncured material can be removed with Sika Colma Cleaner. Cured material can only be removed mechanically.

LIMITATIONS

Minimum substrate temperature: 5 °C. The material must be conditioned by being stored in an area with an ambient temperature between 5 ° and 30 °C for a minimum of 48 hours before using. Do not thin with solvents. Solvents will prevent proper curing and change mechanical properties.

Sikadur®-42 HE is a vapour barrier when cured. Minimum grout depth: 12 mm. Maximum grout depth: 50 mm per lift. Component C must be kept dry. For specific bolt grouting applications please refer to Sika technical service. For proper seating, allow the grout to rise above the bottom (3 mm) of the base plate. Avoid splitting pre-batched units to mix. Mix complete units only. Cold ambient, substrate or material temperatures will influence the curing and flow characteristics of Sikadur®-42 HE. Do not subject cured epoxy grout to sudden temperature changes especially during early curing stages. Contact Sika Technical Services for control joint spacing on large base plate grouting projects.

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.

Please refer also to the "Method Statement Sikadur®-42" Ref: 850 42 01

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.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

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. It may be necessary to adapt the above disclaimer to specific local laws and regulations. Any changes to this disclaimer may only be implemented with permission of Sika® Corporate Legal in Baar.

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