

Sikadur®-42 HE

3-part, high performance epoxy grouting system

Product 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

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
-

Construction



Tests

Approval / Standards Testing according to EN 1504-6.

Product Data

Form

Appearance / Colour Concrete Grey

Packaging 12 kg (A+B+C): pre-batched unit, pallets of 252 kg (21 x 12 kg)
Bulk packaging (not pre-batched):
144 kg (A+B+C)
Component C (Sikadur-514) bag for 24kg units, pallets of 960 kg (40 x 24 kg)

Storage

Storage Conditions/ Shelf-Life 24 months from date of production if stored properly in original and unopened, sealed and undamaged packaging, in dry conditions at temperatures between +5°C and +30°C. Protect from direct sun light.

Technical Data

Chemical Base Epoxy resin.

Density 2'140 kg/m³ (A+B+C)

Layer Thickness Minimum grout depth: 12 mm
Maximum grout depth: 50 mm

Temperature	5°-15°C	15°-30°C
Layer Thickness max.	50mm	50mm*

* no reduction of fillers; apply only with Mixing Ratio A : B : C = 6 : 1 : 35

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

Linear Shrinkage: -0.012% (According to ASTM C531)

Shrinkage: -0.01% (According to EN 52450)

Thermal Expansion Coefficient 2.2 x 10⁻⁵ mm/mm/°C (Temp. range -30°C - +30°C) (According to ASTM C531)
3.8 x 10⁻⁵ mm/mm/°C (Temp. range +24°C - +100°C)

1.9 x 10⁻⁵ mm/mm/°C (Temp. range 23°C - +60°C) (According to EN 1770)

Water Absorption Coefficient W 0.12% (7 days) (According to ASTM C413)

Thermal Stability Heat Deflection Temperature HDT:
HDT = +54°C (7 days / +23°C) (According to ISO 75)

Effective Bearing Area > 90% (According to ASTM C 1339)

Mechanical / Physical Properties

Compressive Strength

(According to ASTM C-579)

Curing time	+5°C	+23°C	+30°C
1 day	-- N/mm ²	~ 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	~ 100 N/mm ²	~ 105 N/mm ²

Product cured and tested at temperatures indicated.

Test specimen size: 50 * 50 * 50 mm

(According to ASTM D695-96)

Curing time	+5°C	+23°C	+30°C
6 h	-- N/mm ²	-- N/mm ²	~ 43 N/mm ²
12 h	-- N/mm ²	~ 44 N/mm ²	~ 77 N/mm ²
1 day	-- N/mm ²	~ 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

Flexural Strength	~ 42 N/mm ²	(According to ASTM C580)
	~ 35 N/mm ²	(According to EN 53452)
Tensile Strength	~ 15 N/mm ²	(According to ASTM D638)
	~ 15 N/mm ²	(According to ISO 527)
	~ 12 N/mm ²	(According to ASTM C 307)
Bond Strength	> 35 N/mm ² (concrete failure) (slant shear)	(According to ASTM C882)
	(According to According to ISO 4624, EN 1542 and EN 12188)	
	~ 11 N/mm ² (on steel)	
	> 3.5 N/mm ² (concrete failure)	
E-Modulus	~ 12'000 N/mm ² (Tangent modulus of elasticity in bending)	(ASTM C580)
	~ 18'000 N/mm ² (Compressive)	(According to ASTM D695-96)
	~ 15'000 N/mm ² (Flexural)	(According to EN 53452)
Elongation	~ 1.4%	(ASTM D638)
Elongation at Break	0.1 ± 0.05% (7 days at +23°C)	(According to ISO 75)
Strength Development	Confirm the strength development by producing cubes on site and testing them for compressive and flexural strength.	
Thermal Compatibility	No delamination / pass	(According to ASTM C884)
Exotherm Peak	64°C (at +23°C)	(According to ASTM D 2471)

System Information

Application Details

Substrate Quality	<p>Mortar and concrete must be older than 28 days (dependent on minimum strength requirements).</p> <p>Verify the substrate strength (concrete, natural stone etc.).</p> <p>The substrate surface (all types) must be clean, dry and free from contaminants such as dirt, oil, grease, existing surface treatments and coatings etc.</p> <p>Steel substrates must be de-rusted to a standard equivalent to Sa 2.5.</p> <p>The substrate must be sound and all loose particles must be removed.</p> <p>Substrate must be dry or mat damp and free from any standing water, ice etc.</p>
Substrate Preparation	<p>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.</p> <p>Steel: Must be cleaned and prepared thoroughly to an acceptable quality standard equivalent to SA 2.5 i.e. by blastcleaning and vacuum. Avoid dew point conditions.</p> <p>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, blastcleaning etc.</p> <p>All anchor pockets or sleeves must be free of water. Apply grout immediately to prevent re-oxidizing / rust formation.</p> <p>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.</p>

Application Conditions / Limitations

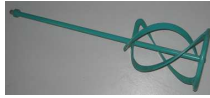
Substrate Temperature	+5°C min. / +30°C max.
Ambient Temperature	+5°C min. / +30°C max.
Material Temperature	Sikadur [®] -42 HE must be applied at temperatures between +5°C and +30°C Condition the material by also storing at this temperature for 48 hours before use
Substrate Moisture Content	≤ 4 % pbw
Dew Point	Substrate temperature during application must be at least 3°C above dew point to avoid condensation.

Application Instructions

Mixing

Part A : B : C = 6 : 1 : (28-35) by weight
Solid / liquid = (4-5) : 1 by weight

Mixing Time



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 potlife.

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 base-plate 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.

Refer also to the "Technical Information Manual 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 Thinner C. Cured material can only be removed mechanically.

Potlife

(200 g, adiabatic testing)

6 : 1 : 35	+20°C	+30°C
	80 minutes	55 minutes

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 parts A+B and C before mixing them (i.e. only when application temperatures are above +20°C).

Notes on Application / 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 h 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 Services. For proper seating, allow the grout to rise above the bottom (3 mm) of the base plate.

Avoid splitting prebatched 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.

Refer also to the "Technical Information Manual Sikadur®-42" Ref: 850 42 01

Value Base

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.

Health and Safety Information

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Material Safety Data Sheet 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.

CE Labelling

CE		
0921		
Sika Schweiz AG Tueffenwies 16-22 CH - 8048 Zuerich 1001		
08		
0921-CPD-2056		
EN 1504-6		
Anchoring Product		
Pull-out strength displacement (at load of 75 kN)	dry concrete wet concrete	≤ 0.6 mm ≤ 0.6 mm
Glass Transition temperature		$\geq 45^{\circ}\text{C}$
Creep under tensile load Displacement (after continuous loading of:)	50 kN for 3 months	≤ 0.6 mm
Reaction to fire		Euroclass E
Dangerous substances:	(comply with 5.3)	None

¹⁾ Last two digits of the year in which the marking was affixed

²⁾ Identification number of the notified body

³⁾ Number of the EC Certificate

⁴⁾ Number of European standard



SIKA LIMITED

Head Office · Watchmead · Welwyn Garden City ·
Hertfordshire · AL7 1BQ · United Kingdom
Phone: +44 1 707 394444 · Fax: +44 1 707 329129 · www.sika.co.uk

