

# PRODUCT DATA SHEET

## Sikadur<sup>®</sup>-53

### Water displacing epoxy resin grout

#### DESCRIPTION

Sikadur<sup>®</sup>-53 is a pourable, multi-functional high density epoxy grout based on a 2-component solvent free epoxy resin system containing fine fillers. Sikadur<sup>®</sup>-53 exhibits excellent insolubility and displacement characteristics in wet and underwater applications but useable in dry general grouting applications also.

#### USES

Sikadur<sup>®</sup>-53 may only be used by experienced professionals.

Sikadur<sup>®</sup>-53 may be used for underwater and dry grouting work and offers excellent adhesion to both dry and clean water immersed concrete, stone masonry, brick, wood or steel surfaces. Highly insoluble in water and safe for specialist diver use. Used for injection of cracks 0.5mm to 40mm wide under water (cracks not conducting a water flow under pressure). Ideal for pile jacketing using prepacked aggregate in formwork. Mixed with 30% by volume sand a high build grout is formed that is easy to apply under water.

Sikadur<sup>®</sup>-53 may be used to grout starter bars, base-plate grouting and bolts for dry and underwater construction work. The material may also be used as a bonding bridge for underwater concreting and as a pipeline jointing material.

#### CHARACTERISTICS / ADVANTAGES

- Suitable for dry, wet, underwater or marine applications.
- Applicable at low temperatures.
- High mechanical strengths.
- Highly insoluble in water and suitable for application by specialist divers.
- Supplied in factory proportioned units.
- Shrink free.
- Can be bulked out with aggregate of thicker pour applications
- Excellent chemical resistance to water, sea water, waste water, sewage, fuels, oils, dilute acids and dilute alkalis.
- To be used in conjunction with Sika Pile Jacket systems for rehabilitation of concrete and timber piles in marine applications.

#### APPROVALS / CERTIFICATES

- CE Marking and Declaration of Performance to EN 1504-4 - Structural bonding
- CE Marking and Declaration of Performance to EN 1504-5 - Concrete Injection
- CE Marking and Declaration of Performance to EN 1504-6 - Anchoring of reinforcing steel bar

#### PRODUCT INFORMATION

<b>Composition</b>	Epoxy resin.		
<b>Packaging</b>	18 kg net pre-proportioned kits		
<b>Colour</b>	Part A: green	Part B: transparent	Part A+B mixed: green

<b>Shelf life</b>	36 months from date of production.
<b>Storage conditions</b>	Dry storage at temperatures from +5°C up to +35°C. Protect from direct sunlight and humidity.
<b>Density</b>	~ 2.0 kg/litre
<b>Viscosity</b>	2,500 to 3,000 mPa.s approx. (+23°C) <i>Note: 1 mPa.s = 1 centipoise (cps)</i>

## TECHNICAL INFORMATION

<b>Shore D Hardness</b>	~ 81 @ 10 days - 20°C	
<b>Compressive strength</b>	1 day	~ 53 MPa (AS 1478.2)
	2 days	~ 61 MPa
	7 days	~ 88 MPa
	14 days	~ 92 MPa
	<i>50mm x 50mm cubes @ 23°C / 50% r.h.</i>	
<b>Modulus of elasticity in compression</b>	~ 6,300 MPa	(EN 13412)
<b>Tensile strength in flexure</b>	~ 35 MPa @ 14 days	(ASTM C348)
<b>Modulus of elasticity in flexure</b>	~ 3,300 MPa	(EN 53452)
<b>Tensile strength</b>	~ 26 MPa @ 14 days <i>Product cured and tested at 20°C; grouted and cured under water</i>	(DIN 53455)
<b>Modulus of elasticity in tension</b>	~ 4,100 MPa	(ISO 527)
<b>Tensile strain at break</b>	~ 0.6 %	(ISO 527)
<b>Tensile adhesion strength</b>	Steel: ~ 10 to 13 MPa (cohesive failure of epoxy) Concrete: ~ 2.5 - 3.5 MPa (concrete failure)	(EN 1542)
<b>Shrinkage</b>	Hardens without shrinkage.	
<b>Coefficient of thermal expansion</b>	~ $7.5 \times 10^{-5}$ 1/K (Temp. range -20 °C – +60 °C)	(EN 1770)
<b>Heat deflection temperature</b>	~ 44° C	(ASTM D-648)

## APPLICATION INFORMATION

<b>Layer thickness</b>	0.50 mm min / 40 mm max.
<b>Ambient air temperature</b>	+5°C min. / +35°C max.
<b>Substrate temperature</b>	+5°C min. / +35°C max.
<b>Pot Life</b>	50 minutes approx. @ 20°C for 1.8 kg mix 35 minutes approx. @ 20°C for 18 kg mix (The temperature at which the Sikadur-53 is stored during the 24 hours before it is mixed will govern its potlife when mixed).
<b>Curing time</b>	24 hours @ 20°C

## 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.

## IMPORTANT CONSIDERATIONS

- Do not part mix kits.
- Only mix as much material as can be applied within the stated potlife.
- Do not dilute the product with solvent as this will affect both the cure and in-service performance of the product.
- Minimum thickness 0.5mm, maximum thickness

40mm.

- Do not apply under water at depths greater than 5m without referral to our Technical Department.
- The temperature at which the Sikadur-53 is stored during the 24 hours before it is mixed will govern its potlife when mixed.
- Compressive strengths etc. of epoxy resins must be qualified by the testing method eg. Test Standard or size of specimen under test and the rate at which the test piece is loaded while under test as these factors will affect the result markedly. Faster loading rates will generally give higher ultimate loads and vice versa. Also a specimen at lower temperature will show higher strengths and vice versa.
- If placing under water allow to stand 10-15 minutes before placing.

## 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 QUALITY

Mortar and concrete must be older than 28 days (depends on minimal requirement of strengths). Verify the substrate strength (concrete, masonry, natural stone).

The substrate surface (all types) must be clean and free from contaminants such as dirt, oil, grease, existing surface treatments and coatings etc.

Steel substrates must be de-rusted similar to Sa 2.5. (commercial blast)

The substrate must be sound and all loose particles must be removed.

### SUBSTRATE PREPARATION

Concrete, mortar, stone, bricks:

Substrates must be sound, clean and free from laitance, ice, 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 i.e. by blastcleaning and vacuum. Avoid dew point conditions.

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## MIXING

Prior to mixing the components should be stored at 15-20°C for the previous 24 hours. Mix all of component A (Green Resin) with all of component B (Hardener) using a slow speed drill (maximum 600 rpm) and windmill stirrer.

Mix until a homogeneous and streak free mixture results.

If placing underwater allow to stand for 10-15 minutes after mixing before placing.

## APPLICATION METHOD / TOOLS

Sikadur-53 may be applied to the prepared substrate by pouring into the void.

Higher strengths achieved if placed using a tremmie placing technique rather than free fall through water. When using Sikadur-53 as a bonding bridge the material may be applied by brush or gloved hand. Ensure an even continuous film. Place fresh concrete immediately.

If injecting cracks, pressure equipment may be used (eg. liquid tight bulk sealant gun; hand pumped grease filling equipment and high pressure pumping equipment may also be used).

Large voids may be filled by pre-filling with clean aggregate. Where possible use coarse rounded river gravel not smaller than 8mm and pouring or injecting/tremmieing Sikadur-53 into the void, displacing the water (i.e. preplaced aggregate technique).

## 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.

## 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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