Construction

Sikadur® AG Grout

High-Performance Grout System

Description

Sikadur® AG Grout is a three-component system, comprising a two-part 100% epoxy blended with Sikadur® Aggregate to provide a flowable grout. Sikadur® AG can be mixed with two types of aggregates depending on the application: Sikadur® Aggregate #3 for thin section grouting of 6 - 25 mm (1/4 - 1 in); Sikadur® Aggregate 8 for grouting pours of 25 - 450 mm (1 - 18 in).

Where to Use

- Sikadur® AG Grout is used in areas requiring a mortar with good thermal shock resistance, excellent flow properties and high aggregate loading capabilities.
- Structural reinforcement of tank liners.
- Crane rail base plate grouting and alignment.
- Transmission tower base plate grouting and alignment.
- Critical alignment of pumps, valves, tanks, compressors, pipe supports, stamping machines, turbines, engines.
- Encapsulation of columns and piles.

Advantages

- Fast cure and high early strength allows fast turn around.
- Capable of high pour thickness in single lift speeds up the grouting process.
- Very low peak exotherm ensures no thermal shrinkage with deep pours.
- Flows easily with excellent surface wetting providing consistent grouting with every pour.
- Can be readily pumped for high speed grouting.
- High impermeability provides good all-around resistance to oils, chemicals and freeze-thaw cycling.
- Outstanding thermal shock resistance allows hot water or steam clean-down procedures in food industry.
- Will not support combustion in the event of fire.
- Versatile mix designs with special blends of aggregate, allows wide range of pour thickness, thermal compatibility and maximum cost effectiveness.
- Very low odour in use with low-dust, pre-wetted aggregates ensures environmentally friendly installation.
- Durable, high strength performance ensures Sikadur® AG Grout provides long service life.
- Canadian Food Inspection Agency acceptance.
- Ministry of Transport Québec acceptance.

Technical Data

Packaging

Application thickness	6 - 25 mm (1/4 - 1 in)	25 - 50 mm (1 - 2 in)	50 - 450 mm (2 - 18 in)
Mix ratio	5:1	7.5:1	10:1
Resin A	8.44 L (2.2 US gal.)	8.44 L (2.2 US gal.)	8.44 L (2.2 US gal.)
Hardener B	2.81 L (0.74 US gal.)	2.81 L (0.74 US gal.)	2.81 L (0.74 US gal.)
Sika Aggregate 3	3 bags of 20 kg (44 lb)	-	-
Sika Aggregate 8	-	4.5 bags of 20 kg (44 lb)	6 bags of 20 kg (44 lb)
Yield	35.7 L (1.3 ft^3)	44.6 L (1.6 ft^3)	59.5 L (2.1 ft^3)
Coefficient of Thermal Expansion, mm/mm/°C (in/in/°F)			
20° - 92°C (68° - 198°F)	27.3 x 10^{-6}/°C (15.2 x 10^{-6}/°F)	25.4 x 10^{-6}/°C (14.1 x 10^{-6}/°F)	25.0 x 10^{-6}/°C (13.9 x 10^{-6}/°F)
Shelf Life	2 years in original, unopened packaging. Store dry between 5 and 32°C (41 and 89°F). Condition product between 20 and 30°C (68 and 86°F) before using.		

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Properties at 23°C (73°F) and 50% R.H.

Component A (Resin)		
Specific gravity	1.12 kg/L (9.3 lb/US gal.)	
Viscosity	600 cps	
Colour	Clear	
Component B (Hardener)		
Specific gravity	0.99 kg/L (8.3 lb/US gal.)	
Viscosity	500 cps	
Colour	Amber	
Curing Schedule, Resin Only		
Pot life at 200 g (7 oz)	30 min	
Curing Schedule, 10:1 Mix		
Pot life at 14 L (3.7 US gal.)	60 min	
Initial set	8 hrs	
Hard set	2 days	
Full cure	7 days	

NOTE: Increasing aggregate loading will extend these times.

Physical Properties of Cured 10:1 Mix		
Density	2.2 kg/L (137 lb/ft^3)	
Compressive Strength ASTM C579, MPa (psi)		
	15°C (59°F)	25°C (77°F)
5 hrs	-	-
18 hrs	-	-
24 hrs	23 (3337)	58 (8416)
2 days	49 (7110)	90 (13 059)
3 days	-	107 (15 525)
4 days	62 (8996)	-
7 days	-	-
28 days	-	107 (15 525)
Flexural Strength ASTM D790	29.7 MPa (4309 psi)	
Modulus of Elasticity ASTM D790	22 GPa (3.2 x 10^{12} psi)	
Bond Strength to Concrete	> 2.5 MPa (363 psi) 100% concrete failure	
Bond Strength to Steel		
Tensile shear normal prep	12.4 MPa (1799 psi)	
Tensile shear new white blast	15.8 MPa (2292 psi)	
Freeze/Thaw Resistance	No failure after 350 cycles	
Water Absorption ASTM D570	0.38%	
Abrasion Resistance ASTM D1044		
CS17 Wheels, 1000 Revs, 1 kg load	0.065 g	
Coefficient of Thermal Expansion ASTM D696	21.6 x 10^{-6}/°C (12.0 x 10^{-6}/°F)	

Chemical Resistance Guide

Acetic Acid 5%	R	Sodium Hypochlorite 12%
Glacial Acetic Acid	NR	M.E.K.
Nitric Acid 20%	R	Methylene Chloride
Sulfuric Acid 10%	R	Mineral Spirits
Sulfuric Acid 50%	R	Toluene
Sulfuric Acid 70%	NR	Xylol
Sodium Hydroxide 10%	R	Diesel
Sodium Hydroxide 20%	R	Mineral Oil
Sodium Hydroxide 50%	R	Motor Oil

R – Recommended: NR – Not Recommended

NOTE: The following represents a general guide at room temperature for chemical splashes and spillages. Where conditions combine high temperatures and chemical immersion, then full details should be given to Sika to confirm suitability of Sikadur® AG Grout or to provide alternate specification

Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods.

How to Use

Surface Preparation

Note: For optimum results when grouting in critical items of equipment, it is recommended that the surface preparation requirements of the latest edition of Chapter 5, API Recommended Practice 686 be followed. This document is the “Recommended Practices for Machinery Installation and Installation Design” published by the American Petroleum Institute.

Concrete surfaces must be cleaned free of old existing coatings. New concrete should cure a minimum of 28 days. Dry surfaces allow easier application of this product, however, product will adhere to clean, damp surfaces. Remove all debris from working surface. Remove all oils, greases, dirt, wax solutions from surface. Use suitable means to remove contaminants, heavy laitance, or curing compounds, which will interfere with proper adhesion. Special consideration must be given to oil or other foreign material, which may have penetrated into the concrete. Pull tests must always be used to verify adequacy of preparation. Repair all cracks with appropriate Sika® epoxy resin.

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Metal base plates should be prepared to bright metal condition and previous coatings or grout material totally removed.

Forming: The consistency of the epoxy grout system requires the use of forms to contain the material around the base plates. In order to prevent leakage or seepage, all forms must be sealed. Apply polyethylene film or wax to all forms to prevent adhesion of the grout. Prepare form work to maintain more than 100 mm (4 in) liquid head to facilitate placement. A grout ox equipped with an inclined trough attached to the form will enhance the grout's flowability and minimize air encapsulation.

Priming: Flowable mix designs for Sikadur® AG Grout will be self-priming. However, where very high aggregate loadings are employed (above 12.5:1 by weight), the surface should be primed with Sikadur® AG Grout Resin at 3 m^2/L (120 ft^2/US gal.) and the mortar placed while the primer is wet or tacky.

Prime and use epoxy mortar as a leveling course for spalled or uneven surfaces and allow to cure 16 to 24 hours at 20°C (68°F) prior to application of grout. Joints should be repaired or replaced as required.

Mixing

Mixing equipment can either be a low speed "Jiffy" type mixer for small mixes, however, a mortar mixer with a 2 cubic foot mixing capacity and an rpm of 20 is preferred.

Pre-stir the individual Components A and B to an even consistency before mixing.

Pre-mix Components A and B to an even consistency using a low speed (200 - 250 rpm) drill and Jiffy type paddle before placing in the mixing vessel or mortar mixer. It is important to scrape the sides and bottom of each container to ensure complete mixing.

Immediately load into the mixer and add the required quantity of aggregate, mixing constantly. When a mortar mixer is being used, it is advisable for the first mix to reduce the aggregate loading by 10%, as some of the resin will wet the mixer surface.

When all aggregate has been added, continue to mix for 3 - 5 minutes, stopping at least once to scrape the blades and walls of the mixer.

Application

Sikadur® AG Grout should be placed immediately following mixing. When placing pourable self-levelling mixes, vibration will assist surface wetting and assist in air removal.

General mix design and planning
The deeper the grout pour and the more extensive the area to be grouted, will demand that certain guidelines are adopted to produce the high quality grout essential for critical alignment, For critical alignment Sikadur® AG Grout can be used to produce two definite mix designs as follows:

Mix Ratio (5:1 - Aggregate #3/Resin): Designed for pours, from 6 to 25 mm (1/4 to 1 in) thick and up to 1.2 m (4 ft) long by gravity feed at 6 mm (1/4 in) thickness and up to 2.25 m (7.3 ft) long at 25 mm (1 in) thickness. It is also ideal for inaccessible and irregular low thickness pours. It can, if preferred, be used as the topping for the 10:1 mix, however, it should be limited to a maximum 25 mm (1 in) pour. Vibration may be necessary for thin section applications.

Mix Ratio (10:1 - Aggregate #8/Resin): Designed for deep pours, from 25 to 450 mm (1 to 18 in) thick and up to 2.25 m (7.3 ft) long. When using this mix (10:1), it is recommended to stop pouring between 25 and 37 mm (1 and 1½ in) below the final total grout thickness. The final topping grout should then be made with a second pour. This will minimize air accumulation under the base plate.

Effect of temperature on viscosity
Temperature of the mixed grout material will have a significant part to play in how well the grout flows. Ideally all components should be conditioned for 24 hours at temperatures between 15 and 30°C (59 and 86°F) to achieve the most efficient grout performance. If the ambient temperature is below 15°C (59°F), Sikadur® AG Grout consistency will be more viscous and less flowable. In such cases, it must be anticipated that flow will be less efficient.

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Effect of temperature on cure time
If a large pour of Sikadur® AG Grout is placed, then as the cure continues there will be a very low exothermic reaction (temperature rise through chemical reaction). For example, in a 300 mm (12 in) mass of a 10:1 Aggregate #8 mix, the peak exothermic temperature is only 27°C (80°F). This factor is very important for critical engineering alignment grouts (if high exothermic temperature resulted during curing, it would be accompanied by physical shrinkage and loss of alignment as the grout mass cooled down). Therefore, any attempt to speed up the Sikadur® AG Grout set time by heating during application should be very cautiously undertaken. Ambient temperature during curing should not exceed 40°C (104°F).

Mixing Equipment
Consistent and complete mixing of Sikadur® AG Grout components is essential to produce a high quality grout. It is also important that excessive air entrainment is avoided during mixing (over mixing in high rpm mortar mixers is a common cause of air entrainment). Mortar mixers should be running around 20 rpm and final mixing time once all ingredients are added should not exceed 5 minutes. Clean down of mixing equipment is important as build up of cured material prevents proper mixing of subsequent batches. All residual Sikadur® AG Grout should be scraped clear after use. The mixer should then be loaded with 6 mm (1/4 in) stone and run until remaining residual material is picked up on the stone. This load can then be discarded. Final cleaning can be achieved using Sika® Equipment Cleaner or a solution of abrasive industrial hand cleaners.

Clean Up

Use Sika® Equipment Cleaner. All equipment must be cleaned immediately after use. If the use of solvent is an environmental issue, a solution of industrial hand cleaner in water can be effective, if coupled with thorough scrubbing. Rinse a second time with more clean solution and finally rinse with water and wipe dry.

Limitations

- Sikadur® AG Grout system can be applied down to 0°C (32°F) and will cure at such temperatures. However, for optimum flow and general handling, ambient temperature should be between 15 and 30°C (59 and 86°F) and product must also be at this temperature.
- Optimum performance is obtained on clean, dry concrete. However, it will bond to damp surfaces by displacing the water.

Health and Safety Information

For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the **most recent Material Safety Data Sheet** containing physical, ecological, toxicological and other safety-related data.

KEEP OUT OF REACH OF CHILDREN
FOR INDUSTRIAL USE ONLY

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