

PRODUCT DATA SHEET

SikaGrout®-3320

Ultra-high-strength, fatigue-certified, onshore wind tower precision grout with reduced carbon footprint

PRODUCT DESCRIPTION

SikaGrout®-3320 is a one-part, ultra-high strength, fatigue-certified, cementitious grout, specially designed for onshore steel and precast concrete wind towers. It contains recycled materials and can therefore contribute to reducing the carbon footprint of the application.

USES

SikaGrout®-3320 is used for:

- Ultra-high performance precision grouting of joints.
- Filling horizontal joints between tower base and foundation.
- Filling horizontal joints between precast concrete elements.
- Applications requiring fatigue resistance.
- Deep section grouting requirements.

Note: The Product may only be used by experienced professionals.

CHARACTERISTICS / ADVANTAGES

- Ready to use, just add water.
- Wide application thickness of 20 mm to 500 mm.
- Rapid early-strength development, even at low temperatures.
- Ultra-high final compressive strength: >110 MPa.
- Very low shrinkage.
- Fatigue-certified.
- Good flowability.
- Very good adhesion to concrete.
- Suitable for pumping long distances.

ENVIRONMENTAL INFORMATION

- Contributes towards satisfying Materials and Resources (MR) Credit: Building product disclosure and optimisation — Environmental Product Declarations under LEED® v4.
- Contributes towards satisfying Materials and Resources (MR) Credit: Building Product Disclosure and Optimisation — Sourcing of Raw Materials under LEED® v4.
- Contributes towards satisfying Materials and Resources (MR) Credit: Building Product Disclosure and Optimisation — Material Ingredients under LEED® v4.
- 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.
- Simplified Fatigue Test Report, Applus, SikaGrout-3320, No. 22/32304192-S.

PRODUCT INFORMATION

Chemical Base	Sulphate resistant cement, selected aggregates, additives and polymers	
Packaging	Standard bag	25 kg
	Refer to the current price list for available packaging variations.	
Appearance / Colour	Grey powder	
Shelf Life	Standard bag	12 months from date of production
Storage Conditions	<p>The Product must be stored in original, unopened and undamaged packaging in dry conditions at temperatures between +5 °C and +35 °C. Always refer to the packaging.</p> <p>Refer to the current Safety Data Sheet for information on safe handling and storage.</p>	
Maximum Grain Size	D _{max} : ~3 mm	

TECHNICAL INFORMATION

Compressive Strength	Cured 24 hours at +20 °C	~60 MPa	(EN 12190)
	Cured 3 days at +20 °C	~85 MPa	
	Cured 28 days at +20 °C	~115 MPa	
	150 mm cylinder, cured 28 days at +20 °C	110 MPa, Class C100/115	(EN 12390-3)
	<p>Early strength: ≥40 N/mm² after 24 hours (class A), according to Guideline DAfStb.</p> <p>At +5 °C early strength: ≥25 N/mm² after 24 hours (class B), according to Guideline DAfStb.</p> <p>For concrete exposure classes: X0, XC 1-4, XD 1-3, XS 1-3, XF 1-4, XA 1-2 / WA</p>		
Modulus of Elasticity in Compression	Cured 28 days at +21 °C	~55 GPa	(EN 13412)
Flexural Strength	Conditioned 28 days at +20 °C	~15 MPa	(EN 196-1)
Shrinkage	<p><0.3 mm/m</p> <p>Shrinkage Class SVKM 0 according to DAfStb Guideline.</p>		
Expansion	>0.1 % volume after 24 hours. Maximum 2 %.		

APPLICATION INFORMATION

Mixing Ratio	Fluid consistency - water content by volume	1.7 L to 2.0 L per 25 kg bag
	Fluid consistency - water ratio by weight	6.75 % to 8 %
Yield	~11.1 L of mortar per 25 kg bag	
Layer Thickness	Maximum	500 mm
	Minimum	20 mm
Product Temperature	Maximum	+35 °C
	Minimum	+5 °C
Ambient Air Temperature	Maximum	+35 °C
	Minimum	+5 °C

Substrate Temperature	Maximum	+35 °C
	Minimum	+5 °C
Pot Life	At +20 °C	~180 minutes
	Pot life depends on temperature Note: Pot life will be shorter at higher temperatures. Pot life will be longer at lower temperatures.	
Flowability	Temperature	Flow
	+5 °C	560 mm
	+20 °C	550 mm
	+30 °C	640 mm
	Class f1: 550 mm to 640 mm	
Fresh mortar density	~2.4 kg/l	

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.

ECOLOGY, HEALTH AND SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

APPLICATION INSTRUCTIONS

NOTES ON INSTALLATION

- Do NOT exceed stated water addition.
- NOT to be used for concrete repair works.
- Do NOT use vibrating pokers.
- If mixing with a drill and paddle:
 - The drill shall be high torque, slow speed (i.e. 200 to 500 rpm) with a suitable grout stirrer.
 - Use a clean, rigid mixing vessel - flexible containers (e.g. 'gorilla tubs') are unsuitable.
 - Add the appropriate quantity of clean, potable water to the mixing vessel first and gradually add the powder to the water, mixing continuously.
 - Keep the mixing head in the material - refrain from lifting in and out, as this will introduce air.
 - Once all powder has been added, mix until homogeneous (i.e. at least 4 minutes).
 - Do NOT try and mix too many bags at a time! Most drills and paddles are only capable of mixing one bag at a time. Large volumes require specialist machinery.
 - Once fully mixed, leave the grout to de-gas for 2 to 3 minutes before use.
- Use only on clean, sound substrates (concrete shall be soaked to saturated surface dry (SSD) condition).
- Avoid application in direct sun and / or strong wind.
- Pour or pump continuously from one side only (keep header boxes / hoppers topped up for the duration of the application).
- Keep exposed surfaces to a minimum.

- Do NOT add additional water during the surface finishing, as this will cause discoloration and / or cracking.
- Protect freshly applied material from freeze-thaw action.
- If applying in cold conditions (i.e. at +5°C), the application area should be covered (e.g. use of a heated tent system) to create a micro-climate, which should then be heated to ~+20°C for a minimum of 2 days prior to application. Store the Product, water and equipment in this environment until also at ~+20 °C.
- Following application and if applied in cool conditions, or if cold conditions are expected, the use of insulating blankets or heated curing blankets is recommended for at least 48 hours to protect the fresh grout from cold temperatures and frost.
- To avoid cracking in warm temperatures, keep bags cool and use cold water.
- When the ambient temperature is warm, protect the working area from direct sunlight with temporary shelters or canopies. Do NOT expose equipment, materials or application to direct sunlight.
- When working in warm conditions and if being used, cover hoses with white membranes (or similar) to reflect heat and keep the hoses cool (or, if possible, do NOT use black / dark coloured hoses).
- To help control the exothermic reaction, particularly at higher layer thicknesses, it is recommended that the grout is cured under water soon after setting has started (i.e. after approximately one hour). Curing under water is recommended for at least 72 hours.

SUBSTRATE PREPARATION

CONCRETE

Prepare the concrete surface by providing a mechanical key and by removing any contamination that may impede the grout flow or reduce adhesion strength.

1. Use suitable preparation equipment to remove laitance, delaminated, weak, damaged and deteriorated concrete.
2. Clean any pockets or holes for structural fixings from all debris and water.

The substrate shall be structurally sound, thoroughly clean, and have a textured finish exposing the aggregate.

STEEL

Prepare the steel to remove any contamination which

will impair the grout flow or reduce adhesion strength.

1. Clean the substrate using grinding, abrading or shot blasting equipment.

The substrate shall be thoroughly clean and free from oil, grease, rust and scale.

SHUTTERING OR FORMWORK

Where formwork is required, ensure that it is of sufficient strength, treated with release agent, and sealed to prevent the leakage of pre-wetting water and grout.

1. If vacuum extraction equipment is NOT used to remove pre-soak water, ensure the formwork comprises outlets for the pre-soaked water to drain.
2. For manual grout application, construct a header box or hopper on one side of the formwork to maintain a minimum grout head of 150 mm to 200 mm during the grouting process.

MIXING

The use of a drill and paddle (in most circumstances) is only suitable for mixing one bag at a time. For larger mixes, use forced action type mixers (NOT concrete tumble mixers which do NOT apply sufficient shear, nor high speed or colloidal mixers, as these may cause thixotropy, leading to loss of flow). This Product is NOT suitable for mixing by hand.

ELECTRIC SINGLE OR DOUBLE PADDLE MIXER

IMPORTANT

Do NOT add more water than the maximum specified

1. Pour the minimum amount of clean, potable water into a suitable clean mixing container. Flexible mixing vessels (e.g. 'gorilla tubs') are unsuitable - rigid vessels shall be used.
2. Stir the water slowly with a spiral paddle (300 to 500 rpm).
3. Slowly add the complete bag of powder into the water whilst continually mixing.
4. Mix continuously for approximately 5 minutes to achieve a uniform, lump-free, smooth consistency. It is of utmost importance that the Product is mixed thoroughly enough that a grout consistency is obtained.
5. Keep the mixing head in the material - refrain from lifting in and out, as this will introduce air.
6. Add more water within the mixing time up to the maximum permitted, until the required consistency is achieved.
7. Stand for 2 to 3 minutes for the Product to de-gas (release entrained air bubbles).
8. Mix again for 1 more minute before use.

GROUT MIXER

IMPORTANT

Carry out equipment trials

Carry out equipment trials to make sure the Product can be mixed satisfactorily before full project application.

IMPORTANT

Do NOT use continuous mixing equipment

The Product is NOT designed for processing with continuous mixing equipment.

1. Pour the minimum water ratio in the correct proportion into the grout mixer.
2. While stirring the water, slowly add the powder.
3. Add more water within the mixing time up to the maximum permitted, until the required consistency

is achieved.

4. Mix continuously for a minimum of 4 minutes. For larger mixes the mixing time must be extended to approximately 6 minutes or as necessary.
5. Mix until the grout achieves a uniform, lump-free, smooth consistency.

APPLICATION

IMPORTANT

Strictly follow installation procedures

Strictly follow installation procedures as defined in Method Statements, Application Manuals and Working Instructions, which must always be adjusted to the actual site conditions.

IMPORTANT

Risk of cracking due to application in direct sun or strong winds

1. Do NOT apply the Product in direct sun, strong winds or both.

IMPORTANT

Risk of reduced strength gain and physical properties due to cold weather

1. Store bags in a warm environment.
2. Use warm mixing water to assist with achieving strength gain and maintaining physical properties.

IMPORTANT

Risk of cracking and reduced physical properties due to hot weather

1. Store bags in a cool environment.
2. Use cold mixing water to assist with controlling the exothermic reaction to reduce cracking and to maintain physical properties.

PRE-SOAKING

1. Thoroughly saturate the prepared concrete substrate with clean water for a recommended 12 hours before application of the grout.
2. Do NOT allow the substrate to dry within this time.
3. Remove all water from within the formwork, cavities or pockets.

The final surface must achieve a dark matt appearance (saturated surface dry) without glistening.

PLACING MANUAL APPLICATION

Preconditions

After mixing, allow material to remain in the mixing container for 2 to 3 minutes to release entrained air bubbles.

IMPORTANT: Avoid trapping air. Pour the mixed grout into the header box / hopper ensuring continuous grout flow - keep header boxes / hoppers topped up for the duration of the application.

PLACING GROUT PUMP APPLICATION

Use grout pumps for large volume placement.

1. Conduct equipment trials to confirm the Product can be pumped satisfactorily before full project application.

SURFACE FINISHING

1. IMPORTANT: Do NOT disturb once grouting has been completed until the Product has initially hardened.
2. Do NOT add water to the surface and do NOT over-work the surface during finishing.
3. Finish exposed grout surfaces to the required surface texture as soon as the grout has started to stiffen.
4. Remove the formwork when the grout has initially hardened.
5. Trim the grout edges while the concrete is 'green'.

CURING TREATMENT

Placed grout, which is exposed, should be protected after finishing from premature drying and cracking by curing in accordance with good concrete practice. Protect the fresh material from premature drying using an approved curing method (e.g. curing compound such as Sikafloor® ProSeal, moist geotextile membrane, hessian, polythene sheet, under water, etc.). In cold weather, apply insulating blankets or heated curing blankets at a constant temperature to protect the Product from freezing and freeze-thaw damage. To help control the exothermic reaction, particularly at higher layer thicknesses, it is recommended that the grout is cured under water soon after setting has started (i.e. after approximately one hour). Curing under water is recommended for at least 72 hours.

CLEANING OF TOOLS

Clean all tools and application equipment with water immediately after use. Hardened / cured material can only be removed mechanically.

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.

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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Product Data Sheet

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