

## PRODUCT DATA SHEET

# SikaGrout®-9550

Ultra-high performance cementitious (UHPC) grout with advanced nanotechnology for offshore wind turbine installations

### DESCRIPTION

SikaGrout®-9550 is a ready-to-use, cement-based dry powder that forms a flowable, cohesive, and impermeable ultra-high performance cementitious (UHPC) grout when mixed with water. With advanced nano-engineered binder technology with blends of Portland, pozzolan, and special cements, achieves high compressive strength quickly. Offering excellent flowability and anti-washout properties, SikaGrout®-9550 is ideal for offshore wind turbine installations. Additionally, SikaGrout®-9550 is chloride-free, shrinkage-compensated, and highly resistant to water and aggressive ion penetration.

### USES

SikaGrout®-9550 has been especially formulated for large scale, pump applications.

- Grouting of wind turbine installations, e.g. foundations, monopiles, transition pieces of wind towers, tripods and jacket structures where very good fatigue resistance is required.
  - Grouting under very harsh conditions, e.g. offshore applications or below water grouting, at temperatures as low as 0°C.
  - All void filling from 25mm to 600mm thickness where high strength, high modulus is important.
- Contact the Technical Department of your local Sika office regarding any application required not mentioned here.

### CHARACTERISTICS / ADVANTAGES

- Certified by Det Norske Veritas (DNV)
  - Ultra-high mean compressive strength  $\geq 135\text{MPa}$ .
  - Ultra-high modulus for exceptional stiffening properties.
  - Quick return to service and removal of temporary supports due to high early strength build-up.  $\geq 70\text{MPa}$  @ 24hrs at 20°C
  - Excellent fatigue resistance.
  - Excellent strength gain at low temperatures @ 0°C at 24hrs
  - No wash-out during below water grouting
  - Pump able over long distances and large heights.
  - Good flowability
  - High early strength
  - Shrinkage compensated
  - No segregation or bleeding
  - Extended pot life
  - Widest range of application between 0 to 35°C without special precautions
- Contact the Technical Department of your local Sika office regarding any application at temperatures 35 °C to 45 °C.

### APPROVALS / STANDARDS

- DNV Type Approval Certificate no. TAK00001BC

## PRODUCT INFORMATION

<b>Packaging</b>	SikaGrout®-9550 is supplied in special 25 kg bags and 500, 1000, 1500 kg big bags
<b>Shelf Life</b>	12 months from date of production
<b>Storage Conditions</b>	Product must be stored in original, unopened and undamaged sealed packaging in dry conditions away from direct sunlight and heat, not exceeding 40 °C. When stored under high temperature and high humidity conditions, the shelf life may be reduced.
<b>Density</b>	2.46 – 2.52 ton/m <sup>3</sup> (EN 12390-7)

## TECHNICAL INFORMATION

<b>Compressive Strength</b>	<u>Age</u>	<u>N/mm<sup>2</sup></u>	(ASTM C109/C109M; EN 12390-3)	
	1 day	> 70		
	3 days	> 100		
	7 days	> 115		
	28 days	> 140		
	91 days	> 145		
	75 mm and 50 mm cubes			
	<u>Age</u>	<u>N/mm<sup>2</sup></u>	(EN 12390-3)	
	1 day	> 70		
	3 days	> 95		
	7 days	> 105		
	28 days	> 130		
	91 days	> 135		
150 x 300 mm cylinder				
<b>Exposure classes</b>				
XC4, XD3, XS3, XF3, XA2, WF			(DIN 1045-2; EN 206)	
<u>Early compressive strength class</u>		<u>A</u>		
<u>Compressive strength class</u>		<u>&gt; C100/115</u>		
Classification according to DAfStb Richtlinie				
<b>Modulus of Elasticity in Compression</b>	53.000 N/mm <sup>2</sup>		(EN 12390-13)	
	<b>Poisson's ratio:</b>			
	0.19		(ASTM C469)	
<b>Tensile Strength in Flexure</b>	20.0 N/mm <sup>2</sup>		(EN 1015-11)	
<b>Tensile Strength</b>	8.0 N/mm <sup>2</sup>		(ASTM C307)	
<b>Shrinkage</b>	<u>Shrinkage class</u>	<u>SKVM 0</u>		
	Classification according to DAfStb Richtlinie			
	<b>Autogenous shrinkage</b>			
	<u>Age</u>	<u>mm/m</u>	(ASTM C1698)	
	1 day	+ 0.050		
56 days	- 0.130			
<b>Expansion</b>	> 0.1% vol.-%		(EN 445)	
<b>Creep</b>	Creep coefficient at 1 year	0.7	(ASTM C512)	
<b>Chloride Ion Diffusion Resistance</b>	<100 (Negligible penetrability)		(ASTM C1698)	

## APPLICATION INFORMATION

<b>Mixing Ratio</b>	7.5 to 9.2 % water / powder ratio		
<b>Consumption</b>	Approximately 440 liters per ton material		
<b>Layer Thickness</b>	25 - 600 mm		
	Minimum	25 mm (valid for anchor cage grouting)	75 mm (valid for annuluses in tubular / conical grouted connections)
	Maximum	600 mm	
<b>Product Temperature</b>	0 °C min. / +35 °C max.		
<b>Ambient Air Temperature</b>	0 °C min. / +35 °C max.		
<b>Substrate Temperature</b>	0 °C min. / +35 °C max.		
<b>Pot Life</b>	3 hours		
<b>Flowability</b>	Initial	280 - 325 mm	(ASTM C1437)
	1 hour	260 - 280 mm	
	Flow through	> 620 mm	(EN 13395-2)
	Flow cone	> 290 mm	
	Flow class	f1	
	Classification according to DAfStb Richtlinie		
<b>Setting Time</b>	Initial	Final	
	6 - 8 hours	8-10 hours	

## 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.

## FURTHER DOCUMENTS

Sika Method Statement: SikaGrout®-9550

## ECOLOGY

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

### NOTES ON INSTALLATION

- SikaGrout®-9550 has been especially formulated for use in specific applications. As such SikaGrout®-9550 should be installed by experienced fully trained contractors. Full application procedures are available on request.
- Sands or other products that could affect the products properties must not be added.

## EQUIPMENT

Mixer type	Paddle mixer
Mixing time	Approximately 6 minutes
Application method	One continuous pour

## MIXING

SikaGrout®-9550 must be mixed using suitable grout mixing equipment combined with agitator for continuous large volume mixing. Volume capacity of equipment must be applicable to the volume of material being mixed for a continuous operation. Equipment trials must be considered to ensure product can be mixed satisfactory before full project application. Put most of the water required in the mixer and add slowly the grout material. Mix until a homogeneous mortar (3 to 4 minutes), add the remaining water and continue mixing for at least another 2 minutes until the required fluid or flowable consistency is obtained. Mix with potable water only. Do not add more water than the maximum specified.

## CLEANING OF TOOLS

Tools and spillages can be cleaned with water while SikaGrout®-9550 is still uncured. Once hardened, the material can only be removed mechanically.

## 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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### Product Data Sheet

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