BUILDING TRUST

PRODUCT DATA SHEET

SikaGrout®-9140

(formerly NaX® Q140-E Onshore)

Ultra-high performance cementitious (UHPC) grout with advanced nanotechnology for onshore wind turbine foundations

DESCRIPTION

SikaGrout®-9140 is a ready-to-use, cement-based dry powder that, when mixed with water, forms a flowable, cohesive, and impermeable ultra-high performance cementitious (UHPC) grout. With advanced nano-engineered binder technology, combining Portland, pozzolan, and special cements, achieves high compressive strength rapidly. Ideal for narrow construction areas such as grout trenches for onshore wind turbines, SikaGrout®-9140 is chloride-free, shrinkage-compensated, and highly resistant to water and aggressive ion penetration.

USES

SikaGrout®-9140 has been especially formulated for:
- Grouting of wind turbine installations, that are installed using pre-stressing techniques e.g. base plate grouting of onshore wind turbines
- Installations where excellent fatigue resistance is required
- Onshore turbines where ultra-high final strengths are required
- Grouting in a wide temperature range
- Anchoring anchor bolts of wind turbine towers
- All void filling from 25mm to 600mm (under tower flange) where high strength, high modulus, high ductility is important

Contact the Technical Department of your local Sika office regarding any application or dimensions required not mentioned here.

FEATURES

- Ultra-high compressive strength: above highest class of EN206, i.e. > C100/115
- Ultra-high modulus for exceptional stiffening properties
- Excellent fatigue resistance
- Quick return to service and removal of temporary supports due to high early strength build-up ≥ 70 MPa @ 24hrs at 20°
- No segregation or bleeding to ensure consistent final physical performance and to prevent pump blockages.
- Extended pot life of ≥ 2 hours
- Can be pumped into complex areas or areas inaccessible to conventional grouting methods.
- Ultra-high Young's modulus for exceptional stiffness
- No segregation or bleeding
- Shrinkage compensated

Contact the Technical Department of your local Sika office regarding any application at temperatures 35 °C to 45 °C.

CERTIFICATES AND TEST REPORTS

- Tests on fresh and hardened grouting mortar - verification by MPA Hannover
- Certification of conformity according to the "DAfStb Richtlinie – Herstellung und Verwendung von zementgebundenem Vergussbeton und Vergussmörtel" (QDB)

PRODUCT INFORMATION

Packaging	SikaGrout®-9140 is supplied in special 25 kg bags and 500, 1000, 1500 kg big bags
Shelf life	12 months from date of production

Storage conditions	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.
Density	2.46 – 2.52 ton/m³ (EN 12390-7)

TECHNICAL INFORMATION

Compressive strength (EN 12390-3; ASTM C109/C109M)

Age	N/mm²
1 day	> 70
3 days	> 100
7 days	> 115
28 days	> 140
91 days	> 145

75 mm and 50 mm cubes (EN 12390-3)

Age	N/mm²
1 day	> 70
3 days	> 95
7 days	> 105
28 days	> 130
91 days	> 135

150 x 300 mm cylinder

Exposure classes

XC4, XD3, XS3, XF3, XA2, WF (DIN 1045-2; EN 206)

Early compressive strength class	A
Compressive strength class	> C100/115

Classification according to DAfStb Richtlinie

Modulus of elasticity in compression 53.000 N/mm² (EN 12390-13)

Poisson's ratio:

0.19 (ASTM C469)

Flexural-strength 20.0 N/mm² (EN 1015-11)

Tensile strength 8.0 N/mm² (ASTM C307)

Shrinkage

Shrinkage class	SKVM 0

Classification according to DAfStb Richtlinie

Autogenous shrinkage (ASTM C1698)

Age	mm/m
1 day	+ 0.050
56 days	- 0.130

Expansion > 0.1% vol. (EN 445)

Creep

Creep coefficient at 1 year	0.7

Chloride ion permeability <100 (Negligible penetrability) (ASTM C1202)

APPLICATION INFORMATION

Mixing ratio	7.5 - 9.2 % water / powder ratio
Consumption	Approximately 440 liters per ton material
Layer thickness	25 - 600 mm
Material temperature	0 °C min. / +35 °C max.
Ambient air temperature	0 °C min. / +35 °C max.

Substrate temperature	0 °C min. / +35 °C max.		
Pot Life	3 hours		
Flowability	Initial	280 - 325 mm	(ASTM C1437)
	1 hour	260 - 280 mm	
	Flow through	> 620 mm	(ASTM C1437; EN 13395-2)
	Flow cone	> 290 mm	
	Flow class	f1	
	Classification according to DAfStb Rictlinie		

Setting time	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 DOCUMENTATION

Sika Method Statement: SikaGrout®-9140

IMPORTANT CONSIDERATIONS

- To avoid cracking of exposed surfaces, protect from direct sun and, or strong wind.
- Use only on clean, sound substrate.
- The substrate must be free of ice.
- Do not exceed water addition.
- Protect freshly applied material immediately.
- Keep exposed surfaces to a minimum. To avoid cracking in warm temperatures keep bags cool & use cold water for mixing.
- Do not use vibrating pokers.
- Do not use continuous mixing equipment.
- Pour or pump from one side only. Avoid exposing surfaces during rainfall and prior to final set.

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

NOTES ON INSTALLATION

- SikaGrout®-9140 has been especially formulated for use in specific applications. As such SikaGrout®-9140 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.
- SikaGrout®-9140 which will be exposed to strong drying conditions, e.g. mortar which is directly exposed to heavy wind and/or direct sunlight, should be protected using appropriate curing agents.

EQUIPMENT

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

SUBSTRATE QUALITY

Concrete
The concrete must be structurally sound, thoroughly clean, free from oil, grease, dust, loose material, surface contamination and materials which will impair the grout flow or reduce adhesion strength. Laitance, delaminated, weak, damaged and deteriorated concrete and where necessary sound concrete must be removed by suitable mechanical preparation as directed by the engineer or supervising officer. Any pockets or holes for structural fixings must also be cleaned of all debris.

Shutter Formwork
Where formwork is to be used, all formwork must be of adequate strength, treated with release agent and sealed to prevent leakage of pre-wetting water and grout. Ensure formwork includes outlets for removal of the pre-soaking water or use vacuum extraction equipment to remove water.

MIXING

SikaGrout®-9140 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. Note: Do not use continuous mixing equipment.

APPLICATION

Strictly follow installation procedures as defined in method statements, application manuals and working instructions which must always be adjusted to the actual site conditions.

Pre-wetting

The prepared concrete substrate must be thoroughly saturated with clean water for a recommended 12 hours before application of the grout. The surface must not be allowed to dry within this time. Prior to application of the grout, all water must be removed from within formwork, cavities or pockets and the final surface must achieve a dark matt appearance (saturated surface dry) without glistening.

Placing: Grout pump application

For large volume placement, grout pumps are recommended. Equipment trials must be considered to ensure product can be pumped satisfactory.

Surface finishing

Finish exposed grout surfaces to the required surface texture as soon as the grout has started to stiffen. Do not add additional water on the surface. Do not over work surface as this may cause surface discoloration and cracking. After the grout has initially hardened, remove formwork and trim edges while concrete is ‘green’.

Cold weather working

Consider storing bags in a warm environment and using warm water to assist with achieving strength gain and maintaining physical properties.

Hot weather working

Consider storing bags in a cool environment and using cold water to assist with controlling the exothermic reaction to reduce cracking and maintaining physical properties.

CURING TREATMENT

Protect exposed grout surfaces after finishing (immediately after levelling) from premature drying and cracking by curing under water for at least 72 hours. In cold weather apply insulated blankets to maintain a constant temperature to prevent surface

CLEANING OF EQUIPMENT

Tools and spillages can be cleaned with water while SikaGrout®-9140 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

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