BUILDING TRUST

PRODUCT DATA SHEET

SikaGrout®-9800

(formerly MFlow 9800)

High strength grout with applied nanotechnology for grouting offshore wind turbine installations

PRODUCT DESCRIPTION

SikaGrout®-9800 is a shrinkage compensated, cement based grout which when mixed with water, produces a homogeneous, flowable and easy pump able grout with exceptional mechanical and physical properties. Latest best binder packing models and applied cementitious nanotechnology produces a grout with superior technical performance and exceptional rheological properties.

USES

SikaGrout®-9800 has been especially formulated for large scale, pump applications.

- Grouting of grouted connections in offshore installations, e.g. foundations of wind turbines or oil & gas installations.
- Typical applications are pile-sleeve and stab-in-pile grouted connections, clamp repair, leg filling etc…
- Grouting under very harsh conditions, e.g. offshore applications or below water grouting, at temperatures as low as 2°C or up to 42°C.
- All void filling from 30 mm to 600mm thickness where high strength is important.

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

CHARACTERISTICS / ADVANTAGES

- C90/105 concrete strength class according EN206 and DIN1045
- Can be installed with a continuous mixing and pumping process. Typical output rates of ≥ 20 m³/hour per mixing unit.
- Quick return to service and removal of temporary supports due to high early strength build-up. ≥ 40 MPa @ 24hrs at 20°C.
- Very good strength gain at low temperatures.
- No segregation or bleeding to ensure consistent physical performance inside the grouted connection, and to prevent pump blockages.
- Excellent fatigue resistance
- No wash-out during below water grouting.
- Pump able over long distances and large heights.
- Specially graded sands and exceptional flow and low friction increases pump output, reduces installation times and costs as well as reducing pump pressures and wear.
- Available as silo material.

APPROVALS / STANDARDS

Certified by Det Norske Veritas (DNV)

PRODUCT INFORMATION

Packaging	SikaGrout®-9800 is supplied by bulk transport and is stored in special job-site silos. Upon request, the material may be available as well in special 1000, 1250 kg kg big bags.
Shelf Life	6 months from date of production
Storage Conditions	Product must be stored in closed silos or warehouse under dry conditions.
Density	Approximately 2.25 gr/cm3 ((DIN 18555-2)

TECHNICAL INFORMATION

Compressive Strength

Determined as part of DNV GL verification: (EN 12190-3)

N/mm²	20 °C	2 °C
3 days	83.8	58.9
7 days	94.7	79.4
28 days	103.1	91.8
90 days	124.3	100.5

Characteristic compressive strengths (Determined as part of DNV verification): (150 x 300 mm cylinders)

N/mm2	20 °C	2 °C
28 days	94.5	88.4

Typical values - Additional test results (EN12390-3)

N/mm²	20 °C	5°C	2°C
3 days	≥ 75	≥ 45	≥ 40
7 days	≥ 85	≥ 70	≥ 65
28 days	≥ 95	≥ 80	≥ 75

Characteristic compressive strengths:

Specimen size	20 °C	5 °C
100 mm cubes	$X_{k(n)}$ ≥ 90 N/mm²	$X_{k(n)}$ ≥ 80 N/mm²
150 x 300 mm cylinders	$X_{k(n)}$ ≥ 90 N/mm²	

Exposure classes

XO, XC4, XD3, XS2, XS3, XF3, XA2, WA (EN 206-1, DIN 1045-2)

Modulus of Elasticity in Compression (DIN 1048-5)

GPa	
Static	≥ 30
Dynamic	≥ 35

Determined as part of DNV GL verification: (EN 12390-13)

	GPa
Static	34.9

Poisson ratio (Determined as part of DNV GL verification):

0.271 (ASTM C469)

Flexural Strength

Age	N/mm²
28 days	≥ 10

(EN12390-5)

Characteristic flexural strength:

$X_{k(n)}$ ≥ 9 N/mm² (700 x 150 x 150 mm bars)

Determined as part of DNV GL verification:

N/mm²	20 °C	2 °C
28 days	13.6	12.7

N/mm²	20 °C	2 °C
28 days	13.6	12.7

(EN196-1)

Shrinkage	≤ 0.4 mm/m	(Schleibinger shrinkage drain method)
	(test started 90 minutes after mixing – air sealed samples)	
	Shrinkage class:	
	SKVM 0	DAfStb VeBMR Rili)
	Autogenous shrinkage (Determined as part of DNV GL verification):	
	-0.309 mm/m	(ASTM C1698)
	(test started after initial set of the material)	
Bleeding	No bleeding **Sedimentation stability:** No sedimentation (in accordance of DAfStb Self compacting concrete, section N.1.2.)	

APPLICATION INFORMATION

Consumption	1000 kg of powder will yield approximately 500 to 525 litre of mixed grout.
Layer Thickness	30 - 600 mm
Product Temperature	+2 °C min. / +42 °C max.
Ambient Air Temperature	+2 °C min. / +42 °C max.
Mixing Ratio	Approximately 145 lt / 1000 kg powder
Substrate Temperature	+2 °C min. / +42 °C max.
Pot Life	≥ 120 minutes
Setting time	≤ 10 hours

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.

FURTHER DOCUMENTS

Sika Method Statement: SikaGrout®-9800

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

- Sands or other products that could affect the products properties must not be added.
- SikaGrout®-9800 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	Jet mixer
(other mixer types need approval from Sika)	
Defined by DNV GL:	
Minimum diameter of grout lines	≥ 2 inch
Grout annulus	30 ≤ t ≤ 600
Pumping length through 2” flexible hose	L ≤ 200 m
Pumping elevated head with 2” flexible hose	H ≤ 20 m

CLEANING OF TOOLS

Tools and spillages can be cleaned with water while SikaGrout®-9800 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 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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