BUILDING TRUST

PRODUCT DATA SHEET

SikaGrout®-9300

(formerly MFlow 9300)

Ultra high strength, cement based grout with metallic aggregate and applied nanotechnology for grouting onshore wind turbine installations

PRODUCT DESCRIPTION

SikaGrout®-9300 is a shrinkage compensated, cement based grout which when mixed with water, produces a homogeneous, flowable and pumpable grout with exceptionally high early and final strength and modulus. The product contains special metallic aggregates for increased ductility, fatigue and impact resistance. Latest best binder packing models and applied nanotechnology produces a grout with superior technical performance, exceptional rheological properties, and, uniquely, extended open times.

USES

SikaGrout®-9300has been especially formulated for:

- Grouting of wind turbine installations, e.g. base plate grouting of onshore wind turbines, where excellent fatigue resistance is required
- Grouting under very harsh conditions, e.g. temperatures as low as 2°C.
- Anchoring anchor bolts of wind turbine towers
- All void filling from 30mm to 200mm where high strength, high modulus, high ductility is important (for other void dimensions contact our technical department).

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

CHARACTERISTICS / ADVANTAGES

- Ultra high compressive strength >120 MPa.
- 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. ≥ 60 MPa @ 24hrs at 20°C
- No segregation or bleeding to ensure consistent final physical performance and to prevent pump blockages.
- Contains metallic aggregates to provide increased resistance to dynamic and repetitive loading
- Pump able over long distances and large heights.
- Extended pot life of ≥ 2 hours
- Can be pumped into complex areas or areas inaccessible to conventional grouting methods
- Specially graded sands and exceptional flow and low friction increases pump output, reduces installa-tion times and costs as well as reducing pump pres-sures and wear
- Dust reduced for ease of handling
- Cement based.
- Low chromate.

APPROVALS / STANDARDS

- Mechanical properties of high performance cementitious grout SikaGrout®-9300 – verification by Aalborg University
- Verification of grout properties under hot temperatures – verification by Applus Laboratories
- Mechanical properties of SikaGrout®-9300 – verification by Tecnalia Laboratories
- Testing of compressive strength and dynamic elastic modulus of special mortar SikaGrout®-9300 at different temperatures – verification by Technische Universität München

PRODUCT INFORMATION

Packaging	SikaGrout®-9300 is supplied in 25 kg bags and special 400 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.
Maximum Grain Size	D_{max}: ~4 mm
Density	Appoximately 2.7 gr/cm³

TECHNICAL INFORMATION

Abrasion Resistance	AR1 Class	(Capon abrasion wheel test)
Compressive Strength	**Age** / **N/mm²** 1 day / ≥ 60 7 days / ≥ 100 28 days / ≥ 120 90 days / ≥ 140 **Concrete strength class:** > C100 **Exposure classes:** XO, XC4, XD3, XF3, XA2, WF	(EN 12190) (EN206) (EN 206-1 / DIN 1045-2)
Modulus of Elasticity in Compression	≥ 40.000 N/mm²	(EN 13412)
Flexural Strength	≥ 17 N/mm²	(40 x 40 x160 mm prisms - EN 196-1)
Splitting tensile strength	≥ 7.5 N/mm²	(EN 12390-6)
Tensile adhesion strength	**To concrete:** ≥ 2 N/mm² **After free/thaw (to concrete):** ≥ 2 N/mm²	 (EN1542) (EN 13687-1)
Pull-Out Resistance	≤ 0.6	(EN 1881- displacement at 75 kN load)
Shrinkage	**Drying shrinkage:** ≤ 0.3 mm/m	 (EN 12617-4)
Ring test	No cracking after 180 days	(Coutinho-ring test)
Capillary Absorption	≤ 0.05 kg / m².h$^{-0.5}$	(EN 13057)

APPLICATION INFORMATION

Consumption	2.5 kg powder for 1 litre of mixed mortar
Layer Thickness	30 - 200 mm
Product Temperature	+2 °C min. / +30 °C max.
Ambient Air Temperature	+2 °C min. / +30 °C max.
Mixing Ratio	Approximately 2.125 lt / 25 kg powder (2.00 - 2.25 lt / 25 kg)

Substrate Temperature	+2 °C min. / +30 °C max.
Pot Life	≥ 2 hours
Setting time	≤ 8 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®-9300

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

- SikaGrout®-9300 has been especially formulated for use in specific applications. As such SikaGrout®-9300 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®-9300 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 with moist cloth or plastic foil, or by using appropriate curing agents.
- The temperature of the grout material, mixing water and elements coming in contact with the mixed grout should be in the range of +2°C to +30°C
- When grouting in environments below +2°C or above +30°C contact the Technical Department of your local Sika office.

EQUIPMENT

Mixing time	Approximately 5 minutes
Mixer type	e.g. pan mixer
Application method	One continuous pour

SUBSTRATE PREPARATION

Concrete substrate preparation:
Clean out bolt holes and have the foundation area to be grouted thoroughly clean, rough but level. Saturate the cleaned foundation and any bolt holes with plenty of water. Remove all free standing water just prior to grouting. Always first grout the anchor bolts into the clean, damp (no free water) bolt holes.

Formwork preparation:
Build strong, tight, well-braced formwork. On the grout placing side, slant the form outward and extend this form suitably high to provide a head of grout during placement. Grout should be pumped directly on the sloped form to minimize air entrapment during placement. Use methods of forming that will allow the grout to flow by gravity between the plate of the windmill tower and the foundation. Keep the grout in full contact with these surfaces until it has hardened.

MIXING

Do not add cement, sand or other materials that affect the properties of this quality-controlled product. Mix full bags only. Use one or more mixers (forced action pan mixers are advised) to permit mixing and placing operations to proceed simultaneously without interruption. Mix with potable water only. Put ¾ of the water required in the first 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

APPLICATION

Mix and place the grout as close as possible to the area to be grouted. Have sufficient manpower, materials and tools to make mixing and placing rapid and continuous. SikaGrout®-9300 may only be pumped into the area to be grouted. The grout shall be placed continuously and from one side only, to avoid air entrapment while grouting. Make sure grout fills the entire space to be filled and remains in contact with the base plate and foundation throughout the entire grouting process. DO NOT VIBRATE SikaGrout®-9300.

MAINTENANCE

CLEANING

Tools and spillages can be cleaned with water while SikaGrout®-9300 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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