

MasterFlow 9300

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

MATERIAL DESCRIPTION

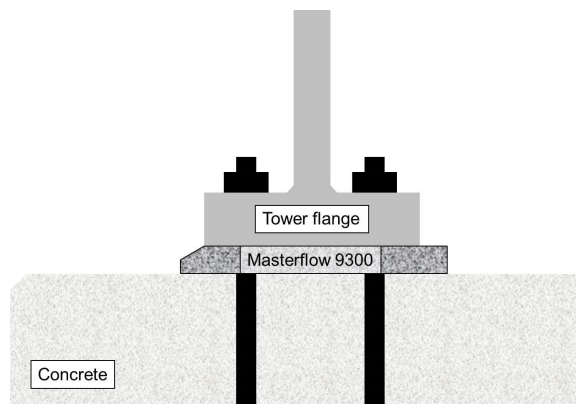
MasterFlow 9300 is a shrinkage compensated, cement based grout which when mixed with water, produces a homogeneous, flowable and pumpable grout with exceptionally high early and final strength and modulus. The product contains special metallic aggregates for increased ductility, fatigue and impact resistance.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

AREAS OF APPLICATION

MasterFlow 9300 has 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 Master Builders Solutions office regarding any application or dimensions required not mentioned here.



CHARACTERISTICS AND BENEFITS

- 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. $\geq 60 \text{ MPa @ 24hrs at } 20^\circ\text{C}$
- 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 installation times and costs as well as reducing pump pressures and wear
- Dust reduced for ease of handling
- Cement based.
- Low chromate.

APPLICATION METHOD

MasterFlow 9300 has been especially formulated for use in specific applications. As such MasterFlow 9300 should be installed by experienced fully trained contractors. Full application procedures are available on request.

(A) 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 $\frac{3}{4}$ 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.

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(B) PREPARATION OF THE CONCRETE SUBSTRATE

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.

(C) FORMWORK

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

(C) PLACEMENT OF GROUT

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. MasterFlow 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 MasterFlow 9300

CLEANING OF TOOLS

Tools and spillages can be cleaned with water while MasterFlow 9300 is still uncured. Once hardened, the material can only be removed mechanically.

CONSUMPTION

ca. 2.5 kg powder for 1 litre of mixed mortar

PACKAGING

MasterFlow 9300 is supplied in 25 kg bags.

STORAGE

Store in cool and dry conditions. Shelf life under these conditions is 12 months in unopened original bags.

NOTES

- Sands or other products that could affect the products properties must not be added.
- MasterFlow 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 MasterKure 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 Master Builders Solutions office.

HEALTH AND SAFETY

Usual preventive measures for the handling of chemical products should be observed when using this product, for example do not eat or drink while working and wash hands when taking a break or when the job is completed. MasterFlow 9300 contains cement. Avoid contact with eyes and prolonged contact with skin. In case of contact with eyes, immediately flush with plenty of water for at least 15 minutes. Call a physician. In case of contact with skin, wash skin thoroughly. Specific safety information referring to the handling and transport of this product can be found in the Material Safety Data Sheet. Disposal of product should be carried out according to the local legislation in force. Responsibility for this lies with the final owner of the product.

Hazards Identification

Symbol: 

Possible hazards:

Irritating to respiratory system and skin.

Risk of serious damage to eyes Hazard Statement:

H318 Causes serious eye damage

H315 Causes Skin irritation

H335 May cause respiratory irritation

Precautionary Statements:

P102 Keep out of reach of children

P280 Wear protective gloves and eye/face protection

P261 Avoid breathing dust

P264 Wash with plenty of water and soap thoroughly after handling
P305/P351/P338 If in eyes: rinse cautiously with water for several
1 minutes.

Remove contact lenses, if present and easy to do.
Continue rinsing.

P315 Get immediate medical advise/attention.

P304/P340 If inhaled: remove victim to fresh air and keep at rest in a
position comfortable for breathing

P302/P352 If on skin: wash with plenty of soap and water

P332/P313 If skin irritation occurs: get medical advise/attention

P362 Take off contaminated clothing and wash before reuse

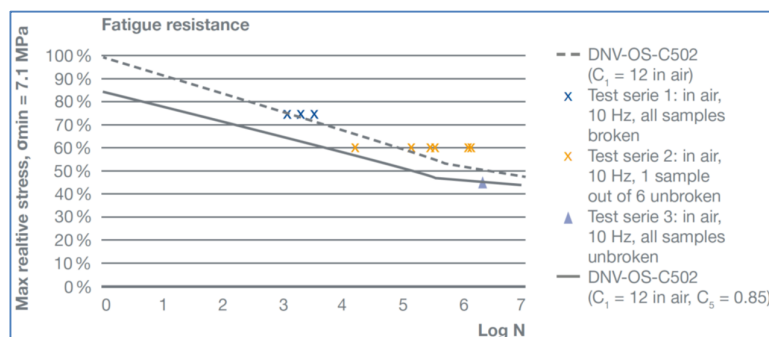
MAL-kode (1993): 00-4

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TECHNICAL DATA	Unit	Values
Density of mixture (DIN18555-2)	g/cm ³	Approx. 2.7
Mixing water demand	litres	Approx. 2.125 / 25 kg powder (2.00 - 2.25 / 25 kg)
Pot life of mixed material	hours	≥ 2
Setting time	hours	≤ 8
Air content (EN 1015-7)	%	≤ 4
Application temperature (substrate and material):	°C	From +2 to +30
Application thickness	mm	30 - 200
Mechanical properties:		
Compressive strength (40 x 40 x 160 mm prisms – EN 12190)	N/mm ²	
- after 1 day		≥ 60
- after 7 days		≥ 100
- after 28 days		≥ 120
- after 90 days		≥ 140
Flexural strength (40 x 40 x 160 mm prisms – EN196-1)	N/mm ²	≥ 17
Concrete strength class (EN206)	Class	C90/105
Tensile splitting strength (EN12390-6)	N/mm ²	≥ 7.5
Static modulus of elasticity (EN 13412)	GPa	≥ 40
Capillary water absorption (EN 13057)	kg / m ² .h ^{0.5}	≤ 0.05
Drying shrinkage (EN 12617-4)	mm/m	≤ 0.3
Crack resistance - Coutinho-ring		no cracking after 180 days
Adhesion strength to concrete (EN 1542)	N/mm ²	≥ 2
Adhesion strength after freeze/thaw (EN 13687-1)	N/mm ²	≥ 2
Rolling wheel abrasion (Capon abrasion)	Class	AR1
Pull-out strength of rebar (EN 1881) displacement at 75kN load	mm	≤ 0.6
Exposure classes (EN 206-1, DIN 1045-2)		XO, XC4, XD3, XF3, XA2, WF

Data are given for conditions of 20°C and 65% R.H. unless otherwise stated. The technical data provided do not represent guaranteed minima.



Fatigue resistance according DNV-OS-C502

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Master Builders Solutions Belgium nv Nijverheidsweg 89, B-3945 Ham 11 BE0056/02	
EN 1504-6 Cement based grout EN 1504-6 Principles 4.1/4.2	
Pull-out strength	Displacement ≤ 0,6 mm at 75 kN load
Chloride ion content	≤ 0,05 %
Reaction to fire	Euroclass A1
Dangerous substances	Complies with 5.3

Master Builders Solutions
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DISCLAIMER

Similar to all the other recommendations and technical information, this technical data sheet serves only as a description of the product characteristics, mode of use and applications. The data and information given are based on our technical knowledge obtained in the bibliography, laboratory tests and in practice. The data on consumption and dosage contained in this data sheet are based on our own experience and are therefore subject to variations due to different work conditions. Real consumption and dosage should be determined on the job by means of prior tests and are the liability of the client. Our Technical Service is at your disposal for any additional advice.

Master Builders Solutions reserves the right to modify the composition of the products provided these continue to comply with the characteristics described in the data sheet. Other applications of the product not covered by those indicated shall not be our liability. In the case of defects in the manufacturing quality of our products we provide a guarantee, any additional claims being exempt and our liability being only to return the value of the goods supplied. The possible reservations with respect to patents or third-party rights should be noted.

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