MasterFlow® 9300

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

MATERIAL DESCRIPTION

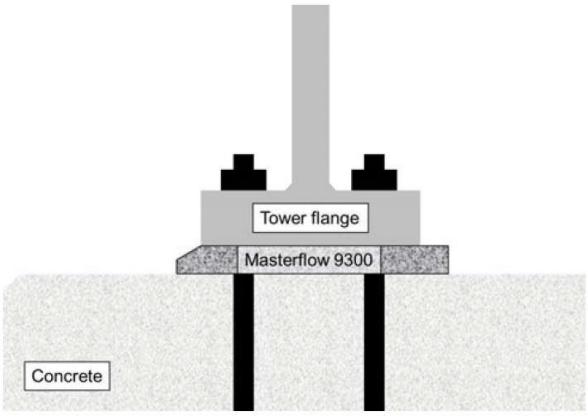
MasterFlow 9300 is a shrinkage compensated, cement based grout which when mixed with water, produces a homogeneous, flowable and pumpable grout with exceptionally high early and final strength and modulus. The product contains special metallic aggregates for increased ductility, fatigue and impact resistance.
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 windmill installations, e.g. base plate grouting of on-shore 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 windmill 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 your local Master Builders Solutions Technical Sales Representative 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.
- ≥ 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 installation times and costs as well as reducing pump pressures and wear
- Dust reduced for ease of handling
- Cement based
- Low chromate

APPLICATION

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.

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 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.

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.

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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.

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**

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 Master Builders Solutions.

ESTIMATING DATA

A 25 kg bag yields 10 litres of mixed mortar. Or, 1000 kg powder will yield approximately 400 litres of mixed grout.

MasterFlow 9300				
L	Thickness in mm /m^2	m^3	bags /m^3	m^2/mm thickness
10	10mm	0.010	100	10m^2

CLEANING

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

PACKAGING

MasterFlow 9300 is supplied in 25kg bags.

SHELF LIFE

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

PRECAUTIONS

For the full health and safety hazard information and how to safely handle and use this product, make sure that you obtain a copy of the Safety Data Sheet (SDS) from our office or website.

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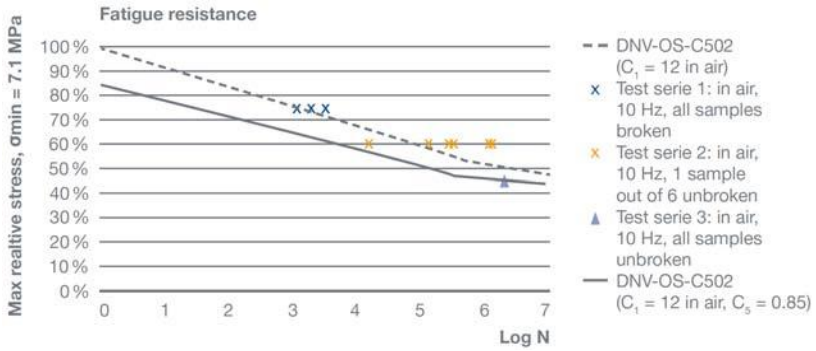
TECHNICAL DATA

Technical Data	Unit	Values
Density of mixture (DIN18555-2)	g/cm3	Approx. 2.7
Mixing water demand	litres	Approx. 2.125 / 25 kg powder (2.00 – 2.25 / kg)
Pot life of mixed material	hours	≥ 2
Setting time	hours	≤ 8
Air content (EN 1015-7)	%	≤ 4
Application temperature (substrate and material):	ºC	From +2 to +30
Application thickness	mm	30 - 200
Mechanical Properties:		
Compressive strength (40 x 40 x 160 mm prisms – EN 12190) - after 1 day - after 7 days - after 28 days - after 90 days	N/mm²	 ≥ 60 ≥ 100 ≥ 120 ≥ 140
Flexural strength (40 x 40 x 160 mm prisms – EN196-1)	N/mm²	≥ 17
Tensile splitting strength (EN12390-6)	N/mm²	≥ 7.5
Static modulus of elasticity (EN 13412)	GPa	≥ 40
Capillary water absorption (EN 13057)	kg / m².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/mm²	≥ 2
Adhesion strength after freeze/thaw (EN 13687-1)	N/mm²	≥ 2
Rolling wheel abrasion (Capon abrasion)	Class	AR1
Pull-out strength of rebar (EN 1881) Displacement at 75kN load	Mm	≥ 0.6
Data are given for conditions of 20ºC and 65% R.H. unless otherwise stated. The technical data provided do not represent guaranteed minima.		



Fatigue resistance according to DNV-OS-C502

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DISCLAIMER

MasterFlow-9300-ANZ-V2-0121

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