

# MasterFlow 9300

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

## MATERIAL DESCRIPTION

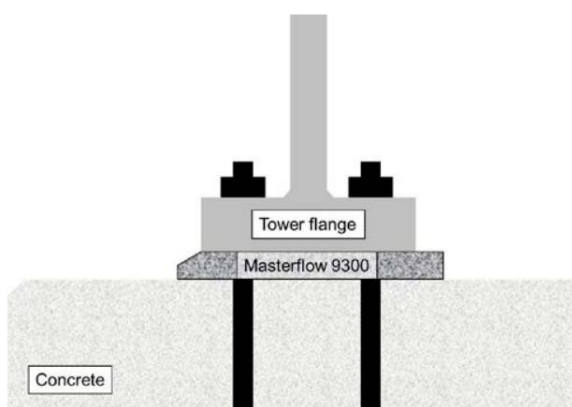
**MasterFlow 9300** is a shrinkage compensated, cement-based grout which when mixed with water, produces a homogeneous, flowable and pumpable grout with exceptionally high early and final strength and modulus. The product contains special metallic aggregates for increased ductility, fatigue and impact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

## FIELDS 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 the Technical Department of your local Master Builders Solutions office regarding any application or dimensions required not mentioned here.



## FEATURES 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.  $\geq 60$  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  $\geq 2$  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.

### 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.

### 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**.

## 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.

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## 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.

Safety phrases

Symbol: Xi Irritant

Contains: Cement, Portland, chemicals. After adding water the mixture is alkaline. Contains less than 2 mg water soluble chromate per kg of cement.

- R37/38 Irritating to respiratory system and skin.
- R41 Risk of serious damage to eyes.
- S2 Keep out of the reach of children.
- S22 Do not inhale dust.
- S24/25 Avoid contact with skin and eyes.
- S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S28.1 After contact with skin, wash immediately with plenty of water and soap.
- S27 Take off immediately all contaminated clothing.
- S37/39 Wear suitable gloves and eye/face protection.
- S46 If swallowed, seek medical advice immediately and show this container or label.

MAL-kode (1993): 00-4

## NOTE

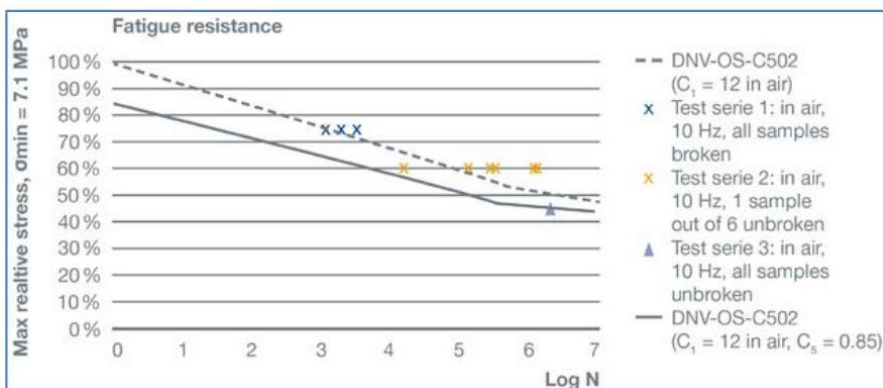
Technical support, where provided, does not constitute supervisory responsibility. For additional information contact your local MB Construction Chemicals Solutions South Africa (Pty) Ltd representative. MB Construction Chemicals Solutions South Africa (Pty) Ltd shall not be liable for technical advice provided.

MB Construction Chemicals Solutions South Africa (Pty) Ltd reserves the right to have the true cause of any difficulty determined by accepted test methods. Undertaking such tests is not, and shall not be deemed to be, an admission of liability or an assumption of any risk, loss, damage or liability.

## QUALITY AND RESPONSIBLE CARE

All products originating from MB Construction Chemicals Solutions South Africa (Pty) Ltd are manufactured under a management system independently certified to conform to the requirements of the quality standards ISO 9001, environmental and occupational health and safety standards.

\* Properties listed are based on laboratory controlled tests.



Fatigue resistance according DNV-OS-C502

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TECHNICAL DATA	Unit	Values
Density of mixture (DIN18555-2)	g/cm <sup>3</sup>	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
<b>Mechanical properties:</b>		
Compressive strength (40 x 40 x 160 mm prisms - EN 12190) - after 1 day - after 7 days - after 28 days - after 90 days	N/mm <sup>2</sup>	≥ 60 ≥ 100 ≥ 120 ≥ 140
Flexural strength (40 x 40 x 160 mm prisms – EN196-1)	N/mm <sup>2</sup>	≥ 17
Concrete strength class (EN206)	Class	C90/105
Tensile splitting strength (EN12390-6)	N/mm <sup>2</sup>	≥ 7.5
Static modulus of elasticity (EN 13412)	GPa	≥ 40
Capillary water absorption (EN 13057)	kg / m <sup>2</sup> .h <sup>0.5</sup>	≤ 0.05
Crack resistance - Coutinho-ring		no cracking after 180 days
Adhesion strength to concrete (EN 1542)	N/mm <sup>2</sup>	≥ 2
Adhesion strength after freeze/thaw (EN 13687-1)	N/mm <sup>2</sup>	≥ 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 20°C and 65% R.H. unless otherwise stated. The technical data provided do not represent guaranteed minima.

## DISCLAIMER

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