

MasterFlow 9650

Bulk supplied, high strength grout with applied nanotechnology for grouting offshore wind turbine installations

MATERIAL DESCRIPTION

MasterFlow 9650 is a shrinkage compensated grout which when mixed with water, produces a homogeneous, flowable and pumpable grout. Latest best binder packing models and applied cementitious nanotechnology produces a grout with superior technical performance, and exceptional rheological properties.

AREAS OF APPLICATION

MasterFlow 9650 has been especially formulated for large scale, pump applications.

- For use as high strength grout in offshore foundations like monopiles using bolted connections
- For rock socket structural grouting in offshore applications, or similar.
- Grouting of structural and non-structural parts of offshore wind turbine installations, e.g as skirt backfill
- Grouting under very harsh conditions, e.g. at temperatures as low as 0°C.

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

CHARACTERISTICS AND BENEFITS

- Compressive strength class C60/75, even at cold temperatures.
- Available as silo material.
- Can be applied in the shortest weather windows.
- Excellent strength gain.
- No segregation or bleeding to ensure consistent final physical performance.
- For applications in a wide temperature range.
- Excellent flow and pumping properties reduce installation times and costs.
- Very fast grout installation: limited to no interference with the critical path of the installation vessel.
- Pumpable through 2" grout lines.
- Volume stable.

APPLICATION METHOD

MasterFlow 9650 has been especially formulated for use in specific applications. As such MasterFlow 9650 should be installed by experienced fully trained contractors. MasterFlow 9650 may be installed in the traditional way by pumping the grout from bottom up. The material can also be installed using the stinger technique. Full application procedures are available on request.

CLEANING OF TOOLS

Tools and spillages can be cleaned with water while MasterFlow 9650 is still uncured. Once hardened, the material can only be removed mechanically

CONSUMPTION

1000 kg powder will yield approximately 485 to 530 litre of mixed grout.

PACKAGING

MasterFlow 9650 is supplied by bulk transport and is stored in special jobsite silos or containers. Upon request, the material may be available as well in special big bags.

STORAGE

Store under dry conditions in closed silos or warehouse. Shelf life under these conditions is 6 months. First-in / First-out principle shall however be used.

NOTES

- Sands or other products that could affect the products properties must not be added.
- MasterFlow 9650 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 MasterKure curing agents.
- As the powder may densify over time, especially when the goods are stored on the vessel in the offshore silos and exposed to many vibrations, the First-in / First-out principle is key to a successful grouting job.



MasterFlow 9650
Certificate NO. TAK0000202

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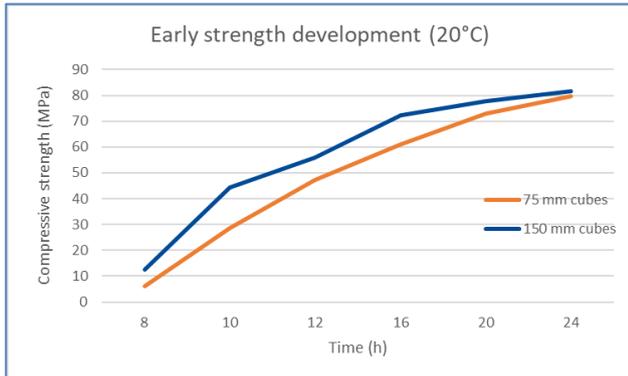
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| TECHNICAL DATA | Unit | Values | | |
|---|---|--------------------------------|-------------|-------------|
| Density of mixture (DIN18555-2) | g/cm ³ | Approximately 2.25 | | |
| Mixing water demand | litres | 140 / 1000 kg powder (± 5) | | |
| Pot life of mixed material | Minutes | ≥ 180 at 20°C ≥ 240 at 10°C | | |
| Air content (EN 1015-7) | % | ≤ 4 | | |
| Application temperature (substrate and material): | °C | 0 ≤ T ≤ 30 | | |
| Application thickness | mm | 50 - 1000 | | |
| Typical values | | | | |
| Compressive strength (150 mm cubes – EN 12390-3) | N/mm ² | <u>5°C</u> | <u>10°C</u> | <u>20°C</u> |
| - After 8 hours | | | | ≥ 5 |
| - After 12 hours | | | ≥ 5 | ≥ 30 |
| - after 1 day | | ≥ 30 | ≥ 40 | ≥ 65 |
| - after 7 days | | | ≥ 70 | ≥ 75 |
| - after 28 days | | ≥ 75 | ≥ 80 | ≥ 90 |
| Concrete strength class (EN 206) | Class | C60/75 | | |
| Sedimentation stability (in accordance of DAFStb Self compacting concrete, section N.1.2.) | | No sedimentation | | |
| Mechanical properties determined as part of DNV GL verification: | | | | |
| Compressive strength (150x300 mm cylinders – EN12390-3) | N/mm ² | <u>20°C</u> | <u>-1°C</u> | |
| - after 1 day | | 76.5 | 8.6 | |
| - after 3 days | | 83.2 | 62.3 | |
| - after 7 days | | 91.6 | 81.4 | |
| - after 28 days | | 105.7 | 88.5 | |
| - after 90 days | | 121.3 | 92.9 | |
| Characteristic compressive strength (150x300 cylinders – after 28 days) | N/mm ² | <u>20°C</u> | <u>-1°C</u> | |
| | | 100.5 | 83.3 | |
| Flexural strength (40x40x160 mm prisms – EN196-1) after 28 days | N/mm ² | <u>20°C</u> | <u>-1°C</u> | |
| | | 15.6 | 14.7 | |
| Modulus of elasticity (28 days - EN 12390-13) | GPa | 35.6 | | |
| Poisson's ratio (ASTM C469) | | 0.19 | | |
| Restrained shrinkage (28 days – ASTM C1581) | mm/m | 0.035 | | |
| Operational limitations as defined by DNV GL: | | | | |
| Minimum diameter of grout lines | ≥ 2 inch | | | |
| Grout annulus | 50 ≤ t ≤ 1000 mm | | | |
| Pumping length through 2" flexible hose | L ≤ 225 m | | | |
| Pumping elevated head with 2" flexible hose | H ≤ 25 m | | | |
| Installation / Additional information | | | | |
| Mixer and pump type | Continuous mixing and pumping system Batch mixing system | | | |
| Exposure classes (EN 206-1, DIN 1045-2) | XO, XC4, XD3, XS2, XS3, XF3, XA2, WA | | | |
| Data are given for conditions of 20°C and 65% R.H. unless otherwise stated. The technical data provided do not represent guaranteed minima. | | | | |

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Typical Results



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 9650 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 minutes.

Remove contact lenses, if present and easy to do.
Continue rinsing.
P315 Get immediate medical advice/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 advice/attention
P362 Take off contaminated clothing and wash before reuse

MAL-kode (1993): 00-4

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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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The present data sheet becomes null and void on issuance of a new edition

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