MasterFlow 9800

High strength grout with applied nanotechnology for grouting offshore wind turbine installations

MATERIAL DESCRIPTION

MasterFlow 9800 is a shrinkage compensated, cement based grout which when mixed with water, produces a homogeneous, flowable and easy pump able grout with exceptional mechanical and physical properties.
Latest best binder packing models and applied cementitious nanotechnology produces a grout with superior technical performance and exceptional rheological properties.

AREAS OF APPLICATION

MasterFlow 9800 has been especially formulated for large scale, pump applications.

- Grouting of grouted connections in offshore installations, e.g. foundations of wind turbines or oil & gas installations.
- Typical applications are pile-sleeve and stab-in-pile grouted connections, clamp repair, leg filling etc…
- Grouting under very harsh conditions, e.g. offshore applications or below water grouting, at temperatures as low as 2°C or up to 42°C.
- All void filling from 30 mm to 600mm thickness where high strength is important.

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

CHARACTERISTICS AND BENEFITS

- C90/105 concrete strength class according EN206 and DIN1045
- Can be installed with a continuous mixing and pumping process. Typical output rates of ≥ 20 m³/hour per mixing unit.
- Quick return to service and removal of temporary supports due to high early strength build-up. ≥ 40 MPa @ 24hrs at 20°C.
- Very good strength gain at low temperatures.
- No segregation or bleeding to ensure consistent physical performance inside the grouted connection, and to prevent pump blockages.
- Excellent fatigue resistance
- No wash-out during below water grouting.
- Pump able over long distances and large heights.
- 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.
- Available as silo material.

APPLICATION METHOD

MasterFlow 9800 has been especially formulated for use in specific applications. As such MasterFlow 9800 should be installed by experienced fully trained contractors.

CLEANING OF TOOLS

Tools and spillages can be cleaned with water while MasterFlow 9800 is still uncured.
Once hardened, the material can only be removed mechanically.

CONSUMPTION

1000 kg of powder will yield approximately 500 to 525 litre of mixed grout.

PACKAGING

MasterFlow 9800 is supplied by bulk transport and is stored in jobsite silos.

STORAGE

Store under dry conditions in closed silos. Shelf life under these conditions is 6 months.

NOTES

- Sands or other products that could affect the products properties must not be added.
- MasterFlow 9800 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.

MasterFlow 9800
Certificate N0. TAK00000RW

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TECHNICAL DATA	Unit	Values		
Density of mixture (DIN18555-2)	g/cm^3	Approx. 2.25		
Mixing water demand	litres	Approx. 145 / 1000 kg powder		
Pot life of mixed material	minutes	≥ 120		
Setting time	hours	≤ 10		
Air content (EN 1015-7)	%	≤ 4		
Application temperature (substrate and material)	ºC	From 2 to +42		
Application thickness	mm	30 - 600		
Characteristic strength:				
Compressive strength (150x300 mm cylinders)	MPa	$X_{k(n)}$ ≥ 90		
Compressive strength (100 mm cubes) - at 20°C - at 5°C	MPa	 $X_{k(n)}$ ≥ 90 $X_{k(n)}$ ≥ 80		
Flexural strength (700x150x150 mm bars)	MPa	$X_{k(n)}$ ≥ 9		
Typical values – additional test results				
Compressive strength (100 mm cubes – EN12390-3) - after 3 days - after 7 days - after 28 days	N/mm²	20°C ≥ 75 ≥ 85 ≥ 95	5°C ≥ 45 ≥ 70 ≥ 80	2°C ≥ 40 ≥ 65 ≥ 75
Flexural strength (700x150x150 mm bars – EN12390-5) - after 28 days	N/mm²	 ≥ 10		
Modulus of elasticity (28 days) - Static (DIN 1048-5) - Dynamic (DIN 1048-5)	GPa	 ≥ 30 ≥ 35		
Autogenous shrinkage (Schleibinger shrinkage drain method) (test started 90 minutes after mixing – air sealed samples)	mm/m	≤ 0.4		
Shrinkage (in accordance of DAfStb VeBMR Rili)	class	SKVM 0		
Sedimentation stability (in accordance of DAfStb Self compacting concrete, section N.1.2.)		No sedimentation		
Application information:				
Mixer	Jet mixer (continuous mixing)			
Hose diameter	min. 2”			

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

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Mechanical properties determined as part of DNV GL verification:			
Compressive strength (150x300 mm cylinders – EN12390-3)	N/mm²	20°C	2°C
- after 3 days		83.8	58.9
- after 7 days		94.7	79.4
- after 28 days		103.1	91.8
- after 90 days		124.3	100.5
Characteristic compressive strength (150x300 cylinders – after 28 days)	N/mm²	20°C 94.5	2°C 88.4
Flexural strength (40x40x160 mm prisms – EN196-1)	N/mm²	20°C	2°C
- after 28 days		13.6	12.7
Modulus of elasticity (28 days)	GPa		
- Static (EN 12390-13)		34.9	
Poisson's ratio (ASTM C469)		0.271	
Autogenous shrinkage (ASTM C1698) (test started after initial set of the material)	mm/m	-0.309	
Operational limitations as defined by DNV GL:			
Minimum diameter of grout lines	≥ 2 inch		
Grout annulus	30 ≤ t ≤ 600 mm		
Pumping length through 2" flexible hose	L ≤ 200 m		
Pumping elevated head with 2" flexible hose	H ≤ 20 m		

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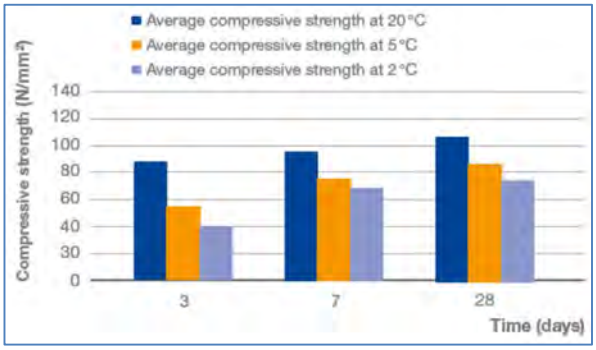
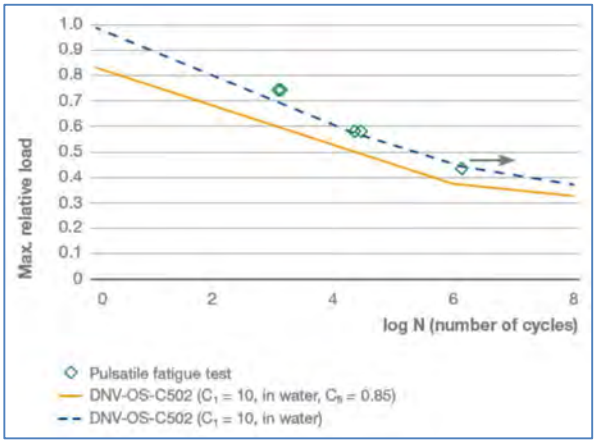
Typical Results



Compressive strength development at different temperatures (100 mm cubes – EN12390-3)



Fatigue resistance of MasterFlow 9800 in water (100x200 mm cylinders)

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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 9800 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 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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DISCLAIMER:

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