

MasterFlow® 928HF

High performance, high flow, hydrogen free, non-shrink cementitious grout

DESCRIPTION

MasterFlow 928HF is a ready to use, factory quality controlled, fine grey cementitious powder. It requires only the on-site addition of water to produce a high performance, high flow, non-shrink precision grout with predictable, consistent properties. Special additives ensure hydrogen free expansion in the fresh plastic and the hardened stages to ensure the grout maintains full contact, and efficient load transfer, with the underside of baseplates, or within the void to be filled.

TYPICAL APPLICATIONS

MasterFlow 928HF is formulated for use at any consistency from fluid to damp-pack, and may be used with confidence for bedding, grouting and precision bearing operations such as:

- Gas or steam turbines
- Generators
- Presses
- Crane rails
- Milling machines
- Precast elements
- Anchor bolts
- Suitable for use in bridge bearing applications
- Form and fill concrete repairs
- It is particularly suited for situations where hydrogen expansion grouts are not allowed

ADVANTAGES

- Non shrink
- Adjustable consistency
- Proven and predictable performance
- Excellent workability retention even at high ambient temperatures
- High bond strength to steel and concrete
- Early strength development
- Good fatigue and impact resistance
- Microsilica content enhances strength and durability
- Impermeable
- Can be extended by the addition of 5-13 mm clean washed aggregate when large volume void filling is required. **MasterEmaco FL 100** aggregate supplied in 20kg bags, subject to approval by Master Builders Solutions Construction Chemicals, Technical Services Department.

PACKAGING

MasterFlow 928HF is supplied in 25 kg bags.

STANDARDS

Complies with ASTM C1107-14

TYPICAL PROPERTIES*

Wet Density (ASTM C 905)	~2220 kg/m ³
Compressive strength (ASTM C 109)	
1 day	>20 N/mm ²
3 days	>30 N/mm ²
7 days	>50 N/mm ²
28 days	>70 N/mm ²
Flexural strength (EN 12390 Part 5)	
7 days	>8 N/mm ²
28 days	>10 N/mm ²
Static Modulus of Elasticity (ASTM C 469M 2014)	>25,000
Slant shear bond strength to concrete (ASTM C 882)	>13 N/mm ²
Pull out strength (BS 1881 part 207 1992)	>75 kN
Plastic expansion (ASTM C 827)	0.05 – 2.0%
Recommended section thicknesses	25 mm – 100 mm

APPLICATION GUIDELINES

SURFACE PREPARATION

The surface onto which the grout is to be applied should be prepared to remove laitance and expose aggregate. Do not use heavy bush hammers or similar preparation equipment that can crush the aggregate but leave it in place. The surface must be free of oil, dust, dirt, paint, curing compounds, etc. Soak area to be grouted with water for 24 hours prior to grouting to minimise localised absorption and to assist in the free flow of the grout. Surfaces should be damp but free of standing water.

Particular attention should be paid to bolt holes to ensure that these are water-free. Use oil free compressed air to blow out bolt holes and pockets as necessary.

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Base plate, bolts, etc. must be clean and free of oil, grease and paint etc. Set and align equipment. If shims are to be removed after the grout has set; lightly grease them for easy removal.

Ensure formwork is secure and watertight to prevent movement and leaking during the placing and curing of the grout. The area should be free of excessive vibration. Shut down adjacent machinery until the grout has hardened.

In hot weather, base plates and foundations must be shaded from direct sunlight. Bags of grout should be stored in the shade prior to use.

In cold weather, the temperature of base plates and foundations should be raised to >10°C.

MIXING

In hot weather use cool water to bring the mixed grout temperature to <30°C.

In cold weather use warm water to raise the mixed grout temperature to >10°C.

Damp down the inside of the grout mixer with water prior to mixing the initial batch of

MasterFlow 928HF.

Add the pre-measured quantity of water See Table 1.) Slowly add the **MasterFlow 928HF**, mixing continuously. Mix for at least five minutes until a smooth, uniform, lump free consistency is achieved.

Table 1: Typical mixing water requirements

Application	Consistency	Test method	Flow Values	Mix Water (in litres)	
				Min	Max
Grouting machinery	Flowable	ASTM C1437-20	>150%	4.25	4.5
Grouting machinery	Fluid	ASTM C 939/939M-16	<35 sec	4.5	5.0

* ASTM C939 (formerly CRD-C 79)

Adding aggregate for thicker sections

When aggregate "bulking" is required addition rate for the 5-13mm aggregate should be confirmed by site trials. Typically, the addition rate would be between 10-15kg of clean dry aggregate per 25kg bag of **MasterFlow 928HF**.

Add the aggregates to the mixing water in the concrete mixer and then slowly add the **MasterFlow 928HF** powder and mix for 5 minutes until a lump free uniform consistency is achieved.

Ideally the slump should be 75-200mm depending upon application requirements.

PLACING / APPLICATION

Lengths of metal strapping laid in the formwork prior to placing may be necessary to assist grout flow over large areas and in compacting and eliminating air pockets. Pour the grout continuously from one side only. Maintain a constant hydrostatic head, preferably of at least 15cm. On the side where the grout has been poured, allow 10cm clearance between the side of the form and the base plate of the machine.

On the opposite side allow 5cm clearance between the formwork and the base plate.

MasterFlow grouts can be installed with most types of pumping equipment.

MasterFlow 928HF when bulked with aggregate as above should be placed and compacted by light rodding and tapping of formwork faces only. Mechanical vibration should NOT be utilized.

Immediately after **MasterFlow 928HF** grout is placed, cover all exposed grout with clean damp hessian, and keep moist until grout is firm enough to accept a curing membrane.

Should the grout shoulders require finishing work, this should be carried out prior to application of the curing membrane. We recommend the use of a curing membrane from our **MasterKure** range.

Treatment of Exposed Grout Shoulders

Due to differences in temperature between the grout under the base plate, and exposed shoulders that are subject to more rapid temperature changes, debonding and / or cracking can occur. Avoid shoulders wherever possible.

If shoulders are required, they should be firmly anchored with reinforcing to the substrate to prevent debonding.

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COVERAGE / YIELD

13.5 L per 25kg bag at 5 L water addition rate. Therefore, 1 m³ of grout requires approximately 74 x 25kg bags.

Recommended thickness

MasterFlow 928HF is recommended for use in thicknesses from 25mm to 100mm. For thicker sections consider using **MasterFlow 980HF**. For applications below 25mm consult Master Builders Solutions Technical Services Department for advice.

WATCHPOINTS

The temperature of both the grout and elements coming into contact with the grout should be in the range of +10°C to +35°C. Do not use water in an amount or at a temperature that will produce a consistency more than fluid or cause mixed grout to bleed or segregate.

To simulate on-site conditions and create the conditions for which **MasterFlow 928HF** has been formulated as an expansive grout, it is necessary to restrain cubes cast for strength testing, for the first 24 hours immediately after casting.

DO NOT OVERWORK AND AVOID USING MECHANICAL VIBRATION. UNDER NO CIRCUMSTANCES SHOULD MasterFlow 928HF BE RETEMPERED BY THE LATER ADDITION OF WATER.

It is essential that a mechanically powered grout mixer is used to obtain the optimum properties.

STORAGE AND SHELF LIFE

Store out of direct sunlight, clear of the ground on pallets protected from rainfall. Avoid excessive compaction. Shelf life is approximately 12 months when stored as above in original sealed bags. Failure to comply with the recommended storage conditions may result in premature deterioration of the product or packaging. For specific storage advice consult Master Builders Solutions Technical Services Department.

HEALTH AND SAFETY

As with other products containing Portland cement, the cementitious material in **MasterFlow 928HF** grout may cause irritation. Avoid contact with eyes and prolonged irritation. 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.

QUALITY AND CARE

All products originating from Master Builders Solutions Dubai, UAE facility are manufactured under a management system independently certified to conform to the requirements of the quality, environmental and occupational health & safety standards ISO 9001 and ISO 14001.

Request and refer to recommended installation procedures for **MasterFlow** grouts prior to use

* Properties listed are based on laboratory controlled tests.

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STATEMENT OF RESPONSIBILITY

The technical information and application advice given in this Master Builders Solutions publication are based on the present state of our best scientific and practical knowledge. As the information herein is of a general nature, no assumption can be made as to a product's suitability for a particular use or application and no warranty as to its accuracy, reliability or completeness either expressed or implied is given other than those required by law. The user is responsible for checking the suitability of products for their intended use.

NOTE

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