



The Chemical Company

MASTERFLOW[®] 648 CP

High strength foundation grout

Description

MASTERFLOW[®] 648 CP is a high performance non-shrink, epoxy grouting material for support and precision of heavy equipment to ensure the proper transmission of static and dynamic loads to the equipment foundation.

Advantages

MASTERFLOW[®] 648 CP is a three component system that includes a two-part epoxy resin and carefully blended aggregate. At elevated temperatures, MASTERFLOW[®] 648 CP provides excellent resistance to creep, high compressive strength, modulus of elasticity and excellent resistance to cracking. This product also produces a high percentage of bearing surface, and good adhesion to steel and concrete. Critical machinery alignment is assured because of its excellent resistance to creep and high temperature compressive strength. MASTERFLOW[®] 648 CP is chemically stable for temperatures up to 150°C.

When installation conditions vary, the handling properties of MASTERFLOW[®] 648 CP can be optimised by adjusting the amount of aggregate used. This does not significantly change the grout's mechanical properties but has the important advantage of maximising the bearing area while maintaining proper flow.

MASTERFLOW[®] 648 CP is resistant to oil, synthetic lubricants, water and most chemicals, and cures quickly which means equipment can return to service much sooner.

Application

The gas transmission industry made MASTERFLOW[®] 648 CP the industry standard for grouting large compressors as well as other equipment. The steel industry selects MASTERFLOW[®] 648 series grout for foundations under crushers, ball mills, rod mills slab tables, scale breakers, bolt pockets, and other heavy equipment. The mining, power, pulp and paper, and chemical industries are also successfully using 648 series grout in a variety of applications. High strength, low creep, and good chemical resistance spell a multitude of uses for MASTERFLOW[®] Grouts.

MASTERFLOW[®] Grouts are essential wherever precise permanent alignment of machinery is required.

Fill ratios

MASTERFLOW[®] 648 CP is packaged in units containing 6.75 fill ratios, that is, the ratio by weight of aggregate to the combined resin and hardener components. Because the foundation temperature and geometry will vary on each installation, MASTERFLOW[®] 648 CP is designed so that the amount of aggregate can be adjusted to provide maximum bearing area while maintaining good flow and handling properties.

The following chart lists the amount of aggregate, in litres, that may be withheld from each full unit. However, it is always preferable to use the greatest amount of aggregate that will allow for proper placement.

MASTERFLOW[®] 648 CP

Litres of aggregate that may be removed from each full unit:

Temp.	Thin pours or long flow distances	Thick pours normal conditions	or open areas
>32°C	3.8 ltr	0	add 3.8 ltr
21-32°C	7.6 ltr*	3.8 ltr	0
10-21°C	7.6 ltr*	7.6 ltr	3.8 ltr

* Do not remove more than 7.6 litres of aggregate without first consulting manufacturer.

* Loose bulk density of aggregate = 1650 to 1700kg/m³

Chemical resistance

MASTERFLOW[®] 648 CP resists non-oxidising mineral acids and salts, caustics, dilute oxidising acids and salts, plus some organic acids and solvents. For more specific information contact your BASF Construction Chemicals UAE LLC Representative.

Cure time vs. temperature

Cure time of the grout will depend upon the temperature of the base and foundation rather than the ambient air temperature. Unless the ambient air temperature has been constant for several days the base / foundation temperature will generally be lower than air temperature. A surface thermometer and field judgement should be used to determine actual cure rates. Cured grout should have solid, almost metallic ring when struck lightly with a hammer, checking as close to the base as possible.

Pour thickness

MASTERFLOW[®] 648 CP can be used for deep pours up to 300mm. For greater thicknesses, please contact our technical department.

Estimating and ordering

Due to installation variables etc., it is best to order an additional 10-20% as a safety precaution.

104.3kg Full Unit

Yield 0.049m³

MASTERFLOW[®] 648 CP:

Liquid	1	10.1kg
Hardener	1	3.4kg
Aggregate	4	22.7kg

Installation procedures

Detailed installation procedures for MASTERFLOW[®] 648 CP are contained in Installation Procedures Bulletin 210a.

The following procedures briefly describe installation of MASTERFLOW[®] 648 CP:

Concrete preparation and sealing

The concrete surface must be scabbled so that large aggregate is exposed to ensure removal of all laitance and weak surface material. New concrete should have a compressive strength of at least 20 MPa; greater strength is preferred. THE CONCRETE SURFACE MUST BE CLEAN AND DRY WHEN THE GROUT IS POURED. The concrete areas to be grouted should not be primed or sealed.

UngROUTED exposed concrete surfaces may be sealed to prevent oil penetration.

Metal preparation and priming

Base plates or rails and other metal surfaces to be grouted should be cleaned to obtain proper adhesion. This is preferably done just prior to grouting. Primer should be used ONLY when a long delay between cleaning and grouting will allow rusting or contamination.

Surfaces where a bond is not desired should be protected with heavy coats of wax.



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Forming

MASTERFLOW[®] 648 CP is fluid and requires forms. Forms are generally wood, the same as used for forming concrete. They should be of sufficient strength, anchored or braced to withstand pressure from the grout and must be "liquid tight".

Finishing and clean up

A smooth finish may be obtained by spraying or brushing the surface with Solvent No. 2 approximately 1 hour after the grout is poured. Best results can be obtained by smoothing the surface several times just prior to the hardening of the grout surface. Clean tools and mixer with SOLVENT NO. 2.

Safety precautions

MASTERFLOW[®] 648 CP is a three component epoxy grout formulated for industrial and professional use only and must be kept out of the reach of children. These products contain chemicals which may be COMBUSTIBLE and potentially HARMFUL to your health if not stored and used properly. Hazards can be significantly reduced by observing all precautions which are found on material safety data sheets, and product labels. Please read this literature carefully before using product.

Working time

The following chart is a guide for the working time of a fresh grout mix at various ambient temperatures. The working time of a MASTERFLOW[®] 648 CP mix begins when the hardener is added to the liquid.

- 50-60 min at 32°C
- 90-120 min at 21°C
- 120-150 min at 10°C

Typical physical properties: metric

Properties listed are only for guidance and are not a guarantee of performance

Compressive Strength

(ASTM C 579-82, Method B, Modified 50mm cubes)

Fill ratio*	Test temp (°C)	(MPa) (1)
6.726	23	105
	30	110
	40	115

14 day cure at specified test temperature.

Compressive Strength development when cured at*:

Time (hrs)	40°C (MPa)
24	100
72	110
336	110

*fill ratio 6.25:1

Tensile Strength - ASTM C 307-83

14MPa

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Modulus of Elasticity - ASTM C 580-74 (GPa)

Test temp °C	Fill ratio		
	5.75:1	6.25:1	6.726:1
24	18	18	18
43	15	16	16
52	14	15	15
60	11	12	12
68	5	5	6

Flexural strength - ASTM C 580-74

Temperature (°C)	Strength (MPa)
24	32

**Co-efficient of Thermal Expansion
ASTM C 531-81**

23°C 21.2 x 10⁻⁶ °C

Bond Strength to steel - tension

23°C 22 MPa
60°C 14 MPa

Bond Strength to steel - shear

23°C 35 MPa
60°C 14 MPa

Density ASTM C 905-79

5.75 2100 kg/m³
6.25 2110 kg/m³
6.726 2115 kg/m³

Flashpoints (Pensky-Martens Closed Cup)

MASTERFLOW[®] 648 CP base 109°C
MASTERFLOW[®] 648 CP hardener 110°C

Impact Strength - superior to concrete

Abrasion Resistance - superior to concrete

Colour - dark grey

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As all BASF technical datasheets are updated on a regular basis it is the user's responsibility to obtain the most recent issue.

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