

MasterFlow[®] 648

High strength foundation grout

DESCRIPTION

MasterFlow 648 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 is a three component system that includes a two-part epoxy resin and carefully blended aggregate. At elevated temperatures, **MasterFlow 648** 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** is chemically stable for temperatures up to 150°C.

When installation conditions vary, the handling properties of **MasterFlow 648** can be optimised by adjusting the amount of aggregate used.

MasterFlow 648 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** 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 is packaged in units containing 6.726 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** 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.

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 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 Saudi BASF Construction Chemicals 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.

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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 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:

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

INSTALLATION PROCEDURES

Detailed installation procedures for **MasterFlow 648** are contained in Installation Procedures Bulletin 210a.

The following procedures briefly describe installation of **MasterFlow 648**:

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.

FORMING

MasterFlow 648 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 MasterTop Thinner 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 MasterTop Thinner No. 2.

SAFETY PRECAUTIONS

MasterFlow 648 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

Given below is a guide for the working time of a fresh grout mix at various ambient temperatures. The working time of a **MasterFlow 648** mix begins when the hardener is added to the liquid.

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

TYPICAL PHYSICAL PROPERTIES:

Physical properties are affected by fill ratio and cure temperature. At temperatures below 25°C the following guidelines are recommended:

- Mix and apply grout in the warmest part of the day.
- Store grout materials in a warm environment.
- Maintain a minimum mixed temperature of 25°C.

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COMPRESSIVE STRENGTH (min): EFFECT OF FILL RATION AND CURE TEMPERATURE

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

Fill ratio*	Test temp (°C)	25°C
6.726	23	105N/mm ²
	30	110N/mm ²
	40	115 N/mm ²

14 day cure at specified test temperature.

Compressive strength development when cured at*

Fill ratio*	Time	40°C
6.25 :1	24 hrs	100N/mm ²
	72 hrs	110N/mm ²
	336 hrs	110 N/mm ²

FLEXURAL STRENGTH- @25°C -ASTM, C 580-74

32Mpa

TENSILE STRENGTH @25°C -ASTM C 307 -83

14Mpa

MODULUS OF ELASTICITY-ASTM C 580 74 (GPa)

Test temp	Fill ratio		
°C	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

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 base 109°C
MasterFlow 648 hardener 110°C

IMPACT STRENGTH

Superior to Concrete

ABRASION RESISTANCE

Superior to concrete

Colour

Dark Grey

NOTE

Field service, where provided, does not constitute supervisory responsibility. For additional information contact your local BASF representative.

BASF reserves the right to have the true cause of any difficulty determined by accepted test methods.

QUALITY AND CARE

All BASF Products are manufactured under a management system independently certified to conform to the requirements of the quality, environmental and occupational health and safety standards of ISO 9001 and BASF ESHQ recommendations.

* Properties listed are based on laboratory controlled tests

® = Registered trademark of the BASF-Group in many countries.

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NOTE

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