

# MasterFlow<sup>®</sup> 648

## HIGH STRENGTH FOUNDATION GROUT

### DESCRIPTION OF PRODUCT

**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 which 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. 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** 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 and other heavy equipment. The mining, power, pulp and paper, and chemical industries are also successfully using **MasterFlow 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

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	1.1 Ltr	0	add 1.1 ltr
21-32° C	2.2 Ltr	1.1 Ltr	0
10-21° C	2.2 Ltr	2.2 Ltr	1.1 Ltr

\* Do not remove more than 2.2 Litres of aggregate without first consulting manufacturer

\* Loose bulk density of aggregate = 1650 to 1700kg/m<sup>3</sup>

### 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 Master Builders Solutions 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.

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## POUR THICKNESS

**MasterFlow 648** can be used for deep pours.

When pour thickness exceeds 150mm, use of steel rebar is recommended. See Installation Bulletin on expansion joint and reinforcement bar suggestions.

## ESTIMATING AND ORDERING

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

### 30kg Full Unit

Yields 0.014m<sup>3</sup>

## INSTALLATION PROCEDURES

Detailed installation procedures for **MasterFlow 648** are contained in Installation Procedures Bulletin 91 I. The following procedures briefly describe installation of **MasterFlow 648**:

### CONCRETE PREPARATION AND SEALING:

The concrete surface must be chipped 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 solvent 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.

## 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 the 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** mix begins when the hardener is added to the liquid.

50- 60 minutes at 32°C

90-120 minutes at 21°C

120-150 minutes at 10°C

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## TYPICAL PHYSICAL PROPERTIES: METRIC

Colour:	Dark grey		
Compressive strength development when cured at 40°C (fill ratio 6:1):	Time (days)	(MPa)	
	1	100	
	3	110	
	14	110	
Tensile strength - ASTM C 307-83 (fill ratio 6:1):	14MPa		
Modulus of elasticity - ASTM C 580-74 (GPa):	Test temp.	fill ratio	
	°C	5.5:1	6:1
	24	18	18
	43	15	16
	52	14	15
	60	11	12
	68	5	5
Flexural strength - ASTM C 580-74, at 24°C:	32MPa		
Co-efficient of thermal expansion ASTM C 531-81, at 23°C:	21.2 x 10 <sup>-6</sup> °C		
Bond strength to steel – tension:	23°C	22MPa	
	60°C	14MPa	
Bond strength to steel – shear:	23°C	35MPa	
	60°C	14MPa	
Density ASTM C 905-79:	5.50	2100kg/m <sup>3</sup>	
	6	2110kg/m <sup>3</sup>	
Flashpoints (Pensky-Martens Closed Cup):	<b>MasteFlow 648</b> base:		109°C
	<b>MasteFlow 648</b> hardener:		110°C
Impact strength:	Superior to concrete		
Abrasion resistance	Superior to concrete		

### PACKAGING

**MasteFlow 648** is supplied in 30kg unit size.

### STORAGE

Store under cover, out of direct sunlight, and protect from extremes of temperature. In tropical climates, the product must be stored in an air-conditioned environment.

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's Technical Services Department.

### SHELF LIFE

Up to 12 months if stored in unopened containers according to manufacturer's instructions.

### SAFETY PRECAUTIONS

As with all chemical products, care should be taken, during use and storage, to avoid contact with eyes, mouth, skin and foodstuffs (which can also be tainted with vapor until product has fully cured or dried). Treat splashes to eyes and skin immediately. If accidentally ingested, seek medical attention. Re-seal containers after use.

### NOTE

Field service, where provided, does not constitute Supervisory responsibility. For additional information, contact your local Master Builders Solutions representative.

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

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### QUALITY STATEMENT

All products manufactured by Master Builders Solutions Egypt, or imported from Master Builders Solutions affiliate companies world-wide, are manufactured to procedures certified to conform to the quality, environment, health & safety management systems described in the ISO 9001:2015, ISO 14001:2015 & OHSAS 18001:2007 standards.

\* Properties listed are based on laboratory controlled tests.

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