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# **BASF CONSTRUCTION CHEMICALS AUSTRALIA and NEW ZEALAND**

## **APPLICATION GUIDE for MASTERFLOW® EPOXY GROUTS**

Masterflow® 622

Masterflow® 628

Masterflow® 648 CP Plus

Masterflow® 678 DP Plus

### **IMPORTANT: READ THIS FIRST**

BASF Construction Chemicals does not warrant the performance of this product unless the instructions of this document and other related BASF Construction Chemicals documents are adhered to in all respects.



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## 1. SURFACE PREPARATION

The foundation surface must be free of all laitance and unsound material and thoroughly cleaned and cured. Keeping the surface covered will make the later job of cleaning the surface prior to grouting much easier and less costly.

The grout foundation should be roughened as specified. The concrete surface may be uniformly roughened before it has set by the use of a nail rake in one direction only. Use of a bull float, darby, broom, or wood float finish, or scratching at random with a garden rake or trowel is NOT recommended.

After the concrete hardens, hand held, pistol grip pneumatic hammers with chisel point heads are recommended for roughening to remove laitance and loose material to ensure a good bond. Use of large paving breakers equipped with bush hammers, spade or chisel bits, are NOT recommended. Where grout will extend horizontally out beyond the edge of the plate or object grouted, the foundation must also be prepared below these areas to help assure bond.

Before setting structural elements or machinery, all of the areas of the foundation, which will be in contact with the grout, including anchor boltholes, must be thoroughly cleaned. Remove any oil, grease, and curing membrane. Surfaces should be clean and dry before application of the grout.

## 2. FORMING

Forms should be watertight and strong enough to withstand the hydraulic pressure of plastic, flowable or fluid grout, without leaking. When flowing the grout into place, all forms should extend vertically at least 25mm above the underside of the bedplate surface to help ensure complete filling of the space to be grouted and prevent overflowing. The side forms should not be tight against the plate, but should be erected 25 to 50mm horizontally away from the plate so that air being displaced is not trapped below the plate.

The vertical form on the exit side (opposite the placing side) should be extended 50 to 100mm away from the plate so that straps or other placing aids can be inserted to assist movement of the grout should that become necessary.

HEADER BOX - The form on the placing side should be extended 50 to 100mm horizontally from the plate at the foundation and be slanted upward at an approximate 45 degree angle so that grout can be poured on it with a minimum of turbulence (and entrapment of air bubbles) while directing it smoothly on its way under the plate. A blackboard (splash board) form should be built on top of the plate and at the plate edge, opposite the slanted headboard, to prevent spillage of grout and provide containment of the "head" of grout as it is being placed.



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For many applications, such as turbines and generators, or other base plates of lengthy dimensions, it is not prudent to build high, pouring “head” forms for these base plate lengths. In lieu of this, low forms, sufficiently high to contain the grout and at least 25mm above the bottom elevation of the plate to be grouted may be used. However, as a sloped pouring form is desirable, a portable “head box” which can be moved along the length of the plate as the grouting proceeds may be used. This portable “head box” serves well in helping to place the grout and saves a lot on forming costs. The box with a sloped pouring surface should rest in part on the form, floor and/or base plate and this method serves just as well, and often better than a long sloped form, as the thrust of the grout flow is better controlled.

Forms should be caulked to prevent leakage. Forming materials should be coated with a good curing compound (such as Masterkure 100WB) or plastic coating. These coatings act as bond breakers so that smooth grout surfaces result after form removal and the forms are protected for reuse. The points to caulk are the interfaces between the form and rough foundation surface where grout might leak out during its placement or before setting. Material used for caulking between the form and concrete surface may joint sealants or epoxy mortars. Vertical joints in the forms should be caulked if large cracks are evident. The use of duct tape applied on the inside of the form, at corners, is useful for this.

### **3. HOT WEATHER GROUTING**

Avoid high temperatures while grouting. If the packaged grout is above 30°C, chill the sealed pails of grout liquid in a tub of ice, or cover the pails with water-soaked hessian. When grouting under hot conditions (ie >30°C), it is necessary to cool the grout and aggregate (if applicable) below 25°C. Provide shade from sunlight for at least 24 hours before and 48 hours after grouting.

### **4. COLD WEATHER GROUTING**

Do not use at ambient temperatures of less than 15°C unless artificial means of heating can be used to assist cure. During cold weather, pails of grout liquid should be pre-warmed to between 20 and 30°C. If heating is required, an enclosure (typical materials are polyethylene or canvas) should be erected around the equipment and foundation and suitable heating used to increase the temperature of the equipment and foundation.

### **5. CRACKING**

Cracking may occur on the shoulder near sharp corners of the baseplate and anchor bolts. This is due to lack of restraint at that point and has no impact on long term performance. Horizontal edge cracks may occur just below the grout-concrete interface due to the differences in thermal capacity and most often occurs in external applications. This is due to the differential thermal movement and the crack will be limited to the shoulder area and will not affect the ability of the grout to support the equipment.



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In most cases cracking does not impact the support and alignment performance of the grout. If there is concern regarding the likelihood of cracks allowing oil or chemical contamination of the concrete substrate, the cracks should be filled with a grout binder such as **Concresive 2525** or **Concresive 1375**.

## 6. PLATE AND EQUIPMENT PREPARATION

The bonding surfaces of the base or plate to be grouted should be sandblasted to "white metal" and be free of coatings, wax, grease or scale. However, where new plant and equipment have been surface finished with high quality coating systems (eg polyurethane), these need not be removed. Other mechanical methods such as grinding or sanding are also effective but do not produce as high bond strength as sandblasting. To permit easy clean up, wax or cover all surfaces where the grout may splash.

## 7. DEEP POUR RECOMMENDATIONS

Where a deep pour is necessary, 10-12mm steel reinforcement at 300-450mm centres may be used to minimise stress cracking. The top tier should be located about 50mm below the equipment base. A bottom tier should be placed about 50mm above the foundation surface. Additional tiers, if required, should be spaced equal distances in the grout pour with vertical supports as required.

For deep pours up to 150mm, **Masterflow 648 CP Plus** is recommended. For deep pours greater than 150mm and up to 450mm, **Masterflow 678 DP Plus** is recommended.

## 8. ANCHOR BOLT GROUTING

**Bolts** must be free of oil, grease and rust. Solvent wipe before placement with Thinner No. 1. Bolts must be deformed bar, threaded rod, with nut or head preferred. Grit blasting or abrasive wheel may be required.

**Holes drilled dry** must have dust blown out and be free of oil and grease. **Wet drilled holes** must have free water rinse to remove drilling slurry. **Formed holes** must be chipped to remove laitance, form oil residue. If polystyrene was used for forms, do not melt with petrol or thinner because a sticky residue will remain. Mechanically remove polystyrene and clean hole with wire brush or scraper on a vibrating hammer.

### Hole Dimensions

Hole Depth - 12 times bolt diameter  
Hole Diameter - 1.5 times bolt diameter. Over 600mm deep a minimum of plus 50mm bolt diameter is recommended.

### Hole spacing at edges

Edge spacing and space between holes is bolt diameter x 8. Shear loads acting to the edge of concrete will need to be considered separately.



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## 9. BULKING WITH AGGREGATES

Two methods are possible:

A) Use large particle size aggregate e.g. 25-30mm and pour grout through or tremmie from bottom. Points to note on this method are:

- Use large round stone to maintain flow.
- Stone will fill approximately 45% of void thereby lowering material usage and exotherm temperature.
- Only suitable for large voids with easy access.
- Compressive strengths will generally only be slightly lower than without stone providing stone is high quality, dry, silt free, quartzite.
- Contact on the perimeter of void is 100% of resin so bond to substrates is perfect.

B) Mixing aggregate in:

- **Masterflow 678 DP Plus** and **Masterflow 648 CP Plus** have aggregate (supplied by BASF) mixed in as standard – refer to appropriate technical data sheets for more details.
- **Masterflow 622** has the ability to be bulked out with aggregate/filler supplied by BASF. Use 15kg of **Masterflow 622 Filler** per 10kg kit in large void situations with little reinforcement. In applications requiring higher flow, use 10kg of **Masterflow 622 Filler** per 10kg kit.

Another method of bulking out **Masterflow 622** is the addition of 2 parts by volume of 10mm aggregate to 3 parts **Masterflow 622**. However, the product is only just pumpable at this ratio.

## 10. PUMPS

Pumps can be used for epoxy grouts and the best are diaphragm pumps. They are easily stripped, not affected by solvent, readily available, air powered, cheap and will be abrasive resistant.

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