



شركة أبولو لكيمائيات الأبنية Apollo For Construction Chemicals

Apollo Flo-Grout EG100 Method Statement (High strength pourable epoxy resin grout)

Section A: General Comments

High temperature working

It is suggested that, for temperatures above 35°C, the following guidelines are adopted as good working practice:

- (i) Unmixed materials and equipment should be stored in a cool shaded area and away from direct sunlight.
- (ii) Avoid application during peak temperature of the day.
- (iii) Plan for enough materials, tools and labour to ensure continuous applicant process.

Low temperature working

It is suggested that, for temperatures below 15°C, the following guidelines are adopted as good working practice:

- (i) Store unmixed materials in a warm (preferably temperature controlled) environment, avoiding exposure to frost or temperatures below 5°C.
- (ii) Cold temperatures will decrease the flow properties of the grout.
- (iii) Avoid applying the epoxy grout if there temperature around 5°C and falling.

Equipment

It is suggested that the following list of equipment is adopted as a minimum requirement:

<i>Personal protection</i>	:	<i>Protective overalls</i>
	:	<i>Good quality gloves and goggles</i>
<i>Equipment</i>	:	<i>Mixer</i>
	:	<i>Large paddle</i>
	:	<i>Empty bucket (25 ltr)</i>
	:	<i>Electrical hummer</i>
	:	<i>Chisel and hammer</i>
	:	<i>Feeding hopper</i>



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Section B: Application

1.0 Substrate Preparation

- 1.1 The substrate should be sound, clean and free from contamination. Surface laitance should be removed by scabbling or grit blasting.
- 1.2 The concrete surfaces should be dry.
- 1.3 All anchor pockets, sleeves or holes drilled for anchor bolts must be free of water and cleaned from dust and loose debris using suitable brush or compressed air.
- 1.4 Steel surfaces should be grit blasted to remove all rust and

scale. Base plate underside preparations:

The underside of the base plate should be clean and free from oil, grease, rust, scale or other loosely adherent material.

2.0 Formwork

- 2.1 Ensure that the area to be grouted is clean, before fixing any formwork.
- 2.2 The formwork itself must be constructed to be water tight (leak proof), to prevent any possible grout loss from many formwork joints. This can be achieved by sealing underneath the formwork and at the joints by using appropriate sealant.
- 2.3 To obtain maximum flow distance (free flowing grout application), a side shutter feed (feeding hopper) with 100 mm side height should be erected to build the required hydrostatic head. (It is called hydrostatic head of the grout or a feed hopper).

Note: At 100 mm of head, a flow distance of 1800 mm and 3000 mm can be achieved at gap thicknesses of 40 mm and 75 mm respectively @ 25°C ambient temperatures.

- 2.4 **Pouring side:** Erect formwork approximately 200 mm from the base plate edge (see sketch below) (i.e. pour the mixed grout into the prepared forms from one side only to prevent air entrapment).
- 2.5 The grout should be poured from the shortest distance across the base plate.
- 2.6 The formwork should be fixed in such a way as to allow easy stripping, without causing damage or stress on the grout. Suitable formwork release agent could be used.

- 2.7 All dust, dirt and any other foreign materials have to be removed from the grout area before the last piece of formwork is fixed and sealed.
- 2.8 **Opposite the grout filling side:** Erect the formwork at least 50 mm above and beyond the base plate edge. (see sketch below).
- 2.9 Make air release holes (if necessary) at the highest points within any enclosed areas of the machinery/equipment.



Feeding Hoppers system opposite the filling side Pouring side

3.0 Mixing

- 3.1 A mechanically powered mixer or drill fitted with suitable paddle should be used to ensure proper mixing.
- 3.2 Pour all the contents of the hardener pack into the base container. Make sure the hardener container is fully emptied into the resin component. Mix the two components for 2 minutes until homogenous is obtained.
- 3.3 The filler should be gradually added while mixing. Mixing should continue for 3 minutes or until a uniform consistency obtained.



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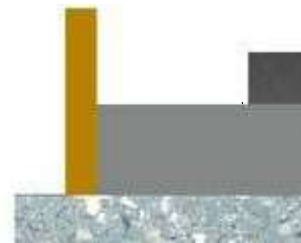
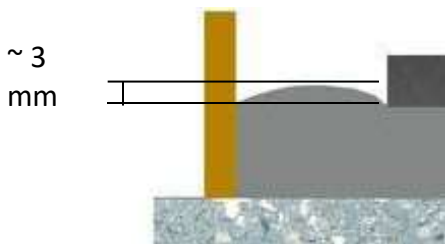
4.0 Placing

- 4.1 It is essential that the machine mixing capacity, material supply and labour availability is adequate to enable the grouting operation to be carried out continuously.
- 4.2 Apply the grout as **immediately** as possible after preparation and cleaning to prevent deoxidizing/rust formation on the surfaces.
- 4.3 Prior to placement, ensure that all surfaces are dry and free from any standing water.
- 4.4 Always mix only that quantity of the grout that can be used within its pot life. Never reduce the mixing time.
- 4.5 Continuous grout flow during the grouting operation is essential. Sufficient grout must be available prior to starting, and time taken to pour a mixed batch must be regulated to the time taken to prepare the next one.
- 4.6 The grout head must be maintained at all times so that a continuous grout front is achieved.
- 4.7 When the grout reaches the open side of the formwork, and rises above the underside of the base plate, pouring should continue slowly down the length of the base plate until completed.

Notes:

- *If temperatures are less than 20°C, the cure rate will be slow, but eventually will go to completion if the temperatures remain above 5°C.*
- *Place the grout down/along any slope, not against/up.*
- *Apply the grout across the shortest width of the equipment/base.*
- **Height of the epoxy grout:** *Place sufficient epoxy grout in the forms for it to rise slightly above the underside (approximately 3 mm) of the base plate.*
It is recommended that during placement of the epoxy grout, the level of the grout has to be slightly above the level of the bottom of the base plate to ensure complete fill of the base. The final height of the epoxy grout should be finished level with the bottom of the base or only slightly higher. This will eliminate any subsequent breaking off or edge 'spalling' of the grout should the equipment be subjected to a rapid increase in temperature later on.

Equal with base plate Fresh Epoxy Grout after placing



Cured Epoxy Grout

5.0 Protection

- 5.1** On completion of the grouting operation, all areas of grout should be protected from solar heat gain by providing shade over the whole areas.

6.0 Cleaning



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- 6.1 All tools should be cleaned **immediately** after finishing using a suitable epoxy thinner. Hardened materials should be cleaned mechanically.
- 6.2 Brush away and remove any excess grout into appropriate containers for disposal before it has hardened.
- 6.3 Always dispose of excess or waste materials in accordance with local regulations.
- 7.0 **Remarks**
- 7.1 Confirm powder type and availability for the mixing equipment.
- 7.2 Calculate the time required for preparing and mixing the epoxy grout and include this in the program. In many cases, a two working teams are necessary to supply the feed hopper and to maintain the work flow. Do not reduce the mixing time, even when in a hurry.
- 7.3 Check the substrate in advance. Ensure that the substrate is in good condition and clean.
- 7.4 Do not change the product mixing ratio.
- 7.5 Do not subject epoxy grouts to sudden temperature changes especially during early curing stages.
- 7.6 Do not vibrate the epoxy grout during placing.
- 7.7 Wherever possible unrestrained 'shoulders' are to be avoided. These have a tendency to crack and/or de-bond.
- 7.8 Contact Apollo Technical Services Department for advice on control spacing for large base plate grouting projects.
- 7.9 This method statement does not include 'Confined Spaces' situation. For working in Confined Spaces, ventilation system must be used and a *Confined Space entry permit system* should be followed under supervision from the project health, safety and environment (HSE) department.



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Section C: Approval and variations

This method statement is offered by Apollo for construction chemical as a 'standard proposal' for the application of **Apollo Flo-Grout EG100** .It remains the responsibility of the Engineer to determine the correct method for any given application. Where alternative methods are to be used, these must be submitted to Apollo for construction chemical for approval, in writing, prior to commencement of any work. Apollo for construction chemical will not accept responsibility or liability for variations to the above method statement under any other condition.