

# Installation Procedures - Epoxy Grout

<b>Description</b>	Epoxy grouts are chemical-resistant, corrosion and impact resistant and suitable for applications requiring vibration resistance. When grouting with epoxy grouts, special considerations differing from cementitious grouting procedures are required. This document is intended to qualify the special considerations and techniques required, to carry-out the grouting of baseplates, soleplates, rails, pumps and skids specifically calling for an epoxy grout bearing system. These procedures are to be used as a guide only, experienced supervisory personnel may vary from these procedures based upon their experience and due to the diversity of special applications. All questions pertaining to any variance in these procedures must be discussed with Sika Technical Service before the work is carried out.
<b>Preparation for Grouting</b>	
<b>Storage of Components</b>	Grouting material must be stored in an area with an ambient temperature between 20° - 30°C (68° - 86°F) for a minimum of 48 hours before using. Note: It is extremely important to precondition the aggregate, as this will determine the temperature and viscosity of the mix.
<b>Surface Foundation</b>	Note: For optimum results when grouting in critical items of equipment, it is recommended that the surface preparation requirements of the latest edition of Chapter 5, API Recommended Practice 686 be followed. This document is the "Recommended Practices for Machinery Installation and Installation Design" published by the American Petroleum Institute. <ol style="list-style-type: none"> <li>1. New concrete foundations must be cured for a minimum of 7 days for high early strength concrete and for 28 days for standard concrete.</li> <li>2. The concrete substrate must be clean, sound and free of oils, grease, water, or any other contaminants.</li> <li>3. Areas to receive grout are to be prepared using a 7 kg (15 lb) chipping hammer with a chisel bit, to remove concrete exposing a fractured aggregate surface.</li> <li>4. Check that the substrate is thoroughly dry. Moisture content can be checked with a Sika moisture meter. An additional test can be made, by taping a 1 m<sup>2</sup> piece of poly over the new concrete and leaving it for 24 hours. If there is moisture on the underside of the poly the next day, the concrete is not ready for the placement of epoxy grout. Repeat the test until there is no moisture. Unprotected cured concrete will absorb moisture from rain. Sika Canada Inc. recommends a moisture test before application of epoxy grout.</li> <li>5. It is recommended that the minimum concrete substrate and equipment temperature be between 18° - 30°C (65° - 86°F) for 48 hours prior to and after placing the grout.</li> <li>6. Shade the foundation from extreme summer sunlight for at least 24 hours prior to grouting and 24 hours after grouting.</li> <li>7. Where anchor bolts are in contact with grout, they should be isolated by wrapping with a flexible foam material or other suitable means. Anchor bolt sleeves can be filled with Sikaflex® 2c SL to allow increased stretch length of the anchor bolt and to allow for thermal growth of the equipment.</li> <li>8. Shims or jack-screws should also be isolated from the epoxy grout to allow for removal after the grout cures. Circular shims/plates are recommended to eliminate stress risers.</li> </ol>
<b>Surface Equipment</b>	<ol style="list-style-type: none"> <li>1. Sika Canada Inc. recommends the bonding surfaces of the base be sandblasted to "White Metal" and be free of all bond inhibiting materials. Sandblasting to white metal has proven to produce the best bonding surface.</li> <li>2. Primer should only be used when a long delay between sandblasting and grouting would be anticipated, thus avoiding excessive rusting or other types of contamination.</li> <li>3. If the base must be primed, use Sikadur® 35 Hi-Mod LV epoxy. If the primed base plate is not grouted within 48 hours after priming, the primed surface must be abraded and solvent wiped using Sika® Equipment Cleaner/Epoxy Thinner. Allow the solvent to flash off before pouring grout.</li> <li>4. Prior to placing the equipment on the foundation, an inspection of the underside of the base should be conducted to ensure there is no contamination or bond inhibiting materials present.</li> </ol>
<b>Rotary Pump Installation</b>	<ol style="list-style-type: none"> <li>1. Vent holes at least 12 mm (1/2 in) diameter must be located at the corners of each bulkhead compartment as well as at the high points and perimeter edges. Angle iron or "C" channels added as stiffeners will also require vent holes on both sides. The installation of an adequate number of vent holes will insure that no air is trapped beneath the plate, thus avoiding the formation of voids.</li> </ol>
<b>Forming</b>	<ol style="list-style-type: none"> <li>1. All forming material coming in contact with the grout shall be coated with coloured paste wax. The colouring to contrast with the forming material colours. Do not allow wax to contact areas in which a bond is required.</li> <li>2. Forms shall be made liquid tight to prevent leaking of grout material. Sikaflex® 1a is recommended, as it is a single component polyurethane fast cure sealant.</li> <li>3. Forms shall rise at least 12 mm above the underside of bearing surface.</li> <li>4. The spread of the grout from the edge of the base plate must be equal to or less than the depth of the grout bed. Otherwise, pin or create a shear key to resist curling.</li> <li>5. All vertical and horizontal edges must be chamfered, a minimum of 15 mm (5/8 in), at 45°.</li> <li>6. If grout forms are tight to the equipment base, it is recommended that vent holes be drilled at 450 mm (18 in) intervals along the top of the forms, starting at the corner. Plug holes once complete venting has occurred.</li> <li>7. Minimum grout depth: 25 mm (1 in).</li> </ol>

- Expansion Joints**
1. Expansion joints are to be made of 25 mm (1 in) closed polyethylene cell foam (or equal) and placed at 1.2 to 1.8 m (2-6 ft) intervals, perpendicular to the centerline of the base plate, in accordance with API Recommended Practice 686.
  2. Position expansion joints so that they do not interfere with anchor bolts.
  3. Expansion joints can be constructed in many ways. Please consult your Sika Sales Representative for additional information.

- Mixing and Placement**
1. In the A component pail mix the entire contents of components A and B for 3 min with a mixing paddle ("Jiffy" type is acceptable) with a low-speed (200-250 rpm) drill. Prior to starting the drill, submerge the mixing blade into the liquids. This will avoid additional unwanted air within the final mix. Place the mixed epoxy into an appropriate mixer. Slowly add the entire contents of component C and mix until uniformly blended (Approx. 5 min).
  2. When mixing the first batch of grout in a clean dry mixer (15-20 rpm), withhold 10 kg (22 lb) of component "C" to wet out the mixer. Note: It is very important to only mix long enough to wet out the entire "C" component, excessive mixing will entrap unwanted air.
  3. When grouting without pour holes, prepare formwork to maintain a minimum of 100 mm (4 in) liquid head to facilitate placement. A grout box equipped with an inclined trough attached to the form will enhance the grout's flowability and minimize air encapsulation. Pour the grout into the prepared forms from one or two sides only, to eliminate air.
  4. For pours requiring long travel lengths, strapping across the underside of the base is recommended. Strapping is placed under the plates to move grout due to restrictions and to minimize air entrapment.
  5. Should increased flowability of the epoxy grout be required, reduce the quantity of aggregate. Consult Sika Technical Data Sheet for further details.

- Deep Pour Recommendations**
1. For pour depths greater than 150 mm (6 in) consult your Sika Sales Representative at 1-800-933-7452.
  2. When placing epoxy grout in multiple lifts, allow the temperature of the preceding lift to start declining.

- Cold Weather Grouting**
1. Foundation and equipment must be preconditioned to temperatures between 18° - 21°C (65° - 70°F). Preconditioning generally takes between 24-48 hours.
  2. Do not subject the curing epoxy to sudden temperature changes. Maintain an ambient temperature above 16°C (61°F) for 48 hours. Reduce heat gradually.

- Warm Weather Grouting**
1. Avoid high temperatures while grouting in the summer. Grouting with high ambient temperatures will shorten the pot life of the grout. It will also create greater internal stresses within the grout during colder temperatures.
  2. Shade foundation for a minimum of 24 hours prior to grouting and after grouting during summer months.

- Pre-Grout Checklist**
1. The grout bed is clean, dry and free from debris and the underside of the base is free of oils and contaminants.
  2. Anchor bolts sleeves are filled with a flexible bond inhibiting material.
  3. Exposed surfaces of the anchor bolts are protected from the epoxy grout.
  4. Jack bolts are greased and wrapped for easy removal.
  5. Leveling plates are all in position beneath the jacking bolts.
  6. Vent holes are positioned where required and are unobstructed. (Venting properly will minimize plate voids.)
  7. Forms are at the correct elevation, properly braced, waxed, sealed and chamfered.
  8. All grouting materials and tools are on site and at the mixing station.
  9. Grouting components have been conditioned to a temperature between 20° - 30°C (68° - 86°F).
  10. Machined surfaces are protected from epoxy grout contamination.
  11. Strapping is in place under the plates (if required) to move the grout due to long flow distances and restrictions.
  12. A copy of Sika's Installation Record and Checklist must be on hand and duly completed.

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