Planigrout® 350

Introduction

Many commercial, manufacturing, public works and infrastructure facilities have heavy equipment that must be level and secure for daily use. Typically that equipment may produce a key part to the manufacturing of an item, it may move copious amounts of liquid from one tank to another, it may generate electricity, or it may be in a more aggressive environment and require some additional chemical resistance. The use of epoxy grout in these areas can be essential to the life cycle of the equipment as well as providing support from the equipment base to the concrete foundation.

Epoxy grouts, as with non-shrink cementitious grouts, need to be properly chosen for the application type and the end use of the product. This installation guide will help in answering application questions and act as a reference point for the use of MAPEI's epoxy grouting systems. Even if the contractor is familiar with general grouting applications, a pre-job meeting with key representatives – such as the owner, Engineer of Record (EOR), contractor, machine manufacturer and grout manufacturer – is highly recommended.

A successful grouting application encompasses proper preparation, form design and proper product placement. Along with addressing those issues, this installation guide will act as an aid in referencing industry documents from ACI and API for a successful placement.

Surface preparation

Surface preparation of the concrete substrate as well as the surface of the metal baseplate that encounters the epoxy grout is important for bonding. Lack of bonding can result in grout failure, so this step is crucial to a successful placement.

New concrete must be fully cured for 28 days and dry. At the discretion of the EOR, new high-performance concrete or the use of MAPEI's *Planitop® 18*, *Planitop 18 ES* or *Planitop 18 TG* products may require less time for curing than conventional ready-mixed concrete.

Existing concrete must be structurally sound and free of contamination from oil, fatty acids, chlorides, waxes and sealers that may interfere with proper bonding. In both cases, the area to be used for equipment placement must be able to handle the static loads of equipment placement as well as any anticipated dynamic loads during equipment use.

Some key points for surface preparation are:

- Concrete surface must be clean and free of loose particles, efflorescence, paints, tars, grease, asphaltic materials, bond breakers, curing compounds, wax, and any foreign substance or any conditions that may affect product performance or proper bonding.
- Mechanically profile and prepare concrete surfaces by engineer-approved methods in accordance with the most current ICRI 310.2R Guidelines to obtain an International Concrete Repair Institute (ICRI) concrete surface profile (CSP) of #5 to #9.

ICRI CSP 5:
Medium shotblast

ICRI CSP 6:
Medium scarification

ICRI CSP 7:
Heavy abrasion blast

ICRI CSP 8:
Scabbled

ICRI CSP 9:
Heavy scarification

NOTE: Do not use aggressive mechanical preparation such as bush heads, needle points or concrete breakers at more than 25 lbs. (11.3 kg) to prepare concrete for grouting, as these can increase the concern of micro-cracking in the substrate, which can fail during end use of the equipment being grouted.

NOTE: If a more aggressive profile is required with equipment that cannot produce the required CSP, multiple perpendicular passes may be needed to obtain the correct profile.

- If utilizing hydro demolition, wait at least 48 hours or until the concrete is visibly dry before proceeding with the grouting application.
- On existing concrete: Ensure that all contaminated or oil-saturated concrete is removed, and that the placement area is free from soft, unsound concrete.
- Repair all cracks with an appropriate crack injection epoxy such as MAPEI's *Epojet*™ or *Epojet LV* and allow curing prior to grouting.
- Clean anchor holes with oil-free compressed air to ensure that all dust, dirt and debris have been removed. Anchor holes should be dry before grouting procedures.
- Metal surfaces that will encounter the grout should be abrasive-blasted to a near white finish metal and wiped clean with a non-residue solvent such as acetone in accordance with SSPC-SP-5 or NACE-2 requirements.
- Expansion joints should be installed every 4 to 7 feet (1.22 to 2.13 m) perpendicular and parallel to the long axis of the baseplate.
- Expansion joints should be filled in accordance with recommendations by the equipment manufacturer and ACI/API.
- Use paste wax, caulk or other means to protect any surfaces not intended to bond with grout, such as shims and jacks.

Note: Refer to API Recommended Practice 686, Section 3.6 and/or ACI 351.5-15, Specification for Installation of Epoxy Grout between Foundations and Equipment Bases, Section 3.1, for more information regarding surface preparation requirements.

Preparation of forms

- Build forms from materials that will have adequate strength and durability to handle the weight of the epoxy grout. It is typical to utilize 3/4" (19 mm) well-braced plywood.
- Before formwork is installed, it should be coated with multiple coats of an industrial-grade paste wax to facilitate removal after the grout cures. Heavy-gauge plastic film thicker than 15 mils has also been used as a successful bond breaker on formwork for grouts.
- Install formwork within contract specifications and anchor it securely to the foundation with drilled anchors.
- Seal the formwork with caulk or putty so that the epoxy grout is not able to escape from the formed area.
- Utilize strips that produce a 45-degree angle at all vertical corners within the form and on horizontal edges to eliminate sharp edges.
- Design the forms to create an adequate hydraulic head to facilitate grout placement and flow in one direction. Refer to API Recommended Practice 686, Section 3.7, and/or ACI 351.5-15, Specification for Installation of Epoxy Grout between Foundations and Equipment Bases.
- Forms should extend 2 to 4 inches (5 to 10 cm) past the length of the baseplate on the installation and non-installation sides, and should extend 1 inch (2.5 cm) above the bottom of the baseplate. The sides parallel to the placement direction should extend from the baseplate at 1 inch (2.5 cm) to allow for air displacement from under the placement area.
- Head boxes should be constructed at one end of the placement area and should have a 45-degree angle protruding from the form where being placed. The height of the head box should be 1/5 of the anticipated travel distance under the baseplate.
    - Example: If travel distance under the baseplate is 5 feet (1.52 m), the height of the head box should be 1 foot (0.30 m) high.
- Prior to installation, it is recommended that a pre-installation meeting be held to go over placement methods, including but not limited to:
    1. Confirming tightness of formwork.
    2. Confirming surface preparation and profile.
    3. Confirming proper head box placement.
        - If it is a movable head box, confirm the direction of movement to the sequential placement of grout.
- Inspect and confirm that proper air-relief holes are free and clean of debris and that they remain open during placement.
- Ensure that all removable leveling shims and jacks are accessible during placement. Pads used for leveling jacks should be round with chamfered corners.

Mixing

Before product use, take appropriate safety precautions. Refer to the Safety Data Sheet for details.

1. Condition all materials to between 75°F and 90°F (24°C and 32°C) for at least 24 hours before mixing.
2. Mix only complete units of parts A and B. Do not thin the mixture with solvents or add more aggregate than allowed for the pre-measured kit of *Planigrout 350*.
3. Add Part B to the Part A pail and mix the material with a low-speed drill (at 300 rpm) and paddle mixer for 3 minutes or until blended uniformly. Do not introduce air into the epoxy while mixing. While mixing, remove all material from the sides of the mixing vessel to ensure that the epoxy is fully blended.
4. After blending parts A and B, transfer the mixed material to a mortar mixer and add Part C one bag at a time, waiting until the aggregate from each consecutive bag is wetted out before adding the next bag. Once all four bags of aggregate have been added and are wetted out, discharge the material and proceed with grout placement.

    NOTE: Never utilize a rotary drum concrete mixer for epoxy grout, as the material will not mix adequately and the possibility of air entrapment is greater.

    NOTE: Stage your horizontal shaft mortar mixture on an elevated surface at a sufficient height to pour directly into your wheelbarrow, buckets or pump.
5. Flow of material can be adjusted by utilizing less than four bags of aggregate. However, do not utilize less than 2.5 bags of the supplied aggregate.

    NOTE: Reducing the number of bags of preblended aggregate that comes with *Planigrout 350* can increase flowability of the mixture for easier placement when tighter tolerances of formwork and/or length of travel is expected. However, a reduction in mixed volume will be realized and should be accounted for prior to ordering the material for the project.

Product application

Read all installation instructions thoroughly before installation.

1. Place *Planigrout 350* into the forms from one location or entry port to ensure a consistent flow direction to minimize the effects of entrapping air.
2. Use a head box to create head pressure and assist in product placement. Move the head box if needed for larger baseplates in order to ensure complete encapsulation. The use of chains or strapping in a sawing motion can aid in moving the grout the length of the baseplate as well.
3. Ensure that *Planigrout 350* is placed consistently. If a head box is used, do not allow the volume of grout to completely empty within it. Place expansion joints as required, typically every 3 to 7 feet (0.91 to 2.13 m) or as directed by the equipment manufacturer.
4. Examine the forms for leaks and plug all leaks with putty or a fast-setting cement, such as MAPEI's *Planiseal® Plug*, if there is leakage during placement.
5. When forms are filled to the desired depth, the exposed surface may be lightly misted (avoid puddling) with undiluted *Mapecrete™ Film* or a suitable solvent such as xylol or toluene, and then finished with a trowel or brush.

CLEANUP

- *Planigrout 350* is a low exothermic grout. Its extended set time provides ample time to clean equipment with a soap-and-water solution. Once material begins to harden, xylol or a similar solvent will be required for cleaning. Cured material can only be removed mechanically.

  NOTE: Using soap and water to clean equipment can be aided by charging the mixer with 3/8 inch (10 mm) rounded pea gravel. This will aid in cleaning and removing larger accumulations in the mixer. Alternatively, a large scrub brush can be used for fine deposits of resin only.

LIMITATIONS

- Condition all materials to a temperature between 75°F and 90°F (24°C and 32°C) for at least 24 hours before mixing and placement.
- No additional ingredients are required. Do not thin *Planigrout 350* with solvents.
- The maximum depth of application for *Planigrout 350* is 18 inches (45.7 cm) per lift.
- Always follow the provided temperature guidelines when mixing and applying product.
- Do not use less than 2.5 bags of aggregate to create a more flowable mixture.
- Create a test mixture before job installation to validate that the appropriate flow has been achieved.

MKT: 20-3361
Edition Date: December 10, 2020

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