



Vertical Cracks in Epoxy Grout

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VERTICAL CRACK IN EPOXY GROUT

Epoxy grout vertical cracks and the effect they have on precision epoxy grout placements can be a concern if not properly addressed. These cracks usually occur after the grout has cured and gone through one or more temperature cycles. The cracks are typically visible in the shoulders and may or may not extend all the way through the grout.

These vertical cracks are a result of the grout “stress relieving” itself because of the different expansion and contraction rates of the various materials (steel, concrete, and epoxy) that are now bonded together as one foundation system. The crack can be viewed as the system forming its own expansion joint to relieve the internal stresses.

Vertical cracks in epoxy grout are typically small and are not the result of cracks in the foundation. Even if they extend past the

grout shoulder under the baseplate, the total surface area of all the cracks is so minute compared to the surface area of grout in contact with the baseplate that they have no effect on the compressive capability or the stability of the grout. The primary reason to address these vertical cracks is to prevent water and contaminant infiltration which can cause damage to the grout and the concrete foundation particularly if the grout and foundation are exposed to freeze/thaw cycles or chemicals.

Epoxy grout installations that are “crack free” are the result of careful planning. Vertical cracks in epoxy grout are usually a result of internal stresses in the grout that can be caused by any of the following:

- Embedded steel leveling mechanisms (such as shims) that are placed too close to the perimeter of the grout and not placed parallel to the edge of the baseplate
- Shims and Jack bolt bearing pads that are square in shape without radiused corners
- Interior corners where the forms cause a sharp 90-degree point load
- Anchor bolts that are prematurely torqued
- Excessively large grout shoulder
- Premature removal of forms and/or forms bonding to the grout requiring excessive force to remove



VERTICAL CRACKING OFF A JACK BOLT

Preventative Methods:

Vertical cracking in epoxy grout can be reduced by using the following procedures:

- Restrict the width of the shoulders to 3 inches (75 mm) or less.
- Adhere to the epoxy grout manufacturer’s technical data sheet for maximum volume and depth limitations.
- Provide expansion joints on 4-foot to 6-foot (1.2 m – 1.8 m) centers across the short dimension of equipment placement.
- Do not embed or encapsulate the soleplate or baseplate in the grout.
- Generously round any corners on shims and jack bolt landing pads embedded in the grout and keep these items 2 inches (50 mm) away from the edge of the grout and parallel to the baseplate.
- To protect anchor bolts and jack screws from epoxy grout bonding to them, coat them with a bond breaker material or wrap them in duct tape or a protective sleeve.
- Follow appropriate anchor bolt tightening procedures.

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Repair Method:

The primary repair for a vertical crack in epoxy grout is to seal it. Cracks which are dynamic and susceptible to continued thermal expansion and contraction should be sealed with an elastomeric joint sealant. If it can be determined that the crack is not acting as a “stress relief control joint” and the stresses are relieved, a low viscosity epoxy material may be used to repair it. However, if the grout is sealed with a low viscosity epoxy material and the internal stresses still need to be relieved, it is likely to crack again. Some equipment owners seal the cracks initially with a low viscosity epoxy repair material rather than repair the crack with a flexible material (i.e., elastomeric joint sealant) because the repair is less obvious and does not always reoccur if the stresses are relieved.



VERTICAL CRACK REPAIR IN EPOXY GROUT USING ELASTOMERIC JOINT SEALER

Five Star recommends the following approach to repair cracking in epoxy grout shoulders:

1. Using a grinder with a diamond blade create a joint or groove directly over the existing crack on the horizontal and vertical surfaces of the shoulder. This joint should be roughly $\frac{3}{8}$ inches (9.5 mm) wide by $\frac{1}{4}$ inch (6 mm) deep.
2. Clean the joint using oil free compressed air to remove any dust and keep the area dry.
3. Place tape along the edges of the newly created joint.
4. Apply elastomeric joint sealant or low viscosity epoxy material to fill the joint. Make sure the prepared crack is full.
5. Remove tape before the sealant cures.

For additional information, contact your Five Star® Technical Sales Representative.

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