

## Floor Surface Issues from Filler Overfill

The overfill-and-razor method of achieving a flush filler profile may have two negative side effects: surface staining and the pulling of surface fines. Both issues are related.

### Surface Staining

When joints are overfilled (crowned), the liquid filler will spread across the slab surface. In many cases the filler will leave a slight shadow, residue, or "stain" on the surface, even after the excess filler has been razored off. The severity of the staining will somewhat depend on the filler's properties (viscosity, cure time, ability to wet the surface, adhesive strength, etc.), in the case of polyurea fillers, the timing of the razoring process can play a role in the degree of staining or film residue. But setting all these variables aside, the predominant factor in stain severity is almost always the condition of the slab surface itself.

If a slab is composed of quality, properly proportioned concrete components, and is very densely troweled, the surface will be so tight that a drop of water will bead, rather than be absorbed. In this case, the stain left from a filler, after razoring, will generally be very slight. This can usually be eliminated over time through normal floor scrubbing, although a slightly abrasive scrub may sometimes be needed initially. The use of a liquid hardener/densifier as an integral part of the slab design/construction will also help reduce stain severity by reducing surface porosity.

But all slabs are not created equal. Some slab surfaces may appear tight, but a drop of water on the slab will be absorbed rather than bead, indicating porosity. In fact, surface tightness may vary, even within a single floor. Perhaps one area dried out sooner due to weather conditions, or the start of troweling was delayed. Both can reduce surface tightness. If this is the case, a deeper stain can be expected, along with more difficult stain removal.

Recognizing that slab surface tightness can vary, and that some projects have an aesthetics criteria (retail stores, etc.) that makes staining unacceptable, Metzger/McGuire developed a stain-prevention film called "SPF." SPF is applied as a liquid which, when dried, will leave a thin film that creates a bond breaker between the filler and the concrete. SPF works very well in the vast majority of floors, but it cannot prevent staining in a floor that has a porous surface. In fact, we've seen cases where the SPF itself penetrated into the surface and left a stain, in addition to the filler's stain. Because the SPF is now below the surface, removal can be difficult if not impossible.

When extensive overfill staining occurs, always start by examining the tightness and porosity of the slab surface.

### How to Reduce Staining Issues

The key to dealing effectively with staining issues is always prevention. Here are some steps that should be employed on every project where staining could be contentious:

1. Establish stain tolerance criteria before filling starts.
2. Apply a filler sample before the onset of the filling operation. Determine the post-razoring staining level with and without an **SPF** application.
3. If staining is still objectionable with an **SPF** application, test with a thicker application, and then with two.
4. If it appears that our **SPF** is leaving a stain, discontinue further **SPF** use and contact us for recommendations.

### Surface Fine Pulling

The razoring-off of the filler may also result in the removal of some of the floor surface. This phenomenon is referred to as "pulling surface fines." As with overfill staining, the problem is almost always related to the slab surface finish.

The initial assumption on projects where this occurs is that the filler's adhesion is so high that it is pulling off the slab surface. This assumption is incorrect for two reasons:

1. *The adhesive strength of most semi-rigid fillers, and all Metzger/McGuire fillers, is only 250-400 psi. The integral strength of a properly finished floor slab should always be far higher than this, meaning it should be impossible for the filler to tear off slab elements.*
2. *The only way a filler can pull off fines is if it has both a chemical and a mechanical bond. As explained in the staining section of this bulletin, a filler should not penetrate into a properly densified, tight slab surface.*

As with staining, the first test should be to evaluate whether a bead of water is absorbed into the surface, thus indicating porosity. A second test is to apply a strip of duct tape firmly to the surface, heat slightly with a torch and allow to cool, then peel it up. If the tape pulls up fines, the conclusion is obvious. If these tests are not considered adequate evidence accepted by all, a consulting engineer can perform more conclusive forensic testing.

If it is verified that the surface density is lacking, an additional treatment of hardener/densifier should be considered.

### Summary

All Metzger/McGuire fillers have been formulated not to have adverse effects on a properly densified surface and each filler batch is produced to an exacting standard. Conversely, every slab placed is unique in its composition and workmanship. It is the human variables that should be considered in regards to staining and pulling of fines.

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