# SealBoss®

# *Floor Repair Tips*

**1. Removal of Existing Joint Fill**

The removal of existing joint fill can be one of the most labor intensive portions of a joint fill project. There are several manual tools that can act as a joint sealant repair product, but the most efficient tool is an upright circular saw that utilizes an up-cut blade orientation to remove the existing joint sealant without pushing it under the blade and causing build-up in the joint. For joints that are not filled, fresh saw-cuts followed by compressed air are recommended.

**2. Moisture Recommendations**

Polyurea and semi-rigid joint fillers are sensitive to moisture. Even the most "moistureintolerant" of joint fillers being marketed, will have some adverse effect to wet, or submerged conditions. It is always recommended to apply material to dry concrete and in dry conditions without the presence of water from water-aided saw cutting or power washing. If water is present, or has been recently present, it is good practice to take a jobsite approved gas torch to the joints prior to application. If there is a question of the amount of moisture present, a test section can be utilized to observe the reaction of the joint filler overnight.

**3. Temperature Recommendations**

Temperatures can affect the reaction of the material as well as the condition of the concrete. Both of these variables can be the difference between a success and failure. Concrete expands and contracts through thermal expansion and contraction. For this reason, a sealed substrate can open considerably in times of thermal contraction (cold) when concrete contracts a bit. For this reason, it is always recommended to apply these materials in as cold of a condition as possible with respect to the required job execution time frame. The reason for this is so that the material will be applied to the joints when they are at their widest condition. When temperatures increase, the joint will become smaller due to the thermal expansion of the concrete. The sealant will then be in a compressed state compared to an elongated state in the opposite direction. A compression seal will perform better in a compressed state than it will in an expanded state. It is also good practice to perform cup tests of any material being installed on the day of application as temperatures can make material cure much faster on hotter days. For this reason, the speed of installation/shaving on a 50°F day can be much different than the optimal speed on a 90°F day.

**4. Mixing Material**

With most pigmented materials, pigments and hardeners will settle when material sits idle for extended periods of time. This settlement can cause very significant and noticeably changes in the reaction of the material. Prior to applying a cartridge, it is imperative to shake the cartridge vigorously for several minutes to fully mix these pigments and hardeners. If using bulk pails, it is recommended to paddle mix the pails thoroughly for a couple minutes to ensure a well-mixed pail to be poured into the hoppers of the JointMaster Pro2 machine. Due to this settling, drum and tote packaging is not recommended for polyurea and semirigid joint fillers. Pail packaging provides much more user-friendly packaging.

**5. Dimension Recommendations**

The ACI joint filling guideline recommend a depth to width ration of 3:2 for optimal sealant performance. This is calculated simply by multiplying the designed width by 1.5 to find the optimal depth of joint fill. For control joints, the depth of the total saw cut must be at least ¼ of the overall thickness in depth in order to perform in the manner in which they are intended. In a 12" slab example, then, the overall control joint would be cut to 3" in depth, with a backer rod being placed at a 3:2 depth to width ratio depending upon the width of the saw-cut.Please refer to the ACI Joint Filling Guideline for more detailed information on the specifics of the recommendation and for their testing results on stresses to the joint sealant at various geometric depth:width ratios.

**6. 2-Pass Technique**

It is common to have small amounts of water and/or air in the bottom of the joints depending on the underslab environments and previous sealant. If results suggest, or there is questioning of this condition, applicators can employ a 2-pass technique of filling half of the joint in the first pass following by an immediate subsequent fill of the joint following the curing of the first layer. The functional effect of this technique is for any moisture/air to present itself in the chemical reaction of the material applied in the first pass. This may be evident by small bubbles or air pockets from CO2 off-gassing during the polymerization reaction. The second pass of material is commonly much more uniform in cure. It should be noted that this technique is NOT recommended for application of material into a wet joint, rather, as a useful technique to employ when all other techniques suggest entrapped air/moisture in the joints.

**7. Bubbling / Swirling Causes**

The root cause for these observations is mixing of the B-side component. As previously mentioned, the pigments and hardeners will settle when material sits idle for extended periods of time. If these are not thoroughly mixed prior to application, the mixed materials showcase inconsistencies through a swirling pattern observed in the in the color of the material. When this occurs, the hardeners are typically also off-ratio which is depicted in random 'soft spots' or 'tacky' areas of the joint. If the material cures to a solid joint fill, and the client approves, swirling does not necessitate removal and re-application. However, soft spots and tackiness do. The best way to address this condition is to manually remove the soft material by mechanical means and reapply the joint fill with a thoroughly mixed batch.

**8. Scraping / Finishing**

Joint fills are typically over-filled and shaved flush with the substrate for final finish. This technique can be done several ways. The most common technique is to allow for total cure of the material, followed by running a blade across the top of the joint to remove the excess filler. On smooth concrete, this is a relatively user-friendly technique. Take note to find the optimal cure time at which to shave, as waiting too long can cause the shave to 'chatter' or skip, while shaving too soon can expose uncured portions of the joint fill or pull the curing material out of the joint. On notched concrete, this method is very difficult and more attention to flush fill should be paid. Final finishes of joint fill often times include grinding or polishing. If the joints are being freshly cut, a useful trick is to use marking paint to mark the line for saw cut, fill the joints, and shave after. The marking paint also acts as a bond breaker for the joint fill and eliminates any residue that may be left behind from the over-fill. Other techniques to avoid over-fill residue include waxing, soaping, and taping the joint edges as a bond-breaking effort.

**9. Coating / Polishing**

The intended finish of many industrial floor is polished. If a polished look is intended, then all joint fill and spall repair products must have the ability to be polished. SealBoss QuickFix fits this description. Another very common finish for industrial flooring is an elastomeric or epoxy overlay coating. In the event of epoxy overlays, applicators must pay specific attention to the design and behavior of the substrate. For example, if a substrate experiences significant expansion/contraction during hot/cold cycles, the flooring contractor must be aware of the rigidity, or stiffness, of the epoxy coating. Taking into consideration the expansion state vs. compressed state covered in Section 3, a compressed state will create a small bulge profile above the surface level. If this is an elastomeric coating, this may be observed in a small mound at the joint. If this is an epoxy coating, this may be observed as a crack. It is very important to address these contraction/expansion variable prior to joint filling or overlay.

**10. Adhesive/Cohesive Separation**

Some industrial floors, such as distribution warehouses, are often left unpolished and uncoated. In these scenarios, the joint fill material itself is responsible for all durability across the joint and any expansion/contraction forces that may result. When stresses become too severe, or joint contamination prior to application causes internal bond breaking, it is common to observe what is known as adhesive and/or cohesive failure in the joint filler. Adhesive failure is when the joint filler pulls away from the edge of the joint walls. A hypothetical cause for this would be if joint filler was installed during thermal expansion state, and upon contraction of the concrete in cold temperatures, the joint filler does not exhibit enough elongation to tolerate the stresses caused from this widening, or expansion. The joint fill then pulls away from the wall, which is termed Adhesive Failure. Cohesive failure is observed by cracking or splitting of the joint fill in the middle of the cured product. This can be caused by breakdown due to extended durations in UV contact, or by extreme compression forces from heavy loads or improper depth:width ratios. With the proper care given to floor behavior, conditional exposures, and intended use and finish, joint filling and spall/crack repair applications can be very user-friendly and aesthetically pleasing projects. By asking the right questions and planning for the conditions that the floor will experience, we can ensure successful floor repair results.

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