

TROUBLESHOOTING

5 Common Sealer Problems

Know why sealer issues occur on decorative concrete applications so you can prevent them.

Concrete sealer problems and the associated call-backs are one of the largest sources of frustration for decorative concrete contractors. When a concrete sealer does not look or perform as expected, the cause can usually be traced back to over-application, application in non-ideal conditions or a build-up of multiple coats. Below are some common sealer issues decorative concrete contractors face, why they happen and how to avoid them.

Problem #1: Sealer bubbled

The presence of bubbles or popped bubbles in the sealer is a sign of over-application. Sealers should be applied so thin that they should not be able to physically support bubbles. Any air displacement from the concrete surface during sealer application should be free to quickly move through the thin, wet sealer film. At a typical coverage rate of 300 square feet per gallon, one coat of an acrylic concrete sealer should be about 5 mils thick when wet. When dry, one coat of sealer is only about 2 mils thick. For comparison, a sheet of copy paper is about 10 mils thick and a credit card is 120 mils thick.

When the sealer is applied too heavily, the air displaced through the surface can't escape, and it forms a bubble in the sealer surface. Concrete sealers are best applied in two thin coats. The first coat of sealer acts like a primer. Most of it will disappear into the concrete surface, and the concrete will probably look fairly unattractive after the first coat. The second thin coat will provide an even finish, color enhancement and gloss. It is time consuming to actually measure out 300 square feet of concrete and 1 gallon of sealer in order to ensure the coverage rate as applied follows the manufacturer's recommendation. It also requires more time and patience to apply two thin coats of sealer instead of one heavy coat. However, taking these two steps will prevent many sealer issues and avoid callbacks.

Bubbling of a sealer can also occur if application is done in hot weather, or if the concrete is in direct sun. In these conditions, the sealer will "skin over" and dry on the surface before all of the solvent has evaporated. Over time, the pressure of the solvent trying to evaporate will form a bubble in the sealer surface.



Bubbles can form in a sealer when it is applied too thick; it is recommended to apply sealer in two thin layers.

Carefully follow the sealer manufacturer's recommended coverage rate and apply during the coolest part of the day when concrete is not in direct sun. Two thin coats should be applied rather than one heavy coat.

Contractors working in East Coast and Midwestern states are challenged by regulations that prohibit the use of traditional concrete sealers based on xylene or mineral spirits. In these states, sealers must be either water based or formulated with "exempt" solvents that do not contribute to air pollution. Although exempt solvents keep the air cleaner, sealers based on these solvents dry much faster than traditional solvent-based products. For this reason, application of exempt solvent-based sealers can be tricky until the contractor has become accustomed to the fast dry time and the changes in application methods that are required. Following the rules regarding application thickness and applying in the proper environmental conditions are even more critical when using these specialty products.

Problem #2: Solvent-based sealer turned white, is peeling or is flaking off

There are two key contributors to "blushing," or whitening of a solvent-based concrete sealer. The first is application to a concrete surface that is wet or to fresh concrete that still contains bleed water. When this occurs, the sealer will not bond to the concrete surface but will instead float on a trapped film of water. The second cause of sealer blushing is over-application. Thick coats of sealer, or a buildup of coats applied over the

years, will cause moisture to become entrapped under the sealer and, in time, the sealer debonds from the concrete. When this occurs, the sealer itself does not turn white but the surface appears white because the trapped moisture and air under the debonded sealer changes its refractive index, making it look white to the human eye. In time, the sealer will peel or flake off the surface. To avoid this problem, follow the sealer manufacturer's recommendations regarding coverage rate, number of recommended coats and preparation of the surface before sealing.



Problem #3: Water-based sealer is white or powdery

Solvent-based sealers dry simply by evaporation of the solvent carrier. The drying process of water-based sealers is more complicated and is significantly affected by the temperature and humidity of the environment during application. Water-based acrylic sealers dry by a process called coalescence where first the water and then the coalescing solvent evaporate and fuse together the acrylic particles to form the sealer film. If the temperature during application is too low or humidity is too high, the coalescing solvent will evaporate before the water does and the sealer will dry white or powdery because the latex particles did not come together before drying.

Some water-based sealers, even after proper application and drying clear, remain susceptible to blushing when exposed to

Heavy applications of sealer can lead to moisture entrapment and a white appearance.

frequent moisture such as around pool decks or in areas where water puddles form. Always read the product literature before applying a sealer to become familiar with its limitations, especially when selecting a water-based product.

Problem #4: Sealer is stained from oil, leaves, tires, fertilizer, etc.

The most common concrete sealers are manufactured with acrylic polymers that do not provide exceptional chemical or stain resistance to the concrete. For more durability and resistance to chemicals and staining, consider an epoxy or urethane coating



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Decorative

system, and ensure that the coating is appropriate for exterior use before applying to outdoor concrete.

Problem #5: Concrete is dark and/or blotchy after sealer is applied

Film-forming sealers will darken concrete and leave a glossy shine to some extent, giving the concrete a wet look. The concrete will lighten back to its unsealed color over time as the sealer wears off or is removed.

Because every slab is unique in its color and texture, the color of concrete after sealer application is difficult to predict. The mix design, use of chemical admixtures, finishing techniques and porosity are just a few factors that will affect the concrete surface color. A sealer will deepen the true color of concrete and will highlight all the differences in the surface texture that result from floating and finishing. Sealers also bring out the "grain" in concrete just like a varnish does on wood. If changing the concrete color after sealing is a concern, use a penetrating water repellent

sealer or do a small test application of a film-forming sealer to make sure the color change will be acceptable.

Please note that water-based cure and seals are a milky white color as supplied, but will dry clear if applied properly. Water-based sealers do not darken concrete as extensively as solvent-based materials, and the gloss level is lower.

Concrete sealer problems are much



An excessively heavy application of sealer led to blushing followed by complete bond failure.

easier to prevent than to solve. All of these unfortunate circumstances can be avoided by carefully reading and following the instructions on the sealer technical data page or by contacting the manufacturer to get assistance before applying the product. **CC**

Jennifer Crisman is a product manager with The Euclid Chemical Company. She has 15 years of experience in formulating and marketing concrete sealers, coatings and joint fillers. Crisman is a member of ACI committees 308 Concrete Curing and 310 Decorative Concrete, as well as several ASTM International committees. You can reach her at (216) 692-8359 or jcrisman@euclidchemical.com.

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