WATER-BASED SEALERS: GUIDE TO SUCCESSFUL APPLICATION

Water-based concrete cure & seals are excellent options for both curing new concrete and sealing existingconcrete surfaces. They have much less odor and lower VOC levels compared to solvent based products,making water-based materials more suitable for interior concrete or applications such as schools, hospitals,and "green" building projects. Drying and film formation of water-based sealers is complex, so applying atsuitable temperature and humidity conditions is critical. This guide will illustrate the process of water-basedsealer film formation, describe the proper conditions for application, and help troubleshoot and repair water-based cure & seals and sealers when problems occur.

Water-based acrylic cure & seals and sealers (referred to as just "sealers" hereafter) are fascinatingly complicated compositions. Unlike solvent based acrylic sealers which are simply dissolved polymer in a petroleum solvent such as xylene, water-based acrylic sealers are sensitive emulsions of tiny polymer beads suspended in water along with additives called coalescing solvents that help the sealer form a film upon drying.

The drying process for water-based sealers and solvent based sealers is quite different as well. Solvent based sealers dry when the solvent carrier evaporates, leaving a solid film on the concrete surface. The solvent based sealer film remains re-dissolvable after drying; this is why solvent based acrylic sealers can be damaged by gasoline or other chemical spills, and also why many solvent based sealer issues can be remedied by stripping or scrubbing the sealer with xylene.

Water-based sealers dry by a more complicated process called coalescence, as described below.

Step 1: The water-based sealer is applied to the concrete surface. Beads of polymer are near each other but remain separated by the water phase.

Step 2: As the water begins to evaporate, the coalescing solvent migrates into the beads of polymer, causing them to swell and begin to fuse together.

Step 3: The coalescing solvent evaporates next, further combining the polymer beads into a continuous film.

The water-based sealer drying mechanism is irreversible; that is, the dried sealer cannot be re-dissolved in water and is quite resistant to other solvents. Also, if the water and coalescing solvent do not evaporate in the proper sequence due to environmental conditions or improper application, the coalescence and drying of a water-based sealer will be flawed, leading to sealer appearance and performance problems that are difficult or sometimes impossible to fix.

Daily temperature variations can be especially pronounced during spring and fall, when warm days are often followed by cold nights. It's important to check weather forecasts and ensure that both the air and concrete surface temperature will be high enough for application and remain above the minimum of 45°F (7°C) for at least 24 hours after the sealer is applied.

Applying sealer at the coverage rate prescribed on the technical data sheet is also critical to good film formation. Heavy or uneven application can cause water to become trapped within the sealer, and coalescence and film formation will be compromised. Heavy applications or too many coats of sealer will often look milky white after drying.

CORRECTING WATER-BASED SEALER PROBLEMS

If a water-based sealer has dried to a chalky or powdery condition, unfortunately the only remedy is to remove the sealer and all residue by sweeping and scrubbing or by using a power washer. The best method for removal will depend on the job site and the amount of residue. Once the surface is completely clean, the concrete should be allowed to dry for 24 hours if it was pressure washed, and the sealer may be applied again under suitable environmental conditions and at the correct coverage rate.

If the film is milky white or hazy in appearance but is completely bonded to the concrete with no peeling or powdering, the sealer may be salvageable if addressed within the first 24 to 48 hours after application. The process for correcting this issue involves a "solvent wash", similar to what is done when a solvent based sealer is bubbling or turning white. Xylene should be applied to the problem area at 300 ft^2/gallon, using a suitable sprayer or a roller, and then allowed to soak until the sealer becomes soft and gummy; this typically takes less than five minutes. If he sealer was over-applied and is too thick, it may be necessary to use a natural bristle broom to gently scrub the sealer. (Note that this scrubbing may disrupt or remove the pigmented antiquing agents used on stamped concrete.) Always read the SDS for the xylene solvent before using and follow all safety precautions listed on packaging.

When the sealer is thoroughly wet with xylene, a paint roller dampened with more xylene should be rolled through the dissolved sealer to remove and scrubbing patterns caused by the broom and should leave behind a clear, even film. Do not roll back and forth; instead only roll in one direction.

When attempting to correct water-based sealer problems, always first attempt a small trial area to confirm that the process will be successful. Not all water-based sealer issues can be fixed. If the solvent wash does not produce acceptable results, the sealer will need to be completely removed from the surface. Or, simply allow the sealer to wear away naturally over time.

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