

WATER-BASED SEALERS: GUIDE TO SUCCESSFUL APPLICATION

Water-based concrete cure & seals are excellent options for both curing new concrete and sealing existing concrete 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 at suitable temperature and humidity conditions is critical. This guide will illustrate the process of water-based sealer 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