



What is the Major Cause of Premature Coating Failure on Concrete?

John Bennett, Eco Safety, Inc.

While there are many application and substrate variables that may lead to premature coating failure, the single most important prevention is proper surface cleaning and preparation to ensure optimum lifespan of your coating project. This process is often viewed as insignificant cleaning and you want to get on with the artistic work. This is by far the least glamorous, and the urge to take shortcuts is tempting. If you are a contractor, time is money and the client has a deadline of yesterday. Or if you are a Do-It-Yourselfer (DIY) and excited to get the project done and you just can't wait to see the finished product. Trust me, once you invested time, money, and sweat the last thing you want is a "redo" anytime soon. Take extra time now for this process and save time, money, body/headache over the long run. Keep in mind that the overall success and performance of stains, sealers, and other coatings on new or existing concrete substrates are highly dependent on the quality and attention to detail during the surface preparation process.

When installing a penetrating decorative concrete stain such as SoyCrete™, you will find that the extra detail will provide you with more decorative and artistic options, not to mention a more beautiful end project. The main objective is to achieve the highest degree of cleaning and surface profiling that will allow the chosen coating material to reach its optimum penetration and/or bonding strength that is equal to or exceeds the tensile strength of the substrate that the material is being applied to. If there are limitations to performing thorough surface preparation, you must be prepared to accept a lower expectation level of the coating lifespan.

For instance, if you install a coating over dust and dirt, you are bonding to dust and dirt which has zero bonding strength to the concrete. Likewise, if you install a coating over an existing coating that has a weaker bond than the new coating or one that is already beginning to flake, your new coating will only be as strong as what it is applied to. When that area gets enough abrasion (very little) the coating will come up. If you are applying a penetrating stain which needs to penetrate into the surface for long lasting results without ever peeling but you fail to properly open the pores to allow penetration, it will reside on top with a weak film and will wear prematurely. If you stain or coat over efflorescence, you are simply attaching to loose soluble salts that will easily be removed through abrasion. On the other hand, if you have a thoroughly cleaned surface with optimum porosity, whether you are installing a penetrating stain or a topical floor coating, the material will achieve maximum absorption and will bond more deeply within the substrate providing significantly longer life span than one having a weak grip on a non-porous surface.

What to Look For: Thoroughly investigate the surface for contaminants, defects, internal contaminants, bond breakers, and potential moisture vapor transmission problems. Look for signs of dusting, cracking, efflorescence, water, oils, curing compounds, form release agents, and laitance.

New concrete is not an excuse to overlook detailed evaluation and preparation. Curing compounds are liquid materials that are commonly applied to newly placed concrete to allow hydration curing by retarding water from evaporation. If it hasn't dissipated or is not removed, this will be a bond breaker. You may also find form release agents which are applied inside the forms to facilitate the release and removal of the forms. These release agents do not allow the forms to stick, thus will not allow materials to absorb or bond as well. Additionally, the density or porosity level of the concrete will vary by the type of concrete mixture and the finishing method used. Laitance (a thin, weak cement layer of partially hydrated cement paste) also leads to premature failure as these areas have a weak bond.

Issues such as efflorescence (powdery white water-soluble salts that migrates to the surface transported by water) and common surface contaminants (stains, dust, mastic, paint, oils, grease, tar, gum, etc.) are easily identified by visual observation. Contaminants such as curing compounds, release agents and other solvent materials may not be obviously noticeable. The quickest way to observe such bond breakers is to lightly spray the surface with a water mist. If the water beads and does not immediately penetrate the surface, there is a bond breaker present. You will also notice lighter areas where the water does not absorb and darker areas of the concrete where the water has absorbed. This step will also help you identify ghosting patterns left from previously installed grout or carpet adhesives on existing concrete. If you have high moisture vapor issues, keep in mind that the more permeable or breathable the material, the longer the life span. Less permeable or non-breathable coatings will require a moisture barrier coating to keep the pressure below the manufacturer's recommendations. Otherwise, the pressure will build beneath the coating and cause premature delamination.

The Surface Preparation Process: Regardless of the method chosen, the surface preparation process should at minimum include: pre-clean, surface preparation/profile, and final cleaning. Repeat final cleaning as necessary to remove any missed residues.

Pre-Cleaning: Broom, vacuum or use an oil-free compressed air blower to remove all loose debris, followed by using a heavy duty concentrated neutral pH degreaser such as Soy-It™ Degreaser Concentrate to pre-clean. Do not use solvent cleaners that dissolve the contaminants which results in spreading the contaminants over a larger area. Degrease with a floor buffer w/black stripping pad or pressure washer as applicable, followed immediately with a water rinse and wet vacuum extraction.

Surface Prep/Profile: To remove surface contaminants such as coatings, sealers, curing compounds, and release agents, use chemical strippers such as EcoProCote™ Brand Strippers or by mechanical grinding machines with a vacuum attachment using applicable resin pads to remove contaminants and to provide a desirable surface profile. Be aware of the equipment choice and experience level of the applicator when using mechanical preparation methods to avoid detrimental scaring, track lines or texture that may negatively affect your decorative coating appearance. Other mechanical methods may include media blasting by those specialized in decorative concrete blasting procedures. Thorough vacuuming followed by degreasing is recommended to remove all dust particles in the concrete pores and to release any film residue resulting from the mechanical stripping process. Degreasing is always necessary to remove chemical stripper residue when these methods are used. Repair cracks and tack strip divots with an applicable cementitious or epoxy crack filler that will accept penetration and/or bonding of your coating material. (Note: If staining over crack fillers, understand that the color will be different and may be incorporated into your design to create veining, borders, or other desired effects unless you plan on installing a microtopping such as Deco-Poz™ Eco Blend Resurfacing System which provides a thin 1/16" new concrete canvas that will cover these patched imperfections). Profile the surface to increase porosity for optimum penetration and for optimum adhesion of coatings to the substrate. Please understand that profiling does not necessarily mean creating a rough, textured or exposed aggregate appearance unless that is what you choose. Using the right grit or establish the right concentration and dwell time when using a liquid etcher will provide the exact balance of porosity and appearance desired. If using a liquid etcher, use a non-hazardous etching liquid such as Eco Etch Pro™ Concentrate to effectively etch (open the pores) and clean cementitious substrates including the removal of efflorescence. This type of product is a muriatic and hydrochloric acid replacement that is biodegradable, non-fuming and non-corrosive to metals or skin. It may be used in conjunction with mechanical profiling when using diamond resin pads to help ensure uniform profiling and better results.

Final Cleaning: Perform a final cleaning with a floor buffer w/black stripping pad, water rinse, and wet vacuum extractor. Use a degreaser mixture during the buffing process if excessive residues were discovered during this process. Immediately rinse and extract. Allow the surface to thoroughly dry, and then check one more time for residue or

powdering. Perform a final porosity test by spraying a light mist of water to observe that the water is immediately absorbing into the concrete. If all passes this final test, you are ready to begin your decorative coating application.

Maintenance Cleaning & Floor Care: *If you don't need chemicals, why use them.* Dry mop, broom, vacuum, blower or simply clean with water where applicable. When a cleaner is necessary, we recommend using a neutral pH degreaser such as Soy-It™ Heavy Duty Degreaser Concentrate at 15 parts water to 1 part degreaser for regular maintenance cleaning. **Precautions:** Wait 7-14 days before damp mopping a newly installed decorative floor. This is to ensure the material is fully cured and to avoid accidentally re-emulsifying the coating by using cleaning chemicals prematurely. Also wait 7-14 days if placing floor mats on the new decorative floor. These mats will slow down the curing time as it traps the moisture that is trying to evaporate. *Never use plastic or acrylic backed floor mats.* These types of backing materials contain plasticizers that will try to bond with your coating or cause discoloration. If unsure, periodically check by slowly lifting the mat to see if you notice it trying to stick to your decorative floor surface or if you begin to notice signs of discoloration. Never apply tape to your decorative floor. The tape resins will adhere to the finish and potentially could pull the finish and stain right out of the floor. Always clean liquid spills as soon as possible to avoid staining.

Pet Owners- Be sure to clean animal urine as quickly as possible. The acidic content can degrade your new floor.

Protective Tips- Use felt pads or protective sliding casters under furniture or equipment legs to prevent scratching. Place throw rugs, 100% rubber or fabric backed mats under heavy furniture or equipment. (Remember, never use acrylic or plastic backed mats). Place door mats outside entrances to reduce tracking in unwanted debris and contaminants.

Interior Floors: We recommend a wet/dry microfiber mop for cleaning smooth surface decorative floor coatings. Use the dry pad for regular dusting and a wet pad for occasional damp mopping. A microfiber mop does a much better job of cleaning than a conventional mop. You are able to scrub where needed to remove stubborn debris, and avoid spreading contaminated material across the floor. You easily wash each pad for a more hygienic cleaning program. If a high gloss floor finish is used such as EcoFlorZ™ Floor Finish, periodic high speed floor burnishing will restore its original high gloss luster. Never use an acidic or caustic cleaners (ammonia, bleach, PineSol, etc.) on a decorative floor as it will slowly eat away at the coating, sealer or floor finish causing premature deterioration.

Exterior Floors: To clean an exterior or textured aggregate coating, you may use a power washer with water broom attachment, fan spray tip 40°-60°, or simply brush clean the area. When using a power washer for maintenance cleaning, never use a high pressure stream that may remove your coating and can damage the concrete surface. Always remove oil and fluid spills as soon as possible to prevent staining the surface.

By taking time to be thorough in preparation and maintain proper care, your new decorative floor can last a lifetime. Reward yourself with the accolades of your customers or guests that will enjoy the most contemporary and sustainable flooring option available today!

Eco Safety, Inc. is the manufacturer of the EcoProCote Brand, a full line of sustainable coatings used for architectural, decorative, industrial, marine, and maintenance chemicals.

Corporate Office
2921 W. Culver Street, #4B
Phoenix, Arizona 85009 U.S.A.
T: (602)305-9397
E: info@ecoprocote.com
W: www.ecoprocote.com