



TROUBLESHOOT GUIDE

TROUBLESHOOTING ISSUES WITH CONCRETE COATINGS.

Below you will find several issues that can commonly be associated with concrete coatings and common causes for the those issues. You will also see tips and advice that, in most cases, will help resolve these problems. For more information on what you can do you remedy coating trouble, call SUNDECK Products, Inc. at 877-478-6335.

AIR BUBBLES IN THE COATING

OUTGASSING: Air that is trapped in the coating's surface that had escaped the coating's porous surface.

AIR MOVEMENT: Excess air from one of many types of sources that may cause quick, flash drying, preventing air release.

TEMPERATURE/HUMIDITY: Extreme heat and humidity can cause rapid drying times causing air entrapment.

MOISTURE: Moisture in the air and/or concrete may result in the formation of bubbles into the coating.

DIRECT SUNLIGHT: Exposure to direct sunlight may result in quickly tacking and forming air bubbles.

IMPROPER MIXING: Very fast or improper mixing may result in air entrapment into coating.

ROLLER COVER: Using a roller cover with a too long or too short nap may generate bubbles into the coating.

LATE APPLICATION: Rolling and/or squeegeeing the coating too late can introduce late air that does not have time to escape.

• RECOMMENDED SOLUTION

Note that ensuring the concrete is completely sealed off with a primer coat will help to reduce or eliminate sources of air that can create bubbles. If bubbles occur, a light sanding or screening may be necessary to remove the bubbles and crater edge. Depending on the size, filling and sanding smooth prior to another coat may be necessary.

COLOR & PIGMENT FLOODING

IMPROPER MIXING: Improperly mixing a colored coating may result in unsightly streaking or flooding of pigments.

OVER TINTING: The addition of too much pigment into a coating may result in color floating.

• RECOMMENDED SOLUTION

Always thoroughly mix tinted coatings with a high speed drill equipped with a squirrel mixer. Always mix the recommended amount of pigment into a coating. If additional color is needed, add small amounts at a time. Always test for color acceptance prior to use.

DE-LAMINATION OR PEELING

IMPROPER CLEANING: Coatings will not properly adhere to oily, greasy, or contaminated surfaces resulting in peeling.

VISCUS COATING: Heavy, high solids coatings applied to an unprimed surface may result in de-lamination.

IMPROPER ETCH: Substrates that are not properly etched or "opened" may not ensure proper adhesion.

EXCESS MOISTURE: High levels of moisture can form pressure between the substrate and coating causing de-lamination.

INTERCOAT ADHESION: Incompatible and improperly applied coatings may de-laminate between coats.

• RECOMMENDED SOLUTION

Always thoroughly clean and prep substrates prior to applying all coatings. Read all application, priming and re-coat instructions prior to applying coatings. Using a moisture meter and/or simple moisture test will help determine if moisture may cause trouble prior to application. Note that sanding, screening or stripping / full mechanical removal may be necessary if de-lamination or peeling does occur in high-performance coatings.

DISCOLORED WHITE SPOTTING

ENTRAPPED SOLVENT: Solvent entrapment may result in discoloration or white spots.

LAIANCE/CONTAMINANTS: Alkaline salts or residues not removed prior to coating may result in discoloration.

MOISTURE/HUMIDITY: Moisture content or humidity may result in discoloration of some coatings.

• RECOMMENDED SOLUTION

Always thoroughly clean all substrates prior to coating application and allow adequate time to dry if using any water. Note that sanding, screening or stripping / full mechanical removal may be necessary for coatings.

DULL FINISH

POOR VENTILATION: When proper ventilation is not achieved, solvent may trap in the coating diminishing the gloss.

RECOATING TOO FAST: Re-coating too fast may result in a dulling finish.

ANTI-SLIP ADDITIVES: The addition of anti-slip additives, such as Surf-Grip and High Wear Additive, may dull the finish of coatings.

• RECOMMENDED SOLUTION

Always use proper ventilation when using concrete coatings. Read technical data prior to application for re-coat times and apply within those parameters. Anti-slip additives are necessary for some applications but cut down the gloss finish of a coating. If a gloss finish is desired in an application that anti-slip additives are necessary, use only the amount of anti-slip that is absolutely necessary for needed grip to reduce the amount of lost gloss.

EXCESSIVE WEAR OF COATING

SOFT SUBSTRATE: Applying coatings to poor concrete substrates may result in the excessive wear of the coating.

IMPROPER MAINTENANCE: Poor maintenance habits may result in the minimal use but excessive wear of a coating.

• RECOMMENDED SOLUTION

For soft substrates the application of a topical cementitious overlay prior to coating may be necessary. Maintaining a coating or a floor wax over an interior coating will help to prolong the life of a coating.

FISH EYES IN THE COATING

CONTAMINANTS-SILICONE: Silicone deposits from welding or spraying practices may result in fish eyes.

CONTAMINANTS-OILS: Grease and oil on the floor may force the coating function improperly resulting in fish eye effects.

• RECOMMENDED SOLUTION

In many cases this may be hard to overcome. Start by stripping, sanding, shot blasting and/or grinding the affected areas back to bare concrete. The use of an industrial strength degreaser may be helpful to remove contaminants from the substrate. After thoroughly cleaning the area, reapply the coating. Note that an oil stop primer may be necessary in some situations.

SHADING/COLOR DIFFERENCES

MATERIAL SETTling: If a material is allowed to settle, not scraping and mixing well may result in color shading.

DISCOLORATION OR SPOTTING: Chemical attacks to coatings may allow spotting or discolorations in isolated areas.

UV EXPOSURE: Exposure to sunlight or UV rays may result in the fading of the coating.

BATCH VARIATIONS: Batches may show variations batch to batch.

LATE APPLICATION: Rolling and/or squeegeeing the mixed material at a much different time after being mixed may result in variations in color profile.

• RECOMMENDED SOLUTION

Always thoroughly mixed tinted coatings with a high speed drill equipped with a squirrel mixer. Always thoroughly clean all substrates prior to coating application. Use only UV stable, exterior application approved coatings outdoors as well as in areas where prolonged sun exposure may be possible. Always check batch numbers and use materials from the same batch on the same floor whenever possible. Blend multiple batches of color to make one uniform color if necessary. Apply mixed material as quickly as possible and do not mix more than can be used in a reasonable amount of time. Using control joints as stopping and starting places may make color variations less noticeable. Sand and re-coat if color is not acceptable.

WRINKLING OF COATING

TOO HEAVY APPLICATION: When heavily applied, some coatings may wrinkle after drying.

OUTSIDE RE-COAT WINDOW: Some coatings are too chemically reactive to simply re-coat, resulting in wrinkling like effects.

SOLVENT ATTACK: Some solvents / chemicals may be too harsh for certain coatings having a negative effect on the coating.

• RECOMMENDED SOLUTION

Always apply coatings at suggested coverage rate and within acceptable re-coat window. Always read tech data and instructions prior to all coats. Note that sanding, screening or stripping / full mechanical removal may be necessary to fix some coatings. Only use coatings intend

*The statements made on these pages are suggestions only. No statement made is intended as absolute nor is warranted by SUNDECK Products, Inc. Always perform tests prior to application.

GLOSSARY

BACK ROLL - The act of rolling a final pass over a freshly applied coating to help even out the coverage and eliminate late bubbles and roller marks.

LAITANCE - A weak, easily-crumbled layer on the surface of concrete, consisting of cement and fine aggregates that rise to the surface when too much water is added. Laitance may also be caused by over-trowelling, rain damage, or poor curing.

ORANGE PEEL - A slight dimpled texture left behind by concrete coating that resembles the texture of an orange peel.

OUT-GASSING - Air that passes through the pores of concrete and can become trapped in bubbles in coatings.

PORES - The small capillaries in concrete that allows air and moisture to pass through and allows coatings to soak in and bond.

POT LIFE - The amount of time a product remains usable inside a mixing container.

SOLIDS - The percentage of a concrete coating that remains on (or in) the surface after it cures.

WORKING TIME - The acceptable amount of time a product can be touched with application tools after it is on the surface.

MOISTURE TESTING PRIOR TO COATING INSTALLATION

The first step in any concrete coating installation should always be testing the substrate for moisture. Excessive moisture content in the concrete substrate can have an adverse long term effects on a coatings appearance and/or performance. Below are the three most common standards for testing moisture in concrete.

- ASTM D4263 (Plastic sheet test) - This test method involves taping an 18-inch square of polyethylene film onto a concrete slab and waiting at least 16 hours. Afterward, any moisture condensation on the plastic or observable darkening of the color of the concrete underneath the sheet suggests excessive moisture and means the substrate may not be suitable for a coating. This method is the most basic moisture test that can be performed and further moisture testing is suggested.
- ASTM F1869 (Calcium chloride test) - This test method utilizes anhydrous calcium chloride to quantify the amount of moisture vapor emitted from a 1000 ft² area (measured in pounds) over a 24 hour period. Follow the instructions on the purchased test kit to perform the calcium chloride test on a bare concrete substrate free of coatings, sealers, curing compounds, paints, adhesives, floor coverings, etc. It is best performed over concrete that has been diamond ground to remove laitance and open the pores of the concrete. For most coatings an acceptable range is up to 3 lbs. in a 24 hour period although some may be more and some may be less.
- ASTM F2170 (Relative humidity test) - This test method measures the relative humidity (RH) by placing in situ RH probes at specific depths in the slab. After allowing the RH probes to equilibrate, measurements of RH are taken to assess the overall moisture condition of the slab. It is recommended to perform this test at the same time in varying locations (near exterior doors & walls, the center of the room, etc.) to see how the moisture may differ within the same slab. The ASTM standard limits RH to $\leq 75\%$ for concrete to be coated, unless otherwise specified by the manufacturer.

Hand held meters are a quick and easy general survey tool that uses radio signals to measure up to 6% MC in concrete flooring. These can instantly identify areas that require more precise testing without having to affect the concrete surface. These tests only take readings from about one inch into the slab and may provide false readings as they can interact with metal in the concrete.

It is important to note that moisture testing only shows the results on the day(s) that the testing was performed. Moisture levels in concrete will vary based on season, weather, location, etc. Always ask the floor owner if there has been a history of visible moisture or sweating on the surface, damp/musky odors or any other cause for concern. If possible, also find out if the concrete was poured over a vapor barrier (plastic). If in doubt, MVB can be used and act as an "insurance" policy for questionable floors.

TEMPERATURES AS THEY RELATE TO CONCRETE COATINGS

When installing concrete coatings, temperatures are a critical external component to ensure that the coating not only has the desired finished appearance but also performs correctly during and after application. Temperatures can affect everything from pot life and working time to penetration and dry time of any coating. This will affect the workability of the product, the adhesion to the substrate and the products ability to layout or settle to reduce or prevent orange peel and/or roller marks. Temperatures can also effect the optimal re-coat window. In higher temperatures, the re-coat window may be much shorter.

When people think of temperature they are most likely going to pull out their phone or look at a thermometer and check the temperature of the air but when coating a floor, air temperatures are not the only important temperature reading. It is equally important to know the temperatures of the air, the surface to be coated as well as the material being used to coat the floor at the time of installation. It is highly recommended that all concrete coatings installers carry a pyrometer (remote-sensing thermometer) to every job site to measure the conditions before installing any coatings.

Below are a few tips to help ensure a successful install when it comes to controlling temperatures.

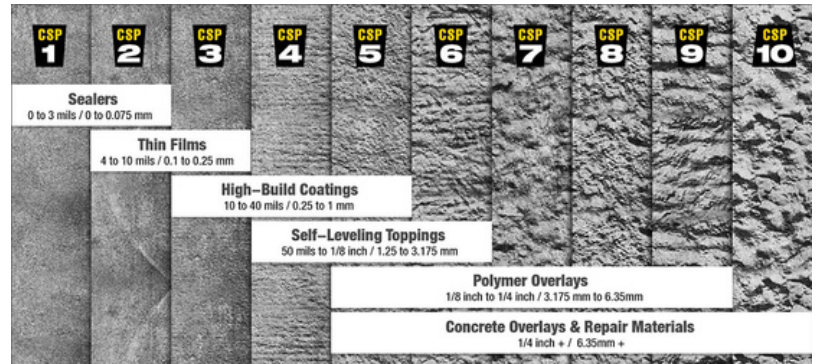
- If possible use HVAC to control the temperature right up until installation. With most coatings (especially solvent based) it is suggested to block HVAC vents to prevent distributing fumes/odors however using the HVAC can help maintain constant temperatures in all three critical areas until the time comes to block the vents.
- Store coatings in temperature controlled environments or the same environment to be coated. Leaving coatings in vehicles or trailers can raise their temperatures by 20+ degrees in the summer and drastically lower then in the winter in a short period of time. Even having them exposed to direct sunlight outside of the work area can quickly raise their temperatures to an unacceptable level.
- Avoid direct sunlight on the substrate. Keep all exterior doors closed or cracked if possible to avoid prolonged exposure to direct sunlight. Know what time of day the sun hits the floor and plan the installation around it. Even a window can create a hot spot on the surface if the sun shines through for a prolonged period of time.

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CONCRETE SURFACE PREPARATION PROFILES & METHODS

Proper surface preparation of existing concrete is essential for long term performance of concrete coatings. It is very important to understand the profile requirements for the product to be used as well as the best method of preparation to achieve the required profile.

These Concrete Surface Profiles were developed by the International Concrete Repair Institute (ICRI), are divided into ten classifications (CSP 1-10) of surface textures based on the average distance textures based on the average distance from the peaks of the surface to the valleys. They are accepted industry standards to help guide the installer achieve the proper texture for successful bonding of the overlay or coating. The lower number profiles are smoother (CSP 1 is nearly flat), and the higher numbers have more “tooth” and get progressively rougher.



Determine the duty and application expected of the floor from [Table 1](#). Then refer to [Table 2](#) to determine the surface profile required for this coating and the preparation method(s) suitable to attain necessary profile.

TABLE 1

DUTY	TRAFFIC	APPLICATIONS	COATING TYPES
Light	Pedestrian only	Offices, living spaces, etc.	Sealers, thin mil roll or spray on coatings
Medium	Pedestrian, cars, soft wheels	Labs, residential garages, showrooms, etc.	Roll or spray on coatings, broadcast systems, high build epoxies
Heavy	Forklifts, pallet trucks, hard wheels, heavy vehicles	Warehouses, commercial kitchens, commercial/military shops, etc.	High build epoxies, double broadcast systems, troweled epoxies

TABLE 2

• = Not Recommended •• = If Only Option ••• = Acceptable Option •••• = Best Method

COATING TYPE	PROFILE	ACID ETCH	DIAMOND GRIND	SHOTBLAST	SCARIFIER
Sealer (0-3 mils)	CSP 1 - CSP 2	••••	••••	••	•
Thin-mil, roll, or spray on (4-10 mils)	CSP 2 - CSP 3	•••	••••	•••	•
High build coating (10-40 mils)	CSP 3 - CSP 5	•	••••	••••	••
Self-leveling (50 mils - 1/8 inch)	CSP 4 - CSP 6	•	••	••••	•••
Polymer overlay (1/8 - 1/4 inch)	CSP 5 - CSP 10	•	••	••••	••••

CONTROLLING DUST IN THE WORK AREA

Dust will act as a contaminate affecting the finished appearance of a coating as well as the long term properties and wear resistance. Making sure that not only the surface is free of dust but also that the entire work area is as dust free as possible will help ensure a successful coatings installation.

- Choose a vacuum with high CFM, HEPA filters and automatic or manual filter cleaning pulse/purge.
- Always use diamond grinders with complete dust shrouds that sit evenly on the surface with a vacuum attached.
- Avoid allowing dust to become air born as much as possible.
- Allow adequate time for air born dust to fall to the surface before installation of a coating.
- If necessary, clean walls and other objects in the area.
- Vacuum the floor several times. Pay extra attention to corners, under drywall & other areas where dust may be hard to reach.
- Block HVAC vents and fans that may blow dust into a coating as it cures.
- Minimize traffic in and out of the work areas as installation begins.
- Wear clean shoes, spiked shoes, boot covers, etc. to reduce dust being tracked in.