ESD Floor Wax / ESD Floor Finish

What Causes an Oily Slippery Film and How to Fix it!

The Cause: A condition that is specific to ESD finishes is directly related to the anti-static active ingredients they contain. This condition occurs when multiple coats of ESD finishes are applied without sufficient time for the finish to cure and the anti-static ingredient to bond to the polymer chain. In these circumstances, the un-bonded active ingredient (which has a lower specific gravity than the other floor finish components) floats to the top surface and forms a greasy sometimes slippery feeling layer on the surface.

The Solution: Correcting this problem requires that the surface be scrubbed with a low speed (175-300 Rpm) buffing machine or automatic scrubber equipped with red buffing or blue cleaning pads and a solution of 8-10 ounces of United SCP ElectraClean per gallon of warm or hot water. The solution that will now contain the dissolved anti-static ingredient should be vacuumed or mopped up. The floor should then be coated with a thin application of United SCP ElectraGlaze and allowed to cure for 24 hours before being put back into service.

ESD Floor Finish is NOT applied like Standard Floor Wax!

The application and maintenance procedures for applying anti-static floor finish is NOT like applying and maintaining standard floor finish. ESD (static dissipative) floor finishes made by *any* manufacturer, have a different chemical structure which requires that special attention be paid to certain details when they are being applied and maintained. To provide static dissipation anti-static finishes contain a special active ingredients. This active ingredient is not readily compatible with standard floor finish polymer chemistry. Producing a *quality* ESD finish requires that a finely tuned balance be achieved between having a sufficient concentration of the active ingredient to provide effective ESD properties, while avoiding an unacceptable level of the side effects inherent when incorporating anti-static compounds into finishes. These side effects can include increased water sensitivity, reduced gloss, extended drying times and

slipperiness. The cause of these side effects is the active ingredient's tendency to absorb humidity present in the environment into the finish film. These hydrophilic properties help anti-static floor finishes to dissipate static charges. The consideration is that factors that inhibit regular floor finishes from drying and curing (like cool floor temperatures, high air temperatures coupled with high humidity and heavy coat application) also effect anti-static floor finishes, but to a much greater extent. This means that additional care and time must be taken when applying anti-static floor finishes.

Application Considerations

In order to achieve effective static dissipative properties, a sufficient amount of active ingredient must be present in the floor finish film. To obtain static dissipation on ESD conductive or static dissipative tiles, sheet vinyl, ESD epoxy or ESD concrete sealer United SCP recommends application of only one to two thin coats of ElectraGlaze. ElectraGlaze will provide a high shine, fill spaces and height deviations in the tiles and will provide a very effective sacrificial coating that is easy to maintain. Unlike an untreated ESD floor, scuff marks may easily be high speed burnished from ElectraGlaze. Please Note: United does not recommend ESD floor finish be used on standard vinyl tiles! Why? No matter who's ESD floor finish you choose clients will constantly fight the electrical properties needed for compliance and static control and rarely meet the new ANSI ESD S20.20-2014 standards.

In order to function correctly, both immediately after application and over time, the anti-static active ingredient must effectively bond to the polymer chain. Once a floor finish is applied, film formation occurs in two phases. The first phase involves the evaporation of the water from the finish. Most floor finishes, ESD and regular, contain between 75% and 84% water, which must leave the finish film before the second curing phase can start. The second phase, sometimes referred to as the glass transition phase, occurs after the water has evaporated and the co-solvents/plasticizers have reached a high enough concentration to initiate cross-linking of the various polymers used to make up the finish. It is during this curing phase that the anti-static

ingredient becomes bonded to the polymer chain. During both of these phases there are a number of environmental conditions and application factors that impact both evaporation rates and the curing of the polymer.

1. Air Circulation - moving air holds more moisture than stagnant air, so although positive air circulation is beneficial under any circumstance it becomes critical in higher humidity conditions.

2. Floor Temperature - the optimum floor temperatures for effective evaporation and curing of both regular and ESD finishes is 65-75^{o} F. Floor temperatures at either extreme can have a significant negative impact. At less than 50^{o} F many polymers will never achieve the glass transition phase, never cure and will display adhesion failure, powdering, lack of gloss and streaking and mop marks. At excessively high temperatures, greater than 85^{o} F, floor finishes can flash dry at the interface between the floor and bottom of the finish film and may not adhere properly. Whenever possible, adjustments should be made to the environmental controls to bring floor temperatures a close to optimal as possible. If adjustments can't be made, cooler floor temperatures will require additional drying and curing time.

3. Humidity - humidity conditions are an important factor in the drying and curing of any finish, but can have a critical impact on the performance of ESD finishes. The ideal application humidity level for ESD finishes is 40% relative humidity or lower. 40% relative humidity is also the level at which ESD finishes provide optimum static dissipative properties. As previously mentioned, the second curing phase of finishes starts when sufficient water has evaporated and the co-solvent/plasticizer levels reach a high enough concentration to initiate cross-linking of the polymers. The challenge with ESD finishes is that this is also approximately the point at which the anti-static active ingredient reaches a high enough concentration to start absorbing atmospheric humidity. This creates a conflicting set of chemical reactions which results in ESD finishes being much more sensitive to humidity levels and drying times than standard floor finishes. At humidity levels higher than 60% ESD finishes can take an extraordinarily long time

to cure, as much as 24 hours per coat, so when possible, it is best to simply avoid applying ESD finishes under these circumstances.

4. Drying Times - most standard vinyl composition tile finishes will generally dry and have cured sufficiently to allow additional coats to be applied within 20-60 minutes depending on humidity conditions. Because of their chemistry ESD finishes take substantially longer. United SCP recommends that no more than 3 coats be applied in an 8-hour period, under positive drying conditions. A minimum of 2 and preferably 4 hours drying time should be allowed between coats. Adverse drying conditions will require allowing even longer drying times between coats.

5. Coat Thickness - due to ESD finish's particular chemistry they should be applied as thinly as possible. Coverage rates should be approximately 2000 ft2 to 2500 ft2 per gallon. Heavy applications will take longer to dry and cure, and will increase the potential for experiencing short and longer term performance problems.

Revision History

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