

Technical Bulletin # 400B

Surface Preparation

The foundation of any coating system is the surface preparation. It is the most important factor in developing a successful coating system. The purpose of surface preparation is to remove all contaminants that can interfere with adhesion and to develop a surface roughness to promote mechanical bond.

Existing Conditions: First, determine if any kind of curing membrane or sealer is present. Visual inspection for a “water bead” test can be used to determine if one was used. If a sealer is present, it must be removed by sandblasting, shot-blasting, mechanical scarification or suitable chemical means. It is also extremely important to determine if any type of moisture condition exists in the concrete that could adversely affect an impermeable flooring system. To check for hydrostatic moisture conditions, the following tests can be performed:

- Calcium Chloride Test ASTM F 1869-98 (preferred method)
- Electrical Resistance Test (i.e., Delmhorst Moisture Meter)
- Plastic sheet method ASTM D 4263

New Concrete: Surface must be clean, dry, sound and offer sufficient profile to achieve adequate adhesion. Minimum substrate cure is 28 days at 75° F, however certain conditions can effect the cure rate. The depth of the pour, presence of a moisture barrier, type of concrete, temperature and humidity can all change the cure schedule.

Check with ITW Resin Technologies’ Technical Department for information on moisture resistance of various coatings.

Several methods are available to prepare good, sound concrete.

1. Shot-blasting: This method is a one-step process which strips, cleans and etches simultaneously. All dust and contaminants are collected by a vacuum system which permits the immediate application of the coating system. All deposits of oil or grease must be removed before shot-blasting. Care should be taken to recommend sufficient coating to cover the blast profile.

2. Mechanical Scarification: This method uses a machine which grinds, cuts, sands or breaks away the top surface of the concrete to expose a clean, fresh surface. In most areas, these machines may be rented on a daily basis. All deposits of oil or grease must be removed before scarifying. Care should be taken to recommend sufficient coating to cover the blast profile.

3. Acid Etching: (ASTM D 4260, ASTM D 4262). Sweep floors clean and scrub any contamination with detergent. Dampen floors with clean water, prior to applying acid. Etch with Muriatic Acid, diluted in water to 16% (1 gal. 32% muriatic acid to 1 gal. water). Apply approximately one gallon mixture per 75 sq. ft. Using a stiff bristled floor broom or scrubber, spread and scrub into the surface, allowing the acid to foam for 10-15 minutes while agitating. Neutralize solution on floor and vacuum up. Rinsing must be done immediately to avoid formation of salts on the surface. Do not allow the solution to dry on the floor. Rinse surface 2 to 3 times with clean water and allow to dry. Test pH level before coating. Normally, the desired profile is similar to that of medium sandpaper. A dry surface is essential for successful coating applications, and overnight drying is generally necessary. Higher concentrations of acid can be used if necessary. Follow all appropriate regulations regarding disposal. Acid etching produces corrosive fumes, therefore appropriate protective measures should be taken.

4. Sandblasting: Either wet or dry blasting can be used. Blasting of concrete requires removal of loose and powdery concrete along with laitance. Vacuum or air blast to remove all sand and dust. All deposits of oil or grease must be removed before blasting. Care should be taken to recommend sufficient coating to cover the blast profile.

Old Concrete: Coating older but uncoated concrete floors is done in much the same manner as new concrete. The concrete must be thoroughly cleaned with a strong detergent to remove grease and oils. The floor should be thoroughly wetted before application of detergent and thoroughly rinsed after cleaning. Any loose concrete should be removed. Holes and cracks should be filled with IMPAX Crack

Filler before application of a coating. Where surface deterioration presents an unacceptably rough floor, IMPAX 5020 Trowelable Floor Resurfacer is recommended to patch and resurface damaged concrete.

Steel: Minimum surface prep is sandblast to Commercial Grade SP-6 to ensure removal of rust, mill scale, oxidation or old coatings. If this is not possible, acceptable alternatives are either a water blast or mechanical preparation, if carefully done. A degreasing solvent wipe is recommended prior to blasting or sanding, utilizing IMPAX IXT-59 solvent and solvent-clean method SP-1.

Wood: A clean, sound wood surface is required. Remove any oils and dirt from surface by suitable means, using degreasing solvent or strong detergents. Sanding or mechanical cleaning is then required to remove loose or deteriorated surface wood to obtain the proper surface profile.

Plastic (FRP): Sandblast or power sand lightly to remove surface contaminants, old coatings, etc. New plastic surfaces require light sanding or brush blast to remove mold release and other adhesion inhibitors. A solvent wipe is recommended before blasting or sanding, using IXT-59 solvent. An alternative to mechanical preparation is to use a plastic prep wash, usually a diluted Phosphoric Acid solution, to remove mold release and obtain the proper surface profile. The ITW Resin Technologies' Technical Department should be consulted before coating any plastic surface.

Previously Painted Surfaces: If the paint is peeling or degrading in any way, it should be completely removed by sanding, blasting or stripping. If previous coating is completely intact, the surface may be cleaned with a strong detergent or solvent and scuff sanded to remove the gloss. A spot test should be made by applying a small amount of coating over old paint. The old finish may wrinkle or lift within 30 minutes. If it does not, wait five days and test for adhesion. Do this by cutting an "X" into the coating, place tape firmly over the cut, then strip with a hard, fast pull. If the old finish fails, it should be removed or appropriate barrier coat should be considered.

Suggested References

The following publications are highly recommended reference materials:

International Concrete Repair Institute; Guideline No. 03732 - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays (including visual standards); Jan. 1997. Phone (703) 450-0116 Fax (703) 450-0119

SSPC/NACE International; Publication 98-05 - Surface Preparation and Coating of Concrete; 1998. Phone (412) 281-2331.

ASTM E 1907-97; Determining Moisture Related Acceptability of Concrete Floors to Receive Moisture - Sensitive Finishes; American Society For Testing and Materials; 1997

Date

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