



## Guidelines for Applying Two-Component Urethanes to Concrete Floors

Coatings For Industry, Inc. • 319 Township Line Road, Souderton, PA 18964 / 215-723-0919

### CFI Bulletin No. G-3

#### General Objective

The objective of this guide is to describe the material and workmanship necessary to produce a high quality, high performance concrete floor coating system for industrial and commercial services. The painting shall be done according to the manufacturer's instructions and shall be done so as to meet the satisfaction of the project engineer.

#### Scope

This guide covers the application of WEARCOAT 490 primer/sealer, WEARCOAT 480 high-build intermediate coat and URETHABOND 111 abrasion and chemical resistant finish coat.

#### Coating System

##### A. Concrete floors with minimal profile (i.e. acid etch)

Primer: WEARCOAT 490

Finish: URETHABOND 111, two coats

##### B. Concrete floors with a large profile (i.e. blastrac)

Primer : WEARCOAT 490

Intermediate: WEARCOAT 480, one or two coats dependant on profile

Finish: URETHABOND 111, two coats

#### Preparation of Surface

Do not apply coatings over weak, damp or contaminated surfaces. Test concrete with a hammer and chisel. If it easily breaks or crumbles, it is not sound and coatings should not be applied. Test for dryness with moisture meters or by plastic patch test. Test for contamination by water spot test.

##### A. New Concrete

New Concrete must be well cured, free of laitance, dust, form oils, curing compounds and other foreign matter. Form oil and curing compounds can be removed by Terrazzo machine grinding, sanding with coarse open-grit paper, sandblasting, mechanical blasting or scarifying techniques. Concrete hardeners should be avoided in new concrete floors which are to be painted.

New concrete floors, free of form oils, sealers, hardeners, and insoluble curing compounds should be etched with a 15 to 20% solution of muriatic acid to produce a slightly granular surface. Approximate spreading rate for the acid solution should be 50 to 75 square feet per gallon.

Note: If acid does not foam when applied to concrete and beads up, this is an indication that curing compounds, oil, wax or other contamination is present. If this happens, scarifying will be necessary.

Acid should be worked into surface with stiff bristle broom. When foaming action stops, flush the surface with plenty of water.

In some cases more than one acid etching operation is required to obtain a satisfactory profile. Each acid etch should be followed with a thorough water flush. Follow closely the mixing and safety instructions supplied with the muriatic acid.

Upon achieving a surface profile similar to that of medium grit sandpaper, check surface with pH paper. If reading is below 6 neutralize with a 1% ammonia solution. Flush with water and check the pH again. If the pH is between 6 and 8, preferably 7, the pH is satisfactory. The floor must be thoroughly dry before coating. The floor should look dry ( light gray color ). Moisture can be checked by several moisture detectors on the market; however, if not available, a simple method is to tape a polyethylene sheet approximately 2 ft. sq. to the concrete, taping down all edges and allowing to set overnight, then examine for moisture under polyethylene. If present, allow additional drying time before coating.

## **B. Old Concrete**

Remove all oil, grease, wax and dirt accumulation. This may be accomplished by high pressure steam cleaning using a hot caustic solution. Presoaking floor with a caustic solution prior to steam cleaning is also recommended. An alternate method to steam would be high pressure (1000 psi) hot water machine using caustic solution. After thoroughly flushing with clean water use water spot test.

If water beads up on floor, oil, wax, or grease contamination is still present and additional caustic cleaning is necessary. Chemical cleaners, strippers and solvents may be used in conjunction with the above hot caustic cleaning techniques, if necessary, to remove certain chemical contamination.

Upon completely removing all residual contamination, as indicated by water spot tests, acid etching should be done as the next step prior to coating. Follow procedures outlined above in **Section A** for new concrete.

## **C. Previously Painted Concrete**

Buff or sand floor to remove gloss and loose paint. Vacuum all dust from floor prior to painting. Apply URETHABOND 111 finish to small test patch of old paint for check on lifting. If lifting occurs, old finish must be completely removed and concrete surface treated as in **Section B**. An alternate test is to saturate a diaper with lacquer thinner and tape it to the floor for 6-8 hours. If blistering occurs, the old finish must be removed.

The importance of a thoroughly and properly prepared floor can not be stressed too much. It is vital to the adhesion of the paint system applied.

## **Paint Application**

### **Primer**

The primer coat should be Wearcoat 490. This should be applied with a short nap roller at a spreading rate of approximately 300 square feet per gallon. **Important:** Do not apply to damp surface or when humidity is above 90% or temperature is below 50 degrees. Note: It is important to check the floor surface temperature as this may be below the ambient temperature.

WEARCOAT 490 is supplied in a premeasured kit form. Mix the two components together while under mechanical agitation to ensure thorough mixing. The combined components should then set for 45 minutes as an induction period to start the chemical reaction required for cure.

Wearcoat 490 can be recoated 4 hours after application. The recoat time should be no longer than 24 hours from the time of application to prevent a possible intercoat adhesion problem.

Cutting in of edges may be done by brush or detail roller. It is best to terminate and cut in at expansion joints and avoid overcoating of caulking and joint compounds. Metal surfaces should be primed with Urethabond 104 metal primer.

### **Intermediate Coat**

An intermediate coat of WEARCOAT 480 should be used whenever the surface has a large profile such as after blastrac or shot blast preparation. The WEARCOAT 480 should be applied by roller at a thickness of 8 to 10 mils DFT with a spreading rate of 150 to 200 sq. ft. per gallon.

WEARCOAT 480 is supplied in a premeasured kit form. Both parts should be mixed together while under mechanical agitation. There is no induction time necessary for WEARCOAT 480 and should be used directly after mixing so as not to exceed the 30 minute pot-life.

A second coat can be applied after the first coat has become tacky and should not exceed 10 hours after application. In most cases a second coat will be necessary to fully cover the profile of the surface preparation and provide the smoothest possible surface.

The WEARCOAT 480 should be allowed to cure overnight before application of the URETHABOND 111 finish coat.

### **Finish Coats**

The finish consists of two coats of URETHABOND 111 Each coat shall be rolled at the spreading rate of 275 to 300 sq. ft. per gallon. The first coat of finish should be allowed to dry approximately five hours to overnight prior to the application of the final coat. The temperature of the slab will affect the drying time of the finish coats, and work should be scheduled accordingly. Do not apply these finishes when the temperature is less than 30 degrees.

Urethabond 111 two-component finishes are supplied in premeasured kits. After adding part B to part A stir until uniform under low speed agitation. No induction period is necessary and these coatings are ready for application upon mixing. They are also supplied at application viscosity, so thinning is generally not required. .

The finish may consist of two color coats or a color coat and clear topcoat. The latter is used where a maximum "wet look" is desired or where there is danger of contact with strong oxidizing agents(i.e battery acid) which could bleach certain pigments out of the coating.

The high gloss of these coatings gives an apparent wet look to them and, therefore, they appear to have a slippery surface. They, in fact, are no more slippery than conventional floor and deck enamels, but sealing any concrete surface with a coating causes spills to remain on the surface rather than soaking in, and the spilled material will result in a slippery condition when compared to uncoated concrete.

This condition can be somewhat reduced by broadcasting an anti-skid aggregate, usually aluminum oxide, over the first finish coat while it is still wet. It should be noted, however, the size of this aggregate and its concentration will affect the appearance and cleanability of the coating. This aggregate may also be mixed into the first finish coat and rolled as above.

## Cleaning and Maintenance

Urethane floor coatings represent the state-of-the-art system for industrial/ commercial floors. They have far greater chemical, abrasion and impact resistance than conventional floor coatings-even other two component types. Their long-term beauty and effectiveness can be enhanced with a minimum amount of care and maintenance.

Allow these coatings to cure 48 hours before subjecting them to harsh chemical spills and heavy traffic conditions. Although they will tolerate light traffic within 12 hours of application, they do need a proper cure cycle of several days to achieve maximum properties. Also, once cured , it is still wise not to allow harsh chemicals to lay on the surface for prolonged periods and to repair deep cuts that would allow chemicals to penetrate beneath the coating to concrete. The use of a urethane coating on a concrete floor will reduce routine cleaning to the use of mild detergents, usually a mild TSP solution, unless unusually stubborn spills occur. These can generally be cleaned with whatever solvent or chemical is necessary to cut them, as urethanes have excellent resistance to solvents and chemicals.

Use brushes with soft nylon or polyethylene bristles and always wet mop in preference to dry mopping of gritty materials.

Finally, urethane floor systems can be dressed with conventional floor waxes and polishes. These must, however, be completely removed from any areas that may be recoated at a later date.

**LIMITED WARRANTY:** All statements, technical information and recommendations contained herein are based on tests the manufacturer believes to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties, express or implied:

Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective at the time the sealed container is first opened, and in no event beyond the shelf life date printed on the label. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, use shall determine the suitability of the product for his intended use, and user assumes all risk and liability whatsoever in connection therewith.

All data, statements and recommendations made herein are based upon information manufacturer believes to be reliable, but are made without any representation or guaranty or warranty of accuracy and are made with reservation of all patent rights. All products are sold on the condition that the user will evaluate them, as well as manufacturer's recommendation, to determine their suitability for user's own purpose before adoption. Statements regarding the use of the products are processes are not to be construed as recommendations for their use in violation of any patent rights or in violation of any applicable laws or regulations.