

TECHNICAL BULLETIN

Concrete Surface Preparation for Floor Coatings

PREPARING A CONCRETE SLAB

The most difficult aspect of satisfactorily coating a concrete floor is preparing the floor to insure that the coating system will adhere. The following tests should be performed to determine the extent of surface preparation required to insure a successful coating application.

Test for Curing Compound: Most concrete had a chemical curing agent applied at the time the concrete was poured. Such chemical curing agents frequently prevent adhesion of coatings. Test for curing compound by applying a muriatic acid solution to bare concrete. If the solution does not react, (bubble vigorously) when in contact with the concrete, the presence of a curing compound is indicated. Check various areas of the floor. Curing compounds must be either chemically or mechanically removed prior to coating. Generally, acid etching does not remove chemical curing compounds

Test for Grease: The presence of oil or grease will interfere with coating adhesion. Dark and discolored areas often indicate that grease and/or oil has contaminated the floor. Test for contamination by pouring a small amount of water on the floor. If it beads up, oil and/or grease is present. Another test which can indicate the presence of oil or grease is to press a strip of duct tape firmly onto the surface. If the duct tape does not strongly adhere to the surface, oil and/or grease may be indicated. If grease or oil is present, the floor must be degreased before further surface preparation is performed.

Test for Moisture: There may be moisture in the concrete or moisture vapor may be seeping up through it. Test for moisture by taping a 2' x 2' plastic sheet over different areas of the floor. Examine the plastic after 24 hours for signs of moisture. If moisture is present the floor should not be coated until the source of the moisture is determined. Hydrostatic Pressure occurs when a body of water, restricted by any structure, is prevented from flowing along its normal path. The pressure created by this build of water exerts unpredictable amounts of pressure on the concrete itself and any coating that may be attached. This force has the capability of causing failure in a concrete foundation hence a failure in any coating system applied where hydrostatic pressure exists. Because the effects of hydrostatic pressure can not be predicted, there exists no guarantee by Diamond Vogel that any coating will be able to withstand the forces capable of causing failure in the concrete substrate.

Test Adhesion of Previous Coatings: Some coating systems do not require the complete removal of previously applied coatings in order to repaint the floor but all existing coating that remains that is painted over must be tightly adherent. After required mechanical and chemical cleaning of the surface is accomplished, cut 2" x 2" "X" cross-hatches into remaining coatings. Then apply 6" stripes of duct tape over the "X's" and press the duct tape firmly onto the floor and then quickly pull it off. If large portions of the prior coating come off with the tape additional surface preparation must be done before recoating. The applicator of the coating is responsible for determining whether the floor will hold a coating or not.

For More Information:

800-72-VOGEL | diamondvogel.com

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Abrasive blast cleaning may be necessary to completely remove all existing coatings and to provide a new surface profile. Some floors may be impregnated with oils, solvents, or water to such a degree that coating adhesion will be impossible even with abrasive blasting. If the floor has been heavily soiled in the past it is recommended that a core sample of the concrete be taken to determine the level of contamination. If the core sample indicates contamination into the concrete that can not be removed by abrasive blasting the floor will probably never allow a coating to adhere.

DEGREASING A CONCRETE FLOOR

Dampen the concrete surface and then apply a 1:1 solution of Great Lakes Laboratories' Extra Muscle and water. Allow to soak for 15 to 20 minutes. Keep the surface wet by adding water while scrubbing the solution over the entire floor with an electric floor scrubber or stiff bristle brush. Rinse floor thoroughly using a power washer with a minimum 1000 psi and a minimum fluid flow of 1 gpm. Final rinse water should be neutral-pH 7. Allow to dry. The color and dullness of the floor should be uniform. Dark areas indicate the presence of grease/oil and the floor must be de-greased again. Check for invisible grease/oil in several areas of the floor by applying a 1:1 solution of muriatic acid to the floor. If the acid turns brown or does not react (bubble), grease/oil has penetrated the floor and a repeat de-greasing procedure is necessary. Repeat the acid test after subsequent de-greasing until all areas tested indicate the floor to be free of grease and oil. After repeat de-greasing, rinse the floor by power washing to a neutral pH. Duct tape should adhere tightly to

a properly de-greased floor. If the tape does not tightly adhere, the presence of grease is indicated and further degreasing is necessary.

PREPAING A CONCRETE FLOOR BY ACID ETCHING

Sweep the floor clean and dispose of dust. Remove from the floor any contaminant, including oil and grease. Dampen the floor and apply a 1:1 solution of muriatic acid and water through a sprinkling device. The acid should bubble vigorously when applied to the concrete. Coverage should be about 1 gallon of solution per 100 square feet. Allow reaction between solution and concrete to occur for approximately 3-5 minutes, then follow with a stiff broom or mechanical scrubber to remove surface laitance. Rinse the etched surface with clean water, preferably with a high pressure washer. If use of a pressure washer is not possible, rinse and remove water a minimum of three times to ensure a complete rinse is obtained. Do not let the acid dry out on the floor. Continue power scrubbing while rinsing with clean potable water.

Household ammonia or soda ash may be added in the rinse to help neutralize the acid. Pick up the water. Litmus paper should be used to check the pH of the rinse water. If the rinse water is not pH neutral (pH 7-8) or if there appears to be a film on the floor, additional rinsing is necessary. Allow the surface to completely dry then vacuum again to remove fine particles loosened by the acid-etch. Do not allow un-neutralized acid solution to flow into the sewer system or ground.

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PREPARING A CONCRETE FLOOR BY SHOT BLASTING

Sweep the floor clean and dispose of dust. Remove from the floor any contaminant including oil and grease. Shot blast to produce a 3 - 4 mil profile on the concrete floor. The shot blasting machine must be equipped with a vacuum system to recover shot and to reduce airborne dust and contaminants. After blasting sweep the floor to remove any shot, dust and loose contaminants. Areas that cannot be reached with the blasting machine must be mechanically abraded by hand held devices to remove curing compound and produce a minimum 3-4 mil profile.

DYNAMIC AND NON-DYNAMIC CRACKS

Dynamic cracks or joints greater than 1/4" should be filled with Vulkem #45 Polyurethane sealant after the coating is applied (within three months). Degloss the coating adjacent to the joint by scuffing with 3M #7447 Scotch-Brite hand pads. Vulkem #45 requires a minimum of 24 hours drying time to become tack free and require 7 days for a full cure. This product cures by reacting with moisture in the air. Curing can be sped up by misting the sealant with moisture after application but you must anticipate a period in which you can not drive or walk directly onto the sealant.

Joints should be filled from the deepest point to the surface. In joints over 1/2" sealant depth should be controlled to a maximum of 1/2" with Closed Cell Backer Rod.

Fill all holes, spalled spots and random non-dynamic cracks with Nu-Klad 114A Epoxy Filler. Body-up compound with silica sand when filling holes over 1/4" in diameter. Areas must be dry and dust free. Apply Nu-Klad 114A Epoxy Filler into depressions with a putty knife and smooth to an aesthetic appearance. 114A will not shrink and cannot easily be sanded once cured. Allow 12-48 hours for cure depending upon temperature.

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