



Innovative Equine Systems

Exceptional Equestrian Facility Products and Structures

CONCRETE SURFACE PREPARATION

GENERAL INFORMATION

Surface preparation is considered to be the most important step of any flooring application. Improper surface preparation could turn what seems to be a simple process into a lengthy, difficult repair. The following conditions will dictate the type of surface preparation:

Concrete Placement

For slab-on-grade or on the ground, an efficient vapor barrier is necessary to prevent moisture vapor transmission. Proper jointing will minimize cracking, which could transmit through the rubber flooring system.

For elevated slabs, pan construction should be vented. Metal deck construction should be properly jointed to minimize movement.

Curing and Finishing Techniques

Curing compounds, if used, must be mechanically removed from the concrete surface prior to all rubber flooring applications. Recommended techniques: Wet cure, light steel trowel finish to minimize latency and provide hard surface.

Age of Concrete

Concrete must be a minimum of 30 days old for rubber flooring applications.

Previous contamination can affect the bond of the rubber flooring and must be removed. Types of contamination are:

- Oil, grease, or food fats can usually be burned off with a flame gun or removed with a commercial degreasing compound of solvent or mechanical methods.
- Curing compounds, sealers, and other latents are best removed mechanically with: vacuum blasting, scarifying, sand blasting, shot blasting.

Present Condition

Test for moisture:

Rubber flooring system bond failures on slabs on grade caused by moisture vapor transmission are the industry's largest single problem and result in extreme frustration from owners, clients and contractors. We recommend testing for moisture by one of the following methods:

ASTM D4253 (Plastic Sheet) Test: Place plastic sheet on concrete slab for 24 hours. If moisture has collected or slab has darkened, the vapor transmission is too high for a successful rubber flooring application.

Calcium Chloride Crystal Test: The maximum allowed water/vapor transmission rate is 3 pounds per 1000 ft²/24 hours.

Moisture related failures can be prevented by following these tips:

- a. Placing new concrete over an efficient vapor barrier
- b. Testing for moisture content as prescribed above prior to rubber flooring application
- c. Applying a “breathable” flooring system where moisture content is too high for successful rubber flooring applications
- d. Repairing cracks prior to rubber flooring applications

NOTE: A clean surface is necessary to establish a strong bond between the rubber flooring and concrete. Rubber flooring systems are only as sound as the concrete they are applied to. All unsound concrete should be repaired or replaced prior to rubber flooring applications. Rubber flooring materials should be applied to level concrete substrates. Grind or fill high and low spots prior to application. Repair cracks prior to rubber flooring applications.

Mechanical Prep vs. Acid Etching

Rubber flooring materials ideally bond to concrete with a rough, sandpaper finish. This finish can be achieved by either acid etching or mechanical methods. Industry standards no longer consider acid etching to be an acceptable way to do surface preparation. When you etch the concrete, you attack the cement that holds together the concrete. This weakens the substrate and so reduces the quality of the overall system. We do not recommend nor endorse the use of acid etching to prepare the concrete. Also, there are ecological restrictions involved with waste removal which could prohibit the use of acid etching and other chemical methods. The choice of preparation is dictated by the factors listed above.

Acid Etching

Again, we do not recommend nor endorse the use of acid etching to prepare the concrete. However, if you or the owner insists that preparation is done by acid etching, then the following steps are recommended:

- Dilute commercial muriatic acid with water using 1 part acid by volume to 3 parts clean water by volume. Add the acid slowly, taking care to avoid splashing. Workers should be protected with safety glasses, rubber gloves and boots. If skin or eye contact occurs, rinse affected area thoroughly with clean water and follow Material Safety Data recommendations.

- Sprinkle acid solution onto the entire surface in order to allow the acid to reach all areas of the concrete. Adequate coverage is approximately 15 ft²/gallon of acid/water solution. Do not puddle and spread.
- Scrub the acid solution into the concrete using a stiff bristle broom to remove loose concrete and laitance.
- Before rinsing, look for areas where bubbling did not occur. These areas have not been sufficiently cleaned and will require mechanical scarifying and additional acid etching.
- When the acid solution has stopped bubbling (usually after approximately 15 minutes), rinse the floor thoroughly with water. Do not allow the floor to dry before rinsing, because the salts formed by the acid reaction may cause problems with the adhesion and performance of the rubber flooring system.
- Finally, the floor should be dry mopped to remove standing water and dirt remaining after the acid etching. Allow the floor to completely dry prior to the application of any rubber flooring system. Failures can occur in rubber flooring system applications due to moisture remaining in the substrate.
- The floor should then be mechanically cleaned to remove concrete damaged by the etching process.

Mechanical Preparation

Contamination and other foreign materials must be mechanically removed to ensure a satisfactory bond. All dust and debris must be thoroughly removed. Vacuum blasting is an effective, dust-free method of preparing existing concrete.

OLD CONCRETE

Old concrete surfaces must be structurally sound. Any unsound areas must be repaired prior to proceeding with the rubber installation. For proper patching and repairing, use epoxy mortar with graded aggregate. Remove existing paint, scale and loose concrete by rough sanding, sandblasting, shot blasting or dust free grinding. In some cases where plant conditions allow, a stripper may be used to remove excessive build-up of paints or sealers.

Structurally sound concrete should be mechanically prepared to remove any contamination. Vacuum shot blasting is the best method for achieving a good profile for bonding and should be used where possible. Before installation of any rubber flooring system, the surface must be examined for moisture vapor transmission using:

ASTM-D-4263 Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.

Other ASTM tests which are applicable to concrete preparation are:

- ASTM-D-4258 Standard Practice for Surface Cleaning Concrete for Coating
- ASTM-D-4259 Standard Practice for Abrading Concrete
- ASTM-D-4260 Standard Practice for Acid Etching Concrete
- ASTM-D-4261 Standard Practice for Surface Cleaning Concrete Unit Masonry for Coating
- ASTM-D-4262 Standard Test Method for PH of Chemically Cleaned or Etched Concrete Surfaces
- ASTM-C-811 Standard Practice for Surface Preparation of Concrete for Application of Chemical Resistant Resin Monolithic Surfacing

NEW CONCRETE

New concrete must be well cured and dry prior to coating. Allow to cure a minimum of 30 days. No curing agents or sealing compounds should be used at any time prior to the rubber floor installation. A light steel trowel finish is recommended when finishing the concrete surface.

Any oil, grease, latent or other foreign material must be removed. Steam clean with a strong degreaser such as tri-sodium phosphate. Latent and other foreign material is best removed by mechanical methods such as vacuum blasting, scarification or grinding.

All new concrete can be mechanically prepared by vacuum blasting, sand blasting, scarifying or dust-free grinding.

When acid etching, use a 3-to-1 dilution of water to acid and follow directions printed above.

Before the installation of any rubber system, the surface must be examined for moisture test for moisture vapor transmission or high moisture content using ASTM-D-4263 – Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.