



Atlas Minerals & Chemicals, Inc.



DATA SHEET

PS-30 (1-98)
Supersedes PS-30 (9-94)

SURFACE PREPARATION

DESCRIPTION AND USES

The general requirements for surface preparation of concrete, metal and wood surfaces before application of floor systems, tank linings, coatings or membranes are described. For additional information, refer to the specific Data Sheet for the system being installed. Proper surface preparation is necessary for the successful performance of all protective systems. Proper system selection for the job requirements, quality and condition of substrate are equally important for the success of the application. Surface preparation procedures must comply with all local, state and federal environmental regulations.

NEW CONCRETE

Concrete should be cured for a minimum of 28 days in accordance with American Concrete Institute (ACI) recommended concrete practices. **NO AIR-ENTRAINING AGENTS, ADDITIVES OR FILM FORMING CURING MEMBRANES MAY BE USED. ADDITIVES OF THIS TYPE MAY AFFECT THE BOND, CURE OR PERMEABILITY OF THE PROTECTIVE SYSTEM TO BE APPLIED. LUBRICANTS OR RELEASE AGENTS SHALL NOT BE USED ON TOOLS, EQUIPMENT OR FORMS DURING THE PLACING AND FINISHING OF CONCRETE.**

The concrete substrate must be structurally sound, clean, dry and of sufficient profile to optimize bond of the protective system to be applied. The finished concrete must be free of ridges, protrusions, fins, mortar splatter and have a tight laitance-free steel trowel finish. Imbedded foreign matter, such as plastic or paper, must be removed. Honeycomb and other voids must be filled.

The concrete substrate must be free of all oil, grease, dirt and other contaminants. Commercial detergents can be used to remove contaminants. Steam cleaning or other methods may be necessary to remove grease and oil.

The soundness of the concrete can be evaluated through the use of instruments, such as the Swiss (Schmidt) hammer, as outlined in ASTM C805, "Standard Test Method for Rebound Number of Hardened Concrete".

The bond strength, which is related to surface tensile strength, may be evaluated using a standard pull-tester. An alternate method is described as follows:

Apply a small amount of the material to be installed (approximately 2" in diameter and 1" thick) on several properly prepared areas. Allow test samples to harden and remove with a hammer and chisel. Examine the fractured concrete. Concrete with fractured aggregate attached to the sample over the entire area indicates a suitable slab. Cleavage through the sample indicates a sound bond was achieved. Further surface preparation is required if cleavage occurs between the sample and the concrete.

The next step in preparing new concrete involves roughening the surface. Abrasive grit blasting is recommended for removing surface laitance and providing an adequate profile. Follow equipment manufacturer's safety precautions.

Acid washing, when required, also provides a good surface for sound concrete. A mixture of one part muriatic acid to two parts water or one part phosphoric acid to eight parts water is recommended. Wet the concrete with water then acid wash. Following the acid etching, neutralize with household ammonia or a solution of one pint trisodium phosphate or sodium carbonate per two gallons of water. Flush thoroughly with clean water and allow to dry. Protect the surroundings and equipment from acid fumes. Plastic film or a protective coating, such as petroleum jelly, may be used. Follow manufacturer's safety precautions for handling acid.

Note: Use of Blastrac on concrete will leave a "zebra stripe" pattern which will be visible through clear finishes.

The four profiles described and depicted in the ACI 303 R-24 are brush, light, medium and heavy sandblast finish. Most ATLAS Flooring systems will bond well to a light to medium finish. Refer to the specific Data Sheet or contact ATLAS' Technical Service Department for assistance.

OLD CONCRETE

The concrete substrate must be structurally sound, clean, dry and free of all contaminants, such as sealers, curing compounds, coatings, oil, grease, dirt, dust and water before preparation is started.

NOTE: ATLAS makes it a practice to continuously update and enhance our CCM (Corrosion Resistant Construction Materials) products. For the most recent version of any Data Sheet, please visit our Web site at www.atlasmin.com.

Surface preparation requirements are outlined under "New Concrete". When the concrete surface has been contaminated, weakening of the substrate and possible delamination of coatings and floor overlays may occur. The pH of the slab can be checked by testing with Universal Indicator Paper (pH paper). Pour a small amount of water on the slab and allow to stand at least five minutes. Press a strip of pH paper onto the wetted area. Compare the color to the color on the chart. If the concrete slab is in the acidic range, wash the floor with a solution of ammonia or trisodium phosphate. Rinse thoroughly and recheck the pH. Alkaline pH may only indicate the natural alkalinity of the concrete. Readings of 12 or higher could indicate alkaline contamination. If contamination from prior service is suspected, we recommend installing 10 sq. ft. test patches to check for bond at several points on the floor. Consult ATLAS' Technical Service Department for recommendations when extensive concrete repair is needed or if chemical contamination has occurred.

Weak and loose concrete must be removed down to sound concrete. Cracks in the concrete should be routed, saw cut or opened to a 1/4" width with a crack chaser and repaired. Non-moving cracks may be filled. Contact ATLAS' Technical Service Department for a suitable repair material based on the protective system to be applied. Moving cracks must be treated as control joints. The surface of the concrete slab must be clean, dry and sound prior to mechanical roughening.

If the surface preparation fails to remove all contaminants, it may be necessary to completely remove and replace the contaminated concrete.

MOISTURE TESTING

Surface moisture may inhibit bond of some products. Moisture migration in the slab, sometimes accelerated by change in temperature or barometric pressure, can be the reason for blistering or pinholes.

ACI Test Method - This method is described in ACI 515 R-16/Paragraph 3.4.5.2, "Dryness of Surface". It replaces the frequently used rubber mat test. Securely tape the edges of a 4' x 4' film of PVC or PE to the surface. These films should be placed at several locations on the slab. The film will act as a moisture barrier and will trap moisture migrating from the concrete. Allow the film to remain on the concrete for a minimum of 16 hours. If there is visible moisture or darkening of the concrete, the slab is too wet. Drying can be accelerated through the use of fans to provide air movement over the surface.

Speedy Moisture Tester - Model MC 321A may be obtained from ELE-Soiltest, Inc.; 86 Albrecht Drive; Lake Bluff, IL 60044 (800-323-1242). A small amount of the concrete surface is removed. A controlled amount of concrete and calcium carbide, by weight, is placed in a vessel supplied with the kit. The gauge on the sealed vessel registers the moisture content. Moisture readings must be 4% or under prior to installation of protective systems.

METAL SURFACES

Carbon Steel - Steel and fabrication defects must be corrected prior to surface preparation. Welds must be smooth, continuous and solid with no porosity, high spots, lumps or pockets. Weld splatter and slag must be removed by chipping or grinding. Dirt, oil, grease and foreign matter must be removed by either using solvents, detergents or steam cleaning. When using solvents, follow the manufacturer's safety precautions. Rust, mill scale, coatings and other foreign matter must be removed by abrasive grit blasting. Abrasive grit blasting performs two functions. First, it removes foreign materials and oxidized metal. Second, it provides a surface profile or tooth which aids in the mechanical bond of many coatings and overlays. The finish required is a white metal blast cleaning, as specified in SSPC-SP5 or NACE #1 Finish. The profile should be tested using a profile gauge to ensure it meets the recommended specifications for the material being applied. Typical profiles range from 2 mils for thin film coatings to 4 mils or greater for resin based linings. A sharp, hard abrasive, such as "Black Beauty", can be utilized. After abrasive grit blasting, remove the dirt and residue by vacuum cleaning. Priming and/or coating should take place immediately.

Galvanized Steel - Surfaces must be clean and free from dirt, oil, grease and foreign matter. Remove dirt with a stiff brush, scraper or by other suitable means. Oil and grease are removed by using clean rags or brushes wetted with a suitable solvent, detergents, mineral spirits or high-flash naphtha. The final wipe must be done with clean rags or brushes to prevent dispersion of oil or grease films. Follow manufacturer's recommended usage and safety precautions.

Oil and grease may also be removed with alkaline detergents. However, the detergents must be rinsed with hot water under pressure to remove the alkaline residue. Brush blast the surface to provide a suitable profile or use ATLAS' AMPVAR PRIMER.

WOOD SURFACES

Surfaces must be clean and dry. Remove deposits of sap or pitch by scraping and wiping with rags dampened with mineral spirits.

Determine the security of the boards to the substrate. Loose or flexing boards must be removed and replaced. Sound wood floors must be stripped to remove coatings, waxes and other substances. Roughen floors to open pores and vacuum dust prior to application.

TECHNICAL SERVICES

ATLAS maintains a staff of Technical Service Representatives who are available to assist you with the use of ATLAS Products. In the event of difficulties with the application of ATLAS materials, the installation should be stopped immediately and ATLAS' Technical Service Department consulted for assistance.