TECHNICAL BULLETIN 110

Subject: Concrete Surface Preparation Guide

Poured Concrete – Exterior or Interior Applications

The preparation of new concrete surfaces is as important. The following precautions will help assure maximum performance of coatings, elastomeric concrete, epoxy adhesives, silicone and polyurethane systems and satisfactory product adhesion:

1. **Cure** – Concrete must be cured prior to coating. Cured is generally defined as concrete poured and aged at an average temperature of at least 75°F for at least 28 days.

2. **Moisture** – Reference ASTM F1869-98 Moisture Test by use of Calcium Chloride or ASTM D4263 Plastic Sheet Method. Concrete must be free from moisture as much as possible. Vapor pressures, temperature, humidity, differentials and hydrostatic pressures can cause products defined above to prematurely fail. The source of moisture, if present, must be located and the cause corrected prior to application.

3. **Temperature** – Surface and material temperatures must be in keeping with requirements for the selected product during and after product application, until product is cured.

4. **Contamination** – Remove all grease, dirt, paint, oil, laitance, efflorescence, loose mortar and cement by the recommendations listed in the surface preparation section.

5. **Surface Condition** – Hollow areas, bug holes, voids, honeycombs, fin form marks and all protrusions or rough edges are to be ground or stoned to provide a continuous surface of suitable texture for proper adhesion of the product. Imperfections may require filling, as specified, with a structural repair product recommended by engineer of record for the construction project.

6. **Concrete Treatment** – Hardeners, sealers, form-release agents, curing compounds and other concrete treatments should be removed to ensure adequate product adhesion and performance.

Surface Cleaning Methods (prior to and after completion of blasting)

Vacuum cleaning, air blast cleaning and water cleaning per ASTM D4258 are acceptable and used to remove dirt, loose material and/or dust from concrete.

Detergent water cleaning and steam cleaning per ASTM D4258 are acceptable to remove oils and grease from concrete.

Prior to abrasive cleaning, and after abrasive cleaning, surfaces should be cleaned by one of the methods described above.

Methods of Surface Preparation for Concrete - SSPC-SP13 / NACE 6

Dry-abrasive blasting, wet-abrasive blasting, vacuum-assisted abrasive blasting and centrifugal-shot abrasive blasting per ASTM D4259. Used to remove contaminants, laitance, and weak concrete, to expose subsurface voids and to produce a sound concrete surface with adequate profile and surface porosity. The requirements of this standard are applicable to all types of cementitious surfaces including cast-in-place concrete floors and walls, precast slabs, masonry walls and shotcrete surfaces. For complete instructions, refer to Joint Surface Preparation Standard SSPC-SP13/NACE 6.

Soda Blasting Method. Soda blasting is a non-destructive method for many applications in cleaning, paint stripping, industrial equipment maintenance, rust removal, graffiti removal, molecular steel pacification against rust, oil removal by saponification and translocation, masonry cleaning and restoration, and soot remediation. The soda blasting material consists of formulated sodium bicarbonate (also known as baking soda) having a crystalline structure that has a naked eye appearance of course granular sugar as opposed to the conventional powdery baking soda. Blasting soda is an extremely friable material that has micro fragmentation on impact, literally exploding away surface materials without damage to the substrate. Blasting soda is specially formulated and processed sodium bicarbonate (baking soda) that is nonabrasive, dissolves in water, and is formulated to be pure and free flowing. Blasting soda is typically packaged in easy to handle 50 lb bags. Approved for use by FDA, USDA, CODEX, USP, and EPA.

In the functional process of soda blasting you will use a piece of specialty equipment which is a self contained system that includes a blast generator, high pressure compressed air, moisture decontamination system, blast hose with remote controls, and a blast nozzle that is capable of handling dry or wet blasting material.

High-pressure water cleaning or water jetting per SSPC-SP12 or NACE 5. Used to remove contaminants, laitance, and weak concrete, to expose subsurface voids and to produce a sound concrete surface with adequate profile and surface porosity. Refer to Moisture Content Guide Line listed above prior to application of product.

Chemical Surface Preparation Methods / Acid etching per ASTM D4260
Used to remove some surface contaminants, laitance and weak concrete, and to provide a surface profile on horizontal concrete surfaces. This method requires complete removal of all reaction products and pH testing to ensure neutralization of the acid. Not recommended for vertical surfaces. Etching with muriatic acid shall not be used where corrosion of metal in the concrete is likely to occur. Adequate ventilation and safety equipment required.

Clean surface per ASTM D4260, Wet surface with clean water, Etch with 10-15% muriatic acid solution at the rate of 1 gallon per 75 square feet, Scrub with stiff brush, Allow sufficient time for scrubbing and until bubbling stops, if no bubbling occurs, surface is contaminated. Refer to ASTM D4258 or ASTM D4259, Rinse surface two or three times. Remove acid/water each time, Surface should have a texture similar to medium-grit sandpaper, Neutralize surface with a 3% solution of tri-sodium phosphate and flush with clean water, Allow to dry and check for excess moisture.

Refer to Moisture Content Guide Line listed above prior to application of product.

Block (Cinder and Concrete)
Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement and hardeners. Concrete and mortar must be cured at least 30 days at 75° F. The pH of the surface should be between 6 and 9. On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary to prepare the surface. Fill bug holes, air pockets and other voids with a cement-patching compound (per ASTM D4261).