

## **ATB-103 *General Coating Preparation Guidelines***

### **Introduction**

In real estate, the key phrase is – “Location! Location! Location!” With paints and coatings, the phrase is “Preparation! Preparation! Preparation!” Next to using a top quality coating, preparation is the most important part of a successful and long lasting coating project. Preparation is critically important in obtaining the desired performance of any coating, and a properly prepared surface is the foundation that a successful coating system can be built upon.

The vast majority of coating problems are the result of improper surface preparation. Contaminants left on the surface can greatly interfere with coating adhesion. Primers and sealers may improve adhesion, but are not a substitute for proper cleaning.

### **Contaminants**

There are many surface contaminants that can interfere with coating adhesion. The following are the most common:

#### **Existing Paint**

Complete removal of existing paints or coatings is not always economical or feasible. However, any surface preparation short of total removal of the old coating may compromise the service life of the new coating system. Overcoating an existing paint or coating should only be done if the existing coating is in a condition that will provide a suitable base for the new coating. Existing coatings that are brittle, cracking, or in poor condition should not be overcoated, and in some cases complete removal of the existing coating system will be necessary.

#### **Corrosion**

As with an existing coating, complete removal of all rust and oxidation is the best approach to dealing with corrosion. However, it is recognized that this is not always possible or feasible. Rust and other forms of oxidation are serious problems that need to be addressed with serious measures. Improper or incomplete preparation of corrosion can greatly reduce the performance and effectiveness of a coating system. All loose rust must be removed. Tightly adhered rust may be coated, but must be treated with a rust inhibitive primer. Commercially available rust converters can also be effective for some applications.

#### **Dust & Dirt**

Dust remaining on the surface prior to coating can significantly impact the adhesion of the coating. Dust can be blown off with air blowers while embedded dirt will require more aggressive cleaning techniques.

## **Oil & Grease**

The presence of a thin film of oil or grease can seriously affect the adhesion of coatings. Solvent wiping can be effective, but if not done properly it can spread the oil or grease over a wider area. When wiping down the surface, use a clean cloth that has not been contaminated with oils or grease. Several passes may be necessary.

## **Chalk**

The fine, light colored, powdery residue found on painted exterior surfaces is usually chalk from the existing paint or coating. As a paint or coating weathers, it erodes slowly and leaves a residue of the pigments that were used in the coating. This chalk will interfere with adhesion of a new coating and should be removed. On some surfaces, a sealer can be used to lock-down the chalk, but the surface should still be washed down prior to using the sealer.

## **Mildew and Mold**

If mildew or mold is present on the substrate, then it must be killed and removed prior to applying coatings. If not completely removed, then the active spores can continue to grow and the mildew can reappear. Commercial mildew removers or a combination of Trisodium Phosphate (TSP) and bleach can be effective at combating unwanted organic growth. These cleaners should be used according to the manufacturers' instructions. All safety precautions need to be taken and you need to protect the surrounding areas including shrubs and plants that might be damaged by such cleaners. Any treated surfaces should be thoroughly rinsed prior to applying primers or coatings.

## **Soluble Salts**

Soluble salts are ionic surface contaminants at the molecular level. Although dissolvable in water, soluble is somewhat of a misnomer in that these salts cannot be completely removed by a simple washing of the surface. The most damaging salts encountered are chlorides, sulfates, and nitrates. When present in sufficient concentrations these salts have been shown to cause reductions in coating performance and useful life.

There are three main reasons why soluble salts are a concern. First, like any surface contaminants, they will interfere with adhesion of a coating to the substrate. Second, when not removed water-soluble salts, such as chlorides, sulfates and nitrates, can cause osmotic blistering by pulling moisture through the coating film. Third, like any ionic compound, they can help perpetuate corrosion and oxidation of the substrate they are in contact with.

Special cleaners are commercially available to help solvate these ionic contaminants and allow them in most cases to be removed in a single wash. These cleaners should be considered during any surface preparation, but especially on metal surfaces.

Consult the Acrymax Technical Department for further information on this subject.

## **Common preparation methods**

### **Water Washing**

Washing with water is the most common method used for preparing surfaces to be coated with Acrymax coatings. Detergents or other additives to help improve the cleaning process can be added to the water.

### **High Pressure Washing**

Power washers should be standard equipment for coatings applicators. Power washers can effectively remove dirt, contaminants, loose rust, and loose paint with the use of high pressure

water. Small and efficient gas powered power washing units can deliver up to 3500 PSI. For industrial or commercial applications powerwashing units with much greater pressures are available. Special attention should be paid to the force exerted on the substrate while power washing. Too much force can damage the substrate, while too little force may not effectively clean the substrate. Rotating tips can be used that spin the water using centrifugal force to produce a strong impact. By spinning the discharge water, the spray adds additional scrubbing ability to the cleaning process.

### **Low Pressure Washing**

Sometimes high pressure washing is not practical or suitable. In these cases low pressure water along with scrubbing with stiff bristle brushes can be effective. In most cases detergents will need to be used when using low pressure washing.

### **Cleaning Additives**

If water alone is not sufficient to clean the surface, then cleansers may need to be added to the water. When a cleanser is used the surfaces must be thoroughly rinsed of any residue that can affect the adhesion of coatings.

Tri-sodium Phosphate (TSP) is an effective cleaner; however, concerns about the environment have led to development of TSP substitute cleansers. These biodegradable cleaners are available at hardware or paint stores and should be used as the manufacturer directs. TSP is an alkali cleaner that should not be used on or near aluminum, stainless steel, or galvanized metal.

Acrymax PR-101 is a heavy duty cleanser that is used to clean and prepare EPDM roofing for coatings and can also be used on other single-ply membranes. (Consult Product Data Sheet more information on this product).

### **Acid Etching**

A 5 - 10% solution of muriatic acid can be used to roughen concrete or other dense, glazed surfaces. Muriatic acid reacts with cementitious materials and produces a powder residue called calcium carbonate. When the residue is removed, it leaves behind a porous and roughened surface. This provides an anchoring profile to which a coating system can adhere. It is vitally important that the etched surfaces are thoroughly rinsed to remove the reaction products prior to applying coatings.

### **Hand Cleaning**

This includes the use of hand tools including wire brushes, scrapers, chisels, and sandpaper. This technique is typically used mainly on small projects.

### **Power Tool Cleaning**

Rotary wire brushes, discs, and grinders are the most commonly used power cleaning tools. Power tools are more effective than hand cleaning, but greater care must be taken to not damage the surface being prepared.

### **Abrasive blast cleaning**

This method is one of the most thorough cleaning techniques for removing heavy contaminants from the surface. It also roughens the surface to provide a profile to which coatings can anchor themselves.

### **Paint Strippers**

There are many types of paint strippers available to remove existing coatings. In the past, these paint strippers were mainly solvent based materials that were hazardous to work with. Now,

there are environmentally responsible paint strippers (several of which are based on bio technology) that are much safer to work with and are very effective.

### **Chemical Etching / Deglossing**

Glossy surfaces are generally less porous and harder for paints and coatings to adhere to and need to be “deglossed” to provide a profile for a new coating to adhere to. The two methods for doing this are by sanding or using a chemical deglosser. Follow manufacturer’s instructions carefully and use caution when using a chemical deglosser.

### **Other Methods**

There are other surface preparation methods that can be used when conditions warrant. These include ice blasting, sodablasting, steam cleaning, and chemical cleaning. Please consult an Acrymax Technical Representative to obtain information on preparation of specific substrates.

## **Evaluating Preparation**

A critical step in any coating project is evaluating the surface preparation done to make sure it is adequate.

### **Visual Inspection**

Visual inspection of surface is the first step of any evaluation. This evaluation will identify things such as dirt, dust, flaking paint, and other visible contaminants,

### **Soluble Salts**

There are specific test methods and also commercially available test kits for testing for soluble salts. For further information consult an Acrymax Technical Representative .

### **Tape Test**

An easy and effective method to evaluate preparation effectiveness is a tape test. A flexible tape is applied to the surface with standardized pressure, uniformly peeled off after a set time, and then examined. The tape should have little or no dust, dirt, or other contaminants that would interfere with adhesion. For consistent results, the same type and width of tape should be used to check different areas

### **Adhesion Tests**

An adhesion test can be used to evaluate the effectiveness of the surface preparation. More information on this test method can be found in Acrymax Technical Bulletin ATB-104. Although this test method is typically used to evaluate the suitability of a particular coating for a specific project, it can also serve to evaluate the effectiveness of the surface preparation.

### **Industry Standards**

The following standards for evaluating preparation methods and effectiveness are also available. They include

*ASTM International* – Offers several standards regarding preparation including:

D2200 Standard Practice for Use of Pictorial Surface Preparation Standards and Guides for Painting Steel Surfaces

D7120 Guide for Evaluation and Preparation of Roof Membranes for Coating Application

*The Society for Protective Coatings (SSPC)* – Offers surface preparation standards that are used to specify proper surface preparation methods used for steel, other metals, and concrete.

## Primers and Sealers

In choosing a primer, it is very important to consider the type of surface to be coated. Primers can be used to seal a porous surface, improve adhesion, "lock-down" chalk, prevent bleed through of materials that can discolor paint films, and inhibit or prevent corrosion. Consult an Acrymax Technical Representative regarding primers for specific substrates.

*Use of a primer or sealer is not a substitute for proper cleaning!*

**Lead Paint Warning** - Removal of old paint by sanding, scraping, or other methods can generate dust or fumes that contain lead. Follow all appropriate regulations and safety procedures.

On April 22, 2008, EPA issued a rule requiring the use of lead-safe practices during renovation, repair, and painting projects. Under the rule contractors performing work that disturbs lead-based paint in homes, child care facilities, and schools built before 1978 must be certified and must follow specific work practices to prevent lead contamination. Information about this rule can be obtained from <http://www.epa.gov/lead/pubs/renovation.htm>

Additional information about lead paint can be obtained by calling the National Lead Information Center at 1-800-424-LEAD.

For additional information contact the Acrymax Technical Department.

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