



SPI Coating System Application Procedures

Rust Grip®

Corrosion Protection System For Galvanized Metal

(Rev 1 - 10/07/13)

PART 1 - GENERAL

1.1 Purpose.

- A. This specification covers the surface preparation and the application procedures for coating of galvanized metal with Rust Grip® to provide corrosion protection.

1.2 System Description.

- A. Corrosion Protection: Rust Grip® is a one-part polyurethane, metallic pigmented coating that absorbs atmospheric moisture to cure. Rust Grip® is a protective coating film of superior adhesion, flexibility, abrasion, and impact resistance. When applied directly to the surface of the pipe, Rust Grip® penetrates into the pores of the metal substrate and seals the surface from moisture penetration and air infiltration and prevents corrosion.

1.3 Handling, Storage, and Safety.

- A. All materials delivered to job-site shall be in original sealed and labeled containers of Superior Products International II, Inc. ("SPI"), the coating manufacturer.
- B. All coatings shall be stored in facilities designed for the purpose of coating storage and mixing. Storage areas shall be located away from open flames, be well ventilated, and be capable of maintaining ambient storage temperature as recommended by SPI.
- C. Coatings, reducing agents, and other solvents must be stored in original containers until opened. If not re-sealable, then they must be transferred to UL approved safety containers.
- D. Provide proper ventilation, personal protection, and fire protection for storage before, during, and after application.

1.4 Environmental Requirements.

- A. Coatings shall be applied in an enclosed area or during good weather.
- B. Surface temperature shall be at least 5 degrees F above dew point.
- C. Coatings shall have no exposure to freezing temperatures after application {day or night) until fully cured. Applicator must consider temperature and wind-chill factor.

- D. Air and surface temperatures shall be within limits prescribed by SPI for the coating being applied and work areas shall be reasonably free of airborne dust at the time of application and while coating is drying.

PART 2 - EQUIPMENT

2.1 Rust Grip®.

- A. Rust Grip® may be applied by soft bristle brush, one quarter inch (¼”) nap roller made for solvent use, or airless spray.
- B. Recommended spray equipment is a standard airless sprayer (1.5 gallons/minute at 3,300 psi) with carbon steel or titanium tip sized between .013-.017 tip.

2.2 Other Equipment Requirements.

- A. The applicator's/contractor's coating equipment shall be designed for application of materials specified and shall be maintained in first class working condition.
- B. In accordance with requirements set forth by regulatory agencies applicable to the oil production industry, the manufacturer's printed Instructions, and appropriate technical bulletins, the contractor shall provide and require use of protective life-saving equipment for persons working in or around the project site.
- C. Where ventilation is used to control hazardous exposure, all equipment shall be explosion-proof.
- D. Ventilation shall reduce the concentration of air contaminants to the degree that a hazard does not exist.

PART 3 - EXAMINATION

3.1 Examination.

- A. All structural repairs must be made before preparation of surface and application of product begins.
- B. Thoroughly examine surfaces scheduled to be coated prior to commencing work.
- C. Report in writing to the General Contractor's representative any condition that may affect proper application and overall performance of the coating system.
- D. Do not proceed with work until such conditions have been corrected.
- E. Commencing with work indicates acceptance of existing conditions and responsibility for performance of applied coating.

3.2 Surface Preparation for Galvanized Metal.

- A. Galvanized metal is usually smooth and is coated with either a layer of oil to prevent white rust or is passivated. Do not apply Rust Grip® over this oily surface or clear passivator. The zinc of the galvanizing may chemically react with Rust Grip®, create a “soapy” film (saponification) on the galvanized metal, and cause peeling.
 - 1. When unpainted galvanized metal is exposed to the atmosphere and allowed to weather without being painted and is exposed to the

atmosphere, the protective zinc coating will oxidize into a white rust until eventually the zinc metal is depleted. The underlying steel will then rust.

- B. Surface shall be free of all previously existing pack rust, mill scale, dirt, contaminants, embedded oils, and foreign matter. However, a slight amount of visible flash rust on the surface is preferable before coating with Rust Grip®.
- C. Surface shall have all loose rust, loose mill scale, and loose coatings uniformly removed.
 - 1. If pack rust or mil-scale exists, they must be removed by hand tool, power tool, or needle gun.
 - 2. A weathered galvanized surface develops a layer of white rust, which must be removed using a wire brushing or scrubbing with a stiff brush or abrasive pad.
 - 3. Loose paint flakes must be removed by using a wire brush.
- D. Surface shall be cleaned using TSP (tri-sodium-phosphate) or a citrus cleaner to remove embedded oils and to release dirt and degreaser residue. All embedded oils, tar, rust, grease, salts and films must be removed from the surface.
 - 1. The galvanized metal's protective layer of oil / passivator must be completely removed. Typically cleaning with a water-soluble cleaning agent will remove the oily residue.
 - 2. However, the passivator may not be affected or removed using such cleaners. This can be easily confirmed by cleaning a small test area with a water-based or solvent-based cleaner and by lightly sanding the test area with an emery cloth. Once the area is dry, test the clean galvanized area with a copper sulfate solution by dissolving 20 grams of copper sulfate in one quart and applying the solution to the cleaned and sanded area. If the galvanized surface does not turn black, the passivator remains on the surface and must be removed to coat the substrate.
 - 3. If a passivator is determined to be present, the galvanized surface must be scrubbed with a phosphoric acid solution and thoroughly rinsed with clean water or must be cleaned with an abrasive brush blast to remove the passivator treatment.
 - 4. Most hydrocarbon solvents, including mineral spirits, leave a thin layer of residue that leads to adhesion failure of the coating film. Instead, use a water-based cleaner/degreaser to clean a galvanized surface.
- E. Surfaces are to be tested for salt contamination. Salt contamination on a surface can come as a result of salt water, fertilizers, and motor exhaust. If salts are present on the surface above the acceptable levels, use Chlor*Rid or equivalent to clean and decontaminate the surface. The only acceptable levels of salt contaminant that do not require special cleaning are nitrates (5-10 mcg/cm²), sulfates (5-10 mcg/cm²), and chlorides (3-5 mcg/cm²).
- F. Surface must be COMPLETELY dry and clean. Very Important.
 - 1. Wipe surfaces with Acetone if necessary to remove moisture from the pores of the metal.

PART 4 - APPLICATION INSTRUCTIONS

4.1 Rust Grip®.

- A. Prior to application of Rust Grip®, the coating shall be mixed by hand or with a power drill using low-medium speed with NO vortex. (A vortex will draw moisture into the coating.)
1. When the container is opened, the coating will be a yellowish green color. Mix continuously (with no vortex) until the entire surface of the coating turns a silver gray color. Once the coating color has turned completely silver-gray, mix for two more minutes making sure all paste is off of the bottom. Stirring this paste distributes the metallic pigments throughout the coating.
 2. Rust Grip® should not be diluted or thinned.
 3. NOTE: Once container is opened, the product must either be used completely, or sealed with visqueen/plastic before reattaching lid after use, or repackaged and sealed well in an unlined metal can. Product may thicken if left open in can. Pour off the amount you intend to use after proper stirring. If left open, the product will harden in the container.
- B. Rust Grip® must be applied in two or more coats at no less than a total of 8 mils wet/4 mils dry (200 square feet per gallon) over the highest peak of the profile height of the surface. No less than two coats or passes over the same surface area will be required to achieve the minimum required coating thickness of Rust Grip® and must be applied as soon as each coat of Rust Grip® is tacky to the touch.
- C. In all applications (brush or roller), apply at “half-speed” and use a cross-hatch method (side-to-side, then top-to-bottom) slowly to prevent pinholes and allow penetration.
1. Note: if using a brush, the bristles can drag over the surface and wipe wet Rust Grip® off the tops of the highest peaks of the surface profile. Therefore, the initial coat of Rust Grip® should be applied by using a forceful and firm brushing action to push Rust Grip® deep into the pores, cracks, and voids of the surface profile. Then, to achieve the correct thickness of Rust Grip® over the highest peaks of the surface profile, use a roller or soft bristle brush in a easy action to allow the film thickness of Rust Grip® to build up over the peaks to the required 4 mils (100 micron) dry film thickness
- D. The number of coats necessary and the thickness of each will be in accordance with the job specifications and surface profile. Surface profile must be factored when estimating the spread rate and amount of product required. Allow for penetration into the profile and adjust accordingly (i.e. if the profile takes 2 mil (50 micron) to fill before achieving the 4 mils (100 microns) then you must figure 6 mil (150 microns) dry as the appropriate spread rate).
1. The dry mil thickness must be 4 dry mils (100 micons) over the “top” of the highest peak of the surface profile. This thickness is essential to cover all peaks of either the existing surface rust or blasted surface profile

blast to prevent pinholes developing at these peaks when the coating film when is wet.

- E. Overcoat with Rust Grip® or other coatings immediately after surface is dry to the touch to achieve proper adhesion. Higher temperature and humidity will shorten curing times, lower temperatures will slow curing. The overcoat time, normally within 1 to 2 hours after reaching the dry-to-touch stage, will be determined in accordance with the project specifications. If product applied after the specified overcoat time, the surface will need to be lightly sanded to achieve good adhesion.
 - 1. At high RH values of 60% or more, Rust Grip® cures very quickly and the window for applying another layer of coating is very short. At 85% RH, it could be determined that one has only an hour or less over-coat window depending on the ambient temperature. The higher the temperature, the faster solvents evaporate out of the coating. It is always best to overcoat immediately when the first coat of Rust Grip® becomes dry to the touch. Since the curing process is so dependent on ambient temperature and RH, the physical touch-test is always the best approach when working in high humidity environments. RH of 60% and up.
 - 2. If a specific surface color is required for safety or other purposes, Enamo Grip can be tinted to any designated color and is the recommended topcoat for Rust Grip®.
- F. If breaks are taken, spray systems should be flushed with solvent. After completion, spray system should be flushed and cleaned with solvent. After completion, brushes and rollers should be discarded.

PART 5– CLEAN UP

5.1 Clean Up Equipment.

- A. After completion, spray systems should be flushed and cleaned with MEK or other comparable solvents.
- B. After completion, brushes and rollers should be discarded and should not be stored or reused.

5.2 Clean Up Area.

- A. Upon completion, the applicator shall clean up and remove from site all surplus materials, tools, appliance, empty cans, cartons and rubbish which result from painting work. Site shall be left in a neat and orderly condition.
- B. Remove all protective drop clothes and masking from surfaces not being painted. Provide touch-up around same areas as directed by BHP Billiton representative.
- C. Remove all splatters and drippings.
- D. Upon completion of the work, all staging, scaffolding and containers shall be removed from the site or destroyed in a manner approved by BHP Billiton.
- E. The applicator shall keep the area of the work in a clean condition and shall not permit blast cleaning materials to accumulate as to constitute a nuisance or hazard to the execution of the work or the operation of the existing facilities

PART 6 – PROTECTION

6.1 Protection

- A. Diligence should be taken to ensure that vehicles, equipment, fixtures, miscellaneous hardware.
- B. Surfaces not to be coated will be marked, removed, or otherwise covered to protect against cleaning and coating application procedures and weather. Care shall be exercised to avoid lapping on glass or hardware. Finished surfaces shall be free from defects or blemishes.
- C. Protective coverings or drop clothes shall be used to protect floors, fixtures, and equipment.

PART 7 - INSPECTION

7.1 Inspection.

- A. After application of each coating in the specified system and its surface has cured, measure its thickness with a properly calibrated dry film thickness gauge. Follow standard method for measurement of dry paint thickness.
- B. Make as many determinations as needed to ensure the specified thickness are achieved and make adjustments to all surfaces having less dry film thickness than specified until the specified thickness is achieved.