

GUIDE FOR APPLYING TO MILD STEEL

GUIDE FOR APPLYING SPI PURE POLYUREA PRODUCTS TO MILD STEEL

1. SCOPE

- 1.1** This Guide describes basic procedures for surface preparation and application of SPI PURE POLYUREA PRODUCTS to mild steel surfaces in industrial plants or commercial facilities.
- 1.2** The Guide is pertinent for both new construction and maintenance applications.
- 1.3** This Guide is intended to be used by owner's representatives and applicators.

2. DESCRIPTION AND DEFINITIONS

2.1 DESCRIPTION

All surfaced to be blasted shall be solvent cleaned or steam cleaned with detergent to remove all oil grease, soil, drawing and cutting compounds and other contaminants. If steam cleaning with detergent is used, all surfaces shall be steamed or washed with clean, hot water to remove all traces of detergent residue.

2.1.1 SPI PURE POLYUREA PRODUCTS are applied to mild steel surfaces to protect against corrosion.

2.1.2 The major procedures covered in this Guide are surface preparation, coating application, inspection and safety.

2.2 DEFINITIONS

2.2.1 CORROSION: The gradual destruction of materials (usually metals) by chemical reaction with their environment.

2.2.2 MILL SCALE: A black scale of magnetic oxide of iron formed on iron and steel when heated for rolling, forging, or other processing

2.2.3 RUST BACK: (re-rusting) is rusting that occurs when freshly exposed, dry, bare steel is exposed to conditions of high humidity, moisture, or a corrosive atmosphere. It is the term used when steel cleaned by dry abrasive blasting, power tools, or wet abrasive blasting begins to rust after the steel surface has completely dried

2.2.4 FLASH RUST: An oxidation product that forms as a wetted carbon steel substrate dries.

2.2.5 DEW POINT: The temperature at which the water vapor in a sample of air at constant barometric pressure condenses into liquid water at the same rate at which it evaporates.

2.2.6 Relative Humidity (RH%): The ratio of the partial pressure of water vapor to the equilibrium vapor pressure of water at the same temperature. Relative humidity depends on temperature and the pressure of the system of interest.

3. REFERENCE STANDARDS

- 3.1** The standards referenced in this guide are listed in Sections 3.3 to 3.5.
- 3.2** The latest issue, revision, or amendment of the reference standards in effect on the date of invitation to bid should govern unless otherwise specified.

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3.3 SSPC STANDARDS:

PA Guide 1	Shop, Field and Maintenance Painting
PA Guide 3	A Guide to Safety in Paint Application
TG Guide 12	Guide for Illumination of Industrial Painting Projects
PA 2	Procedure for Determining Conformance to Dry Coating Thickness Requirements
SP 1	Solvent Cleaning
SP 7	Brush Off Blast Cleaning
SP14	Industrial Blast Cleaning
SP6	Commercial Blast Cleaning
SP10	Near White Blast Cleaning
SP5	White Metal Blast Cleaning

3.4 ASTM STANDARDS:

D-3359	Standard Test Methods for Measuring Adhesion by Tape Test
D-4541	Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
D-4414	Practice for Measurement of Wet Film Thickness by Notch Gages
D-4417	Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel

3.5 NACE STANDARDS:

SP0188	Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates
RP0287	Field Measurement of Surface Profile of Abrasive Blast-Cleaned Steel Surfaces Using Replica Tape

4. SURFACE PREPARATION OF MILD STEEL

4.1 Requirements for Preparing Mild Steel for SPI PURE POLYUREA PRODUCTS Application

4.1.1 VERIFY SURFACE CLEANLINESS. If found to have dirt, oils, grease or other visible contaminants then SSPC-SP1 should be utilized before performing any other surface preparation methods.

4.1.2 REMOVE SURFACE CONTAMINANTS. Remove oil, grease, dirt, or other foreign contaminants before other surface preparation activities begin by the use of SSPC-SP1 method

4.1.3 ROUGHEN MILD STEEL SURFACE FOR IMPROVED ADHESION. Preferred method is to abrasive blast the surface by using one of the SSPC Surface Preparation Standards listed in section 3.3. All corrosion products, mill scale, and existing coatings should be removed for optimum performance of the SPI Polyurea materials. Surface profile should be as deep as can be achieved. Typically 3-4 mils minimum. For immersion service, the minimum surface profile should be at a minimum of 4 mils or deeper. For immersion service, the minimum requirement for surface preparation would be SSPC-SP10 and the maximum would be SSPC-SP5.

4.1.4 METAL LOSS: In the event that after surface preparation is completed, there is areas with substantial metal loss such as pit corrosion deeper than 1/8" or actual holes in the existing metal surface, these areas should be repaired by welding means. Tape over a hole is NOT a practical method for repair of metal loss in a metal structure.

5. STEPS PRIOR TO APPLICATION OF SPI PURE POLYUREA PRODUCTS

5.1 ENVIRONMENTAL CONDITIONS

Apply SPI PURE POLYUREA PRODUCTS according to specifications regarding the air and substrate temperature, dew point, and relative humidity. Consult Specialty Products, Inc. latest published technical data sheets and application instructions. Also observe recommendations given in SSPC PA 1. Surface Temperature Shall be at Least 5°F (3°C) above the Dew Point and rising. Relative Humidity should not be above 85% during surface preparation and polyurea application activities.

5.2 SPECIAL PRECAUTIONS

5.2.1 Observe other special conditions or requirements as specified by the owner.

5.3 PRE-APPLICATION PROCEDURES

5.3.1 DATA SHEETS. Ensure that Specialty Products, Inc.'s latest published product application data sheets and material safety data sheets (MSDS) are available and reviewed before starting job.

5.3.2 MIXING. Ensure that SPI PURE POLYUREA PRODUCTS B Component is thoroughly mixed before start up. A power mixer with collapsible blades is necessary to adequately mix the product. Contact an SPI technical rep for further information. There shall be no thinning of SPI PURE POLYUREA PRODUCTS A or B Components.

5.3.3 EQUIPMENT. All application and mixing equipment shall be free of contaminants and be operated and maintained in accordance with latest published instructions from the manufacturer.

5.4 COATING APPLICATION

5.4.1 GENERAL. SPI PURE POLYUREA PRODUCTS shall be applied in accordance with Specialty Products, Inc. recommendations and according to good coating application practice as described in SSPC-PA 1.

5.4.2 SURFACE CLEANLINESS. Immediately prior to SPI PURE POLYUREA PRODUCTS application, check the mild steel surface for dust and other debris that may interfere with coating adhesion.

5.4.3 DRY FILM THICKNESS. The film thickness shall be within the minimum and maximum levels specified. Dry Film Thickness should be estimated based on using SSPC-PA2 Methods.

6. INSPECTION

6.1 DRY FILM THICKNESS. Measure dry film thickness in accordance with SSPC PA2 Methods.

6.2 ADHESION. Measure the bond strength of the coating to the steel surface in accordance with ASTM D-4541. This method will require patching of the coating. If acceptable a steel coupon may be substituted that has been prepared and coated during the same time as all work on the project. Surface preparation, surface profile, coating application and coating thickness shall be the same as what is found on the project. Adhesion testing would then be conducted on the coating applied to the coupon instead of testing the coating on the actual work piece.

6.3 HOLIDAY DETECTION. When specified, inspect for holidays in accordance with NACE SP0188 method may require patching of the coating, if holidays are found, or if holidays have to be intentionally made to set the test voltage. Holiday testing should always be performed when a coating system is going to be subjected to immersion service or where the coating will be used to hold some type of liquid in storage or containment.

6.4 CURE OF APPLIED COATING

6.4.1 SPI PURE POLYUREA PRODUCTS should have reached 90% of their overall cure within 24 hours of application. Consult with your SPI representative for more information on your specific cure time needed for return to service requirements.

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7. SAFETY, HEALTH AND ENVIRONMENTAL COMPLIANCE

- 7.1 SAFETY AND HEALTH.** Activities described in this standard shall be done in accordance with all safety and health precautions as described in the MSDS and relevant portions of SSPC PA-Guide 3, in addition to any applicable Federal, State, and local rules and requirements.
- 7.2 ENVIRONMENTAL COMPLIANCE.** Activities described in this standard shall be done in compliance with applicable Federal, State and local environmental regulations.

8. DISCLAIMER

While every precaution is taken to ensure that all information furnished in this guide specifications is as accurate, complete and useful as possible. Specialty Products, Inc. cannot assume responsibility nor incur any obligation resulting from the use of any materials, or methods specified therein, or of the specification or standard itself.

9. NOTES

One of the SPI Urethane or Epoxy primers or other approved primers/sealers may be used to improve the adhesion to the mild steel substrate. Primers are not generally needed, but consult with your SPI representative if you think a primer might be needed.

WARNING & DISCLAIMER

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