

COATING SYSTEMS FOR STEEL PIPES AND MISCELLANEOUS METAL FABRICATIONS

1. GENERAL

1.1 References

.1 The following is a list of standards which may be referenced in this Section:

.1 Steel Structures Painting Council (SSPC):

.1 SP 1, Surface Preparation Specification No. 1, Solvent Cleaning.

.2 SP 2, Hand Tool Cleaning.

.3 SP 3, Power Tool Cleaning.

.4 SP 5, White Metal Blast Cleaning.

.5 SP 6, Commercial Blast Cleaning.

.6 SP 7, Brush-Off Blast Cleaning.

.7 SP 8, Pickling.

.8 SP 10, Near-White Blast Cleaning.

.9 SP 11, Power Tool Cleaning to Bare Metal.

.10 SP 12, High Pressure Water Jetting.

.2 National Association of Corrosion Engineers (NACE):

.1 RP0188-99 Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.

1.2 Definitions

.1 Terms used in this Section:

.1 Coverage: Total minimum dry film thickness in mil, or m^2/L .

.2 MDFT: Minimum Dry Film Thickness, mm.

.3 MDFTPC: Minimum Dry Film Thickness per Coat, mm.

.4 Mil: Thousandth of an inch.

.5 PSDS: Paint System Data Sheet.

.6 SP: Surface preparation.

COATING SYSTEMS FOR STEEL PIPES AND MISCELLANEOUS METAL FABRICATIONS

1.3 Submittals

- .1 Action Submittals:
 - .1 Data Sheets:
 - .1 For each paint system used, furnish a painting system data sheet, and paint colours available (where applicable) for each product used in the paint system, except for products applied by equipment manufacturers.
 - .2 Submit required information on a system-by-system basis.
 - .3 Provide copies of paint system submittals to coating applicator.
 - .4 Indiscriminate submittal of Manufacturer's literature only is not acceptable.
 - .2 Detailed chemical and gradation analysis for each proposed abrasive material.
- .2 Informational Submittals:
 - .1 Coating Manufacturer's letter or certificate stating that the proposed product, material, or service complies with that specified. Attach supporting reference data, affidavits, and certifications as appropriate.
 - .2 Applicator's Qualification: List of references substantiating experience.
 - .3 Manufacturer's written instructions for applying each type of coating.
 - .4 Field Testing: Inspection and test reports.
 - .5 .

1.4 Quality Assurance

- .1 Applicator Qualifications: Minimum five (5) years' experience in application of specified products.
- .2 Regulatory Requirements:
 - .1 Meet federal, provincial, and local requirements limiting the emission of volatile organic compounds.
 - .2 Perform surface preparation and painting in accordance with recommendations of the following:
 - .1 Paint Manufacturer's instructions.
 - .2 SSPC-PA Guide No. 3, Guide to Safety in Paint Applications.
 - .3 Federal, provincial, and local agencies having jurisdiction.

COATING SYSTEMS FOR STEEL PIPES AND MISCELLANEOUS METAL FABRICATIONS

1.5 Delivery, Storage, and Handling

- .1 Deliver materials to Application Site in unopened containers labelled with designated name, date of manufacture, colour, and Manufacturer.
- .2 Store paints in a protected area that is heated or cooled as required to maintain temperatures within the range recommended by paint Manufacturer.
- .3 Shipping:
 - .1 Protect pre-coated items from damage. Batten coated items to prevent abrasion.
 - .2 Use non-metallic or padded slings and straps in handling.

1.6 Environmental Requirements

- .1 Do not apply paint in temperatures outside of Manufacturer's recommended maximum or minimum allowable, or in dust, smoke-laden atmosphere, damp or humid weather.
- .2 Do not perform abrasive blast cleaning whenever relative humidity exceeds 85%, or whenever surface temperature is less than 3°C above dew point of ambient air.

2. PRODUCTS

2.1 Manufacturers

- .1 Manufacturer with a minimum of 10 years' experience in manufacture of specified product.

2.2 Materials

- .1 Quality: Manufacturer's highest quality products and suitable for intended use.
- .2 Abrasives: As recommended by paint Manufacturer to produce surface profile recommended for specific paint system.
- .3 Materials Including Primer and Finish Coats: Produced by same paint Manufacturer.
- .4 Thinners, Cleaners, Driers, and Other Additives: As recommended by paint Manufacturer of the particular coating.

2.3 Colours

- .1 Formulate with colorants free of lead and lead compounds.
- .2 Furnish as selected by Contract Administrator.
- .3 Proprietary identification of colours is for identification only; selected manufacturer may supply matches.

2.4 Mixing

- .1 Multiple-Component Coatings:

COATING SYSTEMS FOR STEEL PIPES AND MISCELLANEOUS METAL FABRICATIONS

- .1 Prepare using all the contents of the container for each component as packaged by paint Manufacturer.
 - .2 No partial batches will be permitted.
 - .3 Do not use multiple-component coatings that have been mixed beyond their pot life.
 - .4 Furnish small quantity kits for touch-up painting and for painting other small areas.
 - .5 Mix only components specified and furnished by paint Manufacturer.
 - .6 Do not intermix additional components for reasons of colour or otherwise, even within the same generic type of coating.
- .2 Keep paint material containers sealed when not in use.

3. EXECUTION

3.1 General

- .1 Coatings and linings on steel piping shall be applied in strict accordance with manufacturer's recommendations and the Tender Documents.

3.2 Preparation

- .1 Remove, mask, or otherwise protect hardware, machined surfaces, nameplates on machinery, and other surfaces not intended to be painted.
- .2 Protect all surfaces adjacent to, or downwind of Work area from overspray. Contractor shall be responsible for any damage resulting from overspray.

3.3 Preparation of Surfaces

- .1 Metal Surfaces:
 - .1 Meet requirements of the following SSPC Specifications as referenced in specific coating systems:
 - .1 Solvent Cleaning: SP 1.
 - .2 Hand Tool Cleaning: SP 2.
 - .3 Power Tool Cleaning: SP 3.
 - .4 White Metal Blast Cleaning: SP 5.
 - .5 Commercial Blast Cleaning: SP6
 - .6 Brush-Off Blast Cleaning: SP 7.
 - .2 Wherever the words "solvent cleaning", "hand tool cleaning", "wire brushing", or "blast cleaning", or similar words of equal intent are used in these Specifications or in paint

COATING SYSTEMS FOR STEEL PIPES AND MISCELLANEOUS METAL FABRICATIONS

Manufacturer's specifications, they shall be understood to refer to the applicable SSPC Specifications listed above.

- .3 Hand tool clean areas that cannot be cleaned by power tool cleaning.
- .4 Preblast Cleaning Requirements:
 - .1 Remove oil, grease, welding fluxes, and other surface contaminants prior to blast cleaning.
 - .2 Cleaning Methods: Steam, open flame, hot water, or cold water with appropriate detergent additives followed with clean water rinsing.
 - .3 Clean small isolated areas as above or solvent clean with suitable solvents and clean cloths.
 - .4 Round or chamfer sharp edges and grind smooth burrs, jagged edges, and surface defects.
 - .5 Welds and Adjacent Areas:
 - .1 Prepare such that there is:
 - .1 No undercutting or reverse ridges on weld bead.
 - .2 No weld spatter on or adjacent to weld or other area to be painted.
 - .3 No sharp peaks or ridges along weld bead.
 - .2 Grind embedded pieces of electrode or wire flush with adjacent surface of weld bead.
 - .6 Blast Cleaning Requirements:
 - .1 Type of Equipment and Speed of Travel: Design to obtain specified degree of cleanliness. Minimum surface preparation is as specified herein and takes precedence over coating manufacturer's recommendations.
 - .2 Select type and size of abrasive to produce a surface profile that meets coating Manufacturer's recommendations for particular primer to be used.
 - .3 Use only dry blast cleaning methods.
 - .4 Do not reuse abrasive, except for designed recyclable systems.
 - .5 Meet applicable federal, provincial, and local air pollution and environmental control regulations for blast cleaning and disposition of spent aggregate and debris.
 - .7 Post-Blast Cleaning and Other Cleaning Requirements:

COATING SYSTEMS FOR STEEL PIPES AND MISCELLANEOUS METAL FABRICATIONS

- .1 Clean surfaces of dust and residual particles from cleaning operations by dry (no oil or water vapour) air blast cleaning or other method prior to painting. Vacuum clean enclosed areas and other areas where dust settling is a problem and wipe with a tack cloth.
- .2 Paint surfaces the same day they are blast cleaned. Reblast surfaces that have started to rust before they are coated.

3.4 Application

.1 General:

- .1 Apply coatings in accordance with paint manufacturer's Recommendations. Allow sufficient time between coats to assure thorough drying of previously applied paint.
- .2 Paint units to be bolted or screwed together and to structures prior to assembly or installation.
- .3 For two-package or converted coatings, consult coatings Manufacturer for specific procedures as relates to Manufacturer's products.
- .4 After welding, or threading, prepare holdback areas as required for specified paint system. Apply in accordance with Manufacturer's instructions.

.2 Film Thickness:

- .1 Number of Coats: Minimum required without regard to coating thickness. Additional coats may be required to obtain minimum required paint thickness, depending on method of application, differences in Manufacturers' products, and atmospheric conditions.
- .2 Maximum film build per coat shall not exceed coating Manufacturer's recommendations.
- .3 Film Thickness Measurements:
 - .1 Perform with properly calibrated instruments.
 - .2 Contractor shall provide calibrated DFT gauge for use by Contract Administrator.
 - .3 Recoat and repair as necessary for compliance with the Specifications.
 - .4 All coats are subject to inspection by the Contract Administrator.
- .4 Give particular attention to edges, angles, flanges, and other similar areas, where insufficient film thicknesses are likely to be present, and ensure proper millage in these areas.
- .5 Thickness Testing:
 - .1 After repaired and recoated areas have dried sufficiently, final tests will be conducted by the Contract Administrator.

COATING SYSTEMS FOR STEEL PIPES AND MISCELLANEOUS METAL FABRICATIONS

- .2 Measure coating thickness specified in mils with a magnetic type dry film thickness gauge, provided by the Contractor.
- .3 Check each coat for correct millage. Do not make measurement before a minimum of eight (8) hours after application of coating.
- .3 Damaged Coatings, Pinholes, and Holidays:
 - .1 Feather edges and repair in accordance with recommendations of paint Manufacturer.
 - .2 Hand or power sand visible areas of chipped, peeled, or abraded paint, and feather the edges. Follow with coating in accordance with the specifications.
- .4 Unsatisfactory Application:
 - .1 If item has an improper finish colour, or insufficient film thickness, clean surface and topcoat with specified paint material to obtain specified colour and coverage. Obtain specific surface preparation information from coating manufacturer.
 - .2 Evidence of runs, bridges, shiners, laps, or other imperfections are causes for rejection.
 - .3 Repair defects in coating systems in accordance with written recommendations of coating manufacturer.
 - .4 Leave all staging up until the Contract Administrator has inspected surface or coating. Replace staging removed prior to approval by the Contract Administrator.

3.5 Field Quality Control

- .1 Testing Gauges:
 - .1 Provide a magnetic type dry film thickness gauge to test coating thickness specified.

3.6 Cleanup

- .1 Place cloths and waste that might constitute a fire hazard in closed metal containers or destroy at the end of each day.
- .2 Upon completion of the Work, remove staging, scaffolding, and containers from the Site or destroy in a legal manner.
- .3 Completely remove paint spots, oil, or stains upon adjacent surfaces and floors and leave entire job clean.

3.7 Protective Coatings Systems Schedule

- .1 Protective coatings shall be applied to the following items and as indicated on the drawings:
 - .1 All fuel piping
 - .1 Colour: Yellow – to be confirmed with the Contract Administrator

COATING SYSTEMS FOR STEEL PIPES AND MISCELLANEOUS METAL FABRICATIONS

- .2 Ungalvanized structural steel:
 - .1 Colour: Safety yellow unless otherwise indicated or approved.
- .3 Miscellaneous metal fabrications, interior and exterior,
 - .1 Colour:
 - .1 Interior drip pans: safety yellow
 - .2 Interior ramps: safety yellow
 - .3 Outside pump enclosures: white – painted inside and out.

| Surface Prep. | Application | Paint Material | Product | Min. Cover |
|--|---|----------------------------|---|--|
| Shop Applied | | | | |
| SSPC-SP6 / NACE 3 commercial blast cleaning/, 2-3mil profile. Protect blast profile if specified coating application delayed more than 8 hours, or as per coating manufacturer specifications. | Coat all external surfaces except field welding holdback, prior to assembly. Prepare and apply to holdback after welds. | Low VOC Epoxy. Semi-gloss. | International PC / Devoe Bar Rust 236 or approved equivalent in accordance with B7. and Devoe Devthane 379H gloss polyurethane enamel | 6.0 to 8.0 mils MDFT 2.0 to 3.0 mils MDFT |
| Field Applied to holdback areas, or general touch-up: | | | | |
| Surface prep SSPC-SP1 solvent clean followed by a combination of SSPC-SP2 (hand tool clean) and SSPC-SP3 (power tool clean) as accessibility allows. | | Low VOC Epoxy. Semi-gloss. | Bar Rust as above. Devthane 379 as above. | Bush and roller at 2 – 3 mils DFT. Two coats for a total range of 4 – 6 mils DFT. Devthane 379 applied by brush and roller at 2 mils DFT. |

END OF SECTION