# General

## Scope

### This specification section covers all painting and protective coatings which are not covered under Section 09960 Painting of Steel Tanks and Appurtenances.

#### Section 09960 takes precedence over Section 09900.

## Related Sections

### Comply with Division 1 – General Requirements and all other Specification Divisions, including:

#### Section 01300 – Submittals.

#### Section 01060 – Regulatory Requirements

#### Section 08110 – Steel Doors and Frames

#### Section 09960 Painting of Steel Tanks and Appurtenances

#### Section 15075 – Facilities Piping Identification

#### Section 15200 - Process Piping and Fittings

## References

### Comply with the latest edition of the following statutes codes and standards and all amendments thereto:

#### American Society for Testing & Materials (ASTM)

##### ASTM D523, Standard Test Method for Specular Gloss.

##### ASTM E376 Standard Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Testing Methods

##### ASTM D5162 Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates

#### American National Standards Institute (ANSI):

##### Standard Colours for Colour Identification and Coding.

#### American Water Works Association (AWWA):

##### C203, Coal‑Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot‑Applied.

##### C209, Cold-Applied Tape Coatings for Steel Water Pipe, Special Sections, Connections and Fittings.

##### C210, Liquid‑Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.

##### C213, Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.

##### C214, Tape Coating for Steel Water Pipe.

#### NSF International (NSF)

##### NSF 61: Drinking Water System Components - Health Effects.

##### NSF 372: Drinking Water System Components – Lead Content.

#### NACE International: SP0188, Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.

#### Occupational Safety and Health Act (OSHA).

#### Ministry of the Environment and Climate Change

##### Design Guidelines for Drinking-Water Systems

##### Design Guidelines for Sewage Works

#### The Society for Protective Coatings (SSPC):

##### Steel Structures Painting Manual Vol. 2 – Systems and Specifications published by SSPC – Steel Structures Painting Council.

##### SSPC QP 1, Standard Procedure for Evaluating Qualifications of Industrial/Marine Painting Contractors.

##### SSPC-QP 2, Standard for Evaluating Painting Contractors (Removal of Hazardous Coatings from Industrial/Marine Structures) (Qualification Procedure No. 2).

##### SSPC-SP 1, Surface Preparation Standard No. 1: Solvent Cleaning.

##### SSPC-SP 2, Surface Preparation Specification No. 2: Hand Tool Cleaning

##### SSPC-SP 3, Power Tool Cleaning

##### NACE No. 1/SSPC-SP 5, Joint Surface Preparation Standard White Metal Blast Cleaning.

##### NACE No.3/SSPC-SP 6, Joint Surface Preparation Standard: Commercial Blast Cleaning.

##### NACE No. 4/SSPC-SP 7, Joint Surface Preparation Standard: Brush‑Off Blast Cleaning.

##### NACE No. 2/SSPC-SP 10, Joint Surface Preparation Standard: Near‑White Metal Blast Cleaning.

##### SSPC SP 11, Power Tool Cleaning to Bare Metal.

##### NACE No. 6/SSPC-SP 13, Joint Surface Preparation Standard: Surface Preparation of Concrete.

##### SSPC-PA 1, Shop, Field, and Maintenance Painting of Steel.

##### SSPC PA 2, Procedure for Determining Conformance to Dry Coating Thickness Requirements

##### SSPC-PA Guide 10, Guide to Safety and Health Requirements.

## Measurement and Payment

### All costs associated with the work of this Section shall be included in the price(s) for Item No(s). \_\_\_ in the Bid Form.

## Definitions

### Terms used in this Section:

#### Coverage: Total minimum dry film thickness in microns.

#### FRP: Fiberglass Reinforced Plastic.

#### HCl: Hydrochloric Acid.

#### MDFT: Minimum Dry Film Thickness, microns.

#### MDFTPC: Minimum Dry Film Thickness Per Coat, microns.

#### Micron = 0.0254 mm

#### PSDS: Paint System Data Sheet.

#### PVC: Polyvinyl Chloride.

#### SP: Surface Preparation.

## Submittals

### Submit a complete list of all materials to the Engineer for review and approval before proceeding with the work. List shall state each separate paint system used and identify where each paint system will be used.

#### Identify surface preparation procedures for each substrate and system.

### Submit product data sheets and safety data sheets of all products.

### Submit colour fan deck for initial colour selection.

#### Upon initial colour selection, submit 8 ½” (216mm) x 11” (279mm) draw down card indicating paint type, finish and sheen for each colour and gloss level.

### Samples:

#### Proposed Abrasive Materials: Minimum 2 kg sample for each type.

#### Reference Panel:

##### Surface Preparation:

###### Prior to start of surface preparation, furnish a 100 mm by 100 mm steel panel for each grade of sandblast specified herein, prepared to specified requirements.

###### Provide a panel representative of the steel used; prevent deterioration of surface quality.

###### Upon approval by the Consultant, panel to be reference source for inspection.

##### Paint:

###### Unless otherwise specified, before painting work is started, prepare minimum 200 mm by 300 mm sample with type of paint and application specified on similar substrate to which paint is to be applied.

###### Furnish additional samples as required until colours, finishes, and textures are approved.

###### Approved samples to be the quality standard for final finishes.

### Quality Control Submittals:

#### Applicator’s Qualification: Submit List of references substantiating experience.

#### Factory Applied Coatings: Manufacturer's certification stating factory applied coating system meets or exceed these requirements specified.

#### If the manufacturer of finish coating differs from that of shop primer, provide the finish coating manufacturer’s written confirmation stating that materials are compatible.

#### Manufacturer's written instructions and special details for applying each type of paint.

#### Manufacturer’s written verification that submitted material is suitable for the intended use.

## Quality Assurance

### Qualifications:

#### Applicator: Minimum 5 years’ experience in field of industrial painting.

### Quality Assurance

#### Prior to commencement of painting operations, the Contractor shall meet at Site with the material supplier’s representative and with the Consultant to review these Specifications, painting work to be done and following related items:

##### Equipment use and servicing

##### Material storage and application techniques

##### Surface preparation and ambient temperature

##### Inspection requirements

##### Inspection reports

##### Hold points or check points

##### Safety requirements during application

##### Mock-ups or samples of coatings in highly corrosive environment

#### Submit report of alternative recommendations for adverse conditions encountered.

#### Arrange with the paint manufacturer to visit the Site at intervals during the surface preparation and painting operations to ensure that the proper surface preparation has been completed, the specified paint products are being used, the proper number of coats are being applied and the agreed finishing procedures are being used, and that the paint manufacturer regularly submits written reports.

### Regulatory Requirements:

#### Meet federal, provincial and local requirements limiting the emission of volatile organic compounds.

#### Perform surface preparation and painting in accordance with the following requirements:

##### Paint manufacturer's instructions.

##### SSPC-PA Guide 10, Guide to Safety and Health Requirements

##### Federal, provincial, and municipal agencies having jurisdiction*.*

### Mockup:

#### Before proceeding with the work of this Section, finish one complete space or item of each colour scheme required showing selected colours, finish texture, materials, quality of work, and special details.

#### After Consultant approval, sample spaces or items shall serve as a standard for similar work throughout the Work.

## Delivery, Storage, and Handling

### Shipping:

#### Where pre-coated items are to be shipped to the Site, protect coating from damage. Protect coated items to prevent abrasion.

#### Shop painted surfaces shall be protected during shipment and handling by suitable provisions including padding, blocking, and use of canvas or nylon slings.

### Storage:

#### Store products in a protected area that is heated or cooled to maintain temperatures within the range recommended by paint manufacturer.

#### Primed surfaces shall not be exposed to weather for more than two months before being top-coated, or less time if recommended by the coating manufacturer.

## Project Conditions

### Environmental Requirements:

#### Do not apply paint in temperatures or moisture conditions outside of manufacturer's recommended maximum or minimum allowable.

#### Do not perform final abrasive blast cleaning whenever relative humidity exceeds 85 percent, or whenever surface temperature is less than minus 15 degrees Celsius above dew point of ambient air.

# PRODUCTS

## Abrasive Materials

### Select abrasive type and size to produce surface profile that meets the coating manufacturer’s recommendations for specific primer and coating system to be applied.

## Paint Materials

### General:

#### Manufacturer's highest quality products suitable for intended service.

#### Compatibility: Only compatible materials from a single manufacturer shall be used in the Work. Particular attention shall be directed to compatibility of primers and finish coats.

#### Thinners, Cleaners, Driers, and Other Additives: As recommended by the coating manufacturer.

### Products:

| Product | Definition |
| --- | --- |
| Acrylic Latex | Single‑component, finish as required |
| Acrylic Latex (Flat) | Flat latex |
| Acrylic Sealer | Clear acrylic |
| Alkyd (Semigloss) | Semigloss alkyd |
| Alkyd Enamel | Optimum quality, gloss or semigloss finish as required, medium long oil |
| Block Filler | Primer‑sealer designed for rough masonry surfaces, 100 percent acrylic emulsion |
| Epoxy FillerSurfacer | 100 percent solids epoxy trowel grade filler and surfacer, non-shrinking, suitable for application to concrete and masonry. Approved for potable water contact and conforming to NSF 61 and NSF 372, where required |
| Epoxy Primer – Ferrous Metal | Anticorrosive, converted epoxy primer containing rust‑inhibitive pigments |
| Epoxy Primer – Other | Epoxy primer, high‑build, as recommended by coating manufacturer for specific galvanized metal, copper, or nonferrous metal alloy to be coated |
| Fusion Bonded Coating | 100 percent solids, thermosetting, fusion bonded, dry powder epoxy or polyurethane resin, suitable for the intended service |
| Fusion Bonded, TFE Lube or Grease Lube | Tetrafluoroethylene, liquid coating, or open gear grease as supplied by McMaster-Carr Supply Corporation. |
| High Build Epoxy | Polyamide or polyamidoamine epoxy, minimum 69 percent volume solids, capability of 100 to 200 microns DFT per coat |
| Inorganic Zinc Primer | Solvent or water based, having 85 percent metallic zinc content in the dry film; follow manufacturer's recommendation for top-coating |
| NSF Epoxy | Polyamide epoxy, approved for potable water contact and conforming to NSF 61 and NSF 372 |
| Polyamide Epoxy, High Solids | 80 percent volume solids, minimum, suitable for immersion service |
| Polyurethane Enamel | Two‑component, aliphatic or acrylic based polyurethane; high gloss finish |
| Rust‑Inhibitive Primer | Single‑package steel primers with anticorrosive pigment loading |
| Sanding Sealer | Co‑polymer oil, clear, dull luster |
| Water Base Epoxy | Two‑component, polyamide epoxy emulsion, finish as required |

## Mixing

### Multiple Component Coatings:

#### Prepare using each component as packaged by the paint manufacturer.

#### No partial batches will be permitted.

#### Do not use multiple component coatings that have been mixed beyond their pot life.

#### Furnish small quantity kits for touchup painting and for painting other small areas.

#### Mix only components specified and furnished by the paint manufacturer.

#### Do not intermix additional components for reasons of colour or otherwise, even within the same generic type of coating.

### Colours: Formulate paints with colorants free of lead, lead compounds, or other materials that might be affected by presence of hydrogen sulfide or other gas likely to be present at site.

## Shop Finishes

### Shop Blast Cleaning: Refer to subsection 2.4.3 - Shop Coating Requirements below.

### Surface Preparation: Provide the Consultant with a minimum of 7 days advance notice to start of shop surface preparation work and coating application work.

### Shop Coating Requirements:

#### When required by the applicable equipment Specification Sections, such equipment shall be primed and finish coated in shop by manufacturer and touched up in field with identical material after installation.

#### Where manufacturer’s standard coating is not suitable for intended service condition, Consultant may approve use of a tie coat to be used between manufacturer’s standard coating and specified field finish. In such cases, tie coat shall be surface tolerant epoxy as recommended by the manufacturer of the specified field finish coat. Coordinate details of the equipment manufacturer’s standard coating with field coating manufacturer.

# EXECUTION

## General

### Provide the Consultant with a minimum of 7 days advance notice to start of field surface preparation Work and coating application Work.

### Perform the Work of this section only in presence of the Consultant, unless the Consultant grants prior approval to perform the Work in Consultant's absence.

### Schedule inspection with the Consultant in advance for cleaned surfaces and all coats prior to application of the succeeding coat.

## Examination

### Examine surfaces which are to be finished.

### Report surfaces which are defective, or which cannot be prepared by usual sanding and cleaning. Report unsatisfactory Site and environmental conditions immediately to the Consultant.

### Commence the work of this Section after corrective work has been completed.

### Factory Finished Items:

#### Schedule inspection with the Consultant before repairing damaged factory finished items delivered to Site.

#### Repair abraded or otherwise damaged areas on factory finished items as recommended by the coating manufacturer. Carefully blend repaired areas into original finish. If required to match colours, provide full finish coat in field.

### Surface Preparation Verification: Inspect and provide substrate surfaces prepared in accordance with these Specifications and printed directions and recommendations of the paint manufacturer whose product is to be applied. The more stringent requirements shall apply.

## Protection of Items not to be Painted

### Remove, mask, or otherwise protect hardware, lighting fixtures, switchplates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not specified elsewhere to be painted.

### Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces.

### Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process.

### Mask openings in motors to prevent paint and other materials from entering.

### Protect all surfaces adjacent to, or downwind of Work area from overspray.

## Preparation

### Take all necessary precautions to prevent fire.

### Exercise special precautions for safety of workmen applying coating in enclosed areas by meeting requirements outlined in Occupational Health and Safety Act and O. Reg. 213, Construction Projects.

### Comply with instructions on the paint manufacturer’s Safety Data Sheets.

### Commence the Work only after the Contractor’s acceptance of Site conditions and substrate conditions that will allow the proper application of paints and/or protective coatings.

## Surface Preparation

### Related Work: Surface preparation and prime coat of metal surfaces are specified to form part of the permanent protective coating in Division 5 – Metals, Division 8 – Doors and Windows, Division 10 – Specialties, Division 11 – Equipment, Division 15 – Mechanical, Division 16 – Electrical, including responsibility for surface preparation, shop painting, and field touch-ups after erection. Be responsible for field painting of steel items which will remain exposed, after completion of erection and touch-up of shop primer, including items shop finished with a protective coating, unless specified otherwise.

### Field Abrasive Blasting:

#### Perform blasting for items and equipment where specified and as required to restore damaged surfaces previously shop or field blasted and primed or coated.

#### Refer to coating systems for degree of abrasive blasting required.

#### Where the specified degree of surface preparation differs from the manufacturer’s recommendations, the more stringent shall apply.

### Metal Surface Preparation:

#### Where indicated, meet the requirements of the SSPC Specifications summarized below:

##### SSPC-SP 1, Solvent Cleaning: Removal of all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants by cleaning with solvent.

##### SSPC-SP 2, Hand Tool Cleaning: Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, using non-power hand tools.

##### SSPC-SP 3, Power Tool Cleaning: Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, using power assisted hand tools.

##### NACE No. 1/SSPC-SP 5, White metal Blast Cleaning: Removal of all visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter by blast cleaning.

##### NACE No.3/SSPC-SP 6, Commercial Blast Cleaning: Removal of all visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter, except for random staining limited to no more than 33 percent of each unit area of surface which may consist of light shadows, slight streaks, or minor discolourations caused by stains of rust, stains of mill scale, or stains of previously applied coatings.

##### NACE No. 4/SSPC-SP 7, Brush Off Blast Cleaning: Removal of all visible rust, oil, grease, soil, dust, loose mill scale, loose rust, and loose coatings. Tightly adherent mill scale, rust, and coating may remain on surface.

##### NACE No. 2/SSPC-SP 10, Near White Blast Cleaning: Removal of all visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter, except for random staining limited to no more than 5 percent of each unit area of surface which may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coatings.

##### SSPC-SP 11, Power Tool Cleaning to Bare Metal: Removal of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxide, corrosion products, and other foreign matter using power assisted hand tools capable of producing suitable surface profile. Slight residues of rust and paint may be left in lower portion of pits if original surface is pitted.

#### The words “solvent cleaning”, “hand tool cleaning”, “wire brushing”, and “blast cleaning” or similar words of equal intent in these Specifications or in paint manufacturer's specification refer to the applicable SSPC Specification.

#### Where OHSA and regulations preclude standard abrasive blast cleaning, wet or vacuum blasting methods may be required. Coating manufacturers' recommendations for wet blast additives and first coat application shall apply.

#### Ductile Iron Pipe Supplied with Asphaltic Varnish Finish: Remove asphaltic varnish finish prior to performing specified surface preparation.

#### Hand tool clean areas that cannot be cleaned by power tool cleaning.

#### Round or chamfer sharp edges and grind smooth burrs, jagged edges, and surface defects.

#### Welds and Adjacent Areas:

##### Prepare such that there is:

###### No undercutting or reverse ridges on weld bead.

###### No weld spatter on or adjacent to weld or any area to be painted.

###### No sharp peaks or ridges along weld bead.

##### Grind embedded pieces of electrode or wire flush with adjacent surface of weld bead.

#### Pre-blast Cleaning Requirements:

##### Remove oil, grease, welding fluxes, and other surface contaminants prior to blast cleaning.

##### Cleaning Methods: Steam, open flame, hot water, or cold water with appropriate detergent additives followed with clean water rinsing.

##### Clean small isolated areas as above or solvent clean with suitable solvent and clean cloth.

#### Blast Cleaning Requirements:

##### 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 the coating manufacturer's recommendations.

##### Select type and size of abrasive to produce surface profile that meets the coating manufacturer's recommendations for particular primer to be used.

##### Use only dry blast cleaning methods.

##### Do not reuse abrasive, except for designed recyclable systems.

##### Meet applicable federal, state, and local air pollution and environmental control regulations for blast cleaning, confined space entry (if required), and disposition of spent aggregate and debris.

#### Post Blast Cleaning and Other Cleaning Requirements:

##### Clean surfaces of dust and residual particles from cleaning operations by dry (no oil or water vapor) 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.

##### Paint surfaces the same day they are blasted. Re-blast surfaces that have started to rust before they are painted.

### Galvanized Metal, Copper, and Non-ferrous Metal Alloy Surface Preparation:

#### Remove soil, cement spatter, and other surface dirt with appropriate hand or power tools.

#### Remove oil and grease by wiping or scrubbing surface with suitable solvent, rag, and brush. Use clean solvent and clean rag for final wiping to avoid contaminating surface.

#### Obtain and follow the coating manufacturer’s recommendations for additional preparation that may be required.

### Concrete Surface Preparation:

#### Do not begin until 30 Days after concrete has been placed.

#### Remove grease, oil, dirt, salts or other chemicals, loose materials, or other foreign matter by solvent, detergent, or other suitable cleaning methods.

#### Brush off blast clean to remove loose concrete and laitance, and provide a tooth for binding. Upon approval by the Consultant, surface may be cleaned by acid etching method. Approval is subject to producing desired profile equivalent to No. 80 grit flint sandpaper. Acid etching of vertical or overhead surfaces shall not be allowed.

#### Secure the coating manufacturer's recommendations for additional preparation, if required, for excessive bug holes exposed after blasting.

#### Unless otherwise required for proper adhesion, ensure surfaces are dry prior to painting.

### Plastic and FRP Surface Preparation:

#### Hand sand plastic surfaces to be coated with medium grit sandpaper to provide tooth for coating system.

#### Large areas may be power sanded or brush off blasted, provided sufficient controls are employed so surface is roughened without removing excess material.

### Masonry Surface Preparation:

#### Complete and cure masonry construction for 14 Days or more before starting surface preparation work.

#### Remove oil, grease, dirt, salts or other chemicals, loose materials, or other foreign matter by solvent, detergent washing, or other suitable cleaning methods.

#### Clean masonry surfaces of mortar and grout spillage and other surface deposits using one of the following:

##### Non-metallic fiber brushes and commercial muriatic acid followed by rinsing with clean water.

##### Brush off blasting.

##### Water blasting.

#### Do not damage masonry mortar joints or adjacent surfaces.

#### Leave surfaces clean and, unless otherwise required for proper adhesion, dry prior to painting.

#### Masonry Surfaces to be painted are to have uniform texture and be free of surface imperfections that would impair the intended finished appearance.

#### Masonry surfaces to be clear coated are to be free of discolorations and uniform in texture after cleaning.

## Surface Cleaning

### Brush off Blast Cleaning:

#### Equipment, procedure, and degree of cleaning shall meet requirements of NACE No. 4/SSPC-SP 7, Brush off Blast Cleaning.

#### Abrasive: Either wet or dry blasting sand, grit, or nutshell.

#### Select various surface preparation parameters, such as size and hardness of abrasive, nozzle size, air pressure, and nozzle distance from surface such that surface is cleaned without pitting, chipping, or other damage.

#### Verify parameter selection by blast cleaning a trial area that will not be exposed to view.

#### Consultant will approve acceptable trial blast cleaned area and will use area as a representative sample of surface preparation.

#### Repair or replace surface damaged by blast cleaning.

### Acid Etching:

#### After pre-cleaning, spread the following solution by brush or plastic sprinkling can: 1 part commercial muriatic acid reduced by 2 parts water by volume. Adding acid to water in these proportions gives an approximate 10 percent solution of HCl.

#### Application:

##### Application Rate: Approximately 7.6 L per 9.3 m2.

##### Work acid solution into surface by hard bristled brushes or brooms until complete wetting and coverage is obtained.

##### Acid will react vigorously for a few minutes, during which time brushing shall be continued.

##### After bubbling subsides (10 minutes), hose down remaining slurry with high pressure clean water.

##### Rinse immediately to avoid formation on the surface of salts that are difficult to remove.

##### Thoroughly rinse to remove any residual acid surface condition that may impair adhesion.

#### Ensure surface is completely dry before application of coating.

#### Apply acid etching to obtain a “grit sandpaper” surface profile. If not, repeat treatment.

### Solvent Cleaning:

#### Solvent cleaning consists of the removal of foreign matter such as oil, grease, soil, drawing and cutting compounds, and any other surface contaminants by using solvents, emulsions, cleaning compounds, steam cleaning, or similar materials and methods which involve a solvent or cleaning action.

#### Solvent cleaning shall meet the requirements of SSPC-SP 1.

## Application

### General:

#### The intention of these Specifications is for new, interior and exterior masonry, concrete, and metal surfaces to be painted, whether specifically mentioned or not, except as specified otherwise. Do not paint exterior concrete surfaces, unless specifically indicated.

#### Apply coatings in accordance with these specifications and the paint manufacturers' printed recommendations and special details. The more stringent requirements shall apply. Allow sufficient time between coats to assure thorough drying of previously applied paint.

#### Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.

#### Coat units or surfaces to be bolted together or joined closely to structures or to one another prior to assembly or installation.

#### On pipelines, terminate coatings along pipe runs to 1 inch inside pipe penetrations.

#### Keep paint materials sealed when not in use.

#### Where more than one coat is applied within a given system, alternate colours to provide a visual reference showing required number of coats have been applied.

### Galvanized Metal, Copper, and Non-ferrous Metal Alloys:

#### Concealed galvanized, copper, and non-ferrous metal alloy surfaces (behind building panels or walls) do not require painting, unless specifically indicated herein.

#### Prepare surface and apply primer in accordance with System No. 10 specification.

#### Apply intermediate and finish coats of the coating system appropriate for the exposure.

### Porous Surfaces, Such As Concrete and Masonry:

#### Filler/Surfacer: Use the coating manufacturer's recommended product to fill air holes, bug holes, and other surface voids or defects.

### Film Thickness and Coverage:

#### Number of Coats:

##### Minimum required without regard to coating thickness .

##### Additional coats may be required to obtain the minimum required paint thickness, depending on method of application, differences in manufacturers' products, and atmospheric conditions.

#### Application Thickness:

##### Do not exceed the coating manufacturer’s recommendations.

##### Measure using a wet film thickness gauge to ensure proper coating thickness during application.

#### Film Thickness Measurements and Electrical Inspection of Coated Surfaces:

##### Perform with properly calibrated instruments.

##### Recoat and repair as necessary for compliance with this Specification Section.

##### All coats are subject to inspection by the Consultant and coating manufacturer's representative.

#### Visually inspect concrete, masonry, nonferrous metal, plastic, and wood surfaces to ensure proper and complete coverage has been attained.

#### 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.

#### Apply additional coats as required to achieve complete hiding of underlying coats. Hiding shall be so complete that additional coats would not increase the hiding.

## Protective Coatings Systems

### System No. 1 Submerged Metal – Potable Water:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| NACE No. 1/SSPC-SP 5, White Metal Blast Cleaning | NSF 60/61/372 (as applicable) Epoxy | 3 coats, 75 microns DFT per coat |

### System No. 2 Submerged Metal – Domestic Sewage:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| NACE No.2/SSPC-SP 5, White Metal Blast Cleaning | Prime in accordance with manufacturer’s recommendations | |
|  | Coal-Tar Epoxy -OR- High Build Epoxy | 2 coats, 400 microns DFT  2 coats, 400 microns DFT |

### System No. 3 Exposed Metal – Highly Corrosive:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| NACE No. 2/SSPC-SP 10, Near-White Blast Cleaning | Epoxy Primer – Ferrous Metal | 1 coat, 65 microns DFT |
| Polyamide High Build Epoxy | 1 coat, 100 microns DFT |
| [Polyurethane Enamel | 1 coat, 75 microns DFT] |

### System No. 4 Exposed Metal – Mildly Corrosive:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| NACE No.2/SSPC-SP 10, Near‑White Blast Cleaning | Epoxy Primer – Ferrous Metal | 1 coat, 65 microns DFT |
|  | Polyurethane Enamel | 1 coat, 75 microns DFT |

### System No. 5 Exposed Metal – Atmospheric:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| NACE No. 3/SSPC-SP 6, Commercial Blast Cleaning | Rust‑Inhibitive Primer | 1 coat, 50 microns DFT |
|  | Alkyd Enamel | 2 coats, 100 microns DFT |

### System No. 6 Buried Metal – General:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| NACE No. 2/SSPC-SP 10, Near-White Blast Cleaning | Standard Hot Coal‑Tar Enamel -OR- Coal-Tar Epoxy | AWWA C203-08   2 coats, 400 microns DFT |
|  | For Highly Abrasive Soil, Brackish Water:  Tape Coat System | AWWA C214-14 with Double Outer Wrap |

#### For steel pipe and fittings, follow AWWA C209 and C214 with double outer wrap.

### System No. 8 Galvanized Metal, Copper, and Non-ferrous Metal Alloy Conditioning:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| In accordance with paragraph Galvanized Metal, Copper, and Nonferrous Metal Alloy Surface Preparation | Epoxy Primer – Other | As recommended by the coating manufacturer  Remaining coats as required for exposure |







### System No. 11 High Heat-Resistant –370 Degrees C Maximum:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| NACE No. 3/SSPC-SP 6, Commercial Blast Cleaning | Inorganic Zinc Primer | 1 coat, 65 microns DFT |
|  | Silicone | 1 coat, 50 microns DFT |

### System No. 12 Heat‑Resistant – 220 Degrees C Maximum:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| NACE No.6/SSPC-SP 6, Commercial Blast Cleaning | Inorganic Zinc Primer | 1 coat, 65 microns DFT |
|  | Silicone Acrylic (limited colours) | 2 coats, 50 microns DFT |















### System No. 19 Chemical‑Resistant Wall, Heavy‑Duty – Concrete and Masonry:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| In Accordance With Paragraph Concrete andMasonry Surface Preparation, This Section | Epoxy Filler/Surfacer | 1 coat, As Req'd. to Fill Voids |
|  | High Build Epoxy | 1 coat, 15 m2 per 3.8 L |
|  | High Build Epoxy, Gloss | 1 coat, 15 m2 per 3.8 L |

### System No. 20 Chemical‑Resistant Wall – Concrete and Masonry:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| In accordance with paragraph Concrete andMasonrySurface Preparation, this Section | Epoxy Filler/Surfacer | 1 coat, As Req'd. to Fill Voids |
|  | High Build Epoxy | 1 coat, 15 m2 per 3.8 L |

### System No. 21 Exposed FRP, PVC:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| In accordance with paragraph Plastic and FRP Surface Preparation, this Section | Acrylic Latex | 2 coats, 29.7 m2 per 3.8 L per coat |

### System No. 22 Aluminum and Dissimilar Metal Insulation:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| Solvent Clean (SP1) | Prime in accordance with manufacturer’s recommendations | |
|  | Bituminous Paint | 1 coat, 250 microns DFT |

### System No. 23 Fusion Bonded Coating:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| NACE No.2/SSPC-SP 10, Near‑White Blast Cleaning | Fusion Bonded Coating 100 percent Solids Epoxy or Polyurethane | 1 or 2 coats, 175 microns DFT |

#### For steel pipe and fittings, meet all requirements of AWWA C213.

### System No. 24 Fusion Bonded, Steel Dowel Coating:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| NACE No.2/SSPC-SP 10, Near‑White Blast Cleaning | Fusion Bonded Coating 100 percent Solids Epoxy | 1 or 2 coats, 175 microns DFT |
| TFE Lube, Shop Applied; Grease Lube Alternative, Field Applied Just Prior to Installation | TFE Lube or Grease Lube | 1 coat, as required |

## Architectural Paint Systems



















### System No. 106 Galvanized Metal:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| In accordance with paragraph Galvanized Metal, Copper, and Nonferrous Metal Alloy Surface Preparation, this Section | Manufacturer's Recommended Primer | 1 coat, as recommended by Manufacturer |
|  | Alkyd Enamel (Semi-gloss) | 2 coats,100 microns DFT |

### System No. 107 Metal Trim and Structural Steel:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| NACE No. 3/SSPC-SP 6, Commercial Blast Cleaning | Rust‑Inhibitive Primer | 1 coat, 50 microns DFT |
|  | Alkyd Enamel (Semigloss) | 2 coats, 100 microns DFT |

### System No. 108 Masonry, Flat:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| In accordance with paragraph Masonry Surface Preparation, this Section | Block Filler | 1 coat, 7 m2 per 3.8 L |
|  | Acrylic Latex (Flat) | 2 coats, 22 m2 per 3.8 L per coat |

### System No. 109 Masonry, Semigloss:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| In accordance with paragraph Masonry Surface Preparation, this Section | Block Filler | 1 coat, 7 m2 per 3.8 L |
|  | Acrylic Latex (Semi-gloss) | 2 coats, 22 m2 per 3.8 L per coat |







### System No. 112 Concrete, Flat:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| In accordance with paragraph Concrete Surface Preparation, this Section | Acrylic Latex (Flat) | 2 coats, 22 m2 per 3.8 L per coat |

### System No. 113 Concrete, Semigloss:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| In accordance with paragraph Concrete Surface Preparation, this Section | Acrylic Latex (Semi-gloss) | 2 coats, 22 m2 per 3.8 L per coat |











### System No. 117 Concrete Masonry, Gloss Epoxy:

| Surface Prep. | Paint Material | Min. Coats, Cover |
| --- | --- | --- |
| In accordance with paragraph Masonry Surface Preparation, this Section | Block Filler | 1 coat, 7 m2 per 3.8 L |
|  | Water Base Epoxy (Gloss) | 2 coats, 28 m2 per 3.8 L per coat |



## Colours

### Colour Schedule – General

#### Colour numbers shown are from current brochures of manufacturers of materials.

#### Unless otherwise indicated in the Contract Documents, colours shall be selected by the Owner from the manufacturers full range of colours:

##### Exposed steel lintels, exposed concrete and concrete block surfaces at head of openings: Match colour of wall.

##### Exposed unfinished mouldings and miscellaneous metal trim: Match colour of wall/ceiling.

##### Metal rain water leaders, drains, vents, metal pipe, duct support and similar items. Match colour of wall/ceiling.

##### Galvanized electrical conduits including hanger and brackets where suspended in finished areas except where seamless coating occurs and outdoors: Match colour of wall/ceiling.

##### Aluminum electrical cable trays including hangers and brackets in finished areas and outdoors: Match colour of wall/ceiling and/or to acceptance of the Consultant.

##### Exposed surfaces of fans and dampers: Match colour of wall/ceiling.

##### Fans and dampers mounted within prefinished aluminum panel: Match colour of panel.

##### Items subjected to elevated temperatures in service (valves, expansion joints, exposed parts of insulated piping, exposed parts of insulated equipment and similar items): Standard colour in appropriate protective coating system.

##### Items totally or partially submerged: Standard colour in appropriate protective coating system.

##### Items buried: Standard colour in appropriate protective coating system.

### Proprietary identification of colours is for identification only. Selected manufacturer may supply matches.

### Equipment Colours:

#### Equipment includes the machinery or vessel itself plus the structural supports and fasteners and attached electrical conduits.

#### Paint equipment and piping one colour as selected.

#### Paint non-submerged portions of equipment the same colour as the piping it serves, except as itemized below:

##### Dangerous Parts of Equipment and Machinery: per OSHA guidelines.

##### Fire Protection Equipment and Apparatus: per OSHA guidelines.

##### Radiation Hazards: per OSHA guidelines.

##### Physical hazards in normal operating area and energy lockout devices, including, but not limited to, electrical disconnects for equipment and equipment isolation valves in air and liquid lines under pressure: per OSHA guidelines.

##### Aluminum cable traps: Unfinished.

##### Electrical panels: Prefinished - ANSI/ASA #61 Grey.

##### Galvanized steel conduit: Prefinished - ANSI/ASA #61 Grey.

### Pipe Identification Painting:

#### Colour code non-submerged metal piping, except electrical conduit. Paint fittings and valves the same colour as pipe, except equipment isolation valves.

##### Piping Colour Coding: In accordance with Piping Schedule.

#### Comply with Pipe Identification System of the Ministry of the Environment and Climate Change Section 15075 – Facilities Piping Identification.

#### Ferrous, bituminous coated and fabric jacketed surfaces: Paint full surface of piping.

#### Stainless steel, PVC, and aluminum surfaces: Do not paint. Colour for ferrous appurtenances, such as flanges, valves, couplings, and similar items: Match colour of adjacent surfaces.

#### Pipe Supports: Painted light gray, as approved by the Region and/or Consultant.

#### Fiberglass reinforced plastic (FRP) pipe and polyvinyl chloride (PVC) pipe located inside of buildings and enclosed structures will not require painting, except as noted or scheduled.

#### Colour Schedule – Ducting (HVAC)

##### Galvanized steel and fabric-jacketed surfaces exposed to view: Paint full surface of Duct.

##### Galvanized steel and fabric-jacketed surfaces not exposed to view: Do not paint.

#### Colour Schedule – Piping (Process and Service)

#### Ferrous, bituminous coated, galvanized and fabric jacketed substrates, FRP ducts: Paint full surface of pipe, duct and accessories in colour matching background wall and/or ceiling. Exceptions are:

##### gas piping – paint full surface of pipe classification colour “Yellow”

##### fire protection piping – paint full surface of pipe classification colour “Red”

##### service air piping – paint full surface of pipe “Grey”

##### diesel fuel fill lines – paint full surface of pipe classification colour “Orange”

#### Stainless steel, PVC and aluminum surfaces: Do not paint full surface. Paint only ferrous accessories such as flanges, valves, couplings and similar items to match classification colour of labels. Exceptions are:

##### Gas piping – paint full surface of pipe classification colour “Yellow”

### Colour Schedule – Ducting (HVAC)

#### Galvanized steel and fabric-jacketed surfaces exposed to view: Paint full surface of duct in colour matching background wall and/or ceiling.

#### Galvanized steel and fabric-jacketed surfaces not exposed to view: Do not paint.

## Field Quality Control

### Testing Equipment:

#### Provide magnetic type dry film thickness gauge to test coating thickness specified in mils. Must comply with ASTM E376 – 11. Provide low voltage wet sponge electrical holiday detector to test completed coating systems, 500 microns or less, except zinc primer, high build elastomeric coatings, and galvanizing, for pinholes, holidays, and discontinuities. Must comply with ASTM D5162 - 15.

#### Provide high voltage spark tester to test completed coating systems in excess of 500 microns. Unit to be as recommended by the coating manufacturer.

### Testing:

#### Thickness and Continuity Testing:

##### Measure coating thickness specified in mils with a magnetic type, dry film thickness gauge, in accordance with SSPC-PA 2. Check each coat for correct millage. Do not make measurement before a minimum of 8 hours after application of coating.

##### After repaired and recoated areas have dried sufficiently, retest each repaired area. Final tests may also be conducted at the sole discretion of the Consultant at the expense of the Contractor.

### Inspection: Leave staging and lighting in place until the Consultant has inspected surface or coating. Replace staging removed prior to approval by the Consultant. Provide additional staging and lighting as requested by the Consultant.

### Unsatisfactory Application:

#### 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 the coating manufacturer.

#### Evidence of runs, bridges, shiners, laps, or other imperfections is cause for rejection.

#### Repair defects in accordance with written recommendations of the coating manufacturer.

### Damaged Coatings, Pinholes, and Holidays:

#### Feather edges and repair in accordance with recommendations of the paint manufacturer.

#### Hand or power sand visible areas of chipped, peeled, or abraded paint, and feather the edges. Follow with primer and finish coat. Depending on extent of repair and appearance, a finish sanding and topcoat may be required.

#### Apply finish coats, including touchup and damage repair coats in a manner that will present a uniform texture and colour matched appearance.

## Manufacturer’s Services

### Manufacturer's representative shall be present at the Site as follows:

#### On first day of application of any coating system.

#### A minimum of two additional Site inspection visits, each for a minimum of 4 hours, in order to provide the Manufacturer's Certificate of Proper Installation.

#### As required to resolve field problems attributable to or associated with manufacturer’s product.

#### To verify full cure of coating prior to coated surfaces being placed into immersion service.

## Cleanup

### Place cloths and waste that might constitute a fire hazard in closed metal containers or destroy at end of each Working Day.

### Upon completion of the Work, remove staging, scaffolding, and containers from Site or destroy in a legal manner.

### Remove paint spots, oil, or stains upon adjacent surfaces and floors and leave entire job clean.

## Application Schedule

### As specified herein.

### Surfaces Not Requiring Painting: Unless otherwise stated or shown below or in other Specification Sections, the following areas or items will not require painting or coating:

#### Reinforcing steel.

#### Non-ferrous and corrosion-resistant ferrous alloys such as copper, bronze, Monel, aluminum, chromium plate, atmospherically exposed weathering steel, and stainless steel, except where:

##### Required for electrical insulation between dissimilar metals.

##### Aluminum and stainless steel are embedded in concrete or masonry, or aluminum is in contact with concrete or masonry.

##### Colour coding of equipment and piping is required.

#### Nonmetallic materials such as glass, wood, and porcelain, except as required for architectural painting or colour coding.

#### Prefinished electrical and architectural items such as motor control centers, switchboards, switchgear, panelboards, transformers, disconnect switches (if prefinished in OSHA yellow), acoustical tile, cabinets, elevators, building louvers, and wall panels; colour coding of equipment is required.

#### Non-submerged electrical conduits attached to unpainted concrete surfaces.

#### Cathodic protection anodes.

#### Items specified to be galvanized after fabrication, unless specified elsewhere or subject to immersion.

#### Insulated piping and insulated piping with jacket will require prime coat only, except as required for architectural painting or colour coding.

#### Fiberglass reinforced plastic (FRP) surfaces with an integral ultra violet resistant coloured gel coat do not require painting, provided the colour is as selected.

### Unless otherwise shown or specified, paint surfaces in accordance with the following application schedule. In the event of discrepancies or omissions in the following, request clarification from the Consultant before starting the work in question.

### System No. 1 Submerged Metal – Potable Water: Use on the following items or areas:

#### Metal surfaces below a plane 300 mm above the maximum liquid surface; metal surfaces above the maximum liquid surface that are a part of the immersed equipment; surfaces of metallic items, such as wall pipes, pipes, pipe sleeves, access manholes, gate guides and thimbles, and structural steel that are embedded in concrete; and the following specific surfaces:

##### Interior surfaces of steel piping noted in the Piping Schedule.

### System No. 2 Submerged Metal – Domestic Sewage: Use on the following items or areas:

#### Metal surfaces below a plane 300 mm above maximum liquid surface, metal surfaces above maximum liquid surface that are a part of immersed equipment, concrete embedded surfaces of metallic items, such as wall pipes, pipes, pipe sleeves, access manholes, gate guides and thimbles, and structural steel, and the following specific surfaces:

##### Interior surfaces of steel piping noted in the Piping Schedule.

### System No. 3 Exposed Metal – Highly Corrosive: Use on the following items or areas:

#### Exposed metal surfaces, located inside or outside of structures and exposed to weather.

### System No. 4 Exposed Metal – Mildly Corrosive: Use on the following items or areas:

#### Exposed metal surfaces, located inside or outside of structures and exposed to weather or in a highly humid atmosphere, such as pipe galleries and similar areas.

### System No. 5 Exposed Metal – Atmospheric: Use on the following items or areas:

#### Exposed metal surfaces, located inside or outside of structures or exposed to weather, including metal doors and frames, vents, exterior metal ductwork, flashing, sheet metalwork and miscellaneous architectural metal trim.

#### Apply surface preparation and primer to surfaces prior to installation. Finish coats need only be applied to surfaces exposed after the completion of construction.

### System No. 6 Buried Metal – General: Use on the following items or areas:

#### Buried, below grade portions of steel items, except buried stainless steel or ductile iron.

### System No. 8 Galvanized Metal, Copper, and Non-ferrous Metal Alloy Conditioning: Use on the following items or areas:

#### Galvanized surfaces requiring painting.

#### After application of System No. 8, apply finish coats as required for exposure.

### System No. 11 High Heat-Resistant – 371 Degrees C Maximum: Use on the following items or areas:

#### Metals subject to temperatures up to 371 Degrees C.

### System No. 12 Heat-Resistant – 218 Degrees C Maximum: Use on the following items or areas:

#### Metals subject to temperatures up to 218 Degrees C.

### System No. 19 Chemical Resistant Wall, Heavy Duty, Concrete and Masonry: Use on the following items or areas:

#### Concrete and/or masonry walls where a heavy duty chemical resistant coating is required.

### System No. 20 Chemical Resistant Wall, Concrete and Masonry: Use on the following items or areas:

#### Concrete and/or masonry walls where a medium duty chemical resistant coating is required.

### System No. 21 Exposed FRP, PVC: Use on the following items or areas:

#### All exposed-to-view PVC and CPVC surfaces, and FRP surfaces without integral UV-resistant gel coat.

### System No. 22 Aluminum and Dissimilar Metal Insulation: Use on aluminum surfaces embedded or in contact with concrete.

### System No. 23 Fusion Bonded Coating: Use on the following items:

#### [ .]

### System No. 24 Fusion Bonded, Steel Dowel Coating: Use on steel expansion joint dowels specified in Section 03251 - Concrete Joints.

### System No. 106 Galvanized Metal: Use on the following items or areas:

#### Hollow metal frames and doors.

#### Exposed galvanized metal substrates which are specified to receive a paint finish.

### System No. 107 Metal Trim and Structural Steel: Use on the following items or areas:

#### Carbon steel trim and structural steel which is specified to receive a paint finish.

### System No. 108 Masonry, Flat: Use on the following items or areas:

#### Masonry which is specified to receive a flat finish.

### System No. 109 Masonry, Semi-gloss: Use on the following items or areas:

#### Masonry which is specified to receive a semi-gloss finish.

### System No. 112 Concrete, Flat: Use on the following items or areas:

#### Concrete which is specified to receive a flat finish.

### System No. 113 Concrete, Semi-gloss: Use on the following items or areas:

#### Concrete which is specified to receive a semi-gloss finish.

### System No. 117 Concrete Masonry, Gloss Epoxy: Use on the following items or areas:

#### Concrete masonry which is specified to receive a gloss finish.

### Pipe System Colour Code:

#### Refer to Section 15075 – Facilities Piping Identification

**END OF SECTION**