
Instructions for use Construction Specification 82—Painting Metalwork

1. Applicability

Construction Specification 82 is applicable to the painting of metalwork including structural metal, water control gates, piping, pumps, and other metal equipment and machinery.

The durability of paint films on metal depends upon the exposure condition, the types of paints used, the thickness of the coating, and the method of preparing the metal surface before the application of primers and paint. To a large extent the type of paint required is dictated by the exposure condition, and the required surface preparation is dictated by the type of paint to be applied. Each paint system specifies the type and quality of paint, the number of coats or minimum paint film thickness required, and the finish (gloss, semigloss, flat).

The paint systems are not equivalent optional methods. Each paint system is designed to provide protection for a particular exposure condition or to produce a particular finished appearance or both. The criteria for selection of the appropriate paint system and surface preparations for that finish are summarized in table 82-1 of these instructions.

Where a minor amount of painting is to be performed and it is not required for protection, use a simple note on the drawings rather than Construction Specification 82.

2. Material specifications

Material Specification 583, Coal Tar-Epoxy Paint, complements Construction Specification 82 when Paint System F is specified. References to the Steel Structures Paint Council (SSPC) for surface preparation are summarized. Refer to SSPC for full text as appropriate. No other material specifications complement this specification. Any material requirements are to be specified in section 10.

3. Included items

Items to be included in contract specifications and drawings follow:

- a. Indicate by notes on the drawings, the surfaces and items to be painted.
- b. Designate the paint system (by letter) to be used for painting each indicated item. If all metalwork is to be painted by the same paint system, one standard note to that effect is sufficient.
- c. Waiver of the requirement that the contractor furnish a plan and material list if the plan is not necessary.
- d. Provide color requirements, finish (gloss, semigloss, flat) and any special requirements as appropriate.
- e. Instructions for painting, surface preparation, or other special conditions or methods not covered by the standard specification.
- f. Surface preparation for needed maintenance painting may be limited to those spots or areas having loss of protection by corrosion and/or wearing surfaces. A clean, sound paint surface provides a good base for added layers.
- g. Provide tinting requirements as appropriate. Various coatings have a unique tolerance for pigmentation. Under- or over-pigmentation can produce poor cover quality (hide) and less than desirable performance.
- h. Note in section 10 if the contractor is to provide paint specification information to the engineer that is to be shared with the owners to use for their responsibility for operation and maintenance.

4. Methods

Select the method or methods for surface preparation that is appropriate for the durability and length of service required. Refer to table 82-1 for surface preparation recommendations. The quality of surface preparation diminishes as the method number increases, and the expected surface life is reduced accordingly. The small cost increase in selecting a higher quality preparation can significantly reduce operation and maintenance costs and untimely coating failure.

5. Items of work and construction details

Starting at the top of page 82-5, prepare and outline job specific "Items of Work and Construction Details" (IWCD) in accordance with these instructions. For ease of utilization, the use of recyclable color paper for the IWCD should be considered.

Table 82-1 Paint systems for metalwork*

Paint system	Type of paint material	Description and conditions for use	Example applications	Surface preparation
A	Alkyd primer (type 1) Alkyd enamel (type 2) Gloss or semigloss (type 3)	A good interior and exterior system. It is not intended for humid or damp environments. System A should not be applied to a surface that constantly sweats or is immersed in water. It chinks or oxidizes when subjected to sunlight.	Interior and exterior surfaces of buildings, piping, pumps, and machinery above operating floors, doors, frames, tanks.	Method 2 or 3, commercial blast or brush-off blast.
B	Single package moisture cured urethane primer (type 9) Alkyd enamel (type 2) Gloss or semigloss (type 3)	Similar to the qualities of system A. Urethane primer allows system to be applied over poorly prepared surfaces particularly in areas where proper preparation is difficult or impractical. It is a good system for repainting over old existing paint for rehabilitation.	Exterior or interior surfaces of buildings, piping, pumps, and machinery above operating level. Good rehabilitation system when preparation is minimal.	Method 2 or 3, commercial blast or brush-off blast.
C	Epoxy polyamide (type 4) Epoxy polyamide (type 5)	An excellent system for constant or intermittent immersion in salt or fresh water. Excellent for surfaces exposed to constant humidity and sweating. Excellent chemical resistance and available in almost all colors. Will chalk or oxidize when exposed to sunlight.	Trash racks and guards or flap gates, stop logs and guides, pumps, piping, machinery, and storage tanks.	Method 1, near white blast.

See footnotes at end of table.

Table 82-1 Paint systems for metalwork—Continued

Paint system	Type of paint material	Description and conditions for use	Example applications	Surface preparation
D	Epoxy polyamide primer (type 4) Epoxy polyamide (type 5) Acrylic polyurethane gloss (type 6) or semigloss (type 7)	Same as system C except is topcoated with acrylic polyurethane. Not recommended for immersed metals. Excellent interior or exterior in humid or arid environment. High abrasion resistance. Excellent color and gloss retention (15 times greater than systems A, B, or C). Excellent on steel that sweats. Available in either gloss or semi-gloss. Should be considered for long-term exposure to sunlight or when esthetics are a factor.	Exterior surfaces of buildings, such as drains, overflows, gutters, and piping exposed to either humid or arid conditions. Any metal items that gather condensation and/or have high exposure to sunlight. Interior surfaces, such as walls, ceilings, structural steel, equipment, and piping.	Method 2 or 3, commercial blast or brush-off blast.
E	Single package moisture cured Urethane primer (type 9) Acrylic polyurethane gloss (type 6) or semigloss (type 7)	Good system for dry or humid environments. Excellent color and gloss retention. Cannot be used for coating immersed metals and is not as good as system D in constant moisture. Excellent long-term esthetics.	Structural steel, siding, doors, frames, piping, machinery, and storage tanks.	Method 2 or 3, commercial or brush-off blast.
F	Coal tar epoxy (type 10)	Excellent in constant or intermittent immersion in salt or fresh water. Excellent also for buried steel surfaces. Available in black only; changes to brown when exposed to sunlight, but sunlight does not adversely effect performance. Excellent chemical resistance and dependability exhibited in extensive use throughout the water and wastewater treatment industry. Note: Galvanized surfaces require a pretreatment vinyl acid wash primer before applying paint, as noted in type 8 paints. Sandblasting or aged galvanized surfaces do not require a vinyl wash treatment.	Trash guards, water control gates, pipes, steel piling, stop logs and guides, water tanks, and flumes.	Method 1, near white blast.
G	Epoxy polyamide primer (type 4) Single package moisture cured urethane (type 9)	Excellent system for repair of damaged galvanized metal in humid or arid environments. Provides protection for surfaces exposed to constant humidity and sweating.	Trash guards, CMP, stop logs and guides, and other galvanized metalwork.	Method 4 or 5, hand tool or solvent clean.

See footnotes at end of table.

Table 82-1 Paint systems for metalwork—Continued

Paint system	Type of paint material	Description and conditions for use	Example applications	Surface preparation
H	Vinyl acid wash treatment (type 8)	For use as a pretreatment wash for galvanized and nonferrous metals that require painting.	Trash guards, CMP, stop logs and guides, gutters, downspouts, and other galvanized or nonferrous metals.	Steam clean with TSP, or solvent clean, regularly changing rags.

Footnotes:

- a. All surface preparation referred to herein shall be performed in accordance with SSPC (Steel Structures Painting Council).
- b. All painting and coating shall be performed per SSPC Good Painting Practices and paint manufacturer's recommendations.
- c. Coated steel subjected to potable water service shall be coated in accordance with American Water Works Association (AWWA) provisions and directions. Said coatings shall meet United States National Sanitation Foundation (US-NSF) requirements.
- d. When special protective coatings or other specific painting recommendations are necessary, refer to the Paint Manual, United States Department of Interior (USDI), Bureau of Reclamation, or paint manufacturer's data.
- e. Surface preparation indicated is the method that will provide coating quality appropriate for exposure conditions. Methods that produce a greater or a lesser quality can be chosen to produce the quality of work that is necessary. Hand tool cleaning (method 4) and solvent cleaning (method 5) are applicable for field applications, small areas requiring coating, or in making repairs to factory coatings.