



Suggested Specification for Preparing Hot-Dip Galvanized Steel Surfaces for Painting

Revised February 2002

This suggested specification is provided as a guide to preparing a quality document calling for surface preparation of a Hot-Dip galvanized article or fabrication for paint application. This document is not a substitute for professional specification assistance. It is designed to comply with the CSI format for compatibility with the greatest number of specification systems.

Sections in italics are for reference, and may be included or dropped from the final specification based on the judgment of the specifying professional. References to section numbers refer to standard locations within a CSI format specification.

Section 1.03 may include other reference documents as required.

For assistance with this or other galvanizing specifications call the AGA's specification hotline at 800-HOT-SPEC (800-468-7732), fax 720-554-0909, or e-mail aga@galvanizeit.org.

Section 09900

Preparing Hot-Dip Galvanized Surfaces for Painting

This specification covers surface preparation of hot-dip galvanized articles or fabrications prior to painting either in the shop or in the field.

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Degreasing surfaces.
- B. Surface profiling.
- C. Washing and rinsing.

1.02 RELATED WORK

- A. Hot-Dip galvanizing is specified in other sections.
- B. Painting is specified in other sections.

1.03 REFERENCES

- A. Publications
 - 1. American Galvanizers Association (AGA)
Inspection of Products Hot-Dip Galvanized After Fabrication
Duplex Systems: Painting Over Hot-Dip Galvanized Steel
 - 2. Elsevier, van Eijnsbergen, J.F.H., New York, 1994:
Duplex Systems - Hot-Dip Galvanizing Plus Painting
Wet Storage Stain
- B. Reference Standards
 - 1. American Society for Testing and Materials (ASTM):

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A 123 /123M Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

A 153/A 153M Zinc Coating (Hot-Dip) on Iron and Steel Hardware

A 780 Repair of Damaged Hot-Dip Galvanized Coatings

B 201 Testing Chromate Coatings on Zinc and Cadmium Surfaces

D 6386 Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting

E 376 Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Test Methods

2. Federal Specifications

DOD-P-21035, Paint, High Zinc Dust Content, Galvanizing Repair

MIL-P-26915, Primer Coating, Zinc Dust Pigmented

3. The Society for Protective Coatings (SSPC)

Surface Preparation Specification No. 1 Solvent Cleaning

Surface Preparation Specification No. 2 Hand Tool Cleaning

Surface Preparation Specification No. 3 Power Tool Cleaning

Surface Preparation Specification No. 7 Brush-Off Blast Cleaning

1.04 QUALITY ASSURANCE

Coating Applicator: Company specializing in painting or Hot-Dip galvanizing after fabrication.

1.05 SUBMITTALS

In accordance with provisions of Section [01300] and [01360], submit an original and two copies of the coating applicator's notarized Certificate of Compliance that the

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prepared hot-dip galvanized coating surface meets or exceeds the requirements for successful painting of the surface.

1.06 DELIVERY, STORAGE & HANDLING

- A. Store and protect products under the provisions of Section [01600] and [01610].
- B. Load and store galvanized articles in accordance with accepted industry standards.

PART 2 - PRODUCTS

2.01 ACCEPTABLE SURFACE PREPARERS

Members of the American Galvanizers Association or equal, such as painting contractors, approved by the architect and/or engineer. A list of American Galvanizers Association members is available upon request.

2.02 HOT-DIP GALVANIZED MATERIALS

Material for surface preparation to be suitable for painting is required to be Hot-Dip galvanized as described in ASTM A 123/A 123M and A 153/A 153M. Hot-Dip galvanized articles and fabrications may be newly galvanized, partially weathered or completely weathered.

2.03 HOT-DIP GALVANIZING REQUIREMENTS

- A. Hot-Dip galvanizing practices shall be in accordance with the applicable portions of ASTM A 123/123M or A 153/A 153M.
- B. Water quenching or chromate conversion coating should be avoided as these processes interfere with paint adhesion and surface preparation.

PART 3 - EXECUTION

3.01 SURFACE SMOOTHING

The following process should only be used if high spots of zinc are visible on the parts to be painted.

- A. Zinc high spots, such as a metal drip line, should be removed by cleaning with hand or power tools as described in SSPC Surface Preparation Specification 2 or 3. The zinc should be removed until it is level with the surrounding area, taking care that the base coating is not removed by the cleaning methods.

B. After cleaning, the surface shall be inspected for conformance to the required zinc thickness in accordance with ASTM A 123/A 123M or A 153/A 153M utilizing a magnetic-field-type thickness instrument in accordance with ASTM E 376. Any item falling below the required zinc thickness, before or after removal of any high spots, shall be repaired in accordance with ASTM A 780.

3.02 AQUEOUS ALKALINE CLEANING

This surface cleaning is required for all galvanized steel parts, except for those that have been galvanized less than 24 hours.

A. An alkaline solution, pH in the range of 11 to 12 but not greater than 13, can be used to remove traces of oil, grease or dirt.

B. This solution can be applied through immersion in a tank filled with the solution, sprayed on, or brushed on with a soft bristle brush, usually nylon and not steel or copper.

C. When dipping or spraying, the solution works best in the temperature range from 60 to 85 C (140 to 185F).

D. After cleaning, rinse thoroughly in hot water or water under pressure. Allow to dry completely before proceeding.

3.03 SOLVENT CLEANING

This is an alternative to Section 3.02.

A. Typical cleaning solvents, such as mineral spirits or high-flash naphtha, can be used to remove oil and grease. The procedure to be used is as specified in SSPC Surface Preparation Specification 1.

B. Proper rags or brushes should be used to wipe the galvanized parts. Small parts may be dipped or cleaned in ultrasonic baths of solvents.

C. After cleaning, rinse thoroughly in hot water or water under pressure. Allow to dry completely before proceeding.

3.04 HAND- OR POWER-TOOL CLEANING

The following process should be used only if there is visible evidence of wet storage stain on the galvanized surface.

Hand- or power-tool cleaning may be used to clean light deposits of zinc reaction by-products, such as wet storage stain, as specified in SSPC Surface Preparation Specification 2 or 3.

3.05 SWEEP BLASTING

This process is required for all galvanized parts, except those that have been exposed to the environment for more than one year.

A. Abrasive sweep or brush blasting which uses a rapid nozzle movement will roughen the galvanized surface profile. The abrasive material must be chosen with care to provide a stripping action without removing excess zinc layers. Follow the procedures detailed in ASTM D 6386 for abrasive sweep blasting.

B. Following abrasive blast cleaning, surfaces should be blown down with clean, compressed air.

3.06 ZINC PHOSPHATE TREATMENT

This is an alternate process for Section 3.05.

A. This conversion-coating process consists of treating the newly galvanized zinc surface with an acidic zinc phosphate solution containing oxidizing agents and other salts for accelerating the conversion action. Follow the procedures detailed in ASTM D 6386 for zinc phosphate treatment.

B. After 3 to 6 minutes, the surface should be washed with clean water and allowed to completely dry before application of the paint system.

3.07 WASH PRIMER TREATMENT

This is an alternate process for Section 3.05.

A. This process involves the use of a metal conditioner to neutralize surface oxides and hydroxides and to etch the surface. Follow the procedures detailed in ASTM D 6386 for wash primer treatment.

B. For drying time prior to top coating, follow the manufacturer's instructions. This wash-primer treatment may be better suited to certain types of paint systems.

3.08 ACRYLIC PASSIVATION/PRETREATMENT

This is an alternate process for Section 3.05.

A. The passivation/pretreatment process consists of applying an acidic acrylic solution to the newly galvanized surface and then allowing it to dry, forming a thin film coating. Follow the procedures detailed in ASTM D 6386 for acrylic passivation/pretreatment.

B. Painting is possible any time during a period of four months after application as long as the surface is free of visible zinc oxides or zinc hydroxides.

3.09 REPAIR OF DAMAGED COATING

The following process should be used only if there is visible damage to the zinc coating.

A. The maximum area to be repaired is defined in accordance with ASTM A 123/A 123M Section 6.2, current edition.

1. The maximum area to be repaired in the field shall be determined in advance by mutual agreement between parties.

B. Repair areas damaged by welding, flame cutting or during handling, transport or erection, by one of the approved methods in accordance with ASTM A 780 whenever damage exceeds 3/16" (4.8 mm) in width. Minimum thickness requirements for the repair are those described in ASTM A 123/A 123 M Section 6.2 current edition.

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END OF SECTION

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