



Standard Practice for Inspection of Marine Surface Preparation and Coating Application¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This practice is intended to serve as a guide for determining specific inspection requirements for marine surface preparation and coating application during new construction, major retrofit, or routine maintenance contracts.

1.2 It is intended that this practice be used to coordinate inspection activities between ship owner, ship builder, coatings manufacturer and coatings applicator, and that specific requirements be developed before the commencement of surface preparation or coating application, or both.

1.3 This practice does not provide a means of recording required data (for example, film thicknesses, temperatures, relative humidity, etc.), but instead establishes a format for deciding what data must be recorded, when during the preparation/coating process, and by whom.

1.4 This practice does not establish accept/reject criteria for surface preparation or coating inspection, nor does it address methods of repairing deficiencies found. It does, however, provide a means of determining them.

1.5 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

- D 3276 Guide for Painting Inspectors (Metal Substrates)²
- D 4940 Test Method for Conductimetric Analysis of Water Soluble Ionic Contamination of Blasting Abrasives²
- F 718 Standard for Shipbuilders and Marine Paints and Coatings Product/Procedure Data Sheet³

2.2 SSPC Standards:

SSPC PA 2 Measurement of Film Thickness⁴

SSPC-SP 1 Solvent Cleaning⁴

SSPC-SP 3 Power Tool Cleaning⁴

SSPC-SP 5 White Metal Blast Cleaning⁴

SSPC-SP 6 Commercial Blast Cleaning⁴

SSPC-SP 7 Brush-Off Blast Cleaning⁴

SSPC-SP 10 Near-White Blast Cleaning⁴

SSPC VIS-1 Pictorial Surface Preparation Standards for Painting Steel Surfaces⁴

2.3 JSRA Standard:

SPSS Standard for the Preparation of Steel Surface Prior to Painting⁵

2.4 ISO Standards:

ISO 8501-1:1988 Preparation of Substrates Before Application of Paints and Related Products—Visual Assessment of Surface Cleanliness⁶

ISO 8502-1:1991 Preparation of Substrates Before Applications of Paints and Related Products—Tests for Assessment of Surface Cleanliness: Soluble Iron Products

ISO 8502-2:1992 Preparation of Substrates Before Applications of Paints and Related Products—Tests for the Assessment of Surface Cleanliness—Laboratory Determination of Chloride on Cleaned Surfaces

ISO 8502-3:1992 Preparation of Substrates Before Applications of Paints and Related Products—Tests for the Assessment of Surface Cleanliness—Assessment of Dust on Steel Surfaces Prepared for Painting (Pressure Sensitive Tape Method)

ISO 8502-4:1993 Preparation of Substrates Before Applications of Paints and Related Products—Tests for the Assessment of Surface Cleanliness—Guidance on Estimation of the Probability of Condensation Prior to Paint Application

ISO 8502-6 Preparation of Substrates Before Applications of Paints and Related Products—Tests for the Assessment

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² *Annual Book of ASTM Standards*, Vol 06.02.

³ *Annual Book of ASTM Standards*, Vol 01.07.

⁴ Available from Steel Structures Painting Council, 4400 Fifth Ave., Pittsburgh, PA 15213.

⁵ JSRA standards are available from Shipbuilding Research Assoc. of Japan, Sempakushinko Bldg., 15-16 1-Chome Toranomom Minato-Ku, Tokyo 105.

⁶ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

of Surface Cleanliness—Field Extraction of Water Soluble Salts (Dr. Bresle Method)

ISO 8502-9 Preparation of Substrates Before Applications of Paints and Related Products—Tests for the Assessment of Surface Cleanliness—Field Evaluation of Water Soluble Salts by Conductimetric Evaluation

ISO 8503-1:1988 Preparation of Substrates Before Application of Paints and Related Products—Surface Roughness Characteristics of Blast-Cleaned Steel Substrates—Comparator Procedure

ISO 8503-2:1988 Preparation of Substrates Before Application of Paints and Related Products—Surface Roughness Characteristics of Blast-Cleaned Steel Substrates—Method for the Calibration of ISO Surface Profile Comparators and for the Determination of Surface Profile—Focusing Microscope Procedure

ISO 8503-4:1988 Preparation of Substrates Before Application of Paints and Related Products—Surface Roughness Characteristics of Blast-Cleaned Steel Substrates—Method for the Calibration of ISO Surface Profile Comparators and for the Determination of Surface Profile—Stylus Instrument Procedure

ISO 8504-1:1992 Preparation of Substrates Before Application of Paints and Related Products—Surface Preparation Methods—General Guidelines

ISO 8504-2:1992 Preparation of Substrates Before Application of Paints and Related Products—Surface Preparation Methods—Abrasive-Blast Cleaning

ISO 8504-3:1993 Preparation of Substrates Before Application of Paints and Related Products—Surface Preparation Methods—Hand and Power Tool Cleaning

2.5 ASTM Adjuncts:

Sample Form for Determining Marine Surface Preparation and Coating Application Inspection Practices (F 941)⁷

3. Significance and Use

3.1 This practice may be invoked by any of the parties mentioned in 1.2 and may be included as part of a specification or used to clarify or reinforce an existing specification that does not adequately address inspection. When invoked by the ship owner on the shipbuilder, the shipbuilder is responsible for the coordination effort.

3.2 As surface preparation and coating requirements generally differ from ship area to ship area, this practice shall be applied separately to those areas of similar requirements.

3.3 The contents of this practice shall be addressed (for each applicable ship area) at a prestartup meeting attended by the parties mentioned in 1.2.

4. Procedures

4.1 At the beginning of each new contract, after final protective coatings selection, but well before the start of any surface preparation or coating application, a meeting shall be held between those parties mentioned in 1.2. The Sample Form

for Determining Marine Surface Preparation and Coating Application Inspection Practices⁷ shall be completed (for each separate ship area) by the responsible party prior to and each item discussed and agreed upon during the meeting. The selected coating supplier(s) shall make available at this time specific product data sheets in accordance with Standard F 718 harmonizing with the design intent of the application for each coating specified.

4.2 After completion of the sample form,⁷ and required documentation has been submitted by the coatings supplier(s), signatures of applicable parties shall be obtained and dated.

4.3 A means of collecting and recording the information required by the sample form⁷ shall be developed (see 5.1.6.4).

5. Report

5.1 The following paragraphs coincide with the individual sections of the sample form⁷ to aid in their proper completion. Guide D 3276 shall be consulted for additional guidance on general surface preparation and coating inspection practices.

5.1.1 *Contract*—Indicate name of vessel, present owner/agent, and type of vessel (for example, roll-on/roll-off, tanker, etc.).

5.1.2 *Category*—Indicate whether contract is a new construction, major retrofit, or routine maintenance contract.

5.1.3 *Ship Area(s) Concerned*—Indicate the ship area(s) (for example, underwater hull, ballast tanks, etc.) that are being addressed in the inspection practice. Where appropriate, frame numbers or ship levels, or both, shall be included.

5.1.4 *Surface Preparation Requirements:*

5.1.4.1 *Surface Preparation, Initial*—Indicate the standard(s) that will be used to govern the initial surface preparation process, for the particular ship area(s) under consideration. Both written and visual standards shall be used (ISO, JSRA, NACE, or SSPC as appropriate).⁸

5.1.4.2 *Surface Preparation, Touch-Up*—Indicate the surface preparation that will be used for repair of small areas of coating damage or areas, or both, left free of coatings (for example, erection butts) during construction.

5.1.4.3 *Abrasive*—As a minimum, indicate the type and size of the abrasive that will be used to perform the surface preparation process. Any other data (minimum hardness, moisture content, salt content as per Test Method D 4940, etc.) considered pertinent shall also be considered.

5.1.4.4 *Surface Profile*—Indicate any requirements for surface profile (after preparation), and the method that will be used to perform the measurements.

5.1.4.5 *Surface Imperfections*—Specific requirements for repair or removal of surface imperfections, or both, if not adequately addressed or defined in the applicable surface preparation standard, shall be included in this section. These imperfections include weld spatter, weld porosities, laminations, sharp edges, and pits.

⁷ A Sample Form for Determining Marine Surface Preparation and Coating Application Inspection Practices is available at a nominal cost from ASTM Headquarters. Order ADJF0941.

⁸ SNAME Bulletin 4-9, available from The Society of Naval Architects and Marine Engineers, 601 Pavonia Ave., Jersey City, NJ 07306, may also be used as an additional reference. This document shall be used as a guide only and is not to be used as a standard.

5.1.4.6 *Cleaning Between Coats*—Indicate allowable methods for removal of contaminants from the surface of the primer or intermediate coats before overcoating.

5.1.5 *Coating Requirements:*

5.1.5.1 *Specification, Initial*—Indicate the complete coating system specified to be applied to the ship area(s) under consideration. Include the manufacturer's name, product designation or specification number, required color, and required dry film thickness per coat.

5.1.5.2 *Specification, Touch-Up*—Indicate the coating system (if different from the initial system) that will be used to repair areas of coating damage or areas left uncoated, or both, during construction. Include the manufacturer's name, product designation or specification number, required color, and dry film thickness per coat.

5.1.5.3 *Application Parameters*—Standard F 718 product data sheet shall be completed by the coatings manufacturer for each product specified; these data sheets shall be used to establish specific parameters such as minimum/maximum application temperatures and recoat times, mixing procedures, measurement of wet/dry film thickness, etc. Completed data sheets shall be attached to the applicable inspection practice before obtaining approval signatures. The manufacturers' Material Safety Data Sheets shall be obtained for each product and similarly attached.

5.1.5.4 *Stripe Coats*—Indicate where stripe coats are required, when applied, what coating should be used, and the allowable method(s) of application.

5.1.6 *Inspections:*

5.1.6.1 *Timing and Frequency*—Indicate when inspections will occur during the surface preparation and coating application processes, and their frequency (per unit surface area).

5.1.6.2 *Responsibilities*—Indicate all persons (name, employer, position, telephone number) that must be present at the time of inspection, and a procedure to follow in the event of their absence or delay.

5.1.6.3 *Notification Procedure*—Develop a procedure which establishes a specific method for notifying all responsible parties that a ship area is ready for inspection.

5.1.6.4 *Record Keeping*—Indicate what will be recorded at each inspection, who will accomplish the recording, how the information will be recorded, and to whom copies should be sent. A form shall be developed to aid in this recording process. Space shall be provided for approval or disapproval of the surface preparation or coating application, for noting exceptions found and correction of discrepancies, and for final "sign off" of the completed ship area under consideration.

5.1.7 *Sequencing of Work*—Indicate the general order of accomplishment of the specified surface preparation and coating work, and any additional information that might aid in assuring a smooth flow of this work.

5.1.8 *Approvals*—Signatures shall be obtained from all responsible parties after a thorough review of the completed inspection practice (see Sample Form for Determining Marine Surface Preparation and Coating Application Inspection Practices⁷ and all attached documentation.

6. Keywords

6.1 coating application; inspection requirements; marine surface preparation

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