Designation: F940 – 99 (Reapproved 2019)ε1

An American National Standard

Standard Practice for Quality Control Receipt Inspection Procedures for Protective Coatings (Paint), Used in Marine Construction and Shipbuilding[1]

This standard is issued under the fixed designation F940; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

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

ε[1] NOTE—The Keywords Section was added editorially in December 2019.

1. Scope

1.1 This practice provides the quality control receipt inspection procedures for protective coatings (paints) procured for end item use on ships and other marine structures. The practice includes methods and procedures for verifying that coating materials received are within the range of physical and chemical characteristics as those originally specified and tested.

1.2 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D185 Test Methods for Coarse Particles in Pigments

D523 Test Method for Specular Gloss

D562 Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer

D1200 Test Method for Viscosity by Ford Viscosity Cup

D1210 Test Method for Fineness of Dispersion of Pigment-Vehicle Systems by Hegman-Type Gage

D1308 Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes

D1309 Test Method for Settling Properties of Traffic Paints During Storage

D1475 Test Method for Density of Liquid Coatings, Inks, and Related Products

D1640 Test Methods for Drying, Curing, or Film Formation of Organic Coatings

D1729 Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials

D2196 Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational Viscometer

D2244 Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates

D2369 Test Method for Volatile Content of Coatings

D2621 Test Method for Infrared Identification of Vehicle Solids From Solvent-Reducible Paints

D2697 Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings

D2698 Test Method for Determination of the Pigment Content of Solvent-Reducible Paints by High-Speed Centrifuging

D2805 Test Method for Hiding Power of Paints by Reflectometry

D2832 Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings

D3278 Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus (Withdrawn 2020)[3]

D3925 Practice for Sampling Liquid Paints and Related Pigmented Coatings

[1] This practice is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.01 on Structures.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.

3. Terminology

3.1 *Definitions:*

3.1.1 *batch, n*—a manufacturing run. The industrial unit or quantity of production made in one complete operation. The volume or mass that constitutes a batch is flexible and varies with the size of the plant and its facilities for converting the raw materials into the finished product.

4. Summary of Practice

4.1 Test requirements for identifying characteristics (physical and chemical) of marine coatings are established. Receipt inspection tests are provided to assure that procured paints do not differ significantly from the paints initially evaluated.

5. Significance and Use

5.1 This practice provides a means of assuring that products supplied during ship construction and maintenance are substantially the same as the materials on which the original selection was based. The selection of a paint for shipboard use frequently involves laboratory and field evaluations of candidate materials as part of the specification process. When a paint is selected, it shall have the same composition and characteristics throughout the delivery period as the materials originally evaluated.

5.1.1 When significant changes in composition or paint characteristics are observed, it is necessary to determine the cause of the change (production error or formulation change) and its impact on coating performance. Actions to take if a formulation change is required are specified in 6.5.

5.2 This practice is not meant to cover all possible chemical or physical tests that may be used to identify a coating. Additional tests may be needed to meet specific user needs.

5.3 This practice does not recommend specific tolerance limits for the tests indicated. Tolerance values need to be agreed upon by the coating supplier, the shipbuilder, and the ship's owner.

5.4 This practice does not establish critical attributes that must be controlled. These attributes are selected by the shipbuilder and the ship's owner based on specific needs (for example, colors).

6. Procedures

6.1 At the beginning of each contract, after protective coatings selection, the selected material supplier(s) furnish the values for each property listed in Table 1 for each paint selected. This data shall include accept/reject tolerances. These tolerances shall then be reviewed and approved by the shipbuilder.

NOTE 1—Other properties may be specified by the shipbuilder if deemed important due to the special service requirements of the coatings.

6.2 The shipbuilder may retain a sample of each batch of paint received from the paint supplier (minimum sample size of one pint). This retained sample shall be stored for future reference formula verification.

6.3 Each batch of protective coatings (paint) received under the contract shall, as a minimum, be sampled and tested in accordance with the procedures listed in Table 2.

6.4 The data collected on each batch of material tested in accordance with 6.3 shall then be compared to the base line data established in accordance with 6.1. Any variance not within the approved tolerances shall be cause for rejection of the material. If the material complies with 6.3 but is considered suspect, the additional tests listed in Table 1 shall be performed. Any variance not within the approved tolerances shall also be grounds for rejection.

6.5 Once the material selection has been made against a proprietary formulation, the formulation shall not be changed unless approved by the coating supplier, shipbuilder and owner. If approved, the data furnished in 6.1 shall be updated by the paint material supplier.

7. Keywords

7.1 marine construction; procedures; protective coatings; quality control; receipt inspection; shipbuilding

TABLE 1 Initial Baseline Paint Tests

NOTE 1—Test Methods D562, D1200, and D2196 can be used for consistency measurements. Unless otherwise specified, any one of these three test methods may be used.

Standard	Property Measured
D562	Consistency of paints
D1200	Viscosity of paints, varnishes, and lacquers
D1210	Fineness of dispersion of pigment vehicle systems
D1475	Density of paint, varnish, lacquer, and related products
D1640	Drying, curing, or film formation of organic coatings
D2196	Rheological properties of non-Newtonian materials
D2697	Volume nonvolatile matter in clear or pigmented coatings
D2832	Nonvolatile content of paint and paint materials