



Standard Practice for Quality Control Receipt Inspection Procedures for Protective Coatings (Paint), Used in Marine Construction and Shipbuilding¹

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

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 the safety problems associated with its use. It is the responsibility of the user of this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

- D 185 Test Methods for Coarse Particles in Pigments, Pastes, and Paints²
- D 523 Test Method for Specular Gloss³
- D 562 Test Method for Consistency of Paints Using the Stormer Viscometer³
- D 1200 Test Method for Viscosity by Ford Viscosity Cup³
- D 1210 Test Method for Fineness of Dispersion of Pigment-Vehicle Systems³
- D 1308 Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes⁴
- D 1309 Test Method for Settling Properties of Traffic Paints During Accelerated Storage⁴
- D 1475 Test Method for Density of Paint, Varnish, Lacquer, and Related Products³
- D 1640 Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature²

- D 1729 Practice for Visual Evaluation of Color Differences of Opaque Materials³
- D 2196 Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield) Viscometer³
- D 2244 Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates³
- D 2369 Test Method for Volatile Content of Coatings³
- D 2621 Test Method for Infrared Identification of Vehicle Solids From Solvent-Reducible Paints³
- D 2697 Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings³
- D 2698 Test Method for Determination of the Pigment Content of Solvent-Reducible Paints by High-Speed Centrifuging³
- D 2805 Test Method for Hiding Power of Paints by Reflectometry³
- D 2832 Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings³
- D 3278 Test Methods for Flash Point of Liquids by Set-a-flash Closed-Cup Apparatus³
- D 3925 Practice for Sampling Liquid Paints and Related Pigmented Coatings³

3. Terminology

3.1 *batch*—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.

¹ This practice is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F 25.01 on Structures.

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² *Annual Book of ASTM Standards*, Vol 06.03.

³ *Annual Book of ASTM Standards*, Vol 06.01.

⁴ *Annual Book of ASTM Standards*, Vol 06.02.

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

TABLE 1 Initial Baseline Paint Tests

NOTE—Test Methods D 562, D 1200, and D 2196 can be used for consistency measurements. Unless otherwise specified, any one of these three test methods may be used.

Test Method	Property Measured
D 562	Consistency of paints
D 1200	Viscosity of paints, varnishes, and lacquers
D 1210	Fineness of dispersion of pigment vehicle systems
D 1475	Density of paint, varnish, lacquer, and related products
D 1640	Drying, curing, or film formation of organic coatings
D 2196	Rheological properties of non-Newtonian materials
D 2697	Volume nonvolatile matter in clear or pigmented coatings
D 2832	Nonvolatile content of paint and paint materials

TABLE 2 Routine Receipt Inspection Tests

NOTE—Test Methods D 562, D 1200, and D 2196 can be used for consistency measurements. Unless otherwise specified, any one of these three test methods may be used.

Test Method	Property Measured
D 562	Consistency of paints
D 1200	Viscosity of paints, varnishes, and lacquers
D 1210	Fineness of dispersion of pigment vehicle systems
D 1475	Density of paint, varnish, lacquer, and related products
D 1640	Drying, curing, or film formation of organic coatings
D 2196	Rheological properties of non-Newtonian materials

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.

SUPPLEMENTARY REQUIREMENTS

The following supplementary requirements shall apply only when specified in the contract or order.

S1. Quality Assurance

S1.1 Commercial usage quality assurance testing shall consist of the minimum designated tests of Table 1 and Table 2. Test requirements not covered by these tables shall be agreed upon by the shipbuilder and the shipowner.

S1.2 When specified in the contract or order, Table S1.1 shall be substituted for Table 1 in 6.1 and Table S1.2 shall be substituted for Table 2 in 6.3.

S1.3 Quality assurance for paints procured for use on Navy ships shall include all applicable tests of Table S1.1 and Table S1.2.

S1.4 Both commercial and Navy usage may require tests in addition to those specified in Table 1, Table 2, Table S1.1, and Table S1.2. Typically, these tests will be required for special service conditions. Such test requirements, and the specific test procedures must be specified in the contract or purchase order.

TABLE S1.1 Initial Baseline Paint Tests

NOTE—Test Methods D 562, D 1200, and D 2196 can be used for consistency measurements. Unless otherwise specified, any one of these three test methods may be used.

Standard	Property Measured
D 185	Coarse particles in pigments, pastes, and paints
D 523	Specular gloss
D 562	Consistency of paints
D 1200	Viscosity of paints, varnishes, and lacquers
D 1210	Fineness of dispersion of pigment vehicle systems
D 1308	Household chemicals on clear and pigmented organic finishes
D 1309	Settling properties of traffic paints
D 1475	Density of paint, varnish, lacquer, and related products
D 1640	Drying, curing, or film formation of organic coatings
D 1729	Visual evaluation of color differences of opaque materials
D 2196	Rheological properties of non-Newtonian materials
D 2244	Instrumental evaluation of color
D 2369	Volatile content of coatings
D 2621	Infrared identification of vehicle solids
D 2697	Volume nonvolatile matter in clear or pigmented coatings
D 2698	Pigment content of solvent-type paints
D 2805	Hiding power of paints
D 2832	Determining nonvolatile content of paint and paint materials
D 3278	Flash point of paints/enamels/lacquers/varnishes
D 3925	Sampling liquid paints and related pigmented coatings

TABLE S1.2 Routine Receipt Inspection Tests

NOTE—Test Methods D 562, D 1200, and D 2196 can be used for consistency measurements. Unless otherwise specified, any one of these test methods may be used.

Standard	Property Measured
D 185	Coarse particles in pigments, pastes and paints
D 523	Specular gloss
D 562	Consistency of paints
D 1200	Viscosity of paints, varnishes, and lacquers
D 1210	Fineness of dispersion of pigment vehicle systems
D 1475	Density of paint, varnish, lacquer, and related products
D 1640	Drying, curing, or film formation of organic coatings
D 1729	Visual evaluation of color differences of opaque materials
D 2196	Rheological properties of non-Newtonian materials
D 2369	Volatile content of coatings
D 2697	Volume nonvolatile matter in clear or pigmented coatings
D 2698	Pigment content of solvent-type paints
D 2805	Hiding power of paints
D 2832	Determining nonvolatile content of paint and paint materials
D 3278	Flash point of paints/enamels/lacquers/varnishes
D 3925	Sampling liquid paints and related pigmented coatings

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