Designation: D 1641 – 97

Standard Practice for Conducting Outdoor Exposure Tests of Varnishes[1]

This standard is issued under the fixed designation D 1641; 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.

1. Scope

1.1 This practice covers the procedure for evaluating durability of varnishes applied to a wooden substrate.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *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 962 Specification for Aluminum Powder and Paste Pigments for Paints[2]

D 3924 Specification for Standard Environment for Conditioning and Testing Paint, Varnish, Lacquers, and Related Materials[3]

2.2 *U. S. Federal Specification:*

TT-V-119 [4]

3. Apparatus and Materials

3.1 *Maple Panels*, of close-grained clear maple, 3 by 12 by ½ in. (75 by 305 by 13 mm), with all edges rounded to a ¼-in. (6.4-mm) radius.

3.2 *Varnish Brushes*, 1-in. (25-mm) pure bristle.

3.3 *Sandpaper*, 180-grit.

3.4 *Balance*, capable of weighing to an accuracy of 0.1 g.

3.5 *Tung-Linseed Phenolic Aluminum Sealer*, composed of a varnish complying with the nonvolatile vehicle composition requirements of U. S. Federal Specification TT-V-119[5]; (July l973) that is, approximately 65 % oil content with a minimum of 45 % tung oil, and linseed and castor oils as required, and aluminum paste meeting the requirements of Specification D 962, Type II, Class B, using 1 gal of vehicle and 2 lb of paste (288 g paste to 1 L of varnish). If varnish to TT-V-119 is not available, another agreed upon material of known performance may be used.

4. Preparation of Test Panels

4.1 *Weight of Panel*—Weigh the test panel to the nearest 0.1 g, prior to varnishing.

4.2 *Application of First Coat*—For the first application of the varnish under test coat both faces, ends, and edges of each panel, using a small brush and taking the precaution to brush the coat out well. Allow the varnish to dry 24 h at room temperature (as defined in Specification D 3924) before applying the second coat.

4.3 *Application of Second Coat*—Before applying the second coat, lightly sand the panel with 180-grit sandpaper, taking care not to touch the faces of the panel after sanding, and remove sanding dust by air-blowing or vacuuming. Reweigh the panel and record the final weight of the first coat. Then apply a second coat of the varnish as evenly as possible, covering both faces and all edges of the panel. Apply the second coat as evenly as possible. Allow to dry for 24 h before applying the third coat.

4.4 *Application of Third Coat*—Sand, clean and reweigh the panel as in 4.3. Apply the third coat, covering both faces and edges, with a full brush, laying the varnish on as evenly as possible. Weigh the panel and record the weight of the third coat.

4.5 *Application of Aluminum Sealer*—Prepare the varnish based aluminum sealer as directed in 3.5. Coat one face and all the edges of the panel with a smooth even coat. Take great care to ensure that the ends are completely covered. Allow the coated panel to dry a minimum of 24 h before exposure.

5. Procedure

5.1 Unless otherwise agreed upon or specified, expose all panels in a test series with appropriate positive and negative controls (see Note 1) facing the equator at 45° or other agreed upon angle at a time appropriate for the latitude of the site. The weather conditions at the site should, if possible, be similar to conditions where the varnish is regularly used.

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[1] This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.42 on Architectural Finishes.

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

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

[4] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

[5] The oil content was increased on the basis of studies reported in the *Journal of Paint Technology*, Vol 39, Issue 507, April 1967, p. 212.

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