



Standard Practice for Conducting Outdoor Exposure Tests of Varnishes¹

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 SI 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:²

D 660 Test Method for Evaluating Degree of Checking of Exterior Paints

D 661 Test Method for Evaluating Degree of Cracking of Exterior Paints

D 962 Specification for Aluminum Powder and Paste Pigments for Paints

D 1475 Test Method for Density of Liquid Coatings, Inks and Related Materials

D 1729 Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials

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

G 7 Practice for Atmospheric Environment Exposure Testing of Nonmetallic Materials

2.2 U. S. Federal Specification:

TT-V-119³

3. Significance and Use

3.1 The procedure described in this practice is designed to provide guidance for evaluating the effects of outdoor exposure on varnishes applied to wooden substrates. For many products, fixed angle exposures will produce higher degradation rates than the normal end use of the material.

3.2 The degradation rate produced by this procedure depends on the season of the exposure and geographical location. Because outdoor weather conditions vary from season to season and year to year, this practice is not reliable for establishing absolute performance ratings for varnishes. The practice should be used only for comparing the relative performance of varnishes exposed at the same time and same location.

4. Apparatus and Materials

4.1 *Maple Panels*, of close-grained clear maple, 75 by 305 by 13 mm (3 by 12 by 1/2 in.), with all edges rounded to a 6.4-mm (1/4-in.) radius.

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

4.3 *Sandpaper*, 180-grit.

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

4.5 *Tung-Linseed Phenolic Aluminum Sealer*, composed of a varnish complying with the nonvolatile vehicle composition requirements of U. S. Federal Specification TT-V-119⁴; (July 1973) 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.

5. Preparation of Test Panels

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

5.2 *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

¹ This practice 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 Coatings.

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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 Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098.

⁴ 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.