



Designation: D3732 – 82 (Reapproved 2011)

## Standard Practice for Reporting Cure Times of Ultraviolet-Cured Coatings<sup>1</sup>

This standard is issued under the fixed designation D3732; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

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

### 1. Scope

1.1 This practice applies to all coatings cured by ultraviolet energy.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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:*<sup>2</sup>

**D658** Test Method for Abrasion Resistance of Organic Coatings by Air Blast Abrasive (Withdrawn 1996)<sup>3</sup>

**D968** Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive

**D1474** Test Methods for Indentation Hardness of Organic Coatings

**D2197** Test Method for Adhesion of Organic Coatings by Scrape Adhesion

**D2336** Guide for Specifying Factory Applied Wood Coatings (Withdrawn 2008)<sup>3</sup>

**D2793** Test Method for Block Resistance of Organic Coatings on Wood Panel Substrates

**D2794** Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)

**D3023** Practice for Determination of Resistance of Factory-Applied Coatings on Wood Products to Stains and Reagents

**D3281** Test Method for Formability of Attached Organic Coatings with Impact-Wedge Bend Apparatus (Withdrawn 1995)<sup>3</sup>

**D3359** Test Methods for Measuring Adhesion by Tape Test

**D3363** Test Method for Film Hardness by Pencil Test

### 3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *cure, n*—the condition of a coating after conversion to the final state of cure as measured by tests generally related to end-use performance and mutually agreeable to supplier and purchaser.

3.1.2 *ultraviolet curing, n*—conversion of a coating from its application state to its final use state by means of a mechanism initiated by ultraviolet radiation generated by equipment designed for that purpose.

### 4. Significance and Use

4.1 This practice provides a guide whereby all pertinent variables relating to the ultraviolet cure of a coating are described.

### 5. Procedure

5.1 Apply the coating to be cured to the desired substrate at a film thickness typical to that normally used. After approximately the time delay encountered in production pass the coated substrate through the curing equipment and subsequently test for cure, as defined in 3.1.1, using the appropriate methods listed in 5.1.1 through 5.1.11. The most commonly used test methods are listed in 5.1.1 through 5.1.4.

5.1.1 *Impact Resistance*—Test Method **D2794**.

5.1.2 *Film Hardness*—Test Method **D3363**.

5.1.3 *Solvent Rub Test*—Hold a pad of cheesecloth or other cloth saturated with an agreed-upon solvent, usually methyl ethyl ketone, over two adjacent fingers using a protective covering. Rub the wet pad back and forth across a 100-mm portion of the cured film using vigorous pressure, one forward and one backward movement constituting one double rub. Take the end point as the number of double rubs required to soften or penetrate the film. Fully cured films are normally required to resist a specified number of rubs and the result of the test is given as exceeding the limit or failing the test.

<sup>1</sup> 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 **D01.55** on Factory Applied Coatings on Preformed Products.

Current edition approved June 1, 2011. Published June 2011. Originally approved in 1978. Last previous edition approved in 2005 as D3732 – 82 (2005). DOI: 10.1520/D3732-82R11.

<sup>2</sup> 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.

<sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

5.1.4 *Sandability*—Ultraviolet cured fillers are usually judged by their sandability with an agreed-upon grit of paper. This test is often made immediately after the material leaves the ultraviolet processor.

5.1.5 *Specifying Properties*—Guide **D2336**.

5.1.6 *Abrasion Resistance*—Test Methods **D658** and **D968**.

5.1.7 *Indentation Hardness*—Test Methods **D1474**.

5.1.8 *Adhesion*—Test Methods **D2197** and **D3359**.

5.1.9 *Block Resistance*—Test Method **D2793**.

5.1.10 *Formability*—Test Method **D3281**.

5.1.11 *Stain and Reagent Resistance* —Practice **D3023**.

5.2 Repeat the application, curing, and testing with fresh material on fresh substrates until the shortest time that yields a cured film is obtained.

## 6. Report

6.1 Ultraviolet curing equipment is available with several design variables. Therefore, include the following information with results where applicable:

- 6.1.1 Number of bulbs,
- 6.1.2 Bulb type (intensity, spectral distribution, composition),
- 6.1.3 Bulb age,
- 6.1.4 Bulb location (height from work and orientation to workpiece),
- 6.1.5 Reflector design,
- 6.1.6 Conveyor speed or exposure time to achieve cure,
- 6.1.7 Substrate,
- 6.1.8 Coating identification and age of sample if known,
- 6.1.9 Wet film thickness,
- 6.1.10 Temperature conditions in the curing unit,
- 6.1.11 Curing environment (air, nitrogen, or other atmosphere),
- 6.1.12 Cure tests used (refer to Section 5), and
- 6.1.13 Age of cured film when tests were run.

## 7. Keywords

- 7.1 cure time; ultraviolet-cured coatings

*ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.*

*This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.*

*This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or [service@astm.org](mailto:service@astm.org) (e-mail); or through the ASTM website ([www.astm.org](http://www.astm.org)). Permission rights to photocopy the standard may also be secured from the ASTM website ([www.astm.org](http://www.astm.org)/COPYRIGHT/).*

<https://standards.iteh.ai/>  
**ASTM D3732-82(2011)**

[/catalog/standards/astm/9ba22c4c-bce5-4eb3-9b1f-9519058e6212/astm-d3732-82-2011](https://standards.iteh.ai/catalog/standards/astm/9ba22c4c-bce5-4eb3-9b1f-9519058e6212/astm-d3732-82-2011)