



Standard Practice for Conducting a Test of Protective Properties of Polish Applied to a Painted Panel Using Fluorescent UV-Condensation Light- and Water-Exposure Apparatus¹

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1. Scope

1.1 This practice covers the selection of test conditions from Practice **G53** to be employed for exposure testing of polish-coated paint, related coatings, and materials. This practice covers the basic principles and operating procedures for using fluorescent ultraviolet (UV) and condensation apparatus to simulate the deterioration caused by sunlight and water as rain or dew.

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:*²

D523 Test Method for Specular Gloss

G53 Practice for Operating Light-and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials (Withdrawn 2000)³

3. Significance and Use

3.1 Organic coatings on exterior exposure are subjected to attack by degrading elements of the weather, particularly ultraviolet light, oxygen, and water. This practice may be used for evaluating the protective behavior of polish film applied to a coating. This polish-coated coating is then exposed in an

apparatus that produces ultraviolet radiation, temperature variation, and water condensation for a given time period.

3.2 No single light exposure apparatus, with or without water, can be specified as a direct simulation of natural exposure. This practice does not imply a specific correlation with outdoor exposure. It is, however, useful in screening the relative protective qualities of a polish within the test parameter.

4. Apparatus and Material

4.1 *Fluorescent UV/Condensation Apparatus*, complying with Practice **G53**.

4.2 *Glossmeter*, using an angle of reflection of 60°. The instrument and the reference standards shall conform to the requirements prescribed in Test Method **D523**.

4.3 *Forced-air Oven*.

4.4 *Q Panel*, approximately 7.5 by 15 cm aluminum.

4.5 *Base Paint Coating*—should be a red paint that gives 100 % loss in gloss after being exposed to the test in this practice. Apply this paint to the aluminum Q panel according to the instructions on the spray can. Allow paint coating to air dry for 24 h followed by 2 h of drying in a forced-air oven at 50°C.

4.6 *Polishing and Application Cloth*— shall be the same size and type for each sample tested. Separate cloths shall be used for each polish and for the application step and buffing step. Materials such as washed cheesecloth, rumple cloth, flannel, cotton diaper cloth, and nonwoven fabrics are suitable for this purpose. Felt or paper shall not be used.

4.7 *Samples of Polish*, to be tested.

5. Procedure

5.1 Apply the test polish to one half of the prepared coated panel. If the polish is a commercially available product, follow the directions on the container so far as is possible. When in doubt of the application method use the following:

5.1.1 Apply the polish, allow it to dry to a haze, and then buff it with a soft cloth to a glossy shine. Equal volumes of test polishes should be applied when comparing products. Avoid excessively thin or heavy coats of polish. The temperature and

¹ This practice is under the jurisdiction of ASTM Committee **D21** on Polishes and is the direct responsibility of Subcommittee **D21.04** on Performance Tests.

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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.

relative humidity should be measured so that the polish is applied within 21-27°C and 20-80 % humidity. The precoated panels shall have the same temperature as the surrounding area.

5.2 Using a 60° glossmeter, take and record the gloss readings of the polished and unpolished areas of the panel. Also record the gloss differential, which is the gloss reading of the polished half of the panel minus the unpolished half. After determining these initial gloss readings, place the Q panel in the QUV cabinet.

5.3 Use the condensation mode first, in which there is no light with moisture at 50°C for 4 h.

5.4 This is followed by 5 h of UV exposure, which is fluorescent UV lamp light and no moisture at 70°C for 5 h. The gloss readings are taken as stated in 5.2 after 1, 2, 3, 4 and 5 h of exposure to UV light. Also record a visual observation of the exposed, unexposed, and unpolished parts of the Q panel after the combination of 5.3 and 5.4. These are four separate visual observations of the painted panel.

6. Report

6.1 Report the manufacturer and model of the fluorescent UV/condensation apparatus, the manufacturer's designation for the fluorescent UV lamp, and the relative spectral energy distribution of the lamp.

6.2 For each panel, report gloss readings for polished and unpolished areas and gloss differential. Then, for the same panel, report the same three readings after 1, 2, 3, 4, and 5 h of UV exposure.

7. Precision and Bias

7.1 Precision has not yet been established.

7.2 This test has no bias because the values produced are defined only in terms of this practice.

8. Keywords

8.1 car polish; fluorescent UV/condensation; polish; Q panels; UV radiation; wax

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