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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Method for Light Stability of Clear Coatings¹

This standard is issued under the fixed designation D 2620; 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.

^{ε1} NOTE—Keywords and unit of measurement statement were added editorially in May 1995.

1. Scope

1.1 This test method covers the determination of the discoloration of clear coatings by sunlight through glass.

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 1729 Practice for Visual Evaluation of Color Differences of Opaque Materials²

D 1925 Test Method for Yellowness Index of Plastics³

G 24 Practice for Conducting Exposures to Daylight Filtered Through Glass⁴

3. Summary of Test Method

3.1 The effect of sunlight on discoloration of clear coatings is determined by exposing under glass, coated panels masked at one end, to natural sunlight for a specified time. At the end of the exposure, the mask is removed and the panels evaluated for degree of discoloration.

4. Significance and Use

4.1 Color change, particularly yellowing, is not generally acceptable to users of coatings when it is readily noticeable. In designing clear coating systems for interior use on various substrates, it is of interest to know how well the clear coats will resist color change caused by ambient light. This test method permits the evaluation of the effect of natural indoor light on the color stability of clear coatings.

¹ This test method is under the jurisdiction of ASTM Committee D-1 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 May 29, 1987. Published July 1987. Originally published as D 2620 – 67. Last previous edition D 2620 – 68 (1981)^{ε1}.

² Annual Book of ASTM Standards, Vol 06.01.

³ Annual Book of ASTM Standards, Vol 08.01.

⁴ Annual Book of ASTM Standards, Vol 14.02.

5. Apparatus

5.1 *Exposure Cabinet* as described in Practice G 24.

6. Test Specimens

6.1 For each clear coating under test, use one test panel approximately 3 by 5 in. (75 by 125 mm) of white carrara glass or other specified substrate material.

NOTE 1—Other materials that may be considered for this purpose include: (1) White ceramic tile. (2) A white pigmented, light-stable coating which would not be lifted by the clear topcoat. (A baking enamel with the composition of 30 % melamine formaldehyde resin and 70 % of the phthalic anhydride/coconut alkyd resin with 3 lb/gal (1.36 kg/L) of titanium dioxide per gallon has been found satisfactory.) (3) The substrate intended for use with the clear coating. The light stability of the substrate may be determined by including an extra test panel without a clear topcoat.

6.2 Prepare specimens of the test materials by applying the coatings on the test panels to a dry film thickness of 2 ± 0.2 mil ($50 \pm 5 \mu\text{m}$).

6.3 Prepare a reference specimen, representing a material of known performance in this test, with each set of test specimens.

6.4 Record the panel preparation details: method of coating application, baking conditions, film thickness, etc. These details will be established by mutual agreement between purchaser and seller in accordance with the type of product and its intended use.

7. Conditioning

7.1 Unless otherwise specified, condition the coated panels at $73.5 \pm 3.5^\circ\text{F}$ ($23 \pm 2^\circ\text{C}$) and 50 ± 5 % relative humidity for 48 h if baked, or 7 days if air dried.

8. Procedure

8.1 Prior to exposure, mask one-half of each test panel with aluminum foil to exclude sunlight from the other half of the coating.

NOTE 2—The tape used to attach the mask to the panel should not extend over the edge of the mask but should extend beyond the ends of the mask and stick to the rear of the panel, thereby holding the mask in position. This will prevent contact between the tape and the finish and eliminate the possibility of staining from the tape.

8.2 Mount the test specimens in the glass-covered exposure cabinet continuously 24 h a day for the specified period of