This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: D2199 – 03 (Reapproved 2021)

Standard Test Method for Measurement of Plasticizer Migration From Vinyl Fabrics to Lacquers[1]

This standard is issued under the fixed designation D2199; 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 test method covers an accelerated test for the measurement of a tendency for plasticizers in finished vinyl fabric to be transferred to coatings with which they come in contact.

NOTE 1—Age of fabric sample may affect results of test. To ensure most reliable results, test with fabric sample closest in age to what will be coated.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Summary of Test Method

2.1 A small sample of vinyl fabric is placed on a conditioned coating film under a pressure of 3.45 kPa (½ psi). The assembly is placed in an oven for 3 days at elevated temperature. At the end of that time, the coating is examined for marring or softening. For coatings that may block or print at 50°C or lower, a lower test temperature and a longer test time may have to be used.

3. Significance and Use

3.1 Plasticizers in finished vinyl fabric can be transferred to coatings with which they come in contact. When this takes place, objectionable marring and softening occur. This test method covers an accelerated test for measurement of this tendency.

4. Apparatus

4.1 *Drawdown Blade,* 125-µm (5-mils) clearance to provide a wet film of approximately 63 µm (2.5 mils) in thickness.

4.2 *Plate Glass Panels.*

4.3 *Window Glass,* 51 by 51-mm (2 by 2-in.) square, double strength.

4.4 *Sponge Rubber,* 51 by 51-mm (2 by 2-in.) square by ¼ in. (6.3 mm) thick.

4.5 *Weights,* flat-bottom, sufficient to place a total weight of 910 g (2 lb) on each test sample.

4.6 *Forced-Convection Oven,* thermostatically controlled to ±2°C.

4.7 *Photograph Roller.*[2]

4.8 *Aluminum Foil.*

5. Procedure

5.1 Apply the coating to the glass panel with the drawdown blade to provide a uniform film with an area of at least a 51-mm (2-in.) square and a dry thickness of at least 25 µm (1 mil) or as agreed upon. Dry the coating in accordance with the recommendations of the manufacturer or for a minimum of 24 h at room temperature and 2 h at 50°C.

5.2 Preheat the glass plate bearing the coating, the 51 by 51-mm (2 by 2-in.) glass square, and the weights for 30 min at 50°C. Place the square of vinyl fabric on the coating with care and ensure intimate contact by rolling with the photographic roller. Cover the fabric with foil, sponge rubber, glass, and weight in that order. The total weight shall be 910 g (2 lb).

5.3 Place the assembly in the forced convection oven at a temperature of 50°C for 72 h. After removal from the oven and cooling, remove the weight, sponge rubber, and aluminum foil, and carefully remove the vinyl fabric. Note and report any

[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 D01.55 on Factory Applied Coatings on Preformed Products.

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[2] A squeegee-type roller is satisfactory.

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resistance to removal. Wipe the surface of the fabric with a soft rag dampened with heptane and examine for removal of exuded plasticizer.

6. Rating

6.1 Rate the degree of migration by viewing the surface of the coating at a low angle against the light within 2 h after termination of heating and within 15 min of removal of the fabric.

7. Report

7.1 Report marring or softening, or both, on the scale of no change, faint imprint, severe imprint, or marring.

7.2 If plasticizer is evident when the surface is wiped, this shall be reported.

8. Precision and Bias

8.1 *Precision*—It is not possible to specify the precision of the procedure in Test Method D2199 for measuring plasticizer migration since the test result is nonquantitative. Repeated tests have demonstrated that several laboratories will assign the same rating to various coating fabric combinations. Also, replicate tests by one laboratory are in good agreement.

8.2 *Bias*—No information can be presented on the bias of the procedure in Test Method D2199 for measuring plasticizer migration since no material having an acceptable reference value is available.

9. Keywords

9.1 lacquer; plasticizer migration; vinyl fabrics

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