Designation: D6665 – 24

Standard Practice for Evaluation of Aging Resistance of Pre-stressed Prepainted Metal in a Boiling Water Test[1]

This standard is issued under the fixed designation D6665; 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 can be used to evaluate the resistance of a pre-stressed prepainted metal panel to cracking and loss of adhesion, or both, after accelerated aging by boiling water. Most coil coated products are formed and bent into specific shapes to produce a final product. These operations introduce stresses, which may be relieved by cracking of the coating after aging.

1.2 *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.*

1.3 *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. Referenced Documents

2.1 *ASTM Standards:*[2]

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

D4145 Test Method for Coating Flexibility of Prepainted Sheet

E643 Test Method for Ball Punch Deformation of Metallic Sheet Material

3. Significance and Use

3.1 Prepainted metal is supplied as a painted coil, and it is fabricated into a finished part. The fabrication process induces stress to the paint system. To determine if this stress will lead to a failure in service, it is common to immerse the stressed sample in boiling water. If no failure occurs (see 7.4) after exposure to boiling water, it is very unlikely that a failure will occur in the field.

4. Apparatus

4.1 Boiling water bath large enough to hold formed test specimens.

4.2 10× magnifier (optional).

4.3 Clear, pressure-sensitive tape, natural rubber adhesion, with the following parameters:

4.3.1 Tensile Strength shall be 26.3 N/10mm to 52.6 N/10mm (15 pounds/inch to 30 pounds/inch).

4.3.2 Elongation shall be 10 % to 40 %.

4.3.3 Peel strength shall be 3.28 N/10mm to 4.93 N/10mm (30 pounds/inch to 45 pounds/inch).

4.3.4 Total thickness (backing plus adhesive) shall be 0.041 mm to 0.066 mm (1.6 mils to 2.6 mils).

4.3.5 The specific brand of tape to be agreed upon between the supplier and the user.[3]

5. Reagents

5.1 Deionized or other water, as agreed upon by customer and vendor.

6. Test Specimen

6.1 Prepainted samples that have been deformed by impact, drawing, or other mechanical deformation that has been agreed upon between customer and vendor. These should be prepared according to Test Methods D2794, D4145, E643, and/or prepared in a manner agreed upon by customer and vendor.

7. Procedure

7.1 Examine the test specimens for cracking, flowering and tape pick-off (adhesion loss), and record the results.

[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 D01.53 on Coil Coated Metal.

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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 sole source of supply of the tape known to the committee at this time is 3M Company, 3M Center Bldg., St. Paul, MN 55144-1000. 3M Scotch® Tape 681 has been found to be a suitable tape for this purpose. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,[1] which you may attend.