Designation: D6491 – 09

Standard Practice for Evaluation of Aging Resistance of Prestressed Prepainted Metal In a Dry Heat Test[1]

This standard is issued under the fixed designation D6491; 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 prestressed prepainted metal panel to cracking, or loss of adhesion, or both, after accelerated heat aging. 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 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D4145 Test Method for Coating Flexibility of Prepainted Sheet

3. Apparatus

3.1 *Gravity or Forced Air Laboratory Oven,* capable of maintaining a temperature of 60 ± 3°C (140 ± 5°F).

3.2 *Bench Vise,* with smooth jaws or inserts, 130 mm (5 in.) permanently mounted on a work table or bench, or alternative equipment capable of making the appropriate bends.

3.3 *Bending Dies or Test Shims ,* (optional).

3.4 *10X magnifier,* (optional).

3.5 *Adhesive Tape.*

4. Test Specimens

4.1 Cut samples 75 mm (3 in.) wide (across the bend direction) by whatever length is necessary to make the appropriate number of bends. The direction of the bend may be transverse or longitudinal to the "rolling direction" of the metal—or as agreed upon between customer and vendor.

5. Procedure

5.1 Perform the fabrication at room temperature, 25 ± 1°C (77 ± 2°F). All test specimens should be equilibrated to the same temperature before fabricating. Different fabrication temperatures may be used, when needed, to meet customer or vendor requirements, or both.

5.2 Prepare three "T-bend" test specimens in accordance with Test Method D4145. The T-bend used should be agreed upon between customer and vendor.

5.3 Examine the T-bend for cracking and tape pick-off in accordance with Test Method D4145 and record the results.

5.4 Place the formed test specimens in the 60 ± 3°C (140 ± 5°F) oven for 16 h. Different times and temperatures may be used if agreed upon between the customer and vendor.

5.5 Remove the test specimens and allow them to cool to room temperature.

5.6 Repeat the tape adhesion test.

6. Report

6.1 Report the following information:

6.1.1 Reexamine the test specimens for cracking and tape pick-off.

6.2 The degree of cracking and tape pick-off allowed should be agreed upon between the customer and the vendor. Report substrate, coating system, production or preparation date, the tape used, cracking and tape pick-off noted before heat aging, the heat aging time and temperature and cracking, and tape pick-off noted after heat aging.

7. Keywords

7.1 aging; coil; cracking; dry heat; fabrication; flexibility; heat aging; prepaint; pick-off; stresses; t-bend

[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.