



Designation: D 6491 – 99

Standard Practice for Evaluation of Aging Resistance of Prestressed Prepainted Metal In a Dry Heat Test¹

This standard is issued under the fixed designation D 6491; 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:

D 4145 Test Method for Coating Flexibility of Prepainted Sheet²

3. Apparatus

3.1 *Gravity or Forced Air Laboratory Oven*, capable of maintaining a temperature of $60 \pm 3^\circ\text{C}$ ($140 \pm 5^\circ\text{F}$).

3.2 *Bench Vise*, with smooth jaws or inserts, 13 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*.

¹ These test methods are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications, and is the direct responsibility of Subcommittee D01.53 on Coated Metal.

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² *Annual Book of ASTM Standards*, Vol 06.02.

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, $25 \pm 1^\circ\text{C}$ ($77 \pm 2^\circ\text{F}$). All test specimens should be equilibrated to the same temperature before fabricating.

5.2 Prepare three “T-bend” test specimens in accordance with Test Method D 4145. 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 D 4145 and record the results.

5.4 Place the formed test specimens in the $60 \pm 3^\circ\text{C}$ ($140 \pm 5^\circ\text{F}$) 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, cracking and tape pick-off noted before heat aging 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