



AEROSPACE STANDARD

AS6507™

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Test Method and Limits for Bow Height of Aluminum Sheet Samples After Chemical Milling

RATIONALE

This new SAE Aerospace Standard (AS) defines the test method and limits for the bow height of aluminum sheet samples after chemical milling.

1. SCOPE

- 1.1 The results of this test are intended to be a useful indication of the resistance to distortion of bare or two-side Alclad, flat sheet aluminum used in chemical milling applications.
- 1.2 This specification covers requirements for testing wrought aluminum alloy raw material in the form of sheet by producers.
- 1.3 This Aerospace Standard applies only to heat treated, flat sheet in the heat treated condition (T3X, T6X, T7X, or T8X) temper, and having thicknesses in the range 0.032 to 0.249 inch (0.8 to 6.3 mm). Purchasers are encouraged to contact producers with questions on the availability of material (i.e. alloy/temper/width) that is capable of meeting the requirements of this standard. Product having the capability prescribed by this specification is available in limited quantities and tempers because of the special processing required. NOTE: Sheet in the coiled form cannot be supplied to this specification.
- 1.4 This specification is used to indicate the resistance to distortion of bare and two-side Alclad, flat sheet aluminum that will be chemically milled (often in the manufacture of aircraft skin panels).
- 1.5 This Aerospace Standard is intended to be a supplemental requirement added to the aluminum sheet specification purchase orders for product which is to be used in chemical milling operations.

2. APPLICABLE DOCUMENTS

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM E29 Using Significant Digits in Test Data to Determine Conformance with Specifications

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3. TECHNICAL REQUIREMENTS

3.1 The aluminum sheet for which this Aerospace Standard is specified shall meet all the requirements of the referenced material specification and the additional requirements listed below.

3.2 Allowable Bow Height Change

After chemical milling of test panels in accordance with the procedure in Section 4, the bow height change, h shall not exceed the limits shown in Table 1 for bare sheet and in Table 2 for two-side Alclad sheet when tested as defined in 4.5.

where:

h_1 = the height of the original bow of the specimen

h_2 = the height of the bow of the specimen after chemical milling

$h = h_2 - h_1$

Table 1 - Maximum specimen bow height change allowed for bare sheet products

Material Thickness	Maximum Bow Height Change Allowed (h)
0.032 inch (0.81 mm) to 0.071 inch (1.80 mm), incl	0.375 inch (9.5 mm)
Over 0.071 inch (1.80 mm) to 0.140 inch (3.56 mm), incl	0.30 inch (7.6 mm)
Over 0.140 inch (3.56 mm) to 0.249 inch (6.3 mm), incl	0.20 inch (5.0 mm)

Table 2 - Maximum specimen bow height change allowed for two-side alclad sheet products

Material Thickness	Maximum Bow Height Change Allowed (h)
0.032 inch (0.81 mm) to 0.045 inch (1.14 mm), incl	0.375 inch (9.5 mm)
Over 0.045 inch (1.14 mm) to 0.140 inch (3.56 mm), incl	0.30 inch (7.6 mm)
Over 0.140 inch (3.56 mm) to 0.249 inch (6.3 mm), incl	0.20 inch (5.0 mm)

4. PROCEDURE

4.1 Condition

This test is applied to material in final heat treated temper condition.

4.2 Test Specimens

4.2.1 Test specimens shall be cut samples having dimensions of 2.0 inches x 12.0 inches (50 mm x 300 mm), with the length parallel to the rolling direction of the sheet. Remove saw burrs from test specimen, if necessary, to facilitate accurate bow height measurements.

4.2.2 If the specimen is not flat, measure the height of the bow, h_1 , according to requirements of 4.5.1.

4.2.3 Initial bow height h_1 shall not exceed 0.060 inch (1.50 mm).

4.2.4 Retain an adjoining portion of the sheet for use as an initial thickness reference until the completion of the test.

4.3 Application of Masking Material

4.3.1 The side of the test specimen, which is not to be chemically milled, shall be protected with maskant (e.g., tape, sealant or a suitable paint) applied per the maskant's instructions.

4.3.2 If the test specimen is not flat, apply the maskant to the convex side and chemically mill the concave side.