



Standard Test Methods for Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products (Metric)¹

This standard is issued under the fixed designation B557M; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 These test methods cover the tension testing of wrought and cast aluminum- and magnesium-alloy products, with the exception of aluminum foil,² and are derived from Test Methods E8M, which cover the tension testing of all metallic materials.

NOTE 1—These metric test methods are the equivalents of those in Test Methods B557, and are compatible in technical content except for the requirement of longer gage lengths for round specimens.

NOTE 2—Foil is sheet metal less than 0.20 mm thick. There is an overlap in the thickness range 0.15 to 0.20 mm defined for foil and sheet. Sheet products in this thickness range are supplied to sheet product specifications and foil products in this thickness range are supplied to foil product specifications. Exceptions to the provisions of these test methods may need to be made in individual specifications or test methods for a particular material.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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:³

B209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate

E4 Practices for Force Verification of Testing Machines

E6 Terminology Relating to Methods of Mechanical Testing

¹ These test methods are under the jurisdiction of ASTM Committee B07 on Light Metals and Alloys and are the direct responsibility of Subcommittee B07.05 on Testing.

Current edition approved Oct. 1, 2015. Published October 2015. Originally approved in 1976. Last previous edition approved in 2014 as B557M – 14. DOI: 10.1520/B0557M-15.

² For test methods of tension testing of aluminum foil, see Test Methods E345.

³ 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.

E8M Test Methods for Tension Testing of Metallic Materials [Metric] (Withdrawn 2008)⁴

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

E83 Practice for Verification and Classification of Extensometer Systems

E345 Test Methods of Tension Testing of Metallic Foil

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E1012 Practice for Verification of Testing Frame and Specimen Alignment Under Tensile and Compressive Axial Force Application

3. Terminology

3.1 The definitions of terms relating to tension testing appearing in Terminology E6 shall be considered as applying to the terms used in these test methods.

4. Significance and Use

4.1 Tension tests provide information on the strength and ductility of materials under uniaxial tensile stresses. This information may be useful in comparisons of materials, alloy development, quality control, and design under certain circumstances.

4.2 The results of tension tests of specimens machined to standardized dimensions from selected portions of a part or material may not totally represent the strength and ductility properties of the entire end product or its in-service behavior in different environments.

4.3 These test methods are considered satisfactory for acceptance testing of commercial shipments and have been used extensively in the trade for this purpose.

5. Apparatus

5.1 *Testing Machines*—Machines used for tension testing shall conform to the requirements of Practices E4. The forces used in determining tensile strength and yield strength shall be

⁴ The last approved version of this historical standard is referenced on www.astm.org.

*A Summary of Changes section appears at the end of this standard