Designation: B 557M – 02a

METRIC

Standard Test Methods of Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products [Metric][1]

This standard is issued under the fixed designation B 557M; 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 Department of Defense.

1. Scope *

1.1 These test methods cover the tension testing of wrought and cast aluminum- and magnesium-alloy products, excepting aluminum foil[2], and are derived from Test Methods E 8M, which cover the tension testing of all metallic materials.

NOTE 1—These metric test methods are the equivalents of those in Test Methods B 557, and are compatible in technical content except for the requirement of longer gage lengths for round specimens.

NOTE 2—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 *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 The following documents of the issue in effect at the time of reference form a part of these test methods to the extent referenced herein:

2.2 *ASTM Standards:*

E 4 Practices for Force Verification of Testing Machines[3]

E 6 Terminology Relating to Methods of Mechanical Testing[3]

E 8M Test Methods for Tension Testing of Metallic Materials [Metric][3]

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications[4]

E 83 Practice for Verification and Classification of Extensometer[3]

E 345 Test Methods of Tension Testing of Metallic Foil[3]

E 1012 Practice for Verification of Specimen Alignment Under Tensile Loading[3]

3. Terminology

3.1 The definitions of terms relating to tension testing appearing in Terminology E 6 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 E 4. The forces used in determining tensile strength and yield strength shall be within the verified force application range of the testing machine as defined in Practices E 4.

5.2 *Gripping Devices*:

5.2.1 *General*—Various types of gripping devices may be used to transmit the measured load applied by the testing machine to the test specimens. To ensure axial tensile stress within the gage length, the axis of the test specimen must coincide with the centerline of the heads of the 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.

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[2] For test methods of tension testing of aluminum foil, see Test Methods E 345.

[3] *Annual Book of ASTM Standards*, Vol 03.01.

[4] *Annual Book of ASTM Standards*, Vol 14.02.

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

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