



Designation: B 565 – 94 (Reapproved 2000)

Standard Test Method for Shear Testing of Aluminum and Aluminum-Alloy Rivets and Cold-Heading Wire and Rods¹

This standard is issued under the fixed designation B 565; 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 This test method covers the double shear testing of aluminum and aluminum alloy rivets with round, solid shanks and cold-heading wire and rod.²

NOTE 1—Exceptions to this test method may be necessary in individual specifications or methods for tests for a particular material.

NOTE 2—The values stated in inch-pound units are the standard. The SI values in parentheses are for information only.

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 latest issues of the following documents form a part of this standard to the extent referenced herein:

2.2 ASTM Standards:

B 316/B 316M Specification for Aluminum and Aluminum-Alloy Rivet and Cold Heading Wire and Rods³

B 769 Test Method for Shear Testing of Aluminum Alloys³

B 831 Test Method for Shear Testing of Thin Aluminum Alloy Products³

E 4 Practices for Force Verification of Testing Machines⁴

E 6 Terminology Relating to Methods of Mechanical Testing⁴

3. Terminology

3.1 *General*—The definitions of terms relating to shear testing in Terminology E 6 are applicable to the terms used in this test method.

¹ This test method is under the jurisdiction of ASTM Committee B07 on Light Metals and Alloys, and is under the jurisdiction of Subcommittee B07.05 on Testing. Current edition approved March 15, 1994. Published May 1994. Originally published as B 565–72. Last previous edition B 565–87.

² This product is covered by Specification B 316/ B 316M.

³ *Annual Book of ASTM Standards*, Vol 02.02.

⁴ *Annual Book of ASTM Standards*, Vol 03.01.

4. Summary of Test Method

4.1 The test consists of subjecting a length of wire or rod or a rivet in full cross section, or a machined length of rod or rivet, to double-shear loading, with a suitable test jig in a tension testing machine, and determining the shear stress required to fracture the specimen (that is, the shear strength).

5. Significance and Use

5.1 This test method is intended solely for the shear testing of rivets and cold-heading wire and rod, and is not generally recommended for the determination of the shear strength of other products. For rivets, this method is limited to rivets having a shank length equal to or greater than $2d$.

NOTE 3—The results of shear tests of specimens machined from products other than wire, rod, and rivets may be greatly dependent upon the orientation of the specimen within the original test material, and the direction in which the load is applied relative to the grain flow in the specimen.⁵ It is recommended that shear strengths of other products be determined by Test Method B 769 for products greater than 0.250 in. (6.4 mm) and Test Method B 831 for products less than 0.250 in. (6.4 mm). Shear strengths developed by this test method have been shown to vary from those developed by other methods.⁵ If Test Method B 565 is used for shear testing of other products, variables such as those described in Test Method B 769 should be identified and controlled.

5.2 The results of shear tests are dependent upon the relative and absolute lengths of specimen which are sheared out and those which are supported.⁵ The results of tests made in accordance with this method should not be directly compared with those determined in other types of tests in which the methods of loading and supporting the specimen are different.

5.3 The presence of a lubricant on the surfaces of the specimen and jig may result in shear strengths up to 3 % lower than those determined in the absence of lubrication.

NOTE 4—In order to be able to test rivets having shanks as short as $2d$, the supported lengths of the specimen are $\frac{1}{2}d$ (Fig. 1), although it is

⁵ Kaufman, J. G., and Davies, R. E. "Effects of Test Method and Specimen Orientation on Shear Strengths of Aluminum Alloys," *ASTM Proceedings*, ASTEA, Am. Soc. Testing Mats., Vol 64, 1964.

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