



Standard Practice for Preparation of Bar and Rod Specimens for Adhesion Tests¹

This standard is issued under the fixed designation D2094; 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 describes bar- and rod-type butt-joined adhesion test specimens and procedures for preparing and bonding them. The specimens are intended to be used with various adherend materials in like or unlike combinations for determining the strength properties of adhesives in accordance with Test Method D2095.

1.2 The values stated in SI units are considered to be the standard. The values 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:²

D907 Terminology of Adhesives

D2093 Practice for Preparation of Surfaces of Plastics Prior to Adhesive Bonding

D2095 Test Method for Tensile Strength of Adhesives by Means of Bar and Rod Specimens

D2651 Guide for Preparation of Metal Surfaces for Adhesive Bonding

2.2 ASTM Adjuncts:

Alignment Fixture Drawings³

3. Terminology

3.1 **Definitions**—Many terms in this practice are defined in Terminology D907.

¹ This practice is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.80 on Metal Bonding Adhesives.

Current edition approved March 1, 2014. Published March 2014. Originally approved in 1962. Last previous edition approved in 2006 as D2094 – 00 (2006). DOI: 10.1520/D2094-00R14.

² 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.

³ Detailed working drawings of the fixtures shown in Fig. 4 and Fig. 5 and their parts are available from ASTM International Headquarters. Order Adjunct No. ADJD2094. Original adjunct produced in 1966.

4. Significance and Use

4.1 The procedures outlined in this practice are designed to standardize the test specimens, surface preparations, combinations of materials, and adhesive selection. Because of the flexibility in the procedure, it is important to have some idea of the kind of properties that will be observed during testing.

5. Test Specimens

5.1 **Geometry**—Test specimens conform to the forms and dimensions shown in Fig. 1, Fig. 2, or Fig. 3. Only the bar specimen (Fig. 1) shall be used for cleavage strength tests. Only the rod specimen (Fig. 2) or the modified bar specimen (Fig. 3) shall be used for tests in torsional shear. A modification of the specimen is permissible in tensile tests with dissimilar adherends, particularly if one of the adherend materials is difficult to machine (for example, glass) or if the strength of the adherend is such that failure under stress occurs at the drilled hole. This modification consists of a sheet of the material approximately 19 mm ($\frac{3}{4}$ in.) square and 1½ to 6 mm ($\frac{1}{16}$ to $\frac{1}{4}$ in.) thick inserted and bonded between the ends of the bar or rod specimens. For comparison purposes, specimen geometry shall be the same unless the effect of insert dimensions is under study.

5.2 Machining of Adherends:

5.2.1 Use metal adherends machined from bar or rod stock with the surface to be bonded finished to 1 μ m.

5.2.2 Machine plastic from laminated flat panels using a diamond charged wheel for rough machining and a carbide-tipped tool for finish machining. Do all machining dry using care not to damage surfaces by overheating or contamination with lubricants. Machine laminar materials so that the axis of the specimen will lie in the plane of the lamina, and so that the plane of the lamina coincides with one side of the specimen with the hole perpendicular to the plane of the lamina. Finish plastic to 80 μ m or better unless studying surface finish.

5.2.3 Nonreinforced plastics (either thermoplastic or thermosetting) molded in a 127 by 12.7 by 12.7-mm (5 by 0.5 by 0.5-in.) bar mold, machined to a 38.1 mm (1.5 in.) length and a hole drilled as shown in Fig. 1. Specimens machined from extruded, cast, or molded plastic rod or sheet are also acceptable.

5.3 Surface Preparation of Adherends: