



Standard Practice for Resistance of Adhesive Bonds to Chemical Reagents¹

This standard is issued under the fixed designation D 896; 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. This practice replaces Method 2011.1 of Federal Test Method Standard No. 175a

1. Scope

1.1 This practice provides a uniform procedure for the exposure of adhesively bonded substrates to selected environments. This practice also provides for a qualitative measure of the adhesive bond strength using existing standard methods after exposure.

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. For specific warnings, see Section 8.*

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:²

- B 117 Practice for Operating Salt Spray (Fog) Apparatus
- D 471 Test Method for Rubber Property—Effect of Liquids
- D 543 Test Method for Resistance of Plastics to Chemical Reagents
- D 907 Terminology of Adhesives
- D 1002 Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal)
- D 1151 Test Method for Effect of Moisture and Temperature on Adhesive Bonds
- D 3164 Test Method for Strength Properties of Adhesively Bonded Plastic Lap-Shear Sandwich Joints in Shear by Tension Loading

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.

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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. Terminology

3.1 **Definitions**—Many terms in this practice are defined in Terminology D 907.

4. Summary of Practice

4.1 Specimens are immersed in selected reagents for a specified time and temperature. The specimens are recovered, dried, and tested in accordance with selected methods, such as Test Methods D 1002 or D 3164.

5. Significance and Use

5.1 This practice is designed to determine the general effects of chemical reagents on the strength of the bonded system. It cannot distinguish between adsorption in the bulk adhesive or penetration at the adhesive/substrate interface.

6. Apparatus

6.1 The apparatus consists of containers for test specimens and a cabinet for maintaining a temperature of $23 \pm 3^{\circ}\text{C}$ ($73 \pm 5^{\circ}\text{F}$). Other suitable apparatus is required for immersing specimens above and below room temperature.

NOTE 1—Exercise care in the choice of materials with respect to adherend and containers. Confirm that they are unaffected by the chemicals and solvents used in this practice.

6.2 Apparatus for making strength tests is specified in the method for the property to be measured.

7. Reagents

7.1 Directions for preparations of reagents are for approximately 1-L quantities. All percentages are by weight.

7.2 Standard chemical reagents are selected from the list given in Test Method D 543. Standard oils and fuels are selected from the list given in Test Method D 471.

7.3 **Distilled Water**—Freshly prepared distilled water is used wherever water is specified in this practice.

8. Supplementary Reagents (see 7.1)

8.1 Hydrocarbon Mixture No. 1:

Isooctane (2,4-trimethylpentane)

600 mL