



Designation: D 896 – 97

Standard Test Method 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 approval. 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 test method replaces Method 2011.1 of Federal Test Method Standard No. 175a

1. Scope

1.1 This test method provides a uniform procedure for the exposure of adhesively bonded substrates to selected environments. This test method 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 precautions, see Section 8.*

1.3 Values stated in SI units are to be regarded as the standard.

2. Referenced Documents

2.1 ASTM Standards:

- B 117 Practice for Operating Salt Spray (Fog) Apparatus²
- D 471 Test Method for Rubber Property—Effect of Liquids³
- D 543 Test Method for Resistance of Plastics to Chemical Reagents⁴
- D 907 Terminology of Adhesives⁵
- D 1151 Test Method for Effect of Moisture and Temperature on Adhesive Bonds⁵

3. Terminology

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

4. Summary of Test Method

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.

¹ This test method is under the jurisdiction of ASTM Committee D-14 on Adhesives and is the direct responsibility of Subcommittee D14.80 on Metal Bonding Adhesives.

Current edition approved March 10, 1997. Published April 1998. Originally published as D 896 – 46. Last previous edition D 896 – 92.

² *Annual Book of ASTM Standards*, Vol 03.02.

³ *Annual Book of ASTM Standards*, Vol 09.01.

⁴ *Annual Book of ASTM Standards*, Vol 08.01.

⁵ *Annual Book of ASTM Standards*, Vol 15.06.

5. Significance and Use

5.1 This test method 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 shall consist of containers for test specimens and a cabinet for maintaining a temperature of $23 \pm 1.1^\circ\text{C}$ ($73.4 \pm 2^\circ\text{F}$). Other suitable apparatus will be required for conducting immersion tests 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 test method.

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 test method.

8. Supplementary Reagents (see 7.1)

8.1 Hydrocarbon Mixture No. 1:

Isooctane (2,4-trimethylpentane)	600 mL
Toluene	200 mL
Xylene	150 mL

8.2 Standard Jet Fuel No. 1:

Toluene	300 mL
Cyclohexane	600 mL
Isooctane (2,4-trimethylpentane)	100 mL
n-Butyl disulfide	10 mL
n-Butyl mercaptan (equivalent to 0.005 weight % of mercaptan sulfur)	0.125 g

8.3 Standard Jet Fuel No. 2:

Toluene	300 mL
Cyclohexane	600 mL
Isooctane (2,4-trimethylpentane)	100 mL