Designation: D1828 – 01 (Reapproved 2013)

Standard Practice for Atmospheric Exposure of Adhesive-Bonded Joints and Structures[1]

This standard is issued under the fixed designation D1828; 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 covers the procedure for the direct exposure of adhesive bonded joints and structures to natural atmospheric environments.

1.2 The procedure for sheltered atmospheric exposure, such as a Stevenson screen (**1**),[2] of adhesive-bonded joints and specimens is the same except for the requirements of facing south and measurement of solar radiation.

1.3 This practice is limited to the procedure by which samples are exposed and does not cover the tests that may be used to evaluate the effects of atmospheric exposure on these adhesive-bonded joints and structures. These samples could be any one of several varieties.

1.3.1 A complete structure for test,

1.3.2 A section of a structure for test,

1.3.3 A complete structure or section with strength observations on specimens cut therefrom,

1.3.4 Test specimens themselves, or

1.3.5 Any of the above, mounted under stress.

1.4 Suitable test methods for evaluation of the effects of exposure include nondestructive qualitative or quantitative observations on the same sample at prescribed intervals, or destructive tests on separate sets of specimens in accordance with such tests as Test Method D1002.

NOTE 1—See Test Methods D896 and D897.

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

1.6 *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:*[3]

D896 Practice for Resistance of Adhesive Bonds to Chemical Reagents

D897 Test Method for Tensile Properties of Adhesive Bonds

D907 Terminology of Adhesives

D1002 Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal)

2.2 *ASTM Adjuncts:*

ASTM Standard Racks and Pipe Frames Blueprints[4]

3. Terminology

3.1 *Definitions:*

3.1.1 Many terms used in this practice are defined in Terminology D907.

4. Significance and Use

4.1 The atmospheric exposure tests described in this practice will evaluate the stability of the adhesive bond only in terms of a particular natural atmosphere. Since the atmospheric conditions vary greatly from year to year, these results will not be as reproducible as those derived from laboratory aging procedures. Considerable research has shown that laboratory artificial weathering tests will not give consistently good correlation with outdoor test exposures (**2**, **3**, **4**).

5. Exposure Sites

5.1 The choice of exposure sites is dependent upon the objective of the particular test program.

5.2 In the cases of both metallic and nonmetallic adherends, choose exposure sites to include variations in average temperature (and temperature range), relative humidity, and precipitation.

[1] This practice is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.40 on Adhesives for Plastics.

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[2] The boldface numbers in parentheses refer to the list of references at the end of this practice.

[3] 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.

[4] Blueprints of ASTM standard racks and pipe frames may be obtained from ASTM International Headquarters. Order Adjunct No. ADJD1828. Original adjunct produced in 1957.