Designation: D 3808 – ~~96~~01

Standard Test Method for Qualitative Determination of Adhesion of Adhesives to Substrates by Spot Adhesion[1]

This standard is issued under the fixed designation D 3808; 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 test method covers a simple qualitative procedure for quickly screening whether an adhesive will, under recommended application conditions, bond to a given substrate without actually making bonded assemblies.

1.2 The values stated in SI units are to be regarded as 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:*

D 907 Terminology of Adhesives[2]

[1] This test method is under the jurisdiction of ASTM Committee D=14 on Adhesives and is the direct responsibility of Subcommittee D14.40 on Adhesives for Plastics. Current edition approved ~~Sept.~~ Oct. 10, ~~1996.~~ 2001. Published ~~November 1996.~~ December 2001. Originally published as D 3808 – 79. Last previous edition D 3808 – 9~~2~~6.

E 171 Specification for Standard Atmospheres for Conditioning and Testing Flexible Barrier Materials[3]

3. Terminology

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

3.1.1 *spot adhesion, n*—a qualitative method of determining adhesion by attempting to pry a "spot" of cured adhesive from a substrate.

4. Summary of Test Method

4.1 Spots of adhesive (size can vary, but generally about 6 mm (¼ in.) in diameter) are placed onto a substrate using the application procedure and curing conditions acceptable to both user and supplier of the adhesive.

4.2 The substrate preparation and environmental exposure of the spot of adhesive after cure or setting can be varied as desired.

4.3 The determination of whether an adhesive bonds to the substrate is made by simply trying to pry the spot of adhesive from the substrate.

4.4 The mode of failure is readily evident by examining whether the bond separated adhesively or cohesively, either in the adhesive or substrate.

5. Significance and Use

5.1 This is a quick, simple, and inexpensive test method for qualitatively determining, without the need to prepare bonded test specimens, whether the adhesive under consideration will bond to a particular substrate. If the results are acceptable, then standard quantitative adhesive test procedures can be used to obtain quantitative measurements of the adhesive's performance.

5.2 This test method can also be used to compare relative adhesion of several adhesives to given substrates.

5.3 It can be used to determine whether an adhesive will continue to adhere to the substrate under specified environmental conditions.

5.4 It can be used to evaluate adhesion of a particular adhesive to a variety of substrates.

5.5 It can be used to obtain "subjective" comparative data between several adhesives on a given substrate by noting the relative ease of inducing failure between the adhesives tested.

5.6 It should be most applicable to adhesives that cure or set when exposed to "air" (ambient, heated, etc.) and could be used for anaerobic adhesives if testing is carried out in an oxygen-free atmosphere.

6. Apparatus

6.1 No special equipment is needed for application of the adhesive to the test substrate(s). When using hot-melt adhesives, for example, it would be desirable to have a hand-gun applicator or equivalent apparatus to allow deposition of the hot-melt at a recommended application temperature. The use of such equipment is not mandatory as a hot plate can be used to melt a quantity of the hot melt to the application temperature in a deformable container such as an aluminum weighing dish. Upon reaching proper temperature, the hot melt can be poured onto the substrate after forming a pouring spout in the container.

6.2 For some applications it is desirable to preheat the substrate. For this reason an oven or other heat source would be useful.

6.3 To test adhesion of the adhesive spot, a thin stainless steel spatula or similar probe is needed ~~as a prying lever.~~ to pry or lift the spot from the substrate.

7. Test Specimen

7.1 Any form or shape of the substrate is acceptable. It is advisable to place several spots of the same adhesive onto the substrate.

7.2 In most cases, it is most efficient to test several adhesives on the same substrate sample.

8. Conditioning

8.1 Store the test specimens at the test conditions for 24 h, unless other test time is described. Note this when recording data. If other conditions are not specified, the storage and test conditions shall be 23 ± 2°C and 50 ± 5 % relative humidity. Specification E 171 details these and other test conditions.

9. Failure

9.1 Failure is a visible separation of the adhesive spot either adhesively from the substrate or cohesively in the adhesive or substrate.

9.2 The ease of separation of the adhesive spot can be used to compare the relative performance of the adhesives.

10. Procedure

10.1 Run the tests in the same environment used to condition the test specimens and test apparatus.

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[2] *Annual Book of ASTM Standards*, Vol 15.06.

[3] *Annual Book of ASTM Standards*, Vol 15.09.

10.2 Using a thin-bladed stainless steel spatula or probe, try to separate the adhesive spot from the substrate.

10.3 Note the type and ease of failure as described in Section 9.

11. Report

11.1 Report the following information:

11.1.1 Method of specimen preparation, that is, adhesive used, method of cure, substrate preparation, preheating of substrate, if hot-melt was used, application temperature, and any other relevant information.

11.1.2 Conditioning exposure.

11.1.3 Mode of failure, that is, *adhesive* to substrate or *cohesive* in adhesive or substrate, or both; relative ease of failure and any visible change in substrate due to adhesive attack, for example, discoloration, crazing, softening, etc.

12. Precision and Bias

12.1 No information is presented about either precision or bias of this test method, since the test result is nonquantitative.

13. Keywords

13.1 hot melt adhesive; spot adhesion; structural adhesive