



Designation: F 1842 – 97

Standard Test Method for Determining Ink or Coating Adhesion on Plastic Substrates for Membrane Switch Applications¹

This standard is issued under the fixed designation F 1842; 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 is based on existing Test Method D 3359D 3359, with modifications to make it suitable for plastic substrates and membrane switches.

1.2 Despite the problems associated with a tape test on plastic substrates, it is our belief that this is still one of the best ways to test ink and coating for adhesion for membrane switch applications. In writing this test method we are addressing several of the objections to the test method that could affect its precision and repeatability on plastic substrates.

1.3 These test methods cover whether the adhesion of coating or ink to a substrate is at an acceptable level. They do not distinguish between higher levels of adhesion, for which more sophisticated methods of measurement may be required.

NOTE 1—It should be recognized that differences in adherability of the ink or coating surface can affect the results obtained with inks or coatings having the same inherent adhesion.

1.4 In multi-coat systems adhesion failure may occur between coats, so that the adhesion of the coating system to the substrate is not determined.

1.5 This test method is specifically designed for measuring adhesion of inks and coatings (films) that have a thickness of 5 mil (125 microns) or less, on plastics such as polyester and polycarbonate.

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:*

D 3359 Test Methods for Measuring Adhesion by Tape Test.²

3. Summary of Test Method

3.1 A lattice pattern with six cuts in each direction is made in the ink or coating to the substrate. Pressure sensitive tape is

applied over the lattice and then removed, and adhesion is evaluated by comparison with the descriptions and illustrations.

4. Significance and Use

4.1 If the ink or coating is to fulfill its function, it must adhere to the substrate. Substrates and their surface preparation have a significant effect on the adhesion of inks or coatings. Therefore, a method of evaluating adhesion of inks or coatings to different substrates or surface treatments, or of different inks or coatings to the same substrate and surface treatment, is useful to the industry.

4.2 The limitations of all adhesion methods and the specific limitation of this test method to lower levels of adhesion should be recognized before using it. The intra- and inter-laboratory precision of this test method is under evaluation.

4.3 Printing area to be tested should be a solid area large enough to include the entire cross hatch pattern.

5. Interferences

The type of tape used should be compatible with the type of inks used.

6. Apparatus

6.1 *Cutting Tool*—A multi-blade cutter having a cutting edge angle between 15 and 30 degrees that will make six cuts at once that are 2 mm apart. It is of particular importance that the cutting edges be in good condition.

NOTE 2—Dull cutting edges require more pressure on the tool, which increases the difficulty in controlling the depth of the cuts. Dull edges can also rupture or chip the substrate, ink, or coating and thus yield inconsistent or inaccurate results.

6.2 *Tape*—One inch (25 mm) wide clear or semi-transparent pressure sensitive tape with an adhesion strength agreed upon by the supplier and the user is needed. Because of the variability in adhesion strength from batch-to-batch and with time, it is essential that tape from the same batch be used when tests are to be run in different laboratories. If this is not possible, the test method should be used only for ranking a series of test coatings.

6.3 *Illumination and Magnification*—This is helpful in order to determine if the cuts have been made through the inks and or coatings.

¹ This practice is under the jurisdiction of ASTM Committee F-1 on Electronics and is the direct responsibility of Subcommittee F01.18 on Membrane Switches. Current edition approved Dec. 10, 1997. Published February 1998.

² *Annual Book of ASTM Standards*, Vol 06.01.