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Standard Methods for MEASURING ADHESION BY TAPE TEST[1]

This Standard is issued under the fixed designation D 3359; 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.

1. Scope

1.1 These methods cover procedures for assessing the adhesion of coating films to metallic substrates by applying and removing pressure-sensitive tape over cuts made in the film.

1.2 Method A is primarily intended for use at job sites while Method B is more suitable for use in the laboratory. Also, Method B is not considered suitable for films thicker than 5 mils (125 μm).

1.3 These methods are used to establish whether the adhesion of a coating to a substrate is at a generally adequate level. They do not distinguish between higher levels of adhesion for which more sophisticated methods of measurement are required.

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

2. Applicable Documents

2.1 *ASTM Standards:*

D 609 Preparation of Steel Panels for Testing Paint, Varnish, Lacquer, and Related Products[2]

D 823 Producing Films of Uniform Thickness of Paint, Varnish, Lacquer, and Related Products on Test Panels[2]

D 1000 Testing Pressure-Sensitive Adhesive Coated Tapes Used for Electrical Insulation[3]

D 1730 Recommended Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting[2]

D 2092 Recommended Practice for Preparation of Zinc-Coated Steel Surfaces for Painting[2]

3. Summary of Methods

3.1 *Method A*—An X-cut is made in the film to the substrate, pressure-sensitive tape is applied over the cut and then removed, and adhesion is assessed qualitatively on the 0 to 5 scale.

3.2 *Method B*—A lattice pattern with either six or eleven cuts in each direction is made in the film to the substrate, pressure-sensitive tape is applied over the lattice and then removed, and adhesion is evaluated by comparison with descriptions and illustrations.

METHOD A—X-CUT TAPE TEST

4. Apparatus and Materials

4.1 *Cutting Tool*—Sharp razor blade, scalpel, knife or other cutting device. It is of particular importance that the cutting edges be in good condition.

4.2 *Cutting Guide*—Steel or other hard metal straightedge to ensure straight cuts.

4.3 *Tape*—One-inch (25-mm) wide semi-transparent pressure-sensitive tape with an adhesion strength of 36 ± 2.5 oz/in. (40 ± 2.8 g/mm) width when tested in accordance with Method D 1000. The adhesion shall not change by more than ± 5 % of its mean value within 12 months. An adhesive composed of resin and 100 % crude rubber is reported to meet these

[1] These methods are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings and Materials and are the direct responsibility of Subcommittee D01.23 on Physical Properties of Applied Paint Films.

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[2] *Annual Book of ASTM Standards*, Part 27.

[3] *Annual Book of ASTM Standards*, Part 39.