

Submitted for recognition as an American National Standard

**ABRASION RESISTANCE TESTING—VEHICLE EXTERIOR GRAPHICS AND PIN STRIPING**

**Foreword**—This Document has not changed other than to put it into the new SAE Technical Standards Board Format.

This recommended practice has been developed by the SAE Graphics Task Force of the Decorative Tapes and Molding Subcommittee of the SAE Nonmetallic Materials Committee. The Decorative Tape and Molding Subcommittee was formed in 1984. The objectives of the committee are to develop SAE Standards, Recommended Practices, and Information Reports relative to automotive applications of decorative tapes and moldings.

1. **Scope**—This SAE Recommended Practice applies to the abrasion resistance testing of decorative tapes, graphics, and pin striping. It may also have relevance to certain vehicle labels and plastic wood grain film.

The resistance to abrasive damage is judged qualitatively by its effect on the legibility, pattern, and color of the graphic marking.

This recommended practice is intended as a guide toward standard practice but may be subject to frequent change to keep pace with experience and technical advances. This should be kept in mind when considering the use of this recommended practice.

1.1 **Purpose**—The purpose of this recommended practice is to establish a uniform practice for testing the abrasion resistance of decorative tapes and moldings.

2. **References**—There are no referenced publications specified herein.

3. **Significance and Use**—The plastic decorative tapes and graphic marking films are subject to the abrasive forces of wiping, cleaning, automatic washes, and various exterior environments.

4. **Apparatus**

4.1 **Abrader**—A Teledyne Taber Abraser, Model 174, or its equivalent, complete with vacuum accessory. The abraser should be capable of using "Calibrase" type abrasive wheels under 250, 500, and 1000 g loads.

4.2 **Abrasive Wheels**—"Calibrase" brand, grade CS-17 wheels as supplied by Teledyne Taber.

4.3 **Resurfacing Pads**—150 grit silicon carbide sand paper or equivalent, Teledyne Taber part number S-11.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-8512 FAX: (724) 776-0243  
TO PLACE A DOCUMENT ORDER; (724) 776-4970 FAX: (724) 776-0790  
SAE WEB ADDRESS <http://www.sae.org>

- 4.4 Test Panel**—A clean cold rolled steel panel, 102 mm (4 in) square. A 6.0 mm (1/4 in) hole is centrally located in the panel. The panel thickness should be approximately 1.0 mm (0.04 in). The Teledyne Taber catalog number for such panels is S-16.
- 5. Test Samples**—The test specimens should be of sufficient size to cover the entire surface of the test panel. When the specimen size is too small to cover an entire panel, this should be noted and the material should be mounted to maintain a contiguous test surface.
- 6. Conditioning**
- 6.1** The test materials should be conditioned at  $23\text{ }^{\circ}\text{C} \pm 2$  ( $73.4\text{ }^{\circ}\text{F} \pm 3.6$ ) and  $50\% \pm 5$  relative humidity for not less than 40 h prior to testing.
- 6.2** The abrasion testing should be conducted under standard laboratory conditions as previously outlined.
- 7. Procedure**
- 7.1** The test material should be mounted on the steel test panel in a manner that insures a smooth even application of the film. There should be no entrapped air dirt or wrinkles, which can interfere with the even abrasion of the test surface. Use a separate test panel for each abrasion test.
- 7.2** Attach the pair of CS-17 wheels, but do not handle them by their abrasive surfaces. Attach the weights to produce a 500 g load on the panel surface. The proper weighting requires the use of counterweights to balance the weight of the wheels. Used wheels can be used for this purpose. Mount a refacing pad on the abramer turntable.
- 7.2.1** The vacuum cleaner attachment should be used to remove residue from the refacing pad or test panel. The vacuum nozzle height should be adjusted to within 0.8 to 1.6 mm (1/32 to 1/16 in) of the surface.
- Set the vacuum to a setting of 80 or higher. The vacuum is used only during the refacing process and not during actual testing.
- 7.2.2** New wheels should be refaced for 100 cycles or until a uniform surface is achieved, whichever is greater. Reface previously used wheels for 25 cycles. Reface the wheels for 25 cycles before abrading each test sample. After refacing, brush any residue from the wheels; however, be certain not to touch the surface of the refaced wheels.
- 7.2.3** Discard the refacing pad after using once.
- 7.3** Mount the test panel on the turntable; lower the abrasive wheels carefully onto the test surface. Start the abramer. Expose the test panel to abrasion for the number of cycles specified or until the specified end point is reached. Remove any residue from the test panels with a soft brush. Label each test panel on the film surface with the number of cycles to which it was exposed. Reface the wheels between tests in order to remove abraded materials that collect during the test.
- 7.4** The failure definition is left to the discretion of the tester or specifier. Failures may be determined by appearance after testing to a specified number of cycles. A loss in legibility or wear through to a second surface can be considered a failure point. Abrasion resistance can also be measured by the weight loss of the sample after testing or as the number of abrasion cycles until initial wear through.