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SURFACE VEHICLE RECOMMENDED PRACTICE

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TEST METHOD FOR DETERMINING RESISTANCE TO ABRASION; BEARDING; AND FIBER LOSS OF AUTOMOTIVE CARPET MATERIALS

SCOPE:

This SAE Recommended Practice contains a test method for determining abrasion resistance, two methods for determining fiber loss, and a method for bearding resistance useful for evaluating automotive carpet materials.

A. RESISTANCE TO ABRASION

1. SCOPE:

This method of test is used to determine the resistance to abrasion of automotive carpet materials.

2. MATERIALS AND EQUIPMENT REQUIRED[1]:

2.1 Taber Abraser Model No. 174 or equivalent, complete with vacuum accessory.

2.2 H-18 wheels.

2.3 1000 g weights.

2.4 S.11 Abrasive Paper.

2.5 Mounting card S37, or equivalent.

[1]Available from: Teledyne Taber, 455 Bryant St., North Tonawanda, NY 11435 (Mfg. of Taber Abraser).

3. TEST SPECIMENS:

Test specimens are prepared by folding a 108 x 108 mm sample (or equivalent circular sample) once in each direction and then clipping the folded point to produce a small center hole to fit over the turntable clamping screw. Specimens are then conditioned at 23 ± 2°C and 50 ± 3% relative humidity for 24 h.

Unless otherwise specified, samples shall be taken no nearer the selvage edge than 1/10 width of the material.

4. PROCEDURE:

4.1 Mount the refacing disc holder on the Taber Abraser and fasten to the disc holder a piece of S-11 abrasive paper.

4.2 Adjust test instrument for a 1000 g load. Loosen the knurled cap nuts and install the new set of wheels on their respective flanged holders as indicated by the printing on the side of the wheel. The one marked right side fits on the right hand mounting with printed side out; the same with the left. The nut is then replaced and moderately tightened. Check the wheels for alignment.

4.3 Reface abrasive wheels a minimum of 10 cycles by running them against the S-11 abrasive paper disc mounted on the refacing disc holder. (Note: More cycles may be necessary to clean and true the wheels.)

4.4 The wheels must be refaced before each test run to remove abraded materials from the wheels that collected in the prior test.

4.5 If the wheels are worn out of round, crowned, or excessively clogged with abraded material, they should be dressed using the diamond refacer until the condition is corrected. In cases of doubt about the condition of the abrasive wheels, new wheels should be used.

4.6 Clean the refaced abrasive wheels to remove any loose particles.

4.7 Place test specimen on the turntable. Adjust the clamping ring to a tight fit over the specimen and holder, and press the hold-down ring over the circumference of the holder to pull the test material taut. (A mounting card or equivalent may be necessary to stabilize the sample.)

4.8 Remove any wrinkles in the test specimen by adjusting the specimen edges under the clamping ring. Then, tighten the adjusting screw of the ring. Place the washer over the turntable screw and tighten the nut.

4.9 Lower the abrasive wheels carefully from their upright position to the surface of the test specimen. Set the counter mechanism at zero.

4.10 Position the vacuum nozzle along the diameter of the turntable 3 mm above the surface of the test specimen and set the vacuum dial in the range of 60-70.

4.11 Turn on the vacuum and start the Taber Abraser.

4.12 Run the specimen the number of cyles specified and remove for evaluation.

B. FIBER LOSS
METHOD A - BY WEIGHT OF FIBER

1. SCOPE:

This procedure is used to determine the ability of a material to withstand fiber pull out.

2. MATERIALS AND EQUIPMENT REQUIRED:

2.1 Taber Model 174 or equivalent equipped with a vacuum attachment.

2.2 H-18 Abraser wheels.

2.3 1000 g weights.

2.4 Double-backed masking tape (Minnesota Mining & Manufacturing's No. 400) or equivalent.

2.5 S-11 Abrasive paper.

2.6 Crockmeter Cloth 80 x 84 thread count, combed cotton, desized, bleached. Available from: Test Fabrics, Inc., P.O. Box 118, 200 Blackford Avenue, Middlesex, NJ 08846.

2.7 Calibrated Balance.

3. TEST SPECIMENS:

Test specimens are prepared by folding a 108 x 108 mm sample (or equivalent circular sample) once in each direction and then clipping the folded point to produce a small center hole to fit over the turntable clamping screw. Specimens are then conditioned at 23 ± 2°C and 50 ± 3% relative humidity for 24 h.

Unless otherwise specified, samples shall be taken no nearer the selvage edge than 1/10 the width of the material.

4. PROCEDURE:

4.1 Apply a piece of double-backed masking tape, cut to a 110 mm diameter, to the back side of the specimen.

NOTE: Remove the protective paper from the tape.

4.2 Clean the abraser wheels. If the edges become chipped, do not use.

NOTE: The surface of the wheels shall be re-surfaced (using S-11 Abrasive paper) for 10 cycles after each use. Remove the rubber disk on the specimen table before re-surfacing the wheels. Be sure that all grit is removed from the wheels after re-surfacing.

4.3 Remove any loose fibers by vacuuming, brushing, or blowing with a low pressure air hose.

4.4 Place the specimen, the retainer, and knurled nut on the table. Tighten to hold securely.

4.5 Place the outer clamp on the sample.

4.6 Cover the vacuum hose with a piece of the crockmeter cloth, to collect the abraded fiber and insert the hose into the vacuum port of the Taber Abraser.

4.7 Lower the weighted arms of the Taber machine and the vacuum arm making sure the vacuum opening is approximately 3 mm above the specimen.

4.8 Set the counter to "zero."

4.9 Turn the machine on and run for 300 cycles.

4.10 Upon completion of the specified cycles, turn machine off and lift the weighted arms and the vacuum arm.

4.11 Turn the machine on and run for 25 cycles to insure that all loose fibers in the hose will be collected on the woven cloth.

4.12 Remove the hose from the vacuum port of the Taber Abraser.

4.13 Carefully remove all fibers from the crockmeter cloth.

4.14 Carefully remove all short fibers from the collected bundle.

4.15 Weigh the long fibers and report results in grams.

METHOD B - WEIGHT OF SPECIMEN

1. SCOPE:

This procedure is used to determine the resistance of carpets and other floor covering materials to fiber loss.

2. MATERIALS AND EQUIPMENT REQUIRED:

2.1 Taber Model 174 or equivalent equipped with a vacuum attachment.

2.2 Mounting card No. S-37 (or equivalent).

2.3 H-18 wheels.

2.4 Calibrated balance.

2.5 Clear plastic bags suitable for retaining the collected fiber.

2.6 Crockmeter cloth 80 x 84 thread count, combed cotton, desized, bleached. Available from Test Fabrics, Inc., P.O. Box 118, 200 Blackford Avenue, Middlesex, NJ 08846.

3. TEST SPECIMENS:

Test specimens are prepared by folding a 108 x 108 mm sample (or equivalent circular sample) once in each direction and then clipping the folded point to produce a small center hole to fit over the turntable clamping screw. Specimens are then conditioned at 23 ± 2°C relative humidity and 50 ± 3% relative humidity for 24 h.

Unless otherwise specified, samples shall be taken no nearer the selvage edge than 1/10 the width of the material.

4. PROCEDURE:

4.1 Mount the test specimen on an S-37 mounting card.

4.2 Set the vacuum control on the Taber Abraser in the range of 60-70. Remove the vacuum hose from the Taber Abraser and vacuum the top surface of the specimen to remove any loose fiber. Replace the vacuum hose in the Taber Abraser.

4.3 Weigh the specimen, on the mounting card, to the nearest milligram (W_1).

4.4 Cover the vacuum hose with a piece of the crockmeter cloth, to collect the abraded fiber and insert the hose into the vacuum port of the Taber Abraser.

4.5 Select the proper weights as designated by the engineering material specification, and mount them on the apparatus.

4.6 Place the assembled test specimen on the abrading machine, lower the wheels and adjust the vacuum pick-up nozzle to 3 mm above the test specimen.

4.7 Maintain the vacuum control at 60-70.

4.8 Abrade the specimen for 300 cycles.

4.9 Remove the vacuum hose from the vacuum port, carefully holding the crockmeter cloth, and place the collected fiber into a small plastic bag and retain. Discard the crockmeter cloth.

4.10 Vacuum the top surface of the specimen with the vacuum hose, to remove any loose fiber. Replace the vacuum hose in the Taber Abraser.

4.11 Remove the sample from the specimen holder and weigh the specimen, on the mounting card, to the nearest milligram (W_2).

4.12 Calculate fiber loss in grams (W_3) as follows:

$$W_3 = W_1 - W_2$$

4.13 Remount the sample on the specimen holder and continue to abrade the sample to the number of cycles specified for the applicable abrasion requirement in the engineering material specification, without collecting fiber, and report per the engineering specification.

C. RESISTANCE TO BEARDING (FUZZING)

1. SCOPE:

This method of test is used to determine the resistance to bearding of automotive carpet materials.

2. APPARATUS AND MATERIAL REQUIRED:

2.1 Available from J. K. Industries, P.O. Box 6, Villa Park, IL 60181 Wyzenbeek Wear Tester or equivalent.

The hardness of the rubber pads should remain between 55-75 when tested with a type "OO" durometer on the flat surfaces. Rubber pads which do not fit snugly in their respective holders should be replaced.

Due to misalignment or wear during use, the following procedure should be performed when necessary; after cleaning the drum surface with a solvent, insert a piece of 36 grit sandpaper and clamp into position. Lower the arms removing all applied pressure and abrade the rubber pad for 400 cycles or until they conform to the shape of the drum. Clean the resurfaced rubber pad with a stiff brush and re-insert in the same holder and in the same position. Once a rubber pad has been put through this procedure do not use in any other holder without re-surfacing.

2.2 Vernon Roll Grip No. 707 Rubber Abraidant (available from Vernon Rubber Co. Inc., P.O. Box 131, Danbury, CT 06810).

3. TEST SPECIMENS:

Test specimens 63.5 x 230 mm are prepared to template (Figure 1) size in both warp and fill directions. Condition the test specimens for a minimum of 16 h at 23 ± 2°C and 50 ± 5% relative humidity. Unless otherwise specified, samples shall be taken no nearer the selvage edge than 1/10 the width of the material.

4. PROCEDURE:

4.1 Place the specimen in the clamps with the long dimension parallel to the direction of abrasion. (Sample may be backed with masking tape if necessary).

4.2 Draw the specimen tight enough to bring the weighted tension scale bar into a horizontal position using a 1.35 kg dead weight load.

4.2 (Continued):

NOTE: If the specimen stretches during the test, bring the scale bar back into a horizontal position by adjusting the screw behind the rear clamp.

4.3 Set the weight on the pressure bar at 0.9 kg.

4.4 Set the counter to "Zero."

4.5 Abrade the specimen for the required number of cycles.

4.6 Remove the specimen from the wear tester for evaluation.

4.7 Change the abradant for each set of specimens.

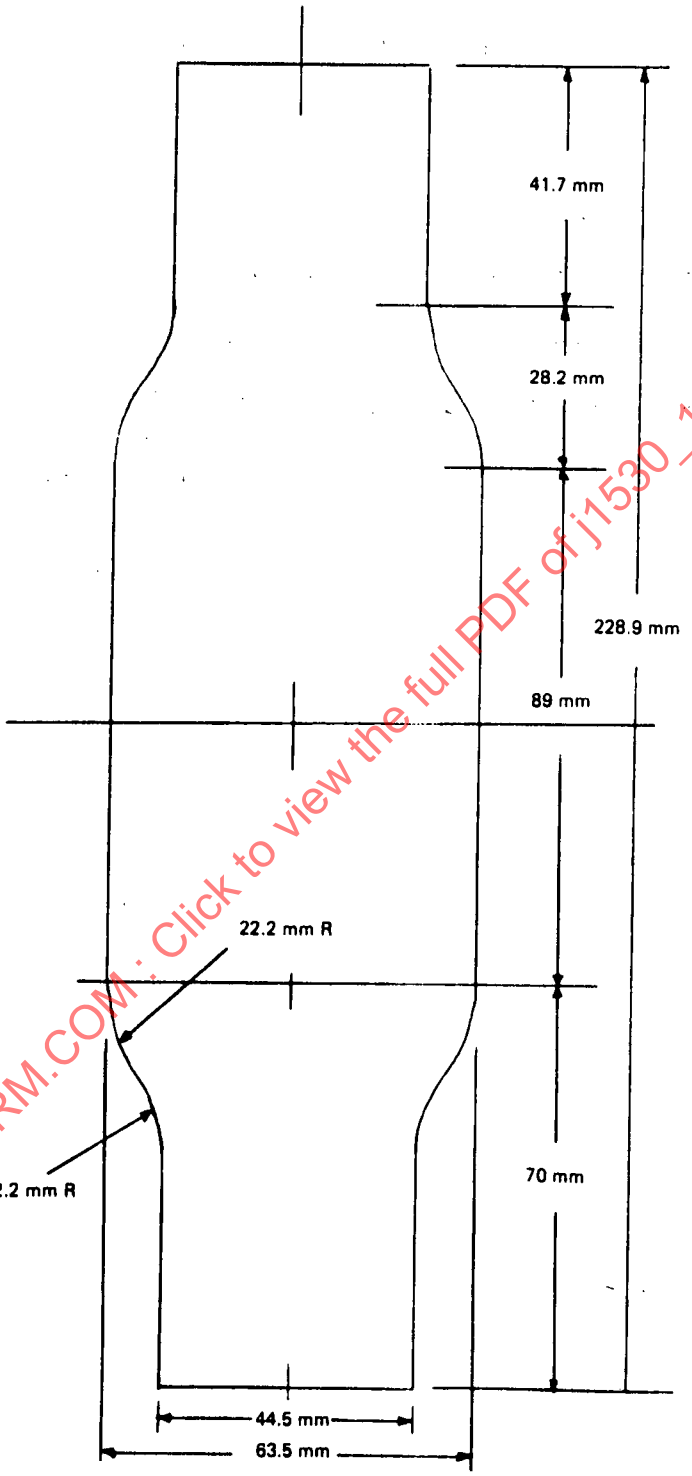

FIGURE 1