Designation: D 3884 – 09

Standard Test Method for Abrasion Resistance of Textile Fabrics (Rotary Platform, Double-Head Method)[1]

This standard is issued under the fixed designation D 3884; 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 the determination of the abrasion resistance of textile fabrics using the rotary platform, double-head tester (RPDH).

NOTE 1—Other procedures for measuring the abrasion resistance of textile fabrics are given in Test Methods D 3885, D 3886, D 4157, D 4158, D 4966, and AATCC 93.

1.2 The values stated in SI units are to be regarded as standard: the values in English units are provided as information only and are not exact equivalents.

1.3 *This standard does not purport to address all of the safety problems, 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:*[2]

D 123 Terminology Relating to Textiles
D 1776 Practice for Conditioning and Testing Textiles
D 3885 Test Method for Abrasion Resistance of Textile Fabrics (Flexing and Abrasion Method)
D 3886 Test Method for Abrasion Resistance of Textile Fabrics (Inflated Diaphragm Apparatus)
D 4157 Test Method for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder Method)
D 4158 Guide for Abrasion Resistance of Textile Fabrics (Uniform Abrasion)
D 4850 Terminology Relating to Fabrics and Fabric Test Methods
D 4966 Test Method for Abrasion Resistance of Textile Fabrics (Martindale Abrasion Tester Method)
D 5034 Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)
D 5035 Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
D 7255 Test Method for Abrasion Resistance of Leather (Rotary Platform, Double-Head Method)

2.2 *Other Documents:*

AATCC 93 Abrasion Resistance of Fabrics: Accelerator Method[3]

3. Terminology

3.1 For all terminology relating to D13.60, Fabric Test Methods, Specific, refer to Terminology D 4850.

3.1.1 The following terms are relevant to this standard: abrasion, abrasion cycle, breaking force.

3.2 For all other terminology related to textiles, refer to Terminology D 123.

4. Summary of Test Method

4.1 A specimen is abraded using rotary rubbing action under controlled conditions of pressure and abrasive action. The test specimen, mounted on a turntable platform, turns on a vertical axis, against the sliding rotation of two abrading wheels. One abrading wheel rubs the specimen outward toward the periphery and the other, inward toward the center. The resulting abrasion marks form a pattern of crossed arcs over an area of approximately 30 cm^2. Resistance to abrasion is evaluated by various means which are described in Section 13.

5. Significance and Use

5.1 The measurement of the resistance to abrasion of textile and other materials is very complex. The resistance to abrasion is affected by many factors, such as the inherent mechanical properties of the fibers; the dimensions of the fibers; the structure of the yarns; the construction of the fabrics; and the type, kind, and amount of finishing material added to the fibers, yarns, or fabric.

5.2 The resistance to abrasion is also greatly affected by the conditions of the tests, such as the nature of abradant, variable action of the abradant over the area of specimen abraded, the

[1] This test method is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.60 on Fabric Test Methods, Specific.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from American Association of Textile Chemists and Colorists (AATCC), P.O. Box 12215, Research Triangle Park, NC 27709, http://www.aatcc.org.

tension of the specimen, the pressure between the specimen and abradant, and the dimensional changes in the specimens.

5.3 Abrasion tests are all subject to variation due to changes in the abradant during specific tests. The abradant must

of predicted durability from specific abrasion data. Laboratory tests may be reliable as an indication of relative end-use performance in cases where the difference in abrasion resistance of various materials is large, but they should not be relied

tension of the specimen, the pressure between the specimen and abradant, and the dimensional changes in the specimens.

5.3 Abrasion tests are all subject to variation due to changes in the abradant during specific tests. The abradant must accordingly be discarded at frequent intervals or checked periodically against a standard. With disposable abradants, the abradant is used only once or discarded after limited use. With permanent abradants that use hardened metal or equivalent surfaces, it is assumed that the abradant will not change appreciably in a specific series of tests. Similar abradants used in different laboratories will not change at the same rate, due to differences in usage. Permanent abradants may also change due to pick up of finishing or other material from test fabrics and must accordingly be cleaned at frequent intervals. The measurement of the relative amount of abrasion may also be affected by the method of evaluation and may be influenced by the judgment of the operator.

5.4 The resistance of textile materials to abrasion as measured on a testing machine in the laboratory is generally only one of several factors contributing to wear performance or durability as experienced in the actual use of the material. While "abrasion resistance" (often stated in terms of the number of cycles on a specified machine, using a specified technique to produce a specified degree or amount of abrasion) and "durability" (defined as the ability to withstand deterioration or wearing out in use, including the effects of abrasion) are frequently related, the relationship varies with different end uses, and different factors may be necessary in any calculation of predicted durability from specific abrasion data. Laboratory tests may be reliable as an indication of relative end-use performance in cases where the difference in abrasion resistance of various materials is large, but they should not be relied upon where differences in laboratory test findings are small. In general, they should not be relied upon for prediction of actual wear-life in specific end uses unless there are data showing the specific relationship between laboratory abrasion tests and actual wear in the intended end-use.

5.5 These general observations apply to all types of fabrics, including woven, nonwoven, and knit apparel fabrics, household fabrics, industrial fabrics, and floor coverings. It is not surprising, therefore, to find that there are many different types of abrasion testing machines, abradants, testing conditions, testing procedures, methods of evaluation of abrasion resistance and interpretation of results.

5.6 All the test procedures and instruments that have been developed for abrasion resistance of fabrics may show a high degree of variability in results obtained by different operators and in different laboratories, however, they represent the procedures most widely used in the industry. Because there is a definite need for measuring the relative resistance to abrasion, this is one of the several procedures that is useful to help minimize the inherent variation in results that may occur.

5.7 Before definite predictions of fabric usefulness can be drawn from an abrasion test as made on the rotary platform, double-head (RPDH) abrader (Fig. 1), actual end-use trials should be conducted and related to the abrasion test. Different

FIG. 1 Rotary Platform Double Head Abrader

types of wear (for example, wear on men's clothing at cuffs, crotch, etc.) may correspond to different ratings of the RPDH test.

5.8 In making a comparison of different fabrics (that is, of

6. Apparatus

6.1 *Rotary Platform, Double-Head (RPDH) Abrader*[4] (Fig. 1), consisting of the following elements described in 6.1.1-6.1.5

types of wear (for example, wear on men's clothing at cuffs, crotch, etc.) may correspond to different ratings of the RPDH test.

5.8 In making a comparison of different fabrics (that is, of different fibers, weights, etc.) the RPDH test will not always reveal a difference known to exist when the fabrics are actually used. Therefore, end-use trials should be conducted in conjunction with the RPDH abrasion test, at least as a guide for future testing of these fabrics.

5.9 Uncontrolled manufacturing or finishing variations occurring within a fabric or within lots of the same style of fabric can, however, be detected satisfactorily with the RPDH tester.

5.10 Because of the conditions mentioned above, technicians frequently fail to get good agreement between results obtained on the same type of testing instrument both within and between laboratories, and the precision of these test methods is uncertain. This test method is accordingly not recommended for acceptance testing in contractual agreements between purchaser and supplier because of the poor between-laboratory precision of the test method.

5.11 If there are differences of practical significance between reported test results for two laboratories (or more), comparative tests should be performed to determine if there is a statistical bias between them, using competent statistical assistance. As a minimum, the test samples used are to be as homogeneous as possible, drawn from the material from which the disparate test results were obtained, and randomly assigned in equal numbers to each laboratory for testing. The test results from the two laboratories should be compared using a statistical test for unpaired data, at a probability level chosen prior to the testing series. If bias is found, either its cause must be found and corrected, or future test results must be adjusted in consideration of the known bias.

6. Apparatus

6.1 *Rotary Platform, Double-Head (RPDH) Abrader*[4] (Fig. 1), consisting of the following elements described in 6.1.1-6.1.5

6.1.1 Removeable, turntable platform that includes a rubber pad, clamp plate and knurled nut, and clamp ring to secure the specimen. The specimen holder shall be motor driven, and mounted so as to produce circular surface travel of a flat specimen in the plane of its surface.

6.1.2 Pair of pivoted arms to which the abrasive wheels and accessory weights are attached.

6.1.3 Motor capable of rotating the platform and specimen at a speed of 72 ±2 r/min.

6.1.4 Vacuum nozzle and vacuum cleaner for removal of lint and debris from specimen. The height of the vacuum nozzle shall be adjustable and the nozzle will have two openings – one opening positioned between the two wheels and over the wear path and the other placed diametrically opposite. The distance between the axes of the two openings shall be 76.0 ±1.0 mm.

6.1.5 Counter for indicating the revolutions of the specimen holder.

6.2 *Abrasive wheels*, which are attached to the free end of the pivoted arms and rotate freely about horizontal spindles.

6.2.1 Their internal faces shall be 52.4 ±1.0 mm apart and the hypothetical line through the two spindles shall be 19.05 ±0.3 mm away from the central axis of the turntable (see Fig. 2). When resting on the specimen, the wheels will have a

[4] The sole source of supply of the apparatus known to the committee at this time is Taber Industries, 455 Bryant St. North Tonawanda, NY 14120. If you are aware of alternate suppliers, please provide this information to ASTM headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend.

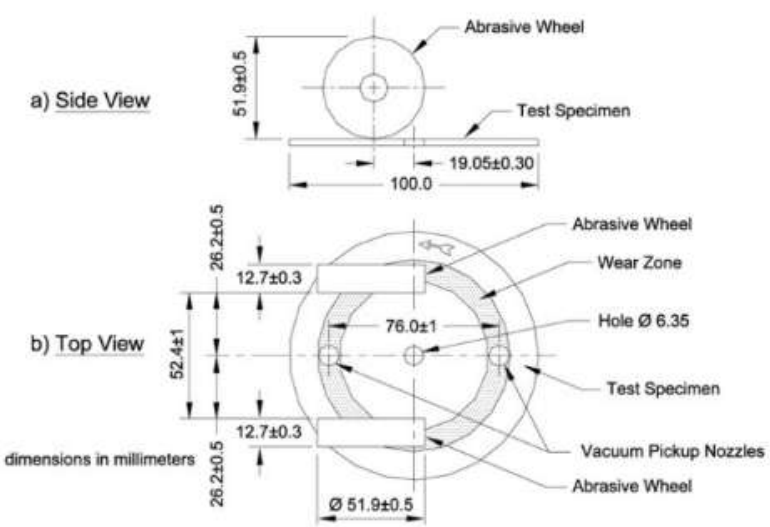

FIG. 2 Position of Abrasive Wheels on Rotary Platform Double Head Abrader

peripheral engagement with the surface of the specimen, the direction of travel of the periphery of the wheels and of the specimen at the contacting portions being at acute angles, and the angles of travel of one wheel periphery being opposite to

8.3.2 For fabric widths less than 125 mm (5 in.), use the entire width for specimens.

8.3.3 Cut specimens representing a broad distribution diagonally across the width of the laboratory sampling unit. Take

peripheral engagement with the surface of the specimen, the direction of travel of the periphery of the wheels and of the specimen at the contacting portions being at acute angles, and the angles of travel of one wheel periphery being opposite to that of the other. Motion of the abrasive wheels, in opposite directions, is provided by rotation of the specimen and the associated friction therefrom.

6.2.2 The abrasive wheels[4] are either resilient or vitrified-based. Both types of wheels consist of hard particles embedded in a binder material and are manufactured in different grades of abrasive quality. The wheels shall be 12.7 ±0.3 mm thick and have an external diameter of 51.9 ±0.5 mm when new, and in no case less than 44.4 mm.

6.3 *Accessory Loads*, The RPDH abrader is provided with a load adjustment for varying the load of the abrader wheels on the specimen. The pivoted abrader arms without auxiliary weights or counter weights apply a load against the specimen of 250 g per wheel (exclusive of the mass of the wheel itself). The manufacturer provides additional weights that can be used to increase the load to 500 or 1000 g per wheel, and a counterweight attachment that can be used to reduce the load on the specimen to 125 g per wheel.

6.4 *Auxiliary Apparatus*—Resurfacing discs (S-11), of carborundum-coated paper, are used to resurface the resilient wheels.

6.5 *Abrasion Wheel Resurfacing Device*, for resurfacing vitrified based wheels or for correcting uneven wheel wear.

7. Sampling

7.1 Take a lot sample as directed in the applicable material specification, or as agreed upon by the purchaser and seller. In the absence of such a specification or other agreement, take a laboratory sample as directed in 7.1.1. Consider rolls or pieces of fabric to be the primary sampling unit.

7.1.1 Take a laboratory sample that is the full width of the fabric and at least 50 cm (approximately 20 in.) long, from each roll or piece of fabric in the lot sample. The laboratory sample should be taken no closer than 1 m (1 yd) from the end of each roll or piece of fabric.

7.2 Sample shipments of garments as agreed upon by purchaser and seller.

8. Number and Preparation of Test Specimens

8.1 If the number of specimens to be tested is not specified by a material specification or an agreement between purchaser and seller, test five specimens.

8.1.1 If the number of specimens to be tested exceeds the number of laboratory samples, randomly select those laboratory samples from which more than one test specimen will be taken. If not, test one specimen per laboratory sample.

8.2 Take specimens from garment samples as agreed upon by all interested parties.

8.3 Cut ten specimens approximately 15 cm (6 in.) square, five for abrasion tests and five reserved for controls. For the five specimens to be abraded, cut a 6-mm (¼-in.) diameter hole in the center of the specimen.

8.3.1 For fabric widths 125 mm (5 in.) or more, take no specimen closer than 25 mm (1 in.) from the selvage edge.

8.3.2 For fabric widths less than 125 mm (5 in.), use the entire width for specimens.

8.3.3 Cut specimens representing a broad distribution diagonally across the width of the laboratory sampling unit. Take lengthwise specimens from different positions across the width of the fabric. Take widthwise specimens from different positions along the length of the fabric.

8.3.4 Ensure specimens are free of folds, creases, or wrinkles. Avoid getting oil, water, grease, etc. on the specimens when handling.

8.3.5 If the fabric has a pattern, ensure that the specimens are a representative sampling of the pattern.

9. Preparation, Calibration, and Verification of Apparatus

9.1 *Wheel Position*—The wheels should be spaced equally on both sides from the wheel-mounting flange to the center of the specimen holder. The distance from the inside of the wheel mounting flange to the center of the specimen holder should be 38.9 ±0.5 mm (1.53 in.).

9.2 *Wheel Bearings*—The abrader wheel bearings, installed in the free end of the pivoting arms to support the abrader wheels, should not stick when caused to spin rapidly by a quick driving motion of the forefinger.

9.3 *Platform Position*—The vertical distance from the center of the pivot point of the abrader arms to the top of the specimen holder should be approximately 25 mm (1 in.). The specimen platform should rotate in the plane of its surface, with no visible wobble. This can be checked with a dial indicator at the top outer edge of the platform.

9.4 *Platform Speed*—The platform should rotate at the speed stated in 6.1.3.

9.5 *Load*—The load to use is dependent on the type of textile fabric being tested, and should be agreed upon by the interested parties.

9.6 *Vacuum Suction*—The vacuum suction force should be adjusted to lift the abraded particles, but not lift the specimen. A setting of 75 – 100 has been found to be sufficient and should be used, unless otherwise agreed upon by the interested parties. At a vacuum level of 100, the suction force shall be 137 millibar (55 in. of water column) or greater, as measured by a vacuum gage.

9.7 *Selection of Wheels*—The abrasive wheels are manufactured in different grades and selection of which wheel type to use must be agreed upon by the interested parties. A wheel selection guide is presented in Appendix A to help with this selection process.

10. Standardization of Abrading Wheels

10.1 *Preparation of resilient abrading wheels*—To ensure that the abrading function of the wheels is maintained at a constant level; prepare the resilient wheels following 10.1.1-10.1.4

10.1.1 Mount the selected resilient wheels on their respective flange holders, taking care not to handle them by their abrasive surfaces. Adjust the load on the wheels to the load agreed upon between the interested parties.

10.1.2 Mount the resurfacing disc (S-11) on the turntable and affix using the clamp plate and nut, and clamp ring. Lower

the abrading heads carefully until the wheels rest on the resurfacing disc. Place the vacuum pick-up nozzle in position and adjust it to a distance of 7 ±1 mm above the surface of the disc.

10.1.3 Set the counter to 'zero' and adjust the vacuum

ring over the specimen and holder with the screw of the clamp at one end of the warp, partly tighten it, and push half way down. Draw fabric taut over the specimen holder by pulling on corners and edges of fabric, then tighten the clamp ring further, and push the ring all the way down over the edge of the holder

the abrading heads carefully until the wheels rest on the resurfacing disc. Place the vacuum pick-up nozzle in position and adjust it to a distance of 7 ±1 mm above the surface of the disc.

10.1.3 Set the counter to 'zero' and adjust the vacuum suction force to 100.

10.1.4 If the vacuum system does not turn on automatically at the start of the test, start the vacuum suction and then the turntable. Resurface the wheels by running them for the appropriate number of cycles against the resurfacing disc as shown in Table 1. Each resurfacing disc is good for one 25 or 50 cycle resurfacing operation, after which it must be discarded.

NOTE 2—*New Set of Wheels (break-in procedure)* - The composition of resilient wheels can make them subject to slight changes of form. Before placing in service a new set of resilient wheels they must be subjected to two (2) resurfacings of 50 cycles to ensure perfect contact of the abrading faces with the specimen surface. The resurfacing disc is used only once (maximum of 50 cycles), therefore this initial resurfacing of new wheels will require two (2) resurfacing discs.

NOTE 3—*Starting a test with previously used wheels* – Before testing a specimen with previously used wheels, resurface 25 or 50 cycles on a new resurfacing disc. When the previous test was short in duration (<1,000 cycles), resurfacing of 25 cycles is sufficient. When the previous test was 1,000 cycles or more, a resurfacing of 50 cycles is recommended. Wheels that have not been used for an extended period of time may require a break-in resurfacing like a new set of wheels.

NOTE 4—*Resurfacing during testing* - To maintain consistency and avoid clogging of wheel faces, the wheels may need to be resurfaced periodically during the test. Remove the specimen and resurface the wheels for 25 or 50 cycles with a new resurfacing disc. The sample should be carefully replaced on the specimen holder after resurfacing of the wheels. To prevent the integrity of the test from being jeopardized when removing and replacing the sample, specimens may be affixed to a mounting card (see Note 5).

10.2 *Preparation of vitrified abrading wheels* – Vitrified wheels do not require refacing unless the abrading surface becomes clogged, chipped or out of round. A wheel refacer should be used to correct any of these conditions.

11. Conditioning

11.1 Condition the test specimens to moisture equilibrium for testing in the standard atmosphere for testing textiles in accordance with Practice D 1776 or, if applicable, in the specified atmosphere in which the testing is to be performed.

12. Procedure

12.1 Test the conditioned specimens in the standard atmosphere for testing textiles, which is 21 ± 1°C (70 ± 2°F) and 65 ± 2% relative humidity.

12.2 *Mounting of Specimen*—Place the test specimen face up, unless otherwise specified, over the rubber mat on the specimen holder. Lightly secure the clamp plate and knurled nut in place to hold the center of the specimen. Place the clamp ring over the specimen and holder with the screw of the clamp at one end of the warp, partly tighten it, and push half way down. Draw fabric taut over the specimen holder by pulling on corners and edges of fabric, then tighten the clamp ring further, and push the ring all the way down over the edge of the holder, thus putting tension on the fabric as it is secured on holder. Then finish tightening the clamp plate and nut, and finally, retighten the clamp ring. Avoid buckling the fabric when tightening. Trim off excess fabric around the edges.

TABLE 1 Preparation of Abrasive Wheels

Wheel Status	Resurfacing Cycles
New	2 resurfacings of 50 cycles
Used (previous test < 1 000 cycles)	25 or 50 cycles
Used (previous test > 1 000 cycles)	50 cycles
During Test (after every 1 000 cycles)	25 or 50 cycles

NOTE 5—It is important that the specimen be mounted such that it is completely flat and remains flat when subjected to abrasion. A mounting card which is approximately 108 mm round or square with a 6.35 mm center hole and one side coated with pressure sensitive adhesive may be used for this purpose. Clean the back of the specimen with a soft bristle brush to remove any loose debris, and attach to the mounting card ensuring the mounted specimen is free of folds, creases, or wrinkles.

12.3 *Number of Revolutions*—The number of revolutions of the table to which the specimen is to be subjected will depend on the type of material being tested, the type of abrader wheels used, and the type of test employed, such as that based on loss in breaking load due to abrasion and loss in mass due to abrasion or occurrence of yarn breakdown. The number of cycles should be predetermined by mutual agreement.

12.4 Lower the abrading heads carefully onto the surface of the specimen.

12.5 *Cleaning of Specimen*—The RPDH vacuum system is used to clean the specimen of debris and abrasive particles during the test. Position the nozzle 7 ±1 mm (1/4 in.) above the specimen surface and adjust the vacuum suction as outline in 9.6. Do not remove the specimen from the specimen holder until the entire test is completed (exception, see Note 4). Wipe the rubber pad clean after each test.

12.6 Start the RPDH tester and subject the test specimen to abrasion for the specified number of cycles. If cycles to a specific end point is used as the evaluation criteria (see 12.5), stop the instrument at intervals during the test to examine the test specimen.

12.7 *Resurfacing and Cleaning of Wheels*—Due to uneven wear and clogging of the surface crevices with fiber particles, sizing, finishing materials, and the like, the abrading wheels should be resurfaced or cleaned at established intervals during tests, the frequency depending on the type of material being tested and the type of wheel used (see Section 10).

12.8 After testing, raise the abrader arms and vacuum nozzle then remove the specimen for evaluation. If desired, the turntable platform may be removed from the tester by lifting straight up. This will permit a closer inspection of the specimen prior to removal from the turntable platform.

13. Interpretation of Results

NOTE 6—This test method does not recommend any specific interpretation of results but does provide procedures commonly used by industry. As a test method, no precision or bias have been determined.

13.1 After the specimens have been abraded to the set number of cycles or other specified end-point, evaluate as directed in 13.2-13.5 as appropriate.

13.2 *Residual Breaking Force*—If residual breaking force is required, calculate the individual breaking force of the individual abraded specimens and the unabraded specimens to the

nearest 0.5 kg (1 lb) significant digits. Use Test Method D 5034 and D 5035, as appropriate, except that the distance between clamps shall be 25 mm (1 in.) and path of the abrasion on the abraded specimen is horizontally placed midway between the

The criteria may include: loss in breaking strength, yarn breakage, loss in coating, loss of luster, napping, pilling, color loss, or other changes in appearance. In those cases, the abraded sample is usually compared to a known standard of the

nearest 0.5 kg (1 lb) significant digits. Use Test Method D 5034 and D 5035, as appropriate, except that the distance between clamps shall be 25 mm (1 in.) and path of the abrasion on the abraded specimen is horizontally placed midway between the clamps of the machine.

13.3 *Average Breaking Strength*—If average breaking strength is required, calculate the average breaking strength of the abraded specimens and the unabraded specimens separately to the nearest 0.5 kg (1 lb) for the laboratory sampling unit for the lot.

13.4 *Percent Loss in Breaking Strength*—If percent breaking strength is required, calculate the percentage loss in breaking strength to the nearest 1 % as the abrasion resistance separately for each the lengthwise and widthwise directions using Eq 1, for the laboratory sampling unit and for the lot.

$$AR = 100(A - B)/A \quad (1)$$

where:

AR = abrasion resistance, %,
A = average breaking force of the unabraded specimens, g (lb), and
B = average breaking force of the abraded specimen, g (lb).

13.5 *Cycles to a Specific End-Point*—When the abrasion test end-point is described in a material specification or contract order, the end-point may consist of a pass/fail criteria. The criteria may include: loss in breaking strength, yarn breakage, loss in coating, loss of luster, napping, pilling, color loss, or other changes in appearance. In those cases, the abraded sample is usually compared to a known standard of the material tested. Aesthetic evaluations should be made using an agreed upon five-step rating system.

14. Report

14.1 State that the specimens were tested as directed in Test Method D 3884. Describe the product sampled and the method of sampling used for the laboratory sampling.

14.2 Type of wheel used,

14.3 Load adjustment or counter weight, if used,

14.4 Vacuum suction level,

14.5 Height of vacuum pick-up nozzle,

14.6 Depending upon the test option used, report the following information:

14.6.1 Residual breaking load,

14.6.2 Percentage loss in breaking load,

14.6.3 Average cycles to failure on the other end point.

14.6.4 If any other means of evaluating the effect of abrasion are used, describe evaluation criteria used to obtain failure or other end point.

15. Keywords

15.1 abrasion; rotary platform; textile fabric

APPENDIX

(Nonmandatory Information)

X1. Wheel Selection (see Table X1.1)

X1.1 Material specifications have been developed for many different types of textile fabrics. If you are following a particular material specification, please refer to it for the appropriate wheel.

X1.2 The following information is intended to serve as a guideline only, when an abrasive wheel is not specified. Deciding which abrading wheel is appropriate for your application is best determined with preliminary testing on the actual material. The ideal selection criterion is to reproduce, as nearly possible, the wear which the material will be subjected to in actual use.

X1.2.1 Resilient wheels:

CS-10— Medium abrasive action.

CS-17 — Medium to coarse abrasive action.

X1.2.2 Vitrified (clay) wheels:

H–38 – Light abrasive action (requires multi-point diamond tool for refacing).

H–10 — Light to medium abrasive action.

H-18 — Medium abrasive action.

H-22 — Coarse abrasive action.

X1.3 Specialty wheels are also available for unique applications.

CS-0 – Resilient material, containing no abrasive grain. Used when a very mild abrasive action is required. Alternatively, sandpaper strips (S-33 or S-42) may be adhered to outer periphery for aggressive abrasive action.

CS-5 – Densely, compacted wool felt. Suggested when the service wear of textile fabrics involves one fibrous material rubbing against another.

S-35 –Tungsten Carbide with sharp, helical teeth cut in its periphery (25 per inch set at 45° spiral pitch). Intended for use on resilient materials only (e.g. rubber, linoleum, and leather) when a cutting and tearing action / severe abrasion is required.

S-39 – Leather strip adhered to a brass hub.

TABLE X1.1 Wheel Selection

	CS-10	CS-17	H-38	H-10	H-18	H-22	Recommended Load (g)
Textile Fabrics					X	X	1000

TABLE X1.1 Wheel Selection

	CS-10	CS-17	H-38	H-10	H-18	H-22	Recommended Load (g)
Textile Fabrics	–	–	–	–	X	X	1000
Textile Fabrics, Medium Weight	X	X	–	–	–	–	500 or 1000
Textile Fabrics, Delicate	X	–	X	–	–	–	250 or 500
Textile Fabrics, Pile	X	–	–	–	–	–	500
Textile Fabrics, Coated	–	-	-	–	X	–	1000
Textile Fabrics, Automotive	X	–	–	–	X	–	1000
Upholstery	–	–	X	–	X	X	500 or 1000
Leather, Automotive	X	–	–	–	X	–	1000
Leather, Dyed	X	X	–	–	–	–	500 or 1000
Leather, Durable	–	–	–	–	X	X	1000
Nonwovens	–	–	–	X	–	–	250
Automotive Carpet Materials	X	–	–	–	–	–	1000
Broadloom Carpet	–	–	X	–	X	X	500 or 1000