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TM-111
Technical Bulletin

Evaluation Procedures for CRI Carpet Cleaning Certification of In-Tank and Pre-Spray Cleaning Products

1. Scope

1.1 This Technical Bulletin describes laboratory procedures used for evaluating in-tank and pre-spray cleaning products available to consumers and users of these products.

1.2 This bulletin details procedures specific to the following attributes of acceptable use of cleaners on pile carpet:

1.1.1 Cleaning Efficacy Evaluation (Section 1)
1.1.2 Resoiling Characteristics (Section 2)
1.1.3 Optical Brightener Presence (Section 3)
1.1.4 Lightfastness Assessment (Section 4)
1.1.5 pH Determination (Section 5)

1.3 These procedures may involve hazardous materials. This document does not purport to address all of the safety precautions associated with its use. It is the responsibility of the user to establish appropriate safe laboratory procedures and techniques.

Section 1

Cleaning Efficacy Evaluation of Carpet Cleaning Products

1. Scope

1.1 This is a standardized laboratory procedure for determining the cleaning efficacy of carpet cleaning chemicals which are designed to be applied as a pre-spray or through extraction equipment. Uniformly soiled control carpets are cleaned using specific extraction equipment and procedures then rated visually and instrumentally to determine the degree to which the cleaning chemical was able to restore the control carpet to its original appearance.

1.2 This test practice is applicable to all liquid carpet cleaning chemicals

2. Reference Documents

2.1 Standard Test Method for Accelerated Soiling of Pile Yarn Floor Covering ASTM D6540-2000.

2.2 AATCC 171-97 - Hot Water Extraction Method of Cleaning Carpets

2.3 AATCC Evaluation Procedure 1 - Gray Scale for Color Change

2.4 AATCC Evaluation Procedure 6 - Instrumental Color Measurement

2.5 AATCC Evaluation Procedure 7 - Instrumental Assessment of Color Change

3. Precision & Bias

3.1 No precision and bias has been established.

4. Significance & Use

4.1 This test practice will provide an indication of the capability of a carpet cleaning chemical to visually improve the appearance of a uniformly soiled floor covering. The level of visual improvement in the laboratory practice will differ from that in home/commercial installations due to variations in carpet styles, soil and other solid particulate composition, the cleaning process employed by individual

operators and other factors.

4.2 In order to provide a uniform basis for measuring the performance in 1.1, standardized test carpets and standardized test soil is employed in this practice.

5. Apparatus and Materials

5.1 As per Standard Test Method for Accelerated Soiling of Pile Yarn Floor Covering ASTM D6540-2000, the following is required:

5.1.1 Weighing scale accurate to 0.01 gram and having a capacity of at least 2000 grams

5.1.2 Ball jar capable of containing a 263 mm x 1000 mm (10 3/8" x 39 3/8") test specimen.

5.1.3 Unitized Jar Mill

5.1.4 Nylon pellets (Zytel ™ 01FNC010)

5.1.5 Chrome alloy ball bearings 9.5 mm, (.375") diameter

5.1.6 AATCC Standard Dry Soil

5.2 Conveyor with a minimum bed length of 3.05 m (10 feet) and stroke of 2.13 m (7 feet) and minimum bed width of 88.9 cm (35 inches). Conveyor must be capable of maintaining specified test speed both forward and reverse. Conveyor must be equipped with brackets to hold the test equipment stationary, exert no horizontal or vertical force, provide a point to electrically ground the unit and maintain the handle height to assure proper extractor wand contact with the test material.

5.3 Conveyor plate to which sample is affixed must be made of a rigid material. Suitable material is 6.35 mm (0.25"- inch) aluminum.

5.4 Tachometer used to measure conveyor speed in meters/second (feet/second).

5.5 Template comprised of the same material as test carpet a minimum of 102 mm (4 inches) wider than the head of control extractor mounted to conveyor plate using double sided fiber reinforced tape or other suitable mounting material.

5.6 Room conditioned and maintained at 50% ± 5% relative humidity and 21.1°C ± 2°C (70°F ± 5°F).

5.7 45/0 Spectrophotometer with one 25.4 mm (1 inch) or larger viewing aperture.

5.8 45/0 Spectrophotometer template comprised of ten (10) viewing locations. See Appendix 1 for template blueprint.

5.9 Thermometer

5.10 Control vacuum with rotating agitator head.

5.11 Hot water box, wand extractor and suitable calibration equipment to confirm extractor performance.

511.1 Generic specifications of control extractor/wand include: 10 gal solution tank; 14.5 gal recovery tank; 100 psi solution pump; 3 stage 1.8 hp vacuum motor; 136 inch sealed water lift; 3 jet (110-03) 13" wand head

NOTE: The specific extractor selected as the control unit can have a bearing on the final cleaning efficacy results.

5.12 Weighted carpet brush. See diagram contained in Appendix 3.

5.13 Standard Test Material

5.13	RESIDENTIAL CUT PILE
Pile Yarn Wt.	848 gm/m^2 (25 Oz/ Yd^2)
Color	Almond White
Pile Height	12 mm (.470 Inch)
Yarn	100% Spun Nylon 6,6
Treatment	No fluorochemical treatment

NOTE: Alternative test material may be specified as agreed upon by participants.

6. Conditioning

6.1 Test room - temperature and humidity are maintained in standard laboratory conditions, 50% ± 5% relative humidity and 21.1°C ± 2°C (70°F ± 5°F) in which all conditioning and testing is done.

6.2 All components involved in the test shall remain and be exposed in the test room for at least 16 hours prior to the start of the test.

7. Initial Preparation and Conditioning of Test Carpet

7.1 New test carpet shall conform to 5.13 unless otherwise agreed upon by participants.

7.2 Cut three (3) samples of the test carpet to fit the inside wall of the soiling drum. The long dimension should be parallel to the machine direction.

7.3 Mark the test specimen with test identification number

7.4 Prepare carpet for testing by clipping selvedge edge and vacuuming to remove loose fibers with the control vacuum, using 10 passes at 0.55m/second (1.8 ft./second).

7.5 Condition prepared samples in test room a minimum of 16 hours prior to testing.

8. Preparation of Soiling Media

8.1 Soil application of Zytel pellets

8.1.1 Place three (3) grams of the standard dry soil for each 1000 grams of Zytel pellets in a two (2) gallon cylindrical container.

8.1.2 Rotate the container on the jar mill for 30 minutes at 40 rpm.

8.1.3 The soiled pellets are ready for use.

9. Soil Application of Test Carpet

9.1 Collect, record and average ten (10) L_{ab} measurements on a specimen of the test carpet using
the spectrophotometer and template. Report as "initial" L_{ab}.

9.2 Secure the carpet to the inside wall of the drum with the pile lay direction if present in the opposite direction of the drum rotation (double-sided tape may be used). Make sure the sample is firmly attached and properly contoured to the curvature of the drum, otherwise non-uniformities will occur.

9.3 Place 3 grams ± 0.2 grams of chrome alloy ball bearings per square inch of test material and the predetermined amount of the Zytel ™ pellets prepared in Section 8.0 into the drum. (Note: the amount of pellets to be used is experimentally determined for soiling of carpets to a ΔE 6.8 ± .6, 2.0 level on the AATCC Gray Scale, unless otherwise specified).

9.4 Close the drum and rotate on jar mill at 40 rpm for 30 minutes.

9.5 Open drum, remove the ball bearings, pellets and carpet sample. Physically remove any loose pellets from the carpet.

9.6 Vacuum soiled carpet sample using control vacuum.

9.6.1 Place the soiled carpet into the conveyor template from the same or like

carpet construction that is larger than the test sample - double sided tape may be used to secure the sample to the conveyor plate.

9.6.2 Make four (4) passes in the long direction with the control vacuum cleaner at 0.55 m/second (1.8 feet/second). (Note: Ensure the last stroke of the vacuum is in the direction of the pile lay).

9.6.3 Repeat step 9.1 for the soiled carpet and calculate ΔE and AATCC gray scale rating and record as initial soil level.

9.6.4 The initial target depth of soiling is ΔE 6.8 $\pm$ .6, 2.0 equivalent AATCC Gray Scale rating. All soiled carpets released for use in this study will fall within $\pm$ 0.5 ΔE of the predetermined target depth of soiling unless otherwise agreed upon by participants.

9.6.5 The soiled carpet sample must be labeled with the date it was prepared. Cleaning must be accomplished with seven (7) days from the time of carpet soiling.

10. Procedures for Cleaning

Note: Cleaning chemical application can be accomplished using control pre-spray apparatus, distribution through tank of control extractor or client supplied equipment.

10.1 Chemical application through pre-spray apparatus and clean water extraction cleaning process.

10.1.1 Follow chemical label dilution directions. If more than one dilution ratio is listed conduct testing using the highest chemical to water ratio unless otherwise directed by client.

10.1.2 Mount pre-spray apparatus in fixture above template/sample on conveyor. Proper location provides a 30 cm (12 inch) spray pattern on template. Confirm gallon per minute flow rate, spray pattern distribution and water/chemical temperature. See appendix.

10.1.3 Set conveyor speed to accomplish designated gallons/square foot application rate.

10.1.4 Record water/chemical temperature of pre-spray mixture within one minute prior to application.

10.1.5 Install pre-soiled test sample into conveyor template. Turn on pre-spray apparatus and initiate conveyor movement.

10.1.6 Turn off pre-spray apparatus and stop conveyor after soiled test sample has traveled 12" - 18" past pre-spray apparatus spray pattern, thus completing the chemical pre-spray application process.

10.1.7 Allow chemical to dwell 10 minutes $\pm$ 1 minute before initiating extraction process.

10.1.8 Mount control extractor wand in conveyor fixture at a location that ensures proper wand head contact with control material.

10.1.9 Set conveyor speed at 0.30 m/second (1 foot/second) or as otherwise specified by client.

10.1.10 Install pre-sprayed test sample into conveyor template. Energize control extractor spray/vacuum and initiate conveyor movement. Sample is installed so that the last stroke is with the pile lean. See Appendix 1 for diagram description.

10.1.11 Complete designated quantity of spray/vacuum strokes and immediately follow with designated quantity of vacuum only strokes, thus completing the pre-spray/clean water extraction procedure.

10.1.12 Place cleaned test sample(s) on rack in conditioned environment until dry.

10.2 Chemical application and cleaning process using the tank of the control extractor.

10.2.1 Follow chemical label dilution directions. If more than one dilution ratio is listed conduct testing using the highest chemical to water ratio unless otherwise directed .

10.2.2 Mount control extractor wand in conveyor fixture at a location that ensures proper wand head contact with control material.

10.2.3 Install a sufficient quantity of properly diluted cleaning solution at the correct temperature into control extractor tank to accomplish cleaning of all test specimens.

10.2.4 Record water/chemical temperature within one minute prior to application.

10.2.5 Set conveyor speed at 0.30 mm/second (1 foot/second) or as otherwise specified.

10.2.6 Install pre-soiled test sample into template. Energize control extractor spray/vacuum and initiate conveyor movement. Sample is installed so that the last stroke is with the pile lean. See Appendix 1.

10.2.7 Complete designated quantity of spray/vacuum strokes and immediately follow with designated quantity of vacuum only strokes, thus completing the chemical application and cleaning through tank of control extractor.

10.2.8 Place cleaned test sample(s) on rack in conditioned environment until dry.

10.3 Chemical application and cleaning process using client supplied equipment.

10.3.1 Follow chemical dilution and equipment manufacturers supplied directions. If more than one dilution ratio or machine setting is listed conduct testing using the highest chemical delivery unless otherwise specified.

10.3.2 Mount the client supplied equipment in the conveyor fixture at a location that ensures proper extractor head contact with control material.

10.3.3 Install a sufficient quantity of properly diluted cleaning solution into control extractor tank to accomplish cleaning of all test specimens.

10.3.4 Record water/chemical temperature within one minute prior to application.

10.3.5 Set conveyor speed at 0.30 m/second (1 foot/second) or as otherwise specified.

10.3.6 Install pre-soiled test sample into template. Energize control extractor spray/vacuum and initiate conveyor movement.

10.3.7 Complete designated quantity of spray/vacuum strokes and immediately follow with designated quantity of vacuum only strokes, thus completing the cleaning using client supplied equipment.

10.3.8 Place cleaned test sample(s) on rack in conditioned environment until dry.

11. Evaluation

11.1 Erect pile of cleaned test samples using the weighted carpet brush see Appendix 3. Brush test sample one stroke against the lay followed by four (4) strokes with the lay.

11.2 Take ten (10) spectrophotometer/colorimeter readings using template. See appendix 1. Record the average L_{ab} and ΔE values.

11.3 Follow “Evaluation Procedure 1" as outlined in the AATCC Technical Manual with a panel of three (3) technicians and record individual and average Gray Scale measurement.

12. Report

12.1 Cleaning chemical descriptive information including manufacturer, brand, dilution

ratio, pH as tested.

12.2 Control extractor descriptive information/specification.
Note: Generic specifications of control extractor/wand include: 10 gal solution tank; 14.5 gal recovery tank; 100 psi solution pump; 3 stage 1.8 hp vacuum motor; 136 inch sealed water lift; 3 jet (110-03) 13" wand head.

12.3 Client supplied equipment descriptive information/specifications when applicable.

12.4 Test material description information including construction, fiber type, pile weight, color, pile height, stitch rate, as reported by material supplier. Soil and stain treatment is confirmed by laboratory.

12.5 Water/chemical temperature as measured within one minute prior to application.

12.6 The number of wet and dry cleaning passes made over the test material.

12.7 Speed of travel of cleaning passes expressed in meter/second (feet/second).

12.8 ΔE L_{ab} and Gray Scale ratings of the control material before soiling, after soiling/vacuuming and after cleaning for each sample tested.

12.9 Average ΔE, L_{ab} and AATCC Gray Scale difference between soiled/vacuumed samples and cleaned samples.

12.10 Any deviations from this test practice.

Section 2

Evaluation of Resoiling Characteristics of Carpet Cleaning Products

1. Scope

1.1 This test method is intended to determine the effects of cleaning equipment, chemistry and technologies on the resoiling properties of a specified floor covering. A control test carpet is cleaned according to the client's directions. The cleaned carpet is allowed to thoroughly dry then soiled per ASTM D6540-2000. Additional control carpet is soiled per ASTM D6540-2000 that has not been cleaned. The differential soil level between the cleaned sample(s) and control sample(s) is rated instrumentally and by a panel of technicians using the AATCC Gray Scale for Color Change.

1.2 This test practice is applicable to all liquid carpet cleaning chemicals

2. Reference Documents

2.1 ASTM D6540-2000 Standard Test Method for Accelerated Soiling of Pile Yarn Floor Covering

2.2 AATCC Evaluation Procedure 1 - Gray Scale for Color Change

2.3 AATCC Evaluation Procedure 6 - Instrumental Color Measurement

2.4 AATCC Evaluation Procedure 7 - Instrumental Assessment of Color Change

3. Precision & Bias

3.1 No precision and bias has been established.

4. Significance & Use

4.1 The propensity of cleaning chemical(s) residue to attract soil at an accelerated rate is measured by first applying the chemical to a control material then using ASTM D6540-2000 Accelerated Soiling of Pile Yarn Floor Covering, to soil both the chemically treated and non-treated samples. The differential soil level between the chemically treated and control samples indicates the level of accelerated soiling contributed by the cleaning chemical.

4.2 In order to provide a uniform basis for measuring the performance in 1.1, standardized test carpets and standardized test soil is employed in this practice.

5. Apparatus and Materials

5.1 As per 2.1 Standard Test Method for Accelerated Soiling of Pile Yarn Floor Covering, ASTM D6540-2000, the following are required:

5.1.1 Weighing scale accurate to 0.01 gram and having a capacity of at least 2000 grams.

5.1.2 Ball jar capable of containing a 263 mm x 1000 mm (10 3/8" x 39 3/8") test specimen.

5.1.3 Unitized Jar Mill

5.1.4 Nylon pellets (Zytel ™ 01FNC010)

5.1.5 Chrome alloy ball bearings 9.5 mm, (.375 inch) diameter

5.1.6 AATCC Standard Synthetic Dry Soil

5.2 Conveyor with a minimum bed length of 3.05 m (10 feet)and stroke of 2.13 m (7 feet) and minimum bed width of 88.9 cm (35 inch). Conveyor must be capable of maintaining specified test speed both forward and reverse. Conveyor must be equipped with brackets to hold the test equipment stationary, exert no horizontal or vertical force, provide a point to electrically ground the unit and maintain the handle height to assure proper extractor wand contact with the test material.

5.3 Conveyor plate to which sample is affixed must be made of a rigid material. Suitable material is 6.35 mm (0.25 inch) aluminum.

5.4 Tachometer used to measure conveyor speed in feet/second.

5.5 Template comprised of the same material as test carpet a minimum of 10.2 cm (4 inches) wider than the head of control extractor mounted to conveyor plate using double sided fiber reinforced tape or other suitable mounting material.

5.6 Room conditioned and maintained at 50% ± 5% relative humidity and 21.1°C ± 2°C (70°F ± 5°F).

5.7 45/0 Spectrophotometer with 25.4 m(1 inch) or larger viewing aperture.

5.8 Template comprised of ten (10) viewing locations. See Appendix 1.

5.9 Thermometer

5.10 Control vacuum with rotating agitator head.

5.11 Hot water box, wand extractor and suitable calibration equipment to confirm extractor performance.

5.11.1 Generic specifications of Professional Testing Laboratory control extractor/wand include: 10 gal solution tank; 14.5 gal recovery tank; 100 psi solution pump; 3 stage 1.8 hp vacuum motor; 136 inch sealed water lift; 3 jet (110-03) 13" wand head.

5.12 Weighted carpet brush. See Appendix 3 diagram.

NOTE: The specific extractor selected as the control unit can have a bearing on the final cleaning efficacy results.

5.13 Standard Test Material

5.13	RESIDENTIAL CUT PILE
Pile Yarn Wt.	848 gm/m^2 (25 Oz/ Yd^2)
Color	Almond White
Pile Height	12 mm (.470 Inch)
Yarn	100% Spun Nylon 6,6
Treatment	No fluorochemical treatment

NOTE: Alternative test material may be specified as agreed upon by participants.

6. Conditioning

6.1 Test room - temperature and humidity are maintained in standard laboratory conditions, 50% ± 5% relative humidity and 21.1°c ± 2°c (70°F ± 5°F) in which

all conditioning and testing is done.

6.2 All components involved in the test shall remain and be exposed in the test room for at least 16 hours prior to the start of the test.

7. Initial Preparation and Conditioning of Test Carpet

7.1 New test carpet shall conform to 5.13 unless otherwise agreed upon by participants.

7.2 Cut three (3) samples of the test carpet to fit the inside wall of the soiling drum. The long dimension should be parallel to the machine direction.

7.3 Mark the test specimen with test identification number.

7.4 Prepare carpet for testing by clipping selvedge edge and vacuuming to remove loose fibers with the control vacuum, using 10 passes at 0.55 m/second (1.8 ft./second).

7.5 Condition prepared samples in test room a minimum of 16 hours prior to testing.

8. Preparation of Soiling Media

8.1 Soil application of Zytel pellets

8.1.1 Place three (3) grams of the standard dry soil for each 1000 grams of Zytel pellets in a two (2) gallon cylindrical container.

8.1.2 Rotate the container on the jar mill for 30 minutes at 40 rpm.

8.1.3 The soiled pellets are ready for use.

9. Procedures for Cleaning

Note: Cleaning chemical application can be accomplished using control pre-spray apparatus, distribution through tank of control extractor, client supplied equipment.

9.1 Chemical application through pre-spray apparatus and clean water extraction cleaning process.

9.1.1 Follow chemical label dilution directions. If more than one dilution ratio is listed conduct testing using the highest chemical to water ratio unless otherwise directed by client.

9.1.2 Mount pre-spray apparatus in fixture above template/sample on conveyor. Proper location provides a 12" spray pattern on template. Confirm gallon per minute flow rate, spray pattern distribution and water/chemical temperature. See Appendix 2 diagram.

9.1.3 Set conveyor speed to accomplish designated gallons/square foot application rate.

9.1.4 Record water/chemical temperature of pre-spray mixture within one minute prior to application.

9.1.5 Install control test sample into conveyor template. Turn on pre-spray apparatus and initiate conveyor movement.

9.1.6 Simultaneously turn off pre-spray apparatus and stop conveyor after soiled test sample has traveled 12" - 18" past pre-spray apparatus spray pattern, thus completing the chemical pre-spray application process.

9.1.7 Allow chemical to dwell 10 minutes ± 1 minute before initiating extraction process.

9.1.8 Mount control extractor wand in conveyor fixture at a location that ensures proper wand head contact with control material.

9.1.9 Set conveyor speed at 0.30mm/second (1 foot/second)or as otherwise specified.

9.1.10 Install pre-sprayed test sample into conveyor template. Energize control extractor spray/vacuum and initiate conveyor movement. Sample is installed so that the last stroke is with the pile lean. See Appendix 1

diagram.

9.1.11 Complete designated quantity of spray/vacuum strokes and immediately follow with designated quantity of vacuum only strokes, thus completing the pre-spray/clean water extraction procedure.

9.1.12 Place cleaned test sample(s) on rack in conditioned environment until dry.

9.2 Chemical Application using the tank of the control extractor.

9.2.1 Follow chemical label dilution directions. If more than one dilution ratio is listed conduct testing using the highest chemical to water ratio unless otherwise directed.

9.2.2 Mount control extractor wand in conveyor fixture at a location that ensures proper wand head contact with control material.

9.2.3 Install a sufficient quantity of properly diluted cleaning solution into control extractor tank to accomplish cleaning of all test specimens.

9.2.4 Record water/chemical temperature in the extractor tank within one minute prior to application.

9.2.5 Set conveyor speed at 1 foot/second or as otherwise specified.

9.2.6 Install control test sample into template. Energize control extractor spray/vacuum and initiate conveyor movement. Sample is installed so that the last stroke is with the pile lean. See Appendix 1diagram.

9.2.7 Complete designated quantity of spray/vacuum strokes and immediately follow with designated quantity of vacuum only strokes, thus completing the chemical application and cleaning through tank of control extractor.

9.2.8 Place cleaned test sample(s) on rack in conditioned environment until dry.

9.3 Chemical application and cleaning process using client supplied equipment.

9.3.1 Follow chemical dilution and equipment manufacturers supplied directions. If more than one dilution ratio or machine setting is listed conduct testing using the highest dilution ratio and chemical delivery unless otherwise directed.

9.3.2 Mount the client supplied equipment in the conveyor fixture at a location that ensures proper extractor head contact with control material.

9.3.3 Install a sufficient quantity of properly diluted cleaning solution into control extractor tank to accomplish cleaning of all test specimens.

9.3.4 Record water/chemical temperature within one minute prior to application.

9.3.5 Set conveyor speed at 0.30 mm/second (1 foot/second) or as otherwise specified.

9.3.6 Install control test sample into template. Energize control extractor spray/vacuum and initiate conveyor movement.

9.3.7 Complete designated quantity of spray/vacuum strokes and immediately follow with designated quantity of vacuum only strokes, thus completing the cleaning using client supplied equipment.

9.3.8 Place cleaned test sample(s) on rack in conditioned environment until dry.

10. Soil Application of Test Carpet

10.1 Collect, record and average ten (10) L_{ab} measurements on specimens of the test carpet using the spectrophotometer and template. Report as “initial” L_{ab}.

10.2 Secure the “cleaned” test carpet as prepared in section 9 to the inside wall of the drum with the pile lay direction if present in the opposite direction of the drum rotation (double-sided tape may be used). Make sure the sample is firmly attached and properly contoured to the curvature of the drum, otherwise non-uniformities will occur.

10.3 Place 3 grams ± 0.2 grams of chrome alloy ball bearings per square inch of test material and the predetermined amount of the Zytel ™ pellets prepared in Section 8.0 into the drum. (Note: the amount of pellets to be used is experimentally determined for soiling of carpets to a ΔE 7.0 ± .5, 2.0 level on the AATCC Gray Scale, unless otherwise specified).

10.4 Close the drum and rotate on jar mill at 40 rpm for 30 minutes.

10.5 Open drum, remove the ball bearings, pellets and carpet sample. Physically remove any loose pellets from the carpet.

10.6 Vacuum soiled carpet sample using control vacuum.

10.6.1 Place the soiled carpet into the conveyor template from the same or like carpet construction that is larger than the test sample - double sided tape may be used to secure the sample to the conveyor plate.

10.6.2 Make four (4) passes in the long direction with the control vacuum cleaner at 1.8 feet/second. (Note: Ensure the last stroke of the vacuum is in the direction of the pile lay).

10.6.3 Repeat step 10.1 for the soiled carpet and calculate ΔE and AATCC gray scale rating and record as initial soil level.

NOTE: The initial target depth of soiling is ΔE 6.80, equivalent to 2.0 AATCC gray scale rating. All soiled carpets released for use in this study will fall within ± 0.6 ΔE of the predetermined target depth of soiling unless otherwise agreed upon by participants..

10.6.4 Label the soiled carpet sample with the date it was prepared. Cleaning must be accomplished with seven (7) days from the time of carpet soiling.

11. Evaluation

11.1 Erect pile of cleaned test samples using the weighted carpet brush (see Appendix). Brush test sample one stroke against the lay followed by four (4) strokes with the lay.

11.2 Take ten (10) spectrophotometer/colorimeter readings using template. See appendix. Record the average L_{ab} and ΔE values.

11.3 Follow “Evaluation Procedure 1" as outlined in the AATCC Technical Manual with a panel of three (3) technicians and record individual and average Gray Scale measurement.

12. Report

12.1 Cleaning chemical descriptive information including manufacturer, brand, dilution ratio, pH as tested and note the presence or absence of optical brighteners.

12.2 Control extractor descriptive information/specification.

Note: Generic specifications of control extractor/wand include: 10 gal solution tank; 14.5 gal recovery tank; 100 psi solution pump; 3 stage 1.8 hp vacuum motor; 136 inch sealed water lift; 3 jet (110-03) 13" wand head.

12.3 Client supplied equipment descriptive information/specifications when applicable.

12.4 Test material description information including construction, fiber type, pile weight, color, pile height and stitch rate as reported by material supplier. Soil and stain treatment is confirmed by laboratory.

12.5 Water/chemical temperature as measured within one minute prior to application.

12.6 The number of wet and dry cleaning passes made over the test material.

12.7 Speed of travel of cleaning passes.

12.8 ΔE L_{ab} and Gray Scale ratings of the control “cleaned” material after soiling/vacuuming for each sample tested.

12.9 Average ΔE, L_{ab} and AATCC Gray Scale difference between the control “cleaned” material and soiled/vacuumed test samples.

12.10 Any deviations from this test practice.

Section 3

Method To Determine The Presence of Optical Brighteners in Carpet Cleaning Products

1. Significance & Use

The presence of optical brighteners in carpet cleaning chemicals has been known to adversely effect fiber color, appearance and long term performance.

2. Procedure

Pour or spray three (3) to five (5) ml of test chemical through a15.24 cm (6 inches) circle template onto a white asorbent paper towel or filter paper. Allow chemical to dry in ambient air, rinse with tap water (30) seconds then allow to dry.

3. Assessment

3.1 View the chemically sprayed/rinsed paper towel/filter paper using an UltraViolet light source and compare to an untreated control of the same paper towel/filter paper.

3.2 A fluorescent glow of the chemically treated towel indicates the presence of optical brighteners in the residual chemical on the absorbent paper towel/filter paper.

4. Report

4.1 If a fluorescent glow is visible in the treated test material then report a positive test result for the presence of optical brighteners.

Section 4

Lightfastness Assessment of Carpet Cleaning Products on a Standard Carpet Sample

1. Significance & Use

1.1 Cleaning chemical residues present on pile yarn floor coverings have been known to adversely affect dyes and accelerate color change. The level to which a chemical residue contributes to color change is determined by exposing a chemically treated standard test carpet with an untreated control sample to accelerated light in accordance with AATCC Test Method 16.

2. Procedure

2.1 Treat a test specimen 57 X 120 mm (2 ¼ inch x 4 ¾ inches) from the standard carpet sample by evenly spraying the surface with three (3) grams of the cleaning chemical.

2.2 Allow the treated sample to dry.

2.3 Subject the treated sample and an untreated “control” sample to accelerated lightfastness testing in accordance with AATCC 16 Option 3 (Xenon Arc Continuous light) for 40 AATCC fading units.

2.4 Remove and rate the test specimens in accordance with AATCC Evaluation Procedure One using the AATCC Gray Scale for Color Change.

3. Results

3.1 Record the Gray Scale ratings for each test specimen, treated and untreated.

3.2 A lower Gray Scale rating on the treated test carpet indicates an adverse effect of the chemical treatment on the lightfastness of the carpet.

Section 5

Method for Determining The pH of Carpet Cleaning Products

1. Scope

1.1 Chemicals which are extremely acidic or alkaline have been known to adversely effect dyes and certain fibers. Chemicals with a more neutral pH are generally considered safer to use when cleaning carpets or rugs.

1.2 This method is applicable to liquid chemicals.

2. Apparatus

2.1 Portable or benchtop pH meter.

2.2 4 pH Buffer Solution

2.3 10 pH Buffer Solution

2.4 100 ml glass beaker or similar suitable container.

3. Procedure

3.1 Follow the manufacturer's instructions for use of the pH meter.

3.2 Measure the pH of the 4 pH and 10 pH buffer solutions to confirm pH meter standardization. Adjust meter if necessary to achieve correct readings.

3.3 Pour an adequate quantity of the chemical to be tested into a clean beaker or other appropriate container compatible for use with the pH meter electrode.

NOTE: Test the chemical in the same dilution strength that is intended to be used.

3.4 Measure the pH of the chemical in accordance with the equipment manufacturer's instructions allowing adequate time for the reading to stabilize.

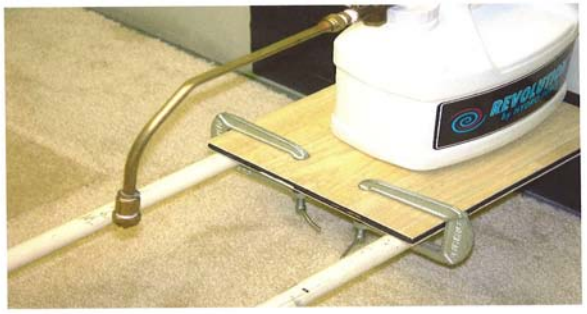
4. Report

4.1 Record the identification of the chemical being tested.

4.2 Record the dilution ratio, if applicable, of the chemical being tested.

4.3 Record the pH of the chemical being tested to the nearest 0.1 decimal point.

APPENDIX



Appendix 3

Appendix 2