

## **Standard Laboratory Practice for Consumer Applied Pet Stain and Odor Removal Chemical Evaluation on Pile Yarn Floor Coverings**

### **1. Scope**

- 1.1 This practice provides users with a standardized means by which a variety of odorous pet staining agents are applied to and removed from the surface of a carpet. It also describes a technique for removal of the applied pet stains.
- 1.2 This practice 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 of this practice to establish appropriate safe laboratory procedures and techniques.

### **2. Significance & Use**

- 2.1 The ability to remove odorous spots and stains from pile yarn floor coverings contributes to long term performance and consumer satisfaction. The evaluation of the effectiveness of pet stain removal and odor removal chemicals is achieved by means of rating specific staining agents which have been cleaned with a particular cleaning chemical.
- 2.2 This practice may be used for the purpose of evaluating the performance of a cleaning agent in removing specific pet stains and odors.
- 2.3 This practice may also be used in evaluating the staining characteristics of carpet fibers and/or the effectiveness of stain resistance chemical treatments. This method is not intended to assess odor resistance of mill applied treatments.
- 2.4 This practice is applicable to all pile yarn floor coverings and all pet stain removal products.

### **3. Referenced Documents**

- 3.1 AATCC Evaluation Procedure 2 – Gray Scale for Staining
- 3.2 ASTM D123 Terminology Relating to Textiles
- 3.3 ASTM D5684 Terminology Relating to Pile Yarn Floor Coverings

### **4. Terminology**

- 4.1 Definitions

- 4.1.1 odor: the property of a contaminant that is perceived by the sense of smell.
- 4.1.2 rating: the determination of the numeric assignment most closely representing the degree of contrast in correspondence to the steps of the Standard Rating Scale.
- 4.1.3 stain: colorant transferred to a substrate as a result of contamination by contact of a substance containing dyes or pigments.

**5. Apparatus**

- 5.1 Lab Oven
- 5.2 Thermometer
- 5.3 Glass specimen jars – 250 ±50 ml with sealable lids
- 5.4 Disposable pipettes – capable of measuring and dispensing 1 to 5 ml capacity
- 5.5 Staining Ring – 3.8 cm (1.5 in) diameter  
3.0 cm (1.2 in) height
- 5.6 Trigger pump spray bottle - adjustable spray nozzle.
- 5.7 Measuring cup or beaker - capable of measuring 0.5 ml increments
- 5.8 Paper Towels - White absorbent paper towels
- 5.9 AATCC Gray Scale for Evaluating Staining
- 5.10 Illumination System - Capable of providing 1000 ± 50 lux (100 lumens/sq. ft) of north sky light or equivalent light source.

**6. Test Specimen**

- 6.1 Recommended test carpet shall be 50 mm x 50 mm (2 inch x 2 inch).

**Table 1**

<b>Test Material</b>	
<b>Construction</b>	Tufted Cut Pile
<b>Weight</b>	25 Oz/Sq Yd ± 7%
<b>Pile Height</b>	.470 Inch
<b>Gauge</b>	1/8
<b>Stitch</b>	8 per inch
<b>Yarn</b>	100% BCF Nylon
<b>Treatment</b>	None

6.2 Select a test carpet of appropriate size to accommodate a minimum of *four (4) staining agents*. A sample 46 cm x 46 cm (18 in x 18 in) or larger is recommended.

**7. Procedure – Stain Removal**

- 7.1 Staining agents and application quantities for each are listed in Table 2.
- 7.2 For thicker, semi-solid staining agents, dilute with tap water at the ratio listed in Table 2.
- 7.3 Pour the staining agents which have been diluted in accordance with Table 2 into the spray bottle and adjust the nozzle to achieve a fine mist. Hold the spray nozzle in the center of the staining ring close enough to avoid over spraying outside the ring. Apply  $2.5 \pm 0.5$  ml of the liquid staining agents.  
**NOTE:** Prior to applying the staining agent, test the stain application quantity by pre-spraying into a measuring tube, cup or beaker.
- 7.4 The staining ring should be held in place until the staining agent has been absorbed into the carpet pile. Rinse staining ring with water to remove residual staining agents between each application.
- 7.5 For pet feces and pet vomit which are too thick to spray, evenly apply  $2.5 \pm 0.5$  grams to the test carpet within the staining ring.
- 7.6 For stain removal evaluations, each staining agent should be applied in triplicate. Stains should be at least 6.5 cm (2.5 inches) apart to avoid cross contamination due to wicking.
- 7.7 Repeat the identical stain application process on another carpet panel to be cleaned later with only water and compared to the stain remover chemical.
- 7.8 Place stained carpet panel on a non-absorbent surface and allow  $24 \pm 2$  hours for substrate to dry before beginning the stain removal procedure.

**Table 2**

Staining Agents	Application	Dilution Ratio
Cat Urine	$2.5 \pm 0.5$ ml	Full Concentration
Synthetic Pet Vomit	$2.5 \pm 0.5$ gms	See Formula
Dog Feces	$2.5 \pm 0.5$ gms	1:1 Water
AATCC Synthetic Soil *	$2.5 \pm 0.5$ ml	0.5 grams/100 ml

\* Soil requires sifting through 100 mesh screen prior to mixing with water.

**Formulas**

Synthetic Pet Vomit

- Mighty Dog Prime Cuts Beef Dinner      4 oz. can
- Water      4 oz.
- HCL      Q.S. pH 3.2 – 3.5

Using equal amounts of the water and the dog food puree, until homogenous. Add sufficient quantity of hydrochloric acid to adjust pH.

Dog Feces Formula – See Table 2  
Cat Urine Source  
Sullivan’s Select Scents Blue Creek, Ohio

## **8.0 Stain Removal Rating**

- 8.1 Remove any solid staining agent residues which may have formed on the pile surface as a result of drying. A bone scraper, spatula or equivalent tool can be used to gently scrape away the solid residue without damage to the pile fiber.
- 8.2 The selected cleaning agent is applied to each stain and cleaning is done in accordance with the chemical manufacturers cleaning instructions. The cleaning process is repeated on each stain for a total of two cleaning cycles.
- 8.3 In the absence of specific cleaning instructions, the following technique is recommended.
  - 8.3.1 Clean each stain individually and completely before proceeding to another stain. Saturate the stain with the cleaning agent and allow to dwell for 1 – 3 minutes.
  - 8.3.2 Blot the stained area by pressing with a clean white absorbent paper towel. Observe the transfer of both cleaning agent and stain residue to the paper towel. Continue blotting with clean dry paper towels until all evidence of liquid transfer is gone.
  - 8.3.3 Re-apply cleaning agent to stain and blot with clean dry paper towels until stain is completely removed or there is no evidence of stain transfer to the clean paper towel. This completes two cleaning cycles per stain.
- 8.4 Place test material on a non-absorbent surface and allow  $24 \pm 2$  hours for substrate to dry before evaluating stains.

## **9. Stain Removal Evaluation**

- 9.1 Rate each stain in accordance with AATCC Evaluation Procedure 2 using the Gray Scale for Staining.
- 9.2 A minimum of three trained technicians separately assess the stains and assign individual ratings which are averaged upon completion of the rating process.

## **10. Procedure – odor removal**

- 10.1 Apply  $2.5 \pm 0.5$  ml of cat urine within a  $37 \pm 3$  mm (1.5 inch) circle centered in the 50 mm (2 inch) x 50 mm (2 inch) carpet test specimen using a disposable pipette.

NOTE: Cat urine is used because it is the most odorous of the pet staining agents.

- 10.2 For odor removal evaluations two test specimens are prepared, one to be cleaned with selected cleaning agent and one to be cleaned with distilled water.
- 10.3 Allow test specimens to dry on a non-absorbent surface.
- 10.4 The selected cleaning agent is applied to one of the test specimens in accordance with the chemical manufacturer's instructions.
- 10.5 The duplicate test specimen is cleaned using distilled water.
- 10.6 Pour 7.5 ml ± 2.5 ml of distilled water into the 250 ml specimen jar. Place a separator in bottom of jar to ensure water does not contact 2" x 2" specimen. Insert 2" x 2" specimen into jar and seal with lid.
- 10.7 Heat sealed specimen jars for 2 hours ± 10 minutes at 60 °C (140°F).
- 10.8 Remove sealed specimen jars from the oven and keep sealed 72 ± 1 hours then perform assessment.

**11. Odor Removal Rating**

- 11.1 Raters are to individually remove the sealed container lid and sniff the contents. Rate both the chemically cleaned and water cleaned specimens using the ten point standard rating scale. (See Table 3)
- 11.2 A minimum of three trained technicians separately assess the odor and assign individual ratings which are averaged upon completion of the rating process.

**12. Odor Removal Evaluation**

**Table 3**

<b>STANDARD RATING SCALE</b>	
<b>10</b>	Odorless
<b>9</b>	Just Noticeable
<b>8</b>	Noticeable
<b>7</b>	Slight
<b>6</b>	Tolerable
<b>5</b>	Borderline Tolerable
<b>4</b>	Objectionable
<b>3</b>	Annoying
<b>2</b>	Very Annoying
<b>1</b>	Intolerable

**13. Report**

- 13.1 The average rating for each staining agent.
- 13.2 The identifying information for the cleaning agent.
- 13.3 Any deviations from this test practice.