

Deep Cleaning Systems Testing Criteria

1. Soil Removal Standard

This test practice utilizes the use of X-Ray Fluorescence (XRF) to measure the average percent removed by weight of compounds used to soil a test carpet. This test practice may be used to evaluate the effectiveness of a cleaning event, an event in a process of several events or the entire system.

Method: X-ray Fluorescence (XRF) is used to detect elements of each compound used to soil a control carpet, then to determine their concentrations after a cleaning process. XRF is a technique that detects elements by ionizing the constituent atoms and recording the characteristic energy signatures given off by the elements as they seek to regain greater stability.

Five compounds containing suitable elements for XRF detection were chosen with consideration given to particle size (Fe_3O_4 at < 1 micron to ZnO at < 74 microns), hardness, solubility, and surface characteristics.

Each compound is first applied to nylon pellets at 6 grams of compound per 1000 grams of pellets (3g/1000 for Sr). Fifty grams of each of the five compound coated pellets are used to soil a 400 square-inch carpet following ASTM-D 6540. This test method uses a drum lined with the test carpet and is rotated a specified number of revolutions to uniformly distribute the synthetic soil into the carpet pile. Each soiled carpet is scanned using XRF to verify the starting concentration of each compound. All XRF scans are with the carpet on a conveyor such that in the 3-minute scan approximately 120 square inches of the 400 square inch carpet are analyzed. The soiled test carpet is then cleaned following the cleaning system procedures as specified by the cleaning system client. Three samples per test are used and the average percentage removed results reported.

- Soil Removal Standard - Percent of soil removed after water only cleaning operation:
 - 55 - 69 % to obtain SOA Bronze Certification
 - 70 - 79 % to obtain SOA Silver Certification
 - 80 - 89% to obtain SOA Gold Certification
 - 90 - 100% to obtain SOA Platinum Certification

2. For Accelerated Re-soiling Propensity of Pile Yarn Floor Covering

This test method is intended to determine the effects of cleaning equipment, chemistry and technologies on the re-soiling properties of a specified floor covering. A clean control test carpet is cleaned according to the client's directions. The cleaned carpet is allowed to thoroughly dry then soiled per ASTM 6540-2000. Additional control carpet is

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soiled per ASTM 6540-2000 that has not been cleaned. The differential soil level between the cleaned sample(s) and control sample(s) is evaluated using an appropriate laboratory instrument (spectrophotometer) using the AATCC Gray Scale for Color Change.

- Equal to or better than water according to the AATCC Gray Scale

3. For Determining Residual Moisture as a result of Deep Cleaning

This test practice is intended to determine the moisture left in a specific carpet as a result of simulated cleaning using a deep cleaning system.

The resultant difference in weight is measured and reported as grams per square meter and ounces per square yard of residual moisture.

- Residual Moisture in carpet immediately after cleaning operation:
 - 271 g/m^2 ($\leq 8 \text{ oz/yd}^2$)**

** When using pre-spray, allow up to 678 grams/m^2 (20.0 oz/yd^2)

4. For Evaluating Surface Appearance Change due to Repeated Cleanings

This test practice provides a laboratory test for the measurement of surface appearance change of textile floor covering as a direct result of multiple cleaning passes in a controlled environment.

This test practice is applicable to all residential/commercial cleaning systems. Six cleaning cycles are applied to residential cut pile carpet for residential specific systems. Eleven cleaning cycles are applied to commercial cut pile carpet for commercial specific systems. Texture appearance change is visually rated.

- Appearance Retention:
 - No more than one step appearance change in the deterioration of the carpet pile surface.

5. Colorfastness To Light

Cleaning chemical residues present on pile yarn floor coverings have been known to adversely effect 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. Accelerated color change in the treated test carpet is compared to the untreated test carpet after exposure.

- No color change



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6. For Determining the pH of Cleaning Chemicals Intended for Use on Carpets

Chemicals which are extremely acidic or alkaline have been known to adversely effect dyes, treatments and fibers. Chemicals with a more neutral pH are generally considered safer to use when cleaning carpets or rugs. The formula is tested by a standard pH meter following the manufacturers recommended dilution.

- pH between 4 and 10

7. For Determining the Presence of Optical Brighteners in Cleaning Chemicals

The presence of optical brighteners in carpet cleaning products has been known to adversely affect fiber color, appearance and long term performance. The cleaning agent is evaluated for optical brightener content using fluorescence.

- No Optical Brighteners