

Test Method for Carpet Soiling: Service Soiling

Developed in 1967 by AATCC Committee RA57; reaffirmed 1970, 1973, 1976, 1979, 1982, 1989, 2000, 2013; editorially revised 1985, 1990; editorially revised and reaffirmed 1987, 1995; revised 2009, 2019.

1. Purpose and Scope

1.1 This test method evaluates the service soiling of textile floor coverings.

2. Principle

2.1 Specimens of carpets and selected control samples are exposed to normal foot traffic in a controlled test area. The test specimens and controls are removed and rated at predetermined intervals corresponding to different degrees of soiling or exposure to soiling.

3. Terminology

3.1 **carpet**, n.—all textile floor coverings not designated as rugs.

3.2 **soil**, n.—dirt, oil or other substances not normally intended to be present on a substrate such as a textile material.

3.3 **soiling**, n.—in textiles, a process by which a textile substrate becomes more or less uniformly covered with/or impregnated with soil.

3.4 **textile floor covering**, n.—an article having a use-surface composed of textile material and generally used for covering floors.

3.5 **use-surface**, n.—of textile floor covering, the part of a textile floor covering directly exposed to foot traffic.

4. Safety Precautions

NOTE: These safety precautions are for information purposes only. The precautions are ancillary to the testing procedures and are not intended to be all inclusive. It is the user's responsibility to use safe and proper techniques in handling materials in this test method. Manufacturers MUST be consulted for specific details such as material safety data sheets and other manufacturer's recommendations. All OSHA standards and rules must also be consulted and followed.

4.1 Good laboratory practices should be followed. Wear safety glasses in all laboratory areas.

5. Soiling Location

5.1 The soiling location shall be sufficiently removed from any street or other outside area so that the specimen will not be subjected to wet traffic. A distance of at least 15 m (50 ft) is suggested.

5.2 It shall be sufficiently isolated from greasy, oily or other nontypical soiling which might be present in factory areas and the like.

5.3 The traffic pattern in the soiling area shall be such that all specimens are subjected to all of the traffic as in the case of a narrow aisle or passageway with access only at either end or, alternately, if the traffic cannot be so confined or directed, it shall be randomized to such a degree as to produce the effect of uniform soiling.

5.4 In the case of the long narrow arrangement with traffic only in two opposite directions, a 2 m (6.5 ft) length of buffer carpet shall be installed at both ends of the test area. For other arrangements, or where there is a random traffic pattern, the buffer carpet shall be installed around the perimeter of the test specimens and may extend for a proportionately shorter distance but in no case for less than 2 m (6.5 ft) in any direction. The buffer carpet may be of any available fiber or construction but should be light in color in order to avoid errors due to the transfer of fiber or dyestuff to the test specimens.

6. Carpet Specimens

6.1 Specimen size. The minimum size of the test specimens shall be 30 × 30 cm (12 × 12 in.).

6.2 Specimen mounting. The carpet specimens shall be mounted or installed in such a way that the specimens can be removed or transported easily. Examples include the use of double sided tape and the mounting of the specimens on 12 mm (0.5 in.) plywood with staples.

7. Arrangement and Rotation of Specimens

7.1 The requirements are related to the dimensions and traffic pattern of the particular soiling area. Therefore, it is not possible to propose a procedure which will be universally applicable. Specimen rotation is necessary to achieve uniform soiling.

7.2 To find a suitable rotation for each particular soiling area, select a material

with a known level of soiling (the control sample for example). Install the correct number of specimens to the soiling area such that all spaces are filled. Soil the known material to the level desired, rotating samples such that consistent soiling is obtained on all specimens. Once the rotation process has been defined in this manner, document the rotation sequence for future use.

8. Soiling Levels

8.1 Control Carpet Soiling Level.

8.1.1 The standard levels of soiling must be predetermined prior to conducting the service soiling test. For general use of this test the soiling intervals may correspond to those required to obtain soiling levels of an arbitrarily selected carpet (control sample) exposed to give a light, medium and high degree of soil (see 13.1). Each laboratory should select and prepare control soiled samples consistent with the needs of the laboratory. If two or more laboratories are involved, identical control samples should be available for each laboratory.

8.1.2 Test and control specimens are removed from the test pattern at specified intervals corresponding to different degrees of soiling or exposure to soiling.

8.1.3 Remove all the specimens from the first group whenever the control test specimen matches the soiled control sample (first soiling level). This is done regardless of the appearance of the other specimens at that time.

8.1.4 Remove the other specimens and control samples in a similar manner at the second and third soiling levels, respectively.

8.1.5 As each soiling level is reached, replace spaces left vacant by the removal of test and control specimens. Use portions of the buffer carpet for this purpose.

8.2 Soiling Level Based on Traffic.

8.2.1 An alternative to the above method is to use a specific amount of traffic to all the test specimens for every test. The amount of traffic the test specimens would be exposed to would be established prior to testing by the laboratory. After that specific level of traffic was attained, the samples would be removed from the area.

9. Evaluation

9.1 After the samples are removed, compare the control sample with the con-



trol soiled sample daily as soon as possible after vacuuming. Once the decision is made to remove a set of specimens, vacuum the set immediately before they are removed from the test area. Soiling continues with the specimens being advanced one position each day.

9.2 Records of the traffic count and the duration of the test may be maintained.

10. Maintenance

10.1 Clean the test specimens daily using an upright motor-driven brush-type of vacuum cleaner.

10.1.1 A proper cleaning shall consist of four passes of the cleaner over a particular area of the carpet. The first pass when starting shall be away from the operator, the second back toward the operator. The last stroke shall be back toward the operator. On the next adjacent section of the specimen to be cleaned, the first stroke shall be away from the operator. Overlaps due to the width of the specimen not being an even multiple of the cleaner shall be ignored.

11. Evaluation

11.1 Visual evaluation can be used to determine differences in degrees of soiling (see AATCC TM121, Test Method for Carpet Soiling: Visual Rating).

12. Precision and Bias

12.1 *Precision.* Precision for this test method has not been established. Until a precision statement is generated for this test method, use standard statistical techniques in making any comparisons of test results for either *within-laboratory* or *between-laboratory* averages.

12.2 *Bias.* Carpet soiling (service soiling method) can be defined only in terms of a test method. There is no independent method for determining the true value. As a means of estimating this property, the method has no known bias.

13. Notes

13.1 In the work of Committee RA57, the soiling levels were defined by nylon cut-pile carpet samples soiled to three different levels (light, medium, heavy) (see Appendix A for Synthetic Soil Preparation).

Appendix A Synthetic Soil Preparation

A1. Synthetic Soil Formulation:

Ingredient.....	% by Weight
Peat moss (dark)	38
Portland cement	17
Kaolin clay	17
Silica (200 mesh).....	17
Carbon black (Lamp or furnace black)	1.75
Black iron oxide.....	0.50
Mineral oil (medicinal grade).....	8.75

A1.1 Peat moss should be dry and free of lumps.

A1.2 Portland cement must be dry. If it contains lumps, discard and use fresh supply.

A1.3 Black iron oxide was incorrectly listed as "red iron oxide" in previous versions of this test method.

A1.4 Mix all dry ingredients together thoroughly before adding mineral oil. Dry mix at 50°C (122°F) for 6-8 h.

A1.5 Place dry mixture in ball mill with ceramic balls. Turn mill on and run for approximately 24 h.

A1.6 Store mixture in vapor tight containers with a desiccant.