

Carpet Soiling: Accelerated Soiling Method

Developed in 1967 by AATCC Committee RA57; editorially revised 1974, 1985, 1990, 1991; reaffirmed 1970, 1973, 1976, 1979, 1982, 1989, 2000; revised 1988; editorially revised and reaffirmed 1995.

1. Purpose and Scope

1.1 This test method describes a procedure for the accelerated soiling of carpets. It can be used to compare the soiling propensity of two or more carpets; or it can be used to soil carpets as a preliminary step in measuring either the ability of a carpet to be cleaned or the efficiency of a cleaning process. This accelerated carpet soiling method has been found to give results similar to floor service soiling, but its use is recommended only as a screening method and not as a replacement for floor testing.

2. Principle

2.1 Specimens of carpet are tumbled together with prepared synthetic soil (see Sections 7 and 8) in a laboratory ball mill for a predetermined time.

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.

3.6 **accelerated soiling, service soiling**, and other key terms will be added when definitions are agreed upon.

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 inclu-

sive. 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.

4.2 Manufacturer's safety recommendations should be followed when operating laboratory testing equipment.

5. Apparatus and Materials

5.1 Jar mill, laboratory, ball, roller type, direct motor driven, 1 L (1 qt) (see 13.1).

5.2 Jar, ball, mill, porcelain, approx. 1 L (1 qt) (see 13.2).

5.3 Flint pebbles, 1.9-2.5 cm (0.8-1.0 in.) diam (see 13.3).

5.4 Soils.

5.4.1 Soil (vacuum cleaner sweepings) (see Section 7).

5.4.2 Synthetic soil (see Section 8).

5.5 Vacuum cleaner: tank type; 120 volts; 750 watts; 50-60 cycles; use fabric or upholstery attachment.

6. Test Specimens

6.1 Cut two specimens, each 18 cm (7 in.) in warp direction of tufting and 9 cm (3 in.) in filling direction or across tufting direction.

6.2 Condition specimens at room temperature for 16 h prior to use.

7. Soil Preparation

7.1 Take sweepings from a vacuum cleaner. For maximum reproducibility use sweepings from several vacuum cleaners within the surrounding area of the testing facilities.

7.2 Pass sweepings through a 20-mesh screen and then through a 100-mesh screen.

7.3 Take soil which finally passes through the 100-mesh screen and sterilize it (for health reasons) by steaming for 30 min; then air dry.

7.4 Mix soil thoroughly and set aside sufficient quantity to complete the series of tests.

7.5 Do not store soil for more than 4 months.

8. Synthetic Soil Preparation

8.1 Synthetic Soil Formulation:

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

8.1.1 Peat moss should be dry and free of lumps.

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

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

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

8.1.5 Store mixture in vapor tight containers with a desiccant.

9. Soiling Levels

9.1 Soiling levels are predetermined on an arbitrarily selected carpet (control sample) soiled to give light, medium and heavy degrees of soil (see 13.4) preferably by exposure to a service soiling test (see 13.5).

9.2 Soiling times in the ball mill are determined by soiling unsoiled specimens of the control sample to match the levels of soiling established with soiled control specimens according to 9.1.

9.3 Carpet specimens under evaluation are soiled for given times established in 9.2.

10. Soiling Procedures

10.1 Place two specimens in the mill jar (see 5.2) with the back of each specimen against the inside cylindrical surface of the jar.

10.2 Place 10 g of soil on the face of the carpet specimens as uniformly as possible.

10.3 Add 50 flint pebbles in the porcelain jar and fasten cover to jar.

10.4 Rotate the jar and contents on the ball mill at 250-300 rpm.

10.5 At the end of the predetermined soiling time remove carpet specimens and clean excess soil from carpet specimens by light vacuuming with the tank-type vacuum cleaner. Five strokes with the vacuum cleaner attachment in each direction should be adequate. Clean all specimens in the same manner.

11. Evaluation of Results

11.1 It is recommended that AATCC Method 121, Carpet Soiling: Visual Rating Method, be used for evaluation.

11.1.1 It may be necessary to use a visual panel evaluation if time or available equipment does not permit evaluation by AATCC Method 121.

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 tech-

niques in making any comparisons of test results for either *within-laboratory* or *between-laboratory* averages.

12.2 *Bias.* Carpet soiling (accelerated 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 Suitable jar mill is Cat. No. 3440-E05 available from Thomas Scientific, 99 High Hill Rd. at I-295, P.O. Box 99, Swedesboro NJ 08085-0099; tel: 800/345-2100. Equivalent jar

mills are available from other laboratory supply companies.

13.2 Suitable jar is Cat. No. 3440-F15, Size 00, available from Thomas Scientific (see 13.1).

13.3 Suitable flint pebbles are Cat. No. 10484, Large, available from VWR Scientific, P.O. Box 66929, O'Hare AMF, Chicago IL 60666; tel: 800/932-5000. Equivalent pebbles are available from other laboratory supply companies.

13.4 In the work of Committee RA57, Floor Covering Test Methods, the soiling levels were defined by nylon cut-pile carpet samples soiled to three different levels (light, medium and heavy).

13.5 See AATCC Method 122, Carpet Soiling: Service Soiling Method.