Designation: D7804 – 12 (Reapproved 2017)

Standard Test Method for Fiber Shedding of Paint Roller Covers[1]

This standard is issued under the fixed designation D7804; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method describes a procedure for determining the amount of releasable fibers transferred from a paint roller cover to a surface being painted.

1.2 This test method is applicable to pile fabric paint roller covers.

1.3 Because both the application and panel evaluation are subjective, this test method should be used only for comparative testing within one facility using one operator for each set of applications, as the end result assigned by different facilities may not agree.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Some specific hazards statements are given in Section 7 on Hazards.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Summary of Test Method

2.1 The paint roller cover that is to be evaluated is used to paint a section of sealed test paper. After the paint film has dried, the fibers are counted.

3. Significance and Use

3.1 fibers that are released during painting can lead to a finish that is aesthetically unacceptable.

4. Test Specimen

4.1 Three identical paint roller covers, 9 by 1.5 in. (228.6 by 38.1 mm) diameter core.

5. Apparatus

5.1 *Paint Roller Frame*—designed for the paint roller cover being tested.

5.2 *Paint Tray*—suitable for the paint roller cover being tested.

6. Materials

6.1 *Test Paint*—commercially available semi-gloss or gloss paint, identified as to type, product number, and color. Paint to be mixed to a uniform consistency. Results may vary when using different paint types.

6.2 *Sealed Test Paper*—to minimize absorption of test paint, which allows formation of paint film. Sections measuring 28 in. (711.2 mm) wide by 20 in. (508 mm) long and have a minimum 10-mil thickness with a basis weight of 50 lb/Mft^2 (250 g/m^2).

6.3 *Tack Cloth*—commercially prepared cloth designed to remove dust and lint.

6.4 *Lighted Magnifying Glass*—with 5× magnification.

7. Procedure

7.1 All tests are to be conducted in controlled environment.

7.2 Prepare a clean, dry paint tray by wiping clean with a tack cloth to remove all foreign material. Wipe paper surface and surrounding area with tack cloth also.

7.3 Secure the two sections of sealed test paper to a flat vertical surface creating a 28 by 40 in. (711.2 by 1.016 mm) test surface.

7.4 Pour fresh paint into tray. Depth of paint to be the same as the pile height of the paint roller covers being tested. For example, ½ in. (12.7 mm) pile height cover would use ½ in. (12.7 mm) of paint in tray. *Do not use paint that has been exposed to fibers.*

7.5 Place the paint roller cover on the frame.

7.6 Load the paint roller cover by using twenty back and forth strokes, ten strokes total that go into the paint tray well to

[1] This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.61 on Paint Application Tools.

Current edition approved June 1, 2017. Published June 2017. Originally approved in 2012. Last previous edition approved in 2012 as D7804 – 12. DOI: 10.1520/D7804-12R17.

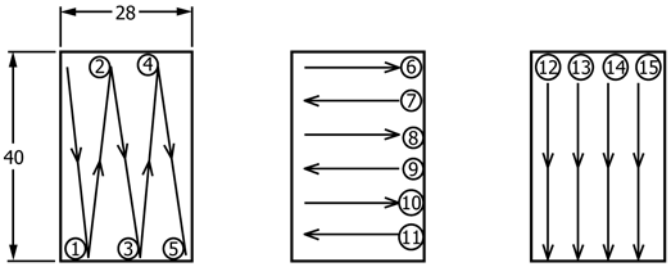

FIG. 1 Roll Out Stroke Pattern

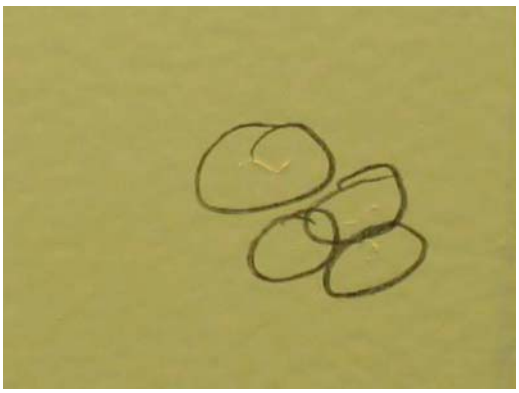

FIG. 2 Roller Fabric Lint – Large Fibers

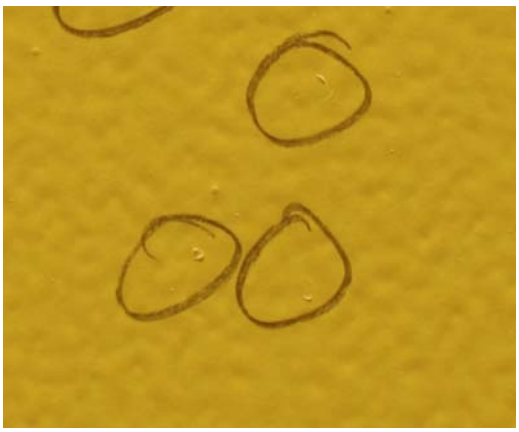

FIG. 3 Roller Fabric Lint – Small Fibers

load the paint. Finish with four back and forth strokes, two total strokes that even out the paint on the ramp of the tray, not going into the paint well. The paint roller cover may require hand rotation to achiever a uniform loading.

7.7 Roll out the paint roller cover on the sealed test paper using the pattern shown in Fig. 1. Care should be taken to maintain consistent light pressure on the paint roller cover during the first eleven strokes. Finish with four lighter strokes, overlapping slightly.

7.8 Cover as much of the test paper as possible without crossing the edges.

7.9 Allow the test paper with paint to dry in a vertical position to touch.

7.10 Repeat procedure following instructions 7.1 – 7.9 two more times on the remaining identical paint roller covers, being sure to use fresh paint and new tray.

7.11 Place painted test panel on a flat horizontal surface in a well-lighted area and wipe with a clean piece of tack cloth.

7.12 Circle and count each fiber (only lint) that is observed in the dried paint film over the entire painted surface with a magnifying glass with 5× power and fluorescent light. Record the results. See Fig. 2 and Fig. 3, magnified to show detail.

7.13 The results will be recorded as number of fibers.

8. Calculation or Interpretation of Results

8.1 Average the three results obtained in 7.13.

9. Precision and Bias[2]

9.1 The precision of this test method is based on an interlaboratory study of D7804, Test Method for Fiber Shedding of Paint Roller Covers, conducted in 2006.[3] Seven laboratories participated in this project, testing two different types of paint roller covers. Data from one laboratory could not be used in the calculation of precision. Every "test result" represents an individual determination. The laboratories obtained three replicated test results for each material.

9.1.1 *Repeatability*—Two test results obtained within one laboratory shall be judged not equivalent if they differ by more than the "*r*" value for that material; "*r*" is the interval representing the critical difference between two test results for the same material, obtained by the same operator using the same equipment on the same day in the same laboratory.

9.1.2 *Reproducibility*—Two test results shall be judged not equivalent if they differ by more than the "*R*" value for that material; "*R*" is the interval representing the difference between two test results for the same material, obtained by different operators using different equipment in different laboratories.

9.1.3 Any judgment in accordance with these two statements would have an approximated 95 % probability of being correct.

9.2 *Bias*—At the time of the study, there was no accepted reference material suitable for determining the bias for this test method, therefore not statement on bias is being made.

9.3 The precision statement was determined through statistical examination of 36 results, from six laboratories, on two materials. The two materials can be classified as the following (Table 1):

Roller cover Type 1: a roller with polyester fiber ½ in. (12.7 mm) pile nap, contactor grade.

Roller cover Type 2: a roller with polyester fiber ½ in. (12.7 mm) pile nap, economy grade.

9.3.1 To judge the equivalency of two test results, it is recommended to choose a roller closest in characteristics to the test roller.

[2] Supporting data have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR:D01-1164. Contact ASTM Customer Service at service@astm.org.

[3] The sealed test paper used in the round robin was Leneta Company Form CU-1M.

TABLE 1 Lint Count

	Average $\bar{x}$	Repeatability Standard Deviation sr	Reproducibility Standard Deviation sR	Repeatability Limit r	Reproducibility Limit R
Roller Cover					
Type 1	38.9	12.8	22.2	35.7	62.1
Type 2	139	51.3	115	144	322

10. Keywords

10.1 lint fiber; shedding

APPENDIXES

(Nonmandatory Information)

X1. RATIONALE

X1.1 Committee D01.61.2 has been meeting since 1998 and has done updating to this procedure many times. Our group consists of people with the common interest of roller cover shedding or linting. The round robins consisted of one roller cover manufacturer sending three roller covers processed as identically as possible. Seven participants then painted with the same lot of paint. Our biggest achievement came when we all joined together and discovered how each were painting with different techniques. Once we identified the techniques, the round robin efforts were acceptable. Differences in painting technique made more difference than any other single factor, therefore it is vital that the same person paint the covers to be tested. No preconditioning was considered in this testing as we strived to have "out of the package" results to duplicate the painting application for most end users.

X2. RESULTS

X2.1 The results show that the precision of this test method may be unstable if the same person does not complete each test.

X2.2 The same cover cannot be painted more than one time.

X2.3 Pressure exerted on the roller cover can alter the results.

X2.4 The person involved in testing should predetermine the size of defect and the definition of lint.

X2.5 Other factors that may alter results are materials and manufacturing processes.