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Standard Practice for Evaluation of Furniture Polish[1]

This standard is issued under the fixed designation D3751/D3751M; 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 practice covers the definition of properties to test and the apparatus to use in evaluating the performance of furniture polishes.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.3 *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.*

2. Terminology

2.1 *Definitions:*

2.1.1 *furniture polish*—a polish used for cleaning and improving the appearance of furniture finishes.

3. Significance and Use

3.1 This practice defines the properties to be tested, the apparatus to be used, and the comparisons of product performance. It is recognized that considerable discretion exists among formulators and marketers of furniture polish on which properties or performance characteristics are best for their products. This practice will be flexible to honor this fact within the confines of the furniture polish definition below.

3.2 The methods of testing are subjective and empirical in order to conform to the basic characteristics of the industry and to allow flexibility in testing.

4. Apparatus and Materials

4.1 *Control Polish,* selected subjectively for comparison to the test polish. It may be a competitive product, a modified formulation of the test polish, etc. The one stipulation is that the control polish be of the same or similar type as the test polish. For example, if the test polish is an aerosol emulsion polish, the control shall be an aerosol emulsion polish. It would not be meaningful to select a paste or liquid product as a control for comparison to an aerosol emulsion test polish.

4.2 *Test Substrate* for which the test polish is intended. The test surface shall be in good physical condition, not badly cracked, scratched, or otherwise damaged so as to interfere with evaluation of polish properties. The minimum test surface area for each sample shall be 1290 cm^2 [200 $in.^2$].

4.3 *Polishing Cloth*—Materials such as washed cheese cloth, rumple cloth, flannel, cotton diaper cloth, and nonwoven fabrics are suitable for this purpose. The same type polishing cloth should be used with each sample tested. Use separate cloths for each sample. Do not use felt or paper.

4.4 *Cleaning Solvent,* aliphatic, with kauri-butanol values less than 38.

4.5 *Eye Droppers and Tap Water.*

5. Test Specimen

5.1 The test specimen shall be the sample of polish to be tested.

6. Selection of Testers

6.1 The application and evaluation of the test and control polishes requires four individuals. They shall be capable of making discriminating judgments of subjective, physical, and aesthetic properties. Training and orientation to specific product performance characteristics may be required.

6.2 Each person applies the polishes to one of the four test panels. The tester then rates all properties except application properties on the remaining three panels that they did not polish. The person applying the polishes rates ease of use and other application properties. This means there will be only four readings on application properties. The three rating the other polish properties do not observe the application because they rate properties of each polish "blind."

7. Procedure

7.1 *Cleaning of Test Substrates*—Use an aliphatic solvent having a kauri-butanol value less than 38, to clean the test

[1] This practice is under the jurisdiction of ASTM Committee D21 on Polishes and is the direct responsibility of Subcommittee D21.04 on Performance Tests.

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substrate thoroughly. Use new paper towels each time to apply the solvent to the surface and to wipe it clean.

7.2 *Application of Polish*—Assuming the control polish or the test polish is a commercially available product, follow the directions on the container so far as possible. When in doubt on the method of use, follow the directions for similar products. Use equal volumes of control and test polish to avoid excessively thin or heavy coats of polish. Use one or two applications depending on the substrate and the discretion of the tester. Use the same number of coats for both the test polish and the control polish.

7.3 *Placement of Polishes:*

7.3.1 *Alternative A*—A controlled randomized method of laying out the test (X) and control (C) polishes is represented as follows:

Test Panel	Left	Center	Right
1	C	X	C
2	C	C	X
3	X	C	X
4	X	X	C

These four positionings should be written on tags and drawn randomly by each of the four who apply the polishes.

7.3.2 *Alternative B*—A controlled randomized method of laying out the test (X) and control (C) polishes is represented as follows:

Test Panel	Left	Right
1	C	X
2	X	C
3	C	X
4	X	C

These four positionings should be written on tags and drawn randomly by each of the four who apply the polishes.

8. Evaluation

8.1 Compare the test polish and the control as follows:

8.1.1 *Application Properties* (*Ease of Rub-Out to Maximum Gloss*)—During application of the polishes note the time and ease with which each product develops maximum gloss.

8.1.2 *Final Properties*—Evaluate any or all of the following properties no sooner than 5 min following application:

8.1.2.1 *Gloss*—Evaluate as depth of gloss.

8.1.2.2 *Uniformity*—Observe the surface for streaks, unpolished dry spots, and general uniformity.

8.1.2.3 *Film Clarity*—Observe the clearness or sharpness of an object's image in the polished surface. Overhead lights, face, hand, or other objects may be used for reflection. This test may be eliminated for low-luster surfaces that do not possess mirror-like finishes.

8.1.2.4 *Smear and Mar Resistance*—Smear is the degree of oiliness or greasiness after the polish is rubbed-out to the desired polish appearance. Mar is the degree of film damage resulting from a glancing blow to the polish substrate. Check smear by making a design such as an *S* with one's finger. A glancing blow with one's knuckles or soft object such as a book or magazine may be used for determining the degree of mar.

8.1.2.5 *Film Healing*—Observe the length of time required for the smear or mar in 8.1.2.4 to disappear from the polish film.

8.1.2.6 *Rebuffability*—Observe the ease and completeness of repairability when the smears and mars are buffed with a polishing cloth. The amount of physical effort and length of time required is noted.

8.1.2.7 *Cleaning*—Observe the ease of removal of old polish films as well as common soiling materials such as dust, grease, oils, finger marks, beverage stains, etc. This may be done either in the laboratory or observed during actual use trials of the products. In the laboratory, removal of old polish may be determined by applying multiple coats (10 to 20 applications) and determining polish build-up. A polish showing little build-up would be rated a good cleaner for old polish. Other materials, such as grease, oils, sugar solutions, etc., should be tested on an individual basis.

8.1.2.8 *Water Spotting*—At least 2 h after application of the polishes, place at random on the polished surfaces several spots of water about the size of a penny. Allow the water to remain on the surface for 5 min, 15 min, 30 min, and 1 h. At precise intervals, blot the water with a paper towel or other absorbent material. DO NOT WIPE. Observe the presence and degree of film damage. Other materials such as milk, coffee, juice, alcoholic beverages, etc., may be used to supplement the water test.

8.1.2.9 *Gloss Retention*—Observe the degree of gloss of a freshly applied polish film compared to that of an aged polish film.

8.1.2.10 *Dust Attraction*—Measure by carefully wiping the test surface to remove all dirt and dust. Place the test substrate in a place to accumulate dust. Check dust build-up on the panel after 24, 48, and 72 h, and after 1 week.

9. Report

9.1 *Alternative A*—Using 7.3.1 rate all properties 0 to 5. A value of 5 equals excellent and 0 equals complete failure. Values in between are various degrees between these extremes. This is a monodic value system for each test surface evaluated based on each individual raters own reference scale. Since the three individuals rating the final properties do not know the placement sequence, each polished area is rated "blind" with no possibility for bias.

9.1.1 Fig. 1 may be used to record the raw data. Fig. 2 may be used to summarize and compare data. The following calculation provides a rating factor for each property tested:

$$F = \frac{X_{\text{property}}}{n} \quad (1)$$

$$F_c = \frac{C_{\text{property}}}{n} \quad (2)$$

	Test Panel Application No.1			Test Panel Application No.2		
Properties	Left	Center	Right	Left	Center	Right

	Test Panel Application No.3			Test Panel Application No.4		
Properties	Left	Center	Right	Left	Center	Right

Rating Scale: 0 to 5

5 = excellent 2 = fair
4 = very good 1 = poor
3 = good 0 = complete failure

NOTE 1—Designate the position of the product (X or C) in the box designating the position on the test panel; for example: *left*, *center*, or *right*.

FIG. 1 FURNITURE POLISH EVALUATION INDIVIDUAL RATINGS FOR 9.1.1

Products Compared _____

_____

Surfaces Used for Testing _____

Temperature _____ Relative Humidity _____

Date _____ Evaluator _____

Properties	Summary of Product (X) Properties			Summary of Control (C) Properties		
	n	^{x}Properties	F	n	^{c}Properties	F_c

FIG. 2 FURNITURE POLISH EVALUATION SUMMARY OF INDIVIDUAL RATINGS FOR 9.2.1

where:

F = rating factor for test polish,
F_c = rating factor for control polish,
$X_{property}$ = sum of all readings of a specific property for the test polish,
$C_{property}$ = sum of all readings of a specific property for the control polish, and
n = number of observations.

9.2 *Alternative B*—Using 7.3.2 rate all properties 1 to 5, with the control surface always given a rating of 3. The scale is as follows:

1 = significantly poorer than control,
2 = slightly poorer than control,
3 = no difference from control,
4 = slightly better than control, and
5 = significantly better than control.

This value system is a paired comparison with the control surface always acting as the point of reference. Since the three testers rating the final properties need the control surface to be identified, the identification of the control product must not be revealed to prevent bias.

9.2.1 Fig. 3 may be used to record the raw data. Fig. 4 may be used to summarize and compare data. The following calculation provides a rating factor for each property tested:

$$F = \frac{X_{property}}{n} \quad (3)$$

where:

F = rating factor for test polish,
$X_{property}$ = sum of all readings for a specific property for the test polish, and
n = number of observations.

Specific properties of the control polish are assigned a value of 3.0.

9.2.2 Record temperature and relative humidity at which tests were run.

10. Precision and Bias

10.1 *Alternative A*—Due to the subjective nature of this test method, no precision and bias can be established.

10.2 *Alternative B*—(Same as Alternative A.) However, since all the rating factors are in relation to the control, the values can be analyzed statistically to determine if the differences observed are significant.

11. Keywords

11.1 furniture polish; polishes

	Test Panel Application No. 1		Test Panel Application No. 2	
Properties	Control	Test	Test	Control

	Test Panel Application No. 3		Test Panel Application No. 4	
Properties	Control	Test	Test	Control

Rating Scale: 1 to 5
5 = significantly better than control
4 = slightly better than control
3 = no difference from control
2 = slightly poorer than control
1 = significantly poorer than control

FIG. 3 FURNITURE POLISH EVALUATION INDIVIDUAL RATINGS FOR 9.2.1

Products Compared _____

_____

Surfaces Used for Testing _____

Temperature _____ Relative Humidity _____

Date _____ Evaluator _____

Properties	Summary of Test Product Properties			Summary of Control Product Properties
	n	^{x}Properties	F	F_c
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0
				3.0

FIG. 4 FURNITURE POLISH EVALUATION SUMMARY OF INDIVIDUAL RATINGS FOR 9.2.1