



Standard Guide for Sensory Evaluation of Household Hard Surface-Cleaning Products with Emphasis on Spray Triggers¹

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1. Scope

1.1 This guide covers guidelines specific to the sensory evaluation of trigger hard surface cleaners. It covers the procedure for preparing a nonporous surface with the intent to measure one or all of the various aspects of a trigger product: package, application, performance, after-use and fragrance characteristics.

1.2 This guide for preparing a nonporous surface may also be used to assess other sensory aspects of a trigger hard surface cleaner, visual, tactile, fragrance, and performance or package ergonomics. It is applicable for use with highly trained assessors and descriptive panels and can be used for consumer acceptance evaluation.

1.3 This guide for preparing nonporous hard surfaces is intended to focus on surface preparation and evaluation, not on panel selection, training, or development.

1.4 The reader should be aware that good sensory practices are required when preparing the surfaces, and in developing and training the panelists.

1.5 The researcher is responsible for identifying the most appropriate test design and using the appropriate statistical tool to address that experimental design.

1.6 Since this guide's intended use is to provide direction on the presentation and measurement of the different aspects of spray trigger hard surface cleaners, this guide may not accurately represent all possible soils and surfaces where spray trigger hard surface cleaners may be used.

1.7 This guide provides suggested procedures and is not meant to exclude alternate procedures that may be effectively used to provide the same results.

1.8 *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 to determine the applicability of regulatory requirements prior to use.*

¹ This guide is under the jurisdiction of ASTM Committee E18 on Sensory Evaluation of Materials and Products and is the direct responsibility of Subcommittee E18.07 on Personal Care and Household Evaluation.

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2. Referenced Documents

2.1 ASTM Standards:²

- D 2960 Test Method of Controlled Laundering Test Using Naturally Soiled Fabrics and Household Appliances
- D 4265 Guide for Evaluating Stain Removal Performance in Home Laundering
- D 5343 Guide for Evaluating Cleaning Performance of Ceramic Tile Cleaners
- E 253 Terminology Relating to Sensory Evaluation of Materials and Products

2.2 ASTM Publications:³

- MNL 13 Manual on Descriptive Analysis Testing for Sensory Evaluation
- MNL 26 Sensory Testing Methods, Second Edition
- STP 433 Basic Principles of Sensory Evaluation
- STP 758 Guidelines for the Selection and Training of Sensory Panel Members

2.3 ISO Documents:⁴

- ISO 4121 Sensory Analysis—Methodology—Evaluation of Food Products by Methods Using Scales and Categories
- ISO 5492 Sensory Analysis—Vocabulary
- ISO 5496 Sensory Analysis—Methodology—Initiation and Training of Assessors in the Detection and Recognition of Odors
- ISO 6658 Sensory Analysis—Methodology—General Guidance
- ISO 8586-1 Sensory Analysis—Methodology—General Guidance for Choosing, Training and Monitoring of Selected Assessors
- ISO 11035 Sensory Analysis—Methodology— Identification of Descriptors for Establishing a Sensory Profile

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from ASTM International Headquarters, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

3. Terminology

3.1 Definitions:

3.1.1 *assessor*—a general term for any individual responding to stimuli in a sensory test.

3.1.2 *nonporous surface*—refers to a solid material that cannot be permeated by liquids.

3.1.3 *trained assessor*—an assessor with a high degree of sensory acuity who has experience in the test procedure and an established ability to make consistent and repeatable sensory assessments. A trained assessor functions as a member of a sensory panel.

4. Summary of Practice

4.1 This guide provides direction on how to assess spray trigger hard surface cleaners. This guide describes sample preparation and evaluation approaches to various aspects of a spray trigger hard surface cleaner: visual, tactile, fragrance, and performance or package ergonomics.

5. Significance and Use

5.1 The methods outlined in this guide can be used to qualitatively and quantitatively describe the sensory characteristics and performance of trigger hard surface household cleaning products for nonporous surfaces.

5.2 The methods are suited for descriptive analysis and may be adaptable for consumer acceptance research.

5.3 This guide provides the procedure for the evaluation of package, application, performance, after-use and fragrance aspects of hard surface cleaners. Depending on the test objectives, all or some of these measures may be used.

5.4 This guide, as defined by ASTM, is designed for use for product research guidance in product formulation, new product development, and quality control issues.

5.5 This guide is a compendium of information or series of options that does not recommend a specific course of action. This guide is not intended for claim substantiation, as it has not been subjected to validation testing.

5.6 This guide is for use by individuals who familiarize themselves with these procedures and who have previous experience with sensory evaluations. It is suggested that the individuals have some experience with developing and training a descriptive panel or work under the supervision of a sensory professional who has.

5.7 This guide might involve hazardous materials. This guide does not claim to address all of the safety problems associated with its use. It is the responsibility of the user of this guide to establish appropriate safety and healthy practices and to determine the applicability of limitations prior to use.

6. Equipment

6.1 The following equipment may be used during the preparation or evaluation process:

6.1.1 Lights for a flat horizontal surface require overhead lighting that simulates North Daylight (that is, Mac Beth Lighting). See ASTM STP 913 (4.1.8).

6.1.2 Lights for a vertical surface may use the Mac Beth portable light box.

6.1.3 Surfaces identified as nonporous are: glass, ceramic, sheet acrylic—also known as Formica®, porcelain, enamel, painted metal, stainless steel, and chrome.

6.1.4 Spangler soil (refer to Guide D 4265 for soil formula).

6.1.5 Metered sprayer.

6.1.6 Deionized water.

6.1.7 Reagent grade Acetone.

6.1.8 Cheesecloth.

6.1.9 Vertical rack for drying soiled surfaces.

6.1.10 Lint free paper towels or absorbent cotton cloths.

7. Procedure

7.1 These procedures are designed for the preparation of nonporous surfaces to be evaluated by trained-assessors or consumers for acceptance in a Central Location Test (CLT) environment. Not all portions of these procedures may need to be conducted and will depend on the objective and scope of the sensory test(s). Depending on the product's end-use, select the soils and surfaces on which this product should be evaluated. It is suggested consideration be given to testing on multiple surfaces or multiple soils, or both, to satisfy the objective of the test.

7.2 *Preparation of Surface for Testing*—Select the nonporous surface(s) that are appropriate for the particular hard surface cleaner to be evaluated. The test surfaces selected should be thoroughly cleaned before and between uses. The test surface has to be evaluated prior to use to determine that it is free of manufacturer defects. This will help minimize any variability from surface to surface. The surface should be cleaned sequentially as follows:

7.2.1 Wash in warm water with unscented hand dish washing liquid.

7.2.2 Rinse with deionized water.

7.2.3 Wipe surface dry of any residual water with cheesecloth. Do not allow water droplets to dry on surface.

7.2.4 Rinse surface with acetone (reagent grade).

7.2.5 Wipe surface dry of any residual acetone with cheesecloth, especially on surface edge.

7.2.6 Exposing the cleaned surfaces to a live stream of air should be used to assess the effectiveness of the surface cleaning process. Those areas not thoroughly clean will take on a white, highly reflective appearance. In such a case, the entire surface will be re-cleaned, repeating the above steps. Soiling of the test surface should not occur until the test surface has been thoroughly cleaned.

7.2.7 After cleaning, place the clean surfaces on a vertical rack. Be sure the vertical rack does not allow the surfaces to touch each other. Take caution to avoid recontaminating the clean surface.

7.3 *Application of Soils*—Select soils suitable for the hard surface cleaner of interest. Industry standard soils are available through ASTM and CSMA. The selected soil should be applied in a reproducible, uniform, and standard manner. To illustrate the specific nature of the application process, the following instruction steps should be used. The example given is when the Spangler soil is applied to a glass surface, but is applicable for other soils and surfaces.

7.3.1 The Spangler soils are applied using a metered spray onto the clean surface.