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Standard Guide for Sensory Evaluation of Household Hard Surface-Cleaning Products with Emphasis on Spray Triggers[1]

This standard is issued under the fixed designation E2346/E2346M; 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.

ε1 NOTE—Subsections 2.3 and 7.3 were editorially updated in October 2022.

1. Scope

1.1 This guide presents 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, and after-use properties, with focus on visual, tactile, fragrance, performance, and package ergonomics. It is applicable for use with assessors, highly trained assessors, and consumers.

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

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

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

1.5 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.

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

1.7 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. Values are stated in only SI units when inch-pound units are not used in practice.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.9 *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. Referenced Documents

2.1 *ASTM Standards:*[2]

D4265 Guide for Evaluating Stain Removal Performance in Home Laundering

D5343 Guide for Evaluating Cleaning Performance of Ceramic Tile Cleaners

E253 Terminology Relating to Sensory Evaluation of Materials and Products

2.2 *ISO Documents:*[3]

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

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

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

ISO 11035 Sensory Analysis—Methodology— Identification of Descriptors for Establishing a Sensory Profile

2.3 *HCPA Test Methods:*[4]

DCC-09 Glass Cleaners

DCC-09A Standard Guide for Evaluating the Filming and Streaking of Glass Cleaners

DCC-12 Guidelines for Screening the Efficacy of Oven Cleaners

DCC-16 Guidelines for Evaluating the Efficacy of Bathroom Cleaners Scrubber Test for Measuring the Removal of Lime Soap

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

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

4. Summary of Guide

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, performance, and package ergonomics.

5. Significance and Use

5.1 The methods outlined in this guide can be used to qualitatively and quantitatively evaluate 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 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 MNL 60 (**1**).[5]

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. Other non-porous surfaces can be used depending on research objectives.

6.1.4 Test soil (refer to Guides D4265 and D5343 for example soil formulas).

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.

[4] Available from Household and Commercial Products Association (HCPA), 1667 K St., NW, Suite 300, Washington, DC 20006, https://www.thehcpa.org.

[5] The boldface numbers in parentheses refer to a list of references at the end of this standard.