



Standard Test Method for Same-Different Test¹

This standard is issued under the fixed designation E2139; 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 comparing two products.

1.2 This test method does not describe the Thurstonian modeling approach to this test.

1.3 This test method is sometimes referred to as the simple-difference test.

1.4 A same-different test determines whether two products are perceived to be the same or different overall.

1.5 The procedure of the test described in this test method consists of presenting a single pair of samples to each assessor. The presentation of multiple pairs would require different statistical treatment and it is outside of the scope of this test method.

1.6 This test method is not attribute-specific, unlike the directional difference test.

1.7 This test method is not intended to determine the magnitude of the difference; however, statistical methods may be used to estimate the size of the difference.

1.8 This test method may be chosen over the triangle or duo-trio tests where sensory fatigue or carry-over are a concern, or where a simpler task is needed.

1.9 *This standard may involve hazardous materials, operations, and equipment. 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. Referenced Documents

2.1 ASTM Standards:²

¹ This test method is under the jurisdiction of ASTM Committee E18 on Sensory Evaluation and is the direct responsibility of Subcommittee E18.04 on Fundamentals of Sensory.

Current edition approved Aug. 1, 2011. Published August 2011. Originally approved in 2005. Last previous edition approved in 2005 as E2139–05. DOI: 10.1520/E2139-05R11.

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.

E253 Terminology Relating to Sensory Evaluation of Materials and Products

E456 Terminology Relating to Quality and Statistics

E1871 Guide for Serving Protocol for Sensory Evaluation of Foods and Beverages

2.2 ASTM Publications:²

Manual 26 Sensory Testing Methods, 2nd Edition

STP 758 Guidelines for the Selection and Training of Sensory Panel Members

STP 913 Guidelines for Physical Requirements for Sensory Evaluation Laboratories

2.3 ISO Standard:³

ISO 5495 Sensory Analysis—Methodology—Paired Comparison

3. Terminology

3.1 For definition of terms relating to sensory analysis, see Terminology E253, and for terms relating to statistics, see Terminology E456.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 α (*alpha*) *risk*—probability of concluding that a perceptible difference exists when, in reality, one does not (also known as Type I Error or significance level).

3.2.2 β (*beta*) *risk*—probability of concluding that no perceptible difference exists when, in reality, one does (also known as Type II Error).

3.2.3 *chi-square test*—statistical test used to test hypotheses on frequency counts and proportions.

3.2.4 Δ (*delta*)—test sensitivity parameter established prior to testing and used along with the selected values of α , β , and an estimated value of p_1 to determine the number of assessors needed in a study. Delta (Δ) is the minimum difference in proportions that the researcher wants to detect, where the difference is $\Delta = p_2 - p_1$. Δ is not a standard measure of sensory difference. The same value of Δ may correspond to different sensory differences for different values of p_1 (see 9.5 for an example).

3.2.5 *Fisher's Exact Test (FET)*—statistical test of the equality of two independent binomial proportions.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.