Designation: E 1432 – 04

Standard Practice for Defining and Calculating Individual and Group Sensory Thresholds from Forced-Choice Data Sets of Intermediate Size[1]

This standard is issued under the fixed designation E 1432; 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.

INTRODUCTION

The purpose of this practice is to determine individual sensory thresholds for odor, taste, and other modalities and, when appropriate, calculate group thresholds. The practice takes as its starting point any sensory threshold data set of more than 100 presentations, collected by a forced-choice procedure. The usual procedure is the Three-Alternative Forced-Choice (3-AFC), as exemplified by Dynamic Triangle Olfactometry. A similar practice, Practice E 679, utilizes limited-size data sets of 50 to 100 3-AFC presentations, and is suitable as a rapid method to approximate group thresholds.

Collection of the data is not a part of this practice. The data are assumed to be valid; for example, it is assumed that the stimulus is defined properly, that each subject has been fully trained to recognize the stimulus and did indeed perceive it when it was present above his or her momentary threshold, and that the quality of dilution medium did not vary.

It is recognized that precise threshold values for a given substance do not exist in the same sense that values of vapor pressure exist. A panelist's ability to detect a stimulus varies as a result of random variations in factors such as alertness, attention, fatigue, events at the molecular level, health status, etc., the effects of which can usually be described in terms of a probability function. At low concentrations of an odorant or tastant, the probability of detection by a given individual is typically 0.0 and at high concentrations it is 1.0, and there is a range of concentrations in which the probability of detection is between these limits. By definition, the threshold is the concentration for which the probability of detection of the stimulus is 0.5 (that is, 50 % above chance, by a given individual, under the conditions of the test).

Thresholds may be determined (*1*) for an individual (or for individuals one by one), and (*2*) for a group (panel). While the determination of an individual threshold is a definable task, careful consideration of the composition of the group is necessary to ensure the determined threshold represents the group of interest.

There is a large degree of random error associated with estimating the probability of detection from less than approximately 500 3-AFC presentations. The reliability of the results can be increased greatly by enlarging the panel and by replicating the tests.

1. Scope

1.1 The definitions and procedures of this practice apply to the calculation of individual thresholds for any stimulus in any medium, from data sets of intermediate size, that is, consisting of more than 20 to 40 3-AFC presentations per individual. A group threshold may be calculated using 5 to 15 individual thresholds.

1.2 *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.*

[1] This practice is under the jurisdiction of ASTM Committee E18 on Sensory Evaluation of Materials and Products and is the direct responsibility of Subcommittee E18.04 on Fundamentals of Sensory.

Current edition approved April 1, 2004. Published April 2004. Originally approved in 1991. Last previous edition approved in 1997 as E 1432–91 (1997).

This document is now POOBLIC

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States.