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Standard Guide for Time-Intensity Evaluation of Sensory Attributes¹

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1. Scope

1.1 This guide covers procedures for conducting and analyzing time-intensity (T-I) evaluations of products or other sensory stimuli. Time-intensity is the measurement of the intensity of a single sensory sensation over time in response to a single exposure to a product or other sensory stimulus. Simultaneous evaluations of multiple sensory attributes are possible, although are outside of the scope of this document. See Reference List for more information.

1.2 This guide utilizes a specially trained panel to measure the intensity of a single continuous sensation during the time from initial exposure:

- 1.2.1 To its extinction,
- 1.2.2 To a specified intensity, or
- 1.2.3 To a predetermined limit of time.

1.3 Applications not covered in this guide include measuring:

- 1.3.1 Multiple sensations,
- 1.3.2 Multiple exposures within a single measurement, and
- 1.3.3 Qualitative or hedonic changes in the perceived sensation.

1.4 This guide includes protocols for the selection and training of judges, descriptions and use of physical data collection devices, and methods of data handling, summarization, and statistical analysis. Illustration of two different data handling and analysis approaches are included in the appendixes.

1.5 This guide is not applicable to measure product shelf life or stability that require evaluations over extended time.

1.6 *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.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standard-*

ization 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

E253 [Terminology Relating to Sensory Evaluation of Materials and Products](#)

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:* See [Fig. 1](#).

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3.1.1 *area after I_{max}* —post-peak area under the curve.

3.1.2 *area before I_{max}* —pre-peak area under the curve.

3.1.3 *AUC*—area under the curve.

3.1.4 *I_{max} or peak intensity*—maximum observed intensity during the time of measurement.

3.1.5 *perimeter*—measured distance of perimeter of area delineated by T-I curve.

3.1.6 *plateau*—duration of peak intensity.

3.1.7 *rate of increase*—rate of intensity increase before peak intensity (slope).

3.1.8 *rate of decrease*—rate of intensity decrease after peak intensity (slope).

3.1.9 *T_{dur} or duration time*—time from onset of sensation until it can no longer be perceived ($T_{ext} - T_{onset}$).

3.1.10 *T_{ext} or time to extinction*—time from initial exposure to the stimulus (T_{init}) until it can no longer be perceived.

3.1.11 *T_{init}* —time of initial exposure to the stimulus, typically when the clock starts.

3.1.12 *T_{max}* —time to reach maximum intensity of the sensation after exposure to the stimulus.

3.1.13 *T_{onset}* —time point when the stimulus is first perceived after initial exposure to the stimulus.

¹ This guide is under the jurisdiction of ASTM Committee E18 on Sensory Evaluation and is the direct responsibility of Subcommittee E18.03 on Sensory Theory and Statistics.

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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.