



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.

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 appendices.

1.5 This guide is not applicable to measure product shelf life or stability that require evaluations at discrete time intervals.

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

2. Referenced Documents

2.1 ASTM Standards:

E 253 Terminology Relating to Sensory Evaluation of Ma-

terials and Products²

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:* See Fig.

1.

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 time*—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 ($T_{\text{ext}} - T_{\text{onset}}$).

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.

3.1.14 *T_{trun} or truncated time*—time until a specified minimum intensity or until a pre-determined time point has been reached.

3.2 The graphical illustration of a typical time-intensity curve is shown in Fig. 1. The time increment may be seconds, minutes, hours, etc., depending upon the characteristic of the particular material under study.

4. Summary of Guide

4.1 This guide describes procedures utilizing specially trained panelists to measure the intensity of a single sensory

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 E18.03 on Sensory Theory and Statistics.

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² *Annual Book of ASTM Standards*, Vol 15.08.