



Designation: E 1909 – 97

AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Guide for Time-Intensity Evaluation of Sensory Attributes¹

This standard is issued under the fixed designation E 1909; 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 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 appendixes.

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.*

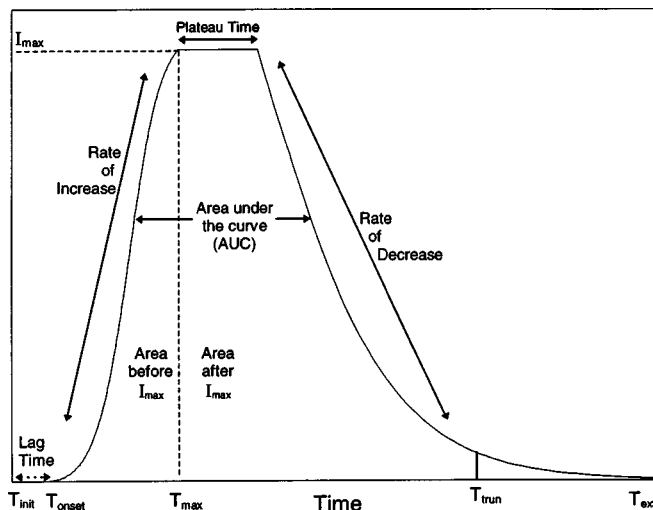
2. Referenced Documents

2.1 ASTM Standards:

E 253 Terminology of Sensory Evaluation of Materials and Products²

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:* See Fig. 1.



NOTE 1—Based on a figure from Ref (15).

FIG. 1 Representative Time-Intensity Curve with Selected Parameters Labeled

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 ($T_{ext} - T_{onset}$).

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.

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

¹ This guide is under the jurisdiction of ASTM Committee E-18 on Sensory Evaluation of Materials and Products and is the direct responsibility of Subcommittee E18.03 on Sensory Theory and Statistics.

Current edition approved Sept. 10, 1997. Published August 1998.

² *Annual Book of ASTM Standards*, Vol 15.07.