



# Standard Test Method for Measuring Response of Solid Plastics to Ignition by a Small Flame<sup>1</sup>

This standard is issued under the fixed designation D 3713; 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 reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

## 1. Scope

1.1 This is a fire-test-response standard.

1.2 This test method covers a small-scale procedure for characterizing the response of a plastic to an ignition source consisting of a small flame of controlled intensity applied to the base of a standard sample being held in a vertical position.

1.3 *This standard should be used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used in a fire hazard assessment or a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard or fire risk of a particular end use.*

1.4 The values stated in SI units are to be regarded as the standard.

NOTE 1—See Method D 3801 which, unless otherwise specified, uses the same specimens for measuring the comparative extinguishing characteristics of solid plastics when tested in a vertical position.

1.5 *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. Specific hazard statements are given in 10.1.*

NOTE 2—There is no similar or equivalent ISO standard.

## 2. Referenced Documents

### 2.1 ASTM Standards:

D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing<sup>2</sup>

D 883 Terminology Relating to Plastics<sup>2</sup>

D 3801 Method for Measuring the Comparative Extinguishing Characteristics of Solid Plastics in a Vertical Position<sup>3</sup>

E 176 Terminology Relating to Fire Standards<sup>4</sup>

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.30 on Thermal Properties (Section D20.30.03).

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<sup>2</sup> This edition was updated to meet current Blue Book guidelines.

<sup>3</sup> Annual Book of ASTM Standards, Vol 08.01.

<sup>4</sup> Annual Book of ASTM Standards, Vol 04.07.

## 3. Terminology

3.1 For definitions of terms used in this test method refer to the terminology contained in Terminologies D 883 or E 176.

### 3.2 Descriptions of Terms Specific to This Standard:

3.2.1 *burning (B)*—that mode of response where the flaming or glowing combustion, or both, exceeds 30 s after the burner is removed but the specimen is neither consumed nor produces dripping ignition of cotton.

3.2.2 *burning time*—that interval of time beginning immediately after removal of the burner flame and lasting until flaming and glowing combustion cease. The burning time, therefore, is the sum of the flame and glow times.

3.2.3 *consumed (C)*—that mode of response where combustible material in the specimen is totally consumed in 30 s or less, after the burner is removed (except for that portion of the specimen in the clamp). Immediately terminate the test if this condition occurs at any point during the test, and record the IRI as “C at (sample thickness),” signifying the material in the designated thickness cannot be evaluated by this method.

3.2.4 *dripping ignition (DI)*—that mode of response where the sample produces flaming droplets igniting cotton placed 305 mm (12 in.) below, either during flame impingement, or within 30 s after the burner is removed. Continued combustion of the specimen after dripping ignition is ignored unless the specimen is totally consumed in less than 30 s, in which case the IRI is reported as “C”.

3.2.5 *dripping, no ignition (D)*—that mode of response where the materials drip when tested in accordance with 10.8 but do not ignite cotton. They are assigned an IRI of D at *t*.

3.2.5.1 *Discussion*—The flame impingement time is not included in the IRI for materials displaying “D”-type behavior because time is not an end point. The end point is the dripping (without ignition of cotton) whenever it occurs, subject to the maximum flame impingement time restriction of 60 s.

3.2.6 *endpoint*—the point at which the burning time of the sample exceeds 30 s after the burner is removed; the material drips, with or without ignition of cotton, either during the flame application or within 30 s after the burner is removed; or the combustible material in the specimen is totally consumed within 30 s or less after the burner is removed.

3.2.7 *flame impingement time*—the time in seconds that the flame from the burner is in contact with the specimen.

3.2.8 *glow*—combustion without visible flame. It occurs after removal of the external flame or after cessation of the self-perpetuating flaming of the material.