



International
Standard

ISO 9773

**Plastics — Determination of
burning behaviour of thin flexible
vertical specimens in contact with a
small flame ignition source**

*Plastiques — Détermination du comportement au feu
d'éprouvettes minces verticales souples au contact d'une petite
flamme comme source d'allumage*

**Third edition
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 4, *Burning behaviour*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 249, *Plastics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 9773:1998), which has been technically revised. It also incorporates the Amendment ISO 9773:1998/Amd. 1:2003.

The main changes are as follows:

- the required light level in the chamber has been added;
- informations on conditioning, laboratory and timing have been amended;
- conditioning of cotton prior to testing has been added;
- information on specimen thickness has been amended;
- information on retesting has been amended;
- mandatory information is provided throughout the document;
- normative references clause has been updated.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Plastics — Determination of burning behaviour of thin flexible vertical specimens in contact with a small flame ignition source

1 Scope

1.1 This document specifies a small-scale laboratory screening procedure for comparing the relative burning behaviour of vertically oriented thin and relatively flexible plastics specimens exposed to a low-energy-level flame ignition source.

NOTE These specimens cannot be tested using method B of IEC 60695-11-10:2013 since they distort or shrink away from the applied flame source without igniting.

1.2 This test method determines the afterflame and afterglow times of specimens.

1.3 The classification system described in [Annex A](#) is intended for quality control and the preselection of component materials for products. The classification established by this method of test is applicable only to the material used for the specimens.

NOTE Test results are influenced by material components, e.g. pigments, fillers, concentrations of fire retardants.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 845:2006, *Cellular plastics and rubbers — Determination of apparent density*

ISO 10093:2020, *Plastics — Fire tests — Standard ignition sources*

ISO 13943:2023, *Fire safety — Vocabulary*

IEC 60695-11-4:2011, *Fire hazard testing — Part 11-4: Test flames — 50 W flame — Apparatus and confirmational test method*

IEC 60695-11-5:2016, *Fire hazard testing — Part 11-5: Test flames — Needle-flame test method — Apparatus, confirmatory test arrangement and guidance*

IEC 69695-11-10:2013, *Fire hazard testing — Part 11-10: Test flames — 50 W horizontal and vertical flame test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13943 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 afterflame

flame that persists after the ignition source has been removed

[SOURCE: ISO 13943:2023, 3.12]

3.2 afterflame time

length of time for which an *afterflame* (3.1) persists under specified conditions

[SOURCE: ISO 13943:2023, 3.13]

3.3 afterglow

persistence of glowing combustion after both removal of the ignition source and the cessation of any flaming combustion

[SOURCE: ISO 13943:2023, 3.14]

3.4 afterglow time

length of time for which an *afterglow* (3.3) persists under specified conditions

[SOURCE: ISO 13943:2023, 3.15]

4 Principle

A test specimen having a nearly cylindrical form is supported vertically by one end and the free end is exposed to two successive applications of a specified gas flame. The burning behaviour of the test specimen is assessed by measuring the afterflame and/or afterglow time,

5 Significance of test

5.1 Tests made on a material under the conditions specified in this document can be of considerable value when comparing the relative burning behaviour of different materials, controlling manufacturing processes or assessing any change in burning characteristics prior to, or during, use. The results obtained from this method are dependent upon the shape, orientation and insulation of the test specimen and the conditions of ignition. Correlation with performance under actual service conditions is not implied.

5.2 Results obtained in accordance with this document shall not be used to describe or appraise the fire hazard presented by a particular material or shape under actual fire conditions. Assessment for fire hazard requires consideration of factors, such as fuel contribution, intensity of burning (rate of heat release), products of combustion and environmental factors such as the intensity of source, orientation of exposed material and ventilation conditions.

5.3 Burning behaviour as measured by this test method is affected by factors, such as density, colour and anisotropy of the material and thickness of the test specimen.

5.4 The effects on the burning behaviour of additives, deterioration, and possible loss of volatile components are measurable using this method. It is acceptable to use results obtained using this method for comparing the relative performance of materials and, potentially, in material assessment.

5.5 The burning behaviour of some plastic materials has the potential to change with time. It is accordingly advisable to make tests before and after oven conditioning by an appropriate procedure that is described in the test report. The preferred oven conditioning conditions shall be 7 days at 70 °C. However, it is acceptable to use other oven conditioning times and temperatures if agreed to by all parties.