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Plastics — Fire tests — Standard ignition sources

Plastiques — Essais au feu — Sources d'allumage normalisées

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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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 documents 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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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 4, *Burning behaviour*.

This third edition cancels and replaces the second edition (ISO/TR 10093:2018), which has been technically revised.

The main changes compared to the previous edition are as follows:

— mandatory information have been added throughout the document;

— referenced standards have been deleted from the bibliography and moved to the normative references clause (see Clause 2).

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.

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Introduction

Fires are caused by a wide range of possible ignition sources. Statistical analysis of fires has identified the major primary and secondary sources, especially for fires in buildings. The most frequent sources of fires have been found to be as follows:

a) cooking appliances;

b) space-heating appliances;

c) electric wiring, connectors and terminations;

d) other electrical appliances (such as washing machines, bedwarmers, televisions, water heaters);

e) cigarettes;

f) matches and smokers' gas lighters;

g) blow-lamps, blow-torches and welding torches;

h) rubbish burning; and

i) candles.

This list covers the major primary ignition sources for accidental fires. Other sources can be involved in fires raised maliciously. Research into causes of fires has shown that primary ignition sources (e.g. glowing cigarettes or dropped flaming matches) can set fire to waste paper, which then acts as a secondary ignition source of greater intensity.

When analysing and evaluating the various ignition sources for applications involving plastics materials, it is important to answer the following questions on the basis of detailed fire statistics.

1) What is the significance of the individual ignition sources in various fire risk situations?

2) What proportion is attributable to secondary ignition sources?

3) Where does particular attention have to be paid to secondary ignition sources?

4) To what extent are different ignition sources responsible for fatal fire accidents?

The laboratory ignition sources described in this document are intended to simulate actual ignition sources that have been shown to be the cause of real fires involving plastics. Laboratory ignition sources are preferred over actual ignition sources due to their consistency, which results in greater data repeatability within a laboratory and greater reproducibility between laboratories.

These laboratory ignition sources can be used to develop new test procedures.

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Plastics — Fire tests — Standard ignition sources

1 Scope

This document describes and classifies a range of laboratory ignition sources for use in fire tests on plastics and products consisting substantially of plastics. These sources vary in intensity and area of impingement. They are suitable for use to simulate the initial thermal abuse to which plastics are potentially exposed in certain actual fire risk scenarios.

This compilation of standard ignition sources describes the ignition sources used by different standards development organizations and contained in standard test methods, specifications, or regulations used to assess the fire properties or plastics and of products containing plastic materials. The ignition sources described in this document are associated with flaming and non-flaming ignition. This document describes the relevant ignition sources and references the associated standard.

This compilation of ignition sources does not discuss the application of the standard referenced in any specific clause in which the ignition source is described, and this compilation is likely not to be a fully comprehensive list of ignition sources.

This document does not address detailed test procedures.

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 871, *Plastics — Determination of ignition temperature using a hot-air furnace*

ISO 5657, *Reaction to fire tests — Ignitability of building products using a radiant heat source*

ISO 5658-2, *Reaction to fire tests — Spread of flame — Part 2: Lateral spread on building and transport products in vertical configuration*

ISO 5659-2, *Plastics — Smoke generation — Part 2: Determination of optical density by a single-chamber test*

ISO 5660-1, *Reaction-to-fire tests — Heat release, smoke production and mass loss rate — Part 1: Heat release rate (cone calorimeter method) and smoke production rate (dynamic measurement)*

ISO 8191-1, *Furniture — Assessment of the ignitability of upholstered furniture — Part 1: Ignition source: smouldering cigarette*

ISO 8191-2, *Furniture — Assessment of ignitability of upholstered furniture — Part 2: Ignition source: match-flame equivalent*

ISO 9705-1, *Reaction to fire tests — Room corner test for wall and ceiling lining products — Part 1: Test method for a small room configuration*

ISO 11925-2, *Reaction to fire tests — Ignitability of products subjected to direct impingement of flame — Part 2: Single-flame source test*

ISO 12136, *Reaction to fire tests — Measurement of material properties using a fire propagation apparatus*

ISO 12863, *Standard test method for assessing the ignition propensity of cigarettes*

ISO 12949, *Standard test method for measuring the heat release rate of low flammability mattresses and mattress sets*

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