

Implementation of
ISO 10093:1994

Plastics — Fire tests — Standard ignition sources

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PRI/26, Burning behaviour of plastics, upon which the following bodies were represented:

- Association of Building Component Manufacturers
- British Apparel and Textile Confederation
- British Cable Makers' Confederation
- British Electrical Systems Association (BEAMA Ltd.)
- British Plastics Federation
- British Railways Board
- British Telecommunications plc
- Civil Aviation Authority
- Department of the Environment (Building Research Establishment)
- Electrical and Electronic Insulation Association (BEAMA Ltd.)
- ERA Technology Ltd.
- GAMBICA (BEAMA Ltd.)
- Home Office
- Institute of Materials
- Ministry of Defence
- Queen Mary and Westfield College
- RAPRA Technology Ltd.
- Society of British Aerospace Companies Limited
- Society of Motor Manufacturers and Traders Limited
- University of Ulster

This British Standard, having been prepared under the direction of the Sector Board for Materials and Chemicals, was published under the authority of the Standards Board and comes into effect on 15 May 1995

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The following BSI references relate to the work on this standard:
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National foreword

This British Standard reproduces verbatim ISO 10093:1994 and implements it as the UK national standard.

This British Standard is published under the direction of the Sector Board for Materials and Chemicals whose Technical Committee PRI/26 has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international committee any enquiries on interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

When ISO 10093 was at the Draft International Standard (DIS) stage, the UK voted against it on certain specific aspects, the most important of which was concern over the inclusion of the ASTM E-84 type burner as an International Standard ignition source. This source is restricted to a limited application i.e. flame spread on a ceiling lining in a tunnel and it is not widely used even for this purpose outside North America.

PRI/26, the responsible BSI committee, decided that, irrespective of the above specific UK concerns, the existing edition of ISO 10093 should be implemented as BS ISO 10093 because of its overall potential for wide use in the UK.

It should be noted in addition that, as a result of the above UK opinions, a new work item proposal for the revision of ISO 10093 has been balloted and approved by majority vote in ISO/TC 61. It is expected that the revised standard will not include the ASTM E-84 type burner and will therefore be fully acceptable to the UK.

NOTE International and European Standards, as well as overseas standards, are available from Customer Services, BSI, 389 Chiswick High Road, London W4 4AL.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ISO title page, pages ii to iv, pages 1 to 18, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

INTERNATIONAL STANDARD

ISO
10093

First edition
1994-11-15

Plastics — Fire tests — Standard ignition sources

Plastiques — Essais au feu — Sources d'allumage normalisées



Reference number
ISO 10093:1994(E)

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 10093 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 4, *Burning behaviour*.

Annex A and Annex B of this International Standard are for information only.

Introduction

Fires are caused by a wide range of possible ignition sources. Statistical analysis of fires has identified the main 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
- i) Candles

The above list covers the major primary ignition sources for accidental fires. Other sources may be involved in fires raised maliciously. Research into the 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, the following questions need to be answered on the basis of detailed fire statistics:

- a) What is the significance of the individual ignition sources in various fire risk situations?
- b) What proportion is attributable to secondary ignition sources?
- c) Where does particular attention have to be paid to secondary ignition sources?
- d) To what extent are different ignition sources responsible for fatal fire accidents?

The following laboratory ignition sources 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.

The laboratory ignition sources may be used to develop new test procedures.

1 Scope

This International Standard specifies a range of laboratory ignition sources for use in fire tests on plastics. These sources vary in intensity and area of impingement. They may be used to simulate the initial thermal abuse to which plastics may be exposed in certain actual fire risk scenarios.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5657:1986, *Fire tests — Reaction to fire — Ignitability of building products*.

ISO 8191-1:1987, *Furniture — Assessment of the ignitability of upholstered furniture — Part 1: Ignition source: smouldering cigarette*.

ISO/TR 10353:1992, *Plastics — Survey of ignition sources used for national and international fire tests*.

IEC 695-2-1:1991, *Fire hazard testing — Part 2: Test methods — Section 1: Glow-wire test and guidance*.

IEC 695-2-2:1991, *Fire hazard testing — Part 2: Test methods — Section 2: Needle-flame test*.

IEC 695-2-4/1:1991, *Fire hazard testing — Part 2: Test methods — Section 4/Sheet 1: 1 kW nominal premixed test flame and guidance*.

IEC 829:1988, *Methods of test for the determination of the ignitability of solid electrical insulating materials when exposed to electrically heated wire sources*.

ASTM D 5025-89, *Standard specification for a laboratory burner used for small-scale burning tests on plastic materials*.

ASTM E 84-91a, *Test method for surface burning characteristics of building materials*.

BS 5852:1990, *Methods of test for assessment of the ignitability of upholstered seating by smouldering and flaming ignition sources*.

DIN 50051:1977, *Testing of materials — Burning behaviour of materials — Burner*.