



SLOVENSKI STANDARD
SIST ISO/TR 10840:1996

01-januar-1996

Polimerni materiali - Obnašanje pri gorenju - Smernice za razvoj in uporabo preskusov z ognjem

Plastics -- Burning behaviour -- Guidance for development and use of fire tests

Plastiques -- Lignes directrices pour le développement et l'utilisation d'essais au feu

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| 13.220.40 | Sposobnost vžiga in obnašanje materialov in proizvodov pri gorenju | Ignitability and burning behaviour of materials and products |
| 83.080.01 | Polimerni materiali na splošno | Plastics in general |

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TECHNICAL
REPORT

ISO
TR 10840

First edition
1993-11-01

**Plastics — Burning behaviour — Guidance
for development and use of fire tests**

iTeh STANDARD PREVIEW

*Plastiques — Lignes directrices pour le développement et l'utilisation
d'essais au feu*
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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 main task of technical committees is to prepare International Standards, but in exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

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- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
 - type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
 - type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).
- <https://standards.iteh.ai/catalog/standards/sist/663f5-793f-4b49-8f18-cf5de1c130c0/sist-iso-tr-10840-1996>

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/TR 10840, which is a Technical Report of type 3, was prepared by Technical Committee ISO/TC 61, *Plastics*, Sub-Committee SC 4, *Burning behaviour*.

Introduction

ISO/TC 61/SC 4 has responsibility for the development of fire tests for plastics as materials. It is recognized that this task is best performed by efficient liaison with those ISO Technical Committees who have to develop fire tests for products. In this way the end-use conditions of a product can be identified, and the essential requirements concerning the fire safety of those products containing plastics can be determined. It is not practical for ISO/TC 61/SC 4 to develop tests for all common fire scenarios. It is possible however to measure the major fire parameters of plastics such as ignitability, rate of heat release, rate of flame spread and rate of smoke generation. These data may then be applied in a variety of hazard assessment protocols to monitor the fire performance of products made from plastics.

At the present time more than 700 different fire tests are in use worldwide to classify materials and manufactured products. Many of these do not take account of properties of thermoplastics such as deformation, melting and dripping when heat is applied. Intumescence is another property of certain plastics which is not taken into account. The specific problems associated with the fire testing of plastics are summarized in the Annex.

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Such behaviour during testing can often make it difficult to interpret test results and, in some cases makes such interpretation impossible.

It is essential that fire test methods contain clear guidelines on data collection and interpretation in order to ensure that valid results are obtained.

Plastics — Burning behaviour — Guidance for development and use of fire tests

1 Scope

1.1 This Technical Report provides guidance on fire testing of plastics for manufacturers, converters, users, specifiers and regulators.

1.2 These guidelines are recommended for use in designing fire tests on plastics and in associated standards so that they fulfil the requirements of the intended use with particular reference to the following :

- a) This guidance applies in particular to the working groups of ISO/TC 61/SC 4 'Burning behaviour of plastics' and is applicable to all the test methods developed by this sub-committee.
- b) Fire tests are necessary for gathering information for estimating fire hazard.
- c) Fire tests are used in legal codes and regulations, specifications, quality assurance, research and development. They are of particular value in monitoring of compliance with legal requirements, consumer protection measures and product design, development and use.

2 References

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| ISO 834 : 1975 | Fire resistance tests on elements of building construction |
| ISO 1210 : 1992 | Plastics - Determination of the burning behaviour of horizontal and vertical specimens in contact with a small ignition source |

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| ISO 1716 : 1973 | Building materials - Determination of calorific potential |
| ISO TR 3814 : 1989 | Tests for measuring 'reaction to fire' of building materials - Their development and application |
| ISO 5657 : 1986 | Reaction to fire - Ignitability of building products |
| ISO 5658-2 ¹⁾ | Fire tests - Reaction to fire - Part 2: Lateral surface spread of flame on building products with specimen in vertical configuration |
| ISO 5659-2 ¹⁾ | Plastics - Smoke generation - Part 2: Determination of optical density by a single chamber test |
| ISO 5660-1:1993 | Fire tests - Reaction to fire - Part 1: Rate of heat release from building products (Cone calorimeter method) |
| ISO 5924 ¹⁾ | Fire tests - Reaction to fire - Smoke generated by building products (Dual Chamber test) |
| ISO 6941 ¹⁾ | Textile fabrics - Measurement of flame spread properties of vertically oriented specimens |
| ISO 8191-1:1987 | Furniture - Assessment of the ignitability of upholstered furniture - Part 1: Ignition source : smouldering cigarette |
| ISO 8191-2:1988 | Furniture - Assessment of the ignitability of upholstered furniture - Part 2: Ignition source: match-flame equivalent |
| ISO TR 9122-1:1989 | Toxicity testing of fire effluents - Part 1: General |
| ISO TR 9122-2:1990 | Toxicity testing of fire effluents - Part 2: Guidelines for biological assays to determine the acute inhalation toxicity of fire effluents (basic principles,criteria and methodology) |
| ISO TR 9122-3:1993 | Toxicity testing of fire effluents - Part 3: Methods for the analysis of gases and vapours in fire effluents |
| ISO TR 9122-4:199 | Toxicity testing of fire effluents - Part 4: Fire model |

¹⁾ To be published

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| ISO TR 9122-5:1993 | Toxicity testing of fire effluents - Part 5: Prediction of toxic effects of fire effluents |
| ISO 9239 ¹⁾ | Floor coverings - Determination of critical radiant flux using a radiant heat energy source |
| ISO 9705 ¹⁾ | Fire tests - Full scale room test for surface products |
| ISO 9772 ¹⁾ | Cellular plastics - Determination of horizontal burning characteristics of small specimens subjected to a small flame |
| ISO 9773:1990 | Plastics - Determination of burning behaviour of flexible vertical specimens in contact with a small flame ignition source |
| ISO 10093 ¹⁾ | Plastics - Categories of ignition sources |
| ISO 10351 : 1992 | Plastics - Method of test for the determination of combustibility of vertically oriented specimens using a 125 mm flame source |
| IEC 332-1:1979 | Tests on electric cables under fire conditions Part 1: Test on a single vertical insulated wire or cable |
| IEC 332-2:1989 | Tests on electric cables under fire conditions Part 2: Test on a single small vertical insulated copper wire or cable |
| IEC 332-3:1992 | Tests on electric cables under fire conditions Part 3: Tests on bunched wires or cables |
| IEC 695-1-1 | Fire hazard testing - Part 1: Guidance for the preparation of requirements and test specifications for assessing fire hazard of electrotechnical products - Section 1 General guidance |
| IEC 695-2-1 | Fire hazard testing - Part 2: Test methods - Section 1: Glow-wire test and guidance |
| IEC 1034-1 : 1990 | Measurement of smoke density of electric cables burning under defined conditions - Part 1: Test apparatus |

¹⁾ To be published