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# International Standard



# 1210

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Plastics — Determination of flammability characteristics of plastics in the form of small specimens in contact with a small flame

*Plastiques — Détermination des caractéristiques d'inflammabilité des plastiques sous forme de petites éprouvettes soumis à une petite flamme*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 1210 was developed by Technical Committee ISO/TC 61, *Plastics*, and was circulated to the member bodies in April 1977.

It has been approved by the member bodies of the following countries:

Austria  
Belgium  
Bulgaria  
Canada  
Chile  
Czechoslovakia  
France  
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Hungary

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USSR  
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The member bodies of the following countries expressed disapproval of the document on technical grounds:

Australia  
Brazil  
Ireland

This International Standard cancels and replaces ISO Recommendation R 1210-1970, of which it constitutes a technical revision.

# Plastics — Determination of flammability characteristics of plastics in the form of small specimens in contact with a small flame

## 1 Scope and field of application

This International Standard specifies a method for determining the relative flammability characteristics of small specimens of semi-rigid and rigid plastics when brought into contact with a small flame.

## 2 Principle

Supporting of a test specimen horizontally by one end. Assessment of the flammability characteristics of the test specimen after a gas flame has been applied to the free end for a specified period of time.

## 3 Significance of the test

**IMPORTANT — This method must not be used to assess potential fire hazards in use.**

Tests made on materials under the conditions described in this International Standard can be of considerable value in comparing the flammability characteristics of various materials under the precise conditions of the test, in checking manufacturing processes, or as a measure of the deterioration or change in flammability prior to or during use. The test is designed for quality control and product evaluation, and must not be regarded as significant for the behaviour of materials under conditions other than those specified in the test; in particular, it is not predictive of behaviour in real fire situations.

## 4 Apparatus

**4.1 Test chamber**, draught free, with a capacity of approximately 1 m<sup>3</sup>, and permitting observations. For safety and convenience, it is desirable that this enclosure (which can be completely closed) be fitted with a device, such as an exhaust fan, to remove products of combustion which may be toxic. However, it is important to note that the device must be turned off during the actual test and started again immediately after the test to remove the products of combustion.

**4.2 Bunsen burner**, of nominal diameter 9,5 mm and gas supply.

**4.3 Installation** to fix the test specimen and the Bunsen burner in the position specified in clause 6.

**4.4 Stop-watch**: timing device for measuring intervals with an accuracy of  $\pm 1$  s.

## 5 Test specimens

**5.1** Five test specimens of length 120 to 130 mm, width  $10 \pm 0,2$  mm and thickness  $4 \pm 0,2$  mm, shall be tested. Each specimen shall be marked by a line perpendicular to the longitudinal axis of the bar, 80 mm from the end which is to be burnt.

**5.2** The specimens shall normally be tested in the "as received" condition. However, it is known that for certain materials the presence of absorbed water can influence the results obtained by this test. Therefore, special preconditioning may be agreed upon by the interested parties.

## 6 Procedure

### 6.1 Adjustment of the installation

Clamp the specimen horizontally by one end so that the width dimension is in the horizontal plane and the free length is at least 100 mm. Adjust the Bunsen burner (4.2), with closed air ports, while in the vertical position, to produce a flame approximately 100 mm long.

### 6.2 Ignition

To ignite the specimen, fix the Bunsen burner at an angle of 45° from the horizontal and direct it toward the unclamped end of the specimen so that the top of the burner is 30 mm below the bottom edge and 5 mm away from the plane of the end of the specimen (see the figure). It shall not be moved if the specimen burns away (see the note). After 60 s, turn off the burner. Determine the burning time,  $t$ , in seconds with the stop-watch (4.4) from the instant that the burner flame is extinguished.

### 6.3 Burning time assessment

**6.3.1** If no flame is visible after the burner has been turned off report the burning time as "less than 5 s".

**6.3.2** If flames are visible after the burner has been turned off which extinguish before reaching the 80 mm mark, report the burning time as the actual time to extinction or not less than 5 s, as appropriate.

6.3.3 If flames extend past the 80 mm mark, report the burning time at which the flame front reaches the mark or not less than 5 s, as appropriate.

#### 6.4 Additional measurements

After the test is terminated, measure the smallest undestroyed distance between the line and the nearest destroyed area on all surfaces of the specimen. Record the smallest of these measurements of undestroyed length,  $p$ , in millimetres.

The undestroyed length shall be taken as the distance from the line to the nearest evidence of damage to the specimen due to flame impingement, including areas of complete or partial consumption, charring or embrittlement, but not including areas sooted, stained, warped or discoloured nor (where this can be assessed with confidence) areas where the material has shrunk or melted away from the heat source.

NOTE — It is obvious that the test cannot be performed if, during the 60 s of the ignition period, the specimen distorts and cannot be reached by the flame.

### 7 Expression of results

Calculate

- the average burning time,  $t$ , in seconds, of the five specimens;
- the average destroyed length,  $L$ , in millimetres, of the five specimens.

For an individual specimen,

$$L = 80 - p$$

### 8 Test report

8.1 The test report shall contain the following particulars:

- a) reference to this International Standard;
- b) full identification of the product tested: type, source and manufacturer's number and code;
- c) description of the preparation of the test specimen and, if applicable, conditioning of the test specimen;
- d) the average burning time,  $t$ , in seconds;
- e) the average destroyed length,  $L$ , in millimetres;
- f) any special observations made during the test (how specimens ignited, smoke formation and colour, whether there was melting without burning, glowing, falling particles, or sagging or buckling of the burning section, any unusual behaviour of the test specimens, etc.).

8.2 The test report shall also include the following statement:

**IMPORTANT — These test results relate only to the behaviour of test specimens under the particular conditions of the test; they are not intended, and must not be used, as a means of assessing the potential fire hazards of the material in use.**

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Dimensions in millimetres

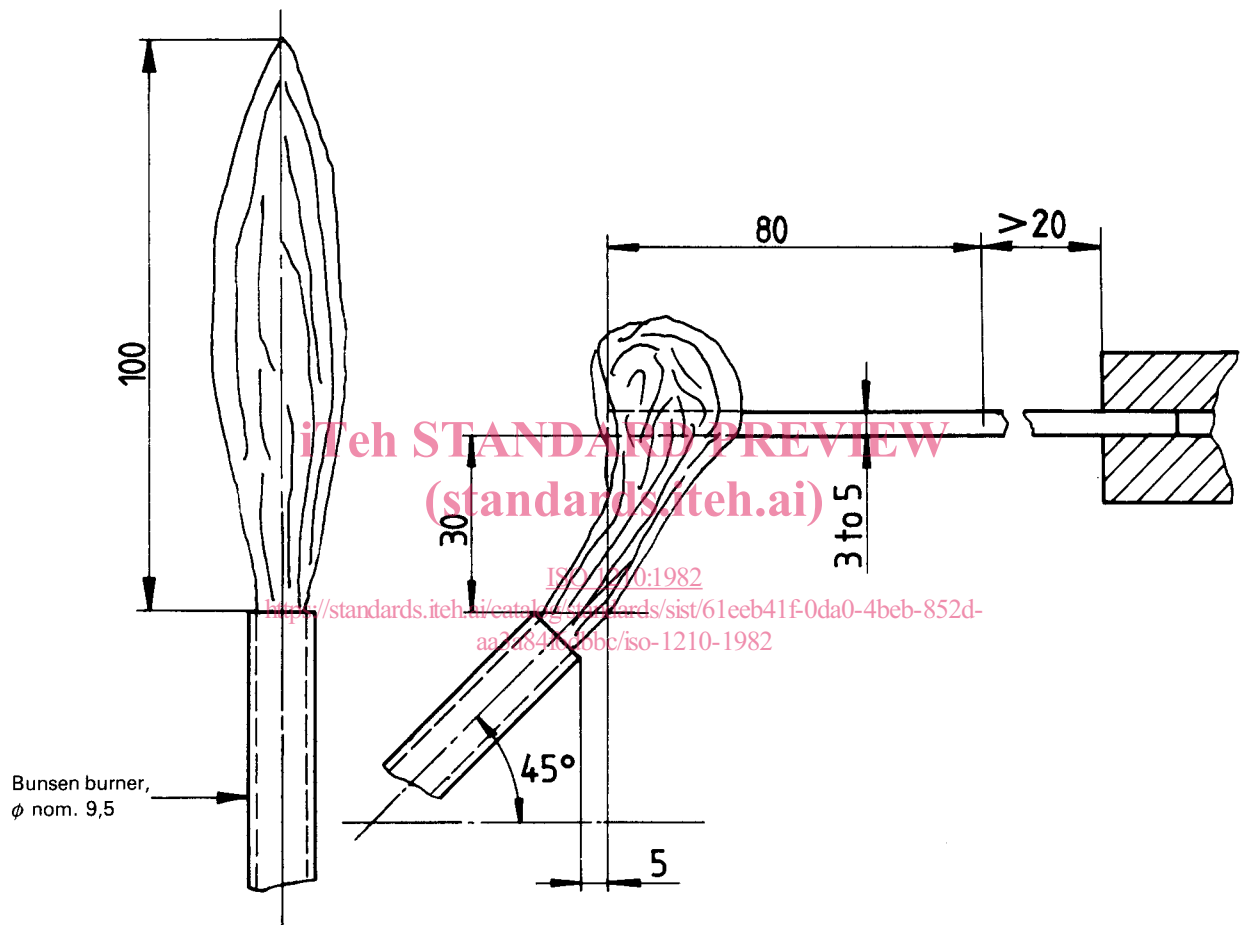


Figure — Setting and positioning of Bunsen burner

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