
**Imaging materials — Photographic films —
Specifications for safety film**

*Matériaux pour image — Films photographiques — Spécifications pour le
film de sécurité*

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 18906 was prepared by Technical Committee ISO/TC 42, *Photography*.

This first edition cancels and replaces the second edition of ISO 543:1990, of which it constitutes a minor revision.

This International Standard is one of a series of International Standards dealing with the physical properties and stability of imaging materials. To facilitate identification of these International Standards, they are assigned a number within the block from 18900 – 18999 (see annex A).

Annexes A to D of this International Standard are for information only.

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Introduction

Although the manufacture of films not complying with this International Standard is currently very rare, if it takes place at all, there remains a great amount of such films stored in archives and libraries. Due to the risk of ignition caused by careless handling, of self-ignition after long and adverse storage conditions, or rapid burning characteristics, it is necessary to provide film owners with a method of determining whether their film is "safety photographic film". That is the objective of this International Standard.

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Imaging materials — Photographic films — Specifications for safety film

1 Scope

This International Standard provides specifications and test procedures for establishing the safety of photographic films with respect to hazards from fire. The specifications are applicable to both unprocessed and processed¹⁾ films on any type of currently known plastic support.

These specifications cover silver films (both gelatin and non-gelatin types), colour films, diazo films, vesicular films, and striped or full-width magnetic films. Magnetic tapes and video recording tapes are excluded.

A field test for burning behaviour is described in informative annex B, and methods of marking film are defined in informative annex C. A simple test to distinguish non-safety nitrate-base film from cellulose ester and polyester-base film is given in informative annex D.

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2 Term and definition

For the purposes of this International Standard, the following term and definition applies.

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2.1 safety photographic film

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photographic film which passes the ignition time test and burning time test as specified in this International Standard

3 Property requirements

3.1 Ignition time

Photographic films are classified as having passed the ignition time test when the ignition time is not less than 10 min when tested as specified in clause 4.

3.2 Burning time

Photographic films having a thickness equal to or greater than 0,08 mm are classified as having passed the burning time test when the burning time is greater than 45 s when tested as specified in clause 5.

Photographic films having a thickness less than 0,08 mm are classified as having passed the burning time test when the burning time is greater than 30 s.

1) Normally, unprocessed and processed films have the same safety characteristics, so either one may be tested for conformance to these specifications. If an additional treatment, such as a lacquer coating, has been applied after processing, the safety characteristics may or may not be affected. In case of doubt, both unprocessed and processed films must be tested.

4 Ignition time test

4.1 Apparatus

4.1.1 Electric resistance oven, the interior of which is a cavity of appropriate size to hold the film specimen and an instrument for measuring the temperature (4.1.2) in the centre of the cavity.

The top of the oven shall be closed by means of a closely overlapping lid having two holes of diameter approximately 7 mm and 15 mm respectively, the centres being at a distance of about 15 mm from each other.

4.1.2 Thermocouple, having connecting wires with an insulated coating fitting tightly into the smaller hole of the lid of the oven (4.1.1).

Alternatively, the temperature in the cavity may be measured by means of other temperature measuring instruments such as a **mercury thermometer** fitted into the smaller hole, protected from the rising heat by means of a cork disc lying above the lid.

4.2 Specimens

Cut three specimens 35 mm long and 8 mm wide from the film to be tested.

Specimens shall be free from perforations as far as is practicable.

4.3 Procedure

Bring the oven to (300 ± 10) °C and maintain it at this temperature. When this temperature is reached, attach the specimen to a thin U-shaped wire hook and introduce it through the larger opening in the lid of the oven.

Fix the instrument for measuring the temperature (4.1.2) and the specimen in such a way that the thermojunction (or mercury bulb) and the centre of the specimen are at an equal depth of approximately 35 mm.

Record the time interval from the insertion of the specimen to the ignition time of the specimen as the ignition time.

Test the three specimens. Before each measurement, thoroughly air the oven.

4.4 Expression of results

If any one of the three specimens does not meet the ignition time requirement, the material is considered to have failed the test.

5 Burning time test

5.1 Specimens

Cut three specimens each 400 mm long and 35 mm wide from the film to be tested. If only films narrower than 35 mm are available, specimens 400 mm long and of full width may be tested²⁾. Mark each specimen at a point 50 mm from each end.

If the specimens are not already perforated, perforate them with holes approximately 3 mm in diameter along one edge, at intervals of not more than 20 mm.

2) Photographic films, when tested by this method, have similar flame propagation characteristics and approximately the same burning times, regardless of whether the width of the samples tested is 35 mm or less.

If a continuous strip 400 mm long cannot be obtained from the film being tested, shorter lengths may be stapled together with a 1 mm to 2 mm overlap to give the required length.

Thread a wire having a diameter of not more than 0,5 mm through the perforations on one side so that the specimen is supported at points not more than 20 mm apart.

Though no conditioning other than the normal room temperature is required, the film shall be dry to the touch.

5.2 Procedure

Carry out the test in a room free from draughts.

With the wire stretched horizontally and the specimen hanging vertically from it, ignite the bottom of one end (see Figure 1).

Record the time that elapses from the moment the flame reached the first mark until the time it reaches the second mark as the burning time.

Test the three specimens.

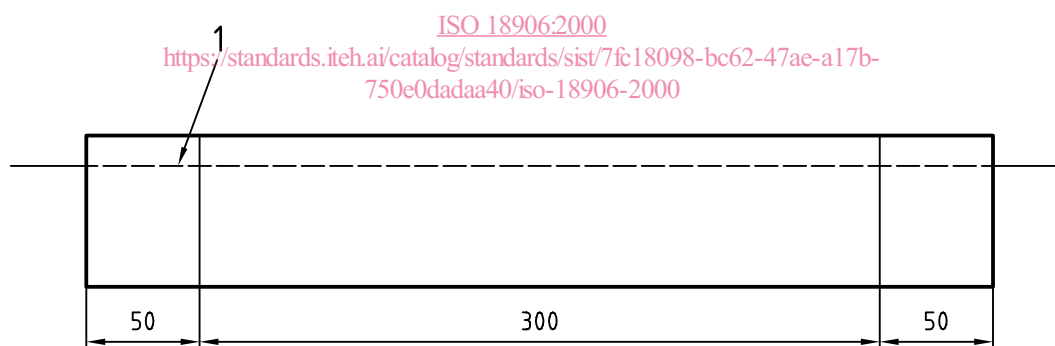
5.3 Expression of results

If the specimen does not ignite or if the flame does not reach the second mark within the stipulated time, classify the film as having passed the burning time test.

If any one of the three specimens does not pass the burning time test, the material is considered to have failed.

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Dimensions in millimetres



Key

1 Wire

Figure 1 — Burning time test specimen (not to scale)