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**Photography — Micrographic films, spools  
and cores — Dimensions**

*Photographie — Films micrographiques, bobines et noyaux — Dimensions*

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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 6148 was prepared by Technical Committee ISO/TC 42, *Photography*.

This second edition cancels and replaces the first edition (ISO 6148:1993), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

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## Introduction

International Standard ISO 6148 is based upon American National Standard ANSI/NAPM IT1.51-1997, which was a revision and redesignation of ANSI PH1.51-1990 (Micrographic films), and incorporates information from ANSI PH 1.33 (Spools) and ANSI/AIIM MS 29 (Cores and spools).

This International Standard acknowledges the practice of coating non-silver duplicating products on thin supports.

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# Photography — Micrographic films, spools and cores — Dimensions

## 1 Scope

This International Standard provides specifications for

- dimensions (thickness, width, length) of raw stock roll and sheet films for micrographic applications, including silver-gelatin, diazo, and vesicular films, designed for document recording, computer output microfilming (COM), and duplicating or printing. These products require wet chemical, vapour, or heat processing after an image-forming exposure with actinic radiation;
- winding requirements for roll films;
- location and width of the heading area for 105 mm wide rolls and sheets, and the width and thickness of the backing of that area;
- dimensions of spools, made either of metal or plastic, for 16 mm, 35 mm, and 105 mm microfilms; other spool materials are excluded, as well as spools that are integral components of cartridges, cassettes or magazines of microfilm-recording equipment;
- dimensions of plastic and metal cores of 16 mm, 35 mm, and 105 mm widths.

Dimensions for thin-walled paper-board cores with wall thickness of 7,6 mm or less, used routinely for sensitized duplicating material, are not included in this International Standard.

This International Standard is not applicable to processed-film dimensions in micrographic applications.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 1:1975, *Standard reference temperature for industrial length measurements*.

ISO 554:1976, *Standard atmospheres for conditioning and/or testing — Specifications*.

## 3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply.

3.1

**aim dimension**

preferred dimension at which the manufacturing process will be aimed or designed

3.2

**diazo film**

very low speed, high resolution, virtually grainless imaging material consisting mainly of a polyester support coated with a polymeric binder containing diazonium salts and a dye precursor which can couple in the presence of a base (e.g. ammonia vapour) to form an azo dye

NOTE Exposure to UV or other actinic radiation causes decomposition of the diazonium salt and destruction of its dye-forming capability. These properties are the basis of a direct-positive imaging system, widely used for producing copies of original silver microfilms or other masters with automatic printer/processors that incorporate UV exposure and ammonia-developing components.

3.3

**film**

flexible plastic material coated with a sensitized-gelatin layer (an emulsion) that can produce stable images upon light exposure followed by chemical processing

NOTE The flexible plastic material is usually transparent cellulose tri-acetate or polyester.

3.4

**grid area**

total area of the microfiche contained within the perimeter of the grid pattern

3.5

**grid pattern**

array of horizontal and vertical lines (usually not represented) which divides an area of a microform (usually a microfiche) into spaces called frames

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3.6

**heading area**

area at the top of a microfiche reserved for the heading

3.7

**heading area coating**

translucent coating applied to the whole surface of the heading area to provide a surface that accepts writing

3.8

**microfiche**

microform in the shape of a rectangular sheet having one or more microimages usually arranged in a grid pattern, with a heading area across the top

3.9

**microform**

generic term for any form, usually film, which contains microimages

3.10

**micrographics**

process, equipment and functions of an information system involving microfilm images, recorded at a substantially reduced scale and viewed at appropriate magnification with the aid of optical or electronic display devices

3.11

**nominal size**

dimensions used in commerce for description of a product, as on product labels or in catalogues

NOTE Nominal sizes are given only in metric values in new and newly revised standards, but are often given in metric and inch values in countries where both are still in everyday use.



**3.12****preferred sizes**

standard industry sizes, determined by most frequent user demand (number of units) and product volume (square metres)

NOTE Designers of new equipment are encouraged to use preferred sizes whenever possible.

**3.13****recognized sizes**

sizes which are in less demand than preferred sizes, but are used in sufficiently large amounts to justify identification in standards

NOTE This category includes sizes whose popularity is diminishing or increasing. However, new equipment should not be designed for such sizes.

**3.14****splice**

union of two pieces of film that are joined to form a single piece (usually found in roll format)

**3.15****spool**

flanged, cylindrical core for roll film, with drive holes in each flange and axial holes for insertion of a spindle or pin

**3.16****tolerances**

dimensions which define the boundaries of conformance of a product to the standard

NOTE When tolerances are expressed as "±", the reference is to the aim dimension, not to the nominal.

**3.17****vesicular film**

low-speed imaging material on a polyester support, coated with a thermoplastic layer containing a UV-sensitive diazonium salt which, upon exposure to actinic radiation, results in decomposition of the diazonium salt and the formation of a nitrogen gas

NOTE Brief post-exposure heating of the film softens the binder layer and permits localized formation and trapping of tiny nitrogen gas bubbles, or vesicles. These scatter light and thereby can function as image elements under proper illumination and viewing conditions. To render such "bubble" images permanent, a second, uniform exposure is given and the resulting nitrogen gas is allowed to diffuse gradually to the surface and escape into the atmosphere.

**4 Conditions for measurement of dimensions**

The dimensions and tolerances specified in this International Standard shall apply at the time of manufacture (except where specifically stated otherwise), when measured under atmospheric conditions of 23 °C ± 2 °C and 50 % ± 5 % relative humidity, as specified in ISO 554.

All measuring instrument calibrations should be conducted at a temperature of 20 °C (as specified in ISO 1) and a relative humidity of 50 %.

**5 Film thickness**

For all micrographic films, except thin non-silver duplicating films, the thickness ranges of the film (including support, sensitized layers and any protective coatings) shall conform to the values given in Table 1.

Thickness of non-silver duplicating micrographic films shall conform to the values given in Table 2.

Table 1 — Film thickness

Dimensions in millimetres

Nominal	Minimum	Up to but not including
0,06	0,058	0,074
0,08	0,074	0,097
0,10	0,097	0,122
0,13	0,122	0,152
0,18	0,170	0,198
0,21	0,198	0,224

Table 2 — Film thickness for thin non-silver duplicating films

Dimensions in millimetres

Nominal	Minimum	Maximum
0,06	0,058	0,071
0,09	0,084	0,102
0,11	0,107	0,122
0,17	0,157	0,178

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## 6 Films in rolls

### 6.1 Width of rolls

Nominal and aim dimensions, and their tolerances, for standard widths shall conform to the values given in Table 3.

Table 3 — Widths of film in rolls

Dimensions in millimetres

Nominal	Aim	Tolerance
16	15,96	± 0,04
35	34,95	± 0,05
105	104,87	± 0,13

### 6.2 Length of rolls

#### 6.2.1 Preferred lengths

Preferred aim lengths shall conform to the values given in Table 4. Actual lengths shall not be less than the aim length. Provision of additional film, in addition to this aim length, is left to the discretion of the manufacturer.

The aim length given excludes all provisions for leaders and trailers.

**Table 4 — Preferred roll lengths**

Dimensions in metres

Aim
30,5
66
75
152
200
305
610

### 6.2.2 Recognized lengths

Recognized aim lengths shall conform to the values given in Table 5. Actual lengths shall not be less than the aim length. Provision of additional film, in addition to this aim length, is left to the discretion of the manufacturer.

The aim length given excludes all provisions for leaders and trailers.

**Table 5 — Recognized roll lengths**  
Dimensions in metres

Aim
40
50
100
122
125
145
313

### 6.3 Winding

Normally, all films should be wound with the sensitized (emulsion) side in. However, when film is wound with the sensitized side out, conspicuous notification shall be given on the package.

Films shall not be attached to cores or spools.

The core should be centred within the film roll. It shall never protrude on either side.

The overall roll width, including departures of the alignment of the film edges throughout the depth of the roll, should not exceed the maximum specified slitting width by more than 1 mm.

### 6.4 Splices

There shall be no splices in raw stock microfilms.