
**Photography — 120-size and 220-size
films — Dimensions**

Photographie — Rouleaux de pellicule formats 120 et 220 — 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 732 was prepared by Technical Committee ISO/TC 42, *Photography*.

This fourth edition cancels and replaces the third edition (ISO 732:1991 and ISO 1048:1991), of which it constitutes a combination and technical revision. A number of technical changes have been made to the figures that describe product dimensions, as well as to the specifications for paper width and thickness.

Annex A of this International Standard is for information only.

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Photography — 120-size and 220-size films — Dimensions

1 Scope

This International Standard provides specifications for

- dimensions of 120-size and 220-size films and of the spools common to both,
- dimensions of the backing paper for 120-size film and the leader and trailer paper for 220-size film, as well as the placement of the paster tape used for attaching these papers to the films,
- minimum length of film required in front of the leading edge of the first image and behind the trailing edge of the last image, and
- markings on the backing paper and the trailer-paper for identification of the intended photofinishing process.

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

backing paper

opaque, photographically inert paper, used with 120-size film and imprinted with frame numbers that are legible through a camera window, providing protection against the danger of light exposure of the film to which it is attached

NOTE The backing paper provides assistance at the beginning of the wind-up.

3.2

creep

difference in location of the film end relative to the numbers on the backing paper, when wound on the spool, compared to their respective positions when laid out flat

NOTE The difference exists because the backing paper, wound outside the film strip, assumes a curve of greater circumference than the film strip for each successive convolution.

3.3

exposure numbers

consecutive numbers, or sets of numbers, printed on the outside of the backing paper away from the film

NOTE The spacing of images on the film is established by sequential centring of these numbers in the window of older style cameras.

3.4

leader paper

trailer paper

shorter strips of paper attached to 220-size film (leader at the start of the film and trailer at the end of the film) for the purposes of light protection and winding, similar to the backing paper for 120-size film

3.5

spool

cylindrical device that has a flange at each end, an axial hole for a pin or spindle, and on which the roll of film and paper is wound

4 Conditions for measurement of dimensions

The dimensions and tolerances specified in this International Standard apply at the time of manufacture (except where specifically stated otherwise), measured under atmospheric conditions of $(23 \pm 2) ^\circ\text{C}$ and $(50 \pm 5) \%$ relative humidity, as specified in ISO 554.

All measuring instrument calibrations should be conducted at a temperature of $20 ^\circ\text{C}$ (as specified in ISO 1) and a relative humidity of 50 %.

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5 Dimensions

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5.1 120-size

The dimensions for 120-size film and backing paper shall conform to the values shown in Figure 1 and given in Table 1.

5.1.1 Thickness

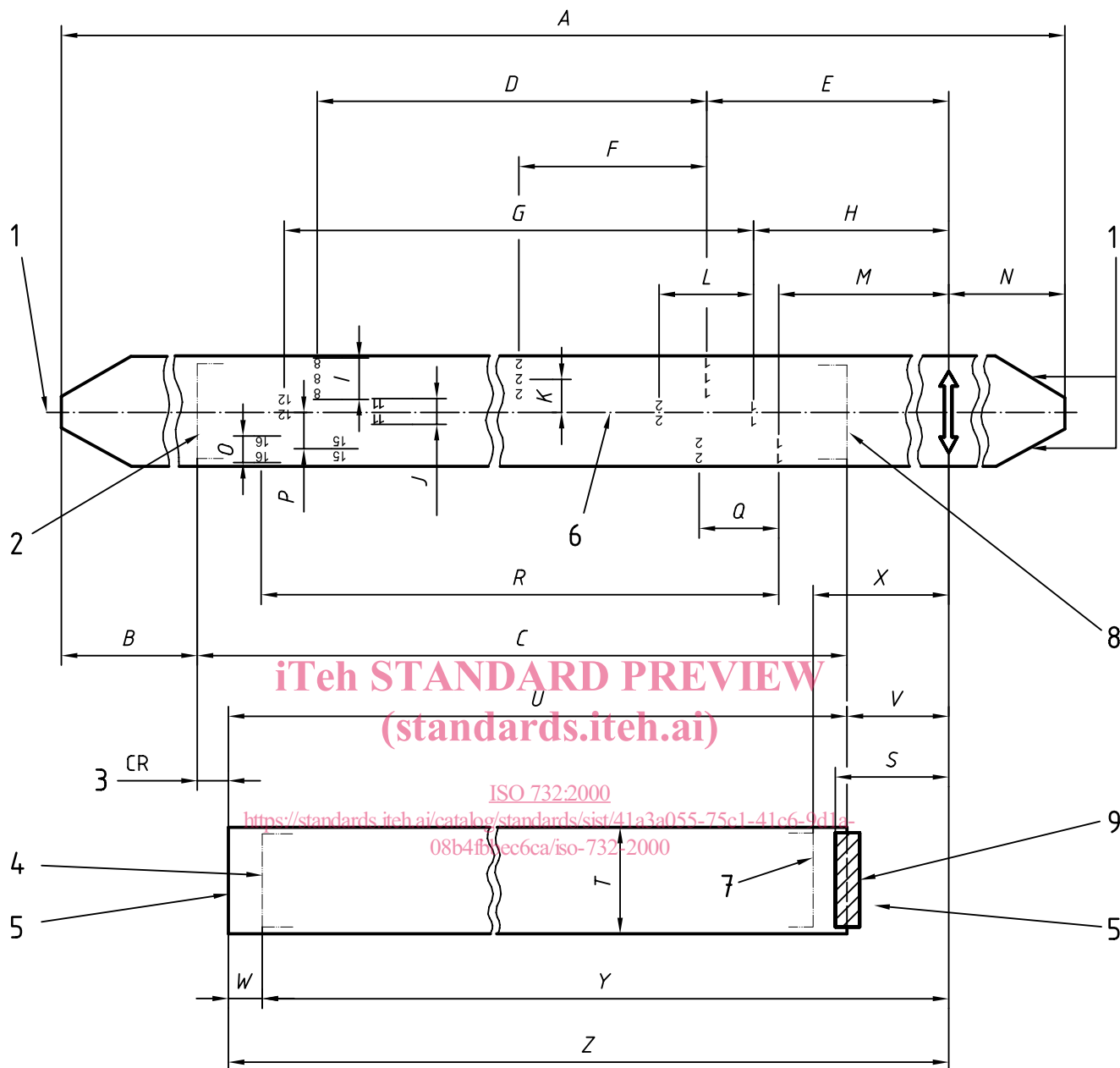
The following thickness values shall be maintained:

- backing paper: 0,06 mm minimum and 0,12 mm maximum;
- backing paper plus film: $0,24 \text{ mm} \pm 0,04 \text{ mm}$;
- backing paper plus film and paster tape: $0,40 \text{ mm} \pm 0,10 \text{ mm}$.

5.1.2 Backing paper width

The maximum backing-paper width shall not exceed 62,90 mm.

The minimum backing-paper width is at the manufacturer's discretion, but should be sufficient to insure light-tightness of the undeveloped film.



Key:

- | | |
|--|--|
| 1 Backing paper dimensions | 6 Centreline of backing paper |
| 2 Position of free end of film in the spooled roll | 7 Leading edge of first exposure |
| 3 Differential or creep | 8 Position of attached end of film |
| 4 Trailing edge of last exposure | 9 Paster for attaching film to backing paper |
| 5 Film dimensions | |

Figure 1 — 120-size film and backing paper

Table 1 — Dimensions of 120-size film and backing paper

Dimensions in millimetres

Symbol	Dimension		
	Minimum	Aim	Maximum
<i>A</i>	1 475		
<i>B</i>	230		
<i>C</i> ^a			
<i>D</i>	651		
<i>E</i>	298	300	302
<i>F</i>	93		
<i>G</i>	704		
<i>H</i>	246	248	250
<i>I</i>			17,5
<i>J</i> ^b			8
<i>K</i>	15,5	19,5	23,5
<i>L</i>	64		
<i>M</i>	238	240	242
<i>N</i>	237	257	277
<i>O</i>			13
<i>P</i>	14	18	22
<i>Q</i>	48		
<i>R</i>	720		
<i>S</i>			205
<i>T</i>	60,7		61,7
<i>U</i>	820		850
<i>V</i>	190		
<i>W</i>	15		
<i>X</i>	211		
<i>Y</i>			981
<i>Z</i>	996		

^a Dimension *C* was specified in the third edition of this International Standard, but has been judged no longer necessary.

^b The tolerance of the centreline of this number series versus the centreline of the backing paper is $\pm 3,2$ mm.

5.1.3 Paster tape

The shorter dimension of the paster tape (extending in the film's winding direction) shall not exceed 25 mm, and its overlap on the film shall not exceed 15 mm.

The longer dimension of the paster tape (across the width of the film and backing paper) shall extend at least to within 3 mm of both edges of the backing paper.

5.1.4 Exposure number orientation

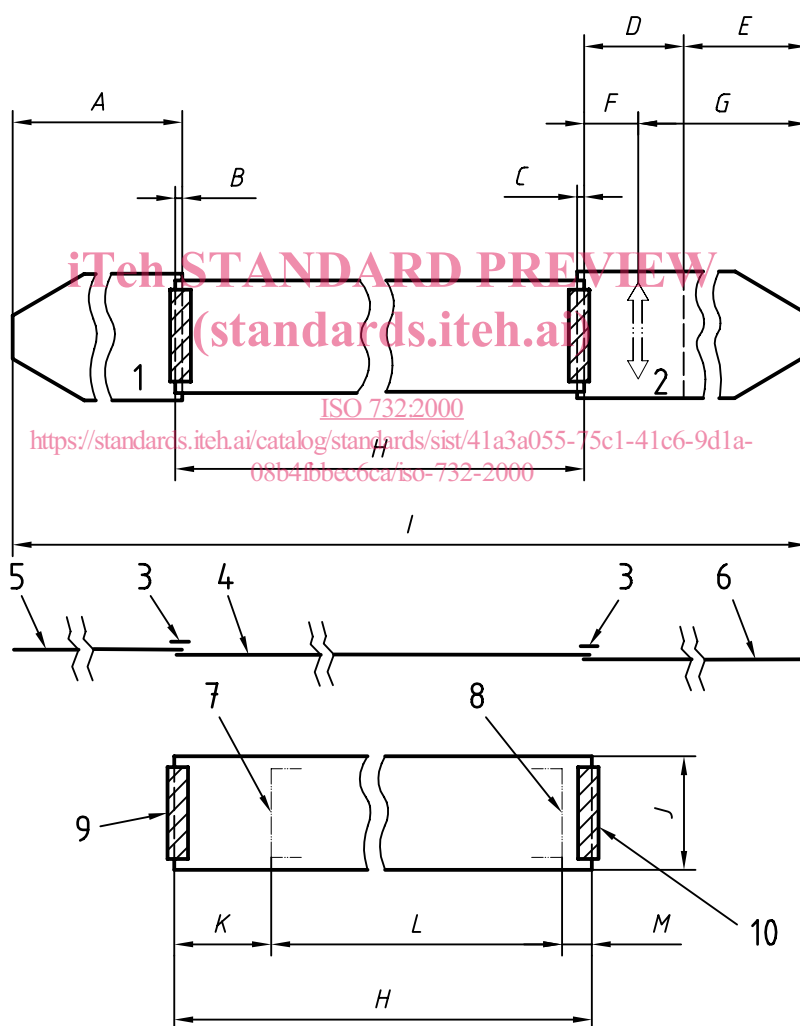
The orientation of the exposure numbers on the backing paper is the option of the manufacturer.

5.1.5 Register marks for automatic cameras

A mark shall be imprinted at a specified distance ahead of the first image position on 120-size backing paper. This mark, shown by dimension *N* in Figure 1, shall have an arrow head at the top and at the bottom. The space between the arrow heads may be filled in at the discretion of the manufacturer (with, for example, a word or a symbol).

5.2 220-size

The dimensions for 220-size film and leader/trailer paper shall conform to the values shown in Figure 2 and given in Table 2.



Key:

- | | |
|------------------------|---|
| 1 Trailer | 6 Paper leader |
| 2 Leader | 7 Trailing edge of last exposure |
| 3 Paster tape | 8 Leading edge of first exposure |
| 4 Film (emulsion side) | 9 Paster tape for attaching film to trailer |
| 5 Paper trailer | 10 Paster tape for attaching film to leader |

Figure 2 — 220-size film and leader/trailer paper