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# INTERNATIONAL STANDARD



# 732

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

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## Photography — Dimensions for 127, 120 and 620 roll film, backing paper and film spools

*Photographie — Dimensions des pellicules, du papier protecteur et des bobines pour les formats 127, 120 et 620*

First edition — 1975-05-15

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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.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 42 has reviewed ISO Recommendation R 732 and found it suitable for transformation. International Standard ISO 732 therefore replaces ISO Recommendation R 732-1971 to which it is technically identical.

ISO Recommendation R 732 was approved by the Member Bodies of the following countries :

Argentina	Czechoslovakia	Poland
Australia	France	South Africa, Rep. of
Belgium	Germany	Sweden
Brazil	Israel	Switzerland
Canada	Italy	United Kingdom
Chile	Japan	U.S.A.

The Member Body of the following country expressed disapproval of the Recommendation on technical grounds :

U.S.S.R.

# Photography – Dimensions for 127, 120 and 620 roll film, backing paper and film spools

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the dimensions for 127, 120 and 620 roll film, backing paper and film spools.

It gives maximum and minimum dimensions for the film strip and spool, and only the minimum dimensions for the backing paper.

## 2 DEFINITIONS

The following definitions of terms are given in order to facilitate comprehension of this International Standard.

**2.1 register mark for automatic camera:** Symbol or mark on the backing paper at a specific distance from the number "1" on the backing paper for use in certain types of automatic film metering cameras. (This mark is shown as an arrow pointed at both ends, but the form is optional.)

**2.2 back window (of camera):** Coloured transparent window (usually red), normally located in the back of a camera, through which the numbers of the backing paper can be seen as the film is wound through the camera.

**2.3 backing paper (also called duplex paper):** Protective strip of paper to which the film is attached. Backing paper is usually black on one side and coloured on the opposite side. Numerals are usually printed on the coloured side in a position where they can be viewed through the back window of the camera.

**2.4 core of a spool:** Cylindrical part, extending between and connecting the flanges, around which the backing paper and film are wound.

**2.5 creep:** Difference in location of the film end relative to the numbers on the backing paper when they are wound on the spool, compared to the respective positions when laid out flat. This difference exists because the backing paper, being wound outside the film strip, assumes a curve of greater circumference than the film strip for each successive convolution.

**2.6 end margin:** Distance from the end of the last picture to the end of the film strip. Included in the end margin is an allowance for attaching a developing clip.

**2.7 exposure numbers:** Consecutive numbers, or sets of numbers, printed on the outside of the backing paper away from the film (usually on the coloured side), which serve to determine the spacing of exposures as these numbers are brought into position successively in the back window of the camera. Some sizes of roll film bear more than one series of numbers, each series being associated with a particular nominal negative size designated by the trade and hence with cameras producing negatives of that nominal size. Proper positioning of the back window in the camera (see ISO 1203<sup>1)</sup>) permits the use of the proper series of numbers for the nominal negative size appropriate to that camera. For example, the film and backing paper represented by No. 120 are adopted for use in three types of cameras producing different nominal negative sizes and bear series of exposure numbers for eight, twelve or sixteen negatives designated by the trade as having nominal sizes of 6 cm X 9 cm (2 1/4 in X 3 1/4 in), 6 cm X 6 cm (2 1/4 in X 2 1/4 in) or 4,5 cm X 6 cm (1 5/8 in X 2 1/4 in), respectively.

**2.8 film:** Sensitized material which receives the photographic image in the camera. Roll film usually consists of a gelatin-silver bromide emulsion coated on one side of a transparent cellulose plastics base about 0,08 mm (0.003 in) thick, with a gelatin layer on the opposite side to counteract curl. The sensitive layer, however, may be coated on other base materials.

**2.9 flanges of a spool:** Disks attached to each end of the spool core, between which the film and backing paper are wound. The main function of the flanges is to prevent light from reaching the edges of the film.

**2.10 flat film:** Plane position of the film convenient for measuring, as distinguished from the position assumed by the film with relation to the backing paper as they are wound from one spool to the other in the camera.

1) ISO 1203, *Photography – Roll film cameras – Back window location and picture sizes.*

**2.11 hub of spool:** Projection beyond the flange of some spools, used as a bearing or support for the spool while in the camera. One hub usually contains a slot or other means for turning the spool.

**2.12 length of film:** Linear lengthwise dimension of the film strip. Four lengths are recognized for each film: the minimum and maximum overall lengths when flat, the minimum projected film length (see 2.15), and the minimum utilizable film length (see 2.20).

**2.13 minimum dimensions:** Lower limiting dimensions for film and backing paper as specified in this International Standard. In practice, many of the minimum dimensions for film and backing paper will normally be exceeded by several manufacturers because of manufacturing tolerances and safety margin.

**2.14 paper slots:** Slots or openings in the core for attaching the backing paper leader preliminary to winding in the camera. The same slots are used by the manufacturer for winding the paper and film on the spool. It is understood that the slots permit the end of the backing paper to pass through the core of the spool.

**2.15 projected film length:** Dimension which shows the distance, measured along the backing paper, between the two ends of the film when wound on the spool. The projected film length is the flat film length plus the creep.

**2.16 roll film:** Daylight-loading supply of photographic film for use in hand-held still picture cameras. It comprises a spool with solid opaque flanges on which is wound a continuous strip of backing paper having a substantially shorter strip of film attached to it in a definite position relative to the exposure numbers printed on the opposite side of the paper. Roll film is distinguished from aerial, and also from other rolled films such as miniature camera film roll, which may have paper leaders and trailer spliced to the film but which do not have backing paper as defined above.

**2.17 spool for roll film:** Core assembled to two solid opaque flanges between which a strip of film with backing paper can be wound to comprise a roll film. A slot, or the equivalent, is provided in at least one end of the spool for engaging the winding key of the camera.

**2.18 start margin:** Distance from the beginning of the film or the beginning of the first exposure. Included in the start margin is an allowance for attaching a developing clip.

**2.19 turning slot** (also called *key slot*): Slot in at least one end of the spool, which is engaged by the winding key of the camera. This slot may be in the flange or hub of the spool.

**2.20 utilizable film length:** Portion of the film length that is utilized for exposing the pictures. It represents the film exclusive of start and end margins and is indicated on the figures by the dotted sections at each end of the film strip.

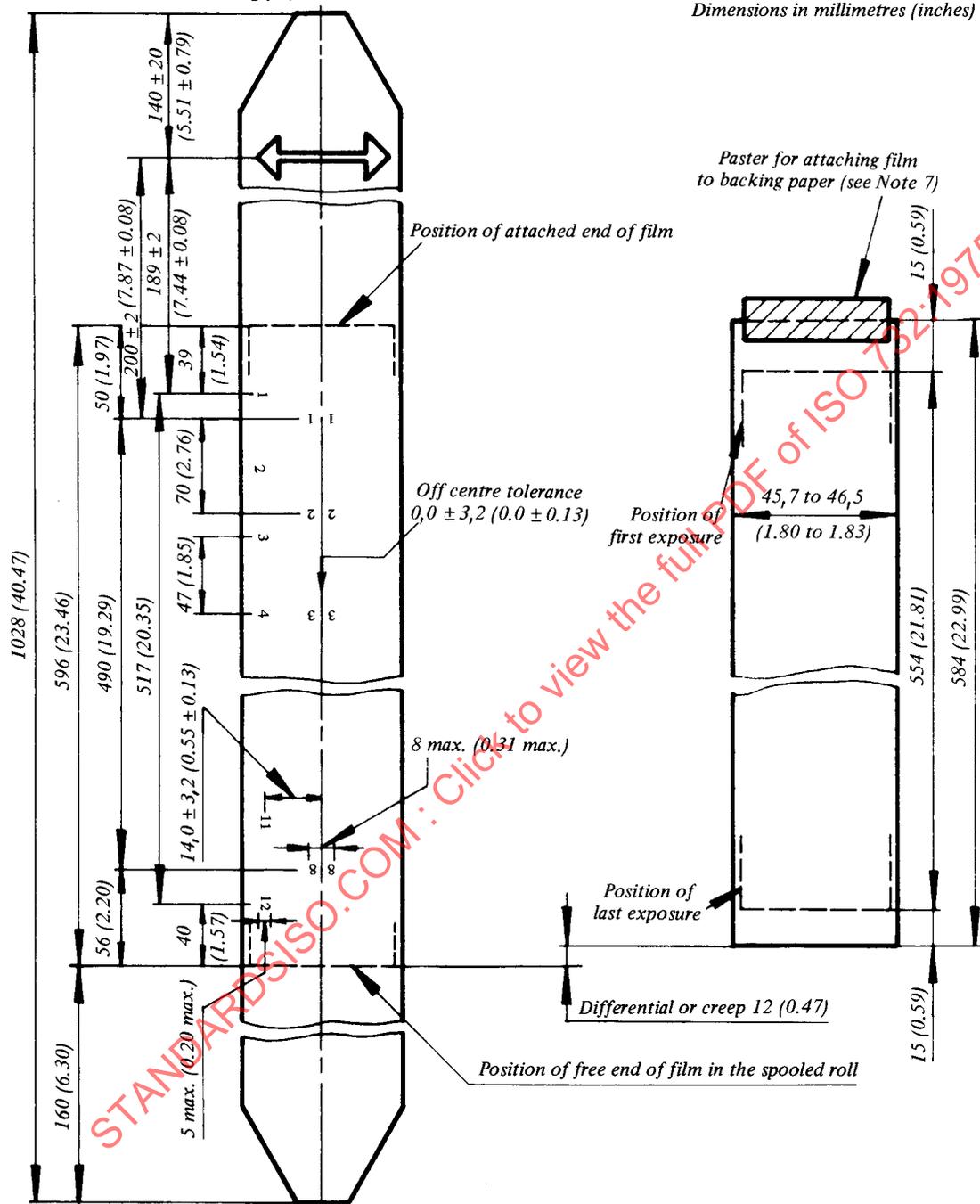
**FIGURES**

	Page
1 – 127 roll film . . . . .	4
2 – 127 roll film spool . . . . .	5
3 – 120 roll film . . . . .	6
4 – 120 roll film spool . . . . .	7
5 – 620 roll film . . . . .	8
6 – 620 roll film spool . . . . .	9

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3 127 ROLL FILM, BACKING PAPER AND SPOOLS

3.1 Dimensions for film and backing paper



NOTES

- 1 The orientation of the exposure numbers is optional with the manufacturer.
- 2 All dimensions are minimum except where a tolerance or maximum is shown.
- 3 The maximum film length shall be not more than 75 mm (3 in) over the minimum.
- 4 The thickness of the backing paper shall not exceed 0,14 mm (0.005 5 in).
- 5 The thickness of the backing paper plus film shall be  $0,24 \pm 0,04$  mm ( $0.009 \pm 0.001 6$  in).
- 6 The thickness of the backing paper plus film plus paster for attaching the film to the backing paper shall be  $0,4 \pm 0,1$  mm ( $0.016 \pm 0.004$  in).
- 7 It is preferred that the paster should be not more than 25 mm (0.984 in) in length in the direction of winding and its width should be such that the edges are not more than 3 mm (0.118 in) from the edges of the backing paper. The overlap between the paster and the film shall not exceed 15 mm (0.59 in).

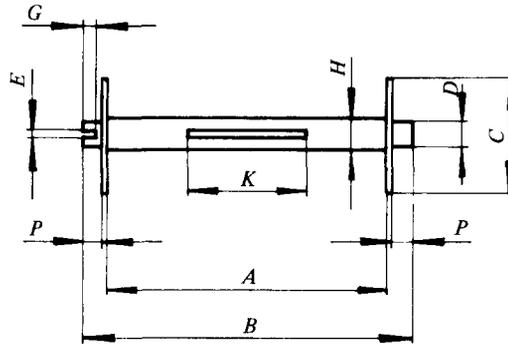
FIGURE 1 – 127 roll film

**3.2 Dimensions for spools**

These dimensions apply to spools with flanges having plane, parallel inside surfaces.

These spools are used in cameras designated by the trade as having nominal negative sizes of :

4 cm X 6,5 cm      or      1 5/8 in X 2 1/2 in  
 4 cm X 4 cm        or      1 5/8 in X 1 5/8 in



Dimension	mm	in
A <sup>1)</sup> max.	47,4	1.866
A <sup>1)</sup> min.	47,1	1.854
B max.	55,4	2.181
B min.	54,5	2.146
C max.	19,2	0.756
C min.	18,8	0.740
D max.	4,0	0.157
D min.	3,7	0.146
E <sup>2)</sup> max.	1,6	0.063
E <sup>2)</sup> min.	1,1	0.043
G min.	2,5	0.098
H max.	5,2	0.205
H min.	4,6	0.181
K min.	20,0	0.787
M <sup>3)</sup> tol.	0,3	0.012
N <sup>4)</sup> tol.	0,3	0.012
P max.	3,4	0.134
P min.	2,7	0.106

1) These dimensions apply to spools with straight parallel flanges which are perpendicular to the core. A tolerance of 0,10 mm (0.004 in) above maximum and below minimum dimensions will be allowed for tilted or distorted flanges.

2) A key slot is required on one end of the core for use as a take-up spool in the camera. Key slots may be provided in both ends at the option of the manufacturer.

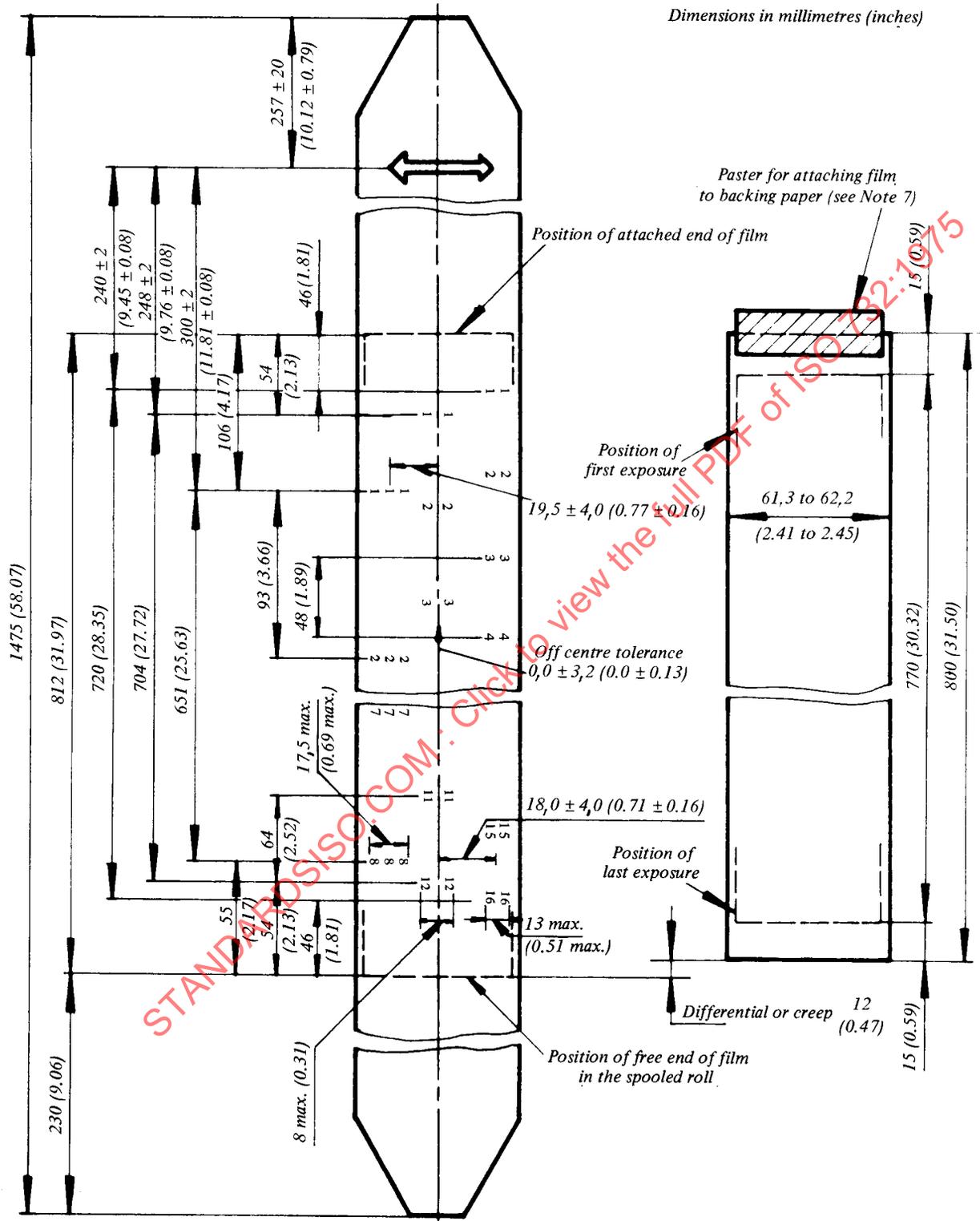
3) M = concentricity of D and C or one-half total dial run-out.

4) N = concentricity of D and H or one-half total dial run-out.

FIGURE 2 – 127 roll film spool

4 120 ROLL FILM, BACKING PAPER AND SPOOLS

4.1 Dimensions for film and backing paper



- NOTES
- 1 The orientation of the exposure numbers is optional with the manufacturer.
  - 2 All dimensions are minimum except where a tolerance or maximum is shown.
  - 3 The maximum film length shall be not more than 50 mm (2 in) over the minimum.
- [notes concluded on page 7]

FIGURE 3 – 120 roll film

NOTES ON FIGURE 3 (concluded)

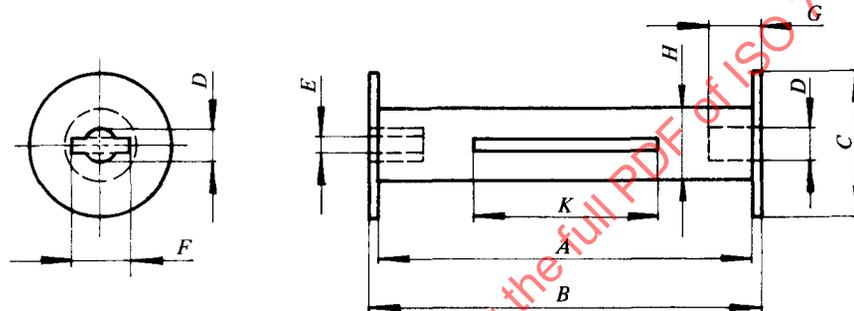
- 4 The thickness of the backing paper shall not exceed 0,14 mm (0.005 5 in).
- 5 The thickness of the backing paper plus film shall be  $0,24 \pm 0,04$  mm ( $0.009 \pm 0.001 6$  in).
- 6 The thickness of the backing paper plus film plus paster for attaching the film to the backing paper shall be  $0,4 \pm 0,1$  mm ( $0.016 \pm 0.004$  in).
- 7 It is preferred that the paster should be not more than 25 mm (0.984 in) in length in the direction of winding and its width should be such that the edges are not more than 3 mm (0.118 in) from the edges of the backing paper. The overlap between the paster and the film shall not exceed 15 mm (0.59 in).

4.2 Dimensions for spools

These dimensions apply to spools with flanges having plane, parallel inside surfaces.

These spools are used in cameras designated by the trade as having nominal negative sizes of :

- 6 cm X 9 cm or 2 1/4 in X 3 1/4 in
- 6 cm X 6 cm or 2 1/4 in X 2 1/4 in
- 4,5 cm X 6 cm or 1 5/8 in X 2 1/4 in



Dimension		mm	in
A <sup>1)</sup>	max.	62,9	2.476
	min.	62,6	2.465
B	max.	66,1	2.602
	min.	65,4	2.575
C	max.	25,3	0.996
	min.	25,0	0.984
D	max.	5,5	0.216
	min.	5,1	0.201
E <sup>2)</sup>	max.	2,8	0.110
	min.	2,2	0.087
F <sup>2)</sup>	min.	10,0	0.394
G	min.	9,0	0.354
H	max.	12,1	0.476
	min.	11,2	0.441
K	min.	31,0	1.220
M <sup>3)</sup>	tol.	0,3	0.012
N <sup>4)</sup>	tol.	0,4	0.016

- 1) These dimensions apply to spools with straight parallel flanges which are perpendicular to the core. A tolerance of 0,10 mm (0.004 in) above maximum and below minimum will be allowed for tilted or distorted flanges.
- 2) A key slot is required in one flange of the spool for use as a take-up spool in the camera. Key slots may be provided in both flanges at the option of the manufacturer. As an alternative, plus-shaped (cross) key slots may be provided at the option of the manufacturer.
- 3) M = concentricity of D and C or one-half total dial run-out.
- 4) N = concentricity of D and H or one-half total dial run-out.

FIGURE 4 – 120 roll film spool