International Standard ISO 3047

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Cinematography — Spool, daylight loading type, for 35 mm motion-picture cameras (capacity 30 m — 100 ft) — Dimensions

Cinématographie — Bobines pour chargement en plein jour pour caméras 35 mm *(capacité* 30 m — 100 ft*) — Dimensions*

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Foreword

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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 3047 was developed by Technical Committee ISO/TC 36, *Cinematography*.

This second edition was submitted directly to the ISO Council, in accordance with clause 5.10.1 of part 1 of the Directives for the technical work of ISO. It cancels and replaces the first edition (i.e. ISO 3047-1975), which had been approved by the member bodies of the following countries :

Australia	India	Spain
Belgium	Italy	Sweden
Bulgaria	Japan	Switzerland
Canada	Mexico	Thailand
Czechoslovakia	Netherlands	USA
Egypt, Arab Rep. of	Romania	USSR
France	South Africa, Rep. of	

The member body of the following country had expressed disapproval of the document on technical grounds :

United Kingdom

Printed in Switzerland

Cinematography — Spool, daylight loading type, for 35 mm motion-picture cameras (capacity 30 m — 100 ft) — Dimensions

1 Scope and field of application

This International Standard specifies the dimensions and characteristics of the general purpose daylight loading spool with a nominal capacity of 30 m (100 ft) for use in 35 mm motion-picture cameras.

NOTE — The dimensions specified in this International Standard are in substantial agreement with corresponding dimensions for microfilm camera spools described in ISO 1116 (see the annex).

2 References

ISO 1101, *Technical drawings — Geometrical tolerancing — Tolerances of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings.*[1]

ISO 1116, *Microcopying — 16 mm and 35 mm microfilms, spools and reels.*

3 Dimensions

3.1 The dimensions shall be as shown in the figures and given in the table.

3.2 If the rivet heads or other fastening devices extend beyond the outer surface of the flange, they shall lie outside the K diameter area, but within the boundaries defined by the volume of rotation diagram.

3.3 Dimension F represents a slot in the spool core for attaching film. The slot sides, starting immediately adjacent to each flange and running a minimum distance of 6,0 mm (0.24 in) from each flange toward the other, should be straight, parallel, and 0,7 to 1,5 mm (0.03 to 0.06 in) apart. The slot sides may diverge over the remaining (central) portions of the slot.

3.4 Dimension J represents the thickness or effective thickness respectively of the spool within a K diameter area which is centred on the spindle hole axis of each flange.

3.5 A reference plane of rotation for each flange is defined by a plane perpendicular to the axis of the spindle and coincident with the surface of a flat 15,0 mm (0.59 in) diameter support which is in contact with the flange and centred on the spindle hole axis of the flange.

The dimension P is the distance measured outwardly from this reference plane[2] of rotation to the plane of rotation generated by the thickest and/or most eccentric point on the flange outside the K diameter area when the spool is rotated on an accurate, tight-fitting spindle. This includes rivets or other fastening devices, variations in flange thickness, flatness and lateral runout of the flanges.

Selection of dimension P value is dependent upon the thickness of the material used for the flanges. According to the flange material thickness :

a) the K diameter area may be depressed (with P greater than zero); or

b) the outside surfaces of the flanges may be flat from spindle hole to periphery (with P equal to zero); or

c) in the case of flanges made of very thin material, the K diameter area may be raised rather than recessed (effectively, P less than zero).

3.6 The maximum effective thickness of spools (including all the characteristics mentioned in 3.5) outside the K diameter area has not been stated because it is a function of a spool's specific J value between the 15,0 mm (0.59 in) diameter reference zones on each flange. The largest such overall effective thickness, however, will be $J_{max} + 2P_{max} = 38{,}90$ mm (1.530 in).

3.7 The eccentricity of the core with respect to the spindle hole axis, Z, should not exceed a total radius variation (total indicator reading) of 1,0 mm (0.04 in) for all spool sizes.

1) At present at the stage of draft. (Revision of ISO/R 1101/1-1969.)

2) The reference plane from which P is measured is not necessarily coincident with all points within the K diameter area, but only needs to be coincident with those which are in contact with the reference support which has a diameter smaller than K.

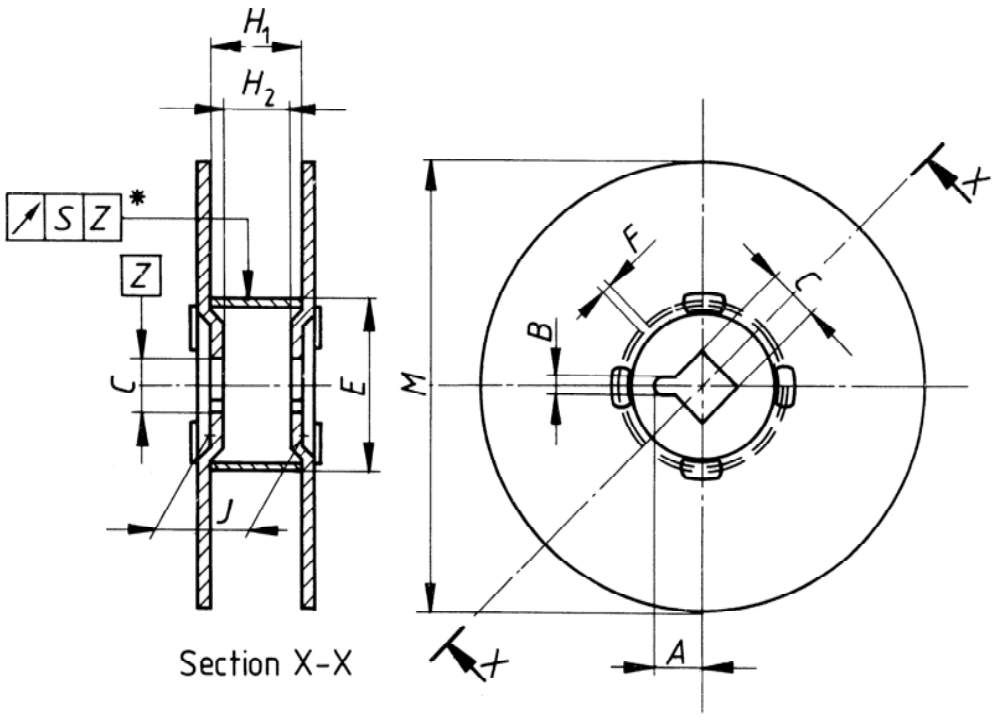

Figure 1 — Flange No. 1
(that which first engages the camera spindle)

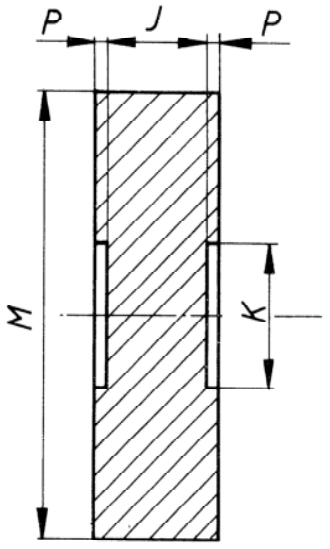

Figure 2 — Volume of rotation diagram

Table

Dimension	mm	in
A	$7{,}6\ ^{+\ 1{,}0}_{\ 0}$	$0.30\ ^{+\ 0.04}_{\ 0}$
B	$3{,}1\ ^{+\ 0{,}4}_{\ 0}$	$0.12\ ^{+\ 0.02}_{\ 0}$
C	$8{,}05\ ^{+\ 0{,}15}_{\ 0}$	$0.317\ ^{+\ 0.006}_{\ 0}$
D	5,40 min.	0.213 min.
E	32,0 ± 0,5	1.26 ± 0.02
F	$0{,}7\ ^{+\ 0{,}8}_{\ 0}$	$0.03\ ^{+\ 0.03}_{\ 0}$
H_1	$35{,}10\ ^{+\ 0{,}40}_{\ 0}$	$1.382\ ^{+\ 0.016}_{\ 0}$
H_2	35,00 min.	1.378 min.
J	$37{,}9\ ^{0}_{-\ 0{,}8}$	$1.49\ ^{0}_{-\ 0.03}$
K	25,5 min.[1]	1.00 min.
M	$92{,}0\ ^{0}_{-\ 1{,}0}$	$3.62\ ^{0}_{-\ 0.04}$
P (see 3.5)	0,50 max.	0.020 max.
U	8,15 ± 0,15	0.321 ± 0.006
V	$11{,}2\ ^{0}_{-\ 0{,}2}$	$0.44\ ^{0}_{-\ 0.01}$

1) The metric dimension specified is not a direct conversion from the basic inch dimension, but has been chosen to reflect current engineering practice in metric countries using the metric system.

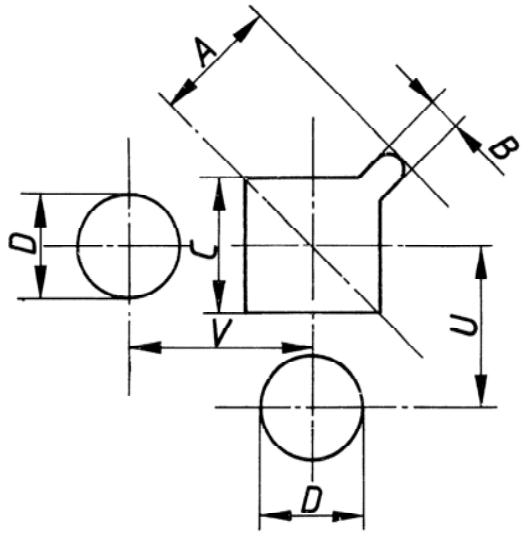

Figure 3 — Spindle and drive holes in flange No. 1 (see 4.2.3)

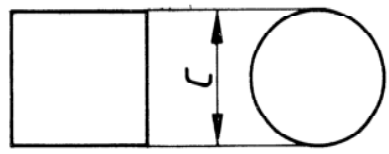

Figure 4 — Optional spindle hole — Types in flange No. 2 (see 4.2)

* See 3.7. This symbol signifies the runout of the cylindrical surface of the core with respect to the Z axis in the manner prescribed in ISO 1101.

4 Spindle hole alignment

4.1 The spindle holes provided in flanges 1 and 2 shall be of the shapes and combinations described in one of the following sub-clauses.

4.2 When square holes are used in both flanges, the alignment of the sides of the squares in the two flanges shall be such that a test bar 8,03 mm (0.316 in) square may be passed completely through the spool.

4.2.1 (Recommended for future construction)

Flanges Nos. 1 and 2 as in the figures, additional optional features are :

a) a second keyway opposite the keyway shown in flange No. 1,

b) a single keyway in flange No. 2.

4.2.2 (Permissible)

Flange No. 1 — as in figure 1 (optional : a second keyway opposite the keyway shown).

Flange No. 2 — round hole with diameter equal to the dimension C.

4.2.3 If drive holes are provided in the flanges, they shall be as shown in figure 3 and the table, except that the following option concerning offset drive holes also is acceptable :

The offset drive holes may be located anywhere on the circles which are described by the radii U and V so long as both holes are rotated an equal amount, and in the same direction from the position shown in the figure.

NOTES

1 When the loaded camera is viewed from the side, with the lens to the left and the bottom of the housing downward (regardless of whether the spool loading mechanism is visible from the side), both the supply and take-up spools rotate in a clockwise direction.

2 Flanges shall be opaque and have low reflectance characteristics.

Annex

(This annex does not form part of the standard.)

Spools for microfilm often employ offset drive holes and/or drive slot as described in ISO 1116. Such holes are optional in spools described in this International Standard covering spools for motion-picture films. Manufacturers who might wish to make a single type of spool for both purposes would need to take the drive holes or slot into account when planning the size of fastening devices and the size of the K diameter area described in this International Standard. That is, the minimum diameter of the K area (and thus, the circle described by the inner edges of fastening devices, if any) would have to be large enough [about 28,5 mm (1.12 in) minimum] to avoid interference with a drive slot.