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Reaffirmed 2009

REAFFIRMED 2003

SMPTE STANDARD

ANSI/SMPTE 174-1994
Revision of
ANSI/SMPTE 174-1988

for Motion-Picture Equipment (16-mm) — Camera Spools — 50- to 400-Ft Capacity

1 Scope

1.1 This standard specifies the dimensions for 16-mm motion-picture camera spools having capacities from 50 ft to 400 ft (15 m to 120 m) of film.

1.2 This standard further specifies the configuration of the positioning of the spindle holes in the two flanges. These shall be identified as styles 1, 2, and 3 (see figure 2).

2 Dimensions

The dimensions shall be as specified in the figures and tables.

3 Spindle hole alignment

In styles 2 and 3, the alignment of the sides of the squares in the two flanges shall be such that a test bar 0.316 in (8.03 mm) square may be passed completely through the spool. The corner keyways in the two flanges of style 2 shall be aligned with each other.

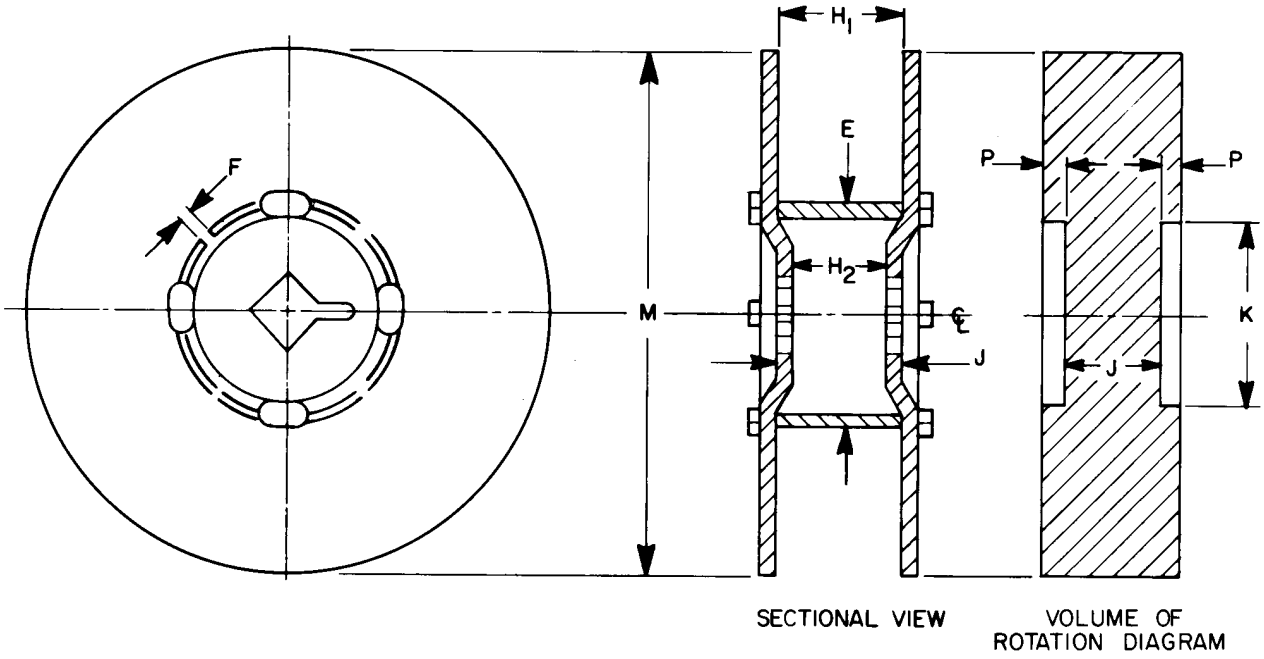

Figure 1 – Camera spool

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American National Standard

Approved
April 13, 1994

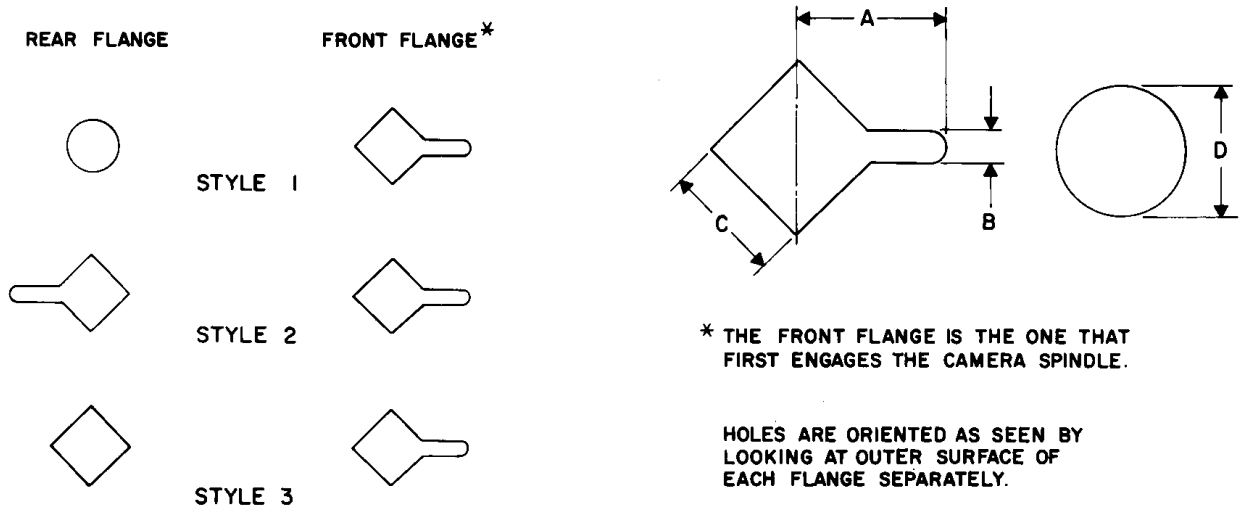

Figure 2 – Flanges

Table 1 – Nominal spool capacity

Dimensions	Feet	Meters	Inches	Millimeters
E	50	15	1.26 ± 0.02	32.0 æ 0.5
	100	30	1.26 ± 0.02	32.0 ± 0.5
	200	60	1.26 ± 0.02	32.0 ± 0.5
	400	120	2.12 ± 0.02	53.8 ± 0.5
K	50	15	1.00 min	25.4 min
	100	30	1.00 min	25.4 min
	200	60	1.00 min	25.4 min
	400	120	1.50 min	38.1 min
M	50	15	2.81 + 0.00 – 0.04	71.4 + 0.0 – 1.0
	100	30	3.62 + 0.00 – 0.04	91.9 + 0.0 – 1.0
	200	60	4.96 + 0.00 – 0.04	126.0 + 0.0 – 1.0
	400	120	6.65 + 0.00 – 0.04	168.9 + 0.0 – 1.0

Table 2 – Dimensions common to spools in table 1

Dimensions		Inches		Millimeters	
A	Keyway depth	0.30	+ 0.04 – 0.00	7.6	+ 1.0 – 0.0
B	Keyway width	0.12	+ 0.02 – 0.00	3.0	+ 0.5 – 0.0
C	Side of square spindle hole	0.317	+ 0.006 – 0.000	8.05	+ 0.15 – 0.00
D	Spindle hole diameter	0.317	+ 0.006 – 0.000	8.05	+ 0.15 – 0.00
F	Film slot (see 4.1)	0.03	+ 0.03 – 0.00	0.8	+ 0.8 – 0.0
H_1	At periphery	0.632	+ 0.014 – 0.000	16.05	+ 0.36 – 0.00
H_2	Distance between flanges at spindle holes	0.630	min	16.00	min
J	Overall thickness at spindle holes	0.73	+ 0.00 – 0.02	18.5	+ 0.0 – 0.5
P	(See note 5)	0.020	max	0.51	max

4 Specifications

4.1 Dimension F represents a slot in the spool core for attaching film. Its sides shall be straight, parallel, and 0.028 in to 0.059 in (0.71 mm to 1.50 mm) apart. It is permissible for the slot sides to diverge in the center portion of the slot. Any divergence shall not be greater than one-half the width of the slot.

4.2 Dimension J is the thickness of the spool within the K-diameter zone, which is centered on the spindle hole axis of each flange.

4.3 The eccentricity of the core with respect to the spindle hole axis shall not exceed a total radius variation (total indicator reading) of 0.030 in (0.76 mm) for all spool sizes.

NOTES

1 The style 2 configuration of spindle holes is recommended as the preferred standard for future design.

2 Flanges shall be opaque and their inner surfaces shall have a low-reflectance characteristic.

3 If the spool or spool hub is made from plastic or other dimensionally unstable material, spindle hole dimensions C and D shall be adjusted so that at least the minimum dimension is maintained throughout the normal use range of temperature and humidity.

4 Rivet heads or other fastening devices, which extend beyond the outer surface of the flange, shall lie outside the K-diameter zone but within the boundaries defined by the volume of rotation diagram (i.e., 0.770 in [19.56 mm] max).

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 0.590 in (14.99 mm) diameter support in contact with the flange and centered on the spindle hole axis of the flange. Dimension P is the distance measured outwardly from this reference plane of rotation to the farthest plane of rotation generated by any point on the flange outside the K-diameter zone when the spool is rotated on an accurate, tight-fitting spindle.

6 The maximum effective thickness of spools (including all the characteristics mentioned in note 5) outside the K-diameter zone has not been stated because it is a function of a spool's specific J value between the 0.590-in (14.99-mm) diameter reference zones on each flange. The largest such overall effective thickness, however, will be J max + 2P max = 0.770 in (19.56 mm).

7 There may be other cutouts or holes in the hub area of the flanges within the limits of dimension K, provided the spool remains nominally in dynamic balance.