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SMPTE 236-1998
Revision of
ANSI/SMPTE 236-1987

SMPTE STANDARD

for Motion-Picture Equipment (8-mm Type R) — Projection Reels

1 Scope

This standard specifies the dimensions for 8-mm type R motion-picture reels used for projection having film capacities of 50, 100, 200, 400, 600, 800, and 1200 ft (15, 30, 60, 120, 180, 240, and 360 m).

2 Dimensions

2.1 The dimensions shall be as specified in the figure and tables.

2.2 The dimensions apply regardless of the material used for construction (see note 3).

2.3 Dimensions C and K apply from the core to the periphery of the reel except for the area of dimension J. All points of the outside surface of the flanges, including the rim, lettering, lugs, and all other protrusions, shall fall between planes as defined by dimension K. If spring fingers are used to engage the edges of the film, dimension C shall be measured with the fingers fully expanded.

2.4 Dimension A applies to both flanges.

2.5 Dimension J shall apply within a circle of 1.0-in (25-mm) diameter or larger, centered on the spindle hole axis.

2.6 Dimension L in table 1 is the total indicator reading on the flanges of the reel at any distance from the reel axis (datum line Z), measured through a complete revolution of the reel. The reel is to be rotated about its axis while being held against a 1-in (25-mm) diameter circular reference support or flange of a horizontal spindle. An exception is made and the restricted runout does not apply over the small zone of transition from dimension J to dimension K.

2.7 The surface of the core and the periphery of the flanges shall be concentric with the spindle holes to within 0.020 in (0.51 mm) total indicator reading.

2.8 For reels of increasing radius or capacity, progressively smaller tolerances for dimension D are specified in table 2. This is done because the potential for greater runout and the masses involved increase with diameter, and larger reels require more precise and positive alignment on the spindle.

2.9 Dimensions P and P′ have been established to ensure symmetry of the recessed area represented by dimension J. They apply only when dimension K exceeds dimension J. They should be measured at the point of departure of dimension J to the larger dimension K.

NOTES

1 For future construction, it is preferred that the flanges of the reel shall have three radial driving slots spaced approximately 120° and conforming to dimensions E and F, and that the drive slots of each flange shall be aligned. If properly aligned, the reel will fit on a test spindle (gauge) of 0.314-in (7.98-mm) diameter with a radial spindle drive key having a length from the spindle shoulder greater than the width of

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the reel, dimension J; a thickness of 0.058 in (1.47 mm) and a height, measured as a radius from the spindle axis, of 0.27 in (6.9 mm). Existing reels with drive slots in only one flange are recognized temporarily.

2 Provision should be made for securing the end of the film so that the reel accepts the full width of the film, and that the film will be freely released at the end of its run. If film attachment is provided by a slot in the core, a suitable cutout in the core may be included to allow free access to the film end and to provide for attachment of a film end retention clip or plug when the reel is used on automatic rewind equipment.

3 The dimensions were determined for reels made from a dimensionally stable material such as metal. If the reel or reel hub is made of plastic or other dimensionally unstable material, the spindle hole diameter, dimension D, should be adjusted so that at least the minimum dimension (0.316 in, 8.03 mm) is maintained throughout the normal use range of temperature and relative humidity.

4 The International Organization for Standardization has established the minimum diameter of the spindle hole, dimension D, as 0.317 in (8.05 mm) to ensure satisfactory fit on internationally available 8-mm projector spindles, and to provide for compatibility of the minimum spindle hole diameter for 8-, 16-, and 35-mm camera and projector spools and reels. It is, therefore, recommended that USA manufacturers direct future production to the 0.317 in minimum.

5 The spindle hole may be a sleeve or there may be an air space between the spindle holes in the flanges, depending upon the type of construction. Because of this, the means for retaining the reel on the projector spindle should be outboard of the reel, as defined by dimension J.

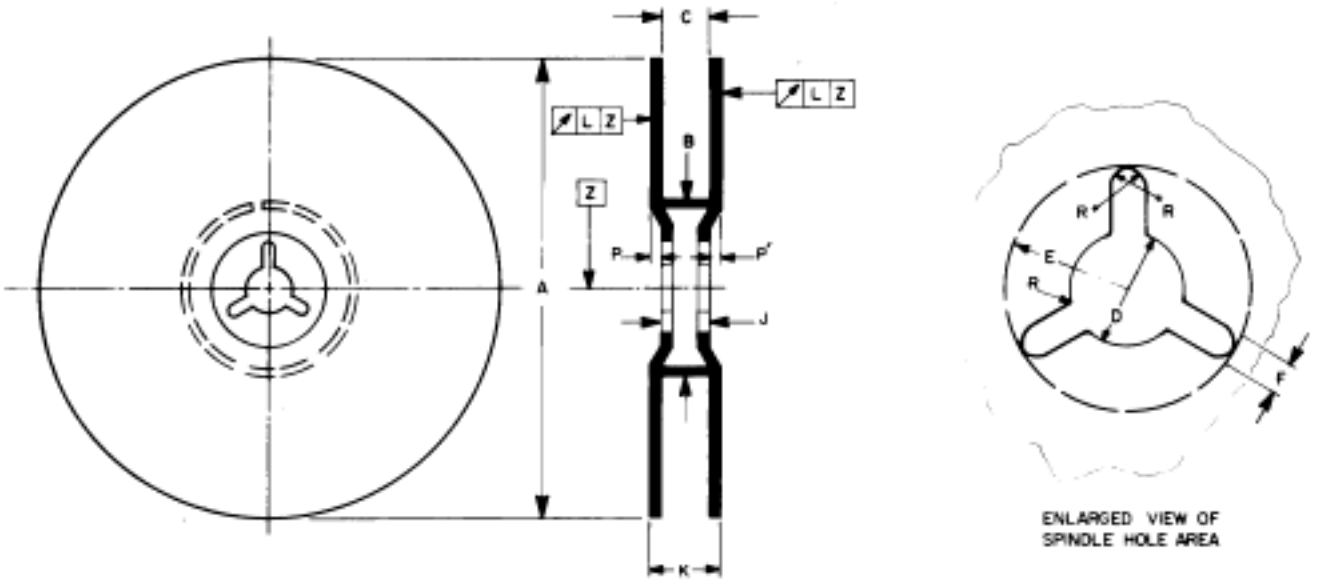

Figure 1 – Specifications

Table 1 – Reel capacity dimensions

Nominal reel capacity		Dimensions	Inches		Millimeters	
Feet	Inches		Minimum	Maximum	Minimum	Maximum
50	15	A	2.91	2.95	73.9	74.9
		B	1.25	1.30	31.7	33.0
		L		0.04		1.0
100	30	A	3.90	3.94	99.1	100.1
		B	1.77	1.81	45.0	46.0
		L		0.04		1.0
200	60	A	5.00	5.04	127.0	128.0
		B	1.77	2.00	45.0	50.8
		L		0.06		1.5
400	120	A	7.00	7.09	177.8	180.1
		B	2.36	2.50	59.9	63.5
		L		0.08		2.0
600[1]	180	A	9.25	9.31	235.0	236.5
		B	4.85	4.91	123.2	124.7
		L		0.10		2.5
800[1]	240	A	10.47	10.55	265.9	268.0
		B	4.85	4.91	123.2	124.7
		L		0.12		3.0
1200[1]	360	A	12.23	12.27	310.6	311.7
		B	4.85	4.91	123.2	124.7
		L		0.12		3.0

[1]See annex A.5.

Table 2 – Common dimensions

Dimensions		Inches	Millimeters
C		0.33 $^{+\ 0.06}_{-\ 0.00}$	8.4 $^{+\ 1.5}_{-\ 0.0}$
D	(100 ft or less)	0.316 $^{+\ 0.010}_{-\ 0.000}$	8.03 $^{+\ 0.25}_{-\ 0.00}$
	(200 ft)	0.316 $^{+\ 0.004}_{-\ 0.000}$	8.03 $^{+\ 0.10}_{-\ 0.00}$
	(400 ft or more)	0.316 $^{+\ 0.003}_{-\ 0.000}$	8.03 $^{+\ 0.08}_{-\ 0.00}$
E		0.312 ± 0.005	7.92 ± 0.13
F		0.06 $^{+\ 0.01}_{-\ 0.00}$	1.5 $^{+\ 0.3}_{-\ 0.0}$
J		0.490 $^{+\ 0.00}_{-\ 0.06}$	12.45 $^{+\ 0.0}_{-\ 1.5}$
K		0.56 max	14.2 max
P = P′		0.020 max	0.51 max
R		Maximum is half the value used for dimension F	

Annex A (informative)
Additional data

A.1 Although the standard specifies three drive slots on each flange, only one is normally used to drive the reel. Three slots are specified to facilitate easy loading of the reel on the drive spindle.

A.2 As noted, a spindle shoulder of 1.0 in (25 mm) in diameter is required for the measurement of lateral runout. The wobble of the reel on the projector will be less if a shoulder of this diameter is also incorporated on the projector spindle and provision made to fit the reel tightly to this shoulder. It is expected that projector manufacturers will incorporate a spindle shoulder of at least 0.50 in (12.7 mm) in diameter.

The arrow in the symbol for runout, shown in figure 1, indicates runout of the referenced surface with respect to datum axis Z and to the limits listed for dimension L in table 1.

A.3 This standard applies to reels used for projection which are considered to be interchangeable on all types of projection equipment. Take-up reels, which may be considered an integral part of the manufacturer's projection equipment, may deviate from the dimensions in this standard. For example, it may be desirable to taper the flanges from the core to the periphery or to provide for special film attachment mechanisms.

A.4 The nominal reel capacity stipulated in table 1 is based on a total film thickness (including any magnetic striping or winding allowance) not exceeding 0.006 in (0.15 mm).

A.5 Reels of 600-, 800-, and 1200-ft capacity are not in common use at this time. Specifications are provided so that a standard will be available should these reels come into use.