SMPTE 239-2004
Revision of
SMPTE 239-1999

SMPTE STANDARD

for Motion-Picture Film (16-mm) — Perforated 8-mm Type R, 2R

1 Scope

This standard specifies the cutting and perforating dimensions for 16-mm motion-picture film with two rows of 8-mm type R perforations and a perforation pitch of either 0.1500 in or 0.1497 in (3.810 mm or 3.802 mm). The width of the 8-mm strip after processing and slitting is also specified.

2 Dimensions

2.1 The dimensions shall be as given in figure 1 and table 1.

2.2 The dimensions pertain to a safety film as defined in SMPTE 223M.

2.3 Except for dimension A', the dimensions apply at the time of cutting and perforating for film adjusted to a temperature of 23°C ± 1°C (nominally converted to 72°F ± 2°F) and a relative humidity of 50% ± 2%. The manufacturer may indicate other nominal temperature and humidity conditions under which the dimensions apply. Dimension A' applies immediately after slitting.

NOTE – The title of this standard was established by the application of a nomenclature system developed for all film dimension standards. Each title provides an indication of the film width, a code designation for the perforation shape (BH, KS, DH, or CS), or the number of rows of perforations (1R, 2R, etc.), depending upon which is the significant factor, or the perforation pitch without the decimal point.

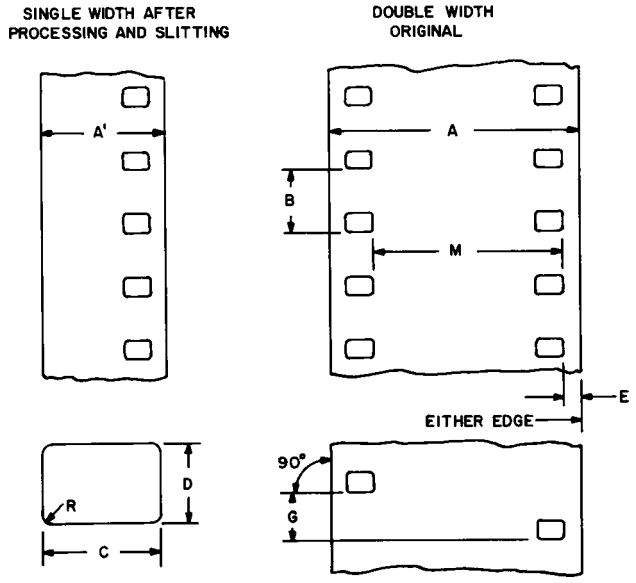

Figure 1 – Single- and double-width film

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Table 1 – Specifications

Dimensions		Inches	Millimeters
A	Film width	0.628 ± 0.001	15.95 ± 0.03
A'	Film width after slitting	0.314 ± 0.002	7.98 ± 0.05
B	Perforation pitch (long)	0.1500 ± 0.0005	3.810 ± 0.013
B'	Perforation pitch (short)	0.1497 ± 0.0005	3.802 ± 0.013
C	Perforation width	0.0720 ± 0.0004	1.829 ± 0.010
D	Perforation height	0.0500 ± 0.0004	1.270 ± 0.010
E	Edge to perforation	0.0355 ± 0.0020	0.902 ± 0.051
G	Perforation misalignment	0.001 max	0.03 max
L	100 consecutive perforation pitches	15.000 ± 0.015	381.00 ± 0.38
L'	100 consecutive perforation pitches	14.970 ± 0.015	380.24 ± 0.38
M	Lateral perforation displacement	0.485 ± 0.001	12.32 ± 0.03
R	Radius of perforation fillet	0.010 ± 0.001	0.25 ± 0.03

Annex A (informative)
Additional data

A.1 The user is reminded that, as a plastic, film can change dimensions temporarily due to moisture or temperature, or permanently due to solvent loss or strain effect.

A.2 The uniformity of pitch, hole size, and margin (dimensions B, C, D, and E) is an important variable affecting steadiness. Variations in these dimensions, from roll to roll, are of little significance compared to variations from one perforation to the next within any small group of consecutive perforations. As an example, the uniformity of the margin is uniquely critical for optical printing. During the printing process, the placement of the image on the film is usually with respect to successive lateral pairs of perforations at one-frame intervals. During subsequent projection, however, the portion of the image projected is usually located, not by these perforations, but by the edge of the film. The lateral steadiness of the projected image is, therefore, directly related to the frame-to-frame uniformity of the margin.

A.3 For historical background on the development of this standard, refer to Miller, A. J. and Robertson, A. C. Motion-picture film — Its size and dimensional characteristics. Journal of the SMPTE 74:3-11; January 1965.

Annex B (informative)
Bibliography

SMPTE 223M-2001, Motion-Picture Film — Safety Film