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SMPTE 151-2004
Revision of
ANSI/SMPTE 151-1998

SMPTE STANDARD

for Motion-Picture Film (8-mm Type S) — 16-mm Film Perforated 8-mm Type S, (1-3)

1 Scope

This standard specifies the cutting and perforating dimensions for 16-mm motion-picture film with 8-mm type S perforations in positions 1 and 3 and a perforation pitch of either 0.1664 in or 0.1667 in (4.227 mm or 4.234 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 dimensions A' and E', the dimensions apply at the time of cutting and perforating for film adjusted to a temperature of 23°C ± 1°C (nominally converted to 73°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. Dimensions A' and E' apply immediately after processing and slitting.

2.4 Notwithstanding accumulation of tolerances, dimensions A' and E' shall be as specified.

NOTES

1 The principal use of film stock perforated 0.1667 in is for the production of prints. The principal use of the stock perforated 0.1664 in is as an intermediate film in the production of prints.

2 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.

The numerals (1-3) have been added to the title of this standard to specify how the rows of perforations are placed on the film. This designation is necessary only when the film stock is wider than its end use and more than one combination of perforation rows is possible. The perforation rows shall be numbered starting at the reference edge. The reference edge is that edge of the strip nearest to the perforations which is retained on one of the slit prints that is not discarded in any subsequent slitting. The designation 1 through 4 of 16-mm films indicates that the perforations are in row

1 – adjacent to the reference edge
2 – on the reference side of center
3 – on the nonreference side of center
4 – adjacent to the nonreference edge

when the film end is observed from the base side with the wound roll above and away from the point of observation.

There can be two different windings for the same numbered rows of perforations. This applies, however, only when the film is perforated in the 1-3 position and the designation of the film would be 1-3, regardless of winding. Winding could be A or B, depending upon the location of the reference edge. (Refer to ANSI/SMPTE 75M).

Approved
November 8, 2004

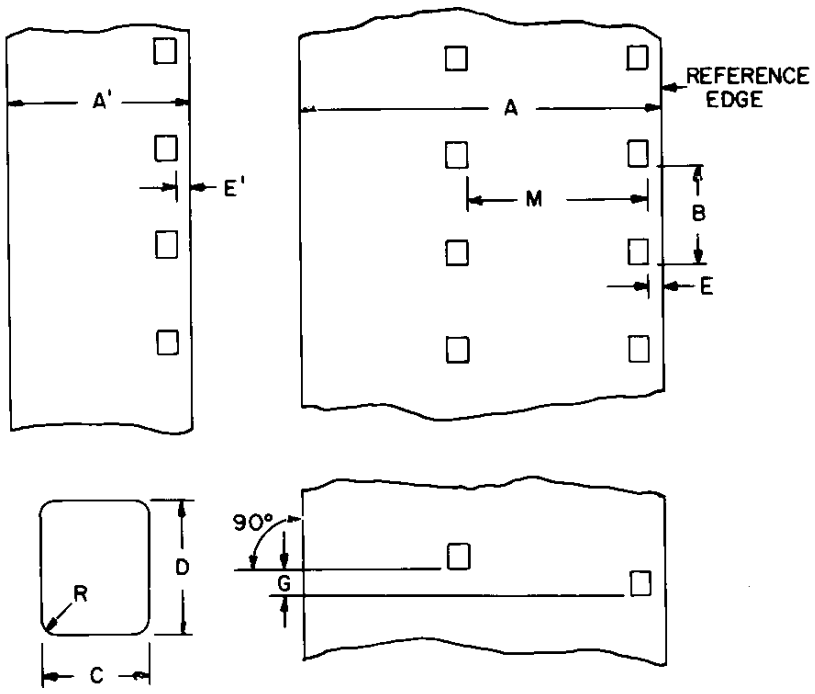

Figure 1 – Dimensions

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)	0.1667 ± 0.0004	4.234 ± 0.010
B'	Perforation pitch (short)	0.1664 ± 0.0004	4.227 ± 0.010
C	Perforation width	0.0360 ± 0.0004	0.914 ± 0.010
D	Perforation height	0.0450 ± 0.0004	1.143 ± 0.010
E	Edge to perforation	0.020 ± 0.002	0.51 ± 0.05
E'	Edge to perforation after slitting	0.020 ± 0.002	0.51 ± 0.05
G	Perforation misalignment	0.001 max	0.03 max
L	100 consecutive perforation pitches	16.670 ± 0.017	423.42 ± 0.43
L'	100 consecutive perforation pitches	16.640 ± 0.017	422.66 ± 0.43
M	Lateral perforation displacement	0.314 ± 0.001	7.98 ± 0.03
R	Radius of perforation fillet	0.005 ± 0.001	0.13 ± 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 Film for positive use has a longitudinal pitch 0.2% longer that its companion unprocessed negative. Shrinkage of the negative during aging and processing prior to printing will generally not exceed 0.2%. Thus, the processed negative stock is expected to be 0.3% ± 0.1% shorter than the unprocessed positive. This difference will minimize slippage between the two on the 12-in (305-mm) circumference sprocket of the printer, assuming a film thickness of 0.0055 in to 0.0065 in (0.140 mm to 0.165 mm).

A.3 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.4 For historical background on the development of this standard, refer to A. J. Miller and A. C. Robertson, "Motion-picture film — Its size and dimensional characteristics," Jour. SMPTE, 74: 3-11, Jan. 1965.

Annex B (informative)
Bibliography

ANSI/SMPTE 75M-1994 (R2003), Motion-Picture Film — Raw Stock — Designation of A and B Windings

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