

American National Standard for motion-picture film (16-mm)— perforated 1R

Approved February 19, 1986
Sponsor: Society of Motion Picture and Television Engineers

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1. Scope

This standard specifies the cutting and perforating dimensions for 16-mm motion-picture film with perforations along one edge and a perforation pitch of either 0.2994 or 0.3000 in (7.605 or 7.620 mm).

2. Referenced American National Standard

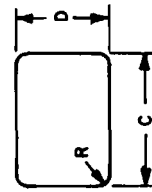
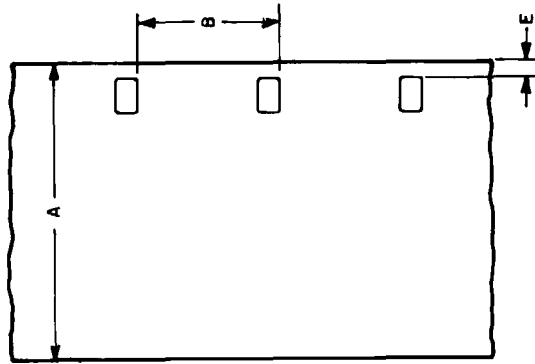
This standard is intended for use in conjunction with the following American National Standard: ANSI/SMPTE 223M-1985, Motion-Picture Film—Safety Film

3. Dimensions

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

3.2 The dimensions pertain to a safety film as defined in ANSI/SMPTE 223M-1985.

3.3 The dimensions apply at the time of cutting and perforating for film adjusted to a temperature of $23^{\circ}\text{C} \pm 1^{\circ}\text{C}$ (nominally converted to $73^{\circ}\text{F} \pm 2^{\circ}\text{F}$) and a relative humidity of 50 ± 2 percent. The manufacturer may indicate other nominal temperature and humidity conditions under which the dimensions apply.



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	Dimensions	Inches	Millimeters
A	Film width	0.628 ± 0.001	15.95 ± 0.03
B	Perforation pitch (long)	0.3000 ± 0.0004	7.620 ± 0.010
B'	Perforation pitch (short)	0.2994 ± 0.0004	7.605 ± 0.010
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
L	100 consecutive perforation pitches (long)	30.00 ± 0.03	762.0 ± 0.8
L'	100 consecutive perforation pitches (short)	29.94 ± 0.03	760.5 ± 0.8
R	Radius of perforation fillet	0.010 ± 0.001	0.25 ± 0.03

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.

Appendix

(This Appendix is not part of the American National Standard, but is included for information only.)

A1. 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.

A2. Film for positive use has a longitudinal pitch 0.2 percent longer than its companion negative. Shrinkage of the negative during aging and processing prior to printing will generally not exceed 0.2 percent. Thus, the negative stock is expected to be 0.3 ± 0.1 percent shorter than the 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 to 0.0065 in (0.140 to 0.165 mm).

A3. 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.

A4. 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.

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ANSI/SMPTE 109-1986

American National Standard for motion-picture film (16-mm)— perforated 2R

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Page 1 of 2 pages

1. Scope

This standard specifies the cutting and perforating dimensions for 16-mm motion-picture film with perforations along one edge and a perforation pitch of either 0.2994 or 0.3000 in (7.605 or 7.620 mm).

2. Referenced American National Standard

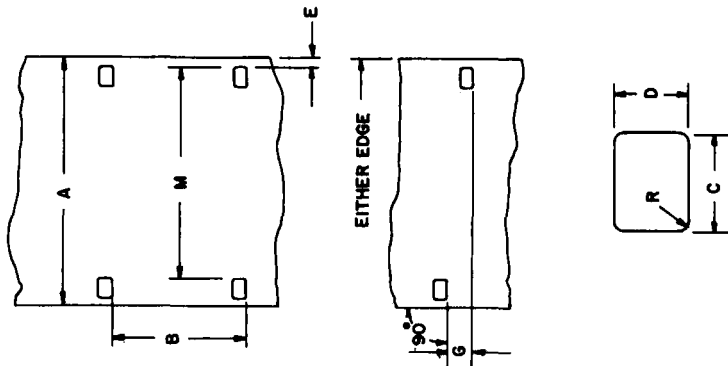
This standard is intended for use in conjunction with the following American National Standard:
ANSI/SMPTE 223M-1985, Motion-Picture Film—Safety Film

3. Dimensions

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

3.2 The dimensions pertain to a safety film as defined in ANSI/SMPTE 223M-1985.

3.3 The dimensions apply at the time of cutting and perforating for film adjusted to a temperature of $23^{\circ}\text{C} \pm 1^{\circ}\text{C}$ (nominally converted to $73^{\circ}\text{F} \pm 2^{\circ}\text{F}$) and a relative humidity of 50 ± 2 percent. The manufacturer may indicate other nominal temperature and humidity conditions under which the dimensions apply.



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	Dimensions	Inches	Millimeters
A	Film width	0.628 ± 0.001	15.95 ± 0.03
B	Perforation pitch (long)	0.3000 ± 0.0004	7.620 ± 0.010
B'	Perforation pitch (short)	0.2994 ± 0.0004	7.605 ± 0.010
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 (long)	30.00 ± 0.03	762.0 ± 0.8
L'	100 consecutive perforation pitches (short)	29.94 ± 0.03	760.5 ± 0.8
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

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.

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