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>
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SMPTE STANDARD

SMPTE 145-2004
Revision of
SMPTE 145-1999

for Motion-Picture Film (65-mm) — Perforated KS

1 Scope

This standard specifies the cutting and perforating dimensions for 65-mm motion-picture film with a KS-type perforation and a perforation pitch of either 0.1866 in or 0.1870 in (4.740 mm or 4.750 mm).

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 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.

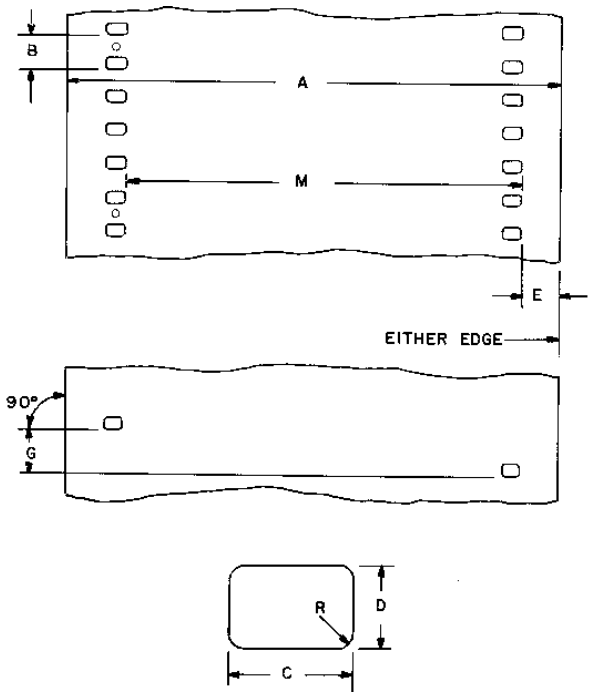

Figure 1 – 65-mm film

Approved
November 8, 2004

Table 1 – Specifications

Dimensions		Inches	Millimeters
A	Film width	2.558 ± 0.002	64.97 ± 0.05
B	Perforation pitch (long)	0.1870 ± 0.0004	4.750 ± 0.010
B´	Perforation pitch (short)	0.1866 ± 0.0004	4.740 ± 0.010
C	Perforation width	0.1100 ± 0.0004	2.794 ± 0.010
D	Perforation height	0.0780 ± 0.0004	1.981 ± 0.010
E	Edge to perforation	0.117 ± 0.002	2.97 ± 0.05
G	Perforation misalignment	0.001 max	0.03 max
L	100 consecutive perforation pitches	18.700 ± 0.015	474.98 ± 0.38
L´	100 consecutive perforation pitches	18.660 ± 0.015	473.96 ± 0.38
M	Lateral perforation displacement	2.214 ± 0.003	56.24 ± 0.08
R	Radius of perforation fillet	0.020 ± 0.001	0.51 ± 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.

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 strain effect or, in some film base materials, due to solvent or plasticizer loss.

A.2 Film for positive use has a longitudinal pitch 0.2% longer than 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 Film this size is generally used as a camera negative. There are two advantages in using this larger size. One is the possibility of producing large prints by contact printing for exhibition in special theaters designed to provide the audience with a large viewing angle. The other purpose is to serve as an original from which 35-mm prints can be produced by reduction with less grain and better definition than can be obtained by making contact prints from 35-mm negatives.

Prints may be made on 70-mm film. The appropriate film is described in SMPTE 119.

Note that the 70-mm film used with 65-mm negative differs in its dimensions from the two films described by ANSI/NAPM 1.10. The perforations have the same size and pitch as those described by ANSI/NAPM 1.10, type II, but the margin and distance between perforations are different. Consequently, dimension M is the same in both 65-mm KS-1870 and KS-1866 films and also for 70-mm perforated 65-mm, KS-1870. The increased space provided by a larger margin E is used to make room for magnetic audio records.

Note that the image usually placed on this film is five pitches high. The manufacture of the film is based on this idea and best results accrue from using this format.

A.5 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

ANSI/NAPM 1.10-1995, Photography (Films) — Aerial Films/Spools/Containers — Dimensions

SMPTE 119-2004, Motion-Picture Film (70-mm) — Perforated 65-mm, KS-1870

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