

SMPTE STANDARD**ANSI/SMPTE 234-1998**Revision of
ANSI/SMPTE 234-1993

for Motion-Picture Film (8-mm Type R)— Projectable Image Area and Projector Usage



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1 Scope

1.1 This standard specifies the maximum dimensions of the film image area intended for projection from an 8-mm type R motion-picture film, and the placement of this area relative to the perforations and the reference edge of the film.

1.2 This standard also specifies the position of the emulsion, the rate of projection, and the orientation of the image area for 8-mm type R motion-picture film as used in a motion-picture projector.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below.

ANSI/SMPTE 239-1995, Motion-Picture Film (16-mm)—Perforated 8-mm Type R, 2R

3 Dimensions

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

3.2 The angle between the horizontal edges of the image area and the reference edge of the film shall be $90^\circ \pm 1/2^\circ$.

4 Relationship to other standards

4.1 This standard may be used as the basis for establishing picture areas from original

photography for final viewing because it presents a description of the picture area on the projection print that is usable for the indicated purposes of the print which is of primary importance because the projection print is the most commonly interchanged item.

4.2 ANSI/SMPTE 231 defines the image area for other important phases of motion-picture operations, and it is consistent with this standard under currently acceptable commercial practice.

5 Emulsion position

Most 8-mm films are projected with the emulsion toward the screen. There are, however, some systems which produce prints that are projected with the base toward the screen.

6 Rate of projection

The normal rate of projection shall be 18 frames per second for silent film and 24 frames per second for sound film.

NOTES

1 Camera and printer apertures. The actual image on the film is significantly larger than the maximum area intended for projection, so that in placement of the images throughout the sequence of the films the tolerance is not restrictive of commercial practice. Upper limits have been established through consideration of good practice in avoiding frame overlap, encroachment upon areas reserved for audio records, flare from perforation edges, etc. Lower limits are similarly related to the avoidance of image effects at a defined edge, tolerances in film position, etc.

2 Projector aperture. Dimensions B, D, and E define the maximum image area on the film that is available for projection. They do not define the opening in the aperture plate of

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a projector. The size of this opening may differ from dimensions A and B, for example, because of the physical separation necessary between the aperture plate and the film to avoid scratching the film, the slant of the marginal rays accepted by the projection lens, etc.

3 Actual projected area. It is recognized that, in many cases, the actual film image area that is projected may be smaller than the projectable maximum and, in some cases, may be nonrectangular (for example, an irregular four-sided figure bound by either straight or curved lines). Such departures may result from equipment considerations such as slight inconsistencies among lenses, screen sizes, etc.; from geometric limitations such as the screen surface being at an angle other than 90° from the projection axis, or being

nonplanar, or both; and from aesthetic considerations such as pictorial composition within more restrictive image limits. In the absence of specific instructions to the contrary, it is intended that the actual projected film image area be the largest appropriately-shaped figure that can be inscribed within the specified dimensions.

When the picture outline on the screen is defined by the projector aperture, it is customary to round the corners of the projected film area. A maximum corner radius of 0.010 in (0.25 mm) at the film plane is recommended.

4 Film perforations. Film intended for projection with this image area is normally perforated as specified in ANSI/SMPTE 231.

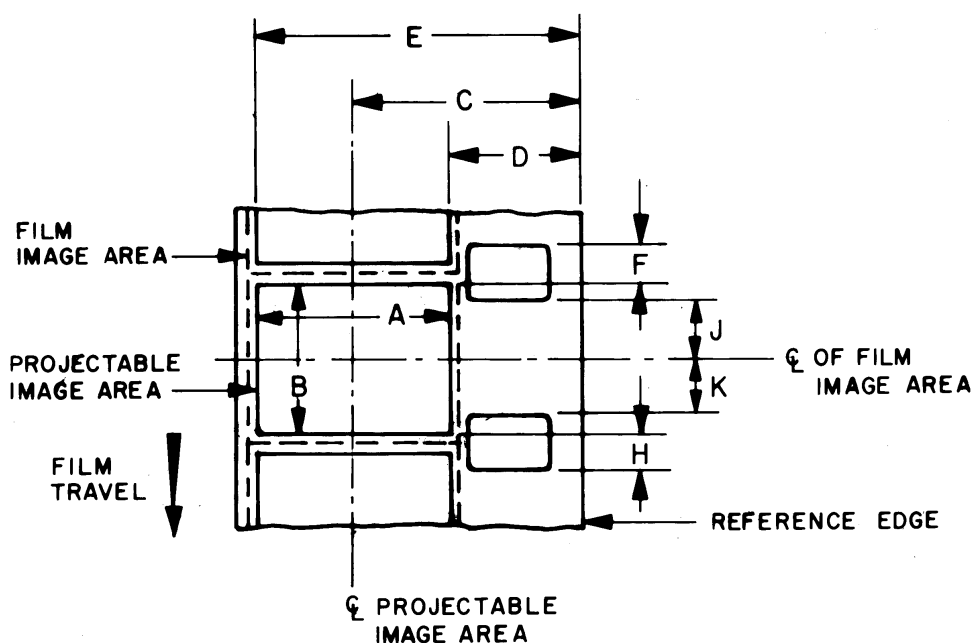


Figure 1 – Projectable image area on film as seen looking through the film toward the lens

Table 1 – Dimensions

Dimensions	Inches	Millimeters
A	0.172 non	4.37 nom
B	0.130 max	3.30 max
C*	0.205 ref	5.21 ref
D	0.117 min	2.97 min
E	0.293 max	7.44 max
F = H	within 0.014	within 0.36
J = K	nominally equal	nominally equal
* See A.1		

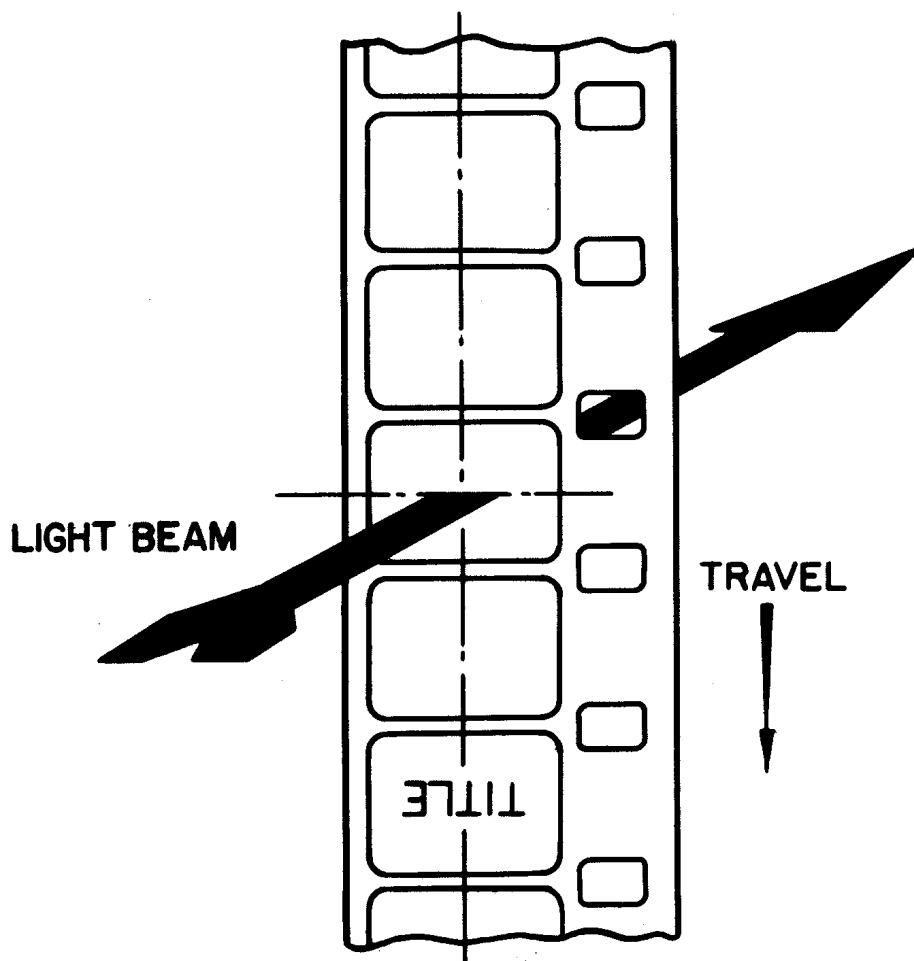


Figure 2 – Film as seen from projector light source looking toward lens

Annex A (informative) General information

A.1 The centerlines of the image area are given for convenience in interpreting the standard, facilitating such applications as the optical design of equipment, and assisting in the understanding of suitable mechanical embodiments related to the projectable image areas. Note that the centerline of the projectable image area is displaced from the centerline of the film by 0.048 in (1.22 mm) nominal.

A.2 Because of the increased intensity of illumination available in modern 8-mm projection systems, the industry has found it desirable to extend the flicker threshold by choosing as high a projection rate (and, therefore, as high a flicker frequency) as practicable. A projection rate of 18 frames per second and a corresponding flicker frequency of 54 cycles per second (obtained with a three-blade shutter) have been found by experience to be an acceptable compromise.

Annex B (informative) Bibliography

ANSI/SMPTE 231-1995, Motion-Picture Film (8-mm Type R)
— Camera Aperture Image and Usage