

# Cinematography — Image area produced by 8 mm Type S motion-picture camera aperture and maximum projectable image area — Positions and dimensions

## 1 Scope and field of application

This International Standard specifies, for 8 mm Type S cameras and projectors, the dimensions of the image area produced by the camera on the film and the maximum projectable image area as well as the image positions relative to the reference edge of the film, and the perforators used to position the images.

## 2 Dimensions and characteristics

2.1 The dimensions shall be as shown in the figures and given in the tables and apply to measurements of the image as formed on, or projected from, a recently exposed and processed film (see the annex clauses A.4 and A.5).

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

2.3 The angle of the vertical edges of the camera aperture image shall be  $0^\circ \pm 1/2^\circ$  to the reference edge of the film.

2.4 Dimension  $K$  is the distance from the bottom edge of the camera aperture image to the bottom of the frame positioning

perforation, two pitches above the perforation adjacent to that image (see the annex clause A.1).

2.5 Dimension  $K_1$  is the distance lengthwise along the path of the film from the bottom of the maximum image area available for projection to the bottom of the frame-positioning perforation, two perforations above the perforation adjacent to the projected image (see the annex clause A.1).

### NOTES

1 The value of dimension  $M_1$  has been chosen so that film having a slight shrinkage when it is projected will be properly centred.

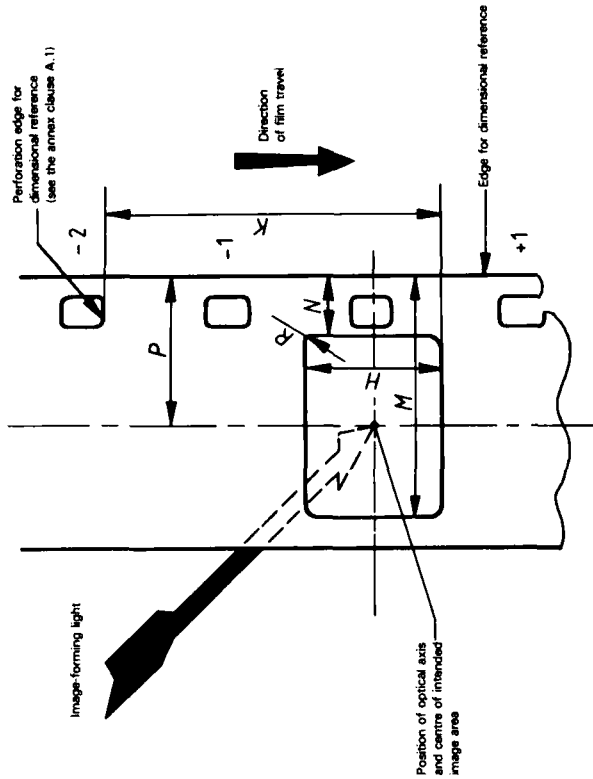
2 If the projector has a fixed edge guide, it should make contact with the edge of the film adjacent to the perforations.

## 3 Bibliography

ISO 1700, *Cinematography — 8 mm Type S motion-picture raw stock film — Cutting and perforating dimensions*.

ISO 1761, *Cinematography — Projector usage of 8 mm Type S motion-picture film for direct front projection*.

ISO 1767, *Cinematography — Camera usage of 8 mm motion-picture film perforated Type S*.



The film is shown as seen from inside the camera looking toward the lens.

Figure 1 — Camera aperture image

Table 1 — Dimensions relating to camera aperture image

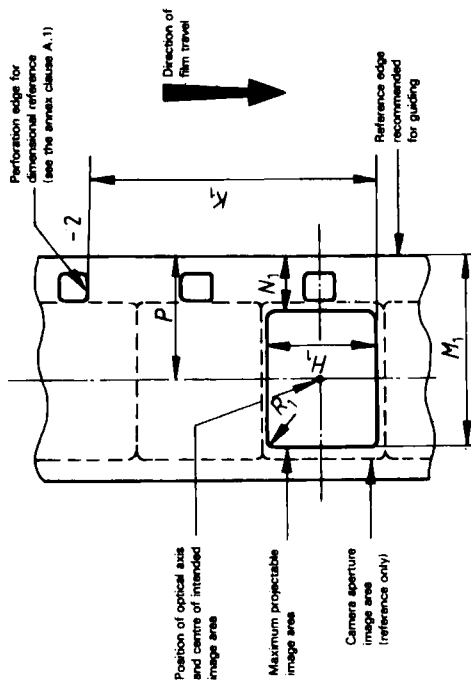
Dimension	mm	in
H	4.22	0
$K^*$	$9.86 \pm 0.05$	$0.383 \pm 0.002$
N	1.47 max.	0.058 max.
P	4.32 nom.	0.170 nom.
R	0.13 max.	0.005 max.
M	7.16 min.	0.282 min.

\* A tolerance of  $\pm 0.13$  mm (0.005 in) is acceptable only for personal-use cameras where intercutting with other camera films is not anticipated.

Annex

Additional data

(This annex does not form part of the standard.)



The film is shown as seen from inside the projector looking toward the lens.

Figure 2 — Maximum projectable image area

Table 2 — Dimensions relating to maximum projectable image area

Dimension	mm	in
$H_1$	4.01 max.	0.158 max.
$K_1^*$	9.88 ref.	0.389 ref.
$M_1$	7.05 max.	0.278 max.
$H_1$	1.60 min.	0.063 min.
$P$	0.25 max.	0.010 max.
$P$	4.32 nom.	0.170 nom.

\* For guidance and information only for projectors without framing devices.

**A.1** The pull-down claw is located at the minus two (-2) perforation with respect to the projector or camera aperture. The reason for selecting the minus two (-2) perforation for positioning is to obtain the positioning perforation as close as possible to the image being projected, yet not so close as to interfere with the optical system and gate structure. Placement of the positioning perforation above the aperture may facilitate the design of self-threading projectors. The claw location above the aperture will also make it easier to maintain the suggested, relatively close sound separation of plus 18 frames for magnetic sound and plus 22 frames for photographic sound. It is recognized that some camera designs depart from the use of the minus two (-2) locating perforation.

**A.2** If the aperture plate is not in the plane of emulsion, the physical dimensions of the aperture in the camera will be slightly different from the dimensions given in the figures. The exact amount of this difference will depend upon the  $F$ -value and focal length of the camera lenses used and upon the distance between the emulsion and the physical aperture. This separation should be no greater than is necessary to prevent scratching of the film.

**A.3** It is the intent of this International Standard to provide a camera image such that the exposed area will always be larger than the maximum projectable image area. Observance of the dimensions given meets this objective without causing double exposure of the area between the frames.

**A.4** The penumbra and flare soften the edge of an image formed by a camera aperture. This creates a problem in knowing how to measure the image; in this situation, it has been decided to recommend that the image position be defined at a point where the density in the penumbra is midway (halfway) between the background surrounding density of the film material and the density of a contrasting image area (for example, an exposure to a white card).

**A.5** It is recognized that, in many cases, the actual film area that is projected may be smaller than the projectable maximum. It is intended that the actual projected image area be the largest appropriately shaped figure that can be inscribed within the specified dimensions.