International Standard 3645

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

Cinématographie — Champ d'image enregistré par la caméra et champ maximal d'image projetable pour film 8 mm *type S — Positions et dimensions*

Second edition — 1984-08-15

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Descriptors : cinematography, motion-picture cameras, motion-picture film, motion-picture film 8 mm, photographic images, position (location), dimensions.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3645 was developed by Technical Committee ISO/TC 36, *Cinematography*.

This second edition was submitted directly to the ISO Council, in accordance with clause 6.11.2 of part 1 of the Directives for the technical work of ISO. It cancels and replaces the first edition (i.e. ISO 3645-1976), which had been approved by the member bodies of the following countries:

Australia	Italy	Switzerland
Belgium	Netherlands	Turkey
Canada	Romania	United Kingdom
Czechoslovakia	South Africa, Rep. of	USA
Denmark	Spain	USSR
France	Sweden	Yugoslavia

No member body expressed disapproval of the document.

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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 perforations 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° ± 1/2°.

2.3 The angle of the vertical edges of the camera aperture image shall be 0° ± 1/2° 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 N_1 has been chosen so that film having a slight shrinkage when it is projected will be properly centred.

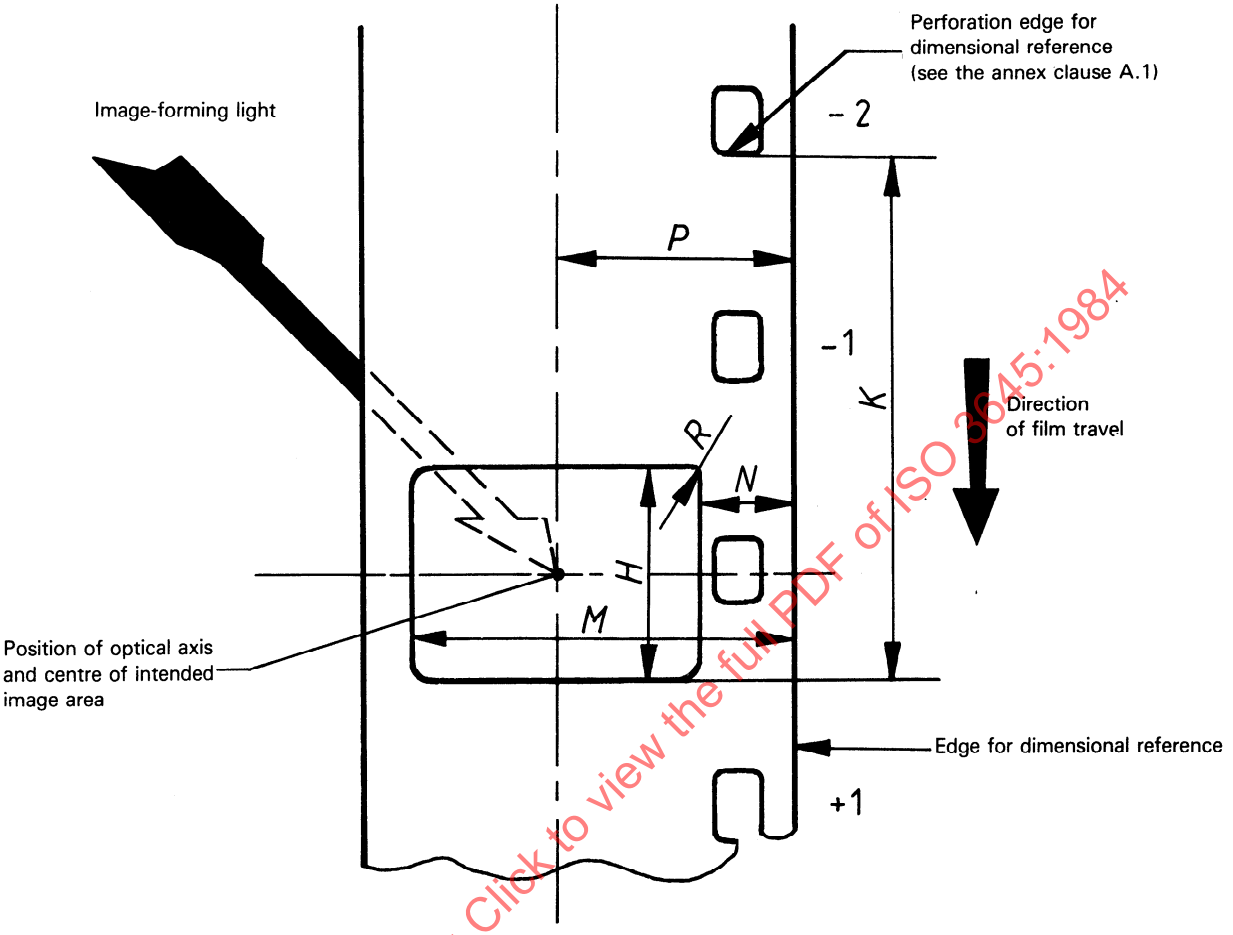
2 If the projector has a fixed edge guide, it should make contact with the edge of the film adjacent to the perforations.

3 Bibliography

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

ISO 1781, *Cinematography — Projector usage of* 8 mm *Type S motion-picture film for direct front projection.*

ISO 1787, *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	$4{,}22\ ^{0}_{-0{,}08}$	$0.166\ ^{0}_{-0.003}$
*K**	9,98 ± 0,05	0.393 ± 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 ± 0,13 mm (0.005 in) is acceptable only for personal-use cameras where intercutting with other camera films is not anticipated.

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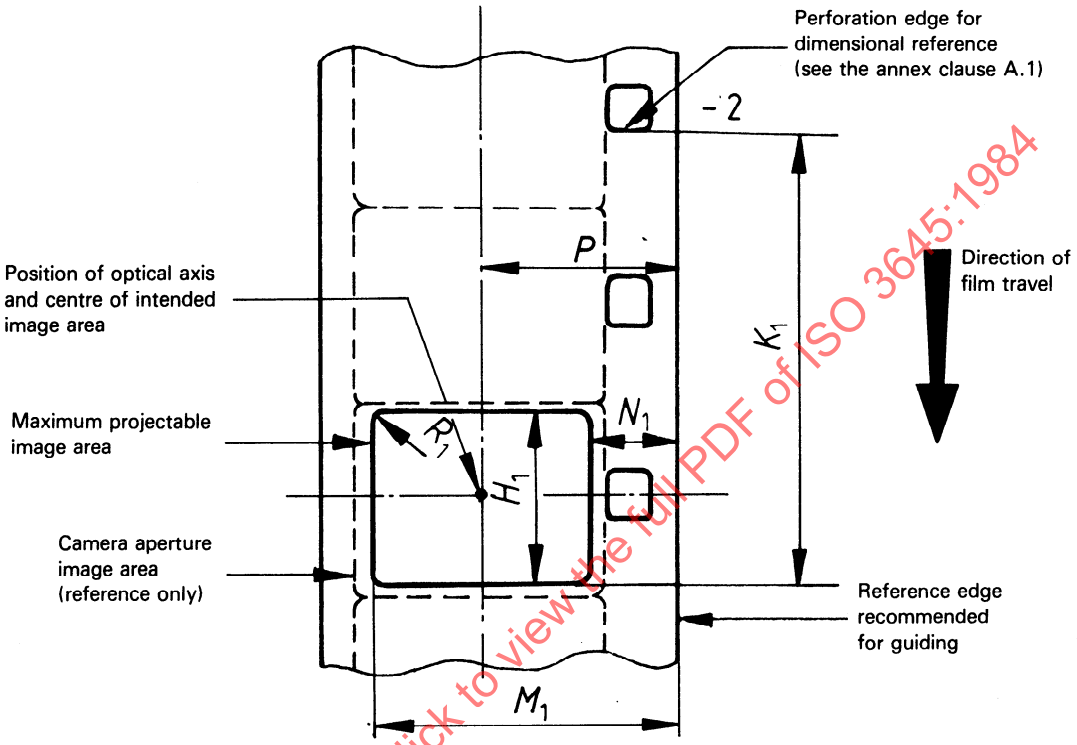

The film is shown as seen from inside the projector looking toward the lens.

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	7,06 max.	0.278 max.
N_1	1,60 min.	0.063 min.
R_1	0,25 max.	0.010 max.
P	4,32 nom.	0.170 nom.

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

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Annex

Additional data

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

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.

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