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Cinematography — Picture image area on 35 mm motion-picture release prints — Position and dimensions and analogue and digital photographic sound to picture record displacement

Cinématographie — Champ d'image sur les copies d'exploitation de 35 mm — Position et dimensions

Reference number
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Contents

Page

Foreword ..... **iv**
1 Scope **1**
2 Normative references **1**
3 Position and dimensions **1**
4 Picture sound displacement **1**
5 Technical characteristics **2**
Annex A (informative) **Compensation for slow speed of sound in air** **4**
Bibliography **5**

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 36, *Cinematography*.

This fourth edition cancels and replaces the third edition (ISO 2939:2002), which has been technically revised. The references to the position and locations of photographic sound records shown in the second edition, and removed in the third edition, have been amended and replaced in this fourth edition together with an informative annex providing information regarding the amendment.

Cinematography — Picture image area on 35 mm motion-picture release prints — Position and dimensions and analogue and digital photographic sound to picture record displacement

1 Scope

This International Standard specifies the positions, dimensions, and location of image and photographic sound records on 35 mm motion-picture release prints, which have been assigned for optical projection based on ISO 2907 or transmitted by television based on ISO 1223.

It also specifies the relative displacement of sound with respect to the corresponding picture image frame and, through normative reference to ISO 17266, the placements of the multichannel analogue and digital photographic sound and control records.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1223, *Cinematography — Picture areas for motion-picture films for television — Position and dimensions*

ISO 2907, *Cinematography — Maximum projectable image area on 35 mm motion-picture film — Position and dimensions*

ISO 17266, *Cinematography — Multichannel analogue and digital photographic sound and control records on 35 mm motion-picture prints and negatives, and digital sound-control records on 70 mm motion-picture prints and negatives — Position and width dimensions*

3 Position and dimensions

3.1 The dimensions of the picture image area shall be as shown in the figure and as specified in Table 1.

3.2 The position and width dimensions of the multichannel analogue and digital photographic sound and control records shall be in accordance with ISO 17266.

3.3 The dimensions given in this International Standard are relative to un-shrunk film.

4 Picture sound displacement

The recording of sound on film shall precede the corresponding picture frame in the direction of film travel in normal projection. The distance between the horizontal centre-line of the picture frame and the horizontal centre-line of its corresponding analogue sound record frame shall be 20 frames ± 0,5 frame (80 perforations ± 2 perforations).

NOTE The record location and reproduction compensation characteristics of each digital photographic sound and control record are intrinsically set such that all digital sound records are reproduced in synchronisation with the reproduction of the analogue sound record. The analogue sound record is the reference sound record for establishing correct picture-sound displacement as its modulation is visible to the eye.

5 Technical characteristics

Spaces between image frames, the image and the sound record and perforations should be substantially opaque.

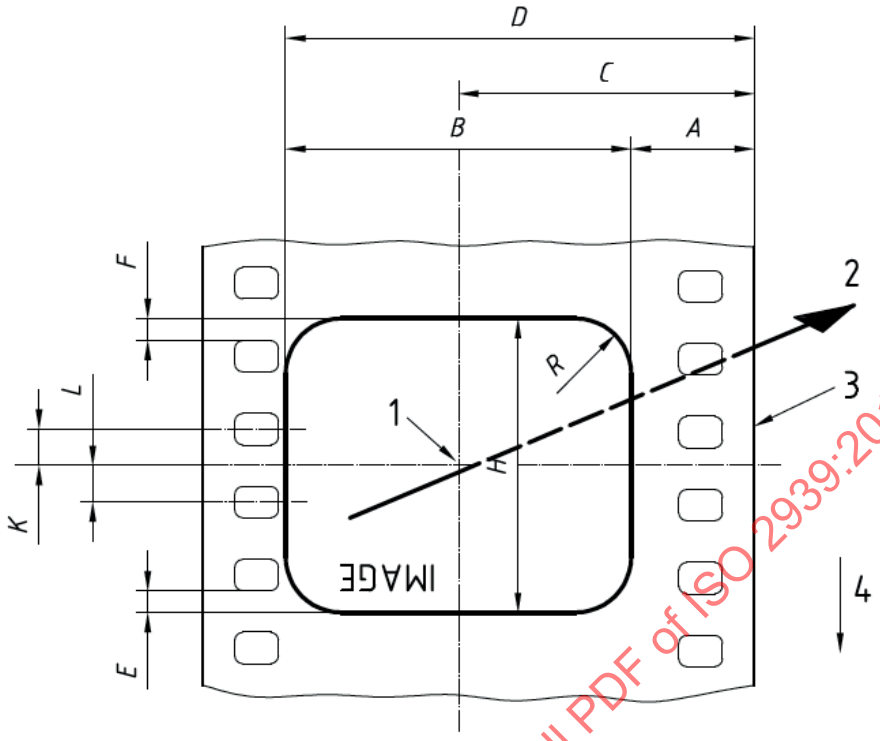
Table 1 — Dimensions of picture image area

Dimensions	mm	in
A	$7{,}87^{+0{,}08}_{-0{,}15}$	$0{,}310^{+0{,}003}_{-0{,}006}$
B_{ref}	21,77	0,857
C_{nom}	18,75	0,738
D_{min}	29,64	1,167
H_1[a]	18,60 min.	0,732 min.
H_2[b]	16,00 min.	0,630 min.
H_3[c]	12,80 min.	0,504 min.
R_{max}	0,8	0,03
$E = F$	±0,25	±0,010
$K = L$	approximately equal	approximately equal

[a] For wide-screen films with anamorphic pictures and aspect-ratios from 2,35:1 to 2,39:1.

[b] For films with non-anamorphic pictures and an aspect-ratio of 1,37:1.

[c] For film with a non-anamorphic picture intended for projection with the picture masking and aspect ratio up to 1,85:1.



Key

1	location of axis of intended image	3	reference edge
2	direction of light beam	4	direction of film travel

NOTE The film is shown as it would be seen from the projector light source looking towards the lens with the photographic layer towards the observer.

Figure 1 — Position and dimensions of picture image area

Annex A
(informative)

Compensation for slow speed of sound in air

ISO 2939:1986, which is the second edition, specified a sound-to-picture displacement of 21 frames ± 0,5 frames. It had a note in 2.3 that suggested an average seat location of 15 m from the screen requires a 1-frame advancement of sound relative to picture to compensate for the relatively slow speed of sound in air, and that this advancement is achieved when a leader film, made in accordance with ISO 4241, is used to assist in the threading of film so that the analogue sound pickup is 20 frames in advance of the picture gate, i.e. 21 frames minus 1 frame.

It has been found that such compensation has not been adopted in the field and that typical international laboratory practice has been to implement a 20-frame displacement in spite of the provisions of previous editions of this International Standard. It has also been found that advancement of sound causes early sound relative to image when viewing distances are relatively close and that, because early sound is not a naturally-occurring phenomenon, this is found objectionable by many cinema-goers. It is a natural phenomenon to experience, and thus tolerate, late sound relative to image when viewing distances are greater. The need for compensation is, therefore, largely unnecessary and unwelcome.