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**Cinematography — Projection leader
(time-based), trailer and cue marks —
Specifications**

*Cinématographie — Amorces, <<trailer>> et <<cue marks>> pour
projection (dans le temps) — Spécifications*

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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. www.iso.org/directives.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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

This fourth edition cancels and replaces the third edition (ISO 4241:2001), of which it constitutes a minor revision.

[Annex A](#) of this International Standard is for information only.

This corrected version of ISO 4241:2013 incorporates a change of the title.

Cinematography — Projection leader (time-based), trailer and cue marks — Specifications

1 Scope

This International Standard specifies the makeup or assembly of time-based leaders and cue marks for 70 mm, 35 mm, and 16 mm motion-picture release prints.

NOTE Extraneous materials are dealt with in [Annex A](#).

2 Normative reference

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 4238:1976, *Cinematography — Optical printing ratios for enlargement and reduction of motion-picture film images — Specifications*

3 Reduction ratio

The reduction ratio in the production of the head and foot leaders from 35 mm motion-picture film to 16 mm motion-picture film shall be in accordance with ISO 4238.

4 General specifications

4.1 Orientation and dimensions of letters and numerals in this International Standard are with respect to 35 mm motion-picture films and are modified proportionally in accordance with ISO 4238 for 70 mm and 16 mm prints.

4.2 Information appearing in the leader which is printed lengthwise (in the direction of film travel) shall read from left to right when viewed from the projection lens towards the projector light source with the head end of the film at the right. Information appearing in the leader which is printed upright shall read normally when the reel is uppermost and the head of the film hangs down ready for threading (see [Figures 1](#) and [5](#) for orientation of information).

4.3 All frames in the head-leader and trailer-leader identification sections (see [5.3](#) and [7.3](#)) and in frames 1 through 171 of the head-leader synchronizing section (see [5.4](#)) shall be masked to the nominal anamorphic projection aperture [20,95 mm (0,825 in) × 17,53 mm (0,690 in)] with clear framelines nominally the height of anamorphic projection aperture framelines [1,55 mm (0,061 in)]. Frames 172 through 218 of the head-leader synchronizing section and frames 1 through 87 of the trailer-leader runout section shall be masked to the nominal anamorphic camera aperture [21,95 mm (0,864 in) × 18,59 mm (0,732 in)] with clear framelines nominally the height of anamorphic camera-aperture framelines [0,41 mm (0,016 in)].

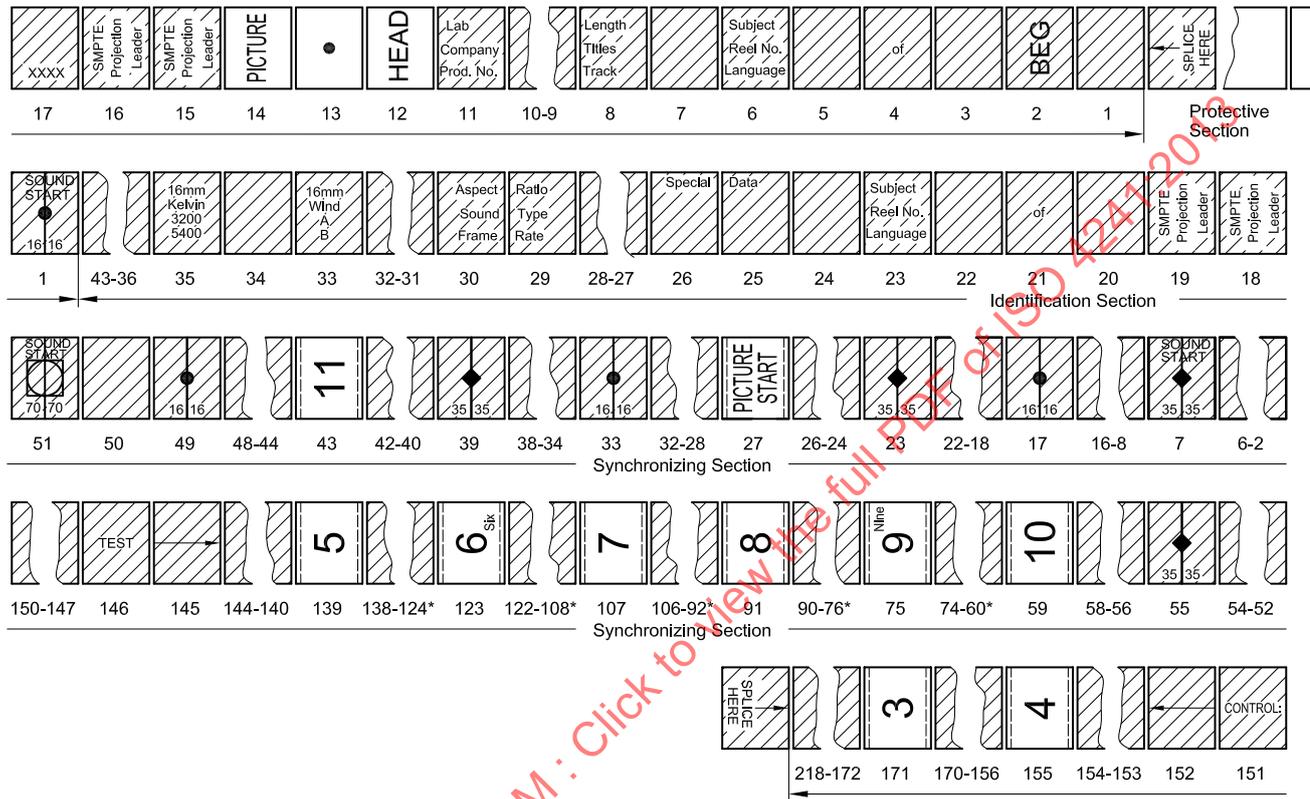
4.4 Because many types of film may be used for leaders, exact neutral densities have not been specified. For the purpose of this International Standard, the following approximate neutral densities are referred to:

- clear (neutral density less than 0,35);
- black (neutral density greater than 1,95).

5 Head leader (see Figure 1)

5.1 Protective section

The protective section of the leader shall consist of a minimum of 2,44 m (8 linear feet) of transparent or raw stock. When the protective leader has been reduced to a length of 1,83 m (6 linear feet), it shall be restored to its original length. Logos, trademarks, part titles, or other extraneous materials, if absolutely necessary, should be placed in this section.



NOTE 1 Repeats frames 44 through 58 of Synchronizing Section.

NOTE 2 Film shown as viewed from projection lens towards projector light source.

NOTE 3 Cross-hatched frames represent a black background with clear images; non-cross-hatched frames represent a clear background with black images.

Figure 1 — Head leader

5.2 Splicing frame

A single frame with the upright words “SPLICE HERE” and an arrow pointing to the frameline between this frame and frame 1 of the identification section to indicate where the protective section joins the identification section. The clear letters should be at least 3,2 mm (1/8 in) high on a black background.

5.3 Identification section

The identification section of the leader shall be 43 frames in length. The identification section of the head leader, when viewed as specified in 4.2, shall be made up as follows:

Frame 1 — Black.

Frame 2 — The word “BEG” in clear letters 11,1 mm (7/16 in) high printed upright in the centre of the frame, on a black background.

Frame 3 — Black.

Frame 4 — The word “of” in clear letters 2,4 mm (3/32 in) high printed lengthwise in the centre of the frame, on a black background.

Frame 5 — Black.

Frame 6 — The words “Subject”, “Reel No.”, and “Language” in clear letters 2,4 mm (3/32 in) high printed lengthwise, on a black background.

Frame 7 — Black.

Frame 8 — The words “Length”, “Titles”, and “Track” with clear letters 2,4 mm (3/32 in) high printed lengthwise, on a black background.

Frames 9-10 — Black.

Frame 11 — The words “Lab”, “Company”, and “Prod No.” with clear letters 2,4 mm (3/32 in) high printed lengthwise, on a black background.

Frame 12 — The word “HEAD” in black letters nominally 9,5 mm (3/8 in) high printed upright in the centre of the frame, on clear background.

Frame 13 — A 1/8 in (3,2 mm) diameter black dot in the centre of the frame on a clear background.

Frame 14 — The word “PICTURE” in black letters nominally 9,5 mm (3/8 in) high printed upright in the centre of the frame, on a clear background.

Frames 15-16 — Two frames in which the words “SMPTE Projection Leader” in clear letters are printed upright on a black background. The letters shall not be less than 3,2 mm (1/8 in) high.

Frame 17 — Four letter “X”s, printed in a lengthwise line adjacent to the 35 mm analog photographic audio record, approximately 7,9 mm (5/16 in) from the 35 mm camera aperture centreline towards the 35 mm analog photographic audio record. Letters shall be clear, 3,2 mm (1/8 in) high and 3,2 mm (1/8 in) wide, on a black background.

Frames 18-19 — Same as frames 15-16.

Frames 20-23 — Same as frames 3-6.

Frame 24 — Black.

Frames 25-26 — The words “Special Data” with clear letters 2,4 mm (3/32 in) high printed lengthwise along the edge of the frame opposite the sound track area, on a black background, starting in the 26th frame.

Frames 27-28 — Black.

Frames 29-30 — The words “Aspect Ratio”, “Sound Type”, and “Frame Rate” with clear letters 2,4 mm (3/32 in) high printed lengthwise, on a black background, starting in the 30th frame and in three separate lengthwise lines.

Frames 31-32 — Black.

Frame 33 — The words “16 mm”, “Wind”, “A”, and “B” with clear letters 2,4 mm (3/32 in) high printed lengthwise, on a black background.

Frame 34 — Black.

Frame 35 — The words “16 mm”, “Kelvin”, “3200”, and “5400” with clear letters 2,4 mm (3/32 in) high printed lengthwise, on a black background.

Frames 36-43 — Black.

5.4 Synchronizing section

5.4.1 The synchronizing section of the leader shall be 218 frames in length.

5.4.2 The words and numerals indicating 16-frame units in the synchronizing section shall have the vertical dimension of the 1,85:1 projection aperture [11,3 mm (0,446 in)]. The orientation of the words and numerals shall be upright. These frames (27, 43, 59, 75, 91, 107, 123, 139, 155, and 171) shall have dashed lines to indicate the 1,37:1 projection aperture height [15,29 mm (0,602 in)].

5.4.3 The synchronizing section, when viewed as specified in 4.2, shall be made up as follows:

Frame 1 — The 16 mm sound indication; the numeral “16” printed lengthwise in clear letters on a black background on both sides of a clear horizontal line with a clear dot of 3,2 mm (1/8 in) diameter in the centre of the frame (as shown in Figure 2). The line shall extend to the edges of the frame. This frame is repeated every 16 frames to frame 129. Frame 1 shall also contain the words “SOUND START” printed lengthwise in clear letters 3,2 mm (1/8 in) high on a black background (see Figure 2).

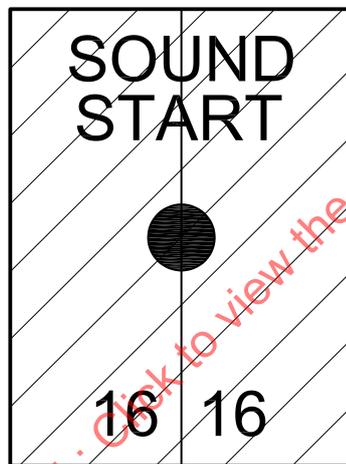


Figure 2 — 16 mm sound-start identification frame

Frames 2-6 — Black.

Frame 7 — The 35 mm sound indication; the numeral “35” printed lengthwise in clear letters on a black background on both sides of a clear horizontal line with a clear diamond at least 4,76 mm × 4,76 mm (3/16 in) in the centre of the frame (as shown in Figure 3). The line shall extend to the edges of the frame. This frame is repeated every 16 frames to frame 135. Frame 7 shall also contain the words “SOUND START” printed lengthwise in clear letters 3,2 mm (1/8 in) high on a black background (see Figure 3).

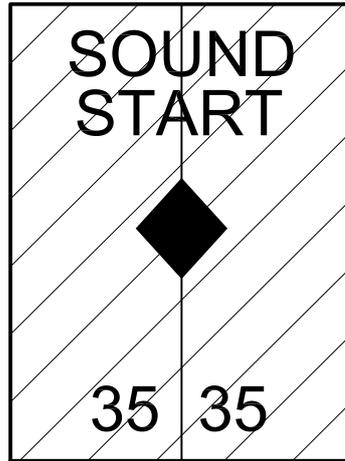


Figure 3 — 35 mm sound-start identification frame

Frames 8-16 — Black.

Frame 17 — Same as frame 1.

Frames 18-22 — Black.

Frame 23 — Same as frame 7.

Frames 24-26 — Black.

Frame 27 — The words “PICTURE START” printed upright in black on a clear background. The letters shall be 4,8 mm (3/16 in) high. The total vertical dimensions of the words shall be as described in [5.4.2](#). Visual countdown begins with this frame.

Frames 28-32 — Black.

Frame 33 — Same as frame 1.

Frames 34-38 — Black.

Frame 39 — Same as frame 7.

Frames 40-42 — Black.

Frame 43 — The numeral “11” printed upright in black on a clear background, with dimensions as described in [5.4.2](#).

Frames 44-48 — Black.

Frame 49 — Same as frame 1.

Frame 50 — Black.

Frame 51 — The 70 mm sound indication; the numeral “70” printed lengthwise in clear letters on a black background on both sides of a clear horizontal line with a clear circle of 9,5 mm (3/8 in) diameter within a clear square 9,5 mm × 9,5 mm (3/8 in) in the centre of the frame (as shown in [Figure 4](#)). This frame is repeated every 16 frames to frame 131. Frame 51 shall also contain the words “SOUND START” printed lengthwise in clear letters 3,2 mm (1/8 in) high on a black background (see [Figure 4](#)).

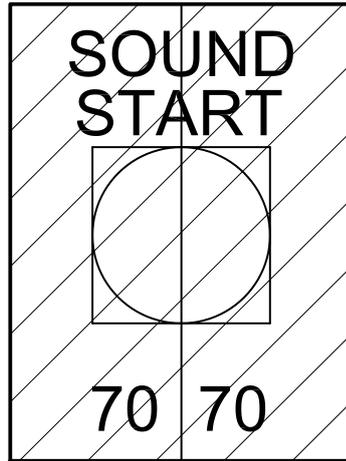


Figure 4 — 70 mm sound-start identification frame

Frames 52-54 — Black.

Frame 55 — Same as frame 7.

Frames 56-58 — Black.

Frame 59 — The numeral “10” printed upright in black on a clear background, with dimensions as described in [5.4.2](#).

Frames 60-139 — Continuation of the sequence described from frame 44 to frame 59, inclusive, with the 16-frame units counting down. The numeral “9” shall be superscripted with the word “Nine”. The numeral “6” shall be subscripted with the word “Six”.

Frames 140-144 — Black.

Frames 145-152 — Eight frames labelled with clear arrows in frames 145 and 152 and the words “Control Test” printed lengthwise in clear letters on a black background to indicate the position in the leader where one to eight frames may be removed and a similar number of control frames spliced in.

Frames 153-154 — Black.

Frame 155 — The numeral “4” printed upright in black on a clear background, with dimensions as described in [5.4.2](#).

Frames 156-170 — Black.

Frame 171 — The numeral “3” printed in black on a clear background, with dimensions as described in [5.4.2](#).

Frames 172-218 — Black.

5.5 Splicing frame

One additional frame shall follow with the inverted upright words “SPlice HERE” as shown in [Figure 1](#), and an arrow pointing to a clear frameline between frame 218 and this frame to indicate where the synchronizing section joins the picture section. The clear letters should be at least 3,2 mm (1/8 in) high printed on a black background.

6 Picture section (see Figure 5)

6.1 Picture

It is recommended that picture action start and finish on fades wherever possible. Otherwise, significant audio should be kept at least 80 frames from the start and finish of the picture.

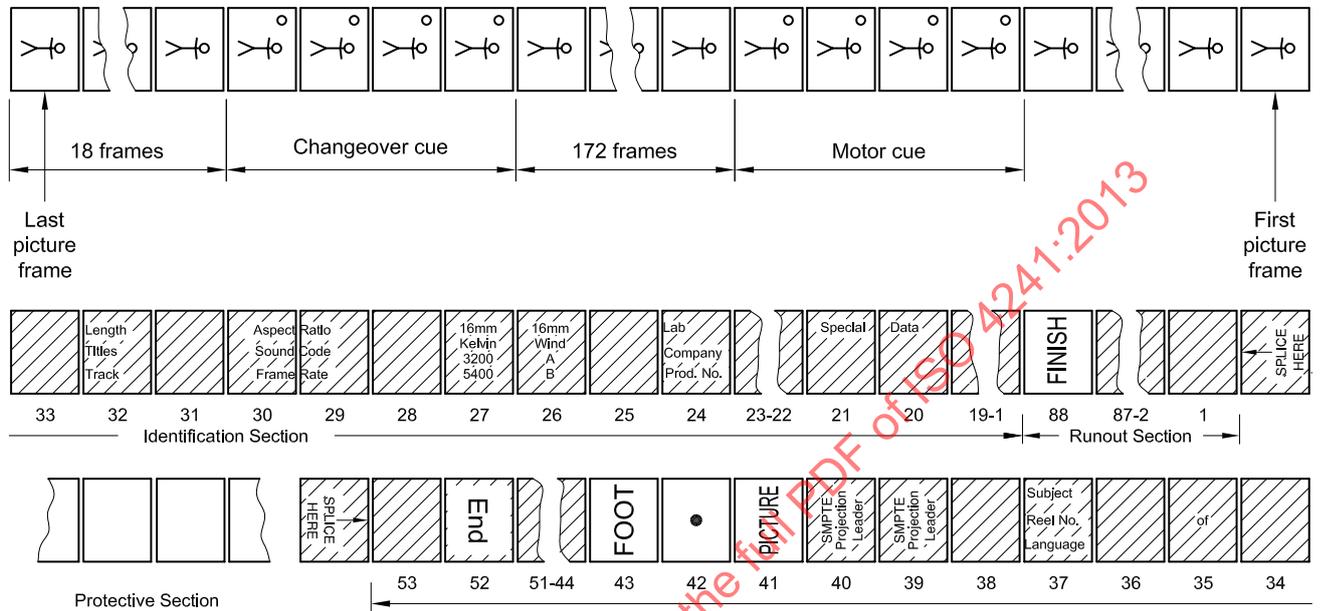


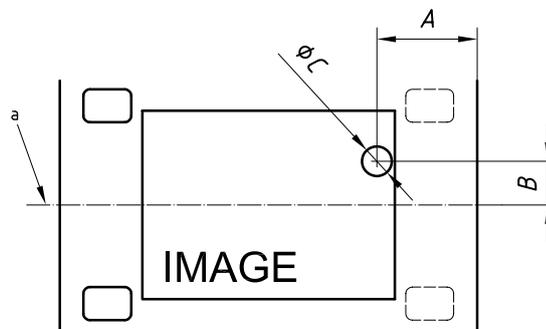
Figure 5 — Picture and trailer leader

6.2 Motor cue

The motor cue shall consist of black circles or clear circles, printed from a negative, which has had four consecutive frames marked as shown in Figures 6, 7, and 8 for 16 mm, 35 mm, and 70 mm films, respectively. The position and dimensions of this mark shall be as given in Table 1. Following the four frames containing the motor cue, there shall be 172 frames to the beginning of the changeover cue.

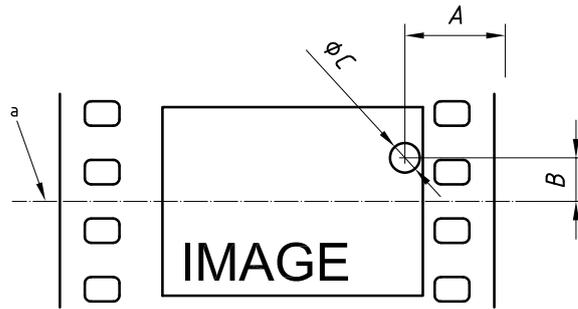
6.3 Changeover cue

The changeover cue shall consist of four frames containing circles of the same dimensions and position on the frame as those in the motor cue. Following the four frames of the changeover cue, there shall be 18 frames to the beginning of the runout section of the trailer.



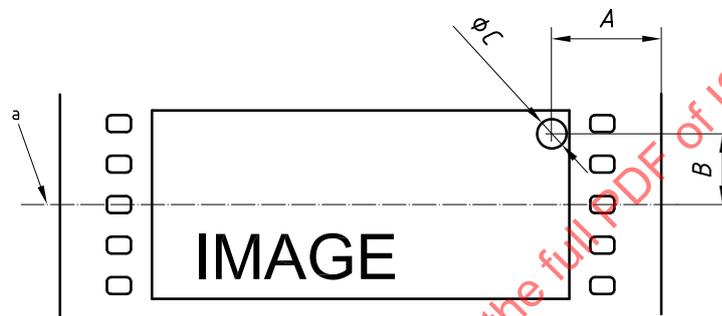
a Centreline of projectable image area.

Figure 6 — 16 mm cue marks



a Centreline of projectable image area.

Figure 7 — 35 mm cue marks



a Centreline of projectable image area.

Figure 8 — 70 mm cue marks

Table 1 — Position and dimensions of cue marks

Dimensions	16 mm film		35 mm film		70 mm film	
	mm	in	mm	in	mm	in
Centre of cue mark to edge of film, <i>A</i>	3,78	0,149	7,14	0,281	12,70	0,500
Centre of cue mark to horizontal centreline of projectable image area, <i>B</i>	1,73	0,068	3,76	0,148	8,31	0,327
Diameter of cue mark, <i>C</i>	1,09	0,043	2,39	0,094	3,45	0,136

7 Trailer (foot) leader (see [Figure 5](#))

7.1 Splicing frame

A single frame with the upright words “SPlice HERE” and an arrow pointing to the clear frameline shall precede frame 1 of the runout section to indicate where the runout section joins the picture section. The clear letters should be at least 3,2 mm (1/8 in) high printed on a black background.

7.2 Runout section

The runout section of the trailer shall consist of 88 frames, the first 87 of which are to be black with framelines as described in [4.3](#) Frame 48 shall have an asterisk on the horizontal centreline adjacent to