INTERNATIONAL STANDARD

ISO 6025

Third edition
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Cinematography — Analogue photographic sound test films, 35 mm and 16 mm — Specifications

Cinématographie — Films pour les essais d'enregistrement sonore photographique analogue, 35 mm et 16 mm — Spécifications

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Contents

Page

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 6025 was prepared by Technical Committee ISO/TC 36, *Cinematography*.

This third edition cancels and replaces the second edition (ISO 6025:1993), clause 1 and Table 7 of which have been revised. Clause 2 has also been revised and a bibliography has been added.

Annexes A and B of this International Standard are for information only.

Cinematography — Analogue photographic sound test films, 35 mm and 16 mm — Specifications

1 Scope

1.1 This International Standard specifies basic technical characteristics for the international exchange of analogue photographic sound test films intended for checking, adjusting and measuring motion-picture projector sound systems and sound reproducing channels of motion-picture installations for monophonic or stereophonic reproduction.

1.2 This International Standard specifies types and technical characteristics of test films made on 35 mm and 16 mm motion-picture films.

1.3 This International Standard includes test films intended for the checking, adjusting and measuring of

a) focusing and azimuth of the scanning beam,

b) scanning beam width and its position relative to the reference edge of the film,

c) uniformity of the scanning beam illumination,

d) level output balance of several motion-picture projectors,

e) frequency response of the sound reproduction channel, and

f) non-uniformity of film travel.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 69:1998, *Cinematography — 16 mm motion-picture and magnetic film — Cutting and perforating dimensions.*

ISO 491:1995, *Cinematography — 35 mm motion-picture film and magnetic film — Cutting and perforating dimensions.*

ISO 4243:1979, *Cinematography — Picture image area and photographic sound record on 16 mm motion-picture release prints — Positions and dimensions.*

ISO 7343:1993, *Cinematography — Two-track photographic sound records on 35 mm motion-picture prints — Positions and width dimensions.*

IEC 60386:1972, *Method of measurement of speed fluctuations in sound recording and reproducing equipment.*

3 Specifications common to all types of photographic sound test films

3.1 Test films shall be made on motion-picture raw stock films, the cutting and perforating dimensions of which shall be in accordance with ISO 491 for 35 mm film and ISO 69 for 16 mm film.

3.2 The film stock should preferably be polyester base or low-shrinkage triacetate base.

3.3 The location and width dimensions of sound records shall be in accordance with ISO 7343 for 35 mm film and ISO 4243 for 16 mm film.

3.4 Test films shall be splice-free, except where joins are an essential part of the test film.

3.5 Each film shall be intended primarily for use at 24 frames per second. All frequencies and velocity tolerances given in this International Standard refer to that velocity. A speed of 25 frames per second may be used. Other test films may be developed for use at other speeds, if the speeds are so stated.

4 Test films for checking and adjusting sound focus and azimuth

The characteristics of the test signal for checking and adjusting sound focus and azimuth shall be as given in Table 1.

Table 1

Test signal characteristic	35 mm	16 mm
Frequency, kHz	9	7,1
Frequency tolerance, %	± 3	± 3
Maximum output deviation, dB	± 0,3	± 0,5
Azimuth angle (relative to reference edge), degrees (°)	90	90
Azimuth tolerance, minutes (′) [a]	± 5	± 5
Minimum modulation as a percentage of maximum, %	80	80
Minimum duration of signal, s	100	100
[a] See annex A.		

5 Test films for checking and adjusting the lateral position of the film in relation to the scanning beam (buzz track)

The characteristics of the test signal for checking and adjusting the lateral position of the film in relation to the scanning beam shall be as given in Table 2.

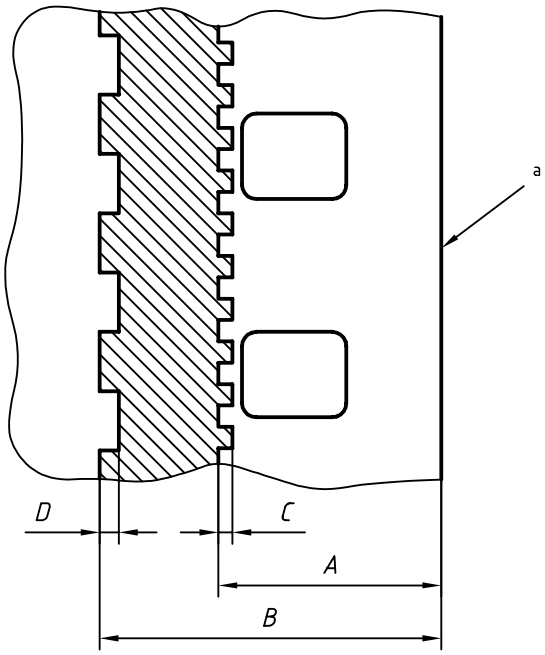
Table 2

Test signal characteristic	All films
Frequency on the picture image side, Hz	300
Frequency on the opposite side, Hz	1 000
Frequency tolerance, %	± 10
Form	Square wave
Minimum duration of signal, s	100

The signal location and width dimensions shall be as given in Table 3.

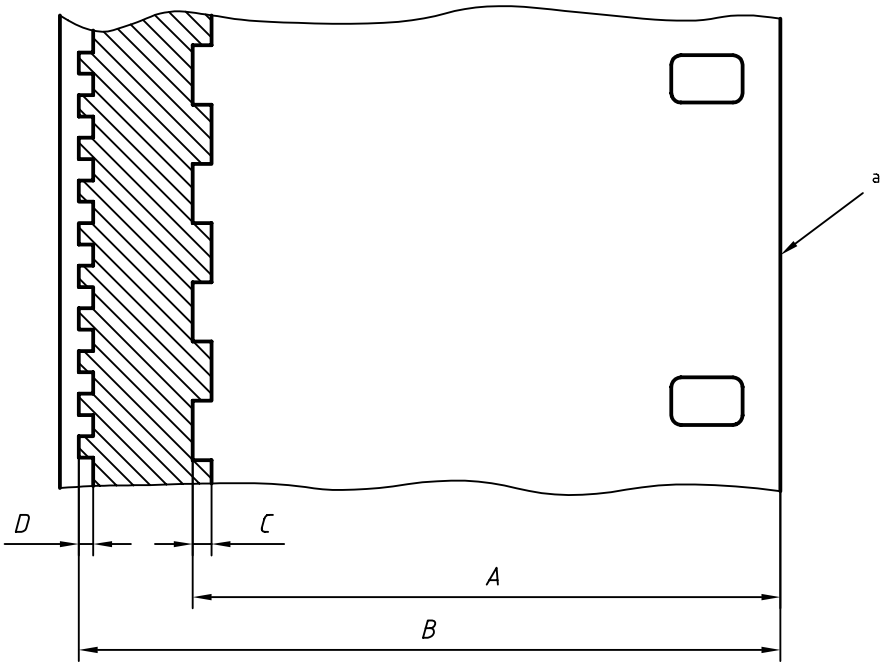
Table 3

Dimension	35 mm (see Figure 1)		16 mm (see Figure 2)	
	mm	in	mm	in
A	5,10 ± 0,03	0,201 ± 0,001	13,58 ± 0,03	0,535 ± 0,001
B	7,23 ± 0,03	0,285 ± 0,001	15,39 ± 0,03	0,606 ± 0,001
C	0,18 min.	0,007 min.	0,30 min.	0,012 min.
D	0,30 min.	0,012 min.	0,18 min.	0,007 min.



a Reference edge

Figure 1 — 35 mm buzz track



a Reference edge

Figure 2 — 16 mm buzz track

6 Test films for checking and adjusting uniformity of the scanning beam illumination (snake track)

The characteristics of the test signal for checking and adjusting the uniformity of the scanning beam illumination shall be as given in Table 4.

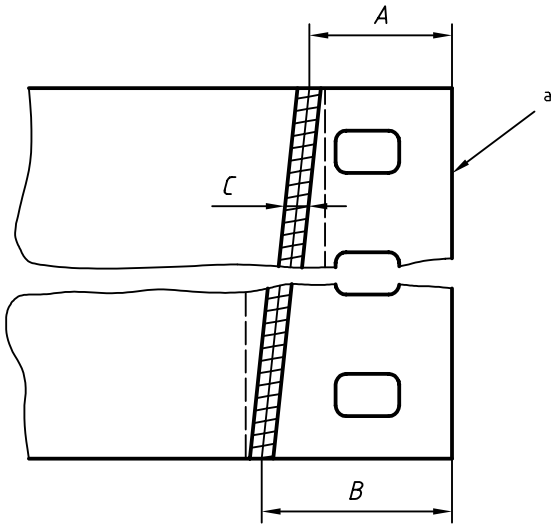
Table 4

Test signal characteristic	All films
Frequency, Hz	1 000
Modulation	Maximum consistent with dimension C
Maximum output deviation along the whole of the test film, dB	± 0,5
Duration of signal [a], s	6
[a] The traverse of the snake track shall not be less than the duration of the signal.	

The signal location and width dimensions shall be as given in Table 5.

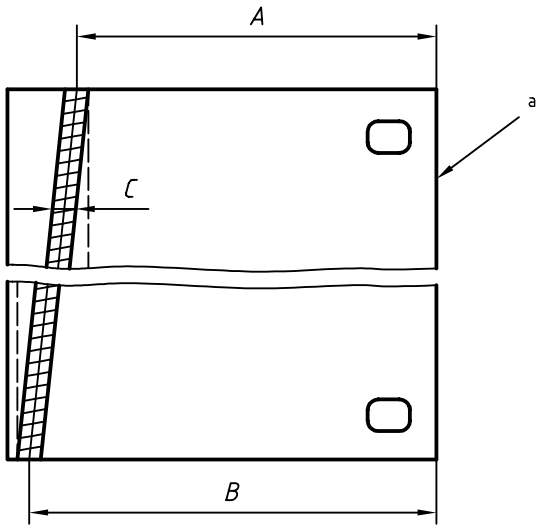
Table 5

Dimension	35 mm (see figure 3)		16 mm (see figure 4)	
	mm	in	mm	in
A	5,20 ± 0,03	0,205 ± 0,001	13,66 ± 0,03	0,538 ± 0,001
B	7,13 ± 0,03	0,281 ± 0,001	15,31 ± 0,03	0,603 ± 0,001
C	0,18 max.	0,007 max.	0,13 max.	0,005 max.



a Reference edge

Figure 3 — 35 mm snake track



a Reference edge

Figure 4 — 16 mm snake track

7 Variable area modulated test films for checking and adjusting sound level

The characteristics of the test signal for checking and adjusting the sound level shall be as given in Table 6.

Table 6

Test signal characteristic	35 mm	16 mm
Frequency, Hz	1 000	400
Frequency tolerance, %	± 3	± 3
Form	Sinusoidal	Sinusoidal
Maximum total harmonic distortion, %	3	5
Maximum output deviation, dB	± 0,5	± 0,5
Photoelectric output factor (for nominal 50 % modulation) [a]	0,344	0,368
Minimum duration of signal, s	60	60
NOTE If the track format is multilateral, care should be taken to ensure that the modulation in each element is equal.		
[a] The photoelectric output factors (POF) given here are for 35 mm stereophonic films using a 0,254 mm (0,010 in) septum between tracks and a receptor with no dead area between tracks and for 16 mm monophonic films. The equivalent 35 mm monophonic modulation is 43,4 %. (See annex B for the calculation of POF.)		

8 Test films for checking and adjusting frequency response

The frequencies for test films for checking and adjusting the frequency response shall be as given in Table 7.

Table 7

Frequencies	35 mm	16 mm
Reference frequency, Hz	1 000	400
Frequency series in order of their location in the test film, Hz	31,5	—
	40	40
	63 [a]	63 [a]
	125 [a]	125 [a]
	250	250
	500	500
	1 000	1 000
	2 000	2 000
	3 150	3 150
	4 000	4 000
	5 000	5 000
	6 300	6 300
	7 100	7 100
	8 000	8 000
	9 000	—
	10 000	—
	11 200	—
	12 500	—
	1 000	400
Frequency tolerance	± (3 % + 2 Hz)	± (3 % + 2 Hz)
If a pink noise section is included on the test film, the pink noise shall be recorded in such a way that the level within a 1/3 octave band with the centre frequency equal to any of the frequencies given in the appropriate series in this table shall be within the tolerances set out in Table 8.		
[a] In countries where the power mains are operated at 60 Hz, the frequencies of 63 Hz and 125 Hz may be replaced by 50 Hz and 100 Hz to minimize the effects of narrow band noise.		

The characteristics of the test signal for checking and adjusting the frequency response tolerance shall be as given in Table 8.

Table 8

Test signal characteristic	35mm	16 mm
Form	Sinusoidal	Sinusoidal
Modulation [a], %	50	50
Maximum output level deviation of the test film at any frequency, when compared with the average output at the reference frequency, dB	± 0,5	± 1,0
Maximum output deviation within each frequency, dB	± 0,3	± 0,5
Maximum total harmonic distortion at any of the test film frequencies up to the given frequency	3 % up to 5 kHz	5 % up to 3 kHz
Azimuth tolerance, minutes (′)	± 5	± 5
Minimum duration of signal at reference frequency, s	20	20
Minimum duration of signal at all other frequencies, s	8	8

[a] If the track format is multilateral, care should be taken to ensure that the modulation in each element is equal.

9 Test films for measuring non-uniformity of film velocity of movement (flutter)

The characteristics of the test signal for measuring the non-uniformity of film velocity of movement shall be as given in Table 9.

Table 9

Test signal characteristic	35 mm [a]	16 mm
Frequency at 24 frames per second, Hz	3 150	3 150
Tolerance on frequency, Hz	± 25	± 25
Form	Sinusoidal or square wave	Sinusoidal or square wave
Minimum modulation as a percentage of maximum, %	80	80
Maximum total weighted wow and flutter content, measured in accordance with IEC 60386, %	± 0,05	± 0,08
Maximum output deviation, dB	± 1,0	± 1,0

[a] This test film may not be suitable for use with some older flutter meters.

Annex A
(informative)

Azimuth tolerance

It is desirable to reduce errors in azimuth setting as much as possible. An azimuth difference of 10′ of arc between a sound track image and the reproducer scanning slit would result, at 9 kHz, in a phase incoherence of approximately 40° at the opposite edges of a 35 mm photographic sound track. Such an error could occur as a result of using test films made at the extreme limits of a ± 5′ tolerance on azimuth. It is therefore recommended that every effort should be made to record test films within an azimuth tolerance of ± 2′ of arc.

Annex B
(informative)

Calculation of photoelectric output factor

The use of photoelectric output factor (POF) to specify the modulation level in Table 6 is a major departure from earlier editions of this International Standard which used percentage modulation levels.

The output level from any reproducer is determined not only by the modulation on the test film, but also by the density of the dark and clear areas of the track. The POF chosen for both 35 mm and 16 mm in Table 6 are representative of current stereophonic 50 % level set films with track dimensions conforming to ISO 7343 for 35 mm and ISO 7739 [1)] for 16 mm.

The POF of an "ideal" test film can be calculated using the following:

$$\text{POF} = \frac{\text{Maximum track width} \times \%\,\text{Modulation}}{\text{Scanned width} \times 100}$$

For 35 mm film, a stereophonic track with dimensions conforming to ISO 7343 has a maximum width of 0,84 mm (0,033 in) for each track and a scanned width of 2,13 mm (0,084 in). Therefore

$$\text{POF of an ideal 50 \% film} = \frac{1{,}68 \times 50}{2{,}13 \times 100} = 0{,}394$$

This ideal 50 % value is then multiplied by a factor to compensate for the fact that the clear area of the track is not completely clear and the opaque area is not completely opaque. This factor is typically 0,872.

Therefore, POF for nominal 50 % modulation = $0{,}394 \times 0{,}872 = 0{,}344$.

1) ISO 7739:1983, *Cinematography — Two-track photographic sound records on 16 mm motion-picture prints — Positions and width dimensions.*

Bibliography

[1] ISO 70:1981, *Cinematography — 35 mm negative photographic sound record on 35 mm motion-picture film — Position and maximum width dimensions.*

[2] ISO 71:1977, *Cinematography — 16 mm negative photographic sound record on 16 mm, 35/16 mm and 35/32 mm motion-picture film — Positions and dimensions.*

[3] ISO 7832:1987, *Cinematography — Photoelectric output factor of photographic-type audio-level test films — Measurement and calibration.*

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