

**SMPTE RECOMMENDED PRACTICE**

**RP 78-1983**

*Specifications for Azimuth Test Film for 16-mm Audio Projectors and Single-System Cameras, Magnetic Type*



INTERNATIONAL STANDARD ISO 3773-1983 (E)

**1. Scope**

This practice specifies a test film for use in aligning the azimuth of magnetic head gaps in 16-mm motion-picture audio projectors and single-system cameras operating at approximately 36 ft (11 m) per minute.

**2. Test Film Signal**

- 2.1 Frequency. The audio record shall be an original recording which will reproduce at a frequency of 7000 ± 100 Hz when the linear speed of the film is 21 perforations per second or approximately 36 ft per minute (7.2 in or 183 mm per second).
- 2.2 Distortion. The total harmonic distortion of the recorded signals shall not exceed 0.5 percent.
- 2.3 Audio Record. The audio record shall be recorded so that it extends from the perforations on one side of the film to the opposite edge, or from one edge of the film to the other.
- 2.4 Recorded Level. The azimuth test tone shall not be less than 10 dB down from the equivalent reference level of 100 Hz at 185 nanowebers per meter after correct equalization of 70 µs.
- 2.5 Flutter. The weighted peak flutter of the audio record shall not exceed ± 0.1 percent when measured in accordance with American National Standard Weighted Peak Flutter of Sound Recording and Reproducing Equipment, ANSI/IEEE 119-1982.
- 2.6 Azimuth. The azimuth of the audio record shall be 90° ± 3° to the reference edge of the film.

**3. Film Stock**

- 3.1 The film stock shall be full-coat splice-free and of the low-shrinkage safety type in compliance with American National Standard Specifications for Motion-Picture Safety Film, ANSI PH22-31M-1980.

- 3.2 Test films shall be made on a base cut and perforated in accordance with short-pitch dimensions specified in American National Standard Dimensions for 16-mm Motion-Picture Film Perforated IR, ANSI PH22-109-1980.
- 3.3 The film stock shall be conditioned for 10 days at 20°C ± 3° (68°F ± 5.4°) at a relative humidity of 50 ± 10 percent prior to recording.
- 3.4 The film shall be recorded and packaged within the temperature and humidity limits specified in 3.3. The recorded film shall be packaged in a metal can and sealed either with a low-moisture permeability plastic tape or a fabric tape having a moisture barrier.

**1. Identification**

Each test film shall be identified by a suitable identification marking.

**3. Calibration**

- 3.1 Flux. The short circuit flux shall be determined by means of the calibrated short-gap ferrimagnetic core reproducer technique. This technique is described in American National Standard Method of Measuring Recombited Flux of Magnetic Sound Records at Medium Wavelengths, ANSI/IEEE 347-1982.
- 3.2 Level. The signal level specified in 2.1 shall be measured with an rms voltmeter calibrated in decibels with an accuracy of ± 0.1 dB over the bandwidth 31.5 Hz to 16 kHz.
- 3.3 The test film shall be calibrated on a reproducing head made in accordance with American National Standard Position, Dimensions and Reproducing Speed of 200-MHz Magnetic Sound Record on 16-mm Motion-Picture Film, ANSI PH22-97-1982.

NOTE: A test film made in accordance with this practice is available from the Society of Motion Picture and Television Engineers.

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**Cinematography — Tape splices for 8 mm Type S motion-picture film for projector use — Dimensions**

3.4 In the plan view, the angle between the respective edges of the spliced film should be 180° ± 5°. Thus, the spliced film should be aligned so that when one portion of the film is placed against a straightedge, the other portion will not deviate more than 0.22 mm (0.009 in) in 15.2 cm (6 in).

3.5 Except as described in 3.6, the dimensions of the tape applied to secure the splice shall be such as not to interfere with the film dimensions as specified in ISO 1700, and shall fall within the area described by dimension F. The width of the tape material used to form the splice should encompass the full width of the film if applied only to one side; however, it also applied to the second side, it may exclude the perforation area or the area of the magnetic record and balance stripes or both.

3.6 If the tape used to form a splice is wrapped around the film, either film edge may be used as the wrap-around edge. However, if the perforated edge is used, it is recommended that the splice add no more than 0.05 mm (0.002 in) to the film width nor limit the perforation dimension by the same amount. The overall width of the spliced area shall not exceed 8.15 mm (0.321 in). If the film is slit after the wrap-around splice has been made, the film width shall not be less than 7.92 mm (0.312 in) and the slitting operation shall not affect the perforated edge of the film.

3.7 The splice shall be made with the mated cuts of the film ends butting together as closely as possible, so that no white light shows between the film ends at the time of projection, and there shall be no overlap of the film at the splice.

NOTE — Based on present technology, films joined with tape splices are not acceptable for use as originals in commercial printing operations.

**1 Scope and field of application**

This International Standard specifies the dimensions of mated cut splices on 8 mm motion-picture film perforated 8 mm Type S made with a transparent adhesive tape. The specifications herein apply to magnetic and photographic sound films as well as to silent films intended only for projection.

**2 Reference**

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

ISO 3077, *Cinematography — Magnetic stripes and recording head gaps for sound record on 8 mm Type S motion-picture prints — Positions and width dimensions*.

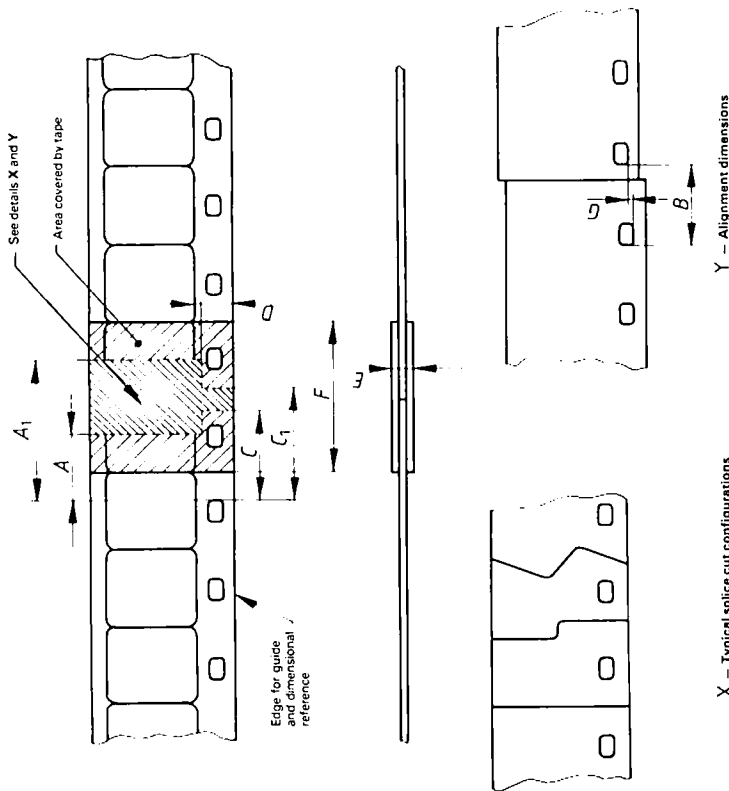
**3 Dimensions and characteristics**

- 3.1 The dimensions shall be as shown in the figure and given in the table. These dimensions apply to a freshly made splice.
- 3.2 The transverse mated cut of the films shall fall within the area defined as detail X in the figure.
- 3.3 The spliced films shall not be offset more than 0.05 mm (0.002 in) dimension G, as measured by the differences in the alignment of the reference side edge of the perforation holes on either side of the spliced halves (see detail Y).

**Annex**  
**Additional data**

(This annex forms part of the standard.)

- A.1** The transverse cut to provide the mated pairs of films for tape splice may be made in numerous configurations. Detail X of the figure shows only some typical configurations. It is desirable, however, to make the splice as inconspicuous as possible, and, therefore, the transverse cuts would usually be on the frame line or occur in one frame only.
- A.2** Dimension *B* controls the longitudinal registration of the two films being spliced. It is measured across the one pitch length containing the cut. It is recognized that splicing blocks are usually constructed having registration pins more widely separated. When this is done, manufacturers are cautioned to allow for possible film shrinkage characteristics, depending on the film type.



X — Typical splice cut configurations

Y — Alignment dimensions

Dimension	mm	in*
A min.	3.66	0.144
A1 max.	7.90	0.311
**B max.	4.28	0.168 5
min.	4.18	0.164 6
C min.	5.0	0.20
C1 max.	6.5	0.26
D min.	1.6	0.06
E max.	0.27	0.010 6***
F max.	25.4	1.00
G max.	0.05	0.002

\* The metric values are primary and the values in inches are derived and purposely noted with more significant places.  
 \*\* Dimension *B* (detail Y) is the distance between common sides of successive perforations measured across the splice.  
 \*\*\* This includes a maximum thickness for magnetic sound stripe of 0.020 mm (0.000 8 in) as specified in ISO 3027