International Standard ISO 6038

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Cinematography — Splices for use on 70 mm, 65 mm, 35 mm and 16 mm motion-picture films — Dimensions and locations

Cinématographie — Raccords sur films cinématographiques 70 mm, 65 mm, 35 mm *et* 16 mm — *Dimensions et emplacements*

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Foreword

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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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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Cinematography — Splices for use on 70 mm, 65 mm, 35 mm and 16 mm motion-picture films — Dimensions and locations

1 Scope and field of application

1.1 This International Standard specifies the dimensions and locations of transverse cemented or welded overlap splices and butt splices on 70 mm, 65 mm, 35 mm and 16 mm motion-picture films and prints with magnetic or photographic sound records.

1.2 The following types are specified:

Type 1 — Laboratory type, overlap splice intended for negatives and intermediate films, perforated short pitch.

Type 2 — Projection type, overlap splice intended for prints with non-anamorphic type picture.

Type 3 — Projection type, overlap splice intended for prints with anamorphic type picture.

Type 4 — Projection type, overlap splice made with transparent adhesive tape and intended for prints.

Type 5 — Projection type specialized uses, butt splice made with transparent tape and intended for prints.

2 Dimensions

2.1 The dimensions specified in the tables apply to motion-picture films which contain nominal shrinkage up to 0,2 %, and recently made splices.

2.2 The dimensions of cemented or welded overlap splices for 16 mm motion-picture films shall be as shown in figures 1, 2 and 5 and given in tables 1 and 5.

2.3 The dimensions of the butt splice shall conform with the dimensions *B* and *E* as specified in the tables.

2.4 The dimensions for 70 mm, 65 mm and 35 mm motion-picture films shall be as shown in figures 3, 4 and 5 and as given in tables 2, 3, 4 and 5.

2.5 The film width at the splice shall not exceed

70,05 mm (2.758 in) — for 70 mm films;

65,05 mm (2.561 in) — for 65 mm films;

35,03 mm (1.379 in) — for 35 mm films;

16,00 mm (0.630 in) — for 16 mm films.

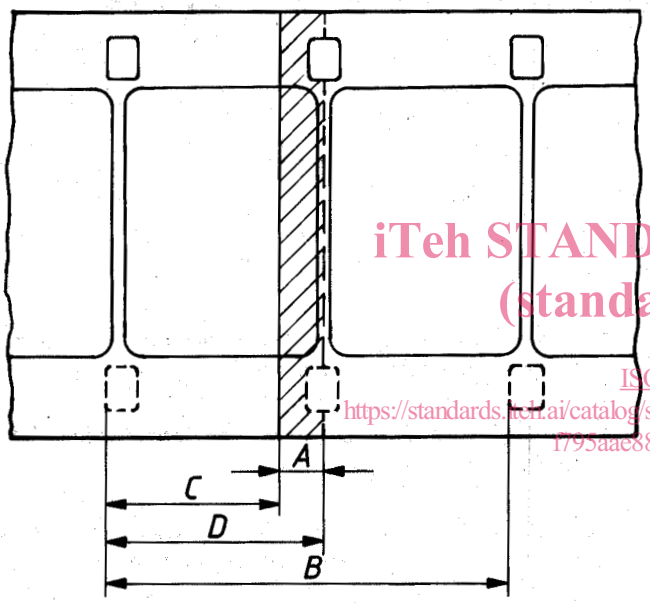

Figure 1 — Splices on 16 mm film laboratory type

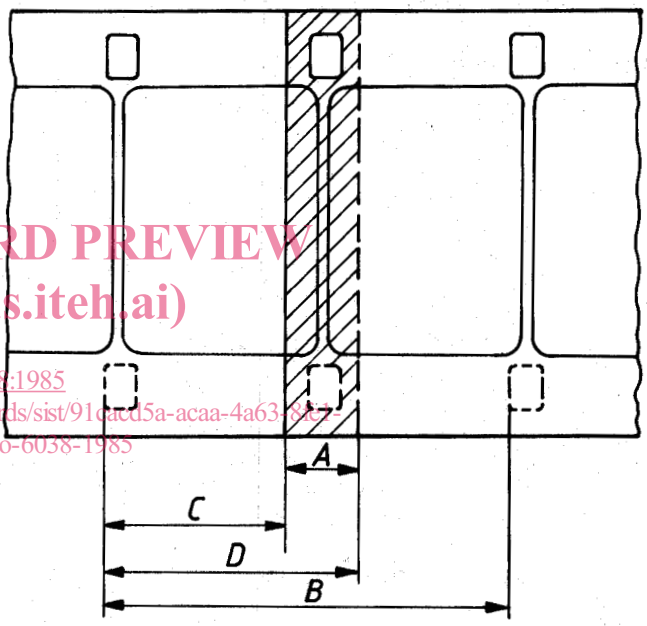

Figure 2 — Splices on 16 mm film projection type

Table 1 — Dimensions of splices for 16 mm motion-picture films

Dimension	Type 1 (Laboratory)*		Type 2 (Projection)	
	mm	in	mm	in
A nom.	1,76	0.070	2,49	0.098
B	15,21 ± 0,05	0.599 ± 0.002	15,24 ± 0,05	0.600 ± 0.002
C	6,47 ± 0,05	0.255 ± 0.002	7,01 ± 0,10	0.276 ± 0.004
D	8,23 ± 0,05	0.324 ± 0.002	9,50 ± 0,10	0.373 ± 0.004

* In single negative printing dimension *C* should be 7,53 ± 0,05 mm (0.296 ± 0.002 in) to minimize the printing of a white line. Dimension *A* becomes 0,70 mm (0.028 in).

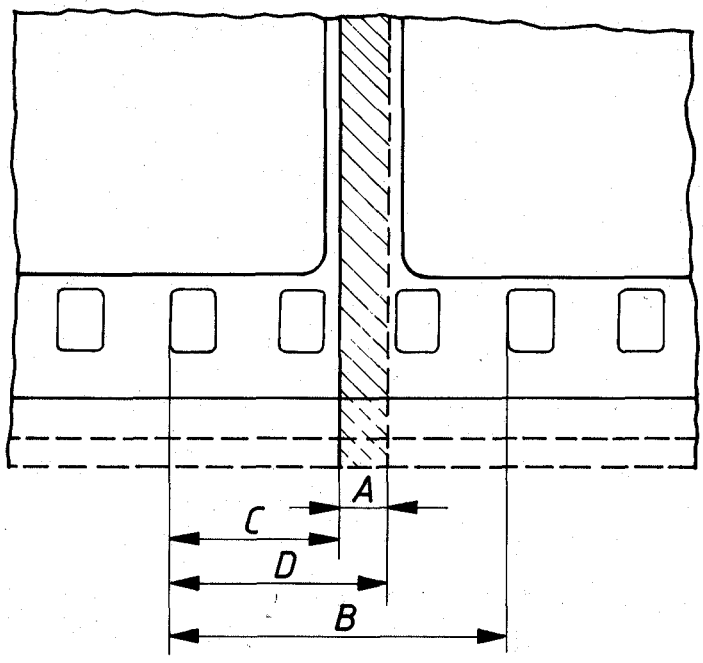

Figure 3 — Splices on 70 mm, 65 mm and 35 mm films

Table 2 — Dimensions of splices for 35 mm motion-picture film

Dimension	Type 1 (Laboratory)**		Type 2 (Projection) (non-anamorphic)		Type 3 (Projection) (anamorphic)*	
	mm	in	mm	in	mm	in
A nom.	1,24	0.049	1,83	0.072	1,24	0.049
B	14,22 ± 0,05	0.560 ± 0.002	14,25 ± 0,05	0.561 ± 0.002	14,25 ± 0,05	0.561 ± 0.002
C	7,42 ± 0,05	0.292 ± 0.002	7,21 ± 0,10	0.284 ± 0.004	7,42 ± 0,05	0.292 ± 0.002
D	8,66 ± 0,05	0.341 ± 0.002	9,04 ± 0,10	0.356 ± 0.004	8,66 ± 0,05	0.341 ± 0.002

* Notice that the Type 3 splices on anamorphic film will fall within the projected area, and extra care should be taken in making a clean splice.

** It is also recommended that dimension *A* be not greater than 1,02 mm (0.040 in) in the anamorphic negative to minimize intrusion of the splice in the projected image area.

Table 3 — Dimensions of splices for 70 mm and 65 mm motion-picture films

Dimension	Type 1 (Laboratory) 65 mm		Type 2 (Projection) 70 mm	
	mm	in	mm	in
A nom.	1,70	0.067	1,70	0.067
B	14,22 ± 0,05	0.560 ± 0.002	14,25 ± 0,05	0.561 ± 0.002
C	7,27 ± 0,05	0.286 ± 0.002	7,27 ± 0,05	0.286 ± 0.002
D	8,97 ± 0,05	0.353 ± 0.002	8,97 ± 0,05	0.353 ± 0.002

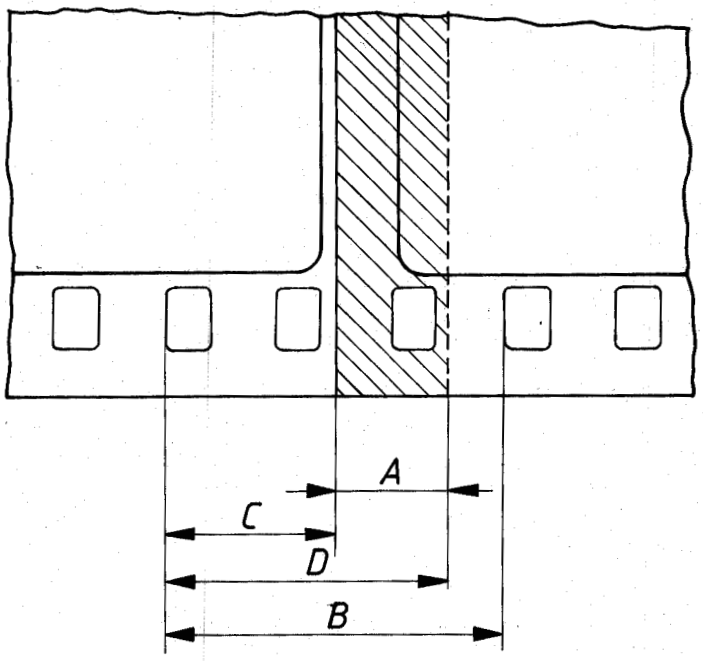

Figure 4 — Full perforation splices on 35 mm projection prints

Table 4 — Dimensions of splices on 35 mm cemented and welded motion-picture projection prints

Dimension	mm	in
A nom.	3,96	0.156
B	14,25 ± 0,05	0.561 ± 0.002
C	8,13 ± 0,05	0.320 ± 0.002
D	12,09 ± 0,05	0.476 ± 0.002

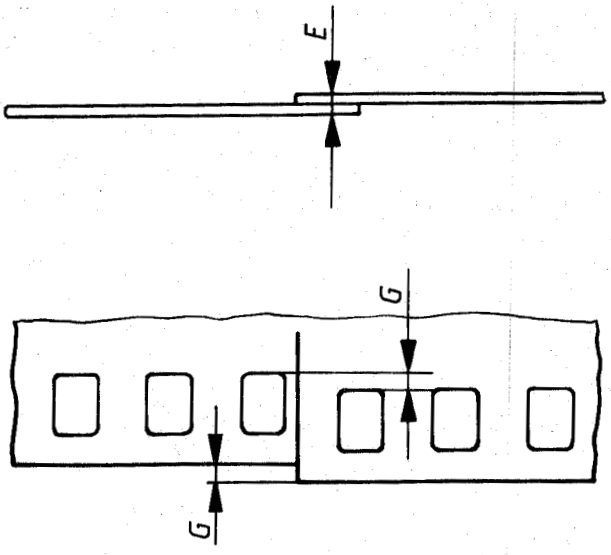

Figure 5 — For all film widths

Table 5 — Dimensions for all splices

Dimension	mm	in
E max.	0,33	0.013
G max.*	0,05	0.002

* A difference in the lateral shrinkages of the two strips may make it impossible to maintain the tolerance. Shoulders formed by such misalignment should be bevelled.

If the film to be spliced contains a photographic sound track, and the modulation level at the point of the splice results in any individual bias line having a width of less than 0,05 mm, then the sound track should be blooped or opaqued to avoid an objectionable audio crash.

NOTES ON BUTT SPLICES

1 Splices with tape on one side only are not functional in projection and are not acceptable.

2 Splices made with tape wrapped around the film interfere with guiding and are not acceptable.

2.6 The angle between the respective edges of the spliced films shall be 180° ± 4'. Thus, the spliced film shall be aligned to the extent that when one portion of the film is placed against a straight edge, the other portion will not deviate more than 0,15 mm (0.006 in) in 13 cm (5 in).

NOTES

OVERLAP (CEMENT) SPLICES

1 The scraped area of one film end should be 0,03 to 0,08 mm (0.001 to 0.003 in) narrower than the area covered by the overlapping film in order to prevent the appearance of a white line on the screen.

2 When splicing, the cement should be applied to the full width of the splice; no air bubbles should be in the splice; cement excess should be removed, including that from the perforation holes.

3 If the film being spliced contains a magnetic stripe, the stripe should be removed from the base of the film falling on top of the mating piece.

4 Bevelled splices are recommended and scraping at an angle is preferred because it provides a stronger splice. When magnetically striped film is spliced, it is recommended that the overlap should be oriented so that the trailing film drops on to the scanning head rather than jolts up on to it.

OVERLAP SPLICES

5 The overlap provides the desirable increase in stiffness at the splice to prevent sharp angular bending when the film goes around a small radius, as in the free loops above and below the projection aperture.

6 When the overlap splice receives its mechanical strength from tape, it is usual not to scrape or otherwise remove the emulsion in the overlap area.

3 Requirements of butt splices

3.1 Butt splices shall be made centrally on the frame line.

3.2 The clearance between the butted edges of the print at the splices shall not exceed 0,08 mm (0.003 in).

3.3 The dimensions of the tape applied to secure a butt splice shall not interfere with the film dimensions as specified in the International Standard for the particular film type.

3.4 The tape shall be wide enough to cover an area of at least half a frame on each side of the splice. It will be less obvious if the tape begins and ends on a frame line.

3.5 The tape shall adhere uniformly to the film without corrugations or entrapped air bubbles.

3.6 For films with photographic sound records, the width of the tape used shall encompass the full width of the film on both sides. For films with magnetic sound records, tape shall be used only on that side which does not carry the magnetic record and balancing stripes, and shall encompass the full width of the film.

4 Additional requirements of splices

4.1 Butt and overlap tape splices shall be made with an optically clear, transparent tape.

4.2 All splices shall be capable of withstanding a tension which is at least 50 % greater than the gate tension of the projector for that film width.

4.3 After splicing, the perforation holes shall be maintained clear at all splices.

5 Bibliography

ISO 69, *Cinematography — 16 mm motion-picture raw stock film — Cutting and perforating dimensions.*

ISO 466, *Cinematography — Image produced by 16 mm motion-picture camera aperture — Position and dimensions.*

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

ISO 2467, *Cinematography — Image area produced by 65 and 70 mm motion-picture camera aperture and maximum projectable image area on 70 mm motion-picture prints — Positions and dimensions.*

ISO 2906, *Cinematography — Image area produced by camera aperture on 35 mm motion-picture film — Position and dimensions.*

ISO 3023, *Cinematography — 65 mm and 70 mm unexposed motion-picture film — Cutting and perforating dimensions.*