

for 16mm amateur films. It was recommended that the Screen Brightness Committee as well as this Committee be balloted and that further action be held up until the results of the voting are known.

At this meeting it was also decided that this Committee would embark on a program of drawing up definitions or a

system of nomenclature for all chemical operations found in motion picture laboratories in order to clarify terms in technical discussions and literature. Should this chemical glossary prove successful, future plans would include expansion of this glossary to include all laboratory products, equipment and functions.

---

## Standards for Splices and Projection Reels

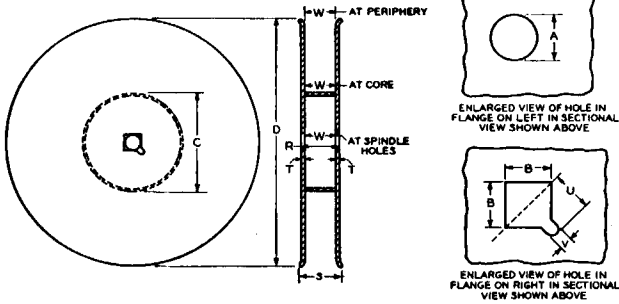
ON APRIL 30, 1952, the American Standards Association approved one new standard, PH22.77-1952, Splices for 8MM Motion Picture Films, and revision of two previous standards, PH22.24-1952, Splices for 16MM Motion Picture Films for Projection, and PH22.11-1952, 16MM Motion Picture Projection Reels.

All three standards were initiated and/or revised by the 16MM and 8MM Committee. The splice standards were published for trial and comment January 1951 and the reel standard first in February 1950 and again in February 1951 when the initial publication resulted in comments indicating a need for further revisions.

American Standard  
for  
**16-Millimeter Motion Picture  
Projection Reels**

**ASA**  
Reg. U. S. Pat. Off.  
**PH22.11-1952**  
Revision of  
Z22.11-1941  
and  
Z52.33-1945  
\*UDC 778.55

Page 1 of 4 pages



**Table 1**

See page 3 for notes.

Dimension	Inches	Millimeters
A	0.319 $\begin{matrix} +0.000 \\ -0.003 \end{matrix}$	8.10 $\begin{matrix} +0.00 \\ -0.08 \end{matrix}$
B	0.319 $\begin{matrix} +0.000 \\ -0.003 \end{matrix}$	8.10 $\begin{matrix} +0.00 \\ -0.08 \end{matrix}$
R <sup>1</sup>	0.790 maximum	20.06 maximum
S <sup>2</sup> (including flared, rolled, or beveled edges)	0.962 maximum	24.43 maximum
T (adjacent to spindle)	0.027 minimum 0.066 maximum	0.69 minimum 1.68 maximum
U	0.312 $\pm 0.016$	7.92 $\pm 0.41$
V	0.125 $\begin{matrix} +0.005 \\ -0.000 \end{matrix}$	3.18 $\begin{matrix} +0.13 \\ -0.00 \end{matrix}$
W, at periphery <sup>3</sup>	0.660 $\begin{matrix} +0.045 \\ -0.025 \end{matrix}$	16.76 $\begin{matrix} +1.14 \\ -0.64 \end{matrix}$
at core <sup>4</sup>	0.660 $\pm 0.010$	16.76 $\pm 0.25$
at spindle holes	0.660 $\pm 0.015$	16.76 $\pm 0.38$
Flange and core concentricity <sup>5</sup>	$\pm 0.031$	$\pm 0.79$

Approved April 30, 1952, by the American Standards Association, Incorporated  
Sponsor: Society of Motion Picture and Television Engineers

<sup>5</sup>Universal Decimal Classification

Copyright, 1952, by American Standards Association, Inc.; reprinted by permission of the copyright holder.

American Standard  
for  
**16-Millimeter Motion Picture  
Projection Reels**



**PH22.11-1952**

Page 2 of 4 pages

**Table 2**

Capacity	Dimension	Inches	Milli- meters	Capacity	Dimension	Inches	Milli- meters
200 feet <sup>a</sup> (61 meters)	D, nominal	5.000	127.00	1200 feet (366 meters)	D, nominal	12.250	311.15
	maximum	5.031	127.79		maximum	12.250	311.15
	minimum	5.000	127.00		minimum	12.125*	307.98*
	C, nominal	1.750	44.45		C, nominal	4.875	123.83
maximum	2.000*	50.80*	maximum	4.875	123.83		
minimum	1.750	44.45	minimum	4.625*	117.48*		
Lateral runout, <sup>7</sup> maximum	0.570	1.45	Lateral runout, <sup>7</sup> maximum	0.140	3.56		
400 feet <sup>a</sup> (122 meters)	D, nominal	7.000	177.80	1600 feet (488 meters)	D, nominal	13.750	349.25
	maximum	7.031	178.59		maximum	14.000*	355.60*
	minimum	7.000	177.80		minimum	13.750	349.25
	C, nominal	2.500	63.50		C, nominal	4.875	123.83
maximum	2.500	63.50	maximum	4.875	123.83		
minimum	1.750*	44.45*	minimum	4.625*	117.48*		
Lateral runout, <sup>7</sup> maximum	0.080	2.03	Lateral runout, <sup>7</sup> maximum	0.160	4.06		
800 feet (244 meters)	D, nominal	10.500	266.70	2000 feet (610 meters)	D, nominal	15.000	381.00
	maximum	10.531	267.49		maximum	15.031	381.79
	minimum	10.500	266.70		minimum	15.000	381.00
	C, nominal	4.875	123.83		C, nominal	4.625	117.48
maximum	4.875	123.83	maximum	4.875	123.83		
minimum	4.500*	114.30*	minimum	4.625	117.48		
Lateral runout, <sup>7</sup> maximum	0.120	3.05	Lateral runout, <sup>7</sup> maximum	0.171	4.34		

\*When new reels are designed or when new tools are made for present reels, the cores and flanges should be made to conform, as closely as practicable, to the nominal values in the above table. It is hoped that in some future revision of this standard the asterisked values may be omitted.

American Standard  
for  
**16-Millimeter Motion Picture  
Projection Reels**

  
Reg. U. S. Pat. Off.

**PH22.11-1952**

Page 3 of 4 pages

**Note 1:** The outer surfaces of the flanges shall be flat out to a diameter of at least 1.250 inches.

**Note 2:** Rivets or other fastening members shall not extend beyond the outside surfaces of the flanges more than 1/32 inch (0.79 millimeter) and shall not extend beyond the over-all thickness indicated by dimension S.

**Note 3:** Except at embossings, rolled edges, and rounded corners, the limits shown here shall not be exceeded at the periphery of the flanges, nor at any other distance from the center of the reel.

**Note 4:** If spring fingers are used to engage the edges of the film, dimension W shall be measured between the fingers when they are pressed outward to the limit of their operating range.

**Note 5:** This concentricity is with respect to the center line of the hole for the spindles.

**Note 6:** This reel should not be used as a take-up reel on a sound projector unless there is special provision to keep the take-up tension within the desirable range of 1½ to 5 ounces.

**Note 7:** Lateral runout is the maximum excursion of any point on the flange from the intended plane of rotation of that point when the reel is rotated on an accurate, tightly fitted shaft.

American Standard  
for  
**16-Millimeter Motion Picture  
Projection Reels**

  
Reg. U. S. Pat. Off.

**PH22.11-1952**

Page 4 of 4 pages

### **Appendix**

(This Appendix is not a part of the American Standard for 16-Millimeter Motion Picture Projection Reels, PH22.11-1952.)

Dimensions A and B were chosen to give sufficient clearance between the reels and the largest spindles normally used on 16-millimeter projectors. While some users prefer a square hole in both flanges for laboratory work, it is recommended that such reels be obtained on special order. If both flanges have square holes, and if the respective sides of the squares are parallel, the reel will not be suitable for use on some spindles. This is true if the spindle has a shoulder against which the outer flange is stopped for lateral positioning of the reel. But the objection does not apply if the two squares are oriented so that their respective sides are at an angle.

For regular projection, however, a reel with a round hole in one flange is generally preferred. With it the projectionist can tell at a glance whether or not the film needs rewinding. Furthermore, this type of reel helps the projectionist place the film correctly on the projector and thread it so that the picture is properly oriented with respect to rights and lefts.


The nominal value for W was chosen to provide proper lateral clearance for the film, which has a maximum width of 0.630 inch. Yet the channel is narrow enough so that the film cannot wander laterally too much as it is coiled; if the channel is too wide, it is likely to cause loose winding and excessively large rolls. The tolerances for W vary. At the core they are least because it is possible to control the distance fairly easily in that zone. At the holes for the spindles they are somewhat larger to allow for slight buckling of the flanges between the core and the holes. At the periphery the tolerances are still greater because it is difficult to maintain the distance with such accuracy.

Minimum and maximum values for T, the thickness of the flanges, were chosen to permit the use of various materials.

The opening in the corner of the square hole, to which dimensions U and V apply, is provided for the spindles of 35-millimeter rewinds, which are used in some laboratories.

D, the outside diameter of the flanges, was made as large as permitted by past practice in the design of projectors, containers for the reels, rewinds, and similar equipment. This was done so that the values of C could be made as great as possible. Then there is less variation, throughout the projection of a roll, in the tension to which the film is subjected by the take-up mechanism, especially if a constant-torque device is used. Thus it is necessary to keep the ratio of flange diameter to core diameter as small as possible, and also to eliminate as many small cores as possible. For the cores, rather widely separated limits (not intended to be manufacturing tolerances) are given in order to permit the use of current reels that are known to give satisfactory results.

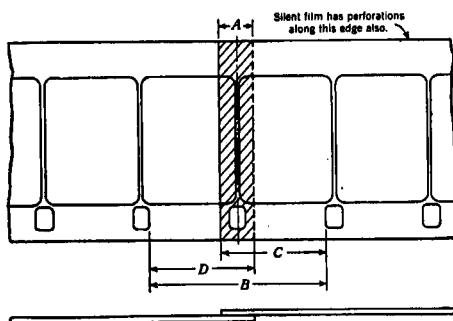
American Standard  
**Splices for  
 16-Millimeter Motion Picture Films  
 for Projection**

  
 Reg. U. S. Pat. Off.  
**PH22.24-1952**  
 Revision of  
 Z22.24-1941,  
 Z22.25-1941, and  
 Z52.20-1944  
 \*UDC 778.55

Page 1 of 2 pages

**Scope**

Splices made in accordance with this standard are primarily for use with films intended for actual projection, such as release prints and reversal films. It is not intended that this standard be prejudicial to the use of diagonal-type splicers, nor to the use of narrower splices for professional purposes. For negatives and other laboratory films, narrower splices, sometimes with one edge on the frameline, frequently are used.



Dimension	Inches	Millimeters
A	0.100 $\begin{matrix} +0.000 \\ -0.005 \end{matrix}$	2.54 $\begin{matrix} +0.00 \\ -0.13 \end{matrix}$
B	0.548 $\begin{matrix} +0.001 \\ -0.001 \end{matrix}$	13.920 $\begin{matrix} +0.025 \\ -0.025 \end{matrix}$
C	0.324 $\begin{matrix} +0.000 \\ -0.003 \end{matrix}$	8.23 $\begin{matrix} +0.00 \\ -0.08 \end{matrix}$
D	0.324 $\begin{matrix} +0.000 \\ -0.003 \end{matrix}$	8.23 $\begin{matrix} +0.00 \\ -0.08 \end{matrix}$

**Note 1:** In the plan view, the splice is arranged with the perforations at the bottom in order to show them as they appear on most splicers. The splice may be made with the film turned through an angle of 180 degrees, or any other angle, but, of course, the emulsion surface should always be up. It is customary to scrape the top (emulsion) surface of the left-hand film and to cement this scraped area to the bottom (base) surface of the right-hand film.

*(Continued)*

Approved April 30, 1952, by the American Standards Association, Incorporated  
 Sponsor: Society of Motion Picture and Television Engineers

\*Universal Decimal Classification

Copyright, 1952, by American Standards Association, Inc.; reprinted by permission of the copyright holder.

American Standard  
Splices for  
16-Millimeter Motion Picture Films  
for Projection

  
Reg. U. S. Pat. Off.

PH22.24-1952

Page 2 of 2 pages

**Note 2:** Dimension A is given a negative, but no positive, tolerance because narrower splices are less conspicuous on the screen and are less likely to affect the normal curvature of the film as it follows the bends in its path through cine-machinery.

**Note 3:** Dimension B controls the longitudinal registration of the two films being spliced. It is measured to the perforations that are most commonly used for registration on splicing blocks, and to the nearer edges of these perforations because they are edges that are generally used for the registration. This dimension is made the same as in the American Standard Splices for 8-Millimeter Motion Picture Films, PH22.77-1952, because many splicers are designed to accept either 16- or 8-mm film.

The nominal value of the B dimension was made 0.548 inch instead of the usual 0.550 (for unshrunk film) because the films being spliced are always shrunk to some extent. The 0.548 figure corresponds to a shrinkage of 0.36 percent, while the 0.549 and 0.547 values, permitted by the tolerances, correspond to 0.18 percent and 0.55 percent, respectively. Thus, the tolerances include the range of shrinkage ordinarily encountered when film is being spliced.

**Note 4:** Dimensions C and D were chosen to give a straight 0.100-inch splice that is symmetrical about the included perforation (and, therefore, the frame-line) when the film is shrunk 0.36 percent. (See Note 3.)

**Note 5:** The width of the film at the splice shall not exceed 0.630 inch. If the film has been widened during scraping, the extra width shall be removed.

**Note 6:** The overlapping perforations of the two films shall not be offset laterally more than 0.002 inch.

**Note 7:** At the splice, the edges of the two spliced films shall not be offset laterally more than 0.002 inch, unless a difference in the lateral shrinkages of the two strips makes it impossible to maintain that tolerance. Shoulders formed by such misalignment shall be beveled after the cement has dried.

**Note 8:** In the plan view, the angle between the respective edges of the spliced films shall be 180 degrees, plus or minus 40 minutes. 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 0.006 inch (approximately the thickness of the film) in 6 inches.

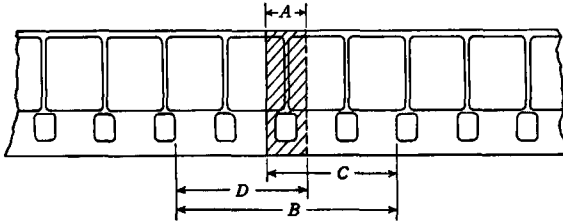
**Note 9:** In order to prevent the appearance of a white line on the screen, the scraped area shall be 0.001 to 0.003 inch narrower than the area covered by the overlapping film. The presence of this narrow uncemented area will not shorten the life of the splice.

American Standard  
Splices for  
8-Millimeter Motion Picture Films

**ASA**  
Reg. U. S. Pat. Off.  
**PH22.77-1952**

\*UDC 778.55

Page 1 of 2 pages



Dimension	Inches	Millimeters
A	0.100 <sup>+0.000</sup> -0.005	2.54 <sup>+0.00</sup> -0.13
B	0.548 <sup>+0.001</sup> -0.001	13.920 <sup>+0.025</sup> -0.025
C	0.324 <sup>+0.000</sup> -0.003	8.23 <sup>+0.00</sup> -0.08
D	0.324 <sup>+0.000</sup> -0.003	8.23 <sup>+0.00</sup> -0.08

**Note 1:** In the plan view, the splice is arranged with the perforations at the bottom in order to show them as they appear on most splicers. The splice may be made with the film turned through an angle of 180 degrees, or any other angle, but, of course, the emulsion surface should always be up. It is customary to scrape the top (emulsion) surface of the left-hand film and to cement this scraped area to the bottom (base) surface of the right-hand film.

**Note 2:** Dimension A is given a negative, but no positive, tolerance because narrower splices are less conspicuous on the screen and are less likely to affect the normal curvature of the film as it follows the bends in its path through cine-machinery. (Continued)

Approved April 30, 1952, by the American Standards Association, Incorporated  
Sponsor: Society of Motion Picture and Television Engineers

\*Universal Decimal Classification

Copyright, 1952, by American Standards Association, Inc., reprinted by permission of the copyright holder.

American Standard  
Splices for  
8-Millimeter Motion Picture Films

  
Reg. U. S. Pat. Off.  
PH22.77-1952

Page 2 of 2 pages

**Note 3:** Dimension B controls the longitudinal registration of the two films being spliced. It is measured to the perforations that are most commonly used for registration on splicing blocks, and to the nearer edges of these perforations because they are edges that are generally used for the registration. This dimension is made the same as in the American Standard Splices for 16-Millimeter Motion Picture Films for Projection, PH22.24-1952, because many splicers are designed to accept either 8- or 16-mm film.

The nominal value of the B dimension was made 0.548 inch instead of the usual 0.550 (for unshrunk film) because the films being spliced are always shrunk to some extent. The 0.548 figure corresponds to a shrinkage of 0.36 percent, while the 0.549 and 0.547 values, permitted by the tolerances, correspond to 0.18 percent and 0.55 percent, respectively. Thus, the tolerances include the range of shrinkage ordinarily encountered when film is being spliced.

**Note 4:** Dimensions C and D were chosen to give a 0.100-inch splice that is symmetrical about the included perforation (and, therefore, the frame-line) when the film is shrunk 0.36 percent. (See Note 3.)

**Note 5:** The width of the film at the splice shall not exceed 0.317 inch. If the film has been widened during scraping, the extra width shall be removed.

**Note 6:** The overlapping perforations of the two films shall not be offset laterally more than 0.002 inch.

**Note 7:** At the splice, the edges of the two spliced films shall not be offset laterally more than 0.002 inch, unless a difference in the lateral shrinkages of the two strips makes it impossible to maintain that tolerance. Shoulders formed by such misalignment shall be beveled after the cement has dried.

**Note 8:** In the plan view, the angle between the respective edges of the spliced films shall be 180 degrees, plus or minus 40 minutes. 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 0.006 inch (approximately the thickness of the film) in 6 inches.

**Note 9:** In order to prevent the appearance of a white line on the screen, the scraped area shall be 0.001 to 0.003 inch narrower than the area covered by the overlapping film. The presence of this narrow uncemented area will not shorten the life of the splice.