Standards

Standards Symbol Changed to PH

IT HAS BEEN ASA's practice to designate each related group of its various activities with a single letter symbol. The letter "Z" was reserved for those "miscellaneous" committees not considered large enough to warrant assignment of a separate symbol. The 30-year old Section Committee on Photography, Z38, has been in that category along with Sectional Committee on Motion Pictures Z22.

Phenomenal growth of interest in photographic standards in recent years has so expanded Z38 that it became too large to function efficiently under its old organization, so ASA and the committee members agreed to certain essential changes. Z38 was divided into four separate committees, which together with Z22 were then placed under the administration of a newly established Photographic Standards (Correlating) Committee. A new letter designation was established to cover the entire group. In view of the imminent need for a double-letter code system, the letter P, first proposed because it had not been used before, was expanded to PH and is now the common symbol for all sectional committees on photography. ASA has officially assigned the following designations to the following committees:

PH1 Films, Plates and Papers
PH2 Photographic Sensitometry
PH3 Photographic Apparatus
PH4 Photographic Processing
PH22 Motion Pictures

These changes in no way affect the scope or membership of the Sectional Committee on Motion Pictures, but change only the code numbers on all new standards. The first proposed standards to carry the new numbers follow in this issue.

Cutting and Perforating 32-Mm Film

TWO APPROVED American standards for cutting and perforating 32-mm film appear on the following pages. These standards were first published in the February, 1949, JOURNAL as proposals to elicit comments or criticisms. Since no adverse criticism was received, they were processed through the required channels and officially approved on October 6, 1950.

Although film of this type has been used commercially since 1934, there never has been a formal standard. During the intervening years a number of changes have been made in the dimensions. Debrie, who was the originator of the slit-film process for release printing, was aware that slitting of 32-mm film into two 16-mm widths might be inaccurate. This inaccuracy would make one half wider than the other half, and could cause trouble in the projector gate. Therefore, he made the original French film narrower than twice the width of 16-mm film. The first French film was about 1.252 in. in width. Manufacturers in this country made film of this width for some time but later

widened it by 0.005 in. to make it 1.257 in.

It appears that there have been four or five slightly different styles of perforating in use at various times. Values currently adopted for film width and for transverse pitch of the perforations are believed to be acceptable to all manufacturers. Differences between the present standards and the earlier dimensions are so slight, it is doubtful that the users can perceive them. Dimensions of the perforation, longitudinal pitch, and the like, are the same as those of current 16-mm film. Dimensioning of the drawings is consistent with the standards for 16-mm raw stock (Z22.5-1947 and Z22.12-1947).

16-Mm Projection Reels

PUBLICATION in the February, 1950, JOURNAL of a proposed complete revision of the American Standard for 16-Mm Projection Reels, Z22.11-1941, resulted in a number of comments. Consideration of these comments by the 16-Mm and 8-Mm Motion Pictures Committee, which developed this proposal, has led to recommendation of changes in dimensions R, S, and T, and in Note 7 (formerly Note 3). Although not apparent on the surface, the intent of these changes is to make possible the design of plastic reels within the standard dimensions. Because of the nature of these changes, the Standards Committee agreed that the revised proposal, as it appears on the following pages, should be republished for ninety days trial and criticism. Please send comments to Henry Kogel, Staff Engineer at Society Headquarters, before June 1, 1951.

Projection Lamps

PROPOSED STANDARDS for two types of projection lamps, developed by the 16-Mm and 8-Mm Motion Pictures Committee, appear on the following pages. They are published here for trial and criticism for a period of ninety days. Please forward any comments to Henry Kogel, Staff Engineer at Society headquarters, by June 1, 1951.

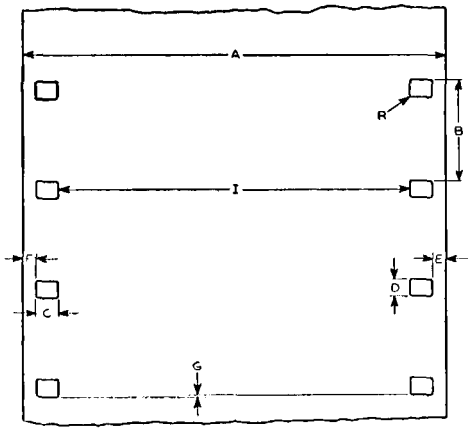
The first of these two proposals, PH 22.84, is entitled Dimensions for Projection Lamps, Medium Prefocus Ring Double-Contact Base-Up Type for 16-Mm and 8-Mm Motion Picture Projectors. It shows a type of base developed recently to provide improved filament positioning, better cooling, and easier replacement with the objective of making the lamp compatible with other recently refined projector elements. In a way, this design has been an ideal subject for standardization in that it is not yet in widespread use and consequently, once the general scheme was agreed upon, the Committee did not have to compromise because of existing practices. The base covered by the proposal is the subject of a patent assigned to the General Electric Company. However, after a search by the Society disclosed no other active patents on pertinent bases, rings or sockets, the General Electric Company agreed to dedicate this patent to the public, clearing the way for standardization.

The second proposed standard is for Dimensions for Projection Lamps, Medium Prefocus Base-Down Type for 16-Mm and 8-Mm Motion Picture Projectors, PH22.85. It will be recognized that lamps of this design have been in general use for many years; however, there has been no American Standard for the dimensions.

American Standard

Cutting and Perforating Dimensions for 32-Millimeter Sound Motion Picture Negative and Positive Raw Stock

ASA
Reg. U. S. Pat. Off.
PH22.71 – 1950
(Z22.71 – 1950)
*UDC 778.534.4



Dimensions	Inches	Millimeters
A	1.257 ± 0.001	31.93 ± 0.025
B*	0.300 ± 0.0005	7.620 ± 0.013
C	0.0720 ± 0.0004	1.83 ± 0.01
D	0.0500 ± 0.0004	1.27 ± 0.01
E	0.036 ± 0.002	0.91 ± 0.05
G	Not > 0.001	Not > 0.025
I	1.041 ± 0.002	26.44 ± 0.05
L**	30.00 ± 0.03	762.00 ± 0.76
R	0.010 ± 0.001	0.25 ± 0.025

These dimensions and tolerances apply to the material immediately after cutting and perforating.

* In any group of four consecutive perforations, the maximum difference of pitch shall not exceed 0.001 inch and should be as much smaller as possible.

** This dimension represents the length of any 100 consecutive perforation intervals.

Approved October 6, 1950, by the American Standards Association, Incorporated

Sponsor: Society of Motion Picture and Television Engineers

*Universal Decimal Classification

American Standard

Cutting and Perforating Dimensions for 32-Millimeter Sound Motion Picture Negative and Positive Raw Stock

ASA
Reg. U. S. Pat. Off.
PH22.71 – 1950
(Z22.71 – 1950)

Appendix

The dimensions given in this standard represent the practice of film manufacturers in that the dimensions and tolerances are for film immediately after perforation. The punches and dies themselves are made to tolerances considerably smaller than those given, but owing to the fact that film is a plastic material, the dimensions of the slit and perforated film never agree exactly with the dimensions of the punches and dies. Shrinkage of the film, due to change in moisture content or loss of residual solvents, invariably results in a change in these dimensions during the life of the film. This change is generally uniform throughout the roll.

The uniformity of perforation is one of the most important of the variables affecting steadiness of projection.

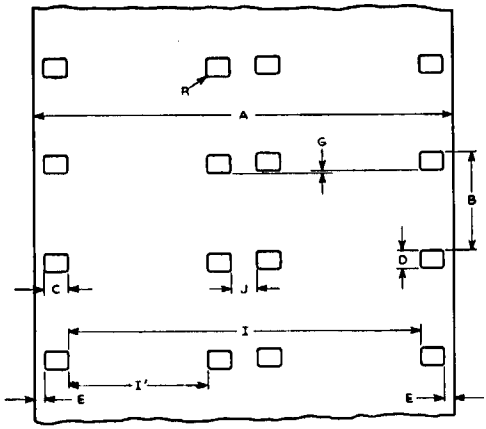
Variations in pitch from roll to roll are of little significance compared to variations from one sprocket hole to the next. Actually, it is the maximum variation from one sprocket hole to the next within any small group that is important. This is one of the reasons for the method of specifying uniformity in dimension B.

Thirty-two-millimeter release print stock is slit, after printing and developing, to 16-mm width. Since a possible error is involved in this slitting, the width of 32-mm film is made 0.001 inch narrower than twice the width of standard 16-mm film. This narrowing gives a tolerance of 0.001 inch in this secondary slitting operation. If the error of slitting exceeds this tolerance, one of the 16-mm halves may exceed the width allowed for 16-mm film and cause interference in the gate of a projector. In addition to errors of centering, there are errors caused by recurring variations in width. These errors will cause weave on the screen even though the maximum width of the film may not be great enough to cause interference in the projector gate.

American Standard

Cutting and Perforating Dimensions for 32-Millimeter Silent Motion Picture Negative and Positive Raw Stock

ASA
Reg. U. S. Pat. Off.
PH22.72 – 1950
(Z22.72 – 1950)
*UDC 778.5



Dimensions	Inches	Millimeters
A	1.257 ± 0.001	31.93 ± 0.025
B*	0.300 ± 0.0005	7.620 ± 0.013
C	0.0720 ± 0.0004	1.83 ± 0.01
D	0.0500 ± 0.0004	1.27 ± 0.01
E	0.036 ± 0.002	0.91 ± 0.05
G	Not > 0.001	Not > 0.025
I	1.041 ± 0.002	26.44 ± 0.05
I'	0.413 ± 0.001	10.490 ± 0.025
J	0.071 ± 0.001	1.803 ± 0.025
L**	30.00 ± 0.03	762.00 ± 0.76
R	0.010 ± 0.001	0.25 ± 0.025

These dimensions and tolerances apply to the material immediately after cutting and perforating.

* In any group of four consecutive perforations, the maximum difference of pitch shall not exceed 0.001 inch and should be as much smaller as possible.

** This dimension represents the length of any 100 consecutive perforation intervals.

Approved October 6, 1950, by the American Standards Association, Incorporated

Sponsor: Society of Motion Picture and Television Engineers

*Universal Decimal Classification

American Standard

Cutting and Perforating Dimensions for 32-Millimeter Silent Motion Picture Negative and Positive Raw Stock

ASA

Reg. U. S. Pat. Off.

PH22.72 – 1950

(Z22.72 – 1950)

Appendix

The dimensions given in this standard represent the practice of film manufacturers in that the dimensions and tolerances are for film immediately after perforation. The punches and dies themselves are made to tolerances considerably smaller than those given, but owing to the fact that film is a plastic material, the dimensions of the slit and perforated film never agree exactly with the dimensions of the punches and dies. Shrinkage of the film, due to change in moisture content or loss of residual solvents, invariably results in a change in these dimensions during the life of the film. This change is generally uniform throughout the roll.

The uniformity of perforation is one of the most important of the variables affecting steadiness of projection.

Variations in pitch from roll to roll are of little significance compared to variations from one sprocket hole to the next. Actually, it is the maximum variation from one sprocket hole to the next within any small group that is important. This is one of the reasons for the method of specifying uniformity in dimension B.

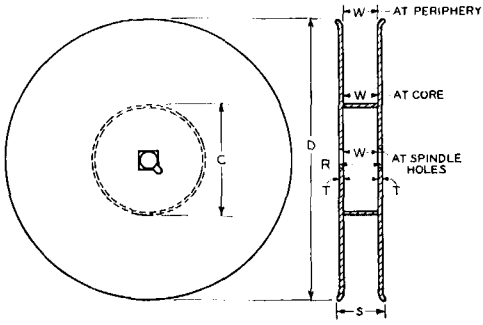
Thirty-two-millimeter release print stock is slit, after printing and developing, to 16-mm width. Since a possible error is involved in this slitting, the width of 32-mm film is made 0.001 inch narrower than twice the width of standard 16-mm film. This narrowing gives a tolerance of 0.001 inch in this secondary slitting operation. If the error of slitting exceeds this tolerance, one of the 16-mm halves may exceed the width allowed for 16-mm film and cause interference in the gate of a projector. In addition to errors of centering, there are errors caused by recurring variations in width. These errors will cause weave on the screen even though the maximum width of the film may not be great enough to cause interference in the projector gate.

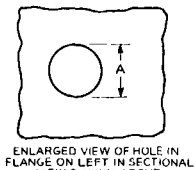
Proposed American Standard

16-Millimeter Motion Picture Projection Reels

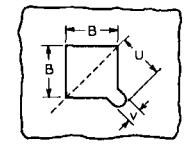
(Second Draft)

PH22.11
(Z22.11)





ENLARGED VIEW OF HOLE IN FLANGE ON LEFT IN SECTIONAL VIEW SHOWN ABOVE



ENLARGED VIEW OF HOLE IN FLANGE ON RIGHT IN SECTIONAL VIEW SHOWN ABOVE

TABLE 1

Dimension	Inches	Millimeters
A	0.319 $^{+0.000}_{-0.003}$	8.10 $^{+0.00}_{-0.08}$
B	0.319 $^{+0.000}_{-0.003}$	8.10 $^{+0.00}_{-0.08}$
R[1]	0.790 *maximum*	20.06 *maximum*
S[2] (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 ±0.016	7.92 ±0.41
V	0.125 $^{+0.005}_{-0.000}$	3.18 $^{+0.13}_{-0.00}$
W, at periphery[3]	0.660 $^{+0.045}_{-0.025}$	16.76 $^{+1.14}_{-0.64}$
at core[4]	0.660 ±0.010	16.76 ±0.25
at spindle holes	0.660 ±0.015	16.76 ±0.38
Flange and core concentricity[5]	±0.031	±0.79

See Notes on p. 3.

NOT APPROVED

Proposed American Standard

16-Millimeter Motion Picture Projection Reels

(Second Draft)

PH22.11
(Z22.11)

TABLE 2

Capacity	Dimension	Inches	Millimeters
200 Feet[6] (61 Meters)	D, nominal	5.000	127.00
	maximum	5.031	127.79
	minimum	5.000	127.00
	C, nominal	1.750	44.45
	maximum	2.000*	50.80*
	minimum	1.750	44.45
	Lateral run-out,[7] maximum	0.570	1.45
400 Feet[6] (122 Meters)	D, nominal	7.000	177.80
	maximum	7.031	178.59
	minimum	7.000	177.80
	C, nominal	2.500	63.50
	maximum	2.500	63.50
	minimum	1.750*	44.45*
	Lateral run-out,[7] maximum	0.080	2.03
800 Feet (244 Meters)	D, nominal	10.500	266.70
	maximum	10.531	267.49
	minimum	10.500	266.70
	C, nominal	4.875	123.83
	maximum	4.875	123.83
	minimum	4.500*	114.30*
	Lateral run-out,[7] maximum	0.120	3.05
1200 Feet (366 Meters)	D, nominal	12.250	311.15
	maximum	12.250	311.15
	minimum	12.125*	307.98*
	C, nominal	4.875	123.83
	maximum	4.875	123.83
	minimum	4.625*	117.48*
	Lateral run-out,[7] maximum	0.140	3.56
1600 Feet (488 Meters)	D, nominal	13.750	349.25
	maximum	14.000*	355.60*
	minimum	13.750	349.25
	C, nominal	4.875	123.83
	maximum	4.875	123.83
	minimum	4.625*	117.48*
	Lateral run-out,[7] maximum	0.160	4.06
2000 Feet (610 Meters)	D, nominal	15.000	381.00
	maximum	15.031	381.79
	minimum	15.000	381.00
	C, nominal	4.625	117.48
	maximum	4.875	123.83
	minimum	4.625	117.48
	Lateral run-out,[7] maximum	0.171	4.34

NOT APPROVED

Proposed American Standard

16-Millimeter Motion Picture Projection Reels

(Second Draft)

PH22.11
(Z22.11)

NOTES

* 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.

[1] The outer surfaces of the flanges shall be flat out to a diameter of at least 1.250 inches.

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

[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.

[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.

[5] This concentricity is with respect to the center line of the hole for the spindles.

[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.

[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.

APPENDIX

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.

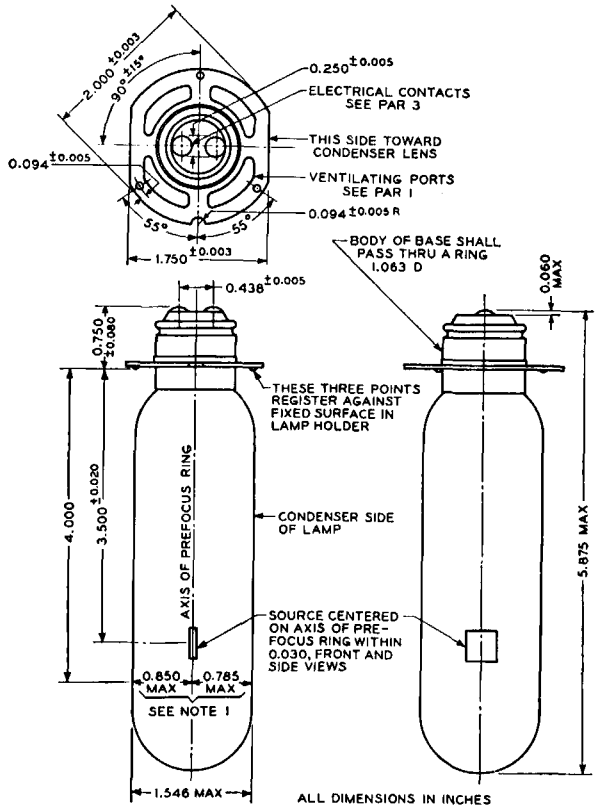
NOT APPROVED

Proposed American Standard

Dimensions for Projection Lamps Medium Prefocus Ring Double-Contact Base-Up Type

for 16-Mm and 8-Mm Motion Picture Projectors

PH22.84



1. Scope. The purpose of this standard is to establish, for the type of lamp shown, the dimensions essential to interchangeability of lamps in projectors. It is not intended to prescribe either operating characteristics or details of design such as the shape of the ventilation ports or method of attachment of the prefocus ring to the base.

2. Operating Position. Lamps of this type are intended to be burned with the axis in an essentially vertical position, and with the base at the top.

NOT APPROVED

Proposed American Standard

Dimensions for Projection Lamps Medium Prefocus Ring Double-Contact Base-Up Type for 16-Mm and 8-Mm Motion Picture Projectors

PH22.84

3. Electrical Contacts. The drawing indicates the area which the electrical members of the lamp holder should contact. It is not intended to dictate the shape of the terminals on the lamp. With lamps of this type, the prefocus ring is not an electrical contact.

Note 1. These dimensions define the maximum excursion of the bulb surfaces from the base axis toward the condensing lenses and the mirror at the points indicated when the lamp is inserted in a holder which rotationally positions the lamp as shown in the end view of the base. Condensing lenses, the mirror, and their mounts must therefore be so located as to insure adequate clearance between these parts and the bulb surface.

Note 2. For medium prefocus base-down projection lamps, see PH22.85.

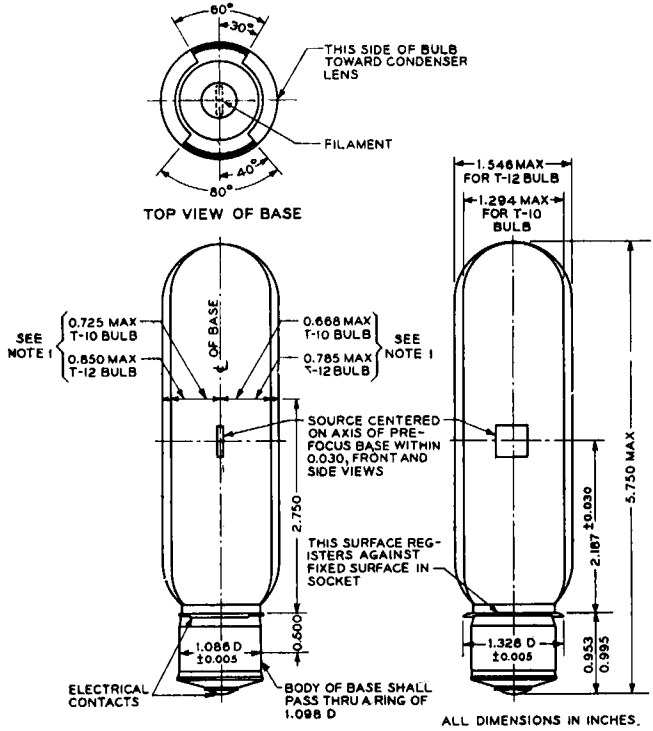
NOT APPROVED

Proposed American Standard

Dimensions for Projection Lamps Medium Prefocus Base-Down Type

for 16-Mm and 8-Mm Motion Picture Projectors

PH22.85



1. Scope. The purpose of this standard is to establish, for the type of lamp shown, the dimensions essential to interchangeability of lamps in projectors. It is not intended to prescribe either operating characteristics or details of design.

2. Operating Position. Lamps of this type are intended to be burned with the axis in an essentially vertical position, and with the base at the bottom.

Note 1. These dimensions define the maximum excursion of the bulb surfaces from the base axis toward the condensing lenses and the mirror at the points indicated when the lamp is inserted in a holder which rotationally positions the lamp as shown in the end view of the base. Condensing lenses, the mirror, and their mounts must therefore be so located as to insure adequate clearance between these parts and the bulb surface.

Note 2. For medium prefocus ring double-contact base-up projection lamps, see PH22.84.

NOT APPROVED