

Seven American Standards

Published on the following pages are seven American Standards, which include revisions of three existing standards, approved by the American Standards Association on May 2, 1958:

PH22.28-1958 Focal Lengths and Markings of 35mm Motion-Picture Projection Lenses (Revision of Z22.28-1946)

PH22.73-1958 Dimensions for 35mm Motion-Picture Film, Perforated 32mm, 2R-2994 (Revision of PH22.73-1951)

PH22.87-1958 100-Mil Magnetic Coating on 16mm Film, Perforated One Edge (Revision of PH22.87-1953)

PH22.89-1958 Scene-Change Cueing for Printing 16mm Motion-Picture Film

PH22.108-1958 Four Magnetic Sound Records on 35mm Film

PH22.111-1958 Picture and Sound Apertures for Continuous Contact Printers for 35mm Release Prints With Photographic Sound

PH22.112-1958 Picture-Sound Separation in 16mm Magnetic Sound Projectors

A history of the development of the above-mentioned standards accompanied their trial publication in the *Journals* indicated below:

PH22.108 — January 1957

PH22.73 and PH22.87 — February 1957

PH22.111 — March 1957

PH22.89 and PH22.112 — April 1957

PH22.28 — May 1957

All but three standards, PH22.28, -.87 and -.112, have been modified since their trial publication. PH22.73 has been changed considerably to bring it into conformance with other film dimension standards. Paragraph 1.1 of PH22.108 has been modified for clarification of scope and paragraph 1.3 of PH22.111 is an addition to the scope not appearing in the previously published proposal. The millimeter value for dimension C in PH22.89 has been rounded off to be consistent with other standards.

— *J. Howard Schumacher, Staff Engineer*

<p>American Standard</p> <h3 style="text-align: center;">Focal Lengths and Markings of 35mm Motion-Picture Projection Lenses</h3>	<p style="text-align: right;">ASA Reg. U.S. Pat. Off. PH22.28-1958 Revision of Z22.28-1946 *UDC 778.55</p>
<p style="text-align: center;">1. Scope</p> <p>1.1 This standard specifies for the lenses used in 35mm motion-picture projectors:</p> <p>(1) The increments in the focal length of lenses up to 7 inches in focal length (see Appendix).</p> <p>(2) The permissive tolerance between actual and designated focal length.</p> <p>(3) The marking on the lenses.</p>	<p style="text-align: center;">2. Focal Length</p> <p>2.1 The focal length of lenses up to 7 inches shall increase in ¼-inch steps (see Appendix for increments above 7 inches).</p> <p>2.2 The actual focal length shall not differ from the value marked on the lens by more than ± 1 percent.</p> <p style="text-align: center;">3. Marking</p> <p>3.1 The focal length of the lens shall be marked on the lens barrel.</p>
<p>APPENDIX</p> <p>(This Appendix is not a part of the American Standard Focal Lengths and Markings of 35mm Motion-Picture Projection Lenses, PH22.28-1958, but is included to facilitate its use.)</p> <p>Practices on lenses greater than 7 inches in focal length differ with the different manufacturers. The increments are either ¼-inch or ½-inch steps, depending on the manufacturer.</p>	
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<p>American Standard</p> <h3 style="text-align: center;">100-Mil Magnetic Coating on 16mm Film, Perforated One Edge</h3>	<p style="text-align: right;">ASA Reg. U.S. Pat. Off. PH22.87-1958 Revision of PH22.87-1953 *UDC 778.554.4</p>												
<p style="text-align: center;">1. Scope</p> <p>1.1 This standard specifies the location and dimensions of the magnetic coating applied to 16mm motion-picture film with perforations along one edge. This film is used for both picture and sound.</p> <p style="text-align: center;">2. Dimensions and Location</p> <p>2.1 The dimensions shall be as given in the diagram and table.</p> <p>2.2 The magnetic coating shall be on the side of the film toward the lamp on a projector arranged for direct projection on a reflection-type screen.</p> <p>NOTE: The balance stripe is optional and may be a magnetic coating or another material of the same thickness.</p>													
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Dimension</th> <th style="text-align: center;">Inches</th> <th style="text-align: center;">Millimeters</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">A</td> <td style="text-align: center;">0.100 + 0.005 - 0.000</td> <td style="text-align: center;">2.54 + 0.13 - 0.00</td> </tr> <tr> <td style="text-align: center;">B</td> <td style="text-align: center;">0.005 max</td> <td style="text-align: center;">0.13 max</td> </tr> <tr> <td style="text-align: center;">C</td> <td style="text-align: center;">0.628 nom</td> <td style="text-align: center;">16 nom</td> </tr> </tbody> </table>		Dimension	Inches	Millimeters	A	0.100 + 0.005 - 0.000	2.54 + 0.13 - 0.00	B	0.005 max	0.13 max	C	0.628 nom	16 nom
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American Standard
Dimensions for
35mm Motion-Picture Film,
Perforated 32mm, 2R-2994

ASA
Reg. U.S. Pat. Off.
PH22.73-1958
Revision of
PH22.73-1951
UDC 778.58

Page 1 of 2 pages

1. Scope

1.1 This standard specifies the dimensions of 35mm motion-picture film having two rows of 16mm type perforations, one near each edge of the 35mm film.

2. Dimensions

2.1 The dimensions shall be as given in the diagram and table.

2.2 These dimensions pertain to a safety film with low-shrinkage characteristics as defined in Appendix 2.

2.3 These dimensions apply to material immediately after cutting and perforating.

2.4 Dimension L represents the length of any 100 consecutive perforation intervals.

Dimension	Inches	Millimeters
A	1.377 ± 0.001	34.98 ± 0.03
B	0.2994 ± 0.0005	7.605 ± 0.013
C	0.0720 ± 0.0004	1.829 ± 0.010
D	0.0500 ± 0.0004	1.270 ± 0.010
E	0.096 ± 0.002	2.44 ± 0.05
F	1.041 ± 0.002	26.44 ± 0.05
G	0.001 max	0.025 max
L	29.94 ± 0.03	760.5 ± 0.8
R	0.010 ± 0.001	0.25 ± 0.03

NOTES

1. The dimensions in the inch system are the fundamental standard. The dimensions in the metric system are practical approximations based on American Standard Inch-Millimeter Conversion for Industrial Use, B48.1-1933, reaffirmed 1947, providing a conversion factor of 1 inch = 25.4 millimeters.

2. The title of this standard was established by the application of a nomenclature system developed for all film dimension standards. Each title provides an indication of the film width, the perforation pitch (without the decimal point) and the perforation shape (BH, KS, DH or CS) or number of rows of perforations (1R, 2R or 4R), depending on which is the significant factor.

3. The fundamental difference between this standard and its 1951 predecessor is in the decrease in the values for dimensions B and L, which were specified respectively as 0.3000 ± 0.0005 inch and 30.00 ± 0.03 inch.

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APPENDICES

(These Appendices are not a part of American Standard Dimensions for 35mm Motion-Picture Film, Perforated 32mm, 2R-2994, PH22.73-1958, but are included to facilitate its use.)

APPENDIX 1

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 since film is a plastic material, the dimensions of the slit and perforated film never agree exactly with the dimensions of the slitters, punches and dies. Film can shrink or swell due to loss or gain in moisture content or can shrink due to loss of solvent. These changes invariably result in changes in the dimensions during the life of the film. The change is generally uniform throughout a roll.

APPENDIX 2

For the purpose of this specification, low-shrink film base is film base which, when coated with emulsion and any other normal coating treatment, perforated, kept in the manufacturer's sealed container for six months, exposed, processed and stored exposed to air having a temperature of 65 F to 75 F, 18 C to 24 C, and a relative humidity of 50 percent to 60 percent, for not more than 30 days, and measured under like conditions of temperature and humidity, shall have shrunk not more than 0.2 percent from its original dimension at the time of perforating.

APPENDIX 3

This kind of 32mm film is made on 35mm stock so that it may be processed on 35mm sprocketless developing machines. It is designed for use in intermediate stages in the making of 16mm prints.

APPENDIX 4

To comply with 2.2 this film is made on safety base complying with American Standard Specifications for Safety Photographic Film, PH1.25-1956. Nitrate film should not be used because this film may be slit to the 16mm width and used on 16mm projectors with subsequent danger of fire.

APPENDIX 5

Films which after processing are intended to pass through a continuous contact printer in which the exposure is made over a cylindrical surface do not yield prints of maximum steadiness unless the actual pitch of the film curved to the smaller radius (the "negative") is slightly less than that of the film curved to the larger radius (the "print stock"). Since positive films in general are perforated to a nominal 0.3000-inch pitch and since negative-type films with low-shrinkage characteristics do not shrink enough for optimum pitch relationship with such positive films, the nominal 0.2994-inch pitch was developed for films to be used primarily as negatives for the subsequent production of prints. They also find other specialized uses.

APPENDIX 6

The uniformity of pitch, margin and hole size (dimensions B, C, D and E) is an important variable affecting steadiness. Variations in these dimensions, from hole to hole to the next within any small group of consecutive perforations that is important.

Page 2 of 2 pages

PH22.73-1958

Scene-Change Cueing for Printing 16mm Motion-Picture Film

Reg. U.S. Pat. Off.
PH22-89-1958
*UDC 778.58

1. Scope

1.1 This standard specifies the dimensions, location and nature of a scene-change cueing spot for actuating the printer light-change mechanism when printing 16mm motion-picture film.

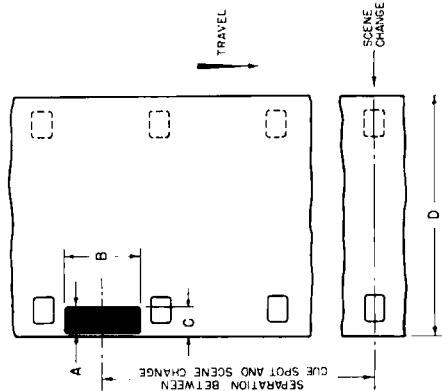
1.2 This standard is applicable to 16mm film with perforations along either one or both edges. The dotted perforations in the diagram indicate the edge which varies in this respect.

2. Dimensions and Location

2.1 The dimensions and location of the cueing spot shall be as given in the diagram and table.

2.2 The cueing spot shall be placed 12 1/2 frames after the scene change with respect to the direction of film travel through the printer

2.3 The cueing spot shall be placed on the emulsion side of the film.



Dimensions	Inches	Millimeters
A	0.070 max 0.065 min	1.78 max 1.65 min
B	0.225 max 0.190 min	5.72 max 4.83 min
C	0.080 max 0.075 min	2.03 max 1.91 min
D	0.628 nom	16 nom

3. Nature of Cueing Material

3.1 The cueing spot shall consist of an adhesive-backed metallic foil rounded at all four corners.

Four Magnetic Sound Records on 35mm Film

Reg. U.S. Pat. Off.
PH22-108-1958
*UDC 778.534.4

1. Scope

1.1 This standard specifies the locations and dimensions of four magnetic sound records on 35mm magnetic film, as determined by the lateral dimensions and position of the magnetic recording heads.

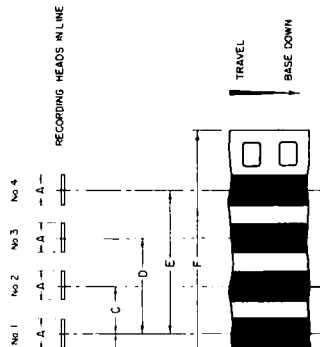
1.2 This standard relates the placement of the magnetic coating on the film to the direction of film travel.

2. Dimensions

2.1 The dimensions shall be as specified in the diagram and table.

3. Magnetic Coating

3.1 With the direction of film travel shown in the diagram, the magnetic coating shall be on the upper face of the film base.



Dimension	Inches	Millimeters
A	0.154 max 0.150 min	3.91 max 3.81 min
B	0.314 ± 0.002	7.98 ± 0.05
C	0.250 ± 0.002	6.35 ± 0.05
D	0.500 ± 0.002	12.70 ± 0.05
E	0.750 ± 0.002	19.05 ± 0.05
F	1.378 nom	35.00 nom

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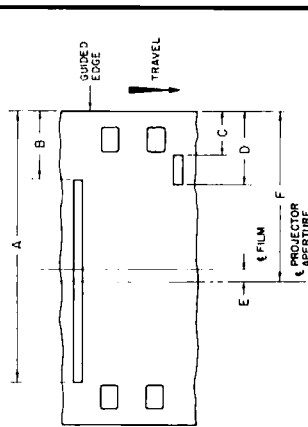
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American Standard
Picture and Sound Apertures for Continuous Contact Printers for 35mm Release Prints with Photographic Sound Records

ASA
 Reg. U.S. Pat. Off.
PH22.111-1958
 UDC 778.554

1. Scope
 1.1 This standard specifies the location and width dimensions of the picture and the sound apertures of continuous contact printers for making 35mm release prints with photographic sound records.
 1.2 This standard is applicable to the printing of motion-picture raw stock film which is cut and perforated in accordance with American Standard Dimensions for 35mm Motion-Picture Positive Raw Stock, PH22.36-1954, or the latest revision thereof approved by the American Standards Association, Incorporated.
 1.3 This standard refers to the adjustment of the printer, and is in accordance with American Standard Photographic Sound Record on 35mm Prints, PH22.40-1957.



2. Dimensions
 2.1 The dimensions shall be as specified in the diagram and Table I.

Note: The centesimal information given in Table II is not part of this standard and is provided as a convenient reference. These two dimensions are specified in American Standard Aperture for 35mm Sound Motion-Picture Projectors, PH22.58-1954.

Dimensions	Inches	Millimeters
A	1.184 ± 0.002	30.07 ± 0.05
B	0.304 ± 0.002	7.72 ± 0.05
C	0.192 ± 0.001	4.88 ± 0.03
D	0.308 ± 0.002	7.82 ± 0.05

Table 1

Dimensions	Inches	Millimeters
E	0.049	1.24
F	0.738 ± 0.002	18.75 ± 0.05

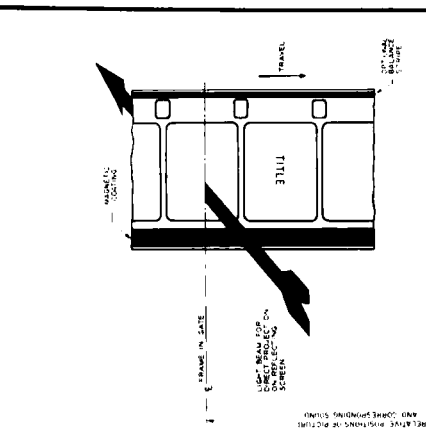
Table 2

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American Standard
Picture - Sound Separation in 16mm Magnetic Sound Projectors

ASA
 Reg. U.S. Pat. Off.
PH22.112-1958
 UDC 778.554.4

1. Scope
 1.1 This standard specifies the picture-sound separation of 16mm motion-picture film with perforations along one edge and with a magnetic sound record on a 100-mil width magnetic coating. (The magnetic coating is specified in American Standard Dimensions for 100-mil Magnetic Coating on Single-Perforated 16mm Motion-Picture Film, PH22.87-1953, or the latest revision thereof approved by the American Standards Association, Incorporated.)
 1.2 This standard specifies the location of the magnetic reproduce head in the projector.
 2. Picture-Sound Separation
 2.1 The magnetic sound record on the film shall precede the center of the corresponding picture by a distance of 28 frames.
 3. Location of Magnetic Reproduce Head
 3.1 The magnetic reproduce head shall be located 28 frames ahead of the picture aperture as measured with a film threaded in the projector in a normal manner. Thus, at any instant the sound corresponding to the picture frame being projected at that moment shall be reproduced from a point on the film which has passed the picture aperture 28 frames previously.



APPENDIX
 (This Appendix is not a part of the American Standard Picture-Sound Separation in 16mm Magnetic Sound Projectors, PH22.112-1958, but is included to facilitate its use.)
 When the projector contains an optical-photographic sound-reproduce system with the optical scan point 26 frames ahead of the picture aperture, the magnetic reproduce head is located two frames more distant from the picture aperture. Thus, a given point of the film will pass the optical scan point before reaching the magnetic head.

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