

# motion-picture standards

## Three Proposed American Standards

### PH22.108

A proposed American Standard, PH22.108, Four Magnetic Sound Records on 35mm Film, is published here for a three-month period of trial and comment.

This proposal was initiated by the Society's Sound Committee in October 1955 and was approved by this committee in August 1956 and by the Standards Committee in November 1956. It conforms to U.S. practice and is modeled after an international proposal developed at the June 1955 Stockholm meeting of International Standards Organization Technical Committee 36 on Cinematography.

All comments should be sent to Henry Kogel, SMPTE Staff Engineer, prior to April 15, 1957. If no adverse comments are received, this proposal will then be submitted to ASA Sectional Committee PH22 for further processing as an American Standard.—H.K.

### PH22.109 and PH22.110

Two Proposed American Standards, PH22.109, Dimensions for 16mm Motion-Picture Film, 1R-2994, and PH22.110, Dimensions for 16mm Motion-Picture Film, 2R-2994, are published here for a three-month period of trial and comment.

The general decrease in the shrinkage characteristics of films over the last few years required consequent modifications of long established cutting and perforating dimensions of certain films. PH22.93-1953, Dimensions for 35mm Motion-Picture Short-Pitch Negative Film, and PH22.73, Dimensions for 35mm Motion-Picture Film, Perforated 32mm, 2R-2994, are standards reflecting this condition in the area of 35mm films. In those standards the primary change was decreasing dimension B, the pitch of the perforations, and dimension L, the length of 100 perforations. In the 16mm proposals presented here, these same modifications have been made but, in addition, the nominal value of dimension A, the film width, has been decreased one

mil. This decrease in dimension A was necessitated by the fact that this low shrink film occasionally tended to stick in the aperture gate when subjected to high humidity conditions. This did not happen to film with the greater shrinkage characteristic since it normally shrank sufficiently to keep its maximum width below 0.630 in. (the projector gate width) regardless of moisture absorption under high humidity conditions.

With the addition of the positive tolerance, dimension A is specified in these proposals as 0.629 in. maximum. To preclude any disposition on the part of equipment manufacturers to decrease the width of the gate an appendix has been added which calls attention to the fact that the gate must continue to accommodate a film width of 0.630 in.

All comments should be sent to Henry Kogel, SMPTE Staff Engineer, prior to April 15, 1957. If no adverse comments are received, these proposals will then be submitted to ASA Sectional Committee PH22 for further processing as American Standards.—H.K.

Proposed American Standard

PH22.108

## Four Magnetic Sound Records on 35mm Film

### 1. Scope

**1.1** This standard specifies the lateral location and dimensions of the magnetic sound recording heads for recording four magnetic sound records on 35mm motion-picture film.

**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.

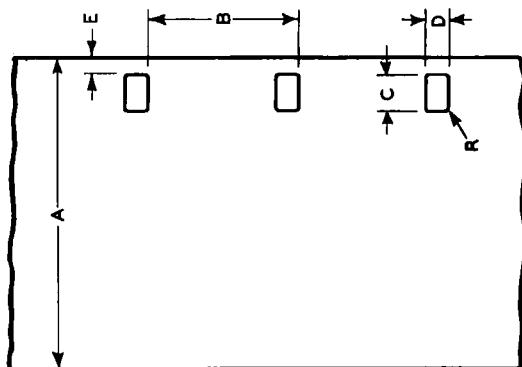
Dimension	Inches	Millimeters
A	0.154 max	3.91 max
	0.150 min	3.81 min
B	0.314 ± 0.002	7.98 ± 0.05
C	0.250 ± 0.002	6.35 ± 0.05
D	0.500 ± 0.002	12.70 ± 0.05
E	0.750 ± 0.002	19.05 ± 0.05
F	1.378 nom	35.00 nom

NOT APPROVED

# Dimensions for 16mm Motion-Picture Film, 1R-2994

PH22.109

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## 1. Scope

1.1 This standard specifies the cutting and perforating dimensions of 16mm motion-picture film with perforations along one edge.

1.2 These dimensions pertain to a safety film with low-shrinkage characteristics as defined in Appendix 1.

## 2. Dimensions

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

2.2 These dimensions apply to negative raw stock immediately after cutting and perforating.

2.3 In any group of four consecutive perforations, the maximum deviations from aim pitch shall be held to a value as much smaller than 0.001 in. as can be obtained. This is desirable because of the beneficial effect on steadiness thus realized.

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

Dimensions	Inches	Millimeters
A	0.628 ± 0.001	15.95 ± 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	0.0355 ± 0.0020	0.902 ± 0.051
L	29.94 ± 0.03	760.5 ± 0.08
R	0.010	0.25

## 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 B48.1-1933, reaffirmed in 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. This standard differs from American Standard PH22.12-1953, Dimensions for 16mm Film, Perforated One Edge, primarily in the values for dimensions A, B and L which are specified there respectively as 0.629 ± 0.001 in., 0.3000 ± 0.0005 in. and 30.00 ± 0.03 in. (See Appendices 2 and 4.)

## APPENDIX 1

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% to 60%, for not more than 30 days, and measured under like conditions of temperature and humidity, shall have shrunk not more than 0.2% from its original dimension at the time of perforating.

## APPENDIX 2

Experience shows that it is common for film to expand when exposed to high relative humidity. Allowance should be made for this factor in equipment

design and in no case should the equipment design fail to accommodate a film width of 16mm, 0.630 in.

## APPENDIX 3

To comply with §1.2, this film is made on safety base complying with American Standard PH1.25-1936,

Safety Photographic Film.

## APPENDIX 4

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

in. 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 in. pitch was developed for films to be used primarily as negatives for the subsequent production of prints. They also find other specialized uses.

# Dimensions for 16mm Motion-Picture Film, 2R-2994

## 1. Scope

1.1 This standard specifies the cutting and perforating dimensions of 16mm motion-picture film with perforations along two edges.

1.2 These dimensions pertain to a safety film with low-shrinkage characteristics as defined in Appendix 1.

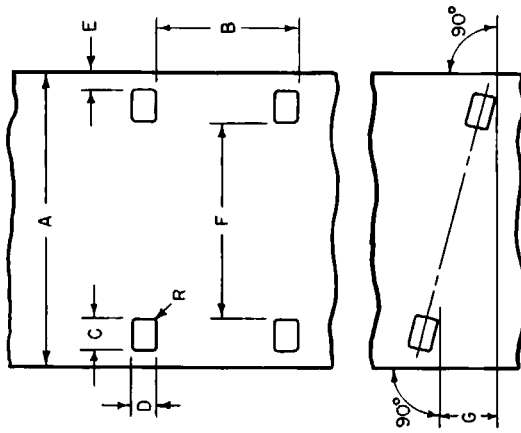
## 2. Dimensions

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

2.2 These dimensions apply to negative raw stock immediately after cutting and perforating.

2.3 In any group of four consecutive perforations, the maximum deviations from aim pitch shall be held to a value as much smaller than 0.001 in. as can be obtained. This is desirable because of the beneficial effect on steadiness thus realized.

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



Dimensions	Inches	Millimeters
A	0.628 ± 0.001	15.95 ± 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	0.0355 ± 0.0020	0.902 ± 0.051
F	0.413 ± 0.001	10.49 ± 0.03
G	0.001 max	0.025 max
L	29.94 ± 0.03	760.5 ± 0.08
R	0.010	0.25

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## 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 B48.1-1933, reaffirmed in 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. This standard differs from American Standard PH22.5-1953, Dimensions for 16mm Film, Perforated Two Edges, primarily in the values for dimensions A, B and L which are specified there respectively as 0.629 ± 0.001 in., 0.3000 ± 0.0005 in. and 30.00 ± 0.03 in. (See Appendices 2 and 4.)

## APPENDIX 1

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% to 60%, for not more than 30 days, and measured under like conditions of temperature and humidity, shall have shrunk not more than 0.2% from its original dimension at the time of perforating.

## APPENDIX 2

Experience shows that it is common for film to expand when exposed to high relative humidity. Allowance should be made for this factor in equipment design

and in no case should the equipment design fail to accommodate a film width of 16mm, 0.630 in.

## APPENDIX 3

To comply with ¶1.2, this film is made on safety base complying with American Standard PH1.25-1956,

Safety Photographic Film.

## APPENDIX 4

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

in. 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 in. pitch was developed for films to be used primarily as negatives for the subsequent production of prints. They also find other specialized uses.