AMERICAN STANDARD

# Dimensions for 35mm Motion-Picture Film, BH-1870

ASA
Reg. U.S. Pat. Off.
PH22.34-1956
(Revision of Z22.34-1949)
*UDC 778.534:771.531.3



## 1. Scope

**1.1** This standard specifies the cutting and perforating dimensions of the 35mm motion-picture film with a Bell & Howell type perforation and a perforation pitch of 0.1870 in.

**1.2** This film is used mostly as camera original or negative film.

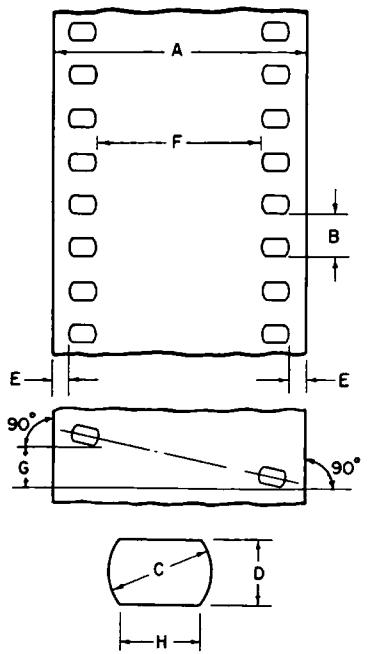
**1.3** Dimensionally, this standard differs from American Standard Dimensions for 35mm Motion-Picture Short-Pitch Negative Film, PH22.93-1953, only in the values of B and L.

## 2. Dimensions

**2.1** The dimensions shall be as given in the diagram and table and refer to the film immediately after cutting and perforating.

**2.2** Dimension H is a calculated value for a dimension not measured routinely in production.

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




| Dimensions | Inches | Millimeters |
|---|---|---|
| A | 1.377 ± 0.001 | 34.98 ± 0.03 |
| B | 0.1870 ± 0.0005 | 4.750 ± 0.013 |
| C | 0.1100 ± 0.0004 | 2.794 ± 0.010 |
| D | 0.0730 ± 0.0004 | 1.854 ± 0.010 |
| E | 0.079 ± 0.002 | 2.01 ± 0.05 |
| F | 0.999 ± 0.002 | 25.37 ± 0.05 |
| G | 0.001 max | 0.025 max |
| H | 0.082 | 2.08 |
| L | 18.700 ± 0.015 | 474.98 ± 0.38 |

Approved October 10, 1956 by the American Standards Association, Incorporated
Sponsor: Society of Motion Picture and Television Engineers

*Universal Decimal Classification

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ASA M1256

Price, 25 Cents

# Two American Standards, PH22.34, .102 — 1956

Published here are American Standards PH22.34–1956, Dimensions for 35mm Motion-Picture Film, BH-1870, and PH22.102-1956, Dimensions for 35mm Motion-Picture Film, CS-1870, which were approved by the American Standards Association on October 10, 1956.

PH22.34, a revision of Z22.34-1949, and PH22.102 had their trial publication in the November 1955 Journal. Subsequently, several editorial modifications of both standards were proposed and approved and are incorporated in these final drafts. These include a new title, an improved method of diagramming dimension G, a limiting scope, formal numbered specifications, two explanatory notes and a slight revision of the appendix.—Henry Kogel, Staff Engineer.



**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.

## APPENDIX

(This Appendix is not a part of American Standard Dimensions for 35mm Motion-Picture Film, BH-1870, PH22.34-1956, but is included to facilitate its use.)

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.

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 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 distance that is important.

AMERICAN STANDARD

# Dimensions for 35mm Motion-Picture Film, CS-1870

ASA
Reg. U.S. Pat. Off.

PH22.102-1956

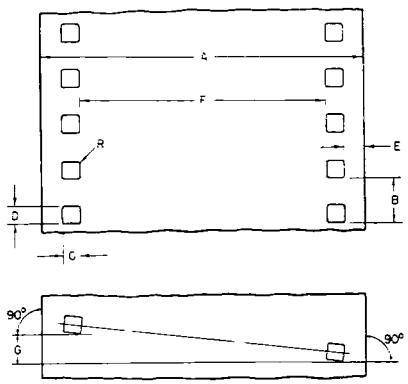
*UDC 778.534:771.531.3



## 1. Scope

**1.1** This standard specifies the cutting and perforating dimensions of the 35mm motion-picture film with a CinemaScope-type perforation and a perforation pitch of 0.1870 in.

**1.2** This film is used mostly for anamorphic release prints. (See Appendixes 2 and 3.)




## 2. Dimensions

**2.1** The dimensions shall be as given in the diagram and table and refer to the film immediately after cutting and perforating.

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

| Dimensions | Inches | Millimeters |
|---|---|---|
| A | 1.377 ± 0.001 | 34.98 ± 0.03 |
| B | 0.1870 ± 0.0005 | 4.750 ± 0.013 |
| C | 0.0780 ± 0.0004 | 1.981 ± 0.010 |
| D | 0.0730 ± 0.0004 | 1.854 ± 0.010 |
| E | 0.086 ± 0.002 | 2.18 ± 0.05 |
| F | 1.049 ± 0.002 | 26.64 ± 0.05 |
| G | 0.001 max | 0.025 max |
| L | 18.700 ± 0.015 | 474.98 ± 0.38 |
| R | 0.013 | 0.33 |

**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.

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(Appendixes 1, 2, and 3 are not a part of American Standard Dimensions for 35mm Motion-Picture Film, CS-1870, PH22.102-1956, 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 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.

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 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 distance that is important.

## APPENDIX 2

It should be particularly noted that film made to this standard will not fit over pins and sprocket teeth designed to fit film perforated to the following American Standards: Dimensions for 35mm Motion-Picture Film, Alternate Standards for Either Positive or Negative Raw Stock, PH22.1-1953; Dimensions for 35mm Motion-Picture Film, BH-1870, PH22.34-1956; Dimensions for 35mm Motion-Picture Positive Raw Stock, PH22.36-1954; Dimensions for 35mm Motion-Picture Short-Pitch Negative Film, PH22.93-1953.
The perforation hole size shown in the American Standards listed above is 0.073 x 0.110 in., except for PH22.36-1954 which has 0.078 x 0.110 in. holes, whereas, for this new standard, the hole size is 0.073 x 0.078 in. Films with holes of this size would be injured at the perforation edges when run on standard sprockets or pins carried by most 35mm film handling apparatus. New or modified sprockets and pins designed to accept the 0.073 x 0.078 in. hole, however, can be used in conjunction with film perforated to the other existing 35mm motion-picture film standards.

The wear life of film perforated in this manner should be nearly equal to that of film having other standard perforations. Experience has shown, however, that the wear life obtained with these perforations, as well as that obtained with other standard types of perforations, can be greatly extended by the use of intermittent sprockets having a base diameter of 0.950 in. to 0.953 in. in place of sprockets of lesser diameter.

## APPENDIX 3

Most 35mm motion-picture films produced prior to 1954 were perforated with two rows of perforations, each perforation being 0.110 x 0.078 in. for positive film or 0.110 x 0.073 in. for negative film or both. Such film, in addition to carrying the picture, accommodates a single sound record between one row of perforations and the picture frame. The desire to reproduce multichannel sound on the same film that carries the picture image, and yet not reduce the image size, led to the use of smaller perforations on positive film. Films perforated to this smaller perforation standard have wider margins (dimension E) and wider usable film areas between the rows of perforations than positive films perforated to American Standards PH22.1-1953 and PH22.36-1954. This permits the placement of a magnetic coating for the multichannel sound record along both edges just outside the perforations and along both sides of the picture just inside the perforations.