

# Who's Who on the Board of Editors 1981-1982

Calvin M. Hotchkiss, *Chairman\**

**Michael Barlow**—Supervising Engineer for the Canadian Broadcasting Corporation, Barlow was born in England, attended Cambridge University, moved to Canada and became a Canadian citizen in 1964. He joined the SMPTE in 1958 and was made a Fellow in 1967. He was Topic Chairman (Television) for the 110th Technical Conference in Montreal. An organizer of the Montreal Section, he served a term as Section Chairman. He resides in Montreal.

**K. Blair Benson**—A member of the SMPTE since 1959 and a Fellow since 1961, he served as Editorial Vice-President from 1976 until the end of 1980. He has also served as Vice-President of Television Affairs and on the Board of Governors. He held various technical and managerial posts with CBS beginning in 1948. In 1972 he joined Goldmark Communications Corp.; and in 1977 he joined the Video Corp. of America, where he holds the post of Vice-President of Engineering and Technical Operations. He resides in Norwalk, Conn.

**Edward J. Blasko**—In 1977 he was the recipient of the Citation for Outstanding Service to the Society. He joined the Society in 1965 and has contributed to the work of the Hollywood, Pacific Northwest, Rochester and Chicago Sections. He is currently stationed in Oak Brook, Ill., where he is Engineering Coordinator for Eastman Kodak Co. He has held various posts with Eastman Kodak since his graduation from the University of Rochester in 1965.

\*See biographical note in *SMPTE Journal*, 90:127, Feb. 1981

**Lincoln L. Endelman**—A Fellow of the SMPTE, Endelman is Vice-President for Photonic Affairs. He has been the Manager of Test Equipment Engineering Aerospace Systems, Perkin-Elmer, for more than 15 years. He was the U.S.A. delegate to the International High-Speed Congresses of 1976 and 1978. He resides in San Jose, Calif.

**Herbert E. Farmer**—A Fellow of SMPTE and a member since 1943, Farmer is Professor of Cinema at the University of Southern California's Division of Cinema and Television. In 1976 he received the Eastman Kodak Gold Medal Award for his achievements in the advancement of education for motion picture production. He is the Society's Vice-President for Motion Picture Affairs.

**Leonard A. Green**—A Fellow of the SMPTE, Green is Chief of Operations for the National Film Board of Canada. He is Chairman of the SMPTE Sound Subcommittee on Time Codes, a member of ISO TC/36 on Sound and Chairman of the PWG-3 Subcommittee on Time Codes. He has served also as Manager of the Toronto Section and has published papers on film and videotape recording. He lives at Pierrefonds, P.Q., Canada.

**Raymond L. Hallows, Jr.**—became a student member of the SMPTE in 1949 and a full fledged member in 1953, following graduation from the University of Cincinnati. He is a charter member of the Philadelphia Section and has served as the Section's Membership Chairman. He is currently employed as Senior Engineer for

Advanced Technology Systems. He resides on Cold Soil Road, in Princeton, N.J.

**William D. Hedden**—President of the SMPTE for the 1977-1978 term, a member of the SMPTE since 1943 and a Fellow since 1961, Hedden has held a number of offices in the Society. He has been Executive Vice-President, Sections Vice-President, a member of the Board of Governors, Sections Vice-President and a Manager of the Chicago Section. He has also served on a number of SMPTE Committees. He was graduated from Purdue University in 1940 with a B.S. in Chemical Engineering. He is currently Vice-President of Calvin Communications in Kansas City, Mo.

**Julian Hopkinson**—Following service in the British Royal Air Force during World War II, Hopkinson joined the overseas staff of British Petroleum in Iran where he developed his interest in Industrial Cinematography and Photography. He came to the United States in 1960, where he is currently Technical Manager of Agfa-Gevaert. A Fellow of the SMPTE, he was a Topic Chairman (Photosensitive Materials for Motion Picture and TV Practices) for the 112th Conference, Associate Program Chairman for the 115th, Program Chairman for the 117th, and Topic Chairman (International Liaison) for the 121st. He is currently Treasurer of the SMPTE.

**Arthur Kaiser**—A member of the SMPTE since 1969, Kaiser is the Associate Director of Advanced Television Development at CBS Technology Center in Stamford, Conn. He joined CBS in 1958 and is a reg-

*continued on page 294*

## Standards & Recommended Practices

### Approved American National Standards

Revisions of three American National Standards were approved by the American National Standards Institute on September 23, 1980: ANSI PH22.93-1980, Dimensions for 35mm Motion Picture Film Perforated BH; ANSI PH22.102-1980, Dimensions for 35mm Motion Picture Film, CS-1870; and ANSI PH22.139-1980, Dimensions for 35mm Motion Picture Film Perforated KS.

Copies of the standards may be obtained for a nominal fee from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

### Approved SMPTE Recommended Practices

Two SMPTE Recommended Practices were approved by the Society's Board of Governors on June 25, 1980: RP 92-1980, Specifications for Audio Level and Multifrequency Test Films for 8mm Type S Sound Reproducers, Magnetic Type; and RP 93-1980, Requirements for Recording American National Standard Time and Control Code on I-in Types B and C Helical-Scan Video Tape Recorders.

SMPTE Recommended Practices are available from Society Headquarters for \$1.50 each.

# American National Standard dimensions for 35-mm motion-picture film perforated BH

Approved September 23, 1980  
Secretariat: Society of Motion Picture and Television Engineers

## 1. Scope

This standard specifies the cutting and perforating dimensions for 35-mm motion-picture film with a BH-type perforation and a perforation pitch of either 0.1866 or 0.1870 in (4.740 or 4.750 mm).

## 2. Dimensions

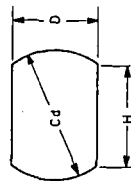
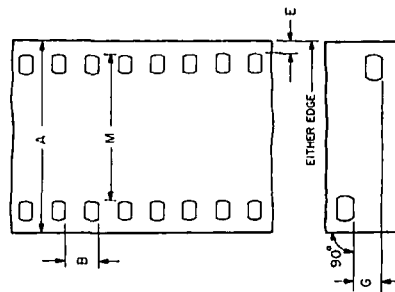
2.1 The dimensions shall be as given in the figure and table.

2.2 The dimensions pertain to a safety film as defined in American National Standard Specifications for Motion-Picture Safety Film, ANSI PH22.31M-1980.

2.3 The dimensions apply at the time of cutting and perforating for film adjusted to a temperature of  $23 \pm 1^\circ\text{C}$  (nominally converted to  $73 \pm 2^\circ\text{F}$ ) and a relative humidity of  $50 \pm 2$  percent. The manufacturer may indicate other nominal temperature and humidity conditions under which the dimensions apply.

2.4 Dimension H is a calculated value.

Page 1 of 2 pages



Dimensions	Inches	Millimeters
A Film width	1.377 ± 0.001	34.975 ± 0.025
B Perforation pitch (long)	0.1870 ± 0.0004	4.750 ± 0.010
B' Perforation pitch (short)	0.1866 ± 0.0004	4.740 ± 0.010
C <sub>1</sub> Perforation width (diameter)	0.1100 ± 0.0004	2.794 ± 0.010
D Perforation height	0.0730 ± 0.0004	1.854 ± 0.010
E Edge to perforation	0.079 ± 0.002	2.01 ± 0.05
G Perforation misalignment	0.001 max	0.03 max
H Perforation chord width (BH perforation)	0.082 calculated	2.08 calculated
L 100 consecutive perforation pitches (long)	18.700 ± 0.015	474.98 ± 0.38
L' 100 consecutive perforation pitches (short)	18.660 ± 0.015	473.96 ± 0.38
M Lateral perforation displacement	1.109 ± 0.001	28.17 ± 0.03

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of publication. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute. Printed in USA.

**ANSI** American National Standards Institute, 1430 Broadway, New York, N.Y. 10018  
Reprinted with permission of the Society of Motion Picture and Television Engineers.

Page 2 of 2 pages

NOTE 1: 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, a code designation for the perforation shape (BH, KS, DH, or CS) or the number of rows of perforations (1R, 2R, etc.), depending upon which is the significant factor, or the perforation pitch without the decimal point.

NOTE 2: The metric conversion of Dimension A is purposely chosen and shown to three dimensional places to prevent the maximum width dimension from exceeding 35 mm.

## Appendix

(The Appendix is not a part of this American National Standard, but is included for information purposes only.)

A1. The user is reminded that, as a plastic, film can change dimensions temporarily due to moisture or temperature, or permanently due to solvent loss or strain effect.

A2. Film for positive use has a longitudinal pitch 0.2 percent longer than its companion negative. Shrinkage of the negative during aging and processing prior to printing will generally not exceed 0.2 percent. Thus, the negative stock is expected to be  $0.3 \pm 0.1$  percent shorter than the positive. This difference will minimize slippage between the two on the 12-in (305-mm) circumference sprocket of the printer, assuming a film thickness of 0.0055 to 0.0065 in (0.140 to 0.165 mm).

A3. The uniformity of pitch, hole size, and margin (Dimensions B, C<sub>1</sub>, 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 perforation to the next within any small group of consecutive perforations. As an example, the uniformity of the margin is uniquely critical for optical printing. During the printing process, the placement of the image on the film is usually with respect to successive lateral pairs of perforations at one-frame intervals. During subsequent projection, however, the portion of the image projected is usually located, not by these perforations, but by the edge of the film. The lateral steadiness of the projected image is, therefore, directly related to the frame-to-frame uniformity of the margin.

A4. For historical background on the development of this standard, refer to A. J. Miller and A. C. Robertson, "Motion-picture film—its size and dimensional characteristics," *Jour. SMPTE*, 74: 3-11, Jan. 1965.

PH22.93-1980

# American National Standard dimensions for 35-mm motion-picture film, CS-1870

Approved September 23, 1980  
Secretariat: Society of Motion Picture and Television Engineers

Page 1 of 2 pages

## 1. Scope

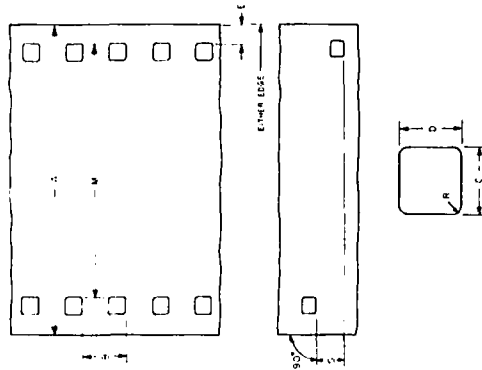
This standard specifies the cutting and perforating dimensions for 35-mm motion-picture film with a CS-type perforation and a perforation pitch of 0.1870 in (4.750 mm).

## 2. Dimensions

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

2.2 The dimensions pertain to a safety film as defined in American National Standard Specifications for Motion-Picture Safety Film, ANSI PH22.31M-1980.

2.3 The dimensions apply at the time of cutting and perforating for film adjusted to a temperature of  $23 \pm 1^\circ\text{C}$  (nominally converted to  $73 \pm 2^\circ\text{F}$ ) and a relative humidity of  $50 \pm 2$  percent. The manufacturer may indicate other nominal temperature and humidity conditions under which the dimensions apply.



Dimensions	Inches	Millimeters
A Film width	1.377 ± 0.001	34.975 ± 0.025
B Perforation pitch	0.1870 ± 0.0004	4.750 ± 0.010
C Perforation width	0.0780 ± 0.0004	1.981 ± 0.010
D Perforation height	0.0730 ± 0.0004	1.854 ± 0.010
E Edge to perforation	0.086 ± 0.002	2.18 ± 0.05
G Perforation misalignment	0.001 max	0.03 max
L 100 consecutive perforation pitches	18.700 ± 0.015	474.98 ± 0.38
M Lateral perforation displacement	1.127 ± 0.001	28.63 ± 0.03
R Radius of perforation fillet	0.013 ± 0.001	0.33 ± 0.03

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of publication. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute. Printed in USA

ANSI American National Standards Institute, 1430 Broadway, New York, N.Y. 10018  
Reprinted with permission of the Society of Motion Picture and Television Engineers.

Page 2 of 2 pages

NOTE 1: 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, a code designation for the perforation shape (BH, KS, DH, or CS) or the number of rows of perforations (1R, 2R, etc.), depending upon which is the significant factor, or the perforation pitch without the decimal point.

## Appendix

(The Appendix is not a part of this American National Standard, but is included for information purposes only.)

A1. The user is reminded that, as a plastic, film can change dimensions temporarily due to moisture or temperature, or permanently due to solvent loss or strain effect.

A2. Film for positive use has a longitudinal pitch 0.2 percent longer than its companion negative. Shrinkage of the negative during aging and processing prior to printing will generally not exceed 0.2 percent. Thus, the negative stock is expected to be  $0.3 \pm 0.1$  percent shorter than the positive. This difference will minimize slippage between the two on the 12-in (305-mm) circumference sprocket of the printer, assuming a film thickness of 0.0055 to 0.0065 in (0.140 to 0.165 mm).

A3. The uniformity of pitch, hole size, and margin (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 perforation to the next within any small group of consecutive perforations. As an example, the uniformity of the margin is uniquely critical for optical printing. During the printing process, the placement of the image on the film is usually with respect to successive lateral pairs of perforations at one-frame intervals. During subsequent projection, however, the portion of the image projected is usually located, not by these perforations, but by the edge of the film. The lateral steadiness of the projected image is, therefore, directly related to the frame-to-frame uniformity of the margin.

A4. Most 35-mm motion-picture films produced prior to 1954 were perforated with two rows of perforations, each perforation being  $0.110 \times 0.078$  in for positive film or  $0.110 \times 0.073$  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, without reducing 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 National Standard Dimensions for 35-mm Motion-Picture Film, DH-1870, ANSI PH22.1-1975; and American National Standard Dimensions for 35-mm Motion-Picture Film Perforated KS, ANSI PH22.139-1980. 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.

A5. It should be noted particularly that film made to this standard will not fit over pins and sprocket teeth designed to fit film perforated to the following American National Standards: Dimensions for 35-mm Motion-Picture Film, DH-1870, ANSI PH22.1-1975; Dimensions for 35-mm Motion-Picture Film Perforated KS, ANSI PH22.139-1980; and Dimensions for 35-mm Motion-Picture Film Perforated BH, ANSI PH22.93-1980.

The perforation hole size shown in the American National Standards listed above is  $0.073 \times 0.110$  in except for ANSI PH22.139-1980 which has  $0.078 \times 0.110$ -in holes. This standard, ANSI PH22.102-1980, has a hole size of  $0.073 \times 0.078$  in. Films with holes of this size would be damaged at the perforation edges when run on sprockets or pins of equipment designed for the larger holes. American National Standard Dimensions for 16-Tooth 35 mm Motion-Picture Projector Sprockets, ANSI PH22.35-1962 (R1976), describes projector sprockets suitable for any of the perforations listed, regardless of the perforation size.

A6. For historical background on the development of this standard, refer to A. J. Miller and A. C. Robertson, "Motion-picture film — its size and dimensional characteristics," Jour. SMPTE, 74: 3-11, Jan. 1965.

PH22.102-1980

# American National Standard dimensions for 35-mm motion-picture film perforated KS

Approved September 23, 1980  
Secretariat: Society of Motion Picture and Television Engineers

Page 1 of 2 pages

## 1. Scope

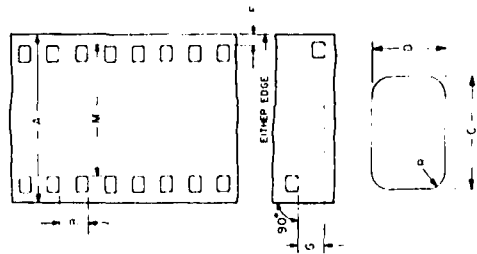
This standard specifies the cutting and perforating dimensions for 35-mm motion-picture film with a KS-type perforation and a perforation pitch of either 0.1866 or 0.1870 in (4.740 or 4.750 mm).

## 2. Dimensions

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

2.2 The dimensions pertain to a safety film as defined in American National Standard Specifications for Motion-Picture Safety Film, ANSI PH22.31M-1980.

2.3 The dimensions apply at the time of cutting and perforating for film adjusted to a temperature of  $23 \pm 1^\circ\text{C}$  (nominally converted to  $73 \pm 2^\circ\text{F}$ ) and a relative humidity of  $50 \pm 2$  percent. The manufacturer may indicate other nominal temperature and humidity conditions under which the dimensions apply.



Dimensions	Inches	Millimeters
A Film width	1.377 ± 0.001	34.975 ± 0.025
B Perforation pitch (long)	0.1870 ± 0.0004	4.750 ± 0.010
B' Perforation pitch (short)	0.1866 ± 0.0004	4.740 ± 0.010
C Perforation width	0.1100 ± 0.0004	2.794 ± 0.010
D Perforation height	0.0780 ± 0.0004	1.981 ± 0.010
E Edge to perforation	0.079 ± 0.002	2.01 ± 0.05
G Perforation misalignment	0.001 max	0.03 max
L 100 consecutive perforation pitches (long)	18.700 ± 0.015	474.98 ± 0.38
L' 100 consecutive perforation pitches (short)	18.660 ± 0.015	473.96 ± 0.38
M Lateral perforation displacement	1.109 ± 0.001	28.17 ± 0.03
R Radius of perforation fillet	0.020 ± 0.001	0.51 ± 0.03

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of publication. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute. Printed in USA

ANSI American National Standards Institute, 1430 Broadway, New York, N.Y. 10018  
Reprinted with permission of the Society of Motion Picture and Television Engineers.

Page 2 of 2 pages

NOTE 1: 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, a code designation for the perforation shape (BH, KS, DH, or CS) or the number of rows of perforations (1R, 2R, etc.), depending upon which is the significant factor, or the perforation pitch without the decimal point.

NOTE 2: The metric conversion of Dimension A is purposely chosen and shown to three decimal places to prevent the maximum width dimension from exceeding 35 mm.

## Appendix

(The Appendix is not a part of this American National Standard, but is included for information purposes only.)

A1. The user is reminded that, as a plastic, film can change dimensions temporarily due to moisture or temperature, or permanently due to solvent loss or strain effect.

A2. Film for positive use has a longitudinal pitch 0.2 percent longer than its companion negative. Shrinkage of the negative during aging and processing prior to printing will generally not exceed 0.2 percent. Thus, the negative stock is expected to be  $0.3 \pm 0.1$  percent shorter than the positive. This difference will minimize slippage between the two on the 12-in (305-mm) circumference sprocket of the printer, assuming a film thickness of 0.0055 to 0.0065 in (0.140 to 0.165 mm).

A3. The uniformity of pitch, hole size, and margin (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 perforation to the next within any small group of consecutive perforations. As an example, the uniformity of the margin is uniquely critical for optical printing. During the printing process, the placement of the image on the film is usually with respect to successive lateral pairs of perforations at one-frame intervals. During subsequent projection, however, the portion of the image projected is usually located, not by these perforations, but by the edge of the film. The lateral steadiness of the projected image is, therefore, directly related to the frame-to-frame uniformity of the margin.

A4. For historical background on the development of this standard, refer to A. J. Miller and A. C. Robertson, "Motion-picture film — its size and dimensional characteristics," Jour. SMPTE, 74: 3-11, Jan. 1965.