

American National Standard specifications for 8-mm type S model 1 motion-picture film camera cartridge, cartridge-camera interface and take-up core drive

Approved August 15, 1980

Secretariat: Society of Motion Picture and Television Engineers

1. Scope

This standard specifies the dimensions of the 8-mm Type S motion-picture film camera cartridge and cartridge-camera interface. Also specified are the dimensions of the take-up core drive opening and critical dimensions of the take-up core as well as the driving force, direction of drive, and recommended drive ratio.

2. Dimensions

- 2.1** The dimensions shall be as given in the figures and table.
- 2.2** The dimensions apply to an assembled cartridge with a film load at the time of manufacture.
- 2.3** Datum Planes B, C, and A are referred to as first, second, and third, respectively. These planes, which are used for dimensioning, are mutually perpendicular and are jointly called a datum reference frame.
- 2.3.1** Datum Plane A is coincident with the center of a circle, located on Plane B by the basic Dimension T. The circle is in contact with the edges of the locating slot defined by Dimensions A, O, P, and Q. The diameter of this circle is such that it applies regardless of a feature size (RFS) that it applies regardless of a feature size (RFS) (See Appendix A3.)
- 2.4** Datum Features B, C, and A are primary, secondary, and tertiary, respectively.

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2.4.1 Datum Feature B is the unnotched, unlabeled surface of the cartridge. It is the primary datum feature and relates the cartridge to the datum reference frame by having a minimum of three points contact the first datum plane, B.

2.4.2 Datum Feature C is the front seating surface of the cartridge. It is the secondary datum feature and relates the cartridge to the datum reference frame by having a minimum of two points contact the second datum plane, C.

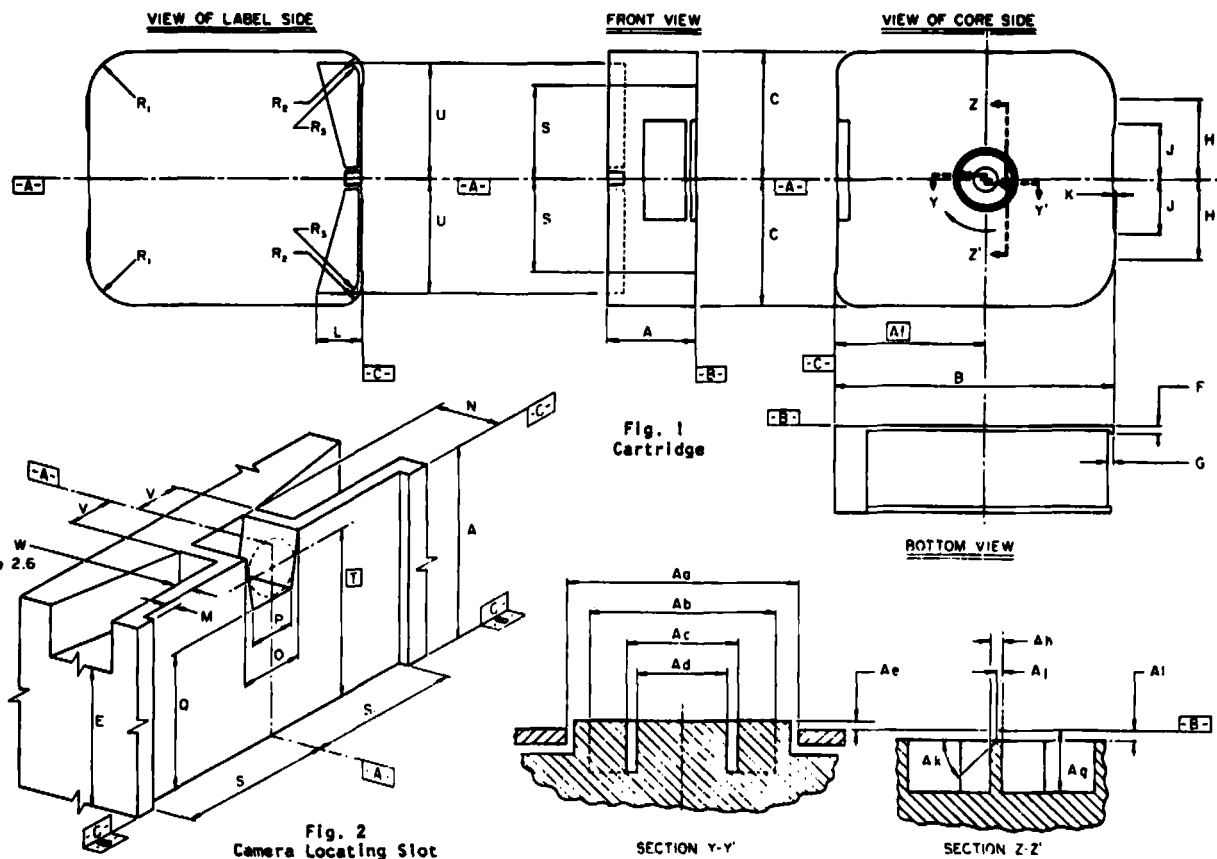
2.5 Dimensions L, M, N, R₁, U, V, and W, measured from Datum Planes A and C to the depth of Dimension E, as shown in the view of the label side, describe the extent of both triangular recessed areas. The inboard wall of the recessed area, defined by Dimensions L and N, shall be a smooth surface and may be fitted sufficiently from the perpendicular to Datum Plane B to allow proper release from a mold, when the cartridge is manufactured in a molding process.

2.6 The thickness of the wall of the cartridge used for notching, Dimension W in Fig. 2, shall be sufficient to withstand a force of at least 1 kgf or 2.2 lbf (10 N) while deflecting no more than 0.04 in (1 mm). (For purposes of measurement, the force is applied by a solid round pin of nominal 0.05-in (1.3-mm) diameter centered 0.03 in (0.8 mm) nominally above or below the film speed or filter notch coincident with Dimension T on Datum Feature C.)

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PH22.159.1-1980

American National Standard dimensions of magnetic striping of 8-mm type S motion-picture film

Approved August 15, 1980
Secretariat: Society of Motion Picture and Television Engineers

1. Scope

This standard specifies the location and dimensions of the magnetic recording stripe and the balance stripe applied to 8-mm motion-picture film with one row of 8-mm Type S perforations.

2. Dimensions

2.1 The location and dimensions of the magnetic recording stripe and the balance stripe shall be as given in the figure and table.

2.2 The magnetic stripe shall be on the side of the film which will be toward the light source when used on a projector arranged for direct front projection on a reflection-type screen.

2.3 The magnetic stripe shall be adjacent to the unperforated edge and is intended for the sound record. The narrow stripe adjacent to the perforated edge is a balance stripe. The balance stripe may be a stripe of magnetic or non-magnetic material of such thickness that the balance and recording stripes project above the surface of the film to substantially the same degree.

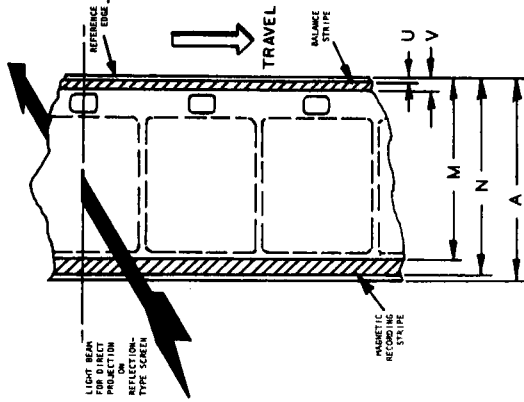
3. Film Stock

The film stock used shall be safety type, cut and perforated in accordance with American National Standard Dimensions for 8-mm Motion Picture Film Perforated 8-mm Type S (Super 8), IR, ANSI PH22.149-1975.

NOTE: Notwithstanding the tolerance on Dimensions M and N, the width of the stripe, Dimension N minus M, shall be 0.0250 in (0.635 mm) minimum.

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Film As Seen Looking Toward Lens

Dimensions	Inches	Millimeters
A	0.314	nom 7.98
M*	0.285 ± 0.002	7.24 ± 0.05
N*	0.312 ± 0.002	7.92 ± 0.05
U	0.003 ± 0.003	0.08 ± 0.08
V	0.015 ± 0.003	0.38 ± 0.08

*See Note.

2.9 The take-up core axis shall be located within 0.010 in (0.25 mm) of the true center formed by Datum Plane A and basic Dimension Af.

2.10 Dimensions Aa, Ab, Ac, and Ad are diameters.

3. Take-Up Core Drive

3.1 The direction of rotation for the core shall be clockwise when viewed from the core side of the cartridge.

3.2 After disengagement of any core anti-backup device, the cartridge shall operate with a nominal torque of 0.85 ounce-force inch with a permissible range of 0.5 to 1.5 ozf-in (6.0 x 10⁻³ to 10.6 x 10⁻³ N·m) with a permissible range of 3.5 x 10⁻³ to 10.6 x 10⁻³ N·m) as applied to the cartridge. (See Appendix A2.)

NOTE 1: Placement of the film data, such as name, number, length of load and inclusion of any notches, shall be in accordance with American National Standard Specifications for 8-mm Type S (Super 8) Motion-Picture Film Camera Cartridge Notches for Exposure Control and Stock Identification, ANSI PH22.166-1977.

NOTE 2: Although two driving lugs are shown in the core and are recommended, only one is essential for satisfactory operation.

NOTE 3: In addition to this standard, there are available the following American National Standards relating to 8-mm Type S Model 1 motion-picture film camera cartridges:

Dimensions and Characteristics of 8-mm Type S Motion-Picture Camera Cartridge Aperture, Camera Aperture Profile, Film Position, Pressure Pad and Pressure Pad Flatness, ANSI PH22.159.2-1980

Specifications for Camera Run Length, Perforation Cut-Out and End-of-Run Notches in 8-mm Type S (Super 8) Motion-Picture Film Model 1 Camera Cartridges (50-Ft, 15-m Capacity), ANSI PH22.159.5-1974

Specifications for 8-mm Type S (Super 8) Motion-Picture Film Camera Cartridge Notches for Exposure Control and Stock Identification, ANSI PH22.166-1977

Appendix

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

A3. To provide a consistent method of measurement, it is recommended that a cartridge gauging fixture be used which incorporates datum surfaces, a locating pin, and means of exerting locating forces on appropriate surfaces of the cartridge.

Dimensions	Inches	Millimeters
A	0.954 ± 0.010	24.23 ± 0.25
B	2.99 ± 0.01	75.9 ± 0.3
C	1.390 ± 0.010	35.31 ± 0.25
E	0.780 max	19.81 max
F	0.09 ± 0.01	2.3 ± 0.3
G	0.06 ± 0.01	1.5 ± 0.3
H	0.88 ± 0.03	22.4 ± 0.8
J	0.61 ± 0.03	15.5 ± 0.8
K	0.015 ± 0.010	0.38 ± 0.25
L	0.470 min	11.94 min
M	0.005 ± 0.003	0.13 ± 0.08
N	0.177 min	4.50 min
O	0.154 ± 0.004	3.91 ± 0.10
P	0.142 ± 0.004	3.61 ± 0.10
Q	0.770 ± 0.010	19.56 ± 0.25
R ₁	0.50 ± 0.10	12.7 ± 2.5
R ₂	0.25 ± 0.05	6.4 ± 1.3
R ₃	0.160 max	4.06 max
S	1.02 ± 0.01	25.9 ± 0.3
T	0.870 basic	22.10 basic
U	1.225 min	31.12 min
V	0.125 max	3.18 max
W	See Sec. 2.6	
Aa	0.680 max	17.27 max
Ab	0.575 min	14.60 min
Ac	0.327 max	8.31 max
Ad	0.264 max	6.71 max
Ae	0.015 max	0.38 max
Af*	1.608 basic	40.84 basic
Ag	0.100 min	2.54 min
Ah	0.040 ± 0.005	1.02 ± 0.13
Aj	0.020 max	0.51 max
Ak	45° nom	45° nom
Al	0.024 max	0.61 max

*See Sec. 2.9.

2.7 Dimension A specifies the normal overall thickness of the cartridge.

2.8 Dimensions B and M are measured from Datum Plane C. Dimensions C, H, J, and S are measured from Datum Plane A.

A1. In designing the camera driver, consideration should be given to the fact that tooth-on-tooth engagement of the core lug on the camera driver pin is a possibility.

A2. It is recommended that the core be tendency driven (by some form of slip-drive mechanism) with a drive ratio of at least one turn of the core for every fifteen strokes of the pull-down claw.

American National Standard dimensions of magnetic striping of 16-mm motion-picture film perforated 8-mm type S, (1-4)

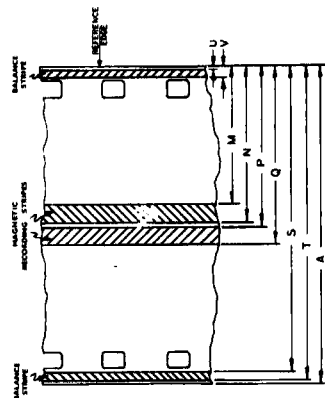
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1. Scope

This standard specifies the location and dimensions of the magnetic recording stripes and the balance stripes applied to 16-mm motion-picture film with two rows of 8-mm Type S perforations in positions 1 and 4.



Dimensions	Inches	Millimeters
A	0.628	nom 15.95
M*	0.285 ± 0.002	7.24 ± 0.05
N*	0.312 ± 0.002	7.92 ± 0.05
P*†	0.316 ± 0.002	8.02 ± 0.05
Q*	0.343 ± 0.002	8.71 ± 0.05
S	0.613 ± 0.003	15.57 ± 0.08
T	0.625 ± 0.003	15.88 ± 0.08
U	0.003 ± 0.003	0.08 ± 0.08
V	0.015 ± 0.003	0.38 ± 0.08

*See Note 3.
†The millimeter conversion is approximate so that Dimension P minimum equals Dimension N maximum.

2. Dimensions

2.1 The location and dimensions of the magnetic recording stripes and balance stripes shall be as given in the figure and table.

2.2 The magnetic striping material shall be applied to the surface of the film away from a camera or projector lens, for example, toward the light source of a projector arranged for direct front projection on a reflection-type screen

2.3 The stripes designated as "recording" are made of a magnetic material and are intended for the sound record. The stripes between the edge of the film and the perforations are the balance stripes. The balance stripes may be stripes of magnetic or nonmagnetic material of such thickness that the balance and recording stripes project above the surface of the film to substantially the same degree.

3. Film Stock

The film stock used shall be safety type, cut and perforated in accordance with American National Standard Dimensions for 16-mm Motion-Picture Film Perforated Super 8, (1-4), ANSI PH22.168-1973 (R1980).

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PH22.162-1980

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NOTE 1: The width and edge-to-perforation distance of the 8-mm slit strip shall be in accordance with ANSI PH22.168-1973 (R1980). The location of the magnetic recording and balance stripes shall be in accordance with American National Standard Dimensions of Magnetic Striping of 8-mm Type S Motion-Picture Film, ANSI PH22.161-1980. Consequently, it is not possible to take full advantage of the tolerance of both the slit width and the location of the magnetic recording and balance stripes.

NOTE 2: Tolerances for the recording stripes are specified to permit usage of a single wide stripe or two separate stripes. If two stripes are used, the amount of separation between the stripes should be sufficient to permit shifting within the requisites of the standard without obtaining undesirable feather edges of magnetic material. The separation required is determined by laboratory practice.

NOTE 3: Notwithstanding the tolerance on Dimensions M, N, P, and Q, the width of the stripes, Dimension N minus M and Q minus P, shall be 0.0250 in (0.635 mm) minimum.

American National Standard dimensions of magnetic striping of 35-mm motion-picture film perforated 8-mm type S, 5R

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1. Scope

This standard specifies the location and dimensions of the magnetic recording stripes and the balance stripes applied to 35-mm motion-picture film with four rows of 8-mm Type S perforations and one row of special perforations.

2. Dimensions

2.1 The location and dimensions of the magnetic recording stripes and balance stripes shall be as given in the figure and table.

2.2 The magnetic striping material shall be applied to the surface of the film away from a camera or projector lens, for example, toward the light source of a projector arranged for direct front projection on a reflection-type screen.

2.3 The stripes designated as "recording" are made of a magnetic material and are intended for the sound record. The balance stripes may be stripes of magnetic or nonmagnetic material of such thickness that the balance and recording stripes project above the surface of the film to substantially the same degree.

3. Film Stock

The film stock used shall be safety type, cut and perforated in accordance with American National Standard Dimensions for 35-mm Motion-Picture Film Perforated Super 8, 5R-1667 (1-3-5-7-0), ANSI PH22.165-1973.

NOTE 1: The width and edge-to-perforation distance of the 8-mm slit strip shall be in accordance with ANSI PH22.165-1973. The location of the magnetic recording and balance stripes shall be in accordance with American National Standard Dimensions of Magnetic Striping of 8-mm Type S Motion-Picture Film, ANSI PH22.161-1980. Consequently, it is not possible to take full advantage of the tolerance of both the slit width and the location of the magnetic recording and balance stripes.

NOTE 2: Tolerances for the recording stripes and balance stripes are specified to permit usage of a single wide stripe or two separate stripes where they are adjacent. If two stripes are used, the amount of separation between the stripes should be sufficient to permit slitting within the requisites of the standard without obtaining undesirable feather edges of magnetic material. The separation required is determined by laboratory practice.

NOTE 3: Notwithstanding the tolerance on Dimensions M_1 , N_1 , M_2 , N_2 , M_3 , N_3 , M_4 , and N_4 , the width of the stripe, Dimension N minus M, shall be 0.0250 in (0.635 mm) minimum.

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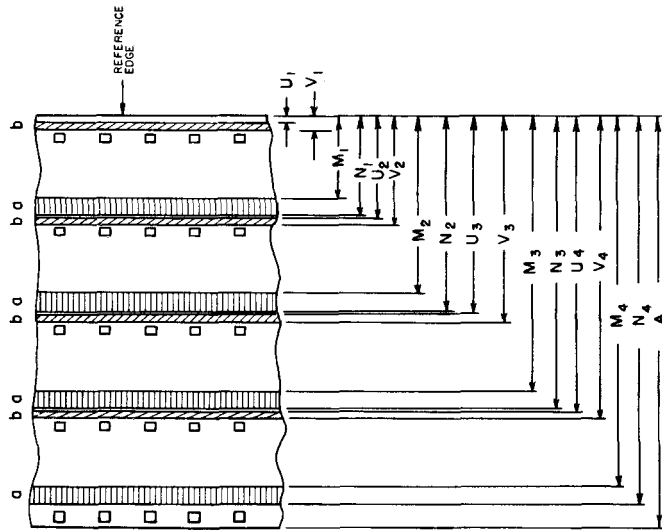
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(O) MAGNETIC RECORDING STRIPES

(B) BALANCE STRIPES



Dimensions	Inches	Millimeters
A	1.377	nom
M_1^*	0.315 ± 0.002	8.00 ± 0.05
M_2^*	0.629 ± 0.002	15.98 ± 0.05
M_3^*	0.943 ± 0.002	23.95 ± 0.05
M_4^*	1.257 ± 0.002	31.93 ± 0.05
N_1^*	0.342 ± 0.002	8.69 ± 0.05
N_2^*	0.656 ± 0.002	16.66 ± 0.05
N_3^*	0.970 ± 0.002	24.64 ± 0.05
N_4^*	1.284 ± 0.002	32.61 ± 0.05
U_1	0.033 ± 0.003	0.84 ± 0.08
U_2	0.347 ± 0.003	8.81 ± 0.08
U_3	0.661 ± 0.003	16.79 ± 0.08
U_4	0.975 ± 0.003	24.76 ± 0.08
V_1	0.045 ± 0.003	1.14 ± 0.08
V_2	0.359 ± 0.003	9.12 ± 0.08
V_3	0.673 ± 0.003	17.09 ± 0.08
V_4	0.987 ± 0.003	25.07 ± 0.08

*See Note 3.