ANSI/SMPTE 206-1998
Revision of
ANSI/SMPTE 206-1993

SMPTE STANDARD

for Motion-Picture Equipment (8-mm Type S) — Model 1 Sound Camera Cartridge — Aperture, Profile, Film Position, Pressure Pad and Flatness (200-ft Capacity)

1 Scope

This standard specifies the dimensions and location of the cartridge aperture, pressure pad, and characteristics necessary for its appropriate flatness, clearance, and location of film in the camera aperture of 200-ft (60-m) capacity 8-mm type S model 1 sound motion-picture film camera cartridges.

2 Dimensions

2.1 The dimensions shall be as given in the figures and tables.

2.2 The dimensions shown in figures 1 and 3 and tables 1 and 3 apply to a cartridge that is fully assembled but does not contain film. The dimensions shown in figure 2 and table 2 apply to an assembled cartridge with a film load at the time of manufacture.

2.3 The datum planes and datum features used for dimensioning are as defined in 2.3, 2.3.1, 2.4, 2.4.1, and 2.4.2 of ANSI/SMPTE 205.

2.4 Dimensions T and U denote the lateral location of the film in the cartridge before insertion in the camera. After insertion, dimension T becomes 0.060 in (1.52 mm) minimum and dimension U becomes 0.050 in (1.27 mm) minimum.

2.5 All dimensions in table 1, except dimensions A and C, apply at the front surface of the pressure pad. A draft of 5° to the recess area is permitted as well as an inside or outside radius of 0.005 in (0.13 mm) at all corners to provide satisfactory mold release when the pressure pad is manufactured in a molding process

2.6 Dimension A denotes the space available from datum plane C for penetration of the camera film alignment guide wings or the camera claw into the recessed area of the cartridge pressure pad.

2.7 Dimension B is measured from datum plane C and determines the operating position of the cartridge pressure pad.

2.8 Dimensions relative to the surface of the pressure pad are measured from a plane established through surfaces 1, 2, and 3, as defined by 0.060-in (1.52-mm) diameter circles dimensionally centered (see figure 3 and table 4). The actual camera aperture bosses may deviate from this shape.

2.9 Dimension G_2 specifies the clearance for film in the camera aperture area, based on dimension T_2, the thickness of the film in the center of the picture area (see note 1).

2.10 Dimension G'_2 specifies the extension of the camera aperture plate boss points (corresponding to 1, 2, and 3) beyond the aperture plate plane at the aperture opening.

2.11 The upper and lower pad areas extend from dimension C_2 to the top and bottom of the cartridge pressure pad within dimension K_2.

2.12 Dimension H_2 is intended to apply from a plane as described in 2.8.

2.13 The plus values given for the pressure pad film surface flatness tolerances are to be directed toward the lens (see note 2).

American National Standard

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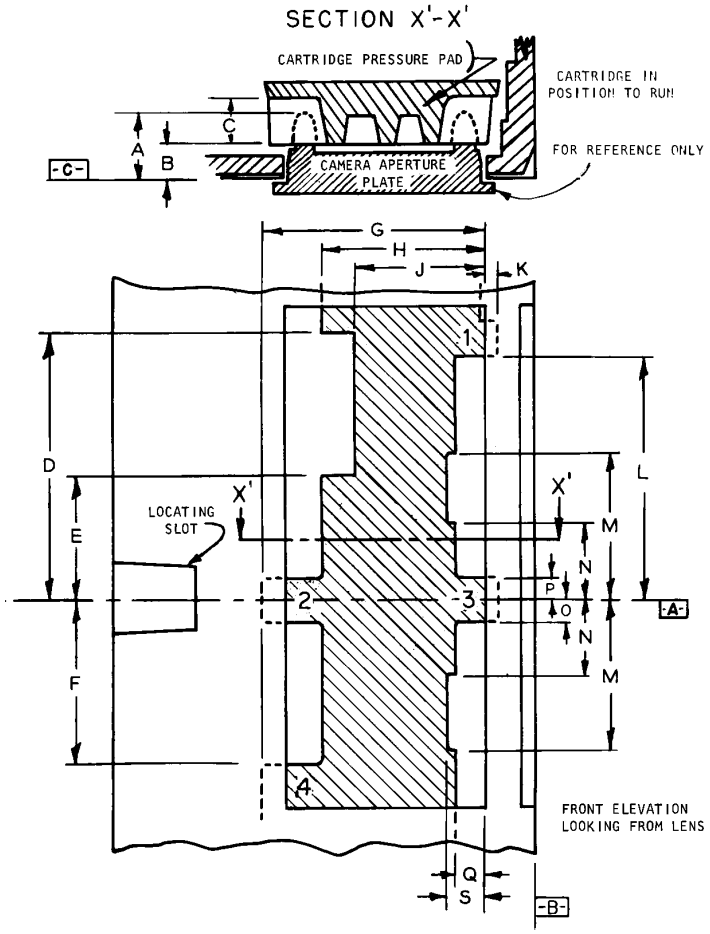

Figure 1 – Cartridge pressure pad

Table 1 – Pressure pad specifications

Dimensions	Inches	Millimeters
A	0.150 max	3.81 max
B	0.077 ± 0.005	1.96 ± 0.13
C	0.090 min	2.29 min
D	0.540 min	13.72 min
E	0.260 max	6.60 max
F	0.360 ± 0.020	9.14 ± 0.51
G	0.455 min	11.56 min
H	0.365 max	9.27 max
J	0.300 max	7.62 max
K	0.000 min	0.00 min
L	0.540 ± 0.020	13.72 ± 0.51
M	0.300 min	7.62 min
N	0.140 max	3.56 max
O	0.058 ± 0.022	1.47 ± 0.56
P	0.038 ± 0.022	0.97 ± 0.56
Q	0.055 min	1.40 min
S	0.090 min	2.29 min

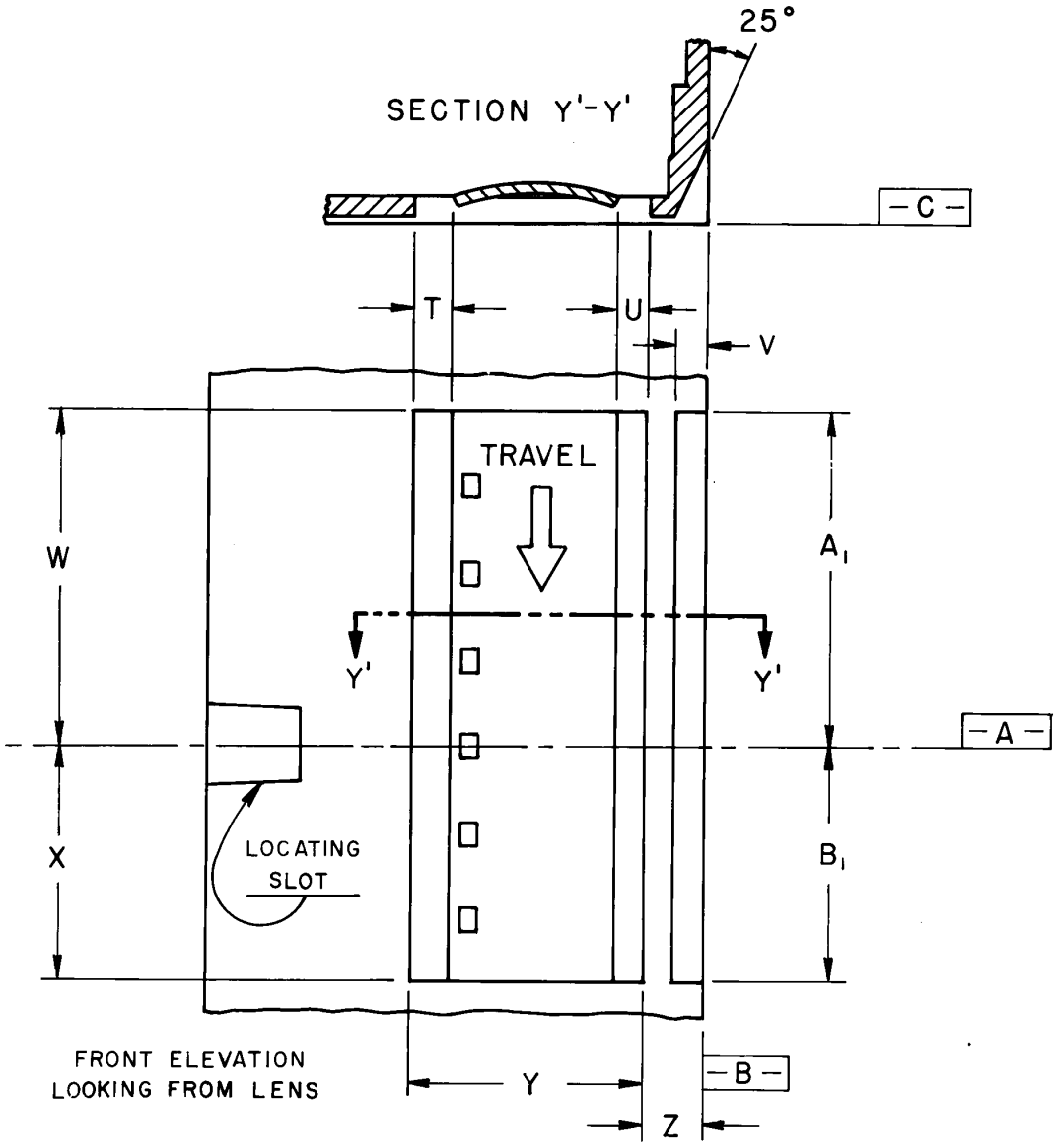

Figure 2 – Cartridge aperture opening and film position

Table 2 – Aperture and film position specifications

Dimensions	Inches	Millimeters
T	0.050 min	1.27 min
U	0.040 min	1.02 min
V	0.061 ± 0.006	1.55 ± 0.15
W	0.648 ± 0.006	16.46 ± 0.15
X	0.451 ± 0.006	11.46 ± 0.15
Y	0.451 ± 0.004	11.46 ± 0.10
Z	0.111 ± 0.003	2.82 ± 0.08
A_1	0.642 min	16.31 min
B_1	0.445 min	11.30 min

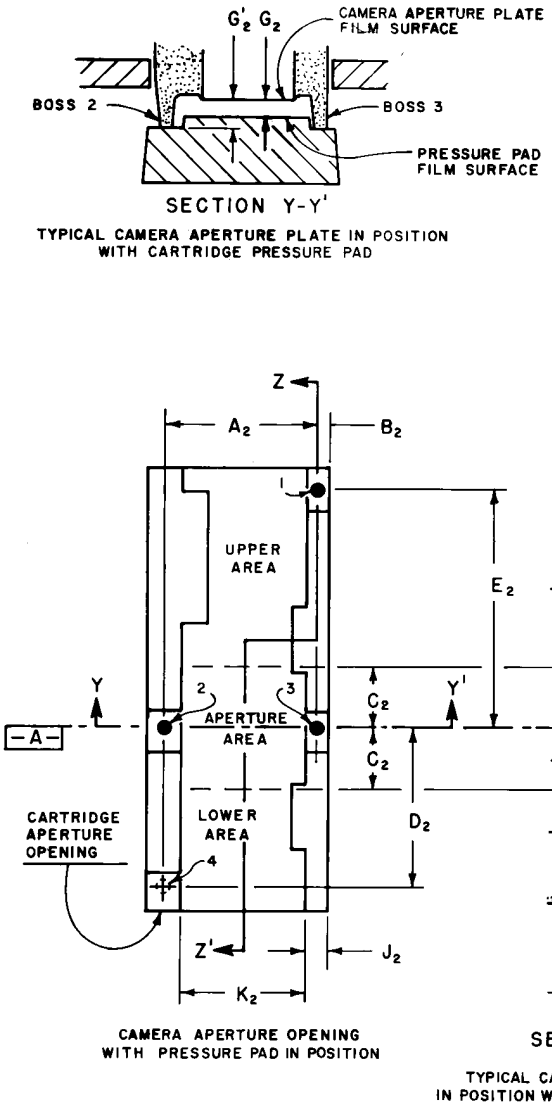

Figure 3 – Pressure pad flatness reference surfaces

Table 3 – Pressure pad flatness dimensions

Dimensions	Inches	Millimeters
A_2	0.378 ± 0.001	9.60 ± 0.03
B_2	0.030 +0.002 −0.000	0.76 +0.05 −0.00
C_2	0.153 nom	3.89 nom
D_2	0.393 ± 0.001	9.98 ± 0.03
E_2	0.590 ± 0.001	14.99 ± 0.03
F_2	0.005 min	0.13 min
G_2	T2 + 0.0007 min T2 + 0.0012 max	T2 + 0.018 min T2 + 0.030 max
G'_2	0.0065 min 0.0070 max	0.165 min 0.178 max
H_2	0.004 min	0.10 min
J_2	0.055 min	1.40 min
K_2	0.310 max	7.78 max

Table 4 – Flatness tolerances on pressure pad film surface

Areas	Inches	Millimeters
Aperture area	+ 0.0058 – T_2	+ 0.147 – T_2
(within dimension C)	+ 0.0048 – T_2	+ 0.122 – T_2
Upper area	+ 0.0078 – T_2	+ 0.198 – T_2
	+ 0.0038 – T_2	+ 0.097 – T_2
Lower area	+ 0.0078 – T_2	+ 0.198 – T_2
	+ 0.0018 – T_2	+ 0.046 – T_2

NOTE – Dimensions are measured from the zero plane defined by surfaces 1, 2, and 3 (see 2.8, figure 3, and note 2).

2.14 Surface 4 of the cartridge pressure pad and boss 4 of the camera aperture are established to aid in seating the cartridge pressure pad to the camera aperture plate. They serve no function once the pressure pad is in operating position (see note 3).

NOTES

1 It is considered good practice to relieve the camera aperture plate above and below the picture area to allow a clearance for film transport and minimize the possibility of film pinching. Dimension F_2 specifies the amount of recess for this purpose.

2 It is intended that the film surface of the cartridge pressure pad be flat, or molded as a flat plane. Pits or depressions, however, which do not interfere with the film flatness are acceptable. Relief in the pad surface equal to the sound stripe thickness may be provided beneath those areas of the film which are striped by adding material to the backing of the film. Tolerances for the flatness on the 8-mm type S cartridge pressure pad film surface are specified to account for slight warpage in molding if the pressure pad is made from a plastic material (see annex A.3).

3 Three lugs, Nos. 1, 2, and 3, on the pressure pad are intended to touch the camera aperture plate and thereby determine the film plane alignment and the clearance allowed for the thickness of the film. Lug 4 should not touch the camera aperture plate.

Annex A (informative)
Additional data

A.1 A force of 8 oz to 14 oz (2.2 N to 3.9 N) must be exerted on the pressure pad for proper seating against the camera aperture plate.

A.2 The two cutout areas in the pressure pad permit the use of fingers for side-guiding. A force of 1.5 oz to 2.5 oz (0.42 N to 0.70 N) per finger is adequate to ensure picture steadiness.

A.3 Other portions of the pressure pad front surface may be recessed in addition to the required recesses, defined by dimension C in 2.5, for camera claw and camera aperture guide finger penetration.

A.4 The cartridge pressure pad recess, defined by dimensions D, E, and J, is available for camera claw film transport engagement. The perforation used for the film vertical registration at its stopping position is specified in ANSI/SMPTE 157, as minus 2 from the perforation adjacent to the image formed by the camera aperture. The horizontal centerline of the camera aperture should coincide nominally with datum plane A.

A.5 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 for exerting locating forces on appropriate surfaces of the cartridge. For pressure pad measurements, a second fixture, incorporating three 0.060-in (1.52-mm) diameter bosses and a means for exerting the appropriate pressure pad seating force, is recommended.

Annex B (informative)
Bibliography

ANSI/SMPTE 157-1994, Motion-Picture Film (8-mm Type S) — Camera Aperture Image and Usage

ANSI/SMPTE 205-1993 (R1998), Motion-Picture Equipment (8-mm Type S) — Model 1 Camera Cartridge — Interface and Take-Up Core Drive (200-Ft Capacity)