

Table 2
Dimensions Controlling Film Speed Values

Film Speed	θ_1^*	J^\dagger	T^\ddagger
DIN	ISO (ASA)	Degrees	Millimeters
13	16	22	11.6
14	20	26	10.85
15	25	30	10.1
16	32	34	9.35
17	40	38	8.6
18	50	42	7.85
19	64	46	7.1
20	80	50	6.35
21	100	54	5.6
22	125	58	4.85
23	160	62	4.1
24	200	66	3.35
25	250	70	2.6
26	320	74	1.85
27	400	78	1.1

*Tolerance for all values $\pm 1/2$ degree
 \dagger Tolerance for all values ± 0.004 in.
 \ddagger Tolerance for all values ± 0.3 mm (0.012 in.)
 **Millimeter dimensions are primary.

NOTE 1: In addition to this standard, there are available the following American National Standards relating to super 8 Model II film camera cartridges:

Specifications for Camera Run Length of Film in 8-mm Type S Model II Motion-Picture Film Camera Cartridges (15-m [50-ft] Capacity), ANSI PH22.188M-1982.

Location of Film Loaded in 8-mm Type S Model II Motion-Picture Film Camera Cartridges, ANSI PH22.189M-1982.

Dimensions and Characteristics for 8-mm Type S Model II Motion-Picture Film Camera Cartridge, Cartridge-Camera Fit and Core Specifications, ANSI PH22.190M-1982.

NOTE 2: The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights.

By publication of this standard, no position is taken with respect to the validity of any patent rights in connection therewith. The patent holder has, however, filed a statement that it will not assert any claims for infringement which necessarily result from compliance with this standard. Details may be obtained from the publisher.

No representation or warranty is made or implied that this is the only waiver that may be required to avoid infringement in the use of this standard.

ANSI PH22.191M-1982

Specifications for 8-mm Type R Registration Test Film

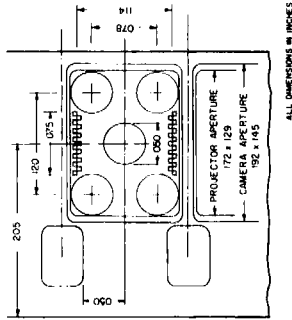


Fig. 1

1. Scope

1.1 This practice specifies the subject material and the dimensions and location of the subject material for an 8-mm Type R test film of high accuracy to assist the user in achieving several quantitative visual tests. (See Appendix A1.)

1.2 The film can be used to test motion-picture projectors and printers.

2. Dimensions

The dimensions and location of the target areas shall be as specified in the figures. The patterns in Figs. 3 and 4 appear in the five circular areas of the test pattern shown in Figs. 1 and 2.

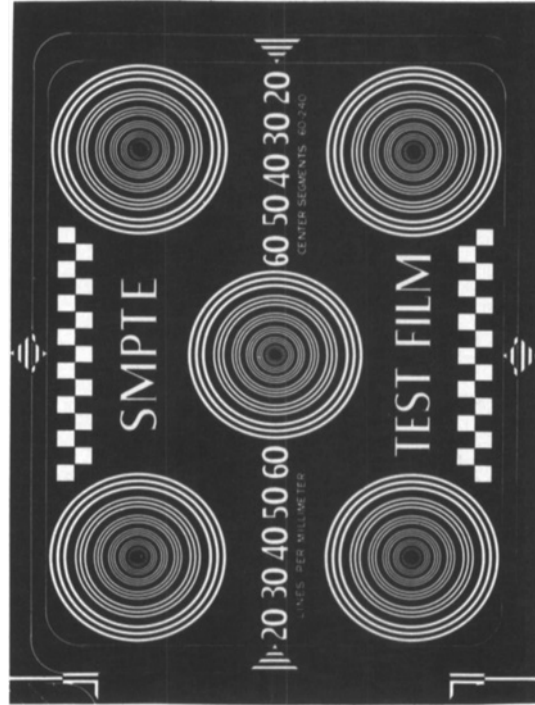


Fig. 2

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 862 Scarsdale Avenue, Scarsdale, NY 10583, (914) 472-6606
 Revision of RP 19-1965
 Approved 15 October 1982

3. Description

- 3.1 The test film shall be produced as a camera original film photographed on high-contrast, high-definition, positive-type motion-picture stock made in accordance with American National Standard Dimensions for 16-mm Motion-Picture Film Perforated 8-mm Type R, 2R, ANSI PH22.17-1982.
- 3.2 The diffuse density of the background area shall be 1.80 ± 0.10 .
- 3.3 The camera and projector image areas shall be in accordance with American National Standard Dimensions of Camera Aperture Image on 8-mm

Type R (Regular 8) Motion-Picture Film ANSI PH22.19-1976 and American National Standard Dimensions of Projectable Image Area on 8-mm Type R Motion-Picture Film, ANSI PH22.20-1981.

3.4 The resolution targets shall be photographed in a magnification which results in the concentric rings reading in lines per millimeter on the film (20, 30, 40, 50, and 60). The rosette in the center shall indicate a measurement from 60 to 240 lines per millimeter. (See Appendix A6.)

Note: A test film made in accordance with this practice is available from the Society of Motion Picture and Television Engineers.

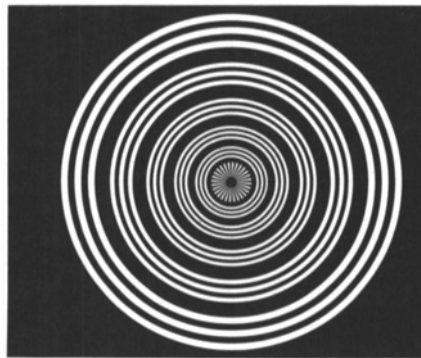


Fig. 3

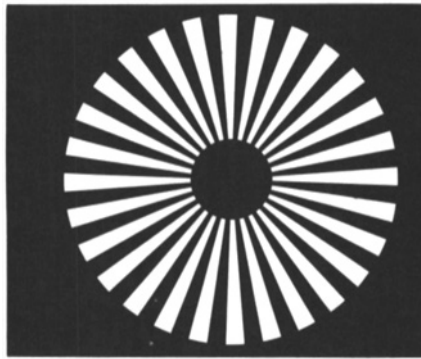


Fig. 4

Appendix

(The Appendix is not a part of this SMPTE Recommended Practice, but is included for information purposes only.)

A1. Visual Tests. The following quantitative visual tests can be performed:

Tests	Projector		Printer	
	Continuous	Step	Continuous	Step
Steadiness (jump and weave)	X	X*	X	X
Aperture alignment	X	X	X	X
Double-exposure alignment	X	X	X	X
Shutter adjustment (travel ghost)	X	X	X	X
Framing accommodation	X	X	X	X
Focus	X	X	X	X
Resolution	X	X	X	X
Field flatness	X	X	X	X

*The perforation pitch of the test film is not optimum for continuous contact printers and its value for this purpose may be limited.

A2. Magnification. If the image of the test film target is projected to 30 x 40 in (762 x 1016 mm), it will be enlarged 230 times.

A3. Jump and Weave. The triangular areas in the centers of the vertical and horizontal framelines can be used to measure jump and weave and aperture misalignment. Each line in these areas is 0.001 in (0.03 mm) wide. The lines are spaced 0.001 in (0.03 mm) apart.

A4. Aperture Centering and Size. The inner rectangle represents the nominal projectable area.

A5. Travel Ghost. The white blocks are 0.005 in (0.13 mm) square and will quickly indicate travel ghost caused

by incorrect shutter adjustment. They also provide a quick check on the ability to frame above and below center position. Travel ghost is a blurring effect seen on the screen and evidenced by vertical tails or light streaks added to the projected images of the more transparent areas on the test film. It is caused by the projector shutter being out of synchronism with the intermittent mechanism. If the ghost is above the blocks, the shutter closes late; if the ghost is below the blocks, the shutter opens early.

A6. Resolution. Resolving power in lines per millimeter can be read directly from the test target to the limit permitted by the film stock used. Resolution targets are spaced one in the center and one in each of the four corners. The outside diameter of the target on the film is 0.050 in (1.27 mm) and will fill the area covered by an average microscope using a 10X objective. (See 3.4.)

A7. Field Flatness. Side-to-side out-of-focus is determined from the difference in softness of the sides. Quantitative differences can be determined from resolution charts. Circle charts at the middle of the field permit quick focus adjustment and detection of in- and out-of-focus effects.

A8. Striping. The user may apply magnetic record and balance stripes to this film by post-process means. If this is done, the dimensions of the film image should be checked to determine if change has been produced by the striping process. It is anticipated that striping will not affect significantly the performance of the test film. However, the user is cautioned that the proximity of the film image to the limiting aperture may be altered due to striping thickness. Also, the frictional characteristics of the test film may be changed, which could affect film transport in the user's apparatus.

Specifications for 16-mm Registration Test Film



Page 1 of 3 pages

1. Scope

1.1 This practice specifies the subject material and the dimensions and location of the subject material for a 16-mm test film of high accuracy to assist the user in achieving several quantitative visual tests. (See Appendix A1.)

1.2 The film can be used to test motion-picture projectors and printers.

2. Dimensions

The dimensions and location of the target areas shall be as specified in the figures. The patterns in Figs. 3 and 4 appear in the nine circular areas of the test pattern shown in Figs. 1 and 2.

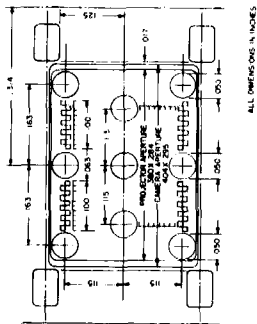


Fig. 1

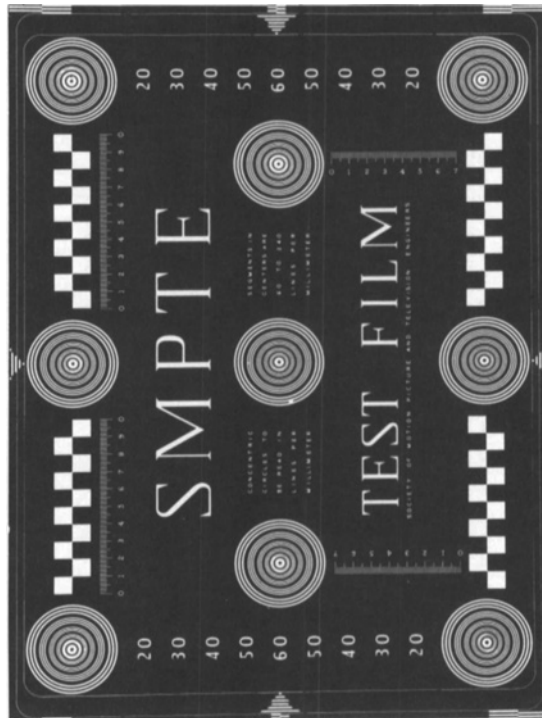


Fig. 2

Page 2 of 3 pages

3. Description

3.1 The test film shall be produced as a camera original film photographed on high-contrast, high-definition, positive-type motion-picture stock made in accordance with American National Standard Dimensions for 16-mm Motion-Picture Film Perforated 2R, ANSI PH22.110-1980.

3.2 The diffuse density of the background area shall be 1.80 ± 0.10 .

3.3 The camera and projector image areas shall be in accordance with American National Standard Dimensions of 16-mm Motion-Picture Camera

Aperture Image, ANSI PH22.7-1976, and American National Standard Dimensions of Projectable Image Area on 16-mm Motion-Picture Film, ANSI PH22.8-1981.

3.4 The resolution targets shall be photographed in a magnification which results in the concentric rings reading in lines per millimeter on the film (20, 30, 40, 50, and 60). The rosette in the center shall indicate a measurement from 60 to 240 lines per millimeter. (See Appendix A6.)

Note: A test film made in accordance with this practice is available from the Society of Motion Picture and Television Engineers.

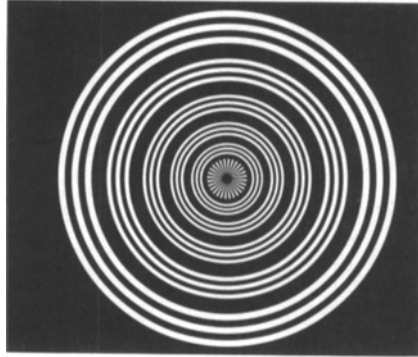


Fig. 3

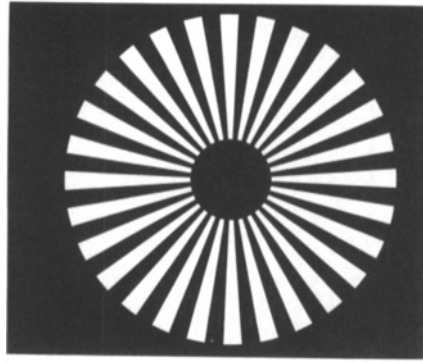


Fig. 4

Appendix

(The Appendix is not a part of this SMPTÉ Recommended Practice, but is included for information purposes only.)

A1. Visual Tests. The following quantitative visual tests can be performed:

Tests	Projector		Printer	
	Contact	Optical Step	Continuous	Step
Steadiness (jump and weave)	X	X*	X	X
Aperture alignment	X	X	X	X
Double-exposure alignment	X	X	X	X
Shutter adjustment (travel ghost)	X	X	X	X
Framing accommodation	X	X	X	X
Focus	X	X	X	X
Resolution	X	X	X	X
Field flatness	X	X	X	X

*The perforation pitch of the test film is not optimum for continuous contact printers and its value for this purpose may be limited.

A2. Magnification. If the image of the test film target is projected to 30 x 40 in (762 x 1016 mm), it will be enlarged 100 times.

A3. Jump and Weave. The triangular areas in the centers of the vertical and horizontal framelines can be used to measure jump and weave, and aperture misalignment. Each line in these areas is 0.001 in (0.03 mm) wide. The lines are spaced 0.001 in (0.03 mm) apart.

A4. Aperture Centering and Size. The inner rectangle represents the nominal projectable area. The horizontal and vertical scales have least divisions of 0.001 in (0.03 mm). They provide useful information when film is double-exposed in a printer to check registration.

A5. Travel Ghost. The white blocks are 0.010 in (0.25 mm) square and will quickly indicate travel ghost caused by incorrect shutter adjustment. They also provide a quick check on the ability to frame above and below center position. Travel ghost is a blurring effect seen on the screen and evidenced by vertical tails or light streaks added to the projected images of the more transparent areas on the test film. It is caused by the projector shutter being out of synchronization with the intermittent mechanism. If the ghost is above the blocks, the shutter closes late; if the ghost is below the blocks, the shutter opens early.

A6. Resolution. Resolving power in lines per millimeter can be read directly from the test target to the limit permitted by the film stock used. Resolution targets are spaced one in the center, four equidistant from the center, and one in each of the four corners. The outside diameter of the target on the film is 0.050 in (1.27 mm) and will fill the area covered by an average microscope using a 10X objective. (See 3.4.)

A7. Field Flatness. Side-to-side out-of-focus is determined from the difference in softness of the sides. Quantitative differences can be determined from resolution charts. Circle charts at the middle of the field permit quick focus adjustment and detection of in- and out-of-focus effects.

A8. Striping. The user may apply magnetic record and balance stripes to this film by post-process means. If this is done, the dimensions of the film image should be checked to determine if change has been produced by the striping process. It is anticipated that striping will not significantly affect the performance of the test film. However, the user is cautioned that the proximity of the film image to the limiting aperture may be altered due to striping thickness. Also, the frictional characteristics of the test film may be changed, which could affect film transport in the user's apparatus.

SMPTÉ RECOMMENDED PRACTICE

Specifications for 8-mm Type S Test Film for Projectors and Printers



1. Scope

This practice specifies the content and dimensions of an 8-mm Type S test film useful in checking the performance of motion-picture projectors and printers. Its use is described in the Appendix.

2. Dimensions

2.1 The dimensions and location of the target areas shall be as specified in Figs. 1 and 2. These values apply when the film is conditioned and measured at 70°F (21°C), 50 percent relative humidity.

2.2 The general tolerance for all dimensions shall be ± 0.0005 in (0.013 mm), unless otherwise specified.

3. Description

3.1 The test film shall be produced as a camera original on high-contrast, high-definition motion-picture film, cut and perforated in accordance with American National Standard Dimensions for 16-mm Motion-Picture Film Perforated Super 8 (14) ANSI PH22.168-1973 (R 1980). It shall be processed to yield a dye image.

3.2 The camera and projector image areas shown on the test film shall meet the requirements for the

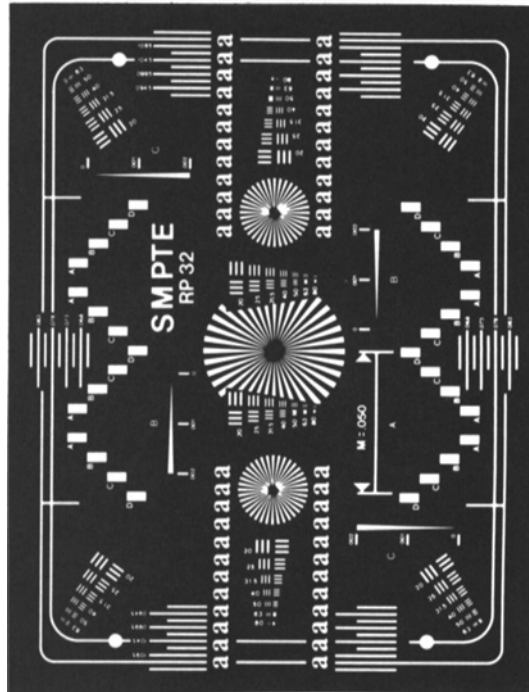


Fig. 1

minimum camera aperture image and the nominal projected image in accordance with American National Standard Dimensions of Camera Aperture Image on Super 8 Motion-Picture Film, ANSI PH22.157:1971 (R1977), and American National Standard Dimensions of Projectable Image Area on 8-mm Type S Motion-Picture Film, ANSI PH22.154:1982.

3.3 The target shall be photographed at a magnification which results in Dimension M at \odot of 0.050

in (1.27 mm) on the film. When this is done, the solid lines have a width of 0.001 in (0.03 mm) \pm 5 percent.

3.4 The vertical and horizontal frame-to-frame placement of the target on the film should be consistent to ensure its usefulness for steadiness measurements. When its placement is measured according to 2.1 above, the frame-to-frame variability of the placement of the image shall be within \pm 0.0002 in (0.005 mm) vertically and horizontally.

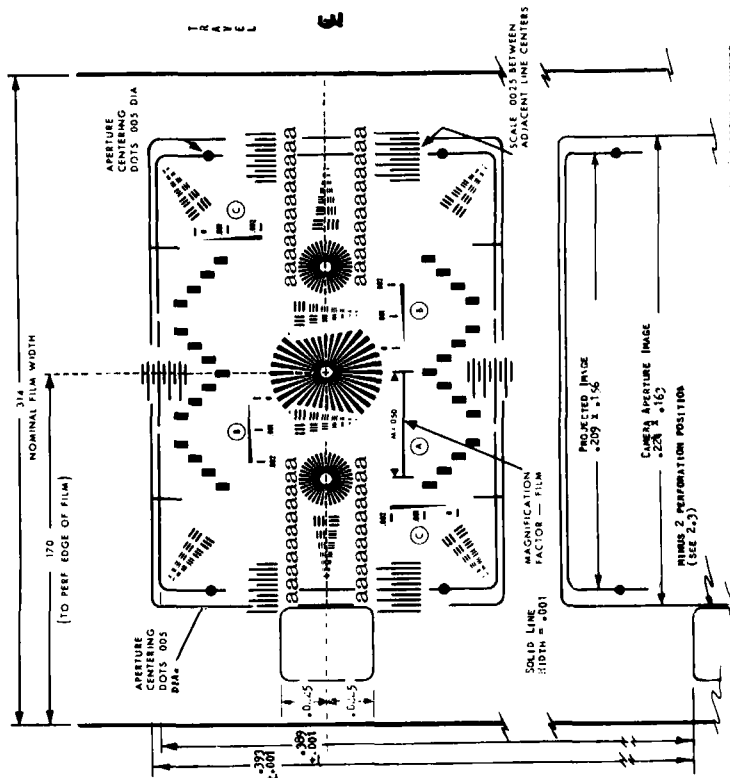


Fig. 2

Note: A test film made in accordance with this practice is available from the Society of Motion Picture and Television Engineers.

Appendix

(The Appendix is not a part of this SMPTE Recommended Practice, but is included for information purposes only.)

A1. Visual Tests. The following quantitative visual tests can be performed.

Tests	Projector		Printer		Optical Step
	Continuous	Step	Continuous	Step	
Steadiness (jump and weave)	X	X*	X	X	X
Aperture alignment	X	X	X	X	X
Double-exposure alignment			X	X	X
Shutter adjustment (travel ghost)	X				X
Framing accommodation	X		X		X
Focus	X		X		X
Resolution	X		X		X
Field flatness	X		X		X

*The perforation pitch of the test film is not optimum for continuous contact printers and its value for that purpose may be limited.

A2. Magnification. If the image of the test film target is projected to 30 x 40 in (762 x 1016 mm), it will be enlarged 192 times.

A3. Steadiness. Wedges for measurement of vertical steadiness B and horizontal steadiness C taper from 0 to 0.002 in (0.05 mm) wide, with an intermediate position of 0.001 in (0.03 mm). The outer sides of the B wedges and the inner sides of the C wedges are parallel to the horizontal and vertical sides of the frame respectively.

A4. Aperture Centering and Size. The inner rectangle represents the nominal projectable area and the center of the large pie is located at midpoints horizontally and vertically. The groups of short lines along the border indicate distances from the center of the aperture and are spaced at intervals of 0.0025 in (0.064 mm). Circular dots near the corners are 0.005 in (0.13 mm) in diameter and can be used for rapid aperture-centering checks. If some portion of all dots is visible, centering would be within 0.0025 in.

A5. Travel Ghost. The A, B, C, and D blocks are used to determine travel ghost. Travel ghost is a blurring effect seen on the screen and evidenced by vertical tails or light streaks added to the projected images of the more transparent areas on the test film. It is caused by the projector shutter being out of synchronism with the intermittent mechanism. If the ghost is above the blocks, the shutter opens early.

A6. Framing Accommodation. The longer lines of the group of lines at the top and bottom of the vertical aperture centerline are 0.005 in (0.13 mm) apart. By centering the aperture and framing above and below, the range of framing is determined. The height of each travel ghost block is 0.007 in (0.18 mm). This permits the extent of framing to be measured beyond the limits of the dimensional lines.

A7. Resolution. Resolving power in lines per millimeter can be read directly from the test target to the limit permitted by the film stock used. The ratio of line spacings of adjacent resolution patterns is equal to 10 $\sqrt{10}$ (i.e., the logarithm to the base 10 of the ratio of adjacent line spacings is 0.10).

A8. Field Flatness. Side-to-side out-of-focus is determined from the difference in softness of the A's at the sides. Quantitative differences can be determined from resolution charts. Pie charts at the middle of the field permit quick focus adjustment and detection of in- and out-of-focus effects.

A9. Stripping. The user may apply magnetic record and balance stripes to this film by post-process means. If this is done, the dimensions of the film image should be checked to determine if change has been produced by the stripping process. It is anticipated that stripping will not significantly affect the performance of the test film. However, the user is cautioned that the proximity of the film image to the limiting aperture may be altered due to stripping thickness. Also, the frictional characteristics of the test film may be changed, which could affect film transport in the user's apparatus.