

SMPTe RECOMMENDED PRACTICE

RP 69-1989



Specifications for Scanning-Beam Uniformity Test Film for 35-mm Motion-Picture Audio Reproducers

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1. Scope

1.1 This practice describes a test film, the use of which is limited to the determination of the uniformity of scanning-beam illumination in 35-mm motion-picture audio reproducers.

1.2 This test film is not intended to be used for the determination of the correct position of the scanning beam with respect to the reference edge of the film.

2. Test film

2.1 The test film shall be a directly-recorded positive or a print from an original negative.

2.2 The test record on the film shall reproduce at a frequency of 1000 ± 20 Hz when the linear velocity of the film is 96 perforations per second or approximately 90 ft/min. (18 in or 45.7 cm/s).

2.3 At full modulation, the test record shall have a width of 0.0050 ± 0.0005 in. (0.127 ± 0.013 mm), as measured between opposite amplitude peaks. It shall be approximately sinusoidal.

2.4 The test record shall move laterally at a uniform rate from one edge of the scanned area to the other, as specified in the figure.

2.5 In any one test film, the combined effect of variation in modulation width and density of the exposed and unexposed areas shall result in a signal amplitude variation not exceeding ± 0.8 dB with respect to the average signal amplitude.

3. Definitions

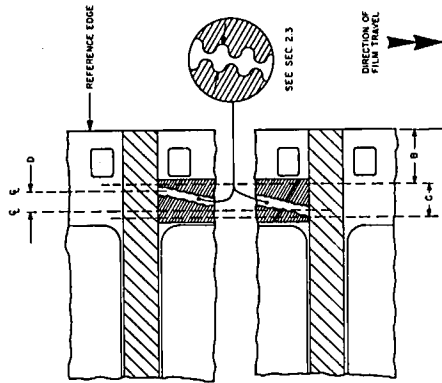
3.1 Edges. For the purpose of this practice, the edge of the test track nearest the reference edge of the film shall be called the outboard edge, and the opposite edge shall be called the inboard edge.

3.2 Centerline Sweep. The centerline sweep of the test track is defined as the lateral displacement of the centerline of the test track from its initial position to its final position. Dimension D is the nominal centerline sweep.

3.3 Total Test Track Sweep. The total test track sweep is defined as the sum of the centerline sweep and the overall width of the test track. Dimension C is the nominal total sweep.

4. Dimensions

The dimensions and position of the audio track shall be as specified in the figure and table. Dimension A extends to the inboard edge of the test track in its initial position. Dimension B extends to the outboard edge of the test track in its final position. Dimensions A and B shall be measured at points opposite the first image area frame-line next to the start and end splice of the test record negative. Dimension C, nominal total sweep, is 0.002 in. (0.05 mm) less than the width of the scanning slit to avoid scanning of the edge of the slit.



Dimensions	Inches	Millimeters
A	0.285 ± 0.000 $- 0.001$	7.24 ± 0.00 $- 0.03$
B	0.203 ± 0.001 $- 0.000$	5.16 ± 0.03 $- 0.00$
C	0.082 nom	2.08 nom
D	0.077 nom	1.96 nom

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5. Film Stock

The film stock, preferably polyester, shall be splice-free, of the low-shrinkage, safety type in accordance with American National Standard for Motion-Picture Film—Safety Film, ANSI/SMPTE 223M:1985, and cut and perforated in accordance with long-pitch dimensions specified in American National Standard for Motion-Picture Film (35-mm)—Perforated KS, ANSI/SMPTE 139-1986.

6. Density

The exposed track area shall have a minimum diffuse density of 2.0 above base density and the unexposed track area shall have a maximum density of 0.10 above base density. The longitudinal variations of these specified densities shall not result in a reproduced output variation exceeding ± 0.5 dB.

7. Width of Exposed Area

The overall width of the exposed track area shall

8. Test Film Length

Each test film shall carry three identical prints of the total length of the test record. In each, the test record shall start near the edge of the film and travel toward the image area. The length of the test record shall be approximately 30 ft (9.14 m).

NOTE: A test film conforming to this practice is available from the Society of Motion Picture and Television Engineers.

Appendix

(This Appendix is not part of the SMPTE Recommended Practice, but is included for information only.)

Before the test film described in this document is used, it is recommended that correct placement of the scanning beam be determined by means of a buzz-track test film as specified in SMPTE Recommended Practice RP 68-1984, Specifications for Buzz-Track Test Film for 35-mm Motion-Picture Photographic Audio Reproducers.

The uniformity of scanning-beam illumination should be measured by an rms voltmeter calibrated in decibels with

an accuracy of ± 0.1 dB over the bandwidth 31.5 Hz to 16 kHz, connected to the output of the audio projector amplifier. The illumination of the scanning beam should be adjusted according to the instructions furnished by the equipment manufacturer.

Variations of the output of the meter should be observed while running the full length of one test track print, spliced into a loop, through the equipment.

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exceed the maximum variation in the scanned area by no less than 0.010 in (0.25 mm) on each side of the slit. The maximum width of the scanning slit as specified in American National Standard for Motion-Picture Film (35-mm)—Photographic Audio Records—Release Prints, ANSI PH22-40-1984, is 0.085 in (2.16 mm). This requires a minimum printed width of 0.106 in (2.69 mm) to ensure a dense area adjacent to the scanned area.

SMPTÉ RECOMMENDED PRACTICE

Specifications for Buzz-Track Test Film for 16-mm Motion-Picture Audio Reproducers, Photographic Type

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1. Scope

This practice specifies a test film for checking the lateral position of the sound scanning beam in 16-mm motion-picture photographic audio reproducers.

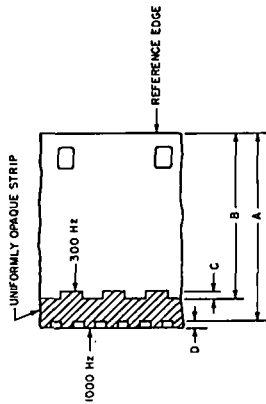
2. Test Film

- 2.1 The test film shall have originally recorded 300- and 1000-Hz signal tracks on opposite sides of the central exposed strip as shown in the figure.
- 2.2 The position of the tracks shall be in accordance with the dimensions given in the table.
- 2.3 The central exposed strip and the exposed portions of the two signal tracks shall have a density of $1.0 \pm 0.4 - 0.0$.

3. Film Stock

3.1 The film stock, preferably polyester, shall be splice-free, of the low-shrinkage, safety type in compliance with American National Standard for Motion-Picture Film—Safety Film, ANSI/SMPTÉ 223M-1985, and cut and perforated in accordance with long-pitch dimensions specified in American National Standard for Motion-Picture Film (16-mm)—Perforated IR, ANSI/SMPTÉ 109-1986.

3.2 Triacetate film stock shall be cut and perforated in accordance with short-pitch dimensions specified in ANSI/SMPTÉ 109-1986. The stock shall have a maximum lengthwise shrinkage of 0.50 percent when tested as follows: At least 20 strips of film approximately 31 inches in length shall be cut for measurement of shrinkage. After normal development and drying (not over 80°F [27°C]), the strips shall be placed at least 1/4 in apart in racks and kept for seven days in an oven maintained at 120°F (49°C) and a relative humidity of 20 percent. The strips shall then be removed, reconditioned thoroughly to 50 percent relative hu-



Dimensions	Inches	Millimeters
A	0.6060 ± 0.0	15.992 ± 0.015
B	0.5340 ± 0.0005	13.564 ± 0.013
C	0.022 min	0.56 min
D	0.022 min	0.56 min

midity at 70°F (21°C), and the shrinkage measured by a suitable method. The percent shrinkage shall then be calculated on the basis of deviation from the nominal dimension for the length of 100 consecutive perforation intervals given in ANSI/SMPTÉ 109-1986.

4. Identification

Each test film shall be identified by a suitable identification marking. This marking shall be printed lengthwise in the picture area and the spacing between consecutive titles shall be approximately 12 in (30 cm).

NOTE: A test film conforming to this practice is available from the Society of Motion Picture and Television Engineers.

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PROPOSED

SMPTÉ RECOMMENDED PRACTICE

Measurement of Screen Luminance in Theaters

RP 98
Revision of
RP 98-1981

1. Scope

This practice specifies the procedure for a complete set of screen luminance measurements in theaters, intended to promote measured luminance uniformity that is widely acceptable to the audience.

2. Measurement Conditions

Projector operating conditions, photometer type, luminance level, spectral distribution, color temperature, stray light, and flicker shall be as specified in American National Standard for Motion-Picture Film—Screen Luminance and Viewing Conditions—Indoor Theater Projection, ANSI/SMPTÉ 196M-1986.

3. Measurement Points on the Screen

The screen shall be considered as being divided into thirds, both horizontally and vertically; thus, the screen is considered to be divided into nine equal-size rectangles. The measurement point shall be at the center of each rectangle.

4. Measurement Locations in the Seating Area

- 4.1 There shall be six measurement locations; three in the center row of the theater and three in the rear row of the theater.
- 4.2 The three locations within the row specified shall be left edge seat, right edge seat, and center seat. (If the center is an aisle, select the nearest aisle seat.)

Appendix

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

A1. The use of gain screens can raise luminance levels for most of the audience and, at the same time, save energy. It should be pointed out, however, that with gain screens, the luminance as seen from front and side seats may not meet the level and distribution specified in ANSI/SMPTÉ 196M-1986. This lower luminance may be advantageous for the front seats because flicker can be objectionable in peripheral vision which is a factor for patrons seated very close to the screen.

A2. The rear seats in theaters without balconies normally will be within the luminance values obtained in the three readings in the center row, but more readings can be taken, if necessary, to properly curve and tilt a gain screen to obtain good pictorial quality for the maximum number of theater patrons. See SMPTÉ Recommended Practice RP 95-1980, Installation of Gain Screens, for guidance on curving gain screens.

4.3 At each measurement location, the photometer shall be at the eye level of the average seated audience (approximately 1.1 meters above the floor).

5. Measurements

Photometer readings shall be taken from each measurement location of each of the nine measurement points (a total of 54 readings).

6. Luminance Range Limits

For each of the six measurement locations, the following shall be true:

- 6.1 The reading at the center measurement point shall be as specified in ANSI/SMPTÉ 196M-1986 ($10 \pm 2 \text{ fL}$ for review rooms and primary theaters, and $16 \pm 4 \text{ fL}$ for other theaters).
- 6.2 The readings of the remaining eight measurement points shall not be greater than the reading of the center measurement point. The readings of the four corner measurement points shall not be less than 8 fL. The readings of the remaining four measurement points, above, below, left and right of the center, shall not be less than 10 fL.
- 6.3 Excluding the center measurement point, the remaining eight measurement points shall not differ by more than 4 fL.

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