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>
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RP 70-2002
Revision of RP 70-1997

SMPTE RECOMMENDED PRACTICE

Specifications for Flutter Test Film for 16-mm Audio Reproducers, Photographic Type

1 Scope

This practice specifies a test film for determining the presence of flutter in 16-mm motion-picture photographic audio reproducers operating at 36 ft (11 m) per minute.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this practice. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this practice are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

AES 6-1982, Method for Measurement of Weighted Peak Flutter of Sound Recording and Reproducing Equipment

ANSI/NAPM IT2.19-1994, Photography — Density Measurements — Part 2: Geometric Conditions for Transmission Density

ANSI/SMPTE 109-1998, Motion-Picture Film (16-mm) — Perforated 1R and 2R

SMPTE 41-1999, Motion-Picture Film (16-mm) — Prints — Photographic Audio Records

SMPTE 223M-2001, Motion-Picture Film — Safety Film

3 Test film signal

3.1 Frequency

The audio record shall reproduce at a frequency of 3150 Hz ± 25 Hz when the linear velocity of the film is 24 perforations per second or approximately 36 ft per minute (7.2 in or 18.3 cm per second).

3.2 Distortion

The total harmonic distortion of the recorded signals shall not exceed 0.5%.

3.3 Location and dimensions

The location and dimensions of the recorded audio record shall be in accordance with SMPTE 41.

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3.4 Recording

The test film shall have an originally-recorded, variable-area audio track. The geometrical modulation of this recording shall be 80% ± 5% of the maximum nominal geometrical amplitude of 0.055 in (1.40 mm). This is equivalent to an rms nominal geometrical amplitude of 0.0440 in ± 0.0028 in (1.118 mm ± 0.071 mm).

3.5 Signal fluctuation

The output level of the film shall be constant within ± 0.25 dB. This is equivalent to a peak-to-peak amplitude tolerance of approximately 2.9% of the 80% modulation or ± 0.0013 in (0.033 mm).

3.6 Density

The density of the dark portion of the audio track shall be between 1.2 and 1.4 and shall be uniform throughout the length of the film within a tolerance of ± 0.05. The combined base and fog density shall be 0.05 ± 0.01. All densities shall be measured in conformity with ANSI IT2.19.

3.7 Flutter

The weighted peak flutter of the audio record shall not exceed ± 0.10% when measured in accordance with AES 6.

3.8 Azimuth

The azimuth of the audio record shall be 90° ± 3′ to the reference edge of the film.

4 Film stock

4.1 The film stock, preferably polyester, shall be splice-free, of the low-shrinkage, safety type in compliance with SMPTE 223M, and cut and perforated in accordance with long-pitch dimensions specified in ANSI/SMPTE 109.

4.2 In the event that triacetate film stock is used, it shall be splice-free and shall have a maximum lengthwise shrinkage of 0.50% 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 ¼ in apart in racks and kept for seven days in an oven maintained at 120°F (49°C) and a relative humidity of 20%. The strips shall then be removed, reconditioned thoroughly to 50% relative humidity 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/SMPTE 109.

5 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 (305 cm).