SMPTE RECOMMENDED PRACTICE — RP 48-1984

Lubrication of 16 and 8-mm Motion-Picture Prints

1. *Scope*

This practice recognizes that surface treatment of 16- and 8-mm motion-picture prints to reduce the film surface friction coefficient is needed to promote good projection performance. The use of such treatment should result in increased steadiness, reduction of noise in the projector gate, and less tendency toward perforation damage during projection.

2. *Specifications*

2.1 Some type of lubricant or treatment to reduce the film surface friction coefficient should be applied to the full width of the film on both the emulsion and support sides prior to the first projection.

2.2 Unless directed toward specific uses, as noted in 2.3, the lubricant or treatment should be removable by certain film-cleaning operations. If removed, the film should be relubricated or retreated prior to the next projection.

2.3 For specific types of projection equipment, particularly where cartridges or endless loops of film are involved, the manufacturer may recommend or require special methods, lubricants, or treatments especially suited to that equipment. In such cases, it is suggested that any nonrecommended lubricant or treatment which may be on the film be removed prior to application of the special lubricant or treatment.

3. *Measurement*

The method of measurement of the degree of lubrication shall be in accordance with American National Standard Methods for Detecting the Degree of Lubrication on Processed Photographic Film by the Paper-Clip Friction Test, ANSI/ASC PH1.47-1972 (R1979).

Appendix

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

The coefficient of friction measured as specified in ANSI/ASC PH1.47-1972 does not necessarily correlate with actual projection life. To determine the efficiency of the lubricant, projection life (wear and tear) tests are recommended.

Overall lubrication of the film must be restricted to amounts of lubricant below the limit at which mottle, streaks, and other coating defects become visible upon projection. Film treatment by lubrication should not interfere with normal projection properties of the film.

Projection performance of processed motion picture film is improved by lubrication when the coefficient of friction is controlled within the range that gives steady reproducible positioning of successive frames with the least strain on the perforations. Printer effectiveness can also be improved by lubricating the negative to facilitate a constant pitch relationship to the raw stock, and to minimize minor abrasion.

The tutorial paper by Frederick J. Kolb, Jr. and Edward M. Wenzel, "Lubrication of Motion-Picture Film," published in the April 1965 issue of the Journal of the SMPTE (vol. 74; pp. 297-307), reviews the pertinent background, examines the processes and materials for lubrication, and describes several procedures of proven effectiveness.

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SMPTE RECOMMENDED PRACTICE — RP 80-1984

Specifications for Azimuth Test Film for 35-mm Four-Track Striped Release Print Audio Reproducers, Magnetic Type

1. *Scope*

This practice specifies a test film for determining the presence of flutter in 35-mm motion-picture magnetic audio reproducers operating at 96 perforations per second or approximately 90 ft (27 m) per minute designed for four-track magnetic audio release prints.

2. *Test Film Signal*

2.1 Frequency. The audio record on each of the four tracks shall be an original recording which will reproduce at a frequency of 8 kHz ± 100 Hz when the linear speed of the film is 96 perforations per second or approximately 90 ft (27 m) per minute (18 in or 46 cm per second).

2.2 Distortion. The total harmonic distortion of the recorded signal shall not exceed 0.2 percent.

2.3 Audio Record.

2.3.1 Full-Coat. The audio record on full-coat material shall be recorded so that it extends from one edge of the film to the other.

2.3.2 Striped Release Print. For release prints that are striped in accordance with American National Standard Motion-Picture Film (35-mm) —Four-Track Magnetic Sound Release Prints— Magnetic Striping, ANSI PH22.137-1982, the audio record shall be recorded in accordance with American National Standard Position, Dimensions and Reproducing Speed of Four Magnetic Sound Records on 35-mm Motion-Picture Release Prints, ANSI PH22.137-1981.

2.4 Recorded Level. The azimuth test tone shall not be less than 6 dB down from the equivalent reference level of 1 kHz at 185 nanowebers per meter after correct equalization of 35 and 3180 μs.

2.5 Flutter. The weighted peak flutter of the audio record shall not exceed ± 0.04 percent when measured in accordance with American National Standard Weighted Peak Flutter of Sound Recording and Reproducing Equipment, ANSI/IEEE 193-1982.

2.6 Azimuth. The azimuth of the audio record shall be 90° ± 5' to the reference edge of the film.

3. *Film Stock*

3.1 The film stock shall be splice-free, safety type in compliance with American National Standard Specifications for Motion-Picture Safety Film, ANSI PH22.5101-1980.

3.1.1 Test films made on low-shrinkage, triacetate base shall be cut and perforated in accordance with long-pitch dimensions specified in American National Standard Dimensions for 35-mm Motion-Picture Film, CS-1870, ANSI PH22.102-1980.

3.1.2 Test films made on polyester base shall be perforated in accordance with short-pitch dimensions specified in ANSI PH22.102-1980.

3.2 The film stock shall be conditioned for 10 days at 20°C ± 5°C (68°F ± 5.4°F) at a relative humidity of 50 ± 10 percent prior to recording.

3.3 The film shall be recorded and packaged within the temperature and humidity limits specified in 3.2. The recorded film shall be packaged in a metal can and sealed either with a low moisture permeability plastic tape or a fabric tape having a moisture barrier.

4. *Identification*

Each test film shall be identified by a suitable identification marking.

5. *Calibration*

5.1 Flux. The short circuit flux on the test film shall be determined by means of the calibrated short-gap ferromagnetic core reproducer technique. This technique is described in American National Standard Method of Measuring Recorded Flux of Magnetic Sound Records at Medium Wavelengths, ANSI/IEEE 347-1982.

5.2 Level. The signal level specified in 2.4 shall be measured with an rms voltmeter calibrated in decibels with an accuracy of ± 0.1 dB over the bandwidth 31.5 Hz to 16 kHz.

5.3 Method. The test film shall be calibrated on a reproducing head made in accordance with ANSI PH22.137-1981.

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

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