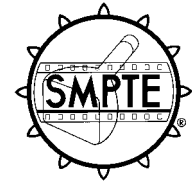


SMPTE STANDARD

ANSI/SMPTE 183M-1996

Revision of
ANSI/SMPTE 183M-1985

for Motion-Picture Film — Photographic Audio Level Test Films — Measurement of Photoelectric Output Factor



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1 Scope

1.1 This standard specifies the method of measurement of the photoelectric output factor of single photographic audio level test films in all film gauges, using a calibrating audio reproducer. It is applicable to both variable-area and variable-density audio records.

1.2 The standard also specifies the intended performance of a calibrating audio reproducer.

1.3 Calibrated audio-level test films are employed to measure the precise output level of photographic audio reproducers and the photoelectric output factor of different audio records, and to establish a reference level on a standard program-level meter appropriately chosen for the installation.

2 Definitions and symbols

2.1 Voltage outputs (V_1 , V_2 , V_3 , and V_4)

The output voltage levels (figures 1 and 2) from the calibrating audio reproducer measured at a point in the circuitry where the voltage relationship to the amplitude of the audio record is essentially linear.

2.2 Maximum photoelectric output (M_{PO})

The voltage difference obtained between full illumination of the photoreceptor by the scanning beam and complete occlusion of the scanning beam, as defined by V_1 and V_4 in figures 1 and 2.

2.3 Photoelectric output factor (P_{OF})

When reproducing an audio level test film on a calibrating reproducer, the photoelectric output factor is the ratio of the peak-to-peak output voltage from the film to the maximum output of the reproducer as defined in 2.2.

3 Method of measurement

3.1 Three steps shall be required to measure the photoelectric output factor:

3.1.1 Measure the maximum photoelectric output (M_{PO}) of the calibrating reproducer by one of two methods — the dc method or the ac method as specified in clause 5.

3.1.2 Measure the peak-to-peak output voltage of the test film as specified in 5.2.

3.1.3 Calculate the photoelectric output factor as specified in clause 6.

4 Measurement of maximum photoelectric output

4.1 Method

Either the dc method or the ac method shall be used for measuring the maximum photoelectric output of the calibrating reproducer.

4.2 Equipment

4.2.1 For both methods, a calibrating reproducer and instrumentation arranged in accordance

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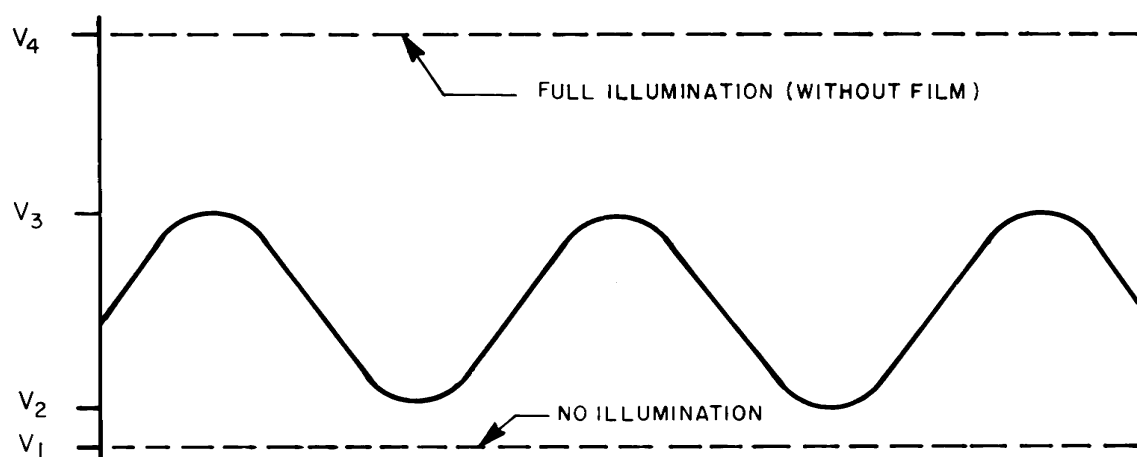


Figure 1 – Calibration waveforms — DC method

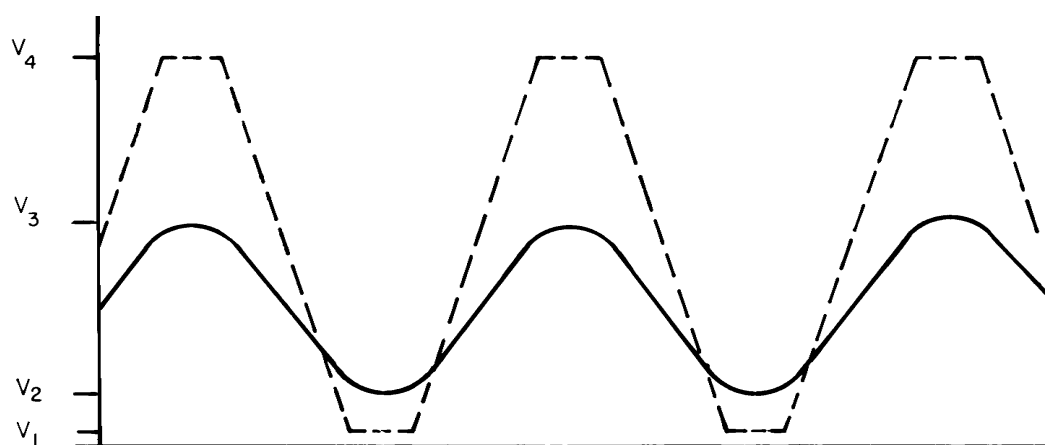


Figure 2 – Calibration waveforms — AC method

with figure 3 and aligned in accordance with the appropriate audio record format document shall be required.

4.2.2 The width of the scanning beam at the film plane shall be within 1% of the nominal value specified in the appropriate audio record format document.

4.2.3 The uniformity of illumination across the width of the scanning beam, together with the point-to-point photon efficiency of the phototransducer, shall be constant within $\pm 5\%$.

4.3 Additional specifications for dc method

The combination of phototransducer and amplifier shall have a constant electrical peak output for all frequencies from the measuring frequency down to 0 Hz or dc $\pm 1\%$ or 0.1 dB.

4.4 Additional specifications for ac method

4.4.1 The scanning beam shall be interrupted by a mechanical shutter (figure 4) that gives equal on-and-off durations at a nominally constant frequency, and has a nonreflecting black surface.