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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Cinematography — Photoelectric output factor of photographic-type audio-level test films — Measurement and calibration

Cinématographie — Facteur de sortie photoélectrique des films d'essai de niveau sonore de type optique — Mesurage et étalonnage

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7832 was prepared by Technical Committee ISO/TC 36, *Cinematography*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Cinematography — Photoelectric output factor of photographic-type audio-level test films — Measurement and calibration

1 Scope and field of application

This International Standard specifies a method of measuring and calibrating the photoelectric output factor of single-channel photographic-type audio-level test films in all gauges, using a calibrating sound reproducer. It is applicable to both variable area and variable density type sound records with a silver audio track.

It also specifies the performance of a calibrating audio reproducer.

Calibrated audio-level test films are employed to measure the precise output level of photographic sound reproducers, and the photoelectric output factor of different sound records.

They are also employed to establish a reference level on a standard program level meter, chosen to be appropriate for the installation in use.

2 References

ISO 2939, *Cinematography — Picture image area and photographic sound record on* 35 mm *motion-picture release prints — Positions and dimensions.*

ISO 4243, *Cinematography — Picture image area and photographic sound record on* 16 mm *motion-picture release prints — Positions and dimensions.*

ISO 4244, *Cinematography — Photographic sound record on* 8 mm *Type S motion-picture prints — Position and width dimensions.*

ISO 6025, *Cinematography — Photographic-monophonic sound test films — Specifications.*

3 Definitions and symbols

For the purpose of this International Standard the following definitions apply.

3.1 voltage outputs (V_1, V_2, V_3, V_4) : The output voltage levels from the calibrating sound reproducer, measured at a point in the circuitry where the voltage relationship to the amplitude of the sound record is essentially linear.

3.2 maximum photoelectric output (MPO) : The voltage difference obtained between full illumination of the photoelectric receptor by the scanning beam, and complete occulting of the scanning beam, as defined by V_1 and V_4 in figures 1 and 2.

3.3 peak-to-peak voltage (PV) : The voltage difference observed for a sound level test film between the maximum output at the crest of a sine wave (+ peak) and the minimum output at the trough of a sine wave (− peak), as defined by V_2 and V_3 in figures 1 and 2.

3.4 photoelectric output factor (POF) : (When reproducing an audio level test film on a calibrating reproducer.) The ratio of the peak-to-peak output voltage (PV) from the film as defined in 3.3 to the maximum output of the reproducer, as defined in 3.2.

NOTE — An ideal test film would have a photoelectric output factor of 1,0 which is a theoretical value that cannot be obtained in photographic sound recording due to sound track image density and base and fog density.

4 Method of measurement

4.1 The photoelectric output factor shall be measured on a calibrating reproducer, as described in clause 7, with the required instrumentation arranged in accordance with the annex and figures 3 and 4.

4.2 The signal frequencies of the test film shall be as specified in ISO 6025.

5 Method of calibration

Two alternative methods of calibration are given.

5.1 d.c. Method

Calibration is carried out by comparing the steady-state values of full scanning beam illumination on the phototransducer with complete occultation (see figure 1 and clause A.2 of the annex).

5.2 a.c. Method

Calibration is carried out by means of an occulting shutter interrupting the scanning beam illumination on the photoelectric transducer, the shutter operating at the same nominal frequency as that of the audio-level test film (see figure 2 and clause A.3 of the annex).

6 Calibration procedure

Calibration requires electrical measurements, which show the peak-to-peak voltage output obtained, using a true peak reading voltmeter, when running an audio-level test film through a calibrating reproducer. This voltage is expressed as a percentage of the maximum output of the reproducer.

6.1 With the calibrating reproducer conforming to ISO 2939, ISO 4243 or ISO 4244, and with no film in the reproducer, measure the voltage difference between V_1 and V_4, as defined in 3.2.

6.2 With the audio-level test film running through the calibrating reproducer, measure the peak-to-peak voltage difference between V_2 and V_3, as defined in 3.3.

6.3 Calculate the photoelectric output factor, POF, of the audio-level test film using the following equation:

$$POF = \frac{PV}{MPO}$$

7 Calibrating reproducer

7.1 The calibrating reproducer shall comply with the flutter specification of ISO 6025 for the audio-level test film being calibrated.

7.2 The location, azimuth, and focus of the scanning beam shall be aligned using the appropriate photographic test film.

7.3 The width of the scanning beam at the film plane shall be within 1 % of the nominal value specified in ISO 2939, ISO 4243 or ISO 4244.

7.4 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 ± 5 % when using a snake track test film.

NOTE — The use of calculated corrections to avoid errors is not permitted.

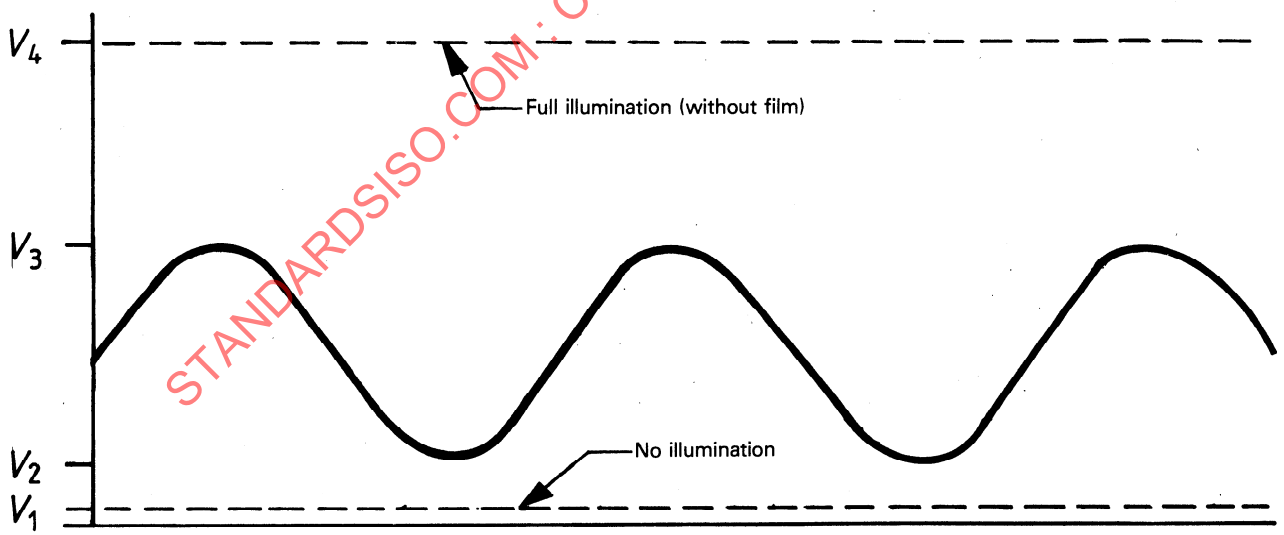


Figure 1 — Calibration waveforms — d.c. method

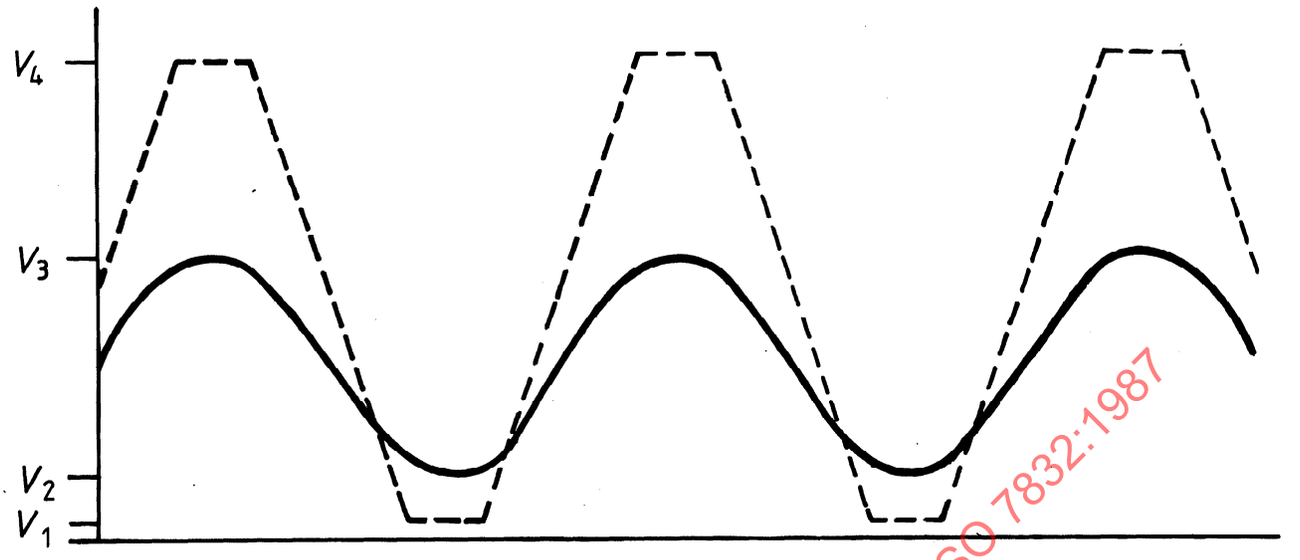
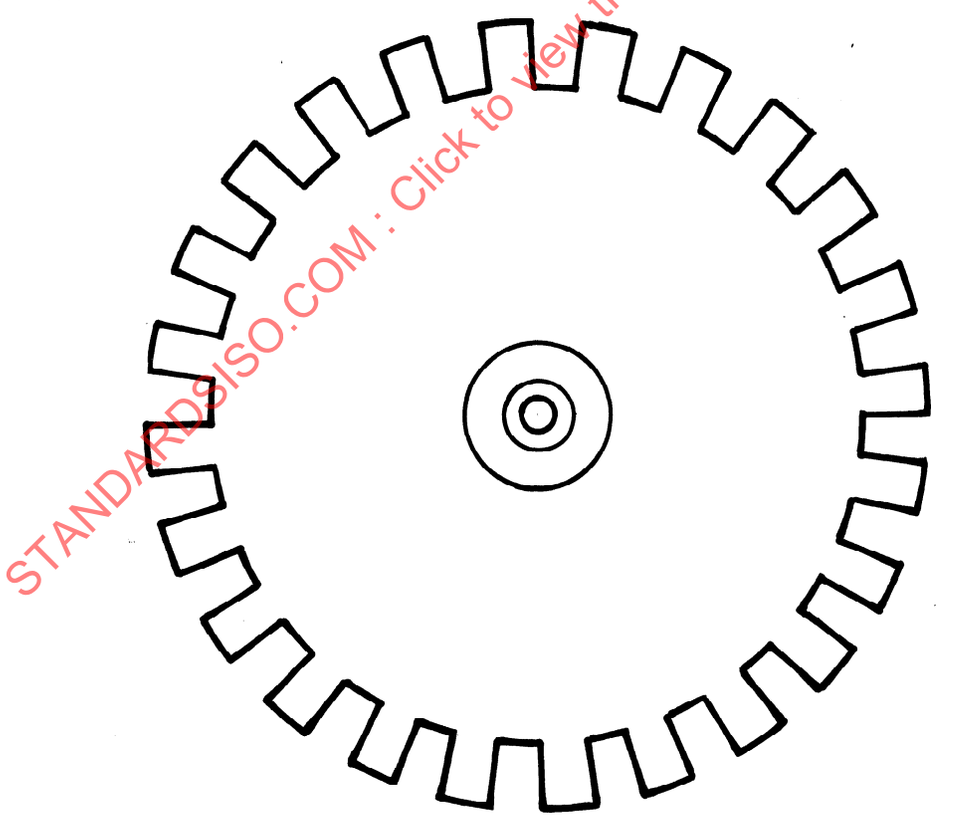


Figure 2 — Calibration waveforms — a.c. method



NOTE — This shutter wheel is designed to give equal on-and-off durations, and may be conveniently driven by any small d.c. motor. The shutter, containing 24 elements as shown, generates a 400 Hz tone at 1 000 r/min, and a 1 000 Hz tone at 2 500 r/min.

Figure 3 — Shutter wheel

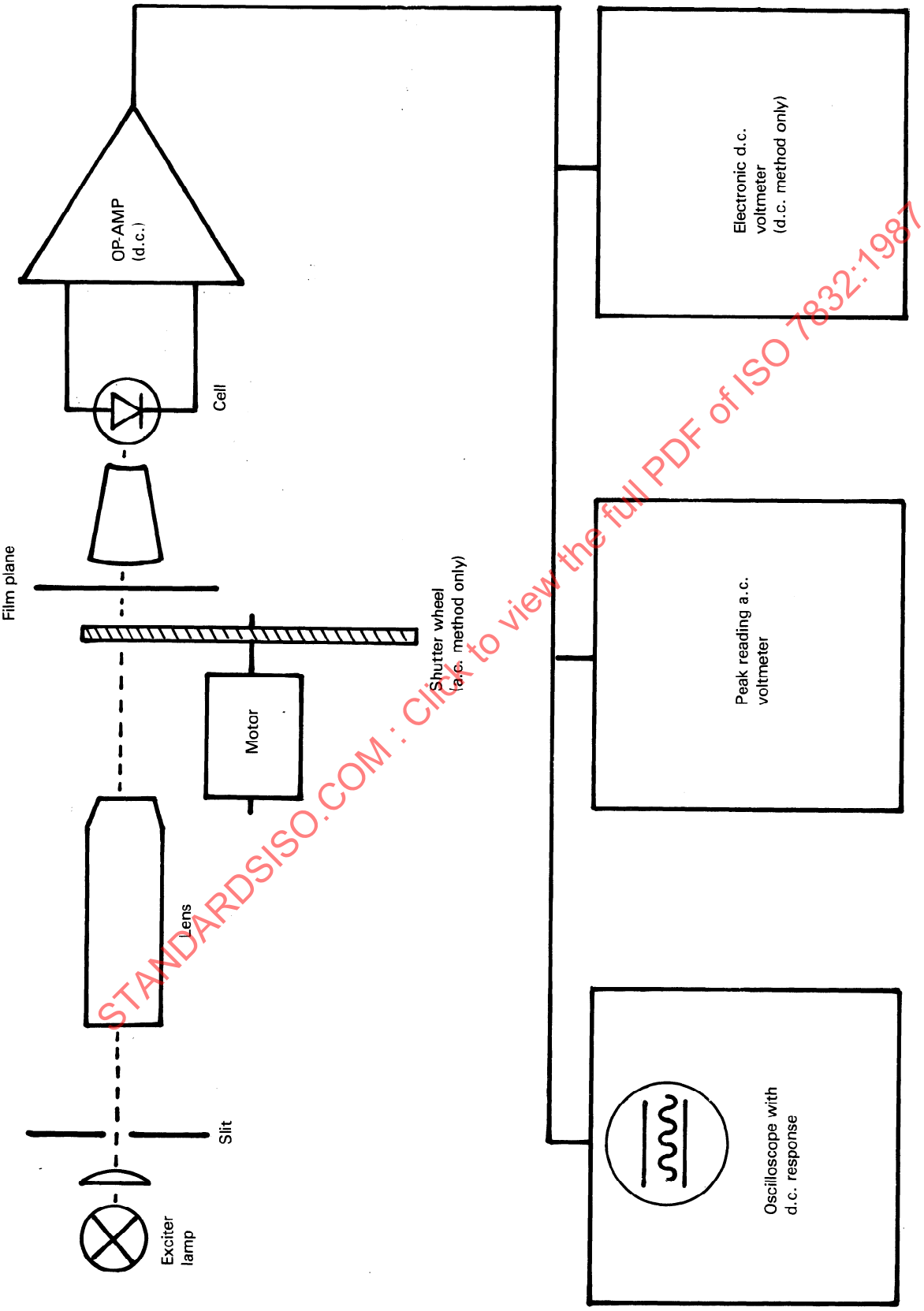


Figure 4 — Equipment required to establish photoelectric output factor