
**Cinematography — Method of
measurement of perceived loudness of
short duration motion-picture audio
material**

*Cinématographie — Méthode de mesure de l'intensité sonore perçue
pour les films cinématographiques de courte durée*



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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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 36, *Cinematography*.

This second edition cancels and replaces the first edition (ISO 21727:2004), of which it constitutes a minor revision.

Introduction

This International Standard is intended to be used in conjunction with the International Standards that cover the reproduction of motion-picture sound, A-chain and B-chain, including ISO 2969 and ISO 22234.

A recommended replay level architecture exists for most current cinema sound formats. This matches a specific recorded modulation level with a specific sound-pressure level at the main seating position in a room designed in accordance with ISO 2969 and ISO 22234. The noise and over-modulation points of each sound format are positioned to allow for a wide range of signal components to be recorded and faithfully reproduced at a valid absolute level as part of a motion-picture soundtrack.

Perhaps due to their competitive nature, many motion-picture commercials and trailers make sustained use of the highest recording level possible for the format. Consequently, many exhibitors now find the need to reduce the replay level to a point much lower than the recommendation. This has caused uncertainty as to the validity of the recommended replay level, which in turn creates problems in matching dubbing theatre sound to that expected from the average cinema.

This International Standard is intended to assist in assessing the subjective loudness of motion-picture sound so that a better match between the sound levels of commercials, trailers and main features is maintained, and so that confidence in the validity of the recommended replay level is re-established.

Cinematography — Method of measurement of perceived loudness of short duration motion-picture audio material

1 Scope

This International Standard specifies a method of measurement of short duration motion-picture sound that allows assessment of the subjective loudness and annoyance of the sound recording when replayed at the recommended replay level in rooms aligned with the characteristics of ISO 2969. The specified method of measurement assesses the entire duration of the sound recording, typically commercials and trailers that do not exceed 3 min in length, with suitable channel summation, frequency weighting and time integration. It does not specify a maximum recommended level for such material and is solely aimed at describing a measurement method.

NOTE Typical recording and replay levels are discussed in [Annex A](#).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For the dated reference, only the edition cited applies. For the undated reference, the latest edition of the referenced document (including any amendments) applies.

ISO 22234, *Cinematography — Relative and absolute sound pressure levels for motion-picture multi-channel sound systems — Measurement methods and levels applicable to analog photographic film audio, digital photographic film audio and D-cinema audio*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 reference level

modulation level equivalent to 50 % modulation of optical variable-area soundtrack, -20 dB (level relative to digital full-scale) in the digital domain and 185 nW/m in the magnetic domain, measured using an average responding meter and a steady-state tone

Note 1 to entry: 100 % modulation of a single track of a two-track variable-area soundtrack has a dimensional modulation of 838,2 μm (0,033 in).

3.2 reference pink noise

pink noise, band-limited to 20 Hz to 20 kHz, set at the reference level, using an average responding meter

3.3 pink noise

stochastic signal having a continuous spectrum from at least 20 Hz to 20 kHz with equal energy $\pm 0,5$ dB per one-third octave of frequency and a Gaussian probability distribution of instantaneous amplitude