International Standard 6774

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Cinematography — Spectral response of photographic sound reproducers for 8 mm Type S motion-picture films — Specifications

Cinématographie — Réponse spectrale des appareils de reproduction du son photographique pour film cinématographique 8 mm type S — Spécifications

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Foreword

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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.

International Standard ISO 6774 was developed by Technical Committee ISO/TC 36, *Cinematography*, and was circulated to the member bodies in November 1980.

It has been approved by the member bodies of the following countries :

Belgium	Italy	Switzerland
Canada	Japan	United Kingdom
Czechoslovakia	Korea, Dem. P. Rep. of	USA
Egypt, Arab Rep. of	South Africa, Rep. of	USSR
France	Spain	
Germany, F. R.	Sweden	

No member body expressed disapproval of the document.

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Cinematography — Spectral response of photographic sound reproducers for 8 mm Type S motion-picture films — Specifications

1 Scope and field of application

This International Standard specifies the spectral response of the photographic sound reproducer light source and receptor as a combination, including any optical filtering that may be interposed.

2 References

ISO 1781, *Cinematography — Projector usage of* 8 mm *Type S motion-picture film for direct front projection.*

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

3 Spectral response

The peak value or maximum response of the combination of sound reproducer light source, filter, and receptor shall be at $550 \, ^{+130}_{0}$ nm.

The electrical response of this combination when integrated with respect to all wavelengths greater than 800 nm, shall not exceed 5 % of the electrical response measured from 400 to 800 nm.

Annex

Response of photoelectric cells

Dyes used in positive colour films for projection usually have a layer order with magenta dye on top, the cyan dye layer in the middle, and the yellow dye layer on the bottom (nearest the support). For reversal colour films, the yellow dye layer is usually on top with the magenta dye layer in the middle, and the cyan dye layer on the bottom.

The production of a sound track recording with maximum resolution is most conveniently accomplished in the top dye layer, with progressive spread as the sound track image lies further below the top surface.

The magenta dye layer is thus the most favourably located single layer for reproduction with good resolution and it is, at the same time, the dye layer which in the image contributes the maximum to visual image resolution. The absorption maximum for magenta dyes is approximately 550 nm.

Photoreceptors with simultaneously a maximum response of 550 nm, plus a useful output signal level leading to a sufficient signal-to-noise ratio, have not yet been demonstrated. Modification of the response of solar photoelectric cells, with optical filters that inhibit response to longer wavelengths has provided the only practical solution available. Yet the response maximum located approximately in the region of 680 nm does not, however, fully utilize the best capabilities of existing films.

Dyes used in colour films often have a relatively high transmission for wavelengths greater than 800 nm. Dirt and other film support imperfections may have an effective optical density, which is relatively high at all wavelengths including wavelengths greater than 800 nm. The purpose of limiting the spectral response of the sound reproducer is to use to advantage the absorption of the dye image to modulate the scanning beam, while obtaining the minimum contribution from dirt particles and other non-functional absorbers. This provides almost the maximum signal-to-noise ratio of which the dye record is capable.

A tungsten filament light source emits its peak energy, and a typical silicon photoreceptor is most sensitive, at wavelengths of about 850 to 1 000 nm. Filters which transmit energy for wavelengths shorter than 800 nm and reflect or absorb wavelengths longer than 800 nm, can be used to introduce a band-pass limitation and thereby provide the response specified in clause 3 in a reproducer employing a tungsten filament source and a conventional silicon photoreceptor.