International Standard 6035

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Cinematography — Viewing conditions for the evaluation of films and slides for television — Colours, luminances and dimensions

Cinématographie — Conditions de visionnement pour l'évaluation des films et diapositives pour la télévision — Couleurs, luminances et dimensions

First edition — 1983-12-01

UDC 771.537 : 621.397.132 **Ref. No. ISO 6035-1983 (E)**

Descriptors : cinematography, motion picture film, film slides, television systems, screens (displays), dimensions, specifications.

Price based on 3 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized 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.

International Standard ISO 6035 was developed by Technical Committee ISO/TC 36, *Cinematography*, and was circulated to the member bodies in June 1980.

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

Australia	France	Spain
Austria	Germany, F. R.	Sweden
Belgium	Ireland	Switzerland
Canada	Italy	United Kingdom
China	Japan	USA
Czechoslovakia	Poland	USSR
Denmark	Romania	
Egypt, Arab Rep. of	South Africa, Rep. of	

No member body expressed disapproval of the document.

Printed in Switzerland

Cinematography — Viewing conditions for the evaluation of films and slides for television — Colours, luminances and dimensions

1 Scope and field of application

1.1 This International Standard lays down the necessary conditions for the colour and luminance of open gate screen illumination and colour and luminance of the surround illumination.

It also specifies the relative size of the surround and screen, and the level of ambient illumination to permit critical evaluation of colour balance and contrast of films intended for television use.

1.2 This International Standard also recommends viewing conditions for review rooms for large audiences.

2 References

ISO 2895, *Cinematography — Screen luminance for review room projection of motion-picture film intended for indoor theatres.*

ISO 6036, *Cinematography — Colour films and slides for television broadcast — Density.*[1)]

3 Colour and luminance of open gate screen

3.1 Although it is recognized that ultimate reproduction of white in the television system will be D_{6500} or illuminant C, a screen chromaticity and spectral distribution approximately that of a black body of nominally 5 400 K shall be used. A range from 5 000 to 6 500 K is acceptable with a preferred characteristic of 5 400 K whenever it can be achieved.

3.2 The screen colour mentioned in 3.1 results from chromatic distribution of the projector light and of the screen reflectance. (See annex A.1.1.)

3.3 To facilitate the illumination of a visual surround, it may be desirable to use a screen of low reflectance, or one with directional properties. (See annex A.1.2.)

3.4 The open gate luminance of the screen measured in accordance with ISO 2895 shall be 137 ± 13,7 cd/m^2 [40 ± 4 ftL[2)]]. This luminance will produce, with a film conforming to that specified in ISO 6036, in the gate, a white luminance of about 68 cd/m^2 (20 ftL), which corresponds approximately to peak white luminance of colour television monitors.

3.5 The luminance at a distance of 5 % of the screen width from the side edges of the screen shall be 90 ± 10 % of the centre luminance along the horizontal axis.

3.6 If a directional screen is used, the viewing audience shall be restricted to that area from which the luminance tolerance is operative.

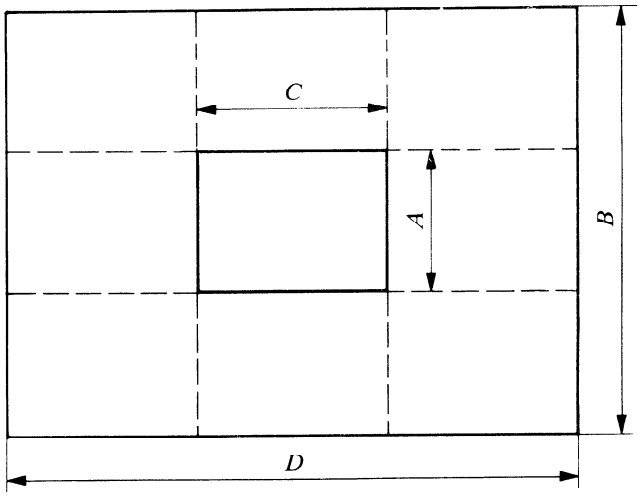
4 Screen dimensions

4.1 The viewing screen shall be of such size that the viewing audience may be seated at a distance from the screen equal to four to six times the screen height. Its size shall be sufficiently small so that a visible surround area of approximately eight times the screen area is possible (see the figure).

4.2 The ratio of screen width to screen height shall be 1,33 :1.

1) At present at the stage of draft.

2) ftL = foot-Lambert.



Figure

Table

Ratio of dimensions	
A	1,00
B	3,00
C	1,33
D	4,00

5 Illuminated surround

5.1 Illuminated surround is defined as the light, visible to the observer, which surrounds, but does not include the central screen area.

5.2 The area of the illuminated surround shall be preferably at least eight times the screen area (see the figure).

5.3 The luminance of the illuminated surround shall be approximately 1/6 to 1/10 the open gate screen luminance (see annex A.2.1).

5.4 The colour of the illuminated surround shall match that of the open gate screen illumination to within ± 200 K (see annex A.2.2).

6 Ambient conditions

6.1 The level of light shall be insignificant in comparison with that of the screen illumination and surround.

6.2 Light falling on the screen which is reflected to the viewing position shall be low enough so that the luminance of the projection screen measures less than 3,4 cd/m^2 (1 ftL). To achieve this, walls should be of low reflectance.

6.3 The viewing room "decor" should preferably give a generally neutral impression without dominant colours being employed.

7 Review room for large audiences

When the audience size exceeds the capacity of the review room described, and the specified conditions cannot be maintained, the evaluation and impression of the characteristics of the film may change. Large audience review conditions for theatrical purposes then apply to the review characteristics as described in ISO 2895. When these conditions exist, the user is cautioned that the elimination of a lighted surround reduces the viewer's sensitivity in making judgment of contrast.

Annex

Additional data

(This annex forms part of the standard.)

A.1 Screen and projector characteristics

A.1.1 The desired colour may be obtained using an arc source in the projector. The high intensity carbon arc usually operates at close to 5 400 K. The xenon arc will operate closer to 6 000 K when new, and may change toward 5 000 K with age. Another method is to use a blue photometric filter having a mired shift value of approximately 110 units with a projector having a tungsten source, changing its nominal colour of about 3 500 K to 5 400 K. A mired shift of minus 110 units may be obtained by the use of a suitable thickness of blue glass photometric filter such as Corning Filter No. 5900. The use of gelatin filter is not recommended.

Colour temperature may be verified most easily by comparison with a known reference of 5 400 K by measurement using a spectroradiometer. Two- or three-colour temperature meters may not give relative results with xenon illumination or other sources which depart from black-body spectral quality. Another method is to use a tungsten light source equipped with a blue photometric filter of such a thickness as to produce a nominal colour of approximately 5 400 K.

A.1.2 The choice of screen material will depend on the projection illumination available and the method chosen to provide surround illumination. If the projection source is tungsten, filtered to 5 400 K by a supplementary filter over the lens, a directional, high-gain screen may be required to provide sufficient open gate screen luminance. If the source is a xenon arc capable of a beam output of the order of 100 lm, a matt white screen can be used. If 500 lm are available, a 20 % reflection grey screen can be used. Both the 20 % matt grey screen and the directional high-gain screen make it possible to achieve the desired black level on the unlighted screen, in the presence of some ambient light. This practice does not preclude the use of rear projection screens, provided uniformity of illumination can be achieved.

For aesthetic reasons, a screen mask or border may be desired. If used, it should preferably be confined to a width not exceeding 4 % of picture width.

A.2 Light surround

A.2.1 To judge contrast in the film, the level of surround luminance ideally should approximate average picture luminance. This is most frequently about 1/5 the picture white luminance, although it can vary widely. However, for optimum sensitivity of the observer to colour casts and colour balance errors, a higher surround brightness is required and a value of 1/3 the picture white luminance is frequently used, although this may be found tiring to the observer in long review sessions. Ideally, the surround brightness level should be adjustable, but if a single-valued compromise is adopted, it should lie between the limits 1/6 to 1/10 of the open gate screen luminance, i.e., 1/3 to 1/5 picture white luminance for a typical print. The level may be measured directly or it may be checked relative to screen luminance by placing the appropriate value of neutral density, non-scattering filter over the projection lens. This attenuates the screen luminance by the required factor allowing a visual match with the surround.

A.2.2 It is important that the surround match the screen for colour. The use of a 0,6 density non-selective, non-scattering filter over the projector lens, permitting a visual match of screen with surround, is the easiest and most accurate way to verify such a match. It is necessary, however, that the filter used introduces no colour. A filter of evaporated metal, such as Inconel, can fill this requirement.

Surround illumination may be obtained in several ways. It can be a transilluminated panel. Front illumination can be used provided the screen itself is not lit. This can be achieved by placing the screen in a plane in front of the surround plane, with surround lights behind the screen. It can also be achieved by projecting surround light with specular optics, masking out the screen area. Or, it can be achieved if a directional, high-gain screen is used, by appropriate placement of overhead light, using readily available fluorescent tubes operating at a nominal colour temperature of 5 400 K.

A.2.3 When problems in room design prevent achievement of the full surround format and geometry, some compromise in uniformity of surround illumination and in centring of the screen in the surround area may still permit the essential performance of this review room.

A.3 Compatibility

A.3.1 Experiments have established that the same colour balance and density for prints is preferred under the larger screen, darkened room condition as under the smaller screen, lighted-surround condition. However, it is possible, because of the visual adaptation, for an observer in the darkened room to judge as acceptable some prints which would be recognized as less acceptable or unacceptable in the presence of the lighted surround.

This page intentionally left blank

This page intentionally left blank

This page intentionally left blank