

International Standard



7944

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

Optics and optical instruments — Reference wavelengths

Optique et instruments d'optique — Longueurs d'onde de référence

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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. Every 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 7944 was prepared by Technical Committee ISO/TC 172, *Optics and optical instruments*.

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0 Introduction

The reference wavelengths used for the characterization of optical glasses differ from country to country, thus making direct comparisons very complicated, because conversions or remeasurements become necessary.

The specifications laid down in this International Standard are intended to reduce the difficulties which have been encountered until now, thus improving mutual understanding and facilitating the evaluation of technical data concerning optical glasses, optical devices and spectacle lenses.

1 Scope and field of application

This International Standard specifies the wavelengths to be used for the characterization of optical glasses, all kinds of optical systems and instruments, together with spectacle lenses. It specifies two reference wavelengths and defines the associated principal refractive indices and principal dispersions. Abbe numbers are defined with regard to these reference wavelengths and the principal dispersions.

NOTE — It is envisaged, in the future, to specify only one reference wavelength.

2 Wavelengths, dispersions and Abbe numbers

See the table.

NOTES

- 1 In the infra-red spectral range, the following wavelengths (nm) are recommended :
Rb 780,0; Hg 1 128,66; Hg 1 395,1; Hg 1 529,6; Hg 1 813,1; Hg 1 970,1; Hg 2 325,4
 - 2 Recommended laser wavelengths (nm) :
He-Ne 632,8; Nd 1 060,0
 - 3 In some countries, the yellow sodium D-line Na 589,29 nm (middle of double line) is also used.
- With a view to standardization, however, this line should be replaced in future by the yellow helium d-line He 587,56 nm.

Table

Spectral lines used	Ultra-violet mercury i-line	Violet mercury h-line	Blue mercury g-line	Blue cadmium F'-line	Blue hydrogen F-line	Green mercury e-line	Yellow helium d-line	Red cadmium C'-line	Red hydrogen C-line	Red helium r-line	Infra-red caesium s-line	Infra-red mercury t-line
Element	Hg	Hg	Hg	Cd	H	Hg	He	Cd	H	He	Cs	Hg
Wave-length, nm	365,01 ¹⁾	404,66	435,83	479,99	486,13	546,07	587,56	643,85	656,27	706,52	852,11	1 013,98
Reference wave-length, nm	—	—	—	—	—	546,07	587,56	—	—	—	—	—
Principal refractive index	—	—	—	—	—	n_e	n_d	—	—	—	—	—
Principal dispersion	$n_e : n_{F'} - n_{C'} \qquad \text{ISO 7944:1984} \qquad n_d : n_F - n_C$											
Abbe number	$v_e = \frac{n_e - 1}{n_{F'} - n_{C'}} \qquad 5492d56395f0/iso-7944-1984 \qquad v_d = \frac{n_d - 1}{n_F - n_C}$											

1) This single line of the Hg-triplet should be used.