International Standard 8255/1

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Optics and optical instruments — Microscopes — Cover glasses — Part 1: Dimensional tolerances, thickness and optical properties

Optique et instruments d'optique — Microscopes — Lamelles couvre-objet — Partie 1: Tolérances dimensionnelles, épaisseur et propriétés optiques

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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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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Optics and optical instruments — Microscopes — Cover glasses — Part 1: Dimensional tolerances, thickness and optical properties

0 Introduction

This part of ISO 8255 lays down dimensions and specifies optical quality requirements in order to guarantee the quality of observation.

The data given in this part of ISO 8255 are applicable to most products in use and have been adapted to take into account the relevant national standards in force.

This part of ISO 8255 contains requirements for dimensional tolerances, thickness and optical properties, whereas quality requirements and test methods related to the material will be dealt with in a future part of ISO 8255.

1 Scope and field of application

This part of ISO 8255 specifies requirements for dimensional tolerances, thickness and optical properties for microscope cover glasses used for transmitted light microscopy in the visible spectral range[1)].

NOTE — This part of ISO 8255 does not cover requirements for suitability for fluorescence microscopy.

2 Reference

ISO 7944, *Optics and optical instruments — Reference wavelengths.*

3 Requirements

3.1 Dimensional tolerance

The tolerance on nominal length, width or diameter of cover glasses shall be ± 0,5 mm.

3.2 Thickness

Cover glasses shall conform to the following thickness ranges:

No. 1 (general purpose) : $0{,}17\ ^{0}_{-0{,}04}$ mm

No. 1-H (high performance) : $0{,}17\ ^{0}_{-0{,}02}$ mm

NOTES

1 Microscope manufacturers, for purposes of optical design, use 0,17 mm as the combined thickness of cover glass and mounting medium, measured from the top surface of the cover glass to the top surface of the specimen being observed.

2 In addition to the above No. 1 and No. 1-H cover glasses, other thicknesses are available, such as 1 1/2 ($0{,}17\ ^{+0{,}02}_{-0{,}01}$ mm) and No. 2 ($0{,}17\ ^{+0{,}08}_{0}$ mm) which may be used for some purposes.

Highest optical quality, particularly with large aperture objectives, may not be obtained with these thicknesses.[2)]

3.3 Optical properties

The optical properties of cover glasses shall be as follows:

Principal refractive index : $n_e = 1{,}525\,5 \pm 0{,}001\,5$

Abbe number : $\nu_e = 56 \pm 2$

NOTE — The principal refractive index, n_e, is the refractive index of light at the green mercury e-line (λ_e = 546,07 nm; see ISO 7944). This wavelength is close to the maximum sensitivity of the eye and has been used as the principal wavelength of optical computation for some time.

1) The visible spectral range is defined as being the range from 400 to 760 nm.

2) Note 2 is only of a cautionary nature, but does not form part of the standard.

The Abbe number, ν_e, is calculated using the following formula:

$$\nu_e = \frac{n_e - 1}{n_{F'} - n_{C'}}$$

where

n_e is the principal refractive index;

$n_{F'}$ is the refractive index of light at the blue cadmium F'-line ($\lambda_{F'}$ = 479,99 nm);

$n_{C'}$ is the refractive index of light at the red cadmium C'-line ($\lambda_{C'}$ = 643,85 nm).

4 Marking

The packaging of microscope cover glasses conforming to this part of ISO 8255 shall be marked with the following information:

a) the thickness, No. 1 or No. 1-H;

b) the dimensions;

c) the average number of cover glasses per package or weight;

d) the manufacturer's or supplier's name or mark, and the country of origin;

e) a statement that the cover glasses comply with the requirements laid down in this part of ISO 8255.