

INTERNATIONAL  
STANDARD

**ISO**  
**9344**

First edition  
1996-12-15

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**Optics and optical instruments —  
Microscopes — Graticules for eyepieces**

**iTeh STANDARD PREVIEW**

*Optique et instruments d'optique — Microscopes — Réticules pour  
oculaires*  
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ISO 9344:1996

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Reference number  
ISO 9344:1996(E)

## 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9344 was prepared by Technical Committee ISO/TC 172, *Optics and optical instruments*, Subcommittee SC 5, *Microscopes and endoscopes*.

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# Optics and optical instruments — Microscopes — Graticules for eyepieces

## 1 Scope

This International Standard specifies dimensions and permissible material defects and processing faults of graticules with diameters of 19 mm, 21 mm and 26 mm to be used in microscope eyepieces for the purpose of measurement, assessment and comparison.

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## 2 Normative references [standards.iteh.ai](http://standards.iteh.ai)

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 10110-1:1996, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 1: General.*

ISO 10110-3:1996, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 3: Material imperfections — Bubbles and inclusions.*

ISO 10110-4:—<sup>1)</sup>, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 4: Material imperfections — Inhomogeneity and striae.*

ISO 10110-5:1996, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 5: Surface form tolerances.*

ISO 10110-7:1996, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 7: Surface imperfection tolerances.*

ISO 10110-8: :—<sup>1)</sup>, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 8: Surface texture.*

<sup>1)</sup> To be published.

### 3 Requirements

#### 3.1 Dimensions

See table 1.

**Table 1 — Dimensions of graticule**

Dimensions in millimetres	
<b>Diameter<sup>1)</sup>, <i>d</i></b>	$19 \begin{smallmatrix} 0 \\ -0,033 \end{smallmatrix}$
	$21 \begin{smallmatrix} 0 \\ -0,033 \end{smallmatrix}$
	$26 \begin{smallmatrix} 0 \\ -0,033 \end{smallmatrix}$
<b>Thickness</b>	$1,0 \pm 0,1$
	$1,5 \pm 0,2$
<b>Protective chamfer</b> according to ISO 10110-1	0,1 to 0,3
1) Other diameters are also permitted if they comply with the specified thickness and the requirements listed in table 2.	

#### 3.2 Permissible material defects and processing faults

See table 2.

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#### 4 Marking

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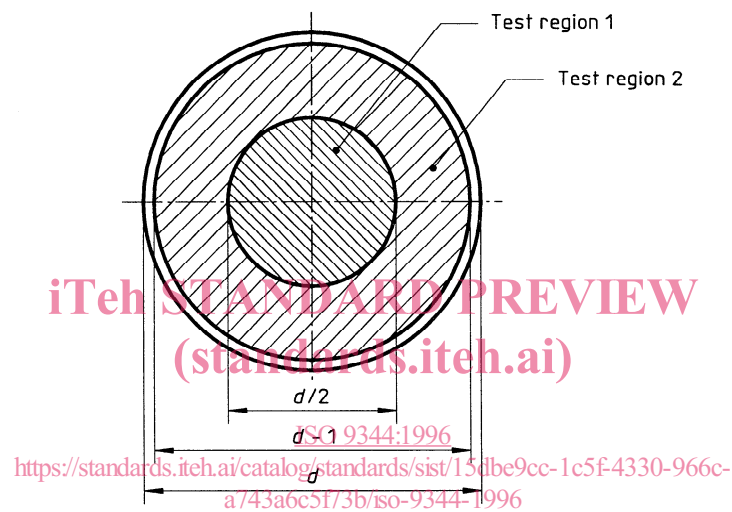
Graticules shall be marked with the words "Conforming to ISO 9344:1996". The marking shall be placed on the graticule itself or on the graticule packaging.

**Table 2 — Permissible material defects and processing faults**

Dimensions in millimetres

Criterion	Reference for specification	Test region <sup>1)</sup>	Minimum requirement
Bubbles	ISO 10110-3	1 2	$1/2 \times 0,016^2$ $1/2 \times 0,025^2$
Striae	ISO 10110-4	—	2/—; 3 <sup>3)</sup>
Surface form errors	ISO 10110-5	—	3/6 (3) <sup>4)</sup>
Surface imperfections for each side	ISO 10110-7	1 2	$5/2 \times 0,016^2$ ; $L2 \times 0,0025^5$ $5/2 \times 0,025^2$ ; $L2 \times 0,004^5$
Surface quality	ISO 10110-8	—	$P3 / \sqrt{6}$ <sup>6)</sup>
Parallelism tolerance	—	—	$\leq 10'$

1) Test regions



2) Code for defect/permissible number of defects multiplied by the square root of the maximum area of the largest defect, in mm<sup>2</sup>.  
EXAMPLE:  $1/2 \times 0,1$  indicates 2 bubble defects with a maximum area of 0,01 mm<sup>2</sup> per bubble.

3) The dash following the defect code indicates that the inhomogeneities are unspecified; the digit 3 indicates the class of striae, which may have the following effective area, in reference to the diameter of the graticule plate:

Diameter, mm	19	21	26
Striae class	3	3	3
Striae area, mm <sup>2</sup>	5	6	10

4) In accordance with ISO 10110-5, the first number after the defect code represents the number of interference fringes, whereas the number in brackets gives the permissible deviation from rotational symmetry (number of fringe spacings).

5) Two long scratches (L) of unspecified length and maximum width of 0,002 5 (0,004) mm are permissible.

6) Polished surface with less than 16 microdefects per 10 mm scan line.

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### ICS 37.020

**Descriptors:** optics, optical equipment, microscopes, optical microscopes, eyepieces, graticules, specifications, materials specifications, dimensions, marking.

Price based on 3 pages

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