INTERNATIONAL STANDARD

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Microscopes — Information provided to the user

Microscopes — Informations délivrées à l'utilisateur

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 172, *Optics and photonics*, Subcommittee SC 5, *Microscopes and endoscopes*.

This second edition cancels and replaces the first edition (ISO 12853:1997), which has been technically revised in order to:

— specify the Scope in more detail;

— add further examples to the field of application (see 3.1.2);

— update the design information (e.g. dimension of overall mechanical depth added and new Figure 1);

— add the optical system to the design information (see 3.2.1).

Microscopes — Information provided to the user

1 Scope

This International Standard specifies the minimum required information to be provided to the user by the microscope manufacturer. This International Standard is not applicable to inverted microscopes, advanced technique microscopes, and digital display microscopes.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8578, *Microscopes — Marking of objectives and eyepieces*

3 Data provided by the manufacturer

3.1 General information

The mandatory data, indicated (m), shall be provided by the manufacturer when the respective microscope assemblies feature the properties described. Provision of further microscope data, indicated (r), is recommended but not required.

3.1.1 Details of origin

3.1.1.1 (m) Manufacturer

3.1.1.2 (r) Country of origin, if required

3.1.2 (r) Field of application

EXAMPLE Schools and courses, laboratories, research, industry.

3.1.3 (m) Imaging and illumination methods

EXAMPLE Transmitted light, reflected light, brightfield, darkfield, phase contrast, differential interference contrast, polarization, fluorescence.

3.1.4 (r) Accessories

EXAMPLE Photographic equipment, alternative light sources, manipulators, photometric equipment, image processing equipment, video equipment.

3.2 Design information

3.2.1 Optical system

3.2.1.1 (m) Type of optical system

EXAMPLE Finite, infinite.

3.2.2 Stand

3.2.2.1 Dimension of stand, expressed in millimetres (see Figure 1):

a) (m) l_1, l_2 base dimensions (measured in x and y directions);

b) (m) l_3 overall mechanical height (without attachments);

c) (m) l_5 distance from exit pupil to base plane (65 mm interpupillary distance);

d) (m) l_7 distance from exit pupil to focus drive (65 mm interpupillary distance);

e) (r) l_4 maximum height of stage surface from base plane;

f) (r) l_6 distance from focus drive to base plane;

g) (r) l_8 distance between the exit pupil and the objective's optical axis;

h) (r) l_9 overall mechanical depth;

i) (r) l_{10} depth of lamp-house.

3.2.2.2 (r) Mass of the stand, expressed in kilograms (including body tube, but without attachments).

3.2.2.3 (r) Interchangeability of components at the stand.

EXAMPLE Viewing tube, stage, substage, lamp housing, nosepiece.

3.2.2.4 Adjustment integrated in the stand:

a) (m) coarse adjustment affecting the stage or the body tube;

b) (m) operating range of coarse adjustment range, in millimetres;

c) (m) fine adjustment affecting the stage or the body tube;

d) (r) operating range of fine adjustment, in millimetres;

e) (r) movement of fine adjustment per scale division or rotation, in micrometres;

f) (r) movement of coarse adjustment per rotation, in millimetres.

3.2.2.5 (r) Slots integrated in the stand.

3.2.2.6 (m) Tube factor q different from 1 × (if tube lens is located in the stand).

3.2.3 Microscope tube

a) (m) Monocular, binocular, or trinocular tube;

b) (m) interpupillary distance adjustment range, in millimetres;

c) (m) tube factor q different from 1 × (if the tube lens is located in the tube);

d) (m) inclination angle α of a viewing direction (see Figure 1);

e) (m) inside diameter of the eyepiece tube(s) (23,2 mm or 30 mm);

f) (r) dioptre adjustment;

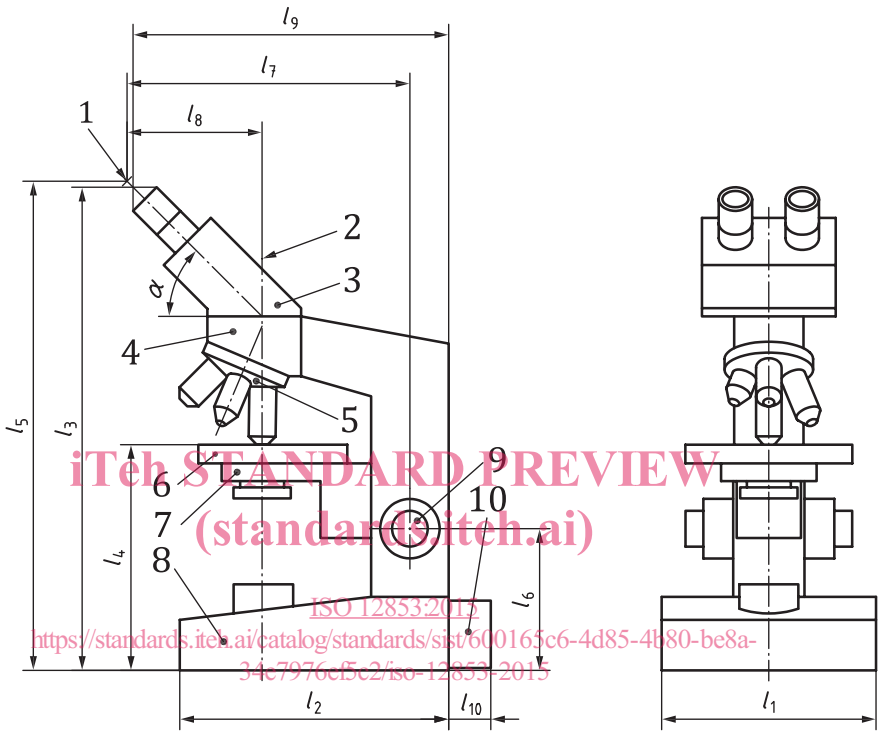
g) (r) tube length compensation;

h) (r) focal length of the tube lens (if the tube lens is corrected for infinite primary image distance);

i) (r) splitting ratio(s) of the beam splitter(s);

j) (r) distance l_8 between the exit pupil and the objective's optical axis (see Figure 1).

Dimensions in millimetres



Key

1 exit pupil
2 optical axis
3 viewing tube
4 body tube
5 nosepiece
6 stage
7 substage
8 base of stand
9 focus drive
10 lamp house

Figure 1 — Dimensions of the stand

3.2.4 Nosepiece

a) (m) Number of mounting holes for objectives;

b) (m) objective centration;

c) (r) dimensions of screw thread other than the RMS thread.

3.2.5 Objectives

The following data of the objectives, suitable for use with related microscope, shall be listed in accordance with ISO 8578:

a) (m) magnification;

b) (m) numerical aperture;

c) (m) state of correction, field of view, and colour;

d) (m) immersion medium (other than air);

e) (m) tube length, in millimetres;

f) (m) cover glass thickness, in millimetres;

g) (m) contrast methods;

h) (m) suitability for polarized-light microscopy;

i) (m) iris diaphragm;

j) (m) free working distance, in millimetres;

k) (m) correction collar.

3.2.6 Eyepieces

The following data of the objectives, suitable for use with related microscope, shall be listed in accordance with ISO 8578:

a) (m) magnification;

b) (m) field number;

c) (m) diameter of eyepiece (23,2 mm or 30 mm);

d) (r) type of correction;

e) (r) interchangeability of graticules;

f) (r) suitability for spectacle wearers;

g) (r) dioptre adjustment.

3.2.7 Condenser

a) (m) Maximum numerical aperture;

b) (m) suitability for contrast methods;

c) (r) type of correction;

d) (r) range of objectives at a given field of view;

e) (r) free working distance, in millimetres;

f) (r) illuminating aperture diaphragm;

g) (r) filter holder;

h) (r) interchangeability;

i) (r) slide thickness, in millimetres.

3.2.8 Illuminating system

3.2.8.1 (r) Substage.

EXAMPLE Interchangeability, centring possibility for the condenser, filter holder, polarizing device, illuminated field diaphragm for transmitted light.

3.2.8.2 (r) Vertical illuminator for incident light.

EXAMPLE Illuminating aperture diaphragm, illuminated field diaphragm, slots for accessories, polarizing device, centring possibility of diaphragms.

3.2.9 Light source

a) (m) Arrangement of the light source (incorporated in the stand or lamp housing attached to the stand);

b) (m) type of light source (halogen, LED, mercury arc, xenon arc, etc.);

c) (m) model number;

d) (m) voltage and wattage of light source;

e) (m) type of current (a.c. or d.c.);

f) (r) colour temperature of the light source at rated voltage;

g) (r) rated lifetime of the light source.

3.2.10 Power supply

a) (m) Main supply voltage (V a.c.);

b) (m) main supply frequency (50 Hz and/or 60 Hz);

c) (m) power consumption (VA);

d) (m) fuse (type rated amperage);

e) (m) built-in or external;

f) (m) output adjustable or fixed.