
Microscopes — Screw threads for objectives and related nosepieces

*Microscopes — Filetages de fixation des objectifs et des porte-objectifs
correspondants*

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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. 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.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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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 third edition cancels and replaces the second edition (ISO 8038:2011), in which [Table 4](#) has been technically revised.

Microscopes — Screw threads for objectives and related nosepieces

1 Scope

This International Standard specifies the dimensions of screw thread types for connecting a microscope objective to the nosepiece.

The use of these screw thread types is recommended for microscopes unless other fittings are required for optical or design reasons.

NOTE A specific combination of eyepiece, objective and tube lens (if provided, e.g. in an infinity-corrected optical system) is frequently used to correct aberrations. Therefore the combination of an objective from one manufacturer and the tube lens or eyepiece from another manufacturer, although conforming to this International Standard, may cause an error in magnification and/or loss of image quality.

2 Types of screw thread

Types of screw thread are listed in [Table 1](#).

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Table 1 — Types of screw thread
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	Name of screw type		
Whitworth screw	RMS ^a	W26	—
Metric screw	M25	M27	M32

^a With the exception of the length of the thread lug (see [Figure 1](#)), the values of the RMS thread conform to the internationally used screw thread defined by the Royal Microscopical Society Standard (RMS Standard), in 1936.

3 Basic dimensions

3.1 General

The basic dimensions of each screw thread type shall be in accordance with those given in [Table 2](#) and illustrated in [Figure 1](#).

Table 2 — Basic dimensions of the screw thread

Dimensions	Symbol	Value				
		Whitworth screw		Metric screw		
		RMS	W26	M25	M27	M32
Angle of thread	α	55°	55°	60°	60°	60°
Pitch	p	0,706 mm	0,706 mm	0,75 mm	0,75 mm	0,75 mm
Height of fundamental triangle	H	0,678 mm	0,678 mm	0,65 mm	0,65 mm	0,65 mm
Nominal diameter	D	20,320 mm	26 mm	25 mm	27 mm	32 mm

3.2 Tolerances

Limit of sizes and tolerances of each screw thread type shall be in accordance with those given in Tables 3, 4, 5, 6, 7 and illustrated in Figures 1 and 2.

Table 3 — Limit of size and tolerances of RMS

Dimensions in millimetres

Dimensions for		Major diameter	Pitch diameter		Minor diameter		Calculated play between internal and external threads		Allowances	Tolerance	Thread lug	
Internal thread	max.	D	20,396	D ₂	19,944	D ₁	19,492	Minimum play	Maximum play	+0,076	0,076	—
	min.		20,320		19,868		19,416			0,000		—
External thread	max.	d	20,274	d ₂	19,822	d ₁	19,370	0,046	0,198	-0,046	0,076	5,000
	min.		20,198		19,746		19,294			-0,122		—

Table 4 — Limit of size and tolerances of W26

Dimensions in millimetres

Dimensions for		Major diameter	Pitch diameter		Minor diameter		Calculated play between internal and external threads		Allowances	Tolerance	Thread lug	
Internal thread	max.	D	—	D ₂	25,660	D ₁	25,300	Minimum play	Maximum play	+0,204	0,100	—
	min.		26,000		25,580		25,200			+0,104		—
External thread	max.	d	25,930	d ₂	25,520	d ₁	25,070	0,060	0,220	-0,070	0,100	5,000
	min.		25,830		25,440		24,940			-0,170		—

Table 5 — Limit of size and tolerances of M25

Dimensions in millimetres

Dimensions for		Major diameter	Pitch diameter		Minor diameter		Calculated play between internal and external threads		Allowances	Tolerance	Thread lug	
Internal thread	max.	D	—	D ₂	24,659	D ₁	24,378	Minimum play	Maximum play	+0,190	0,190	—
	min.		—		24,513		24,188			0,000		—
External thread	max.	d	24,978	d ₂	24,491	d ₁	—	0,022	0,279	-0,022	0,140	5,000
	min.		24,838		24,380		—			-0,162		—

Table 6 — Limit of size and tolerances of M27

Dimensions in millimetres

Dimensions for		Major diameter	Pitch diameter		Minor diameter		Calculated play between internal and external threads		Allowances	Tolerance	Thread lug	
Internal thread	max.	D	—	D ₂	26,660	D ₁	26,378	Minimum play	Maximum play	+0,190	0,190	—
	min.		—		26,513		26,188			0,000		—
External thread	max.	d	26,978	d ₂	26,491	d ₁	—	0,022	0,281	-0,022	0,140	4,500
	min.		26,838		26,379		—			-0,162		—

Table 7 — Limit of size and tolerances of M32

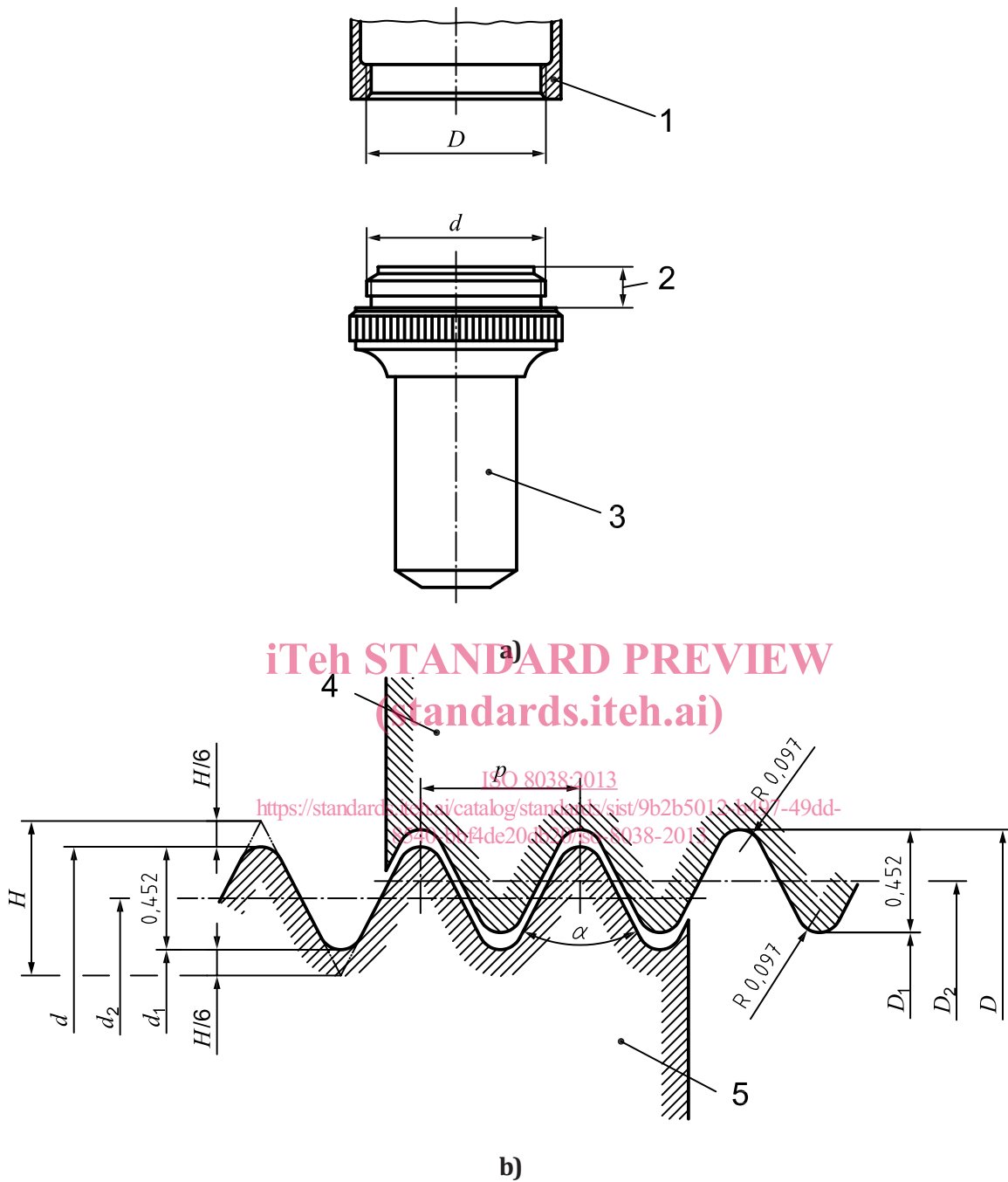
Dimensions in millimetres

Dimensions for	Major diameter		Pitch diameter		Minor diameter		Calculated play between internal and external threads		Allowances	Tolerance	Thread lug
	max.	min.					Minimum play	Maximum play			
Internal thread	D	—	D_2	31,663	D_1	31,378	0,022	0,286	+0,190	0,190	—
		—		31,513		31,188			0,000		—
External thread	d	31,978	d_2	31,491	d_1	—	0,022	0,286	-0,022	0,140	5,000
		31,838		31,377		—			-0,162		—

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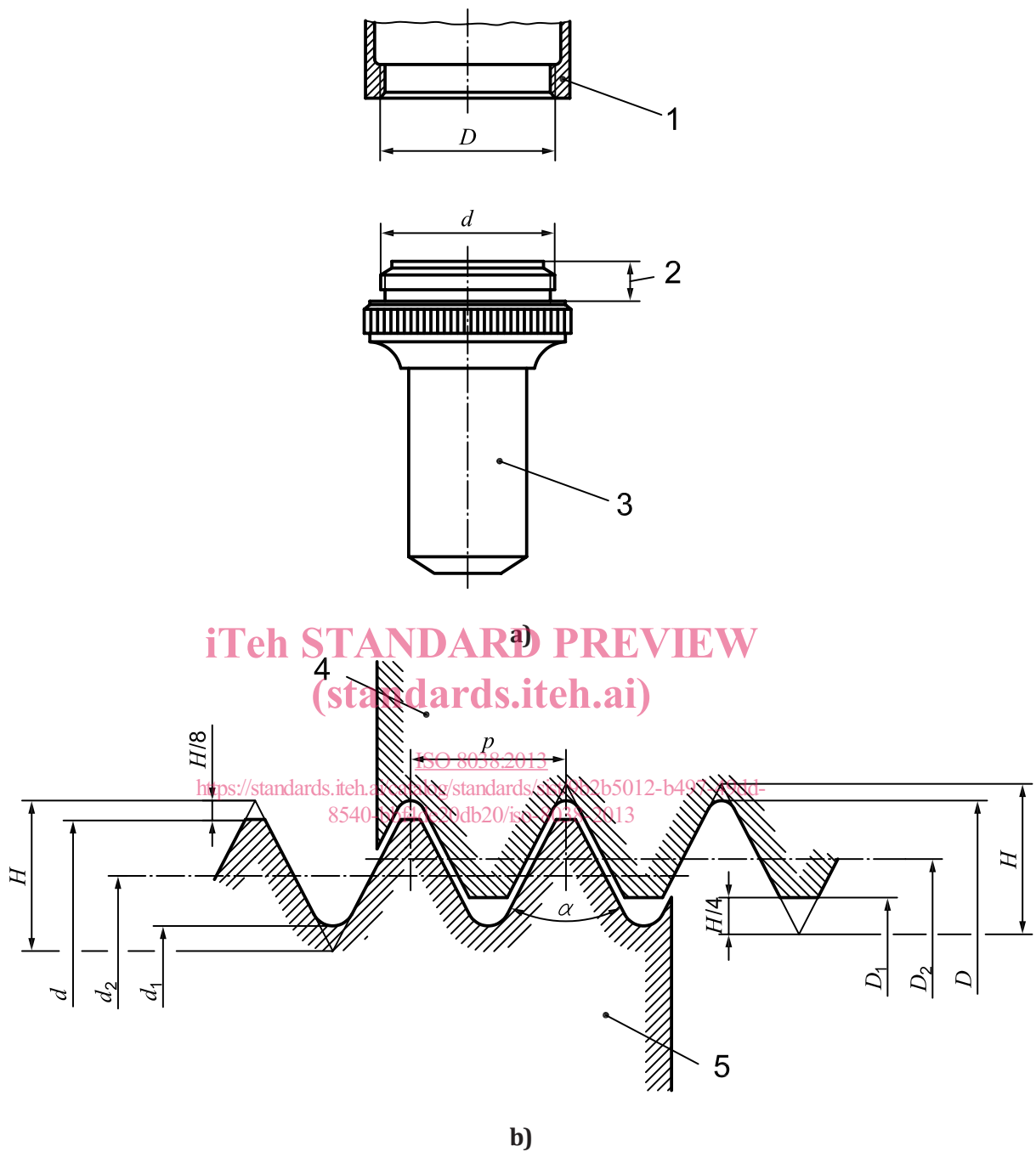
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- Key**
- 1 tube, objective changer, etc
 - 2 thread lug
 - 3 objective
 - 4 internal thread
 - 5 external thread

Figure 1 — Definitions and basic dimensions of Whitworth screw threads, RMS and W26

Dimensions in millimetres



Key

- 1 tube, objective changer, etc
- 2 thread lug
- 3 objective
- 4 internal thread
- 5 external thread

Figure 2 — Definitions and basic dimensions of Metric screw threads, M25, M27 and M32