INTERNATIONAL STANDARD

ISO 8038

Second edition
2011-04-15

Microscopes — Screw threads for objectives and related nosepieces

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

Reference number
ISO 8038:2011(E)

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Published in Switzerland

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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ISO 8038 was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 5, *Microscopes and endoscopes*.

This second edition cancels and replaces the editions of ISO 8038-1:1997 and ISO 8038-2:2001, which have been technically revised.

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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.

NOTE 1 The use of these screw thread types is recommended for microscopes unless other fittings are required for optical or design reasons.

NOTE 2 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 error in magnification and/or loss of image quality.

2 Types of screw thread

Types of screw thread are listed in Table 1.

Table 1 — Types of screw thread

	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

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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		Allow-ances	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	0,046	0,198	0,000		—
External thread	max.	d	20,274	d_2	19,822	d_1	19,370			−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		Allow-ances	Tolerance	Thread lug
Internal thread	max.	D	—	D_2	25,660	D_1	25,300	Minimum play	Maximum play	+0,076	0,190	—
	min.		26,000		25,580		25,200	0,070	0,246	0,000		—
External thread	max.	d	25,930	d_2	25,520	d_1	25,070			−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		Allow-ances	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	0,022	0,279	0,000		—
External thread	max.	d	24,978	d_2	24,491	d_1	—			−0,022	0,140	5,000
	min.		24,838		24,380		—			−0,162		—

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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		Allow-ances	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	0,022	0,281	0,000		—
External thread	max.	d	26,978	d_2	26,491	d_1	—			−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		Allow-ances	Tolerance	Thread lug
Internal thread	max.	D	—	D_2	31,663	D_1	31,378	Minimum play	Maximum play	+0,190	0,190	—
	min.		—		31,513		31,188	0,022	0,286	0,000		—
External thread	max.	d	31,978	d_2	31,491	d_1	—			−0,022	0,140	5,000
	min.		31,838		31,377		—			−0,162		—

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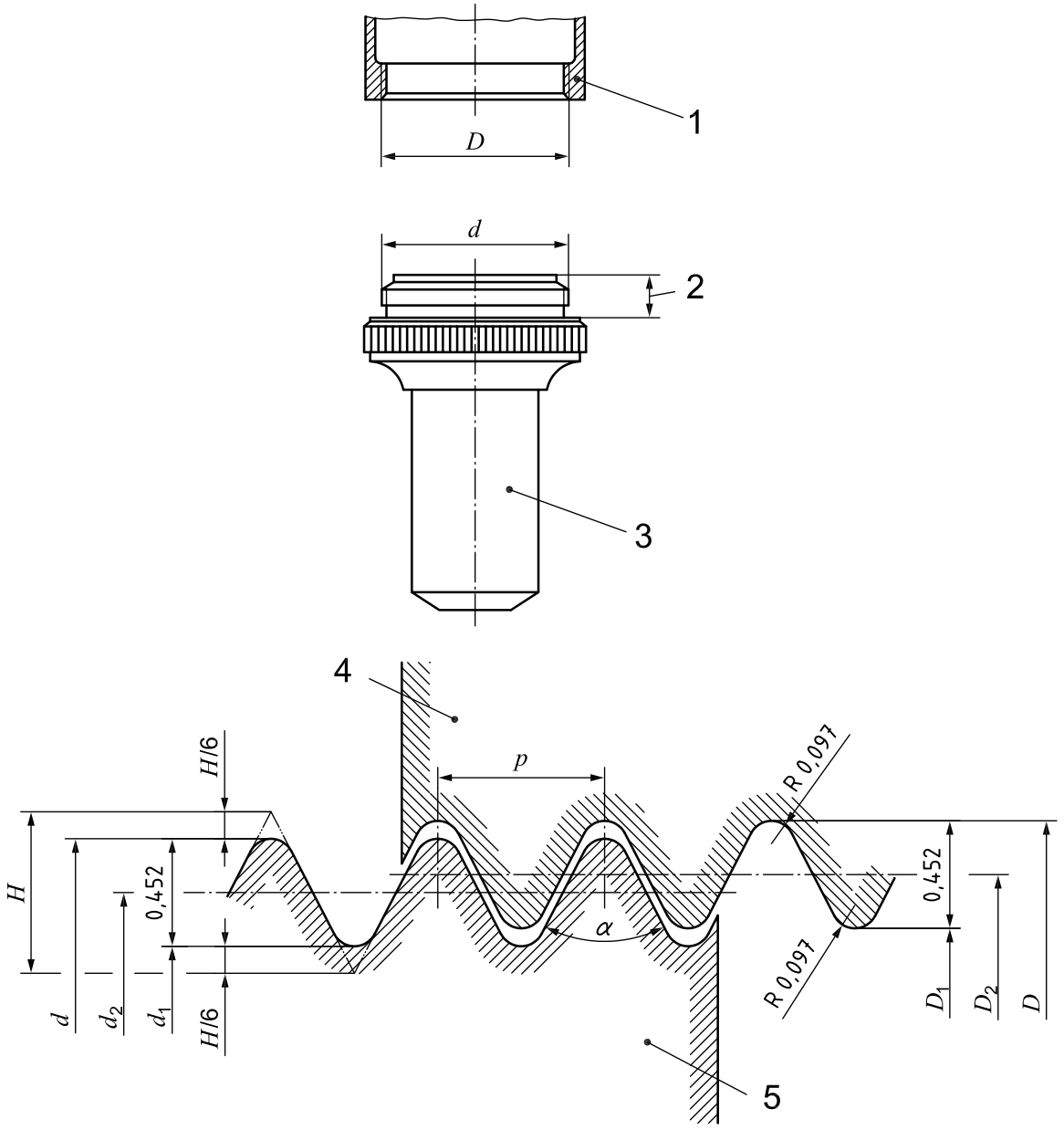
Dimensions in millimetres



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

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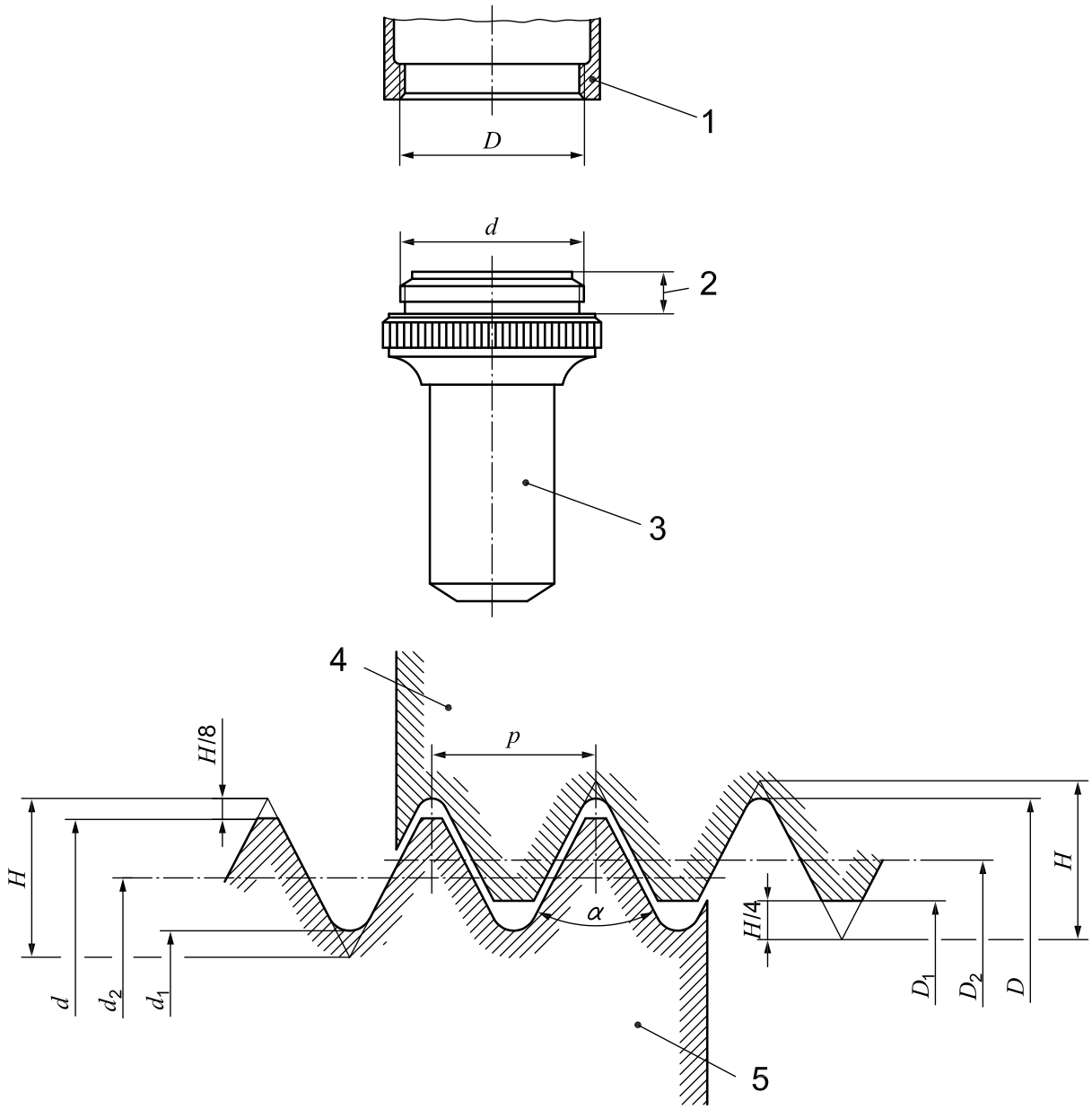

Key

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

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ICS 37.020

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