BS ISO 965-3:2021

BSI Standards Publication

ISO general purpose metric screw threads — Tolerances

Part 3: Limit deviations for screw threads

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National foreword

This British Standard is the UK implementation of ISO 965-3:2021. It supersedes BS ISO 965-3:1998, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee FME/9, Fasteners.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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INTERNATIONAL STANDARD

ISO 965-3

Fourth edition
2021-07

ISO general purpose metric screw threads — Tolerances —

Part 3: Limit deviations for screw threads

Filetages métriques ISO pour usages généraux — Tolérances —

Partie 3: Écarts limites pour filetages

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Contents

Page

Foreword ..... **iv**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Limit deviations **1**
Bibliography **26**

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Full document details: BS ISO 965-3:2021

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).

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).

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

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 1, *Screw threads*.

This fourth edition cancels and replaces the third edition (ISO 965-3:1998), which has been technically revised.

The main changes compared to the previous edition are as follows:

— in the document title, “constructional” has been deleted;

— in Clause 1, the third paragraph has been added;

— in Clause 4, the phrase “basic profiles” has been replaced by “basic profile and fundamental deviation” (first paragraph of ISO 965-3:1998; second paragraph of ISO 965-3:2020);

— in Clause 4 and Table 1, the deviation formula and values for the minor diameter of external threads have been deleted;

— in Table 1 four tolerance classes (4g, 5g4g, 8e and 9e8e) have been added.

A list of all parts in the ISO 965 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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ISO general purpose metric screw threads — Tolerances —

Part 3: Limit deviations for screw threads

1 Scope

This document specifies limit deviations for pitch and crest diameters for ISO general purpose metric screw threads (M) conforming to ISO 261 having basic profile in accordance with ISO 68-1.

The limit deviations specified are derived from the fundamental deviations and tolerances specified in ISO 965-1.

This document is applicable to ISO general purpose metric screw threads with the recommended tolerance classes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5408, *Screw threads — Vocabulary*

3 Terms and definitions

For the purposes of this part of document, the terms and definitions given in ISO 5408 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Limit deviations

Limit deviations are given in Table 1.

For internal threads as well as external threads, the actual root contour shall not in any point transgress the basic profile and fundamental deviation.

For coated threads, the tolerances apply to the parts before coating, unless otherwise stated. After coating the actual thread profile shall not in any point transgress the maximum material limits for position H or h respectively.

NOTE These provisions are intended for thin coatings, for example those obtained by electroplating.

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Table 1 — Limit deviations

Basic major diameter		Pitch	Internal thread					External thread				
over	up to		Tolerance class	Pitch diameter		Minor diameter		Tolerance class	Pitch diameter		Major diameter	
				ES	*EI*	*ES*	*EI*		*es*	*ei*	*es*	*ei*
mm	mm	mm		µm	µm	µm	µm		µm	µm	µm	µm
0,99	1,4	0,2	–	–	–	–	–	3h4h	0	-24	0	-36
			–	–	–	–	–	4g	-17	-47	-17	-53
			4H	40	0	38	0	4h	0	-30	0	-36
			–	–	–	–	–	5g4g	-17	-55	-17	-53
			5G	–	–	–	–	5g6g	-17	-55	-17	-73
			5H	–	–	–	–	5h4h	0	-38	0	-36
			–	–	–	–	–	5h6h	0	-38	0	-56
			–	–	–	–	–	6e	–	–	–	–
			–	–	–	–	–	6f	–	–	–	–
			6G	–	–	–	–	6g	-17	-65	-17	-73
			6H	–	–	–	–	6h	0	-48	0	-56
			–	–	–	–	–	7e6e	–	–	–	–
			7G	–	–	–	–	7g6g	–	–	–	–
			7H	–	–	–	–	7h6h	–	–	–	–
			–	–	–	–	–	8e	–	–	–	–
			8G	–	–	–	–	8g	–	–	–	–
			–	–	–	–	–	9e8e	–	–	–	–
			8H	–	–	–	–	9g8g	–	–	–	–
0,99	1,4	0,25	–	–	–	–	–	3h4h	0	-26	0	-42
			–	–	–	–	–	4g	-18	-52	-18	-60
			4H	45	0	45	0	4h	0	-34	0	-42
			–	–	–	–	–	5g4g	-18	-60	-18	-60
			5G	74	18	74	18	5g6g	-18	-60	-18	-85
			5H	56	0	56	0	5h4h	0	-42	0	-42
			–	–	–	–	–	5h6h	0	-42	0	-67
			–	–	–	–	–	6e	–	–	–	–
			–	–	–	–	–	6f	–	–	–	–
			6G	–	–	–	–	6g	-18	-71	-18	-85
			6H	–	–	–	–	6h	0	-53	0	-67
			–	–	–	–	–	7e6e	–	–	–	–
			7G	–	–	–	–	7g6g	–	–	–	–
			7H	–	–	–	–	7h6h	–	–	–	–
			–	–	–	–	–	8e	–	–	–	–
			8G	–	–	–	–	8g	–	–	–	–
			–	–	–	–	–	9e8e	–	–	–	–
			8H	–	–	–	–	9g8g	–	–	–	–

NOTE "*ES*" and "*es*" are the symbols of "upper deviation"; "*EI*" and "*ei*" are the symbols of "lower deviation".

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Table 1 *(continued)*

Basic major diameter		Pitch	Internal thread					External thread				
over	up to		Tolerance class	Pitch diameter		Minor diameter		Tolerance class	Pitch diameter		Major diameter	
				ES	*EI*	*ES*	*EI*		*es*	*ei*	*es*	*ei*
mm	mm	mm		µm	µm	µm	µm		µm	µm	µm	µm
0,99	1,4	0,3	–	–	–	–	–	3h4h	0	-28	0	-48
			–	–	–	–	–	4g	-18	-54	-18	-66
			4H	48	0	53	0	4h	0	-36	0	-48
			–	–	–	–	–	5g4g	-18	-63	-18	-66
			5G	78	18	85	18	5g6g	-18	-63	-18	-93
			5H	60	0	67	0	5h4h	0	-45	0	-48
			–	–	–	–	–	5h6h	0	-45	0	-75
			–	–	–	–	–	6e	–	–	–	–
			–	–	–	–	–	6f	–	–	–	–
			6G	93	18	103	18	6g	-18	-74	-18	-93
			6H	75	0	85	0	6h	0	-56	0	-75
			–	–	–	–	–	7e6e	–	–	–	–
			7G	–	–	–	–	7g6g	–	–	–	–
			7H	–	–	–	–	7h6h	–	–	–	–
			–	–	–	–	–	8e	–	–	–	–
			8G	–	–	–	–	8g	–	–	–	–
			–	–	–	–	–	9e8e	–	–	–	–
			8H	–	–	–	–	9g8g	–	–	–	–
1,4	2,8	0,2	–	–	–	–	–	3h4h	0	-25	0	-36
			–	–	–	–	–	4g	-17	-49	-17	-53
			4H	42	0	38	0	4h	0	-32	0	-36
			–	–	–	–	–	5g4g	-17	-57	-17	-53
			5G	–	–	–	–	5g6g	-17	-57	-17	-73
			5H	–	–	–	–	5h4h	0	-40	0	-36
			–	–	–	–	–	5h6h	0	-40	0	-56
			–	–	–	–	–	6e	–	–	–	–
			–	–	–	–	–	6f	–	–	–	–
			6G	–	–	–	–	6g	-17	-67	-17	-73
			6H	–	–	–	–	6h	0	-50	0	-56
			–	–	–	–	–	7e6e	–	–	–	–
			7G	–	–	–	–	7g6g	–	–	–	–
			7H	–	–	–	–	7h6h	–	–	–	–
			–	–	–	–	–	8e	–	–	–	–
			8G	–	–	–	–	8g	–	–	–	–
			–	–	–	–	–	9e8e	–	–	–	–
			8H	–	–	–	–	9g8g	–	–	–	–

NOTE "*ES*" and "*es*" are the symbols of "upper deviation"; "*EI*" and "*ei*" are the symbols of "lower deviation".

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Table 1 *(continued)*

Basic major diameter		Pitch	Internal thread					External thread				
over	up to		Tolerance class	Pitch diameter		Minor diameter		Tolerance class	Pitch diameter		Major diameter	
				ES	*EI*	*ES*	*EI*		*es*	*ei*	*es*	*ei*
mm	mm	mm		µm	µm	µm	µm		µm	µm	µm	µm
1,4	2,8	0,25	–	–	–	–	–	3h4h	0	-28	0	-42
			–	–	–	–	–	4g	-18	-54	-18	-60
			4H	48	0	45	0	4h	0	-36	0	-42
			–	–	–	–	–	5g4g	-18	-63	-18	-60
			5G	78	18	74	18	5g6g	-18	-63	-18	-85
			5H	60	0	56	0	5h4h	0	-45	0	-42
			–	–	–	–	–	5h6h	0	-45	0	-67
			–	–	–	–	–	6e	–	–	–	–
			–	–	–	–	–	6f	–	–	–	–
			6G	–	–	–	–	6g	-18	-74	-18	-85
			6H	–	–	–	–	6h	0	-56	0	-67
			–	–	–	–	–	7e6e	–	–	–	–
			7G	–	–	–	–	7g6g	–	–	–	–
			7H	–	–	–	–	7h6h	–	–	–	–
			–	–	–	–	–	8e	–	–	–	–
			8G	–	–	–	–	8g	–	–	–	–
			–	–	–	–	–	9e8e	–	–	–	–
			8H	–	–	–	–	9g8g	–	–	–	–
1,4	2,8	0,35	–	–	–	–	–	3h4h	0	-32	0	-53
			–	–	–	–	–	4g	-19	-59	-19	-72
			4H	53	0	63	0	4h	0	-40	0	-53
			–	–	–	–	–	5g4g	-19	-69	-19	-72
			5G	86	19	99	19	5g6g	-19	-69	-19	-104
			5H	67	0	80	0	5h4h	0	-50	0	-53
			–	–	–	–	–	5h6h	0	-50	0	-85
			–	–	–	–	–	6e	–	–	–	–
			–	–	–	–	–	6f	-34	-97	-34	-119
			6G	104	19	119	19	6g	-19	-82	-19	-104
			6H	85	0	100	0	6h	0	-63	0	-85
			–	–	–	–	–	7e6e	–	–	–	–
			7G	–	–	–	–	7g6g	-19	-99	-19	-104
			7H	–	–	–	–	7h6h	0	-80	0	-85
			–	–	–	–	–	8e	–	–	–	–
			8G	–	–	–	–	8g	–	–	–	–
			–	–	–	–	–	9e8e	–	–	–	–
			8H	–	–	–	–	9g8g	–	–	–	–

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Table 1 *(continued)*

Basic major diameter		Pitch	Internal thread					External thread				
over	up to		Tolerance class	Pitch diameter		Minor diameter		Tolerance class	Pitch diameter		Major diameter	
				ES	*EI*	*ES*	*EI*		*es*	*ei*	*es*	*ei*
mm	mm	mm		µm	µm	µm	µm		µm	µm	µm	µm
1,4	2,8	0,4	–	–	–	–	–	3h4h	0	-34	0	-60
			–	–	–	–	–	4g	-19	-61	-19	-79
			4H	56	0	71	0	4h	0	-42	0	-60
			–	–	–	–	–	5g4g	-19	-72	-19	-79
			5G	90	19	109	19	5g6g	-19	-72	-19	-114
			5H	71	0	90	0	5h4h	0	-53	0	-60
			–	–	–	–	–	5h6h	0	-53	0	-95
			–	–	–	–	–	6e	–	–	–	–
			–	–	–	–	–	6f	-34	-101	-34	-129
			6G	109	19	131	19	6g	-19	-86	-19	-114
			6H	90	0	112	0	6h	0	-67	0	-95
			–	–	–	–	–	7e6e	–	–	–	–
			7G	–	–	–	–	7g6g	-19	-104	-19	-114
			7H	–	–	–	–	7h6h	0	-85	0	-95
			–	–	–	–	–	8e	–	–	–	–
			8G	–	–	–	–	8g	–	–	–	–
			–	–	–	–	–	9e8e	–	–	–	–
			8H	–	–	–	–	9g8g	–	–	–	–
1,4	2,8	0,45	–	–	–	–	–	3h4h	0	-36	0	-63
			–	–	–	–	–	4g	-20	-65	-20	-83
			4H	60	0	80	0	4h	0	-45	0	-63
			–	–	–	–	–	5g4g	-20	-76	-20	-83
			5G	95	20	120	20	5g6g	-20	-76	-20	-120
			5H	75	0	100	0	5h4h	0	-56	0	-63
			–	–	–	–	–	5h6h	0	-56	0	-100
			–	–	–	–	–	6e	–	–	–	–
			–	–	–	–	–	6f	-35	-106	-35	-135
			6G	115	20	145	20	6g	-20	-91	-20	-120
			6H	95	0	125	0	6h	0	-71	0	-100
			–	–	–	–	–	7e6e	–	–	–	–
			7G	–	–	–	–	7g6g	-20	-110	-20	-120
			7H	–	–	–	–	7h6h	0	-90	0	-100
			–	–	–	–	–	8e	–	–	–	–
			8G	–	–	–	–	8g	–	–	–	–
			–	–	–	–	–	9e8e	–	–	–	–
			8H	–	–	–	–	9g8g	–	–	–	–

NOTE "*ES*" and "*es*" are the symbols of "upper deviation"; "*EI*" and "*ei*" are the symbols of "lower deviation".

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