UDC 621.882.211

February 1992

Hexagon head screws with metric fine pitch thread
Product grades A and B
(ISO 8676 : 1988)
English version of DIN EN 28 676

DIN
EN 28 676

This standard incorporates the English version of ISO 8676.

Sechskantschrauben mit Gewinde bis Kopf, metrisches Feingewinde; Produktklassen A und B (ISO 8676 : 1988)

Supersedes DIN 961, January 1990 edition, and DIN ISO 8676, January 1990 edition.

European Standard EN 28 676 : 1991 has the status of a DIN Standard.

A comma is used as the decimal marker.

National foreword

The publication of this standard is in keeping with a decision made by CEN/TC 185 to adopt, without alteration, a series of ISO Standards covering hexagon head bolts and nuts as European Standards. The responsible German body involved in their publication is the *Normenausschuß Mechanische Verbindungselemente* (Fasteners Standards Committee).

As a consequence, all DIN ISO Standards covering hexagon head bolts and nuts have been superseded by the corresponding DIN EN Standards (see table overleaf), with no alteration having been made to the former ISO designation.

The DIN Standards corresponding to the ISO Standards referred to in clause 2 of the EN are as follows:

ISO 225	DIN EN 20 225
ISO 898-1	DIN EN 20 898 Part 1
ISO 3269	DIN ISO 3269 (at present at the stage of draft)
ISO 3506	DIN ISO 3506 (at present at the stage of draft)
ISO 4042	DIN ISO 4042 (at present at the stage of draft)
ISO 4759-1	DIN ISO 4759 Part 1
ISO 6157-1	DIN EN 26 157 Part 1
ISO 6157-3	DIN EN 26 157 Part 3
ISO 8839	DIN EN 28 839
ISO 8992	DIN ISO 8992 (at present at the stage of draft)

Continued overleaf.

EN comprises 10 pages.

DIN EN Standard	Title	Previous DIN ISO Standard	Withdrawn DIN Standard
24 014	Hexagon head bolts; product grades A and B	4014	931 Part 1
24 016	Hexagon head bolts, product grade C	4016	601
24 017	Hexagon head screws; product grades A and B	4017	933
24 018	Hexagon head screws, product grade C	4018	558
24 032	Hexagon nuts, style 1; product grades A and B	4032	934
24 034	Hexagon nuts; product grade C	4034	555
24 035	Hexagon thin nuts (chamfered); product grades A and B	4035	439 Part 2
24 036	Hexagon thin nuts; product grade B (unchamfered)	4036	439 Part 1
28 673	Hexagon nuts, style 1, with metric fine pitch thread; product grades A and B	8673	971 Part 1 934
28 674	Hexagon nuts, style 2, with metric fine pitch thread; product grades A and B	8674	971 Part 2
28 675	Hexagon thin nuts with metric fine pitch thread, product grades A and B	8675	439 Part 2
28 676	Hexagon head screws with metric fine pitch thread; product grades A and B	8676	961
28 765	Hexagon head bolts with metric fine pitch thread; product grades A and B	8765	960

Standards referred to

See clauses 0 and 2.

Other relevant document

Supplement 2 to DIN 918 Fasteners; synopsis of available ISO Standards and DIN Standards

Previous editions

DIN 961: 12.52, 03.63, 11.67, 11.70, 12.83, 01.90, DIN ISO 8676: 01.90.

Amendments

In comparison with the January 1990 editions of DIN 961 and DIN ISO 8676, the following amendments have been made.

a) Thread sizes M 18 × 2, M 22 × 2, M 24 × 1,5 and M 52 × 3 have been deleted.

b) The range of commercial lengths has been reduced.

c) The widths across flats specified in ISO 272 have been adopted for thread sizes M 10, M 12, M 14 and M 22.

d) The technical delivery conditions have been revised.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 28 676

October 1991

UDC 621.882.211

Descriptors Fasteners, screws, hexagon head screws, screw thread, requirements, dimensions, designation

English version

Hexagon head screws with metric fine pitch thread
Product grades A and B
(ISO 8676 : 1988)

Vis à tête hexagonale, à filetage métrique à pas fin; grades A et B
(ISO 8676:1988)

Sechskantschrauben mit Gewinde bis Kopf; metrisches Feingewinde; Produktklassen A und B
(ISO 8676:1988)

This European Standard was approved by CEN on 1991-10-10 and is identical to the ISO Standard as referred to. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Ref. No. EN 28 676 : 1991 E

Foreword

In 1990, ISO 8676 : 1988 was submitted to the CEN PO procedure. Following the positive result of the PQ, CEN/BT agreed to submit ISO 8676 : 1988, with the following modifications, to Formal Vote.

In the French version, replace:

- 'boulon' by 'vis partiellement filetée';
- 'vis' by 'vis entièrement filetée'.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of the International Standard ISO 8676 : 1988 was approved by CEN as a European Standard with agreed common modifications as given above.

0 Introduction

This International Standard is part of the complete ISO product standard series on hexagon drive fasteners. The series comprises:

a) hexagon head bolts (ISO 4014, ISO 4015, ISO 4016 and ISO 8765);

b) hexagon head screws (ISO 4017, ISO 4018 and ISO 8676);

c) hexagon nuts (ISO 4032, ISO 4033, ISO 4034, ISO 4035, ISO 4036, ISO 8673, ISO 8674 and ISO 8675);

d) hexagon flanged bolts (ISO 4162 and ISO 8102);

e) hexagon flanged screws; [1]

f) hexagon flanged nuts (ISO 4161, ISO 7043 and ISO 7044);

g) structural bolting (ISO 4775, ISO 7411 to ISO 7414, and ISO 7417).

1 Scope and field of application

This International Standard gives specifications for hexagon head screws with metric fine pitch thread with nominal thread diameters from 8 to 64 mm, of product grade A for nominal thread diameters from 8 to 24 mm and nominal lengths, l, up to and including 10 d or 150 mm, whichever is shorter, and of product grade B for nominal thread diameters over 24 mm or nominal lengths, l, over 10 d or 150 mm, whichever is shorter.

If, in special cases, specifications other than those listed in this International Standard are required, they should be selected from existing International Standards, for example ISO 261, ISO 888, ISO 898-1, ISO 965-2, ISO 3506 and ISO 4759-1.

Coarse thread screws according to ISO 4017 should be first choice.

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1) These will form the subjects of future International Standards

2 References

ISO 225, *Fasteners — Bolts, screws and nuts — Symbols and designations of dimensions.*

ISO 261, *ISO general purpose metric screw threads — General plan.*

ISO 262, *ISO general purpose metric screw threads — Selected sizes for screws, bolts and nuts.*

ISO 888, *Bolts, screws and studs — Nominal lengths and thread lengths for general purpose bolts and screws.*

ISO 898-1, *Mechanical properties of fasteners — Part 1: Bolts, screws and studs.*

ISO 965-2, *ISO general purpose metric screw threads — Tolerances — Part 2 : Limits of sizes for general purpose bolt and nut threads — Medium quality.*

ISO 3269, *Fasteners — Acceptance inspection.*

ISO 3506, *Corrosion-resistant stainless steel fasteners — Specifications.*

ISO 4042, *Threaded components — Electroplated coatings.*[1)]

ISO 4753, *Fasteners — Ends of parts with external metric ISO thread.*

ISO 4759-1, *Tolerances for fasteners — Part 1: Bolts, screws and nuts with thread diameters* > 1,6 *and* < 150 mm *and product grades A, B and C.*

ISO 6157-1, *Fasteners — Surface discontinuities — Part 1 : Bolts, screws and studs for general requirements.*

ISO 6157-3, *Fasteners — Surface discontinuities — Part 3 : Bolts, screws and studs for special requirements.*

ISO 8839, *Mechanical properties of fasteners — Bolts, screws, studs and nuts made of non-ferrous metals.*

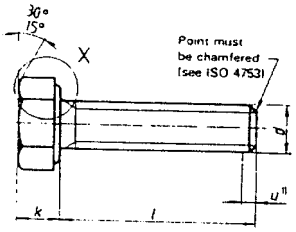
ISO 8992, *Fasteners — General requirements for bolts, screws and nuts.*

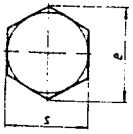
1) At present at the stage of draft

3 Dimensions

NOTE Symbols and designations for dimensions are specified in ISO 225.

Dimensions in millimetres





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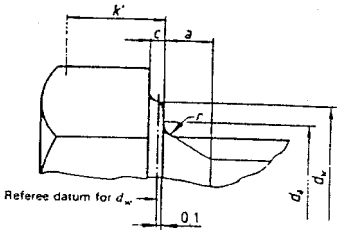

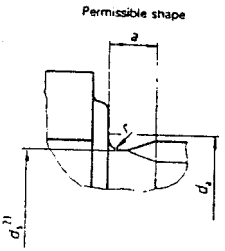

1) Incomplete thread $u \leq 2P$.

2) d_3 = pitch diameter.

Table 1 — Preferred threads

Dimensions in millimetres

Thread ($d \times P$)			M8 × 1	M10 × 1	M12 × 1,5	M16 × 1,5	M20 × 1,5	M24 × 2	M30 × 2	M36 × 3	M42 × 3	M48 × 3	M56 × 4	M64 × 4
a		max.	3	3	4,5	4,5	6	6	6	9	9	9	12	12
		min.	1	1	1,5	1,5	2	2	2	3	3	3	4	4
c		min.	0,15	0,15	0,15	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,3	0,3
		max.	0,6	0,6	0,6	0,8	0,8	0,8	0,8	0,8	1	1	1	1
d_c		max.	9,2	11,2	13,7	17,7	22,4	26,4	33,4	39,4	45,6	52,6	63	71
d_w	Product grade A	min.	11,63	14,63	16,63	22,49	28,19	33,61	–	–	–	–	–	–
	Product grade B	min.	–	–	–	22	27,7	33,25	42,75	51,11	59,95	69,45	78,66	88,16
e	Product grade A	min.	14,38	17,77	20,03	26,75	33,53	39,98	–	–	–	–	–	–
	Product grade B	min.	–	–	–	26,17	32,95	39,55	50,85	60,79	71,3	82,6	93,56	104,86
k		nom.	5,3	6,4	7,5	10	12,5	15	18,7	22,5	26	30	35	40
	Product grade A	min.	5,15	6,22	7,32	9,82	12,285	14,785	–	–	–	–	–	–
		max.	5,45	6,58	7,68	10,18	12,715	15,215	–	–	–	–	–	–
	Product grade B	min.	–	–	–	9,71	12,15	14,65	18,28	22,08	25,58	29,58	34,5	39,5
		max.	–	–	–	10,29	12,85	15,35	19,12	22,92	26,42	30,42	35,5	40,5
k_1 [1]	Product grade A	min.	3,61	4,35	5,12	6,87	8,6	10,35	–	–	–	–	–	–
	Product grade B	min.	–	–	–	6,8	8,51	10,26	12,8	15,46	17,91	20,71	24,15	27,65
r		min.	0,4	0,4	0,6	0,6	0,8	0,8	1	1	1,2	1,6	2	2
s		nom. = max.	13	16	18	24	30	36	46	55	65	75	85	95
	Product grade A	min.	12,73	15,73	17,73	23,67	29,67	35,38	–	–	–	–	–	–
	Product grade B	min.	–	–	–	23,16	29,16	35	45	53,8	63,1	73,1	82,8	92,8

Product grade				
A		B		
nom.	min.	max. [2]	min.	max.
16	15,65	16,35	–	–
20	19,58	20,42	–	–
25	24,58	25,42	–	–
30	29,58	30,42	–	–
35	34,5	35,5	–	–
40	39,5	40,5	38,75	41,25
45	44,5	45,5	43,75	46,25
50	49,5	50,5	48,75	51,25
55	54,4	55,6	53,5	56,5
60	59,4	60,6	58,5	61,5
65	64,4	65,6	63,5	66,5
70	69,4	70,6	68,5	71,5

80	79,4	80,6	78,5	81,5
90	89,3	90,7	88,25	91,75
100	99,3	100,7	98,25	101,75
110	109,3	110,7	108,25	111,75
120	119,3	120,7	118,25	121,75
130	129,2	130,8	128	132
140	139,2	140,8	138	142
150	149,2	150,8	148	152
160	–	–	158	162
180	–	–	178	182
200	–	–	197,7	202,3
220	–	–	217,7	222,3
240	–	–	237,7	242,3
260	–	–	257,4	262,6
280	–	–	277,4	282,6
300	–	–	297,4	302,6
320	–	–	317,15	322,85
340	–	–	337,15	342,85
360	–	–	357,15	362,85
380	–	–	377,15	382,85
400	–	–	397,15	402,85
420	–	–	416,85	423,15
440	–	–	436,85	443,15
460	–	–	456,85	463,15
480	–	–	476,85	483,15
500	–	–	496,85	503,15

1) $k'_{min} = 0,7\ k_{min}$

2) Range of popular lengths between the stepped line, marked thus ———.
   – Product grade A above the stepped line, marked thus – – – –.
   – Product grade B below this stepped line.

NOTE – The threads M10 × 1 and M12 × 1,5 are popular ones but are not included in ISO 262.

Table 2 — Non-preferred threads

Dimensions in millimetres

Thread ($d \times P$)			M10 × 1.25	M12 × 1.25	M14 × 1.5	M18 × 1.5	M20 × 2	M22 × 1.5	M27 × 2	M33 × 2	M39 × 3	M45 × 3	M52 × 4	M60 × 4
a		max.	4	4	4,5	4,5	4,5	4,5	6	6	9	9	12	12
		min.	1,25	1,25	1,5	1,5	1,5	1,5	2	2	3	3	4	4
c		min.	0,15	0,15	0,15	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,3	0,3
		max.	0,6	0,6	0,6	0,8	0,8	0,8	0,8	0,8	1	1	1	1
d_a		max.	11,2	13,7	15,7	20,2	22,4	24,4	30,4	36,4	42,4	48,6	56,6	67
d_w	Product grade $\frac{A}{B}$	min.	14,63	16,63	19,37	25,34	28,19	31,71	–	–	–	–	–	–
			–	–	–	24,85	27,7	31,35	38	46,55	55,86	64,7	74,2	83,41
e	Product grade $\frac{A}{B}$	min.	17,77	20,03	23,36	30,14	33,53	37,72	–	–	–	–	–	–
			–	–	–	29,56	32,95	37,29	45,2	55,37	66,44	76,95	88,25	99,21
k		nom.	6,4	7,5	8,8	11,5	12,5	14	17	21	25	28	33	38
	Product grade A	min.	6,22	7,32	8,62	11,285	12,285	13,785	–	–	–	–	–	–
		max.	6,58	7,68	8,98	11,715	12,715	14,215	–	–	–	–	–	–
	Product grade B	min.	–	–	–	11,15	12,15	13,65	16,65	20,58	24,58	27,58	32,5	37,5
		max.	–	–	–	11,85	12,85	14,35	17,35	21,42	25,42	28,42	33,5	38,5
$k'^{1)}$	Product grade $\frac{A}{B}$	min.	4,35	5,12	6,03	7,9	8,6	9,65	–	–	–	–	–	–
			–	–	–	7,81	8,51	9,56	11,66	14,41	17,21	19,31	22,75	26,25
r		min.	0,4	0,6	0,6	0,6	0,8	0,8	1	1	1	1,2	1,6	2
s		nom. = max.	16	18	21	27	30	34	41	50	60	70	80	90
	Product grade $\frac{A}{B}$	min.	15,73	17,73	20,67	26,67	29,67	33,38	–	–	–	–	–	–
			–	–	–	26,16	29,16	33	40	49	58,8	68,1	78,1	87,8

	Product grade			
	A		B	
	$l^{2)}$			
nom.	min.	max	min.	max.
20	19,58	20,42	–	–
25	24,58	25,42	–	–
30	29,58	30,42	–	–
35	34,5	35,5	–	–
40	39,5	40,5	–	–
45	44,5	45,5	–	–
50	49,5	50,5	–	–
55	54,4	55,6	53,5	56,5
60	59,4	60,6	58,5	61,5
65	64,4	65,6	63,5	66,5
70	69,4	70,6	68,5	71,5
80	79,4	80,6	78,5	81,5

90	89,3	90,7	88,25	91,75
100	99,3	100,7	98,25	101,75
110	109,3	110,7	108,25	111,75
120	119,3	120,7	118,25	121,75
130	129,2	130,8	128	132
140	139,2	140,8	138	142
150	149,2	150,8	148	152
160	–	–	158	162
180	–	–	178	182
200	–	–	197,7	202,3
220	–	–	217,7	222,3
240	–	–	237,7	242,3
260	–	–	257,4	262,6
280	–	–	277,4	282,6
300	–	–	297,4	302,6
320	–	–	317,15	322,85
340	–	–	337,15	342,85
360	–	–	357,15	362,85
380	–	–	377,15	382,85
400	–	–	397,15	402,85
420	–	–	416,85	423,15
440	–	–	436,85	443,15
460	–	–	456,85	463,15
480	–	–	476,85	483,15
500	–	–	496,85	503,15

1) $k'_{min} = 0,7\ k_{min}$

2) Range of popular lengths between the stepped line, marked thus ———.

– Product grade A above the stepped line, marked thus – – – –.

– Product grade B below this stepped line.

4 Specifications and reference standards

Table 3 — Specifications and reference standards

Material		Steel	Stainless steel	Non ferrous metal
General requirements	International Standard	ISO 8992		
Thread	Tolerance	6g		
	International Standards	ISO 261, ISO 965-2		
Mechanical properties	Class[1]	$d < 39$ mm: 5.6, 8.8, 10.9 $d > 39$ mm: as agreed	$d < 20$ mm: A2-70 20 mm $< d < 39$ mm: A2-50 $d > 39$ mm: as agreed	
	International Standards	$d < 39$ mm: ISO 898-1 $d > 39$ mm: as agreed	$d < 39$ mm: ISO 3506 $d > 39$ mm: as agreed	ISO 8839
Tolerances	Product grade	For $d < 24$ mm and $l < 10\,d$ or 150 mm^2[2]: A For $d > 24$ mm or $l > 10\,d$ or 150 mm^2[2]: B		
	International Standard	ISO 4759-1		
Finish		as processed	plain	plain
		Requirements for electroplating are covered in ISO 4042. If different electroplating requirements are desired or if requirements are needed for other finishes, they should be agreed between customer and supplier. Limits for surface discontinuities are covered in ISO 6157-1 and ISO 6157-3.		
Acceptability		For acceptance procedure, see ISO 3269.		

1) The designation symbols for the property classes according to ISO 898-1 can also be used for nominal thread diameters above 39 mm, provided that the finished product has all the properties assigned to the designation symbols in ISO 898-1.

2) Whichever is shorter.

5 Designation

Example for the designation of a hexagon head screw with thread M12 × 1,5, nominal length l = 80 mm and property class 8.8:

Hexagon head screw ISO 8676 - M12 × 1,5 × 80 - 8.8