February 1995

Hexagon fit bolts

DIN 609

ICS 21.060.10

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Descriptors: Fasteners, bolts, fit bolts, hexagon bolts

Sechskant-Paßschrauben mit langem Gewindezapfen

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

Dimensions in mm

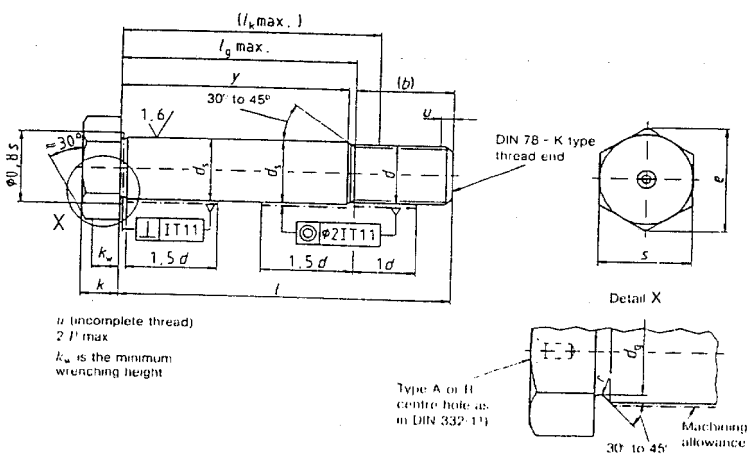
1 Scope and field of application

This standard specifies dimensions and technical delivery conditions for M8 to M52 hexagon fit bolts, assigned to product grade A (for size M10 or less) or product grade B (for size M12 or greater).

For hexagon fit bolts of sizes greater than M39, the specifications of this standard apply only with regard to dimensions and tolerances, the other properties being subject to agreement.

NOTE: For sizes M10, M12, M14 and M22 bolts, this standard specifies widths across flats which are in current use, i.e. 16 mm, 18 mm, 21 mm and 34 mm, in accordance with ISO 272. Specifications for obsolete widths across flats (17 mm, 19 mm, 22 mm and 32 mm) are provided in Appendix A.

2 Dimensions



u (incomplete thread) 2 P max

k_w is the minimum wrenching height

1) A centre hole is only obligatory for bolts with a machining allowance (i.e. d_s is larger). For brushed bolts, any centre hole shall be at the manufacturer's discretion.

Continued on pages 2 to 10

Table 1: Dimensions

	Thread size	M8	M10	M12	(M14)	M16	(M18)	M20
		M8 × 1	M10 × 1,25	M12 × 1,25	(M14 × 1,5)	M16 × 1,5	(M18 × 1,5)	M20 × 1,5
		—	M 10 × 1	M12 × 1,5	—	—	(M18 × 2)	M20 × 2
h (auxiliary size)	[1]	14,5	17,5	20,5	22	25	27,5	28,5
	[2]	16,5	19,5	22,5	24	27	29,5	30,5
	[3]	21,5	24,5	27,5	29	32	34,5	35,5
d_s [4]	Nominal size	9	11	13	15	17	19	21
	min	9,001	11,001	13,001	15,001	17,001	19,002	21,002
	max	9,010	11,012	13,012	15,012	17,012	19,015	21,015
d_e	min	7,9	9,9	11,5	13,5	15,5	17,5	19,1
	max	8,2	10,2	11,8	13,8	15,8	17,8	19,4
e	min	14,38	17,77	19,85	22,78	26,17	29,56	32,95
k	Nominal size	5,3	6,4	7,5	8,8	10	11,5	12,5
	min	5,15	6,22	7,21	8,51	9,71	11,15	12,15
	max	5,45	6,58	7,79	9,09	10,29	11,85	12,85
k_w	min	3,61	4,35	5,05	5,96	6,8	7,81	8,51
r	min	0,4	0,4	0,6	0,6	0,6	0,6	0,8
	max.	0,55	0,55	0,75	0,75	0,75	0,75	0,95
s	max. = nominal size	13	16	18	21	24	27	30
	min.	12,73	15,73	17,57	20,16	23,16	26,16	29,16

For [1] to [4], see page 4.

(continued)

Table 1 (continued)

Thread size					M8		M10		M12		(M14)		M16		(M18)		M20	
					M8 × 1		M10 × 1,25		M12 × 1,25		(M14 × 1,5)		M16 × 1,5		(M18 × 1,5)		M20 × 1,5	
					—		M10 × 1		M12 × 1,5		—		—		(M18 × 2)		M20 × 2	
l Product grade					Shank lengths y and l_g													
Nominal size	A for $d \le 10$ mm		B for $d \ge 10$ mm		y	l_g	y	l_g	y	l_g	y	l_g	y	l_g	y	l_g	y	l_g
	min.	max	min.	max	$^{0}_{-1}$	max	$^{0}_{-1}$	max	$^{0}_{-1}$	max	$^{0}_{-1}$	max	$^{0}_{-1}$	max	$^{0}_{-1}$	max	$^{0}_{-1}$	max
25	24,58	25,42	–	–	8	11,6												
28	27,58	28,42	–	–	11	14,6												
30	29,58	30,42	–	–	13	16,6	10	13,9										
32	31,5	32,5	30,75	33,25	15	18,6	12	15,9	8,5	12,7								
35	34,5	35,5	33,75	36,25	18	21,6	15	18,9	11,5	15,7	9,5	14						
38	37,5	38,5	36,75	39,25	21	24,6	18	21,9	14,5	18,7	12,5	17	9,5	14				
40	39,5	40,5	38,75	41,25	23	26,6	20	23,9	16,5	20,7	14,5	19	11,5	16				
42	41,5	42,5	40,75	43,25	25	28,6	22	25,9	18,5	22,7	16,5	21	13,5	18	10,5	15,7		
45	44,5	45,5	43,75	46,25	28	31,6	25	28,9	21,5	25,7	19,5	24	16,5	21	13,5	18,7	12,5	17,7
48	47,5	48,5	46,75	49,25	31	34,6	28	31,9	24,5	28,7	22,5	27	19,5	24	16,5	21,7	15,5	20,7
50	49,5	50,5	48,75	51,25	33	36,6	30	33,9	26,5	30,7	24,5	29	21,5	26	18,5	23,7	17,5	22,7
55	54,4	55,6	53,5	56,5	36	39,6	33	36,9	29,5	33,7	27,5	32	24,5	29	21,5	26,7	20,5	25,7
60	59,4	60,6	58,5	61,5	41	44,6	38	41,9	34,5	38,7	32,5	37	29,5	34	26,5	31,7	25,5	30,7
65	64,4	65,6	63,5	66,5	46	49,6	43	46,9	39,5	43,7	37,5	42	34,5	39	31,5	36,7	30,5	35,7
70	69,4	70,6	68,5	71,5	51	54,6	48	51,9	44,5	48,7	42,5	47	39,5	44	36,5	41,7	35,5	40,7
75	74,4	75,6	73,5	76,5	56	59,6	53	56,9	49,5	53,7	47,5	52	44,5	49	41,5	46,7	40,5	45,7
80	79,4	80,6	78,5	81,5	61	64,6	58	61,9	54,5	58,7	52,5	57	49,5	54	46,5	51,7	45,5	50,7
85	84,3	85,7	83,25	86,75			63	66,9	59,5	63,7	57,5	62	54,5	59	51,5	56,7	50,5	55,7
90	89,3	90,7	88,25	91,75			68	71,9	64,5	68,7	62,5	67	59,5	64	56,5	61,7	55,5	60,7
95	94,3	95,7	93,25	96,75			73	76,9	69,5	73,7	67,5	72	64,5	69	61,5	66,7	60,5	65,7
100	99,3	100,7	98,25	101,75			78	81,9	74,5	78,7	72,5	77	69,5	74	66,5	71,7	65,5	70,7
105	–	–	103,25	106,75					79,5	83,7	77,5	82	74,5	79	71,5	76,7	70,5	75,7
110	–	–	108,25	111,75					84,5	88,7	82,5	87	79,5	84	76,5	81,7	75,5	80,7
115	–	–	113,25	116,75					89,5	93,7	87,5	92	84,5	89	81,5	86,7	80,5	85,7
120	–	–	118,25	121,75					94,5	98,7	92,5	97	89,5	94	86,5	91,7	85,5	90,7
125	–	–	123	127									94,5	99	91,5	96,7	90,5	95,7
130	–	–	128	132									99,5	104	96,5	101,7	95,5	100,7
135	–	–	133	137									104,5	109	101,5	106,7	100,5	105,7
140	–	–	138	142									109,5	114	106,5	111,7	105,5	110,7
145	–	–	143	147									114,5	119	111,5	116,7	110,5	115,7
150	–	–	148	152									119,5	124	116,5	121,7	115,5	120,7

(continued)

Table 1 (continued)

	Thread size	(M22)	M24	(M27)	M30	(M33)	M36	(M39)
		(M22 × 1,5)	M24 × 2	(M27 × 2)	M30 × 2	(M33 × 2)	M36 × 3	(M39 × 3)
		(M22 × 2)	M24 × 1,5	—	—	—	—	—
b (auxiliary size)	[1]	32,5	—	—	—	—	—	—
	[2]	34,5	36,5	39,5	43	45	49	51
	[3]	39,5	41,5	44,5	48	50	54	56
d_s [4]	Nominal size	23	25	28	32	34	38	40
	min	23,002	25,002	28,002	32,002	34,002	38,002	40,002
	max	23,015	25,015	28,015	32,018	34,018	38,018	40,018
d_k	min	21,1	23,1	25,7	29,7	31,7	35,7	37,7
	max	21,4	23,4	26	30	32	36	38
e	min	37,29	39,55	45,2	50,85	55,37	60,79	66,44
k	Nominal size	14	15	17	19	21	22	25
	min	13,65	14,65	16,65	18,58	20,58	21,58	24,58
	max	14,35	15,35	17,35	19,42	21,42	22,42	25,42
k_w	min	9,56	10,26	11,66	13,01	14,41	15,11	17,21
r	min	0,8	0,8	1	1	1	1	1
	max	0,95	0,95	1,15	1,15	1,15	1,15	1,15
s	max. = nominal size	34	36	41	46	50	55	60
	min	33	35	40	45	49	53,8	58,8

[1] For l 50 mm or less.

[2] For l between 50 mm and 150 mm.

[3] For l exceeding 150 mm.

[4] Tolerance k6; any other tolerances shall be stated when ordering, e.g.:

Fit bolt DIN 609 – M12 n6 × 60 – 8.8

A shank produced to tolerance k6 is normally to be mated with an H7 clearance hole.

The maximum grip length, $l_{k\ max.}$ is equal to $l_{min} - v$ (as specified in DIN 78).

Lengths above 200 mm shall be graded in 10 mm steps.

Bracketed sizes should be avoided if possible.

Bolts are generally manufactured in the sizes for which values of mass and grip length have been specified.

Fit bolts used for repair work should have a shank diameter 1 mm larger than the nominal size (e.g. M20 bolts should have a diameter d_s of 22 mm, not 21 mm). This deviation should be reflected in the designation:

Fit bolt DIN 609 – M20 × 22 × 120 – 8.8

(continued)

Table 1 (continued)

Thread size	(M22)	M24	(M27)	M30	(M33)	M36	(M39)
	(M22 × 1,5)	M24 × 2	(M27 × 2)	M30 × 2	(M33 × 2)	M36 × 3	(M39 × 3)
	(M22 × 2)	M24 × 1,5	—	—	—	—	—

l Product grade B			Shank lengths y and l_g													
Nominal size	mm	max.	y $^{0}_{-1}$	l_g max	y $^{0}_{-1}$	l_g max	y $^{0}_{-1}$	l_g max	y $^{0}_{-1}$	l_g max	y $^{0}_{-1}$	l_g max	y $^{0}_{-1}$	l_g max	y $^{0}_{-1}$	l_g max
48	46,75	49,25	11,5	16,7												
50	48,75	51,25	13,5	18,7												
55	53,5	56,5	16,5	21,7	14	19,8										
60	58,5	61,5	21,5	26,7	19	24,8	16	21,8								
65	63,5	66,5	26,5	31,7	24	29,8	21	26,8	17	23,5	15	21,5				
70	68,5	71,5	31,5	36,7	29	34,8	26	31,8	22	28,5	20	26,5	15	22		
75	73,5	76,5	36,5	41,7	34	39,8	31	36,8	27	33,5	25	31,5	20	27	18	25
80	78,5	81,5	41,5	46,7	39	44,8	36	41,8	32	38,5	30	36,5	25	32	23	30
85	83,25	86,75	46,5	51,7	44	49,8	41	46,8	37	43,5	35	41,5	30	37	28	35
90	88,25	91,75	51,5	56,7	49	54,8	46	51,8	42	48,5	40	46,5	35	42	33	40
95	93,25	96,75	56,5	61,7	54	59,8	51	56,8	47	53,5	45	51,5	40	47	38	45
100	98,25	101,75	61,5	66,7	59	64,8	56	61,8	52	58,5	50	56,5	45	52	43	50
105	103,25	106,75	66,5	71,7	64	69,8	61	66,8	57	63,5	55	61,5	50	57	48	55
110	108,25	111,75	71,5	76,7	69	74,8	66	71,8	62	68,5	60	66,5	55	62	53	60
115	113,25	116,75	76,5	81,7	74	79,8	71	76,8	67	73,5	65	71,5	60	67	58	65
120	118,25	121,75	81,5	86,7	79	84,8	76	81,8	72	78,5	70	76,5	65	72	63	70
125	123	127	86,5	91,7	84	89,8	81	86,8	77	83,5	75	81,5	70	77	68	75
130	128	132	91,5	96,7	89	94,8	86	91,8	82	88,5	80	86,5	75	82	73	80
135	133	137	96,5	101,7	94	99,8	91	96,8	87	93,5	85	91,5	80	87	78	85
140	138	142	101,5	106,7	99	104,8	96	101,8	92	98,5	90	96,5	85	92	83	90
145	143	147	106,5	111,7	104	109,8	101	106,8	97	103,5	95	101,5	90	97	88	95
150	148	152	111,5	116,7	109	114,8	106	111,8	102	108,5	100	106,5	95	102	93	100
160	158	162					111	116,8	107	113,5	105	111,5	100	107	98	105
170	168	172					121	126,8	117	123,5	115	121,5	110	117	108	115
180	178	182					131	136,8	127	133,5	125	131,5	120	127	118	125
190	187,7	192,3					141	146,8	137	143,5	135	141,5	130	137	128	135
200	197,7	202,3					151	156,8	147	153,5	145	151,5	140	147	138	145

(continued)

Table 1 (concluded)

Thread size		M42 M42 × 3 —	(M45) (M45 × 3) —	M48 M48 × 3 —	(M52) (M52 × 3) —
b (auxiliary size)	[2]	56	59	63	65
	[3]	61	64	68	70
d_s [4]	Nominal size	44	46	50	55
	min	44,002	46,002	50,002	55,002
	max	44,018	46,018	50,018	55,021
d_e	min	41,7	43,7	47,7	52,7
	max	42	44	48	53
r	min	71,3	76,95	82,6	88,25
k	Nominal size	26	28	30	33
	min	25,58	27,58	29,58	32,5
	max	26,42	28,42	30,42	33,5
k_w	min	17,91	19,31	20,71	22,75
r	min	1	1	1	1
	max	1,15	1,15	1,15	1,15
s	max = nominal size	65	70	75	80
	min.	63,1	68,1	73,1	78,1

l Product grade B			Shank lengths y and l_g							
Nominal size	min.	max.	y $^{0}_{-1}$	l_g max.	y $^{0}_{-1}$	l_g max.	y $^{0}_{-1}$	l_g max.	y $^{0}_{-1}$	l_g max.
70	68,5	71,5								
75	73,5	76,5								
80	78,5	81,5	17,5	25						
85	83,25	86,75	22,5	30	19,5	27				
90	88,25	91,75	27,5	35	24,5	32	20	28,3	18	26,3
95	93,25	96,75	32,5	40	29,5	37	25	33,3	23	31,3
100	98,25	101,75	37,5	45	34,5	42	30	38,3	28	36,3
105	103,25	106,75	42,5	50	39,5	47	35	43,3	33	41,3
110	108,25	111,75	47,5	55	44,5	52	40	48,3	38	46,3
115	113,25	116,75	52,5	60	49,5	57	45	53,3	43	51,3
120	118,25	121,75	57,5	65	54,5	62	50	58,3	48	56,3
125	123	127	62,5	70	59,5	67	55	63,3	53	61,3
130	128	132	67,5	75	64,5	72	60	68,3	58	66,3
135	133	137	72,5	80	69,5	77	65	73,3	63	71,3
140	138	142	77,5	85	74,5	82	70	78,3	68	76,3
145	143	147	82,5	90	79,5	87	75	83,3	73	81,3
150	148	152	87,5	95	84,5	92	80	88,3	78	86,3
160	158	162	92,5	100	89,5	97	85	93,3	83	91,3
170	168	172	102,5	110	99,5	107	95	103,3	93	101,3
180	178	182	112,5	120	109,5	117	105	113,3	103	111,3
190	187,7	192,3	122,5	130	119,5	127	115	123,3	113	121,3
200	197,7	202,3	132,5	140	129,5	137	125	133,3	123	131,3

For [2] to [4], see page 4

3 Mass

The values provided below are for guidance only.

Approximately the same values may be assumed for bolts with fine pitch thread.

Table 2: Mass

Thread size	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30	M33	M36	M39	M42	M45	M48	M52
Length, *l*	Approximate mass (7.85 kg/dm³) per 1000 units, in kg																	
25	17																	
28	18.5																	
30	19.5	31.8																
32	20.5	33.3	46.5															
35	22	35.5	48.6	68.3														
38	23.5	37.7	51.7	72.5	101													
40	24.5	39.2	53.8	75.3	104													
42	25.5	40.7	55.8	78.0	107	141												
45	27	42.9	59.0	82.2	112	146	195											
48	28.5	45.2	62.1	86.4	118	153	200	250										
50	29.5	45.7	64.2	89.1	121	157	203	254										
55	32	49.9	68.7	96.5	130	167	215	271	310									
60	34.5	53.6	73.9	103	139	178	229	288	339	478								
65	37	57.4	79.2	110	148	189	242	304	358	502	630	782						
70	39.5	61.1	84.4	117	157	201	256	320	378	526	661	818	1 020					
75	42	64.8	89.6	124	166	212	269	336	397	550	693	854	1 070	1 290				
80	44.5	68.6	94.8	131	175	223	283	353	416	574	724	890	1 110	1 340	1 600			
85		72.3	100	138	184	234	297	369	435	599	756	926	1 160	1 390	1 660	1 960	2 340	
90		76.0	105	145	193	245	310	385	455	623	787	961	1 200	1 440	1 720	2 030	2 410	2 890
95		79.7	110	152	202	256	324	402	474	647	819	997	1 250	1 490	1 780	2 100	2 490	2 980
100		83.5	115	158	211	267	338	418	493	671	850	1 040	1 290	1 540	1 840	2 170	2 570	3 080
105			121	165	219	278	351	434	512	695	882	1 070	1 330	1 590	1 900	2 240	2 640	3 170
110			126	172	228	290	365	451	532	719	914	1 110	1 380	1 640	1 960	2 300	2 720	3 270
115			131	179	237	301	378	467	551	744	945	1 140	1 420	1 690	2 020	2 370	2 790	3 360
120			135	186	246	312	392	483	570	768	977	1 180	1 470	1 740	2 080	2 430	2 870	3 460
125					255	323	406	500	590	792	1 010	1 220	1 510	1 790	2 140	2 500	2 950	3 550
130					264	333	419	516	609	816	1 050	1 250	1 560	1 840	2 200	2 560	3 020	3 640
135					273	345	433	532	628	840	1 080	1 290	1 600	1 890	2 260	2 630	3 100	3 740
140					282	356	446	548	647	864	1 110	1 320	1 650	1 940	2 320	2 680	3 180	3 830
145					291	367	460	565	667	889	1 140	1 360	1 690	1 990	2 380	2 760	3 260	3 920
150					300	379	474	581	686	913	1 170	1 390	1 740	2 040	2 440	2 820	3 330	4 020
160									959	1 230	1 460	1 810	2 130	2 540	2 940	3 470	4 180	
170									1 010	1 290	1 530	1 900	2 220	2 660	3 070	3 630	4 370	
180									1 060	1 350	1 600	1 990	2 320	2 780	3 200	3 780	4 550	
190									1 110	1 420	1 670	2 080	2 420	2 900	3 330	3 940	4 740	
200									1 160	1 480	1 740	2 170	2 520	3 020	3 460	4 090	4 930	

4 Technical delivery conditions

Table 3: Technical delivery conditions

Material		Steel	Stainless steel	Nonferrous metal
General requirements		As specified in ISO 8992.		
Thread	Tolerance	6g		
	As specified in	DIN 13-15.		
Mechanical properties	Property class (material*)	Up to size M39: 8.8; for sizes larger than M39: subject to agreement.	Up to size M20: A2-70; for sizes larger than M20 up to M39: A2-50; for sizes above M39: subject to agreement	CuZn*
	As specified in	DIN EN 20 898-1	ISO 3506	DIN EN 28 839.
Limit deviations and geometrical tolerances	Product grade2)	Up to size M10: A; for size M12 or more: B.		
	As specified in	ISO 4759-1.		
Surface finish		As processed. (Thermally or chemically) blackened3).	Bright.	Bright.
		Shank: bright.	–	–
		ISO 4042 shall apply with regard to electroplating4).	–	–
		DIN 267-10 shall apply with regard to hot-dip galvanizing.	–	–
		DIN 267-2 shall apply with regard to surface roughness.		
		DIN EN 26 157-3 shall apply with regard to the limits of surface discontinuities.		
Acceptance inspection		As specified in 3269.		

*) Copper-zinc alloy CU2 or CU3, at the manufacturer's discretion.

1) Where the bolts are to meet requirements differing from those specified (e.g. in respect of property class or material), the specifications of the relevant standards shall be complied with.

2) If product grade A is required for sizes from M12 upwards, this shall be included in the designation, e.g.

Fit bolt DIN 609 – M20 × 100 – 8.8 – A

In this case, the appropriate tolerances as specified in ISO 4759-1 shall apply, except for the shank diameter, d_s.

3) Bolts of other property classes or materials may have different finishes (e.g. property class 5.6: 'as rolled').

4) Electroplated fit bolts may be supplied uncoated, as otherwise the tolerances specified for the shank will not be met. Any necessary coating of shanks shall be subject to agreement.

5 Designation

Designation of an M16 hexagon fit bolt with a nominal length, l, of 60 mm and assigned to property class 8.8

Fit bolt DIN 609 – M16 × 60 – 8.8

Designation of an M20 x 1,5 hexagon fit bolt with machining allowance (i.e. d_s = 21,3 mm), with a nominal length, l, of 100 mm and assigned to property class 8.8:

Fit bolt DIN 609 – M20 × 1,5 × 21,3 × 100 – 8.8

For M10, M12, M14 and M22 bolts, widths across flats in current use, as specified in ISO 272, shall apply and are to be given in the designation, e.g.:

Designation of an M12 x 1,25 hexagon fit bolt with a nominal length, l, of 60 mm, with a width across flats of 18 mm (SW 18), and assigned to property class 8.8:

Fit bolt DIN 609 – M12 × 1,25 × 60 – SW 18 – 8.8

DIN 962 shall apply to the designation of type and finish, with additional information to be given on ordering

The DIN 4000 – 2 – 1 tabular layout of article characteristics shall apply to the screws covered in this standard

Appendix A

Widths across flats for replacement and maintenance purposes

17 mm, 19 mm, 22 mm and 32 mm widths across flats are not included in ISO 272, and their further use is deprecated. However, should such bolts be required as replacement parts, they may still be ordered with the dimensions specified in the table below.

For ordering purposes, the following designation may be used (example):

Fit bolt DIN 609 – M12 × 1,25 × 60 – 8.8

Table A.1: Obsolete widths across flats

Thread size		M10	M12	M14	M22
e	min.	18,90	20,88	23,91	35,03
s	max. = nominal size	17	19	22	32
	min.	16,73	18,48	21,16	31

Standards referred to

DIN 13-15	ISO metric screw threads; fundamental deviations and tolerances for screw threads of 1 mm diameter and larger
DIN 78	Thread ends and lengths of projection of bolt ends for ISO metric screw threads in accordance with the DIN 13 series
DIN 267-2	Fasteners; technical delivery conditions; product grades and tolerances
DIN 267-10	Fasteners; technical delivery conditions, hot-dip galvanized components
DIN 332-1	60° centre holes, types R, A, B and C
DIN 962	Designation system for fasteners
DIN 4000-2	Tabular layouts of article characteristics for bolts, screws and nuts
DIN EN 20 898-1	Mechanical properties of fasteners, bolts, screws and studs (ISO 898-1 : 1988)
DIN EN 26 157-3	Fasteners, surface discontinuities, bolts, screws and studs for special requirements (ISO 6157-3 : 1988)
DIN EN 28 839	Mechanical properties of fasteners, nonferrous metal bolts, screws, studs and nuts
ISO 272 : 1982	Fasteners, hexagon products, widths across flats
ISO 3269 : 1988	Fasteners, acceptance inspection
ISO 3506 : 1979	Corrosion-resistant stainless steel fasteners, specifications
ISO 4042 : 1989	Threaded components, electroplated coatings
ISO 4759-1 : 1978	Tolerances for fasteners, bolts, screws and nuts with thread diameters between 1,6 (inclusive) and 150 mm (inclusive) and product grades A, B and C
ISO 8992 : 1986	Fasteners, general requirements for bolts, screws, studs and nuts

Previous editions

DIN 609: 1942-04, 1951-09, 1953-07, 1953-11, 1956-04, 1963-05, 1971-01, 1984-07.

Amendments

The following amendments have been made to the July 1984 edition:

a) Symbol k' has been replaced by k_s.

b) A perpendicularity tolerance has been specified for the shank.

c) The fine pitch thread has been adopted for thread sizes M8, M10, M12, (M14) and M16.

d) The widths across flats of M10, M12, M14 and M22 bolts have been amended.

e) The tolerances have been given to an accuracy of two decimal places.

f) The standard has been editorially revised.