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Westfield Fasteners Product Specification:

ISO 4017 - Hex Head Set Screw (Fully Threaded Hex Bolt)

This product guide contains the specification for metric threaded Hex Head Set Screws, a series of standard parts available from Westfield Fasteners. The basis of this specification is the internationally recognised ISO standard ISO 4017.

Product Description

Commonly referred to as a set screw or simply as a bolt. The fully threaded hex head set screw is distinct from its partially threaded Hex Bolt counterpart. A standard spanner or ratchet is typically used to secure this fastener. Used for decades on all types of assembly throughout the world. The hex head drive allows a higher torque to be applied over other drive systems. This newer standard ISO 4017 specifies differences in head dimensions for M10, M12, M14 and M22 thread diameters over the older DIN 933 standard.

Scope of the ISO Standard

ISO standard ISO 4017 specifies the characteristics, tolerances and variation in form of metric sized hex head set screws, and covers thread diameters from M1.6 up to and including M64. Mechanical properties for these items are defined in ISO 898 and ISO 3506. Table 1 below defines the overall dimensions and tolerances for hexagon head set screws, whilst table 2 defines the same for what are considered non-preferred threads. Table 3 defines the tolerance on the shank length.

ISO 4017 has specific provision for mild steel, 8.8 and 10.9 hi-tensile steel, stainless steel and non ferrous metals, which may include brass.

ISO 4017 is based on and supercedes DIN 933. Despite this, off the shelf parts are still widely available and often produced to the older standard.

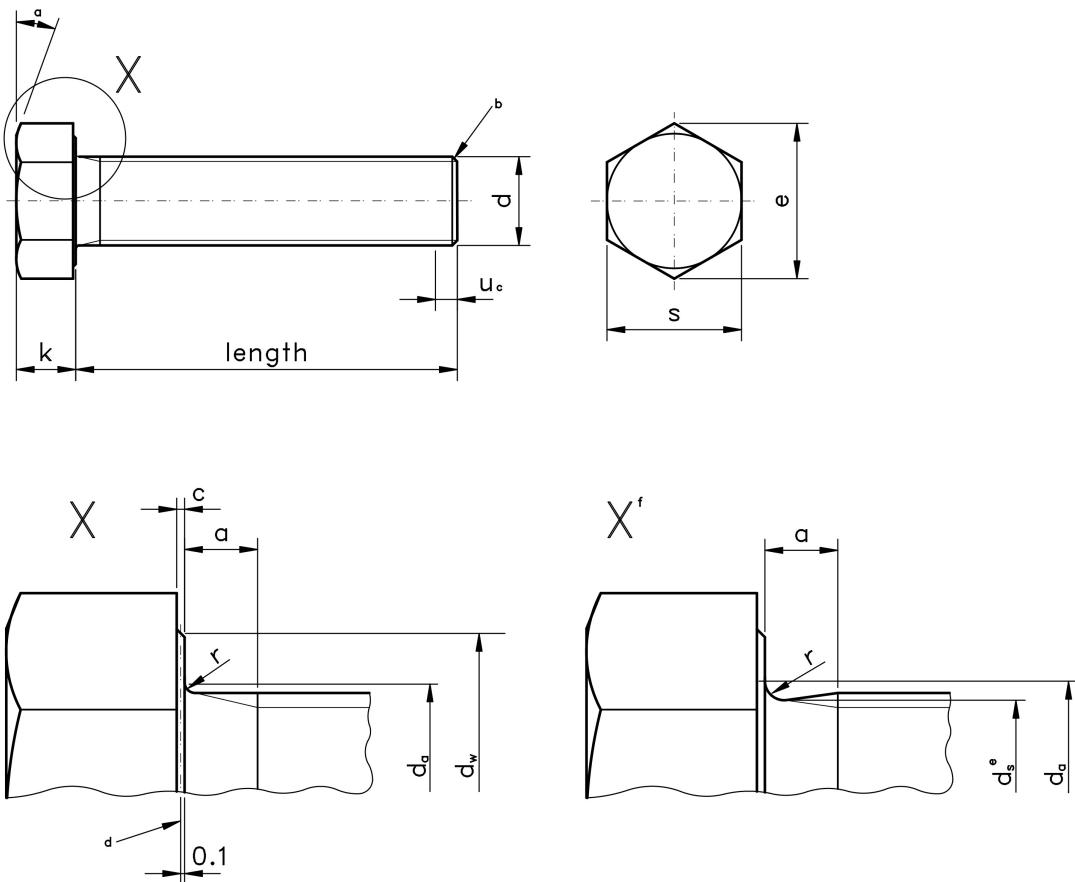


Figure 1: Hexagon Head Set Screw ISO 4017

Notes to figure 1:

- Point (b) is chamfered or for threads equal to or greater than M4, it may be as-rolled (sheared end).
- There may be up to 2 incomplete threads at the end of the bolt (c).
- d - reference datum for dw.
- d_s pitch diameter (e).
- Permissible alternative shape (f).

Variations from ISO 4017

ISO 4014 is an equivalent standard, covering hex head bolts with a partially threaded shank.

Table 1: Dimensions & Tolerances according to ISO 4017 (Preferred Threads)

Thread, d			M1.6	M2	M2.5	M3	M4	M5	M6	M8	M10	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64		
p			0.35	0.4	0.45	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2.5	3	3.5	4	4.5	5	5.5	6		
a	max		1.05	1.20	1.35	1.5	2.1	2.4	3	4	4.5	5.3	6	7.5	9	10.5	12	13.5	15	16.5	18		
	min		0.35	0.40	0.45	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2.5	3	3.5	4	4.5	5	5.5	6		
c	max		0.25	0.25	0.25	0.40	0.40	0.50	0.50	0.60	0.60	0.60	0.80	0.80	0.80	0.80	0.80	1.00	1.00	1.00	1.00		
	min		0.10	0.10	0.10	0.15	0.15	0.15	0.15	0.15	0.15	0.20	0.20	0.20	0.20	0.20	0.30	0.30	0.30	0.30	0.30		
d _a			max		2.0	2.6	3.1	3.6	4.7	5.7	6.8	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	2.27	3.07	4.07	4.57	5.88	6.88	8.88	11.63	14.63	16.63	22.49	28.19	33.61	-	-	-	-	-	-	
				2.30	2.95	3.95	4.45	5.74	6.74	8.74	11.47	14.47	16.47	22.00	27.70	33.25	42.75	51.11	59.95	69.45	78.66	88.16	
e	Product grade	A	min	3.41	4.32	5.45	6.01	7.66	8.79	11.05	14.38	17.77	20.03	26.75	33.53	39.98	-	-	-	-	-	-	
				3.28	4.18	5.31	5.88	7.50	8.63	10.89	14.20	17.59	19.85	26.17	32.95	39.55	50.85	60.79	71.30	82.60	93.56	104.86	
k	-	-	nom	1.1	1.4	1.7	2	2.8	3.5	4	5.3	6.4	7.5	10	12.5	15	18.7	22.5	26	30	35	40	
	Product grade	A	max	1.225	1.525	1.825	2.125	2.925	3.65	4.15	5.45	6.58	7.68	10.18	12.715	15.215	-	-	-	-	-	-	
			min	0.975	1.275	1.575	1.875	2.675	3.35	3.85	5.15	6.22	7.32	9.82	12.285	14.785	-	-	-	-	-	-	
	Product grade	B	max	1.30	1.60	1.90	2.20	3.00	3.74	4.24	5.54	6.69	7.79	10.29	12.85	15.35	19.12	22.92	26.42	30.42	35.5	40.5	
			min	0.90	1.20	1.50	1.80	2.60	3.26	3.76	5.06	6.11	7.21	9.71	12.15	14.65	18.28	22.08	25.58	29.58	34.5	39.5	
k _w	Product grade	A	min	0.68	0.89	1.10	1.31	1.87	2.35	2.70	3.61	4.35	5.12	6.87	8.6	10.35	-	-	-	-	-	-	
			min	0.63	0.84	1.05	1.26	1.82	2.28	2.63	3.54	4.28	5.05	6.8	8.51	10.26	12.8	15.46	17.91	20.71	24.15	27.65	
r	-	-	min	0.1	0.1	0.1	0.1	0.2	0.2	0.25	0.4	0.4	0.6	0.6	0.8	0.8	1	1	1.2	1.6	2	2	
s	-	-	nom=max	3.2	4	5	5.5	7	8	10	13	16	18	24	30	36	46	55	65	75	85	95	
	Product grade	A	min	3.02	3.82	4.82	5.32	6.78	7.78	9.78	12.73	15.73	17.73	23.67	29.67	35.38	-	-	-	-	-	-	
				2.90	3.70	4.70	5.20	6.64	7.64	9.64	12.57	15.57	17.57	23.16	29.16	35.00	45.0	53.8	63.1	73.1	82.8	92.8	

Table 2: Dimensions & Tolerances according to ISO 4017 (Non-Preferred Threads)

Thread, d			M3.5	M14	M18	M22	M27	M33	M39	M45	M52	M60	
p			0.6	2	2.5	2.5	3	3.5	4	4.5	5	5.	
a		max	1.8	6	7.5	7.5	9	10.5	12	13.5	15	16.5	
		min	0.6	2	2.5	2.5	3	3.5	4	4.5	5	5.5	
c		max	0.40	0.60	0.80	0.80	0.80	0.8	1.0	1.0	1.0	1.0	
		min	0.15	0.15	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	
d _a			max	4.1	15.7	20.2	24.4	30.4	36.4	42.4	48.6	56.6	67
d _w	Product grade	A	min	5.07	19.64	25.34	31.71	-	-	-	-	-	-
		B		4.95	19.15	24.85	31.35	38.0	46.55	55.86	64.70	74.2	83.41
e	Product grade	A	min	6.58	23.36	30.14	37.72	-	-	-	-	-	-
		B		6.44	22.78	29.56	37.29	45.20	55.37	66.44	76.95	88.25	99.21
k	-	-	nom	2.4	8.8	11.5	14	17	21	25	28	33	38
	Product grade	A	max	2.525	8.980	11.715	14.215	-	-	-	-	-	-
		A	min	2.275	8.620	11.285	13.785	-	-	-	-	-	-
	Product grade	B	max	2.60	9.09	11.85	14.35	17.35	21.42	25.42	28.42	33.50	38.5
		B	min	2.20	8.51	11.15	13.65	16.65	20.58	24.58	27.58	32.50	37.5
k _w	Product grade	A	min	1.59	6.03	7.90	9.65	-	-	-	-	-	-
		B		1.54	5.96	7.81	9.56	11.66	14.41	17.21	19.31	22.75	26.25
r	-	-	min	0.1	0.6	0.6	0.8	1	1	1	1.2	1.6	2
s	-	-	nom=max	6	21	27	34	41	50	60	70	80	90
	Product grade	A	min	5.82	21.67	26.67	33.38	-	-	-	-	-	-
		B		5.70	21.16	26.16	33.00	40.00	49.0	58.8	68.1	78.1	87.8

Table 3: Shank Length Tolerance according to ISO 4017

mm	+/-	
	Product grade	
	A	B
2-3	0.2	-
4-6	0.24	-
8-10	0.29	-
12-16	0.35	-
20-30	0.42	1.05
35-50	0.5	1.25
55-80	0.6	1.5
90-120	0.7	1.75
130-150	0.8	2
160-180	-	2
200	-	2.3

For further details, please refer to the ISO standard document for this item.