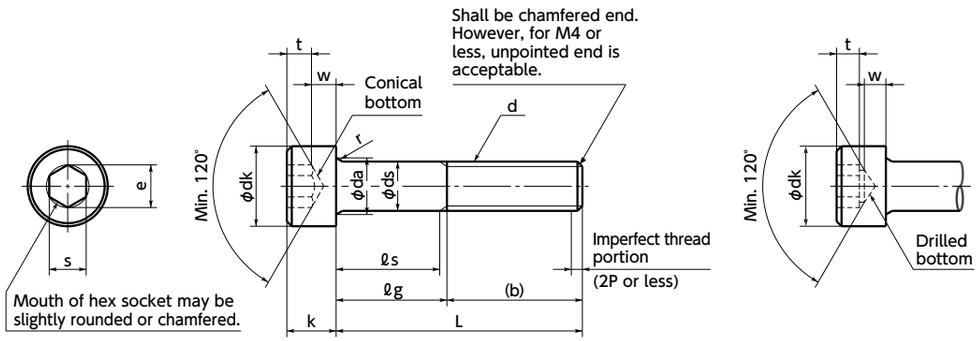
Hexagon Socket Head Cap Screws

Excerpts from JIS B 1176:2015

Shape and dimensions of hex socket head cap screws



Unit: mm

Nominal diameter of thread (d)		M1.6	M2	M2.5	M3	M4	M5	M6	M8	M10	M12	M16	M20	M24
Thread pitch		0.35	0.4	0.45	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2.5	3
b*1	(Reference)	15	16	17	18	20	22	24	28	32	36	44	52	60
d_k	Max.*2	3.00	3.8	4.5	5.5	7	8.5	10	13	16	18	24	30	36
	Max.*3	3.14	3.98	4.68	5.68	7.22	8.72	10.22	13.27	16.27	18.27	24.33	30.33	36.39
	Min.	2.86	3.62	4.32	5.32	6.78	8.28	9.78	12.73	15.73	17.73	23.67	29.67	35.61
d_a	Max.	2	2.6	3.1	3.6	4.7	5.7	6.8	9.2	11.2	13.7	17.7	22.4	26.4
d_s	Max.	1.60	2	2.5	3	4	5	6	8	10	12	16	20	24
	Min.	1.46	1.86	2.36	2.86	3.82	4.82	5.82	7.78	9.78	11.73	15.73	19.67	23.67
e	Min.*4*5	1.733	1.733	2.303	2.873	3.443	4.583	5.723	6.863	9.149	11.429	15.996	19.437	21.734
k	Max.	1.60	2	2.5	3	4	5	6	8	10	12	16	20	24
	Min.	1.46	1.86	2.36	2.86	3.82	4.82	5.70	7.64	9.64	11.57	15.57	19.48	23.48
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
s*5	Nominal Diameter	1.5	1.5	2	2.5	3	4	5	6	8	10	14	17	19
	Max.	1.58	1.58	2.08	2.58	3.08	4.095	5.14	6.14	8.175	10.175	14.212	17.23	19.275
	Min.	1.52	1.52	2.02	2.52	3.02	4.02	5.02	6.02	8.025	10.025	14.032	17.05	19.065
t	Min.	0.7	1	1.1	1.3	2	2.5	3	4	5	6	8	10	12
v	Max.	0.16	0.2	0.25	0.3	0.4	0.5	0.6	0.8	1	1.2	1.6	2	2.4
d_w	Min.	2.72	3.48	4.18	5.07	6.53	8.03	9.38	12.33	15.33	17.23	23.17	28.87	34.81
w	Min.	0.55	0.55	0.85	1.15	1.4	1.9	2.3	3.3	4	4.8	6.8	8.6	10.4

∗1 Shall be applied to non-shaded nominal diameters between thick stepwise lines.
∗2 Shall be applied to unknurled head
∗3 Shall be applied to knurled head
∗4 e_{min}= 1.14 s_{min}
∗5 See JIS B 1016 for gauge inspection of hex socket dimensions s and e.

Unit: mm

Nominal diameter of thread (d)		M1.6		M2		M2.5		M3		M4		M5		M6		M8		M10		M12		M16		M20		M24	
L*		ℓs and ℓg																									
Nominal Diameter Length	min	max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max
2.5	2.3	2.7																									
3	2.8	3.2																									
4	3.76	4.24																									
5	4.76	5.24																									
6	5.76	6.24																									
8	7.71	8.29																									
10	9.71	10.29																									
12	11.65	12.35																									
16	15.65	16.35																									
20	19.58	20.42			2	4																					
25	24.58	25.42					5.75	8	4.5	7																	
30	29.58	30.42							9.5	12	6.5	10	4	8													
35	34.5	35.5									11.5	15	9	13	6	11											
40	39.5	40.5									16.5	20	14	18	11	16	5.75	12									
45	44.5	45.5											19	23	16	21	10.75	17	5.5	13							
50	49.5	50.5											24	28	21	26	15.75	22	10.5	18							
55	54.4	55.6													26	31	20.75	27	15.5	23	10.25	19					
60	59.4	60.6													31	36	25.75	32	20.5	28	15.25	24					
65	64.4	65.6															30.75	37	25.5	33	20.25	29	11	21			
70	69.4	70.6															35.75	42	30.5	38	25.25	34	16	26			
80	79.4	80.6															45.75	52	40.5	48	35.25	44	26	36	15.5	28		
90	89.3	90.7																	50.5	58	45.25	54	36	46	25.5	38	15	30
100	99.3	100.7																	60.5	68	55.25	64	46	56	35.5	48	25	40
110	109.3	110.7																			65.25	74	56	66	45.5	58	35	50
120	119.3	120.7																			75.25	84	66	76	55.5	68	45	60
130	129.2	130.8																					76	86	65.5	78	55	70
140	139.2	140.8																					86	96	75.5	88	65	80
150	149.2	150.8																					96	106	85.5	98	75	90
160	159.2	160.8																					106	116	95.5	108	85	100
180	179.2	180.8																							115.5	128	105	120
200	199.075	200.9																							135.5	148	125	140

∗ Range of nominal length generally distributed is between thick stepwise lines. Shaded nominal length shall be full thread, and length of imperfect thread under head shall be 3P or less.
Non-shaded values show ℓg and ℓs values based on the next formula: ℓg max = ℓnom - b, ℓs min = ℓg max - 5P

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