

Porteous Fastener Company

Product Information Sheet

Hex Cap Screws, Inch Series, Grade 2



- PFC Product Category: 00020
- Typical Material: Low Carbon Steel, 1015 - 1022
- Material and Mechanical Properties: Purchased to meet SAE J429 Grade 2.
- Dimensions: ASME B18.2.1, Rolled Threads
- Zinc Plating: Purchased to meet ASTM F1941 FeZn3A
- Typical Hardness: HRB 80-100 on sizes 1/4 to 3/4 inch; HRB 70-100 on sizes over 3/4 inch.
- Tensile Strength: 74,000 PSI Minimum on sizes 1/4 to 3/4 inch up to 6 inches in length; 60,000 PSI Minimum on sizes over 3/4 inch and lengths longer than 6 inches.

Tensile Strength - NC Threads					
Size	PSI	Pounds	Size	PSI	Pounds
1/4-20	74,000	2350	3/4-10	74,000	24,700
5/16-18	74,000	3900	7/8-9	60,000	27,700
3/8-16	74,000	5750	1-8	60,000	36,400
7/16-14	74,000	7850	1 1/8-7	60,000	45,800
1/2-13	74,000	10,500	1 1/4-7	60,000	58,100
9/16-12	74,000	13,500	1 3/8-6	60,000	69,300
5/8-11	74,000	16,700	1 1/2-6	60,000	84,300

Tensile Strength - NC Threads Lengths over 6 inches		
Size	PSI	Pounds
1/4-20	60,000	1900
5/16-18	60,000	3100
3/8-16	60,000	4650
7/16-14	60,000	6350
1/2-13	60,000	8500
9/16-12	60,000	11,000
5/8-11	60,000	13,550
3/4-10	60,000	20,050

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Cap Screw Grip Length												
Nominal Diameter	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
Nominal length	Max/Min	Max/Min	Max/Min	Max/Min	Max/Min	Max/Min	Max/Min	Max/Min	Max/Min	Max/Min	Max/Min	Max/Min
Up to 1 1/8"	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread
1 1/4	0.50/0.25	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread
1 3/8	0.63/0.38	0.50/0.22	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread
1 1/2	0.75/0.50	0.62/0.35	0.50/0.19	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread
1 5/8	0.88/0.62	0.75/0.47	0.62/0.31	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread
1 3/4	1.00/0.75	0.88/0.60	0.75/0.44	0.63/0.27	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread
1 7/8	1.12/0.88	1.00/0.72	0.88/0.56	0.75/0.39	0.63/0.24	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread
2	1.25/1.00	1.12/0.85	1.00/0.69	0.88/0.52	0.75/0.38	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread
2 1/4	1.50/1.25	1.38/1.10	1.25/0.94	1.12/0.77	1.00/0.52	0.88/0.46	0.75/0.33	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread
2 1/2	1.75/1.50	1.62/1.35	1.50/1.19	1.38/1.02	1.25/0.86	1.12/0.75	1.00/0.55	Full Thread	Full Thread	Full Thread	Full Thread	Full Thread
2 3/4	2.00/1.75	1.88/1.60	1.75/1.44	1.62/1.27	1.50/1.12	1.38/0.96	1.25/0.80	1.00/0.50	Full Thread	Full Thread	Full Thread	Full Thread
3	2.25/2.00	2.12/1.85	2.00/1.69	1.88/1.52	1.75/1.36	1.62/1.21	1.50/1.05	1.25/0.75	1.00/0.44	Full Thread	Full Thread	Full Thread
3 1/2	2.75/2.50	2.62/2.35	2.50/2.19	2.38/2.02	2.25/1.86	2.12/1.71	2.00/1.55	1.75/1.25	1.50/0.94	1.25/0.62	Full Thread	Full Thread
4	3.25/3.00	3.12/2.85	3.00/2.69	2.88/2.52	2.75/2.36	2.62/2.21	2.50/2.05	2.25/1.75	2.00/1.44	1.75/1.12	1.50/0.79	1.25/0.54
4 1/2	3.75/3.50	3.62/3.35	3.50/3.19	3.38/3.02	3.25/2.86	3.12/2.71	3.00/2.55	2.75/2.25	2.50/1.94	2.25/1.62	2.00/1.29	1.75/1.04
5	4.25/4.00	4.12/3.85	4.00/3.69	3.88/3.52	3.75/3.36	3.62/3.21	3.50/3.05	3.25/2.75	3.00/2.44	2.75/2.12	2.50/1.79	2.25/1.54
5 1/2	4.75/4.50	4.62/4.35	4.50/4.19	4.38/4.02	4.25/3.87	4.12/3.71	4.00/3.55	3.75/3.25	3.50/2.94	3.25/2.62	3.00/2.29	2.75/2.04
6	5.25/5.00	5.12/4.85	5.00/4.69	4.88/4.52	4.75/4.36	4.62/4.21	4.50/4.05	4.25/3.75	4.00/3.44	3.75/3.12	3.50/2.79	3.25/2.54
6 1/2	5.50/5.25	5.38/5.10	5.25/4.94	5.12/4.77	5.00/4.62	4.88/4.46	4.75/4.30	4.50/4.00	4.25/3.69	4.00/3.38	3.75/3.04	3.50/2.79
7	6.00/5.75	5.88/5.60	5.75/5.44	5.62/5.27	5.50/5.12	5.38/4.96	5.25/4.80	5.00/4.50	4.75/4.19	4.50/3.88	4.25/3.54	4.00/3.29
7 1/2	6.50/6.25	6.38/6.10	6.25/5.94	6.12/5.77	6.00/5.62	5.88/5.46	5.75/5.30	5.50/5.00	5.25/4.69	5.00/4.38	4.75/4.04	4.50/3.79
8	7.00/6.75	6.88/6.60	6.75/6.44	6.62/6.27	6.50/6.12	6.38/5.96	6.25/5.80	6.00/5.50	5.75/5.19	5.50/4.88	5.25/4.54	5.00/4.29
8 1/2	7.50/7.25	7.38/7.10	7.25/6.94	7.12/6.77	7.00/6.62	6.88/6.46	6.75/6.30	6.50/6.00	6.25/5.69	6.00/5.38	5.75/5.04	5.50/4.79
9	8.00/7.75	7.88/7.60	7.75/7.44	7.62/7.27	7.50/7.12	7.38/6.96	7.25/7.05	7.00/6.50	6.75/6.19	6.50/5.88	6.25/5.54	6.00/5.29
9 1/2	8.50/8.25	8.38/8.10	8.25/7.94	8.12/7.77	8.00/7.62	7.88/7.46	7.75/7.30	7.50/7.00	7.25/6.69	7.00/6.38	6.75/6.04	6.50/5.79
10	9.00/8.75	8.88/8.60	8.75/8.44	8.62/8.27	8.50/8.12	8.38/7.96	8.25/7.80	8.00/7.50	7.75/7.19	7.50/6.88	7.25/6.54	7.00/6.29

This table represents the grip / body lengths of standard cap screws and is in accordance with ASME B18.2.1. It does not apply to Hex Bolts / Hex Machine Bolts. To calculate thread length, subtract the Max/Min Grip Lengths from the nominal cap screw length. This will give you the thread length. Please note the actual length of the cap screw will affect thread length calculations, but will not affect the grip / body length.

Length Tolerances for Cap Screws						
Nominal Length	Nominal Size					
	1/4 to 3/8	7/16 & 1/2	9/16 to 3/4	7/8 to 1	1 1/8 to 1 1/2	Over 1 1/2
Up to & incl 1"	-0.03	-0.03	-0.03			
Over 1" to 2 1/2", incl.	-0.04	-0.06	-0.08	-0.10	-0.12	-0.18
Over 2 1/2" to 4", incl.	-0.06	-0.08	-0.10	-0.14	-0.16	-0.20
Over 4" to 6", incl.	-0.10	-0.10	-0.10	-0.16	-0.18	-0.22
Over 6"	-0.18	-0.18	-0.18	-0.20	-0.22	-0.24

All cap screws have a minus tolerance only.

Wrench / Socket Sizes							
Bolt Size	Socket Size	Bolt Size	Socket Size	Bolt Size	Socket Size	Bolt Size	Socket Size
1/4	7/16	9/16	13/16	1 1/8	1 11/16	2	3
5/16	1/2	5/8	15/16	1 1/4	1 7/8	2 1/4	3 3/8
3/8	9/16	3/4	1 1/8	1 3/8	2 1/16	2 1/2	3 3/4
7/16	5/8	7/8	1 5/16	1 1/2	2 1/4	2 3/4	4 1/8
1/2	3/4	1	1 1/2	1 3/4	2 5/8	3	4 1/2