

# Porteous Fastener Company

## Product Information Sheet

### PFC9 Hex Cap Screws, High Head, Inch Series



- PFC Product Categories: 00090 & 00091
- Material: Alloy Steel
- Mechanical Properties: 180,000 PSI tensile strength, 150,000 PSI proof load (approximately 20% stronger than Grade 8).
- Dimensions: ASME B18.2.1 Hex Cap Screw except head height per table below.
- Zinc-Yellow Plating: Purchased to meet ASTM F1941 FeZn5C
- Hardness: HRC 38-42

Tensile Strength - PFC9 Hex Cap Screws					
Size	PSI	Pounds	Size	PSI	Pounds
1/4-20	180,000	5724	1/4-28	180,000	6552
5/16-18	180,000	9432	5/16-24	180,000	10,440
3/8-16	180,000	13,950	3/8-24	180,000	15,804
7/16-14	180,000	19,134	7/16-20	180,000	21,366
1/2-13	180,000	25,542	1/2-20	180,000	28,782
9/16-12	180,000	32,760	9/16-18	180,000	36,540
5/8-11	180,000	40,680	5/8-18	180,000	46,080
3/4-10	180,000	60,120	3/4-16	180,000	67,140
7/8-9	180,000	83,460	7/8-14	180,000	91,620
1-8	180,000	109,080	1-14	180,000	119,340
1 1/8-7	180,000	137,340			
1 1/4-7	180,000	174,420			

PFC9 Cap Screw Head Dimensions		
Size	Across Flats	Head Height
1/4	0.428-0.438 (7/16)	0.181 - 0.194
5/16	0.489-0.500 (1/2)	0.227 - 0.242
3/8	0.551-0.562 (9/16)	0.273 - 0.289
7/16	0.612-0.625 (5/8)	0.318 - 0.338
1/2	0.736-0.750 (3/4)	0.364 - 0.386
9/16	0.798-0.812 (13/16)	0.410 - 0.433
5/8	0.922-0.938 (15/16)	0.456 - 0.481
3/4	1.100-1.125 (1 1/8)	0.548 - 0.577
7/8	1.285-1.312 (1 5/16)	0.640 - 0.672
1	1.469-1.500 (1 1/2)	0.732 - 0.768
1 1/8	1.631-1.688 (1 11/16)	0.824 - 0.864
1 1/4	1.812-1.875 (1 7/8)	0.916 - 0.959

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.

## PFC9 Hex Cap Screws, High Head, Inch Series

<b>Cap Screw Grip Length</b>												
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.

<b>Initial Target Tightening Torque PFC9 Bolt &amp; Nut</b>					
Size	With Thick Nut (No Lubrication) Ft. Lbs.	With Locknut (Cad & Waxed) Ft. Lbs.	Size	With Thick Nut (No Lubrication) Ft. Lbs.	With Locknut (Cad & Waxed) Ft. Lbs.
1/4-20	18	8	1/4-28	20	9
5/16-18	36	17	5/16-24	40	18
3/8-16	64	29	3/8-24	72	33
7/16-14	102	47	7/16-20	114	52
1/2-13	156	71	1/2-20	175	80
9/16-12	225	102	9/16-18	250	114
5/8-11	310	141	5/8-18	351	160
3/4-10	550	250	3/4-16	614	279
7/8-9	887	403	7/8-14	977	444
1-8	1,329	605	1-14	1,489	677
1 1/8-7	1,883	856			
1 1/4-7	2,656	1,207			

The above torque values are approximate to achieve a load of 75% yield strength. Different applications may require further evaluation to determine optimum tightening torque. No guarantee of accuracy is implied. Added lubrication to the threads of the bolt and/or nut will likely have an impact on torque value to achieve the approximate 75% yield strength, especially if added to a PFC9 assembly using the PFC9 Thick Nut.