

**SOCKET HEAD CAP SCREWS**

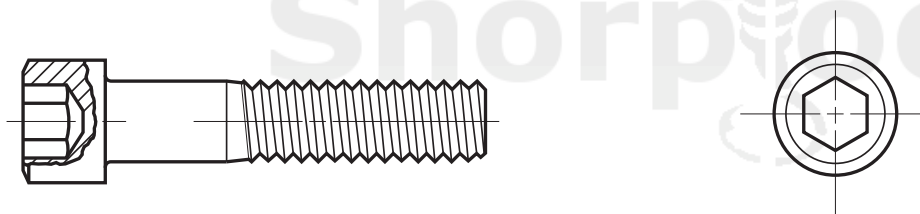
ASME B18.3-2012

Basic Screw Diam.	D		A		H		C	J	F		T	G	K
	Body Diameter		Head Diameter		Head Height		Top Chamfer or Radius	Hex Socket Size	Fillet Juncture Diameter at Bearing Surface		Key Engagement	Wall Thickness	Bottom Chamfer or Radius
	Max	Min	Max	Min	Max	Min	Max	Nom	Max	Min	Min	Min	Max
0	0.0600	0.0568	0.096	0.091	0.060	0.057	0.004	0.050	0.074	0.062	0.025	0.020	0.007
1	0.0730	0.0695	0.118	0.112	0.073	0.070	0.005	1/16	0.087	0.075	0.031	0.025	0.007
2	0.0860	0.0822	0.140	0.134	0.086	0.083	0.008	5/64	0.102	0.090	0.038	0.029	0.007
3	0.0990	0.0949	0.161	0.154	0.099	0.095	0.008	5/64	0.115	0.102	0.044	0.034	0.007
4	0.1120	0.1075	0.183	0.176	0.112	0.108	0.009	3/32	0.130	0.117	0.051	0.038	0.008
5	0.1250	0.1202	0.205	0.198	0.125	0.121	0.012	3/32	0.145	0.132	0.057	0.043	0.008
6	0.1380	0.1329	0.226	0.218	0.138	0.134	0.013	7/64	0.158	0.144	0.064	0.047	0.008
8	0.1640	0.1585	0.270	0.262	0.164	0.159	0.014	9/64	0.188	0.172	0.077	0.056	0.008
10	0.1900	0.1840	0.312	0.303	0.190	0.185	0.018	5/32	0.218	0.202	0.090	0.065	0.008
1/4	0.2500	0.2435	0.375	0.365	0.250	0.244	0.025	3/16	0.278	0.261	0.120	0.095	0.010
5/16	0.3125	0.3053	0.469	0.457	0.312	0.306	0.033	1/4	0.347	0.329	0.151	0.119	0.010
3/8	0.3750	0.3678	0.562	0.550	0.375	0.368	0.040	5/16	0.415	0.397	0.182	0.143	0.010
7/16	0.4375	0.4294	0.656	0.642	0.438	0.430	0.047	3/8	0.484	0.465	0.213	0.166	0.015
1/2	0.5000	0.4919	0.750	0.735	0.500	0.492	0.055	3/8	0.552	0.531	0.245	0.190	0.015
5/8	0.6250	0.6163	0.938	0.921	0.625	0.616	0.070	1/2	0.689	0.664	0.307	0.238	0.015
3/4	0.7500	0.7406	1.125	1.107	0.750	0.740	0.085	5/8	0.828	0.800	0.370	0.285	0.015
7/8	0.8750	0.8647	1.312	1.293	0.875	0.864	0.100	3/4	0.963	0.932	0.432	0.333	0.020
1	1.0000	0.9886	1.500	1.479	1.000	0.988	0.114	3/4	1.100	1.068	0.495	0.380	0.020
1 1/4	1.2500	1.2336	1.875	1.852	1.250	1.236	0.144	7/8	1.370	1.333	0.620	0.475	0.020
1 1/2	1.5000	1.4818	2.250	2.224	1.500	1.485	0.176	1	1.640	1.601	0.745	0.570	0.020

Tolerance on Length	Nominal Screw Size	Nominal Screw Length			
		Up to 1 in., Incl.	Over 1 in. to 2-1/2 in., Incl.	Over 2-1/2 to 6 in., Incl.	Over 6 in.
	0 thru 3/8, Incl.	-0.03	-0.04	-0.06	-0.12
	7/16 thru 3/4, Incl.	-0.03	-0.06	-0.08	-0.12
7/8 thru 1-1/2, Incl.	-0.05	-0.10	-0.14	-0.20	

Stainless Steel

SOCKET CAP SCREWS



MECHANICAL PROPERTIES OF *STAINLESS STEEL SOCKET CAP SCREWS*

Blue Devil®

Nominal Size	Tensile Strength (lbs., min.)		Yield Strength (lbs., min.)		Body Section	Tightening Torque (In.-Lbs.)	
	UNRC	UNRF	UNRC	UNRF	Single Shear Strength (lbs., min.)	UNRC	UNRF
0	-	145	-	72	130	-	1.4
1	-	220	-	111	190	-	2.3
2	295	-	185	-	260	3.8	-
4	480	-	240	-	350	6.0	-
6	725	-	363	-	375	15.0	-
8	1,120	-	560	-	670	28.0	-
10	1,400	1,600	701	800	950	40.0	46.0
1/4	2,550	2,910	1,273	1,455	2,200	95.0	109.0
5/16	4,200	4,645	2,100	2,320	3,450	170.0	188.0
3/8	6,100	7,025	3,100	3,510	4,970	301.0	341.0
1/2	11,350	-	5,675	-	8,840	750.0	-

<b>Description</b>	An externally threaded fastener with unified threads, a cylindrical head with a flat chamfered top surface, knurled cylindrical sides and hexagonal recess. It is made from austenitic <b>stainless steel</b> .
<b>Applications/ Advantages</b>	Although <b>stainless</b> socket cap screws have significantly less tensile and yield strength than alloy sockets, they have superior resistance to corrosion. They retain their mechanical and performance capabilities at higher than ambient temperatures.
<b>Material</b>	<i>Cap screws shall be made from one of the following stainless alloys: 302, 303, 304, 305, 384, XM1 or XM7.</i>
<b>Heat Treatment</b>	The austenitic alloys develop their strength through work hardening during the fastener manufacturing process, as seen from the hardness properties below. The only heat treatment normally available on austenitic <b>stainless</b> alloys is annealing, which is done at approximately 1900°F to a dead soft condition and is not normally thermally reversible.
<b>Hardness</b>	Rockwell B80 minimum
<i>Cap screws of a length 3D or greater, where D equals the nominal diameter of the screw, are subject to tensile strength, yield strength, elongation and reduction of area testing.</i>	
<b>Tensile Strength</b>	80,000 psi. minimum
<b>Yield Strength</b>	30,000 psi. minimum
<b>Elongation</b>	10% minimum (applies to machined specimens of lengths at least 4D where D equals the nominal diameter of the screw)
<b>Reduction of Area</b>	30% minimum (applies to machined specimens)

Blue Devil® is a registered trademark of the Safety Socket Screw Corporation.

# SOCKETS

## SOCKET CAP SCREWS

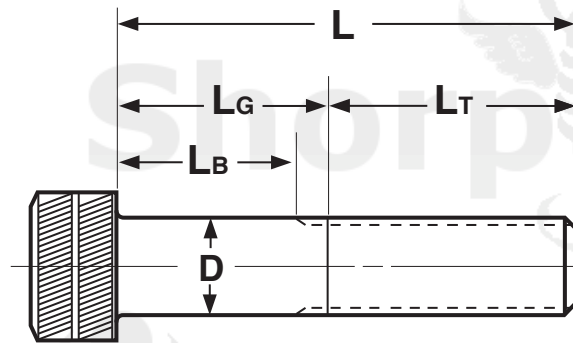
## Length Specifications

BODY AND GRIP LENGTHS OF SOCKET HEAD CAP SCREWS																			ASME B18.3-2012	
Nom. Size D	0		1		2		3		4		5		6		8		10			
Basic Thread Length L <sub>T</sub>	0.500		0.625		0.625		0.625		0.750		0.750		0.750		0.875		0.875			
Nominal Length L	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>		
1.00	0.50	0.44	0.25	0.17	0.25	0.16	0.25	0.15	0.25	0.12	0.25	0.12								
1.25	0.75	0.69	0.62	0.55	0.62	0.54	0.62	0.52	0.25	0.12	0.25	0.12	0.50	0.34	0.38	0.22	0.38	0.17		
1.50			0.88	0.80	0.88	0.79	0.88	0.77	0.75	0.62	0.75	0.62	0.50	0.34	0.38	0.22	0.38	0.17		
1.75					1.12	1.04	1.12	1.02	0.75	0.62	0.75	0.62	1.00	0.84	0.88	0.72	0.88	0.67		
2.00							1.38	1.27	1.25	1.12	1.25	1.12	1.00	0.84	0.88	0.72	0.88	0.67		
2.25									1.25	1.12	1.25	1.12	1.50	1.34	1.38	1.22	1.38	1.17		
2.50											1.75	1.62	1.50	1.34	1.38	1.22	1.38	1.17		
2.75													2.00	1.84	1.88	1.72	1.88	1.67		
3.00															1.88	1.72	1.88	1.67		
3.50																	2.38	2.17		

Nom. Size D	1/4		5/16		3/8		7/16		1/2		5/8		3/4		7/8		1	
Basic Thread Length L <sub>T</sub>	1.000		1.125		1.250		1.375		1.500		1.750		2.000		2.250		2.500	
Nominal Length L	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>	L <sub>G</sub>	L <sub>B</sub>
1.50	0.50	0.25																
1.75	0.50	0.25	0.62	0.35	0.50	0.19												
2.00	1.00	0.75	0.62	0.35	0.50	0.19	0.62	0.27										
2.25	1.00	0.75	1.12	0.85	1.00	0.69	0.62	0.27	0.75	0.36								
2.50	1.50	1.25	1.12	0.85	1.00	0.69	1.12	0.77	0.75	0.36	0.75	0.30						
2.75	1.50	1.25	1.62	1.35	1.50	1.19	1.12	0.77	0.75	0.36	0.75	0.30						
3.00	2.00	1.75	1.62	1.35	1.50	1.19	1.62	1.27	1.50	1.12	0.75	0.30	1.00	0.50				
3.25	2.00	1.75	2.12	1.85	2.00	1.69	1.62	1.27	1.50	1.12	1.50	1.04	1.00	0.50	1.00	0.44		
3.50	2.50	2.25	2.12	1.85	2.00	1.69	2.12	1.77	1.50	1.12	1.50	1.04	1.00	0.50	1.00	0.44	1.00	0.38
4.00	3.00	2.75	2.62	2.35	2.50	2.19	2.62	2.27	2.25	1.86	2.25	1.80	2.00	1.50	1.00	0.44	1.00	0.38
4.50	3.50	3.25	3.12	2.85	3.00	2.69	3.12	2.77	3.00	2.62	2.25	1.80	2.00	1.50	2.00	1.44	2.00	1.38
5.00	4.00	3.75	3.62	3.35	3.50	3.19	3.62	3.27	3.00	2.62	3.00	2.54	3.00	2.50	2.00	1.44	2.00	1.38
5.50			4.12	3.85	4.00	3.69	4.12	3.77	3.75	3.36	3.75	3.30	3.00	2.50	3.00	2.44	3.00	2.38
6.00			4.62	4.35	4.50	4.19	4.62	4.27	4.50	4.12	3.75	3.30	4.00	3.50	3.00	2.44	3.00	2.38
6.50					5.00	4.69	5.12	4.77	4.50	4.12	4.50	4.04	4.00	3.50	4.00	3.44	4.00	3.38
7.00					5.50	5.19	5.62	5.27	5.25	4.86	5.25	4.80	5.00	4.50	4.00	3.44	4.00	3.38
8.00							6.62	6.27	6.00	5.62	6.00	5.54	6.00	5.50	5.00	4.44	5.00	4.38
9.00							7.62	7.27	7.00	6.62	6.75	6.30	7.00	6.50	6.00	5.44	6.00	5.38
10.00									8.00	7.62	7.75	7.30	8.00	7.50	7.00	6.44	7.00	6.38
11.00											9.25	8.80	9.00	8.50	8.00	7.44	8.00	7.38
12.00											10.25	9.80	10.00	9.50	9.00	8.44	9.00	8.38

Length Specifications

SOCKET CAP SCREWS



**Notes Regarding the Thread Length of Socket Head Cap Screws**

- The basic thread lengths ( $L_T$ ) listed directly below the nominal sizes in the table on the previous page represents the nominal length up to which all screws of that diameter shall be fully threaded.
- To determine the threaded portion of the screws with a nominal length greater than  $L_T$ , subtract the minimum design grip length ( $L_G$ ) from the nominal length ( $L$ ).
- For screws over 1 in. in diameter and of nominal lengths longer than  $L_T$ , the maximum grip gaging length ( $L_G$ ) and the minimum body length ( $L_B$ ) of the screws shall be determined as follows:

$$L_G = L - L_T$$

$$L_B = L - L_{TT}$$

Where L: = Nominal length

$L_T$  = Minimum thread length tabulated below

$L_{TT}$  = Maximum total thread length tabulated below

Nominal Size	Min Thread Length ( $L_T$ )	Max Total Thread Length ( $L_{TT}$ )
1 - 1/4	3.12	5.09
1 - 1/2	3.75	6.08