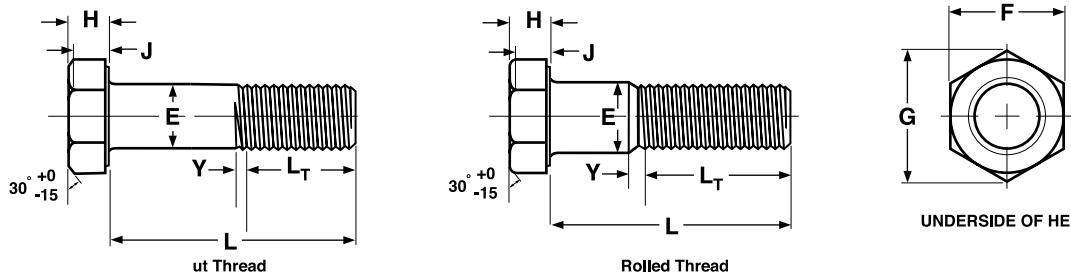


HEX CAP SCREWS

HEAD & THREAD DIMENSIONS



Length of a cap screw is measured from the underhead bearing surface to the extreme end of the screw.

HEX CAP SCREWS

ASME B18.2.1-2012

Nominal or Basic Product Diameter		E		F		G		H			Wrenching Height	LT		Y	
		Body Diameter		Width Across Flats		Width Across Corners		Head Height				Thread Length			
		Max	Min	Basic	Max	Min	Max	Min	Basic	Max	Min	For Screw Lengths ≤ 6 in.	For Screw Lengths > 6 in.		
1/4	0.250	0.250	0.245	7/16	0.438	0.428	0.505	0.488	5/32	0.163	0.150	0.106	0.750	1.000	0.250
5/16	0.313	0.313	0.307	1/2	0.500	0.489	0.577	0.557	13/64	0.211	0.195	0.140	0.875	1.125	0.278
3/8	0.375	0.375	0.369	9/16	0.562	0.551	0.650	0.628	15/64	0.243	0.226	0.160	1.000	1.250	0.312
7/16	0.438	0.438	0.431	5/8	0.625	0.612	0.722	0.698	9/32	0.291	0.272	0.195	1.125	1.375	0.357
1/2	0.500	0.500	0.493	3/4	0.750	0.736	0.866	0.840	5/16	0.323	0.302	0.215	1.250	1.500	0.385
9/16	0.563	0.563	0.555	13/16	0.812	0.798	0.938	0.910	23/64	0.371	0.348	0.250	1.375	1.625	0.417
5/8	0.625	0.625	0.617	15/16	0.938	0.922	1.083	1.051	25/64	0.403	0.378	0.269	1.500	1.750	0.455
3/4	0.750	0.750	0.741	1-1/8	1.125	1.100	1.299	1.254	15/32	0.483	0.455	0.324	1.750	2.000	0.500
7/8	0.875	0.875	0.866	1-5/16	1.312	1.285	1.516	1.465	35/64	0.563	0.531	0.378	2.000	2.250	0.556
1	1.000	1.000	0.990	1-1/2	1.500	1.469	1.732	1.675	39/64	0.627	0.591	0.416	2.250	2.500	0.625
1-1/8	1.125	1.125	1.114	1-11/16	1.688	1.631	1.949	1.859	11/16	0.718	0.658	0.461	2.500	2.750	0.714
1-1/4	1.250	1.250	1.239	1-7/8	1.875	1.812	2.165	2.066	25/32	0.813	0.749	0.530	2.750	3.000	0.714
1-1/2	1.500	1.500	1.488	2-1/4	2.250	2.175	2.598	2.480	15/16	0.974	0.902	0.640	3.250	3.500	0.833

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 in. to 4 in., incl.	Over 4 in. to 6 in., incl.	Longer than 6 in.
	1/4 to 3/8	-0.03	-0.04	-0.06	-0.10	-0.18
	7/16 and 1/2	-0.03	-0.06	-0.08	-0.10	-0.18
	9/16 to 3/4	-0.03	-0.08	-0.10	-0.10	-0.18
	7/8 and 1	-0.10	-0.14	-0.16	-0.20
	1-1/8 to 1-1/2	-0.12	-0.16	-0.18	-0.22

HEX CAP SCREWS

GR.2, 18-8 & 316 SS



GRADE-2 HEX CAP SCREW

Description	A low or medium carbon steel, externally threaded mechanical device 1/4" diameter or larger, with a trimmed hex head and a washer face on the bearing surface.
Applications/ Advantages	Economical for use in non-critical applications where the fastener is not subject to extreme temperatures or stress beyond the limits listed herein.
Material	AISI 1006 - 1050 or equivalent steel.
Hardness	1/4 through 3/4 in. diameter, 6 in. and shorter in length: Rockwell B80 - B100. 1/4 through 3/4 in. diameter, over 6 in. in length: Rockwell B70 - B100. 7/8 through 1-1/2 in. diameter, all lengths: Rockwell B70 - B100.
Proof Load	1/4 through 3/4 in. diameter, 6 in. and shorter in length: 55,000 psi. 1/4 through 3/4 in. diameter, over 6 in. in length: 33,000 psi. 7/8 through 1-1/2 in. diameter, all lengths: 33,000 psi.
Yield Strength*	1/4 through 3/4 in. diameter, 6 in. and shorter in length: 57,000 psi. minimum. 1/4 through 3/4 in. diameter, over 6 in. in length: 36,000 psi. minimum. 7/8 through 1-1/2 in. diameter, all lengths: 36,000 psi. minimum.
Tensile Strength	1/4 through 3/4 in. diameter, 6 in. and shorter in length: 74,000 psi. minimum. 1/4 through 3/4 in. diameter, over 6 in. in length: 60,000 psi. minimum. 7/8 through 1-1/2 in. diameter, all lengths: 60,000 psi. minimum.
Elongation*	18% minimum (all diameters)
Reduction of Area*	35% minimum (all sizes)
Plating	See Appendix-A for plating information

HEX CAP SCREW--STAINLESS STEEL, 18-8 & 316

Description	18-8 and 316 stainless steel cap screws are both made from austenitic alloys as described below.
Applications/Advantages	18-8: Used in products that require general atmospheric corrosion resistance, such as chemical and food-processing equipment. Some chemical environments may require special corrosion resistant materials and precautions. 316: The molybdenum content gives this type of stainless even greater corrosion resistance than 18-8 as well as superior strength at high temperatures.
Material	18-8: A cap screw made from one of the following austenitic alloys: 303, 303Se, 304, XM7, all of which are characterized as having a chromium content of 17-19% and nickel content of 8-10%. 316: A cap screw made from 316 stainless steel, an austenitic alloy which differs from 18-8 by its molybdenum content (2-3%) and a higher nickel content (10-14%).
Heat Treatment	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 stainless alloys is annealing, which is done at approximately 1900°F to a dead soft condition and is not normally thermally reversible.
Hardness	1/4 through 5/8 in. diameter: Rockwell B95 - C32 3/4 through 1 in. diameter: Rockwell B80 - C32
Yield Strength*	1/4 through 5/8 in. diameter, 2.25D and longer: 65,000 psi. minimum 3/4" (2.25D & longer) & 7/8 through 1 in. diameter (3D & longer): 45,000 psi. minimum
Tensile Strength	1/4 through 5/8 in. diameter, 2.25D and longer: 100,000 - 150,000 psi. 3/4" (2.25D & longer) & 7/8 through 1 in. diameter (3D & longer): 85,000 - 140,000 psi.
Elongation in 4D*	1/4 through 5/8 in. diameter: 20% minimum; 3/4 through 1 in. diameter: 25% minimum.

"SP" denotes a "small pattern" across the flats.

*Shakeproof standard #501-01 does not specify dimensions for the #5, #8 SP and 1/2" diameters.