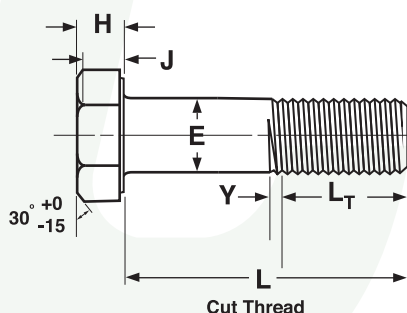
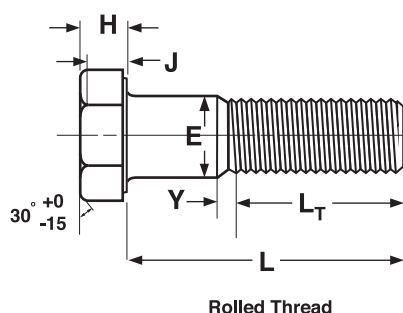


CAP SCREWS & BOLTS

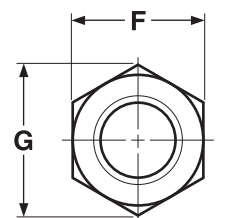
HEX CAP SCREWS

Grades 5 & 8
Cap Screws


Cut Thread



Rolled Thread



UNDERSIDE OF HEAD

±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			J	L _T		Y	
		Body Diameter		Width Across Flats			Width Across Corners		Head Height			Wrenching Height	Thread Length		Transition Thread Length	
													For Screw Lengths ≤ 6 in.	For Screw Lengths > 6 in.		
		Max	Min	Basic	Max	Min	Max	Min	Basic	Max	Min	Min	Ref	Ref	Max	
1/4	0.2500	0.2500	0.2450	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	0.3125	0.3125	0.3065	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	0.3750	0.3750	0.3690	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	0.4375	0.4375	0.4305	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	0.5000	0.5000	0.4930	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	0.5625	0.5625	0.5545	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	0.6250	0.6250	0.6170	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	0.7500	0.7500	0.7410	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	0.8750	0.8750	0.8660	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	1.0000	1.0000	0.9900	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	1.1250	1.1250	1.1140	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	1.2500	1.2500	1.2390	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	1.5000	1.5000	1.4880	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						

CAP SCREWS & BOLTS

Grades 5 & 8 Cap Screws

HEX CAP SCREWS



GRADE-5 HEX CAP SCREW

Description	A cap screw made from medium carbon steel and heat-treated.
Applications/ Advantages	Has greater tensile strength than a Grade-2. Yield-to-tensile ratio is the lowest of all heat treated steels.
Heat Treatment	Grade-5 cap screws shall be heat treated, oil or water quenched, at the option of the manufacturer, and tempered at a minimum tempering temperature of 800°F.
Material	Medium carbon steel. Use of an alloy steel is also acceptable.
Core Hardness	<i>1/4 through 1 in. diameter, all lengths:</i> Rockwell C25 - C34. <i>1-1/8 through 1-1/2 in. diameter, all lengths:</i> Rockwell C19 - C30.
Surface Hardness	<i>1/4 through 1 in. diameter, all lengths:</i> Rockwell 30N54 maximum. <i>1-1/8 through 1-1/2 in. diameter, all lengths:</i> Rockwell 30N50 maximum.
Proof Load	<i>1/4 through 1 in. diameter, all lengths:</i> 85,000 psi. <i>1-1/8 through 1-1/2 in. diameter, all lengths:</i> 74,000 psi.
Yield Strength*	<i>1/4 through 1 in. diameter, all lengths:</i> 92,000 psi. minimum <i>1-1/8 through 1-1/2 in. diameter, all lengths:</i> 81,000 psi. minimum
Tensile Strength	<i>1/4 through 1 in. diameter, all lengths:</i> 120,000 psi. minimum <i>1-1/8 through 1-1/2 in. diameter, all lengths:</i> 105,000 psi. minimum
Elongation*	14% minimum (all diameters)
Reduction of Area*	35% minimum (all sizes)
Plating	See Appendix-A for plating information.



GRADE-8 HEX CAP SCREW

Description	A cap screw made from medium carbon alloy steel and heat-treated.
Applications/ Advantages	Has greater tensile strength than a Grade-5. Designed for use in high stress applications. See specifications below for more information on how the Grade-8 exceeds the strength of a Grade-5.
Heat Treatment	Grade-8 cap screws shall be heat-treated, oil-quenched and tempered at a minimum temperature of 800°F.
Material	Medium carbon alloy steel. Note: For diameters 1/4 through 7/16 inch, it is permissible to use AISI 1541 steel.
Core Hardness	<i>1/4 through 1-1/2 in. diameter, all lengths:</i> Rockwell C33 - C39.
Surface Hardness	<i>1/4 through 1-1/2 in. diameter, all lengths:</i> Rockwell 30N58.6 maximum.
Proof Load	<i>1/4 through 1-1/2 in. diameter, all lengths:</i> 120,000 psi.
Yield Strength*	<i>1/4 through 1-1/2 in. diameter, all lengths:</i> 130,000 psi. minimum
Tensile Strength	<i>1/4 through 1-1/2 in. diameter, all lengths:</i> 150,000 psi. minimum
Elongation*	12% minimum (all diameters)
Reduction of Area*	35% minimum (all sizes)
Plating	See Appendix-A for plating information.

*These properties are tested only on machined specimens when the testing machine cannot provide for full testing of the parts.

**Product standards require the manufacturer's head marking to appear on the top of all cap screws 1/4" diameter and larger. "X" represents one location such a marking may appear.