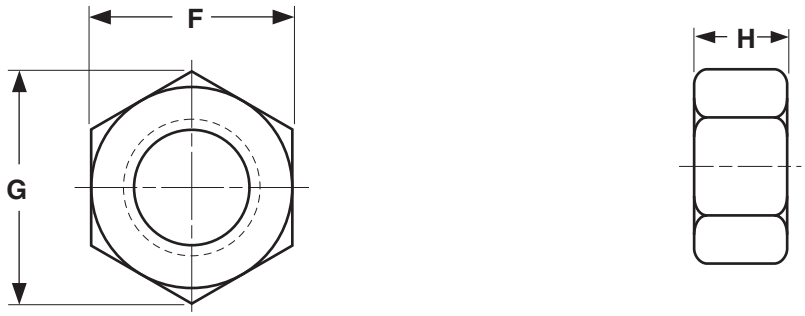
HEAVY HEX

Dimensional Information



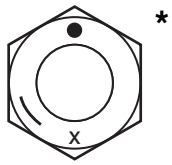
Heavy Hex Nuts

ASME B18.2.2

Nominal Size or Basic Major Diameter of Thread		F			G		H		
		Width Across Flats			Width Across Corners		Thickness		
		Basic	Max	Min	Max	Min	Basic	Max	Min
1/4	0.2500	1/2	0.500	0.488	0.577	0.556	15/64	0.250	0.218
5/16	0.3125	9/16	0.562	0.546	0.650	0.622	19/64	0.314	0.280
3/8	0.3750	11/16	0.688	0.669	0.794	0.763	23/64	0.377	0.341
7/16	0.4375	3/4	0.750	0.728	0.866	0.830	27/64	0.441	0.403
1/2	0.5000	7/8	0.875	0.850	1.010	0.969	31/64	0.504	0.464
9/16	0.5625	15/16	0.938	0.909	1.083	1.037	35/64	0.568	0.526
5/8	0.6250	1-1/16	1.062	1.031	1.227	1.175	39/64	0.631	0.587
3/4	0.7500	1-1/4	1.250	1.212	1.443	1.382	47/64	0.758	0.710
7/8	0.8750	1-7/16	1.438	1.394	1.660	1.589	55/64	0.885	0.833
1	1.0000	1-5/8	1.625	1.575	1.876	1.796	63/64	1.012	0.956
1-1/8	1.1250	1-13/16	1.812	1.756	2.093	2.002	1-7/64	1.139	1.079
1-1/4	1.2500	2	2.000	1.938	2.309	2.209	1-7/32	1.251	1.187
1-3/8	1.3750	2-3/16	2.188	2.119	2.526	2.416	1-11/32	1.378	1.310
1-1/2	1.5000	2-3/8	2.375	2.300	2.742	2.622	1-15/32	1.505	1.433
1-5/8	1.6250	2-9/16	2.562	2.481	2.959	2.828	1-19/32	1.632	1.556
1-3/4	1.7500	2-3/4	2.750	2.662	3.175	3.035	1-23/32	1.759	1.679
2	2.0000	3-1/8	3.125	3.025	3.608	3.449	1-31/32	2.013	1.925
2-1/4	2.2500	3-1/2	3.500	3.388	4.041	3.862	2-13/64	2.251	2.155
2-1/2	2.5000	3-7/8	3.875	3.750	4.474	4.275	2-29/64	2.505	2.401
2-3/4	2.7500	4-1/4	4.250	4.112	4.907	4.688	2-45/64	2.759	2.647
3	3.0000	4-5/8	4.625	4.475	5.340	5.102	2-61/64	3.013	2.893
3-1/4	3.2500	5	5.000	4.838	5.774	5.515	3-3/16	3.252	3.124
3-1/2	3.5000	5-3/8	5.375	5.200	6.207	5.928	3-7/16	3.506	3.370
3-3/4	3.7500	5-3/4	5.750	5.562	6.640	6.341	3-11/16	3.760	3.616
4	4.0000	6-1/8	6.125	5.925	7.073	6.755	3-15/16	4.014	3.862

Steel & Stainless

HEAVY HEX



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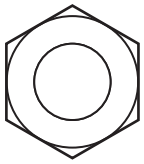
Grade-5



Grade-A

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Grade-C

STEEL

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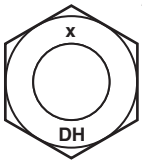
A 194 Grade-2H



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A 563 Grade-DH

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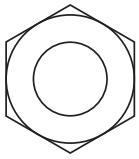
A 563 Grade-DH3

Description	A six-sided internally threaded fastener which is both thicker and wider across the flats than a same-sized finished hex nut. Nuts in sizes 7/16 & smaller shall be double chamfered. Larger sizes are either double chamfered or chamfered on top with a washer faced bearing surface.
Applications/ Advantages	This is the strongest of all comparably-graded nuts because of its greater length of thread engagement and greater resistance to dilation (widening or stretching). ***Grade-5*** nuts are used with medium-carbon cap screws/bolts ***Grade-A*** nuts are used with low-carbon heavy hex bolts. ***Grade-C*** nuts are recommended for use with A-325 structural bolts. ***Grade-2H*** nuts are recommended for use with bolts in high-pressure and high-temperature service. ***Grade-DH*** nuts are recommended for use with A-490, Type-1 structural bolts and Grade-DH3 nuts for use with A-490, Type-3 structural bolts.
Material	Nuts shall be made from a steel which conforms to the following chemical composition requirements (heat analysis)-- ***Grade-5*** *-- **Carbon:*** 0.55% maximum; ***Manganese***: 0.30% max; ***Phosphorus***: 0.05% maximum; ***Sulfur***: 0.15% maximum. ***Grades-A & C*** *-- **Carbon:*** 0.55% maximum; ***Phosphorus***: 0.12% maximum; ***Sulfur***: 0.023% maximum. ***A 194 Grade-2H*** *-- **Carbon***: 0.40% min; ***Manganese***: 1.00% max; ***Phosphorus***: 0.04% max; ***Sulfur***: 0.05% max; ***Silicon***: 0.40% max. ***A 563 Grade-DH*** *-- **Carbon***: 0.20-0.55%; ***Manganese***: 0.60% minimum; ***Phosphorus***: 0.04% maximum; ***Sulfur***: 0.05% maximum. ***Grade-DH3*** *-- **Carbon***: 0.20-0.53%; ***Manganese***: 0.40% minimum; ***Phosphorus***: 0.046% maximum; ***Sulfur***: 0.050% maximum; ***Copper***: 0.20% minimum; ***Chromium***: 0.45% minimum; (Either *Nickel*: 0.20% minimum or *Molybdenum*: 0.15% minimum, may be used).
Heat Treatment	***Grade-2H:*** Nuts are heat treated by quenching in a liquid medium from a temp above the transformation temp and tempering at a temp of at least 850°F. ***Grades-C, DH & DH3:*** Nuts are heat treated by quenching in a liquid medium from a temp above the transformation temp and tempering at a temp of at least 800°F.
Core Hardness	***Grade-5:*** Rockwell C32 max. ***Grade-A:*** Rockwell B68 - C32 ***Grade-C***: Rockwell B78 - C38 ***A 194 Grade-2H***; ***A 563 Grades DH & DH3***: Rockwell C24 - C38
Proof Load	***Grade-5:*** 1/4 thru 1" Diam, Coarse- 133,000 psi.; Fine- 120,000 psi. ***Grade-A:*** Coarse- 100,000 psi.; Fine- 90,000 psi. ***Grade-C:*** 144,000 psi. ***Grade-2H:*** 150,000 psi. ***Grades-DH & DH3:*** 175,000 psi.
Plating	See Appendix-A for plating information.



18-8 STAINLESS STEEL

Description	A six-sided internally threaded fastener which is both thicker and wider across the flats than a same-sized finished hex nut, made of 18-8 stainless. Nuts in sizes 7/16 & smaller shall be double chamfered. Larger sizes are either double chamfered or chamfered on top with a washer faced bearing surface.
Applications/ Advantages	This is the strongest of all 18-8 stainless hex nuts because of its greater length of thread engagement and greater resistance to widening or stretching.
Material	***Nuts shall be made from one of the following austenitic stainless alloys***: 303, 303Se, 304, XM7, all of which are characterized as having a chromium content of 18% and a nickel content of 8%.
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":*** Rockwell B95 - C32 ***3/4 through 1":*** Rockwell B80 - C32
Proof Load	***1/4 through 5/8":*** 100,000 psi ***3/4 through 1":*** 85,000 psi.

*Product standards require all grade-marked nuts 1/4" diameter and larger to have a raised or depressed insignia identifying its manufacturer. "X" represnets one location such a marking may appear.