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Westfield Fasteners Product Specification:

UNC Heavy Hex Nuts - ASME B18.2.2

This product guide contains the specification for UNC Heavy Hex Nuts, a variation of standard UNC threaded hex nuts. This range of parts conform to the ASME (American Society of Mechanical Engineers) standard B18.2.2.

Product Description

Heavy hex nuts are wider across the flats than standard size full hex nuts, and consequently provide a greater bearing surface. Heavy hex nuts are also thicker and heavier than standard hex nuts, and this greater size increases the proof load.

Heavy hex nuts are also known as structural nuts and are usually used with higher strength bolts.

Scope of the ASME Standard

Unlike ISO standards, each ASME standard generally covers a range or family of product types. ASME B18.2.2 covers several nut types, including specific dimensions and tolerances for these heavy hexagon nuts, with thread diameters from 1/4 inch up to and including 4 inches. Table 1 below defines the overall dimensions and tolerances of this product type.

All nuts are potentially double chamfered (i.e. chamfered on both faces), but the standard permits a single flat face on thread diameters above 7/16. In practice, sizes above 7/16 will likely be supplied with this single flat washer face.

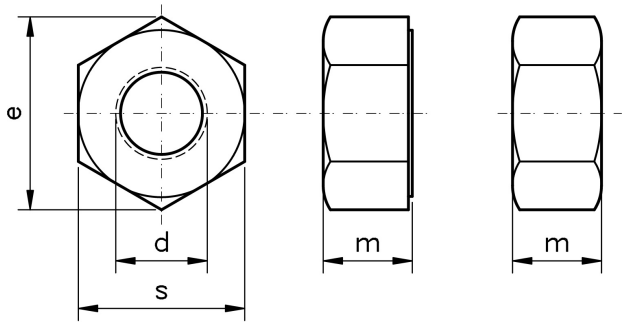

Figure 1: UNC Heavy Hex Nut

Table 1: Dimensions & Tolerances according to ASME B18.2.2

Nominal Size	Basic Major Diameter of Thread	Width Across Flats, s			Width Across Corners, e		Thickness Heavy Hex Nuts, h		
		Basic	min	max	min	max	Basic	min	max
1/4	0.2500	1/2	0.488	0.500	0.556	0.577	15/64	0.218	0.250
5/16	0.3125	9/16	0.546	0.562	0.622	0.650	19/64	0.280	0.314
3/8	0.3750	11/16	0.669	0.688	0.763	0.794	23/64	0.341	0.377
7/16	0.4375	3/4	0.728	0.750	0.830	0.866	27/64	0.403	0.441
1/2	0.5000	7/8	0.850	0.875	0.969	1.010	31/64	0.464	0.504
9/16	0.5625	15/16	0.909	0.938	1.037	1.083	35/64	0.526	0.568
5/8	0.6250	1 1/16	1.031	1.062	1.175	1.227	39/64	0.587	0.631
3/4	0.7500	1 1/4	1.212	0.250	1.382	1.443	47/64	0.710	0.758
7/8	0.8750	1 7/16	1.394	1.438	1.589	1.660	55/64	0.833	0.885
1	1.0000	1 5/8	1.575	1.625	1.796	1.876	63/64	0.956	1.012
1 1/8	1.1250	1 13/16	1.756	1.712	2.02	2.093	1 7/64	1.079	1.139
1 1/4	1.2500	2	1.938	2.000	2.209	2.309	1 7/32	1.187	1.251
1 3/8	1.3750	2 3/16	2.119	2.188	2.416	2.526	1 11/32	1.310	1.378
1 1/2	1.5000	2 3/8	2.300	2.375	2.622	2.742	1 15/32	1.433	1.505
1 5/8	1.6250	2 9/16	2.481	2.562	2.828	2.959	1 19/32	1.556	1.632
1 3/4	1.7500	2 3/4	2.662	2.750	3.035	3.175	1 23/32	1.679	1.759
1 7/8	1.8750	2 15/16	2.844	2.938	3.242	3.392	1 27/32	1.802	1.886
2	2.0000	3 1/8	3.025	3.125	3.449	3.6088	1 31/32	1.925	2.013
2 1/4	2.2500	3 1/2	3.388	3.500	3.862	4.041	2 13/64	2.155	2.251
2 1/2	2.5000	3 7/8	3.750	3.875	4.275	4.474	2 29/64	2.401	2.505
2 3/4	2.7500	4 1/4	4.112	4.250	4.688	4.907	2 45/64	2.647	2.759
3	3.0000	4 5/8	4.475	4.625	5.102	5.340	2 61/64	2.893	3.013
3 1/4	3.2500	5	4.838	5.000	5.525	5.774	3 3/16	3.124	3.252
3 1/2	3.5000	5 3/8	5.200	5.375	5.928	6.207	3 7/16	3.370	3.506
3 3/4	3.7500	5 3/4	5.562	5.750	6.341	6.640	3 11/16	3.616	3.760
4	4.0000	6 1/8	5.925	6.125	6.755	7.073	3 15/16	3.862	4.014

Material and Strength Specifications

The relevent ASTM standards give an idea of the strength using Proof Load Stress. This is the maximum amount of force that a bolt or nut can withstand before deforming plastically (permanent deformation).

Plain and zinc plated carbon steel variants of heavy hex nuts are typically produced to material specification ASTM A563-A. This means that the proof load stress is 100 ksi for plain nuts and 75 ksi for zinc plated variants.

Stainless steel items are typically produced to ASTM F594, with the proof load stress beginning at 76ksi, depending on condition.

For further details, please refer to the ASME/ANSI standard document for this item.