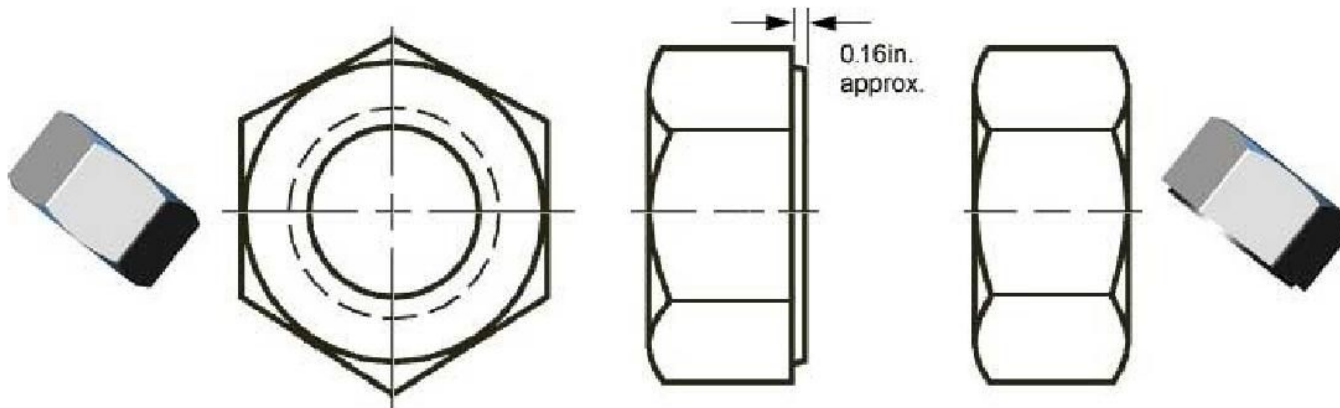


NUTS FOR STUD BOLTS:

To fasten a stud, two heavy hex steel nuts have to be bolted at the opposite ends of the rod.

The stud and the steel nuts join perfectly due to the friction existing between their respective threads, by a slight stretching of the bolt, and the compression of the two joined parts.



The dimensions and weights of heavy steel nuts for stud bolts are covered by the ASME B18.2.2 specification.

Hex nuts (dimensional data) are defined in ASME B18.2.2, and even as bolts the threading in ASME B1.1. Depending on a customer specification, nuts must be both sites chamfered or with on one side a washer-face.

In the past, steel nuts had a squared head. Nowadays, hexagonal head nuts (featuring 6 sides instead of 4) have fully replaced the older shape as they ensure quicker and more effective screwing on the stud.

Nuts for petrochemical applications are tightened to a [specific torque](#) using special torque wrenches. The mechanical strength of the steel nut material shall be compatible with the strength of the mated bolt.

ASTM A194

ASTM A194 covers a variety of carbon, alloy, and martensitic and austenitic stainless-steel nuts. These nuts are intended for high-pressure or high-temperature service, or both.

The ASTM A194 specification covers carbon, alloy and stainless-steel nuts intended for use in high-pressure and/or high-temperature service.

Unless otherwise specified, the American National Standard Heavy Hex Series (ANSI B 18.2.2) shall be used.

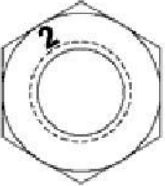
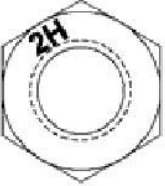
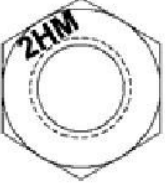
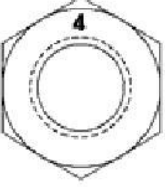
Nuts up to and including 1inch nominal size shall be UNC Series Class 2B fit. Nuts over 1inch nominal size shall be either UNC Series Class 2B fit or 8 UN Series Class 2B fit.

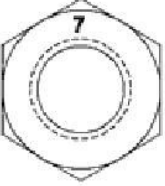
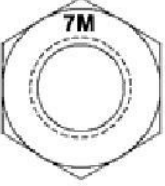
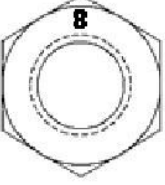
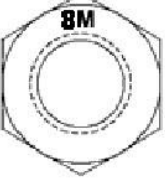
High strength ASTM A194 grade 2H nuts are common in the marketplace and are often substituted for [ASTM A563 grade DH](#) nuts due to the limited availability of DH nuts in certain diameters and finishes.

Various Grades:

2	Carbon steel heavy hex nuts
2H	Quenched & tempered carbon steel heavy hex nuts
2HM	Quenched & tempered carbon steel heavy hex nuts, 100% hardness tested
4	Quenched & tempered carbon-molybdenum heavy hex nuts (withdrawn in 2017)
7	Quenched & tempered alloy steel heavy hex nuts
7M	Quenched & tempered alloy steel heavy hex nuts, 100% hardness tested
7L	Quenched & tempered alloy steel heavy hex nuts, Charpy impact tested
8	Stainless AISI 304 heavy hex nuts
8M	Stainless AISI 316 heavy hex nuts

ASTM A194 NUTS Mechanical Properties :

Grade Identification Marking ⁵	Specification	Material	Nominal Size, In.	Tempering Temp. °F	Proof Load Stress, ksi	Hardness Rockwell		See Note
						Min	Max	
	ASTM A194 Grade 2	Medium Carbon Steel	1/4 - 4	0	150	159	352	1,2,3
	ASTM A194 Grade 2H	Medium Carbon Steel, Quenched and Tempered	1/4 - 4	850	175	C24	C38	1,2
	ASTM A194 Grade 2HM	Medium Carbon Steel, Quenched and Tempered	1/4 - 4	1150	150	159	237	1,2,3
	ASTM A194 Grade 4	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 - 4	1100	175	C24	C38	1,2

	ASTM A194 Grade 7	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 - 4	1100	175	C24	C38	1,2
	ASTM A194 Grade 7M	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 - 4	1150	150	159	237	1,2,3
	ASTM A194 Grade 8	Stainless AISI 304	1/4 - 4	-	80	126	300	4
	ASTM A194 Grade 8M	Stainless AISI 316	1/4 - 4	-	80	126	300	4

NOTES:

1. The markings shown for all grades of A194 nuts are for cold formed and hot forged nuts. When nuts are machined from bar stock, the nut must additionally be marked with the letter 'B'. The letters H and M indicate heat treated nuts.
2. Properties shown are those of coarse and 8-pitch thread heavy hex nuts.
3. Hardness numbers are Brinell Hardness.
4. Nuts that are carbide-solution treated require additional letter A - 8A or 8MA.
5. All nuts shall bear the manufacturer's identification mark. Nuts shall be legibly marked on one face to indicate the grade and process of the manufacturer. Marking of wrench flats or bearing surfaces is not permitted unless agreed upon between manufacturer and purchaser.
6. Other less common grades exist, but are not listed here.

ASTM A194 NUTS Chemical Properties

Element	2, 2H, and 2HM	4	7 and 7M (AISI 4140)	8 (AISI 304)	8M (AISI 316)
Carbon	0.40% min	0.40 - 0.50%	0.37 - 0.49%	0.08% max	0.08% max
Manganese	1.00% max	0.70 - 0.90%	0.65 - 1.10%	2.00% max	2.00% max
Phosphorus, max	0.040%	0.035%	0.035%	0.045%	0.045%
Sulfur, max	0.050%	0.040%	0.040%	0.030%	0.030%
Silicon	0.40% max	0.15 - 0.35%	0.15 - 0.35%	1.00% max	1.00% max
Chromium			0.75 - 1.20%	18.0 - 20.0%	16.0 - 18.0%
Nickel				8.0 - 11.0%	10.0 - 14.0%
Molybdenum		0.20 - 0.30%	0.15 - 0.25%		2.00 - 3.00%

Nut Weight Chart

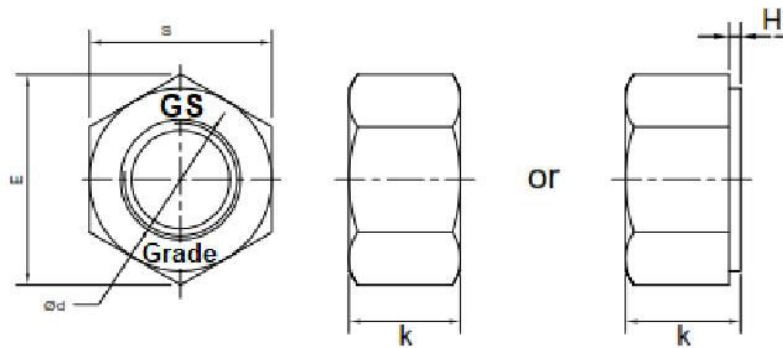
Total weight: 0 lbs.

Pounds (lbs) per 100 pieces

Size	<u>Finished Hex</u>	<u>Heavy Hex</u>	Finished Jam	Heavy Hex Jam	Square	Heavy Square
1/2"	3.750	6.540	2.620	4.000	5.780	7.870
5/8"	7.330	11.900	4.930	6.960	10.800	14.300
3/4"	11.900	19.300	7.700	11.000	15.400	23.500

Size	<u>Finished Hex</u>	<u>Heavy Hex</u>	Finished Jam	Heavy Hex Jam	Square	Heavy Square
7/8"	19.000	29.700	12.000	16.700	24.500	36.200
1"	28.300	42.500	17.600	23.500	36.300	51.500
1-1/8"	40.300	59.200	24.700	32.400	52.500	72.400
1-1/4"	54.300	78.600	36.100	45.800	70.600	95.500
1-3/8"	73.000	102.000	47.900	59.300	94.500	125.000
1-1/2"	94.300	131.000	60.900	74.800	122.000	161.000
1-5/8"		162.000		91.600		
1-3/4"	151.000	204.000	100.000	114.000		
1-7/8"		241.000		134.000		
2"	224.000	299.000	140.000	165.000		
2-1/4"		419.000		227.000		
2-1/2"		564.000		332.000		
2-3/4"		738.000		429.000		
3"		950.000		545.000		
3-1/4"		1194.000		651.000		
3-1/2"		1526.000		851.000		
3-3/4"		1812.000		1005.000		
4"		2180.000		1200.000		

NUTS MARKING :



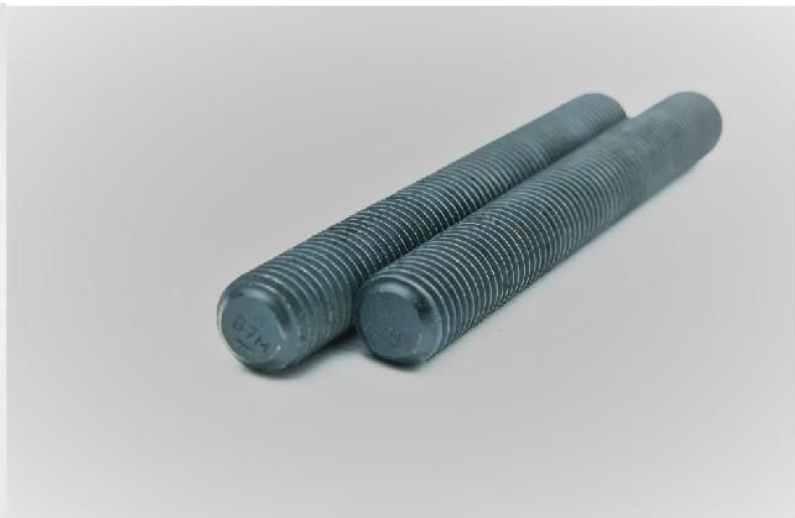
ASTM A194	Grade 2H 	Grade 2HM 	Grade 4 	Grade 7 	* Manufacturer's Identification ** Gr.4 and Gr.7 marking is 4/4L and 7/7L, wherein 4L and 7L is low temp. application
ASTM A194M	Grade 8 	Grade 8M 	* Manufacturer's Identification		

ASTM A194 Nut Compatibility Chart:

Grade of Bolt	A194 Heavy Hex Nut Grade
<u>A193 Grade B7</u>	2H or 4 or 7
<u>A193 Grade B7M</u>	2HM
<u>A193 Grade B8</u> (Class 1 and 2)	8
<u>A193 Grade B8M</u> (Class 1 and 2)	8M
<u>A320 Grade L7</u>	4 or 7
<u>A320 Grade B8</u> (Class 1 and 2)	8
<u>A320 Grade B8M</u> (Class 1 and 2)	8M
<u>A320 Grade B8C</u>	8C
<u>A320 Grade B8T</u>	8T
<u>A320 Grade B8LN</u>	8LN
<u>A320 Grade B8MLN</u>	8MLN

For Class 2 stainless steel grades, strain hardened nuts available as a supplementary requirement

STUD BOLT & NUTS PICTURES CN BE USED IN THE WEB SITE BUT NEED TO REMOVE OUR LOGO :



GR- B7M

Heavy Hex Nuts



NUTS



Gr-B7M Stud bolt

stud bolt assembly with nuts



THREAD ROLLING OPERATION