



ASTM A194

Scope - This specification covers carbon, alloy and stainless steel nuts intended for use in high-pressure and/or high-temperature service. Unless otherwise specified, heavy hex nuts (ANSI B 18.2.2) shall be used. Nuts up to and including 1-inch nominal size shall be UNC Series Class 2B fit. Nuts over 1-inch nominal size shall be either UNC Series Class 2B fit or 8 UN Series Class 2B fit.

Grades	2	Medium Carbon Steel
	2H	Medium Carbon Steel Quenched & Tempered
	2HM	Medium Carbon Steel Quenched & Tempered
	4	Carbon Molybdenum Quenched & Tempered
	7	Alloy Steel Quenched & Tempered
	7M	Alloy Steel Quenched & Tempered
	8	AISI 304 Stainless Steel
	8M	AISI 316 Stainless Steel

Mechanical Properties	Specification	Marking	Nom. Size, In.	Tempering Temp. °F	Proof Load Stress, ksi	Hardness	
						Min	Max
	A194 Grd 2	2	1/4 - 4	1000	150	B159	B352
	A194 Grd 2H	2H	1/4 - 4	1000	175	C24	C38
	A194 Grd 2HM	2HM	1/4 - 4	1000	150	B159	B237
	A194 Grd 4	4	1/4 - 4	1100	175	C24	C38
	A194 Grd 7	7	1/4 - 4	1100	175	C24	C38
	A194 Grd 7M	7M	1/4 - 4	1100	150	B159	B237
	A194 Grd 8	8	1/4 - 4	-	80	B126	B300
A194 Grd 8M	8M	1/4 - 4	-	80	B126	B300	

Chemical Properties	Element	2, 2H, 2HM	4	7, 7M (4140)	8 (304)	8M (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	0.04	0	0.035	0.045	0.045
	Sulfur, max	0.05	0	0.04	0.03	0.03
	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	

Recommended Mating Materials	Bolt Grade	Nuts Spec/Grade	Washers Spec/Grade
	B7	A194 Grade 2H	F436
	B8 Class 1	A194 Grade 8	SS304
	B8M Class 1	A194 Grade 8M	SS316
	B8 Class 2	A194 Grade 8	SS304
B8M Class 2	A194 Grade 8M	SS316	