



# ASTM A563

Scope - This specification covers the chemical and mechanical requirements for carbon and alloy steel nuts used on bolts, studs, and externally threaded fasteners.

Grades	A	Carbon steel
	B	Carbon steel
	C	Carbon steel, quenched and tempered
	D	Carbon steel, quenched and tempered
	DH	Carbon steel, quenched and tempered
	C3	Weathering steel, quenched and tempered
	DH3	Weathering steel, quenched and tempered

Grade	Material Markings	Style	Size, in.	Proof Load, ksi		Hardness, HBN
				Black	Galv.	
A		Hex	¼ to 1-½	90	68	116 - 302
		Heavy Hex	¼ to 4	100	75	116 - 302
B		Heavy Hex	¼ to 1	133	100	121 - 302
		Heavy Hex	1-⅛ to 1-½	116	87	121 - 302
C		Heavy Hex	¼ to 4	144	144	143 - 352
C3						
D	D	Heavy Hex	¼ to 4	150	150	248 - 352
DH	DH	Heavy Hex	¼ to 4	175	150	248 - 352
DH3	DH3					

Element	Grades O, A, B, C				D		DH	
Carbon	0.55 max				0.55 max		0.20 - 0.55	
Manganese					0.30 min		0.60 min	
Phosphorus	0.12 max				0.04 max		0.04 max	
Sulfur	0.15 max*				0.05 max		0.05 max	
<b>Classes for Grade C3*</b>								
	A	B	C	D	E	F	N	DH3
Carbon	0.33 - 0.40	0.38 - 0.48	0.15 - 0.25	0.15 - 0.25	0.20 - 0.25	0.20 - 0.25		0.20 - 0.53
Manganese	0.90 - 1.20	0.70 - 0.90	0.80 - 1.35	0.40 - 1.20	0.60 - 1.00	0.90 - 1.20		0.40 min
Phosphorus	0.040 max	0.06 - 0.12	0.035 max	0.040 max	0.040 max	0.040 max	0.07 - 0.15	0.046 max
Sulfur	0.050 max	0.050 max	0.040 max	0.050 max	0.040 max	0.040 max	0.050 max	0.050 max
Silicon	0.15 - 0.35	0.30 - 0.50	0.15 - 0.35	0.25 - 0.50	0.15 - 0.35	0.15 - 0.35	0.20 - 0.90	
Copper	0.25 - 0.45	0.20 - 0.40	0.20 - 0.50	0.30 - 0.50	0.30 - 0.60	0.20 - 0.40	0.25 - 0.55	0.20 min
Nickel	0.25 - 0.45	0.50 - 0.80	0.25 - 0.50	0.50 - 0.80	0.30 - 0.60	0.20 - 0.40	1.00 max	0.20 min**
Chromium	0.45 - 0.65	0.50 - 0.75	0.30 - 0.50	0.50 - 1.00	0.60 - 0.90	0.45 - 0.65	0.30 - 1.25	0.45 min
Vanadium			0.020 min					
Molybdenum		0.06 max		0.10 max				0.15 min**
Titanium				0.05 max				

\*Selection of a class shall be at the option of the manufacturer. \*\*Nickel or Molybdenum may be used.

Recommended Mating Materials	See ASTM A307, A325, A354, A449, A490
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