

Bennett Bolt Works, Inc.

Technical Data Sheet: ASTM A563

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The ASTM A563 specification covers the chemical and mechanical requirements for carbon and alloy steel nuts used on bolts, studs, and externally threaded fasteners.

A563 Nut Grades

A	Low carbon steel, hex or heavy hex
B	Low carbon steel, hex or heavy hex
C	Carbon steel, quenched and tempered, heavy hex
D	Carbon steel, quenched and tempered, heavy hex
DH	Carbon steel, quenched and tempered, heavy hex
C3	Weathering steel, quenched and tempered, heavy hex
DH3	Weathering steel, quenched and tempered, heavy hex

A563 Chemical Properties

Element	Grades O, A, B, C	D**	DH**
Carbon	0.55% max	0.55% max	0.20 - 0.55%
Manganese, min		0.30%	0.60%
Phosphorus, max	0.12%	0.04%	0.04%
Sulfur, max	0.15%*	0.05%	0.05%

*For grades O, A and B a sulfur content of 0.23% max is acceptable with the purchaser's approval

**For grades D and DH a sulfur content of 0.05 - 0.15% is acceptable provided the manganese is 1.35% min




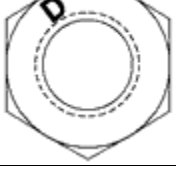
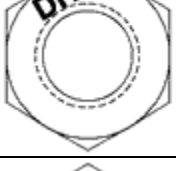

A563 Chemical Properties

Element	Classes for Grade C3*							DH3
	A	B	C	D	E	F	N	
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, max	0.050%	0.050%	0.040%	0.050%	0.040%	0.040%	0.050%	0.050%
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.

Markings & Grade Identification for ASTM A563 Nuts

Grade Identification Marking	Specification	Material	Nominal Size (In)	Proof Load Stress (ksi)	Hardness Rockwell		See Note
					Min	Max	
 Blank	ASTM A563 Grade O	Carbon Steel	1/4 - 1-1/2	69	B55	C32	2,3
	ASTM A563 Grade A	Carbon Steel	1/4 - 1-1/2	90	B68	C32	2,3
	ASTM A563 Grade B	Carbon Steel	1/4 - 1 >1 - 1-1/2	120 105	B69	C32	2,3
	ASTM A563 Grade C	Carbon Steel, may be Quenched and Tempered	1/4 - 4	144	B78	C38	4
	ASTM A563 Grade C3	Atmospheric Corrosion Resistant Steel, may be Quenched and Tempered	1/4 - 4	144	B78	38	4,6
	ASTM A563 Grade D	Carbon Steel, may be Quenched and Tempered	1/4 - 4	150	B84	C38	5
	ASTM A563 Grade DH	Carbon Steel, Quenched and Tempered	1/4 - 4	175	C24	C38	5
	ASTM A563 Grade DH3	Atmospheric Corrosion Resistant Steel, Quenched and Tempered	1/4 - 4	175	C24	C38	4,6