

Bennett Bolt Works, Inc.

Technical Data Sheet: ASTM A449

Jordan, NY
(315)689-3981

ASTM A449 covers specification for medium alloy carbon alloy steel hex bolts, anchor bolts, threaded rods etc. intended for general engineering application.

A449 Grades

Type 1	Medium carbon, carbon boron, or medium carbon alloy steel.
Type 3	Weathering steel.

A449 Mechanical Properties

Size	Tensile, ksi	Yield, ksi	Elong. %, min	RA %, min
1/4 - 1	120 min	92 min	14	35
1-1/8 - 1-1/2	105 min	81 min	14	35
1-5/8 - 3	90 min	58 min	14	35

A449 Recommended Hardware

Nuts			Washers
Plain		Galvanized	F436
1/4 - 1-1/2	1-5/8 - 3	1/4 - 3	
A563B Hex	A563A heavy hex	A563DH heavy hex	

A449 Chemical Composition

Type 1 Bolts

Element	Carbon Steel	Carbon Boron Steel	Alloy Steel	Alloy Boron Steel
Carbon	0.30 - 0.52%	0.30 - 0.52%	0.30 - 0.52%	0.30 - 0.52%
Manganese, min	0.60%	0.60%	0.60%	0.60%
Phosphorus, max	0.040%	0.040%	0.035%	0.035%
Sulfur, max	0.050%	0.050%	0.040%	0.040%
Silicon	0.15-0.30%	0.15-0.30%	0.15-0.35%	0.15-0.35%
Boron		0.0005 - 0.003%		0.0005 - 0.003%

A449 Chemical Composition

Type 3 Bolts

ELEMENT	A	B	C	D	E	F
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%
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%
Phosphorus, max	0.035% max	0.06 - 0.12%	0.035% max	0.035% max	0.035% max	0.035% max
Sulfur, max	0.040%	0.040%	0.040%	0.040%	0.040%	0.040%
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%
Copper	0.25 - 0.45%	0.20 - 0.4%	0.20 - 0.5%	0.30 - 0.50%	0.30 - 0.60%	0.20 - 0.40%
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%
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%
Vanadium			0.020% min			
Molybdenum		0.06% max		0.10% max		
Titanium				0.05% max		