Bennett Bolt Works, Inc.

Technical Data Sheet: ASTM A490

Jordan, NY
(315)689-3981

ASTM A490 specification covers material for quenched & tempered alloy steel bolting material for structural applications. This standard specification for structural bolts, alloy steel, heat treated, 150 ksi minimum tensile strength. ASTM A490 is applicable to heavy hex head bolts only. A490 specified bolts should not be coated by hot-dip galvanizing, any mechanical deposition, or electroplating with zinc due to the potential risk of hydrogen embrittlement.

A490 Grades

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

Material 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%

Material 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		

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