



# ASTM A490

Scope - This specification covers quenched and tempered, alloy steel, heavy hex structural bolts from 1/2" to 1-1/2" diameter with a minimum 150 ksi tensile. These bolts are intended for use in structural connections and therefore have shorter thread lengths than standard hex bolts. This spec is similar to but stronger than ASTM A325 being that A490 is made from alloy steel rather than a medium carbon steel.

Grades	TYPE 1	Medium carbon and alloy steel
	TYPE 3	Weathering steel

Mechanical Properties	Markings		Size	Tensile, ksi	Yield, ksi	Elong. %	RA %	Hardness
	Type 1 A490	Type 3 A490	1/2 to 1-1/2	150-173	130 min	14 min	40 min	C33-C38

Chemical Properties	Type 1 Bolts		
	Element	Sizes 1/2 to 1-3/8	Size 1-1/2
	Carbon	0.30 - 0.48	0.35 - 0.53
	Phosphorus, max	0.04	0.04
	Sulfur, max	0.04	0.04
	Type 3 Bolts		
	Element	Sizes 1/2 to 3/4	Size above 3/4
	Carbon	0.20 - 0.53	0.30 - 0.53
	Manganese, min	0.4	0.4
	Phosphorus, max	0.035	0.035
	Sulfur, max	0.04	0.04
	Copper	0.20 - 0.60	0.20 - 0.60
	Chromium, min	0.45	0.45
	Nickel, min	0.2	0.2
Molybdenum, min	0.15	0.15	

Recommended Mating Materials	Nuts		Washers	
	Type 1	Type 3	Type 1	Type 3
	A563DH & A194 2H	A563DH3 & A194 2H	F436-1	F436-3

Notes – A490 bolts shall not be coated via hot-dip zinc coating, mechanical deposition, or electroplating with zinc due to the potential for hydrogen embrittlement. A zinc/alum coating (dacromet) per ASTM F1136 Grade 3 has been approved for A490 bolts. Also, A490 material is required to be magnetic particle inspected.