

ASTM A490

ALLOY STEEL

TYPE 1

HEAVY HEX BOLTING MATERIAL FOR STRUCTURAL PURPOSE

ASTM A490 and ASTM A490M are ASTM International standards for heavy hex structural bolts made from alloy steel. The imperial standard is officially titled Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength, while the metric standard (M) is titled Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints. These bolts are equivalent to ASTM A325 bolts in application and geometry, but are made to a higher strength. The imperial grades are made to the same strength specifications as ASTM A354 grade BD. The metric grades are made to the same strength specifications as ASTM F568M property class 10.9.[4] Also, unlike their weaker counterparts they cannot be coated by hot-dip galvanization, mechanical deposition, or electroplating, ASTM has approved coating A490 bolts with Zinc/Aluminum Corrosion Protective Coatings per ASTM F1136 Grade 3, commercially called dacromet. Read more about issues with galvanizing ASTM A490..Additional testing in the form of Magnetic Particle Inspection for Longitudinal Discontinuities and Transverse Cracks is a requirement of the A490 specification.

Chemical Properties

C	P	S
	Max	Max
0.28-0.50	0.045	0.045

Characteristic Standard

Materials & Manufacture	ASTM A490M
Finish(Self Colour/Black)	ASTM A490M
Mechanical Properties	ASTM A490M
Dimensions&Tolerances	ASME B18.2.3.7M
Threads	AMSE B1.13M tolerance Class 6g
Workmanship	ASTM F788 / F788M
Magnetic Particle Test	ASTM A490M
Product marking	ASTM A490M

Mechanical Properties

Yield strength	Tensile strength	Elongation	Reduction	Hardness
Min 0.2% Mpa	Min Mpa	Min %	Min %	BHN
895	1035-1170	14	40	311-352

A490M Tensile Strength Requirements For Specimens machined from Bolts

Nominal Dia	Tensile Strength		Yield Strength min	Elongation in 4D min	Reduction
	Min	Max			
	MPa	MPa	MPa	%	%
M16- M36	1040	1210	940	14	40

Heat Treatment

Quenched & tempered

A490M Tensile Load & Proof Load Requirements For Full Size Bolts

Nominal Dia, & Thread Pitch	Stress Area mm2	Tensile Load min		Proof Load # kN	Alternative Proof Load* kN	Hardness Rockwell HRC	
		Min (kN)	Max (kN)			min	max
M16 x 2	157	163	190	130	148	33	39
M20 x 2.5	245	255	296	203	230	33	39
M22 x 2.5	303	315	366	251	285	33	39
M24 x 3	353	367	427	293	332	33	39
M27 x 3	459	477	555	381	431	33	39
M30 x 3.5	561	583	679	466	527	33	39
M36 x 4	817	850	989	678	768	33	39

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