MUDGE FASTENERS, INC.

ASTM A325

Scope

The ASTM A325 specification covers high strength heavy hex structural bolts from 1/2" diameter through 1-1/2" diameter. These bolts are intended for use in structural connections and therefore have shorter thread lengths than standard hex bolts. Refer to the Structural Bolts page of our site for thread lengths and other related dimensions. This specification is applicable to heavy hex structural bolts only. For bolts of other configurations and thread lengths with similar mechanical properties, see Specification A 449. Bolts for general applications, including anchor bolts, are covered by Specification A 449. Also refer to Specification A 449 for quenched and tempered steel bolts and studs with diameters greater than 1-1/2" but with similar mechanical properties.

Types

TYPE 1	Medium carbon, carbon boron, or medium carbon alloy steel.
TYPE 2	Withdrawn November 1991.
TYPE 3	Weathering steel.
T	Fully threaded A325. *(Restricted to 4 times the diameter in length)*
M	Metric A325.

Connection Types

SC	Slip critical connection.
N	Bearing type connection with threads included in the shear plane.
X	Bearing-type connection with threads excluded from the shear plane.

Mechanical Properties

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

Chemical Properties

Type 1 Bolts

Element	Carbon Steel	Carbon Boron Steel	Alloy Steel	Alloy Boron Steel
Carbon	0.30 -	0.30 - 0.52%	0.30 - 0.52%	0.30 - 0.52%
Manganese, min	0.60%	0.60%	0.60%	0.60%
Phosphorus, max	0.04%	0.04%	0.04%	0.04%
Sulfur, max	0.05%	0.05%	0.04%	0.04%
Silicon	0.15-	0.10 - 0.30%	0.15 - 0.35%	0.15 - 0.35%
Boron		0.0005 - 0.003%		0.0005 - 0.003%
Alloying Elements			*	*

** Steel, as defined by the American Iron and Steel Institute, shall be considered to be alloy when the maximum range given for the content of alloying elements exceeds one of more of the following limits: Manganese, 1.65%, silicon, 0.60%, copper, 0.60%, or in which a definite range or a minimum quantity of any of the following elements is specified or required within the limits of the recognized field of constructional alloy steels: aluminum, chromium up to 3.99%, cobalt, columbium, molybdenum, nickel, titanium, tungsten, vanadium, zirconium or any other alloying elements added to obtain a desired alloying effect.*

Recommended Nuts and Washers

Nuts			Washers	
Type 1		Type 3	Type 1	Type 3
Plain	Galvanized	Plain		
A563C, C3, D, DH, DH3	A563DH	A563C3, DH3	F436-1	F436-3

Note: Nuts conforming to A194 Grade 2H are a suitable substitute for use with A325 heavy hex structural bolts. The ASTM A563 Nut Compatibility Chart has a complete list of specifications.

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3050 Palisades Drive Corona, CA 92880
(800) 634-0406 (951) 270-1360
www.MudgeFasteners.com
sales@mudgefasteners.com