

**Table 2-4**  
**Applicable ASTM Specifications**  
**for Various Structural Shapes**

Steel Type	ASTM Designation	F <sub>y</sub> Min. Yield Stress (ksi)	F <sub>u</sub> Tensile Stress <sup>a</sup> (ksi)	Applicable Shape Series															
				W	M	S	HP	C	MC	L	HSS		Pipe						
											Rect.	Round							
Carbon	A36	36	58-80 <sup>b</sup>																
	A53 Gr. B	35	60																
	A500	Gr. B	42	58															
		Gr. C	46	58															
	A501	Gr. A	46	62															
		Gr. B	50	62															
	A529 <sup>c</sup>	Gr. 50	36	58															
		Gr. 55	50	70															
	High-Strength Low-Alloy	A572	Gr. 42	50	65-100														
			Gr. 50	42	60														
Gr. 55			50	65 <sup>d</sup>															
Gr. 60 <sup>e</sup>			55	70															
A618 <sup>f</sup>		Gr. I & II	60	75															
		Gr. III	50 <sup>g</sup>	65															
A913		50	50 <sup>h</sup>	60 <sup>h</sup>															
		60	60	75															
		65	65	80															
A992		70	70	90															
Corrosion Resistant High-Strength Low-Alloy	A242	50	65 <sup>i</sup>																
		42 <sup>j</sup>	63 <sup>j</sup>																
		46 <sup>k</sup>	67 <sup>k</sup>																
	A588	50 <sup>l</sup>	70 <sup>l</sup>																
A847	50	70																	

■ = Preferred material specification  
 □ = Other applicable material specification, the availability of which should be confirmed prior to specification  
 □ = Material specification does not apply

<sup>a</sup> Minimum unless a range is shown.  
<sup>b</sup> For shapes over 426 lb/ft, only the minimum of 58 ksi applies.  
<sup>c</sup> For shapes with a flange thickness less than or equal to 1 1/2 in. only. To improve weldability, a maximum carbon equivalent can be specified (per ASTM Supplementary Requirement S78). If desired, maximum tensile stress of 90 ksi can be specified (per ASTM Supplementary Requirement S79).  
<sup>d</sup> If desired, maximum tensile stress of 70 ksi can be specified (per ASTM Supplementary Requirement S81).  
<sup>e</sup> For shapes with a flange thickness less than or equal to 2 in. only.  
<sup>f</sup> ASTM A618 can also be specified as corrosion-resistant; see ASTM A618.  
<sup>g</sup> Minimum applies for walls nominally 3/4-in. thick and under. For wall thicknesses over 3/4 in., F<sub>y</sub> = 46 ksi and F<sub>u</sub> = 67 ksi.  
<sup>h</sup> If desired, maximum yield stress of 65 ksi and maximum yield-to-tensile strength ratio of 0.85 can be specified (per ASTM Supplementary Requirement S75).  
<sup>i</sup> A maximum yield-to-tensile strength ratio of 0.85 and carbon equivalent formula are included as mandatory in ASTM A992.  
<sup>j</sup> For shapes with a flange thickness greater than 2 in. only.  
<sup>k</sup> For shapes with a flange thickness greater than 1 1/2 in. and less than or equal to 2 in. only.  
<sup>l</sup> For shapes with a flange thickness less than or equal to 1 1/2 in. only.

**Table 2-5**  
**Applicable ASTM Specifications**  
**for Plates and Bars**

Steel Type	ASTM Designation	F <sub>y</sub> Min. Yield Stress (ksi)	F <sub>u</sub> Tensile Stress <sup>a</sup> (ksi)	Thickness of Plates and Bars, in.														
				to 0.75 incl.	over 0.75 to 1.25	over 1.25 to 1.5	over 1.5 to 2 incl.	over 2 to 2.5 incl.	over 2.5 to 4 incl.	over 4 to 5 incl.	over 5 to 6 incl.	over 6 to 8 incl.	over 8					
Carbon	A36	32	58-80															
		36	58-80															
Carbon	A529	Gr. 50	50	70-100		b	b	b	b									
		Gr. 55	55	70-100		b	b											
High-Strength Low-Alloy	A572	Gr. 42	42	60														
		Gr. 50	50	65														
		Gr. 55	55	70														
		Gr. 60	60	75														
		Gr. 65	65	80														
Corrosion Resistant High-Strength Low-Alloy	A242	42	63															
		46	67															
		50	70															
Quenched and Tempered Alloy	A514 <sup>c</sup>	42	63															
		46	67															
		50	70															
Quenched and Tempered Low-Alloy	A852 <sup>c</sup>	90	100-130															
		100	110-130															
Quenched and Tempered Low-Alloy	A852 <sup>c</sup>	70	90-110															

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<sup>a</sup> Minimum unless a range is shown.  
<sup>b</sup> Applicable to bars only above 1-in. thickness.  
<sup>c</sup> Available as plates only.

**Table 2-6**  
**Applicable ASTM Specifications for Various Types of Structural Fasteners**

ASTM Designation	F <sub>y</sub> Min. Yield Stress (ksi)	F <sub>u</sub> Tensile Stress <sup>a</sup> (ksi)	Diameter Range (in.)	High-Strength Bolts		Common Bolts	Nuts	Washers	Direct-Tension-Indicator Washers	Threaded Rods	Steel Headed Stud Anchors	Anchor Rods			
				Conventional	Twist-Off-Type Tension-Control							Hooked	Headed	Threaded & Nurfed	
A108	—	65	0.375 to 0.75, incl.												
A325 <sup>d</sup>	—	105	over 1 to 1.5, incl.	■											
A490 <sup>d</sup>	—	150	0.5 to 1.5	■											
F1852 <sup>d</sup>	—	105	1.125		■										
F2280 <sup>d</sup>	—	120	0.5 to 1, incl.		■										
F2280 <sup>d</sup>	—	150	0.5 to 1.125, incl.		■										
A194 Gr. 2H	—	—	0.25 to 4				■								
A563	—	—	0.25 to 4				■								
F436 <sup>b</sup>	—	—	0.25 to 4				■	■							
F959	—	—	0.5 to 1.5				■	■	■						
A36	36	58-80	to 10				■	■	■	■					
A193 Gr. B7 <sup>e</sup>	—	100	over 4 to 7				■	■	■	■					
A193 Gr. B7 <sup>e</sup>	—	115	over 2.5 to 4				■	■	■	■					
A193 Gr. B7 <sup>e</sup>	—	125	2.5 and under				■	■	■	■					
A307 Gr. A	—	60	0.25 to 4				■								
A354 Gr. BD	—	140	2.5 to 4, incl.				■								
A354 Gr. BD	—	150	0.25 to 2.5, incl.				■								
A449	—	90	1.75 to 3, incl.				■								
A449	—	105	1.125 to 1.5, incl.				■								
A449	—	120	0.25 to 1, incl.				■								
A572	Gr. 42	42	60	to 6											
A572	Gr. 50	50	65	to 4											
A572	Gr. 55	55	70	to 2											
A572	Gr. 60	60	75	to 1.25											
A572	Gr. 65	65	80	to 1.25											
A588	42	63	Over 5 to 8, incl.												
A588	46	67	Over 4 to 5, incl.												
A588	50	70	4 and under												
A687	105	150 max.	0.625 to 3												
F1554	Gr. 36	36	58-80	0.25 to 4											
F1554	Gr. 55	55	75-95	0.25 to 4											
F1554	Gr. 105	105	125-150	0.25 to 3											

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— Indicates that a value is not specified in the material specification.  
<sup>a</sup> Minimum unless a range is shown or maximum (max.) is indicated.  
<sup>b</sup> Special washer requirements may apply per RCSC Specification Table 6.1 for some steel-to-steel bolting applications and per Part 14 for anchor-rod applications.  
<sup>c</sup> See AISC Specification Section J3.1 for limitations on use of ASTM A449 bolts.  
<sup>d</sup> When atmospheric corrosion resistance is desired, Type 3 can be specified.  
<sup>e</sup> For anchor rods with temperature and corrosion resistance characteristics.

**Table 2-7**  
**Metal Fastener Compatibility to Resist Corrosion**

Fastener Metal	Zinc and Galvanized Steel	Aluminum and Aluminum Alloys	Steel and Cast Iron	Brasses, Copper, Bronzes, Monel	Martensitic Stainless Steel (Type 410)	Austenitic Stainless Steel (Type 302/304, 303, 305)
Zinc and Galvanized Steel	A	B	B	C	C	C
Aluminum and Aluminum Alloys	A	A	B	C	Not Recommended	B
Steel and Cast Iron	A, D	A	A	C	C	B
Terne (Lead-Tin) Plated Steel Sheets	A, D, E	A, E	A, E	C	C	B
Brasses, Copper, Bronzes, Monel	A, D, E	A, E	A, E	A	A	B
Ferritic Stainless Steel (Type 430)	A, D, E	A, E	A, E	A	A	A
Austenitic Stainless Steel (Type 302/304)	A, D, E	A, E	A, E	A, E	A	A

**KEY**  
 A. The corrosion of the base metal is not increased by the fastener.  
 B. The corrosion of the base metal is marginally increased by the fastener.  
 C. The corrosion of the base metal may be markedly increased by the fastener material.  
 D. The plating on the fastener is rapidly consumed, leaving the bare fastener metal.  
 E. The corrosion of the fastener is increased by the base metal.

NOTE: Surface treatment and environment can change activity. For a more thorough understanding of metal corrosion in construction materials, please consult a full listing of the galvanic series of metals and alloys.

Note: Reprinted from the Specialty Steel Industry of North America *Stainless Steel Fasteners Designer's Handbook*.