



Designation: F1077 – 05

StandardGuide for Selection of Committee F16 Fastener Specifications¹

This standard is issued under the fixed designation F1077; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

1. Scope*

1.1 This guide is intended to provide a rapid, easy to use method for identifying Committee F16 fastener specifications and their applicable marking requirements. Selection is made by product type (bolts, nuts, washers, etc.) and material (alloy steel, carbon steel, stainless steel, etc.) from **Tables 1-7** as follows:

	Table Number	
	Inch	Metric
Ferrous Metals		
Alloy Steel	1	3
Carbon Steel	1	3
Weathering Steel	1	3
Non Ferrous		
Aluminum, Copper	2	3
Nickel, Titanium		
Stainless Steels	2	3
Others		
Coatings	4	4
Quality Provisions and Test Methods	5	5
Terminology	6	6

1.2 Table size limitations and the need for simplicity prohibit identifying the exact grade, type, condition, etc., for all product/material combinations. The product specification must be reviewed prior to specifying fasteners on drawings or ordering to properly and completely identify the fastener, and its available variations.

2. Referenced Documents

2.1 ASTM Standards:²

- A31** Specification for Steel Rivets and Bars for Rivets, Pressure Vessels
- A307** Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
- A325** Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
- A325M** Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric)

- A354** Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners
- A394** Specification for Steel Transmission Tower Bolts, Zinc-Coated and Bare
- A449** Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use
- A489** Specification for Carbon Steel Lifting Eyes
- A490** Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
- A490M** Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric)³
- A502** Specification for Rivets, Steel, Structural
- A563** Specification for Carbon and Alloy Steel Nuts
- A563M** Specification for Carbon and Alloy Steel Nuts (Metric)
- A574** Specification for Alloy Steel Socket-Head Cap Screws
- A574M** Specification for Alloy Steel Socket-Head Cap Screws (Metric)
- C514** Specification for Nails for the Application of Gypsum Board
- F432** Specification for Roof and Rock Bolts and Accessories
- F436** Specification for Hardened Steel Washers
- F436M** Specification for Hardened Steel Washers (Metric)
- F467** Specification for Nonferrous Nuts for General Use
- F467M** Specification for Nonferrous Nuts for General Use (Metric)
- F468** Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use
- F468M** Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use (Metric)
- F541** Specification for Alloy Steel Eyebolts
- F547** Terminology of Nails for Use with Wood and Wood-Base Materials
- F568M** Specification for Carbon and Alloy Steel Externally Threaded Metric Fasteners (Metric) (Withdrawn 2012)⁴
- F592** Terminology of Collated and Cohered Fasteners and Their Application Tools
- F593** Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

¹ This guide is under the jurisdiction of ASTM Committee F16 on Fasteners and is the direct responsibility of Subcommittee F16.91 on Editorial.

Current edition approved Jan. 1, 2005. Published January 2005. Originally approved in 1987. Last previous edition approved in 2002 as F1077 – 95a (2002). DOI: 10.1520/F1077-05.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Withdrawn.

⁴ The last approved version of this historical standard is referenced on www.astm.org.

***A Summary of Changes section appears at the end of this standard**

TABLE 1 Alloy, Carbon, and Weathering Steels, Inch

Product ^A	Alloy Steel	Carbon Steel		Weathering Steels
		Low	Medium	
Bolts^B :				
Anchor	F1554 Grade 105	F1554 Grade 36	F1554 Grade 55	
Eye	F541		A489	
General purpose:				
UTS 60K		A307 Gr A, B		
UTS 120, 105, 90K			A449 Type 1	
UTS 125, 115K	A354 Gr BC			
UTS 150, 140K	A354 Gr BD			
Roof and Rock			F432	
Structural:				
UTS 120, 105K			A325 Type 1 ^C	A325 Type 3
UTS 150K	A490 Type 1			A490 Type 3
Tension Control, Twist Off			F1852 Type 1	F1852 Type 3
Transmission tower		A394 Type 0	A394 Type 1	A394 Type 3
Nails:				
Gypsum wallboard		C514		
Nuts^B :				
PL 69K		A563 Gr 0		
PL 100, 90K		A563 Gr A		
PL 133, 120, 116, 105K			A563 Gr B	
PL 144K			A563 Gr C	A563 Gr C3
PL 150, 135K			A563 Gr D	
PL 175, 150K	A563 Gr DH			
PL 175K				A563 Gr DH3
Rivets:				
General purpose		A502 Gr 1		
Pressure vessel		A31 Gr A	A31 Gr B	
Structural		A502 Gr 1	A502 Gr 2	A502 Gr 3
Screws:				
Hex cap			A449 Type 1	
Socket head	A574			
Socket button and flat CSK	F835			
Socket set	F912			
Studs:				
UTS 58-80K		A307 Gr C		
UTS 60K		A307 Gr A, B		
UTS 120, 105, 90K			A449 Type 1	
UTS 125, 115K	A354 Gr BC			
UTS 150, 140K	A354 Gr BD			
Washers:				
General Purpose, Soft		F844		
General Purpose, Hard			F436 Type 1	F436 Type 3
Load Indicating			F959 Type 325	
			F959 Type 490	
Structural, Hard			F436 Type 1	F436 Type 3

^A Ultimate tensile strengths (UTS) and proof loads (PL) where shown are approximations and vary with size. For break points, see applicable product specification.

^B For bolt/nut suitability guide, see (A563 Table X 1.1.).

^C May be furnished as carbon, alloy, or carbon boron steel.

TABLE 2 Aluminum, Copper, Nickel, Titanium, and Stainless Steels (Inch)

Product	Aluminum ^A	Copper ^A	Nickel ^A	Titanium ^A	Stainless ^A
Bolts:					
General purpose	F468	F468	F468	F468	F593
Transmission tower	F901				
Nuts:					
General purpose	F467	F467	F467	F467	F594
Transmission tower	F901				
Rivets					
Screws:					
Hex cap	F468	F468	F468	F468	F593
High temperature					F2281
Hex bolts					
Socket Head:					
Socket button and Flat CSK					F879
Socket set					F880
Studs	F468	F468	F468	F468	F593

^A See product specification for available alloys.

TABLE 3 Ferrous, Nonferrous, and Stainless Steel (Metric)

Product	Ferrous ^A			Nonferrous ^A	Stainless Steel ^A
	Alloy Steel	Carbon Steel	Weathering Steel	Al, Cu, Ni, Ti	
<i>Bolts:</i>					
General purpose	F568M CI 12.9	F568M CI 4.6, 4.8, 5.8, 8.8, 9.8, 10.9	F568M CI 8.8.3, 10.9.3	F468M	F738M
Structural: 8.8, 8.8.3 10.9, 10.9.3		A325M Type 1, 2 A490M Type 1, 2	A325M Type 3 A490M Type 3		
Transmission tower					
<i>Nuts</i>		A563M CI 5.9, 8S, 10, 10S, 12	A563M CI 8S3, 10S3	F467M	F836M
<i>Rivets</i>					
<i>Screws:</i>					
Hex cap	F568M CI 12.9	F568M CI 4.6, 4.8, 5.8, 8.8, 9.8, 10.9	F568M CI 8.8.3, 10.9.3	F468M	F738M
Heavy hex	F568M CI 12.9	F568M CI 4.6, 4.8, 5.8, 8.8, 9.8, 10.9	F568M CI 8.8.3, 10.9.3		
Hex flange		F568M CI 4.6, 4.8, 5.8, 8.8, 9.8, 10.9	F568M CI 8.8.3, 10.9.3		
Socket head	A574M				F837M
Socket button and Flat	F835M				F879M
CSK					
Socket set	F912M				F880M
<i>Studs</i>	F568M CI 12.9	F568M CI 4.6, 4.8, 5.8, 8.8, 9.8, 10.9	F568M CI 8.8.3, 10.9.3	F468M	F738M
<i>Washers:</i>					
Hard		F436M Type 1	F436M Type 3		
Load Indicating			F959M Type 10.9 F959M Type 8.8		

^A See product specifications for available alloys.

TABLE 4 Coatings

Products	Coatings
Bolts	F1135, F1136, F1137, F1941, F1941M
Collated and cohered fasteners	
Nails	A153, A641/A641M, B695
Nuts	F1135, F1136, F1137, F1941, F1941M
Rivets	
Screws	F1135, F1136, F1137, F1941, F1941M
Studs	F1135, F1136, F1137, F1941, F1941M
Washers	B695, A153

TABLE 5 Quality Provisions and Test Methods

Products	Quality Provisions	Test Methods	Surface Discontinuities
Bolts	F1469, F1470, F1503	F606/F606M, F1940	F788/F788M
Collated and cohered fasteners			
Nails		F680, F1575	
Nuts	F1469, F1470, F1503	F606/F606M, F1940	F812/F812M
Rivets		F606/F606M, F1940	
Screws	F1469, F1470, F1503	F606/F606M, F1940	F788/F788M
Studs	F1469, F1470, F1503	F606/F606M, F1940	F788/F788M
Washers	F1469, F1470, F1503	F606/F606M, F1940	

[F594](#) Specification for Stainless Steel Nuts

[F606](#) Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, Direct Tension Indicators, and Rivets

[F606M](#) Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, and Rivets (Metric)

[F680](#) Test Methods for Nails

[F738M](#) Specification for Stainless Steel Metric Bolts, Screws, and Studs

[F788/F788M](#) Specification for Surface Discontinuities of Bolts, Screws, and Studs, Inch and Metric Series

[F812/F812M](#) Specification for Surface Discontinuities of Nuts, Inch and Metric Series

[F835](#) Specification for Alloy Steel Socket Button and Flat Countersunk Head Cap Screws

[F835M](#) Specification for Alloy Steel Socket Button and Flat Countersunk Head Cap Screws (Metric)

TABLE 6 Terminology

Products	Definitions
Bolts	F1789
Collated and cohered fasteners	F592, F547
Nails	F547, F592
Nuts	F1789
Rivets	F1789
Screws	F1789
Studs	F1789
Washers	F1789






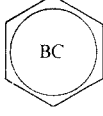
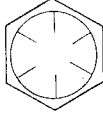
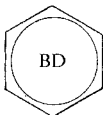

- F836M** Specification for Style 1 Stainless Steel Metric Nuts (Metric)
- F837M** Specification for Stainless Steel Socket Head Cap Screws [Metric]
- F844** Specification for Washers, Steel, Plain (Flat), Unhardened for General Use
- F879** Specification for Stainless Steel Socket Button and Flat Countersunk Head Cap Screws
- F879M** Specification for Stainless Steel Socket Button and Flat Countersunk Head Cap Screws (Metric)
- F880** Specification for Stainless Steel Socket-Set Screws
- F880M** Specification for Stainless Steel Socket Set Screws (Metric)
- F901** Specification for Aluminum Transmission Tower Bolts and Nuts
- F912** Specification for Alloy Steel Socket Set Screws
- F912M** Specification for Alloy Steel Socket Set Screws (Metric)
- F959** Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners
- F959M** Specification for Compressible-Washer-Type Direct Tension Indicators for Use With Structural Fasteners (Metric)
- F1135** Specification for Cadmium or Zinc Chromate Organic Corrosion Protective Coating for Fasteners (Withdrawn 2009)⁴




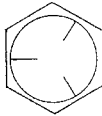





- F1136** Specification for Zinc/Aluminum Corrosion Protective Coatings for Fasteners
- F1137** Specification for Phosphate/Oil Corrosion Protective Coatings for Fasteners
- F1469** Guide for Conducting a Repeatability and Reproducibility Study on Test Equipment for Nondestructive Testing
- F1470** Practice for Fastener Sampling for Specified Mechanical Properties and Performance Inspection
- F1503** Practice for Machine/Process Capability Study Procedure
- F1554** Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
- F1575** Test Method for Determining Bending Yield Moment of Nails
- F1667** Specification for Driven Fasteners: Nails, Spikes, and Staples
- F1789** Terminology for F16 Mechanical Fasteners
- F1852** Specification for “Twist Off” Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
- F1940** Test Method for Process Control Verification to Prevent Hydrogen Embrittlement in Plated or Coated Fasteners
- F1941** Specification for Electrodeposited Coatings on Threaded Fasteners (Unified Inch Screw Threads (UN/UNR))
- F1941M** Specification for Electrodeposited Coatings on Threaded Fasteners (Metric)
- F2281** Specification for Stainless Steel and Nickel Alloy Bolts, Hex Cap Screws, and Studs, for Heat Resistance and High Temperature Applications

3. Keywords

- 3.1 ferrous metals; head markings; non-ferrous; products; stainless steel

TABLE 7 Product Marking Requirements

ASTM Number	Grade, Type, or Alloy	Condition	Product and Size	Manufacturers Identification Required	Product Identification	Notes
A 31	A and B		rivets	no	not required	
A 307	A		bolts and studs	yes	"307A"	Stud grade marking applicable to sizes 3/8 in. and larger only.
	B		bolts and studs	yes	"307B"	Stud grade marking applicable to sizes 3/8 in. and larger only.
	C		studs	yes	"307C"	Stud grade marking applicable to sizes 3/8 in. and larger only.
A 325	1		bolts	yes		In addition may have 3 radial lines 120° apart.
	3		bolts	yes		In addition may have other distinguishing marks indicating weathering type steel.
A 325M	1		bolts	yes		
	2		bolts	yes		
	3		bolts	yes		In addition may have other distinguishing marks indicating weathering type steel.
A 354	BC		bolts and studs	yes		
	BD		bolts 0.25 through 2.5 in.	yes		In addition to the six radial lines, bolts may also be marked with the Grade Symbol "BD."
	BD		bolts over 2.5 in. and all sizes of all other Grade BD products	yes		
A 394	0		bolts	yes		In addition to the product identification, all types are marked with nominal length (Nom Lg).

ASTM Number	Grade, Type, or Alloy	Condition	Product and Size	Manufacturers Identification Required	Product Identification	Notes
	1		bolts	yes		
	2		bolts	yes		
	3		bolts	yes		
A 449	1		bolts	yes		
	2		studs bolts	no yes	not required 	See Supplemental Requirement S1.
A 489	1 and 2		eyebolts	yes	not required	
A 490	1		bolts	yes		
	2		bolts	yes		
	3		bolts	yes		In addition may have other distinguishing marks indicating weathering type steel.
A 490M	1		bolts	yes		

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