



SURFACE VEHICLE STANDARD

J2295M™**MAY2019**Issued 2006-06
Stabilized 2019-05

Superseding J2295M JUN2006

Fasteners - Part Standard - Cap Screws, Hex Bolts, and Hex Nuts (Metric)

RATIONALE

The use of SAE J2295M has been limited due to the fact that most of the metric nuts and bolts available in the United States have not been made to the ASME dimensional standards referenced in SAE J2295. Rather, most of the available metric products available have been manufactured to DIN and ISO standards. ASME has recently been withdrawing their metric dimensional standards in favor of the ISO standards. Other references in SAE J2295 may also have been withdrawn or superseded.

Generally, the fasteners to ISO and other National metric fasteners available on the market are interchangeable with those covered by SAE J2295M. It is recommended that ISO metric fasteners be used for new design. For support of current designs, SAE J2295M requirements can be compared to fasteners manufactured to ISO and other National Metric Standards to determine the suitability of these more readily available fasteners.

However, it is considered important that SAE J2295M standard be available for reference to support those applications where it has been used. The Part Identification Numbers (PINs) in SAE J2295M may have been used on drawings and users may need to refer to this part standard to identify the characteristics of these fasteners.

STABILIZED NOTICE

This document has been declared "Stabilized" by the SAE Ship Systems - Fasteners Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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1. SCOPE

This SAE Part Standard covers selected metric screws, hex bolts, and nuts manufactured in accordance with American Society for Testing and Materials (ASTM) and SAE fastener standards. This document covers fastener materials often used in ship systems and equipment but its use may be applied wherever fasteners of the covered materials are used. This document permits the fasteners to be identified and ordered by a part or identifying number (PIN) as defined in this document.

1.1 Purpose

The purpose of this document is to assist the designer and other personnel by providing requirements and part identifying numbers for the most commonly used fasteners for ship systems and equipment. A part or identification number (PIN) is normally required for all military applications and provides a useful means of communicating fastener requirements to suppliers and manufacturers in a very succinct manner.

1.2 Fastener Part Numbers

This document provides part or identifying numbers that can be used to identify metric socket head cap screws, hex head cap screws, bolts and hex nuts for the parts covered by this document. The parts covered by this document are manufactured in accordance with fastener standards issued by the SAE and ASTM. The part identification number (PIN) identifies material, material strength, coatings and special features, nominal diameter, thread configuration, fastener length, marking requirements, along with the applicable ASTM or SAE fastener specification.

1.3 Relationship of J2295M to ISO Standards

There is no equivalent ISO standard. There are ISO standards that cover some similar products. The ASME dimensional standards referenced are similar to ISO standards and these standards usually contain a comparison to ISO dimensional standards. The metric fastener parts in J2295M are based on ASTM and ASME fastener standards. However, these parts are often not stocked and metric fasteners available from stock are often to DIN, ISO or other standards.

2. REFERENCES

2.1 Applicable Publications

The following documents form a part of this specification to the extent specified herein. The latest issue of the documents shall be used except in those cases where an invitation for bid or procurement contract specifically identifies the issues in effect on a particular date.

2.1.1 SAE Publications

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE AMS 2412 Silver Plating

SAE AMS 2485 Black Oxide Coating

SAE AMS 2487 Anodic Treatment of Titanium and Titanium Alloys

SAE AMS 2488 Anodic Treatment, Titanium and Titanium Alloys

SAE AS1701 Lubricant, Solid Dry Film

SAE J123 Surface Discontinuities on Bolts, Screws, and Studs in Fatigue Applications

SAE J2270 Ship Systems and Equipment—Fasteners—Test, Inspection, and Installation Requirements

SAE J2271M Ship Systems and Equipment—Part Standard for Studs—Continuous and Double End (Metric Series)

SAE J2280 Ship Systems and Equipment—Fasteners—Selection and Identification Requirements

SAE J2295 Fasteners—Part Standard—Cap Screws, Hex Bolts, and Hex Nuts (Inch Dimensioned)

2.1.2 National Aerospace Standards

Available from Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209-3928, Tel: 703-358-1000, www.aia-aerospace.org.

NAS 1283 Fasteners, Male, Threaded, Self-locking

2.1.3 ASME Publications

Available from the American Society of Mechanical Engineers, 22 Law Drive, PO Box 2900, Fairfield, NJ 07007-2900, Tel: 973-882-1170, www.asme.org.

ASME B1.13M	Metric Screw Threads - M Profile
ASME B18.2.3.1M	Metric Hex Cap Screws
ASME B18.2.3.3M	Metric Heavy Hex Screws
ASME B18.2.3.5M	Metric Hex Bolts
ASME B18.2.3.6M	Metric Heavy Hex Bolts
ASME B18.2.3.7M	Metric Heavy Hex Structural Bolts
ASME B18.2.4.1M	Metric Hex Nuts, Style 1
ASME B18.2.4.2M	Metric Hex Nuts, Style 2
ASME B18.2.4.6M	Metric Heavy Hex Nuts
ASME B18.3.1M	Socket Head Cap Screws (Metric Series)
ASME B18.3.5M	Hexagon Socket Flat Countersunk Head Cap Screws (Metric Series)

2.1.4 ASTM Publications

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM A 193/A193M	Alloy Steel and Stainless Steel Bolting Materials for High-Temperature Service
ASTM A 194/A194M	Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service
ASTM A 325M	High-Strength Bolts for Structural Steel Joints [Metric]
ASTM A 342	Standard Test Methods for Permeability of Feebly Magnetic Materials
ASTM A 380	Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment and Systems
ASTM A 453/A 453M	Bolting Materials, High-Temperature, 50 to 120 ksi [345 to 827 MPa] Yield Strength, with Expansion Coefficients Comparable to Austenitic Steels
ASTM A 490M	High Strength Steel Bolts, Classes 10.9 and 10.9.3 for Structural Steel Joints (Metric)
ASTM A 563M	Carbon and Alloy Steel Nuts [Metric]
ASTM A 574M	Alloy Steel Socket Head Cap Screws [Metric]
ASTM B 580	Anodic Oxide Coatings on Aluminum
ASTM F 467M	Nonferrous Nuts for General Use [Metric]
ASTM F 468M	Nonferrous Bolts, Hex Cap Screws and Studs for General Use [Metric]
ASTM F 568M	Carbon and Alloy Steel Externally Threaded Metric Fasteners

ASTM F 738M	Stainless Steel Metric Bolts, Screws, and Studs
ASTM F 788/F 788M	Surface Discontinuities of Bolts, Screws, and Studs, Inch and Metric Series
ASTM F 812/F 812M	Surface Discontinuities of Nuts, Inch and Metric Series
ASTM F 835M	Alloy Steel Socket Button and Flat Countersunk Head Cap Screws [Metric]
ASTM F 836M	Stainless Steel Metric Nuts
ASTM F 837M	Stainless Steel Socket Head Cap Screws [Metric]
ASTM F 879M	Stainless Steel Socket Button and Flat Countersunk Head Cap Screws [Metric]
ASTM F 1136M	Zinc/Aluminum Corrosion Protective Coatings for Fasteners [Metric]
ASTM F 1137	Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners
ASTM F 1470	Fastener Sampling for Specified Mechanical Properties and Performance Inspection
ASTM F1941M	Electrodeposited Coatings on Threaded Fasteners [Metric]
ASTM F 2328M	Determining Decarburization and Carburization in Hardened and Tempered Threaded Steel Bolts, Screws and Studs (Metric)

2.1.5 U.S. Government Publications

Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-2179, http://stinet.dtic.mil/str/dodiss4_fields.html.

2.1.5.1 Military Specifications

MIL-DTL-16232 Phosphate Coating, Heavy, Manganese or Zinc Base

2.1.5.2 Federal Specifications

QQ-N-286 Nickel-Copper-Aluminum Alloy, Wrought

3. FASTENER PART OR IDENTIFYING NUMBERS

3.1 SAE Fastener Part Standards

This SAE part standard is for fasteners manufactured to ASTM and SAE fastener standards in accordance with the requirements defined herein. ASTM has issued many fastener standards but generally has not established part or identifying numbers for fasteners to these standards. When using the ASTM or SAE standards, it is necessary to identify the applicable dimensional configuration, coating requirements, and supplemental quality assurance requirements. This SAE part standard provides for the identification of many frequently used fasteners by identifying the applicable dimensional, coating, and other special features with simple part identifying numbers that can be easily recognized by both manufacturers and users.

3.2 Part or Identifying Numbers (PINs) for Selected Fasteners

PINs are provided herein for selected metric bolts, cap screws, and hex nuts for the purpose of common logistics parts identification between designers, builders, repair activities, and equipment operators. Part numbers are provided for only those fastener configurations and materials most likely to be needed. Industry or military specifications and standards with part numbers already exist for many types of fasteners and therefore part numbers to cover similar fasteners in this standard have usually not been developed.

3.2.1 PINs for Screws and Bolts

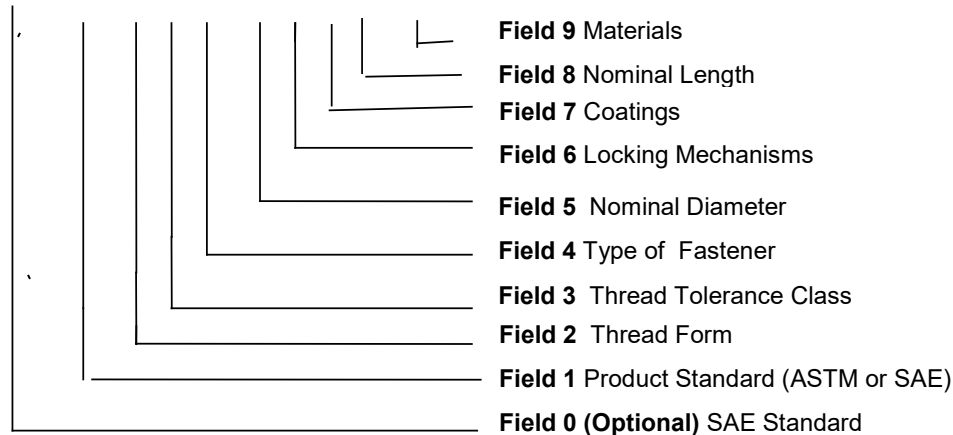
Figure 1 provides part or identifying numbers for hex and socket head screws and bolts in accordance with selected ASTM and SAE product standards. Table 1 is a listing of the standards with the selected materials identified for metric screws and bolts. The part number consists of a number of fields in the following order as identified in Figure 1:

- Field 0—*J2295M (Optional prefix, recommended)*
- Field 1—Product standard (ASTM or SAE)
- Field 2—Thread form
- Field 3—Thread tolerance class
- Field 4—Type of fastener
- Field 5—Nominal Diameter
- Field 6—Locking Mechanisms
- Field 7—Coatings
- Field 8—Nominal length
- Field 9—PIN suffix for the selected material as obtained from Table 1.

3.2.2 PINs for Nuts

Figure 2 provides part or identifying numbers for hex nuts in accordance with selected ASTM and SAE product standards. Table 2 lists the metric nut standards with the selected materials identified. The part number consists of a number of fields in the following order as identified in Figure 2:

- Field 0—*J2295M (Optional Prefix, Recommended)*
- Field 1—Product standard (ASTM or SAE)
- Field 2—Thread form
- Field 3—Thread tolerance class
- Field 4—Type of nut: Hex, Heavy Hex or Jam
- Field 5—Nominal Diameter
- Field 6—Locking Mechanisms
- Field 7—Coatings
- Field 8—PIN suffix for the selected material as obtained from Table 2

J2295M F568 M 6 H 12 L Z 50 J

Field 0—J2295M – Identifies this SAE Standard (This prefix is optional and may be omitted when drawing or computer limitations cannot accommodate the extra characters. See 4.2 for guidance when this prefix is omitted.)

Field 1—Product Standard (ASTM or SAE) – The applicable standards and the Field 1 identification are contained in the first column of Table 2. For standards with a “M” suffix for “Metric”, the suffix is not used since Field 2 describes the type of threads.

Field 2—Thread Form

M = Metric (ASME B1.13M)

Field 3—Thread Class Field

4 = 4g6g (metric) (ASME B1.13M)

6 = 6H (metric) (ASME B1.13M)

Field 4—Type of Fastener

B = Heavy Hex Structural Bolt

H = Heavy Hex Cap Screw

R = Regular Hex Cap Screw

F = Hexagon Socket Flat Countersunk Head Cap Screw
(metric = 90° countersunk)

S = Socket Head Cap Screw

Field 5—Nominal Metric Diameter (See 3.3.2)

XX(X) = mm (Use two digits below 100 mm)

L = Locking Element (See 3.7 for location and testing of

Field 6—Locking Mechanisms

— = No Locking Mechanisms

NOTE: See 4.5 for earlier PIN's when Fields 6 and 7 were combined.

locking elements)

Field 7—Coatings

N = None (However, passivation shall be provided on CRES fasteners and the coating requirements of 3.4.1.3 shall apply to all titanium fasteners.)

A = Aluminum plated (See 3.4.2)

D = Dry Film Lubricant (see 3.4.7)

K = Manganese Phosphate Coating (see 3.4.5)

P = Zinc Phosphate Coating (see 3.4.5)

V = Pigmented Zinc/Aluminum Coating – No Chromium Permitted (See 3.4.8)

W = Pigmented Zinc/Aluminum Coating – Chromium Permitted (See 3.4.8)

X = Zinc/Aluminum Inorganic Coating – No Chromium Permitted (see 3.4.8 and 3.4.8.1)

Y = Zinc/Aluminum Inorganic Coating – Chromium Permitted (see 3.4.8)

Z = Zinc Electroplate (Electroplated zinc See 3.4.4)

B = Black Oxide (See 3.4.3)

G = Zinc – Hot Dip (H) or Mechanically Deposited (M).

These designators no longer used (See 4.10)

S = Silver Plating (see 3.4.6)

Field 8—Nominal Length (See 3.3.1 for length increments)

Metric = mm (For lengths below 100 mm, use two digits)

Field 9—PIN Suffix to Designate Material – Select applicable PIN Suffix from Table 1. If applicable suffix is a number a dash prefix must be used; i.e. "-660".

FIGURE 1 - PART NUMBER SYSTEM FOR SELECTED HEX AND SOCKET HEAD SCREWS