

 SURFACE VEHICLE STANDARD	SAE J2484 DEC2012	
	Issued	2002-07
	Revised	2012-12
Superseding J2484 JUL2002		
(R) Fastener Part Standard - Machine Screws		

RATIONALE

Section 1: Added caution statement about potential hazardous materials.

Section 2: Added new reference standards.

Section 3: Added a Definitions paragraph.

Section 4: Added caution on Black Oxide Coatings. Added requirements for phosphate coatings and zinc/aluminum inorganic coatings. Cadmium coatings are now inactive for new design. Decarburization inspection changed from SAE J121/J121M to ASTM F 2328/F 2328M.

Figure 1:

Field 3: Designator H revised to allow indented or non-indented heads; Designators E and U added for trim head screws.

Field 4: Designators C = Combination Cross Recessed and Slotted Drive, N = Hex Head and Hex Washer Head Screws with no internal drives, S = Slotted, T = Six Point Recess and U = Square Recess are added; Designator H = Hex Socket is inactivated.

Field 6: Designator A for Aluminum plating is deleted due to misidentification of the coating. Designators K = Manganese Phosphate Coating, P = Zinc Phosphate Coating, X = Zinc/Aluminum Inorganic Coating-No Chromium Permitted and ZA = Zinc with clear topcoat are added; Z = Zinc Electroplate allows ZA to be furnished; Designator C for Cadmium is inactivated for new design. Hexavalent chrome is now prohibited due to environmental and regulatory concerns.

Table 1: Reformatted CRES Designators to list not more than once. Previous Designator S alloys other than free machining have been removed to Designators S1, S2 and S3. Designator S1 added new alloy 302HQ and previous Designator S alloy XM7 is now identified as 18-9LW. Designator S3 is added and lists alloys 321 and 347 previously listed in Designators S and S1. There is no change to current practice of allowing suppliers to choose the CRES alloy to be provided and this is noted. Hardness range of CRES Designators is been reduced to align with ASTM F 593.

Designator C added copper alloy 260 and hardness range converted from HRF to HRB to reflect industry practice. Designator C1 for copper alloys 462 and 464 is added.

Designator G steel expanded alloys range to reflect industry production.

Designator T2 for Titanium Alloy 23 (Ti-6Al-4V ELI) is added.

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Permitted coatings column added to table.

Section 4: Informational notes revised and added.

Minor editorial changes, clarifications and corrections made throughout.

1. SCOPE

This SAE Part Standard covers selected machine screws manufactured in accordance with American Society for Mechanical Engineers dimensional standards. This SAE standard covers material most 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 identification number (PIN) as defined in this document.

1.1 Purpose

The purpose of this document is to assist the designer and other personnel in providing requirements and PINs for the most commonly used machine screws for ship systems and equipment. A 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 Procurement Specification Safety - Hazardous Materials

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards that may be involved in such use. It is the responsibility of manufacturers and users to consult with officials on the applicable health and environmental regulations regarding the handling, use and disposal of hazardous materials. For fasteners, some of the hazardous materials concerns are the application of the materials in platings (coatings), release of toxic vapors due to heat (for example, welding) and environmental regulations for disposal.

2. REFERENCES

2.1 Applicable Documents

The following publications 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 International, 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 AMS2412	Plating, Silver, Copper Strike, Low Brake
SAE AMS2485	Coating, Black Oxide
SAE AMS2487	Anodic Treatment of Titanium and Titanium Alloys, Solution pH 12.4 Maximum
SAE AMS2488	Anodic Treatment - Titanium and Titanium Alloys, Solution pH 13 or Higher
SAE AS1701	Lubricant, Solid Film
SAE J2270	Ship Systems and Equipment - Threaded Fasteners - Inspection, Test, and Installation Requirements
SAE J2280	Ship Systems and Equipment - Fasteners - Selection and Identification Requirements

SAE J2295 Fastener Part Standard - Cap Screws, Hex Bolts, and Hex Nuts (Inch Dimensioned)

SAE J2295M Fasteners-Part Standard-Cap Screws, Hex Bolts, and Hex Nuts (Metric)

SAE J2485 Fastener Part Standard - Machine Screw Nuts (Metric and Inch)

2.1.2 Aerospace Industries Association of America, Inc. Publications

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

ASME B1.1 Unified Inch Screw Threads (UN and UNR Thread Form)

ASME B1.13M Metric Screw Threads - M Profile

ASME B18.6.3 Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series)

ASME B18.6.7M Metric Machine Screws

ASME B18.12 Glossary of Terms for Mechanical Fasteners

ASME B18.18 Quality Assurance for Fasteners

2.1.4 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org

ASTM A 29/A 29M Steel Bars, Carbon and Alloy, Hot-Wrought and Cold-Finished, General Requirements for

ASTM A 342/A 342M 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 High-Temperature Bolting, with Expansion Coefficients Comparable to Austenitic Stainless Steels

ASTM B 580 Standard Specification for Anodic Oxide Coatings on Aluminum

ASTM F 468 Nonferrous Bolts, Hex Cap Screws, and Studs for General Use

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 593 Stainless Steel Bolts, Hex Cap Screws, and Studs

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 1136/F 1136M Zinc/Aluminum Corrosion Protective Coatings for Fasteners



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 F 1789	Terminology for F16 Mechanical Fasteners
ASTM F 1941	Electrodeposited Coatings on Threaded Fasteners (Unified Inch Screw Threads (UN/UNR))
ASTM F 1941M	Electrodeposited Coatings on Threaded Fasteners (Metric)
ASTM F 2328	Standard Test Method for Determining Decarburization and Carburization in Hardened and Tempered Threaded Steel Bolts, Screws and Studs
ASTM F 2328M	Standard Test Method for Determining Decarburization and Carburization in Hardened and Tempered Threaded Steel Bolts, Screws and Studs [Metric]

2.1.5 Department of Defense Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, <http://assist.daps.dla.mil/quicksearch/>.

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

3. DEFINITIONS

3.1 For definition or terms used in this standard see ASME B18.12 and ASTM F 1789. In event of a conflict, the definitions in ASME B18.12 takes precedence.

3.2 PIN

Represents Part Identification Number. See 4.2 for description of PINs.

4. MACHINE SCREW REQUIREMENTS

4.1 SAE Machine Screw Standards

This machine screw part standard utilizes ASME dimensional standards for machine screws and primarily ASTM standards for materials,

4.2 PINs for Selected Machine Screws

PINs are provided herein for selected machine screws for the purpose of common logistics parts identification between designers, fastener manufacturers, construction and repair activities and equipment operators. Part numbers are provided for only those fastener configurations and materials most likely to be needed for ship systems and equipment.

A PIN is a unique number comprised of several fields in the order listed in Figure 1 that identify all the significant characteristics of the fastener. The various fields identify the applicable standard, the thread form, head type, drive type, nominal diameter, special features (locking elements and coatings), nominal diameter and material.

<u>J2484</u>	<u>C</u>	<u>C</u>	<u>R</u>	<u>XX</u>	<u>-</u>	<u>YY</u>	<u>S1</u>	
								Field 8 Material
								Field 7 Nominal Length
								Field 6 Special Features
								Field 5 Nominal Diameter
								Field 4 Type of Drive
								Field 3 Type of Head
								Field 2 Thread Form
								Field 1 SAE Standard

Field 1 - SAE J2484 Machine Screw Part Standard

Field 2 Thread Form (See 4.3.3 for thread class)

C = UNC/UNRC (ASME B1.1)

M = Metric (ASME B1.13M)

F = UNF/UNRF (ASME B1.1)

Field 3 Type of Head As defined in ASME B18.6.3 (inch products) ⁽¹⁾ and ASME B18.6.7M (metric products) (See SAE J2295 for small size hex socket type screws)

C = Flat countersunk head, 82 degree (inches), 90 degree (metric)

D = Flat countersunk head, 100 degree (inches)

E = Flat Countersunk Trim Head, 82 degree (inches)

F = Fillister Head (inch only)

G = Fillister Head (Drilled - inch only)

H = Hex Head ⁽²⁾

P = Pan Head

T = Truss Head

U = Oval countersunk trim head 82 degree (inches)

V = Oval countersunk head
82 degree (inches), 90 degree (metric)

W = Hex Washer Head (inch) ⁽²⁾
Hex Flange Head (metric) ⁽²⁾

⁽¹⁾ - See SAE J2295 for small diameter hex socket type screws

⁽²⁾ - May be slotted or cross-recessed unless Field 4 Designator "N" invoked

Field 4 Type of Drive - Head and drive combinations are limited to those defined in ASME B18.6.3 (inch products) and ASME B18.6.7M (metric products)

C = Combination Cross Recessed and Slotted Drive

H = Hex Socket (Inactive, see SAE J2295 for small hex socket type screws)

N = No Internal Drive (For use with Hex Head types when slots or cross recess are prohibited) Hex Head and Hex Washer Head Screws with no internal drives ⁽¹⁾

R = Type I or IA Cross Recessed

S = Slotted

T = Six Point Recess (also known as Torx™ or Hexalobular)

U = Square Recess

⁽¹⁾ - Hex Head Screws with internal drives may be supplied with purchaser's approval.

FIGURE 1 - PINS FOR MACHINE SCREWS