

FED-STD-H28A  
28 December 1994  
SUPERSEDING  
FED-STD-H28  
31 March 1978

## FEDERAL STANDARD

# SCREW-THREAD STANDARDS FOR FEDERAL SERVICES

This standard was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal Agencies.

Beneficial comments (recommendations, addition, deletions) and pertinent data which may be of use in improving this document should be addressed to: Defense Industrial Supply Center (Code DISC-ETT) 700 Robbins Avenue, Philadelphia, PA 19111-5096 by using the self addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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## INFORMATION SHEET ON FEDERAL STANDARDS

This Federal Standard is issued in loose-leaf form to permit the insertion or removal of new or revised pages and sections.

All users of Federal Standards should keep them up to date by inserting revised or new pages as issued and removing superseded and cancelled pages.

New and revised pages will be issued under Change Notices which will be numbered consecutively and will bear the date of issuance. Change Notices should be retained and filed in front of the Standard until such time as they are superseded by a reissue of the entire Standard.

### FOREWORD

This Standard was developed to provide dimensional data requirements for screw threads including, as necessary, those relating to gages and gaging systems as well as other information associated with the purchase/use of interchangeable threaded parts by Federal Government agencies. So far as practicable, these data are intended to conform to generally accepted commercial practice, although certain special requirements of the Federal Services may necessitate the inclusion of some which are not generally applicable outside the Federal Government. References are cited throughout the text to standards approved by the American National Standards Institute (ANSI) and to such other published standards as are in agreement with Federal Services' requirements.

FED-STD-H28, together with its detailed standard sections FED-STD-H28/1, FED-STD-H28/2, etc., superseded Handbook H28 Parts I, II and III.

FED-STD-H28A was prepared by the Defense Industrial Supply Center (DLA-IS) and is an update of FED-STD-H28 dated 31 March 1978 as modified by Change Notices 1, 2 and 3.

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1. **Scope.** This standard includes the basic screw thread dimensional and acceptability requirements for common screw thread forms and applications. Design and use information are also provided when necessary. Specific requirements for particular screw threads, gages, etc., are covered by detailed standard sections.

2.1 **Government publications.** The issues of the following documents in effect on the date of invitation for bids or request for proposal form a part of this standard to the extent specified herein.

#### FEDERAL STANDARDS

FED-STD-H28/1 - Nomenclature, Definitions, and Letter Symbols for Screw Threads

FED-STD-H28/2 - Unified Inch Screw Threads - UN and UNR Thread Forms

FED-STD-H28/3 - CANCELED AND SUPERSEDED by FED-STD-H28/2

FED-STD-H28/4 - Controlled Radius Root Screw Threads, UNJ Symbol

FED-STD-H28/5 - Unified Miniature Screw Threads

FED-STD-H28/6 - Gages and Gaging for Unified Screw Threads - UN and UNR Thread Forms

FED-STD-H28/7 - Pipe Threads, General Purpose

FED-STD-H28/8 - Dryseal Pipe Threads

FED-STD-H28/9 - Gas Cylinder Valve Outlet and Inlet Threads

FED-STD-H28/10 - American National Hose Coupling and Fire-Hose Coupling Threads

FED-STD-H28/11 - Hose Connections for Welding and Cutting Equipment

FED-STD-H28/12 - Acme Threads

FED-STD-H28/13 - Stub Acme Threads

FED-STD-H28/14 - Buttress Screw Threads - 7°/45° Flank Angles

FED-STD-H28/15 - Rolled Threads for Screw-Shells for Electric Lampholders and Lamp Bases

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FED-STD-H28/16 - Microscope Objective and Nosepiece Threads, 0.8000 - 36AMO

FED-STD-H28/17 - Surveying Instrument Mounting Threads

FED-STD-H28/18 - Photographic Equipment Threads

FED-STD-H28/19 - Miscellaneous Threads

FED-STD-H28/20 - Inspection Methods for Acceptability of UN, UNR, UNJ, M and MJ  
Screw-Threads

FED-STD-H28/21 - Metric Screw-Threads

FED-STD-H28/22 - Gages and Gaging for Metric Screw Threads - M and MJ Thread Forms

FED-STD-H28/23 - Class 5 Interference-Fit Screw Threads

#### MILITARY STANDARDS

MIL-S-8879 - Screw Threads, Controlled Radius Root With Increased Minor Diameter,  
General Specification for

#### MILITARY HANDBOOKS

MIL-HDBK-60 - Threaded Fasteners - Tightening to Proper Tension

(Copies of the above documents are available from the Standardization Document Order Desk,  
Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Other publications. The following documents form a part of this standard to the extent  
specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or  
request for proposal shall apply.

#### AMERICAN NATIONAL STANDARDS

#### AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) PUBLICATIONS

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

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- ANSI/ASME B1.2 - Gages and Gaging for Unified Inch Screw Threads**
- ASME B1.3M - Screw Thread Gaging Systems for Dimensional Acceptability - Inch and Metric Screw Threads (UN, UNR, UNJ, M, and MJ)**
- ASME/ANSI B1.5 - Acme Screw Threads**
- ANSI/ASME B1.7M - Nomenclature, Definitions, and Letter Symbols for Screw Threads**
- ASME/ANSI B1.8 - Stub Acme Screw Threads**
- ANSI B1.9 - Buttress Inch Screw Threads**
- ASA B1.10 - Unified Miniature Screw Threads**
- ASA B1.11 - Microscope Objective Thread**
- ASME/ANSI B1.12 - Class 5 Interference-Fit Thread**
- ANSI/ASME B1.13M - Metric Screw Threads - M Profile**
- ANSI/ASME B1.16M - Gages and Gaging for Metric M Screw Threads**
- ANSI/ASME B1.20.1 - Pipe Threads, General Purpose (Inch)**
- ANSI B1.20.3 - Dryseal Pipe Threads (Inch)**
- ASME B1.20.5 - Gaging for Dryseal Pipe Threads (Inch)**
- ASME B1.20.7 - Hose Coupling Screw Threads (Inch)**
- ANSI B1.21M - Metric Screw Threads - MJ Profile**
- ANSI/ASME B1.22M - Gages and Gaging for MJ Series Metric Screw Threads**
- ANSI B18.2.1 - Square and Hex Bolts and Screws, Inch Series**
- ASME/ANSI B18.2.2 - Square and Hex Nuts (Inch Series)**

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ANSI B18.6.2 - Slotted Head Cap Screws, Square Head Set Screws, and Slotted Headless Set Screws

ANSI B18.6.3 - Machine Screws and Machine Screw Nuts

ANSI B18.6.4 - Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) PUBLICATIONS

ANSI C81.61 - Electrical Lamp Bases

ANSI C81.62 - Lampholders for Electric Lamps

ANSI C81.63 - Gauges for Electric Lamp Bases and Lampholders

ANSI PH3.101 - Photography (Cameras) - Tripod Connections for American Cameras (1/4-Inch-20 Thread)

ANSI PH3.102 - Photography (Cameras) - Tripod Connections for Heavy-Duty or Imported Cameras 3/8-Inch-16 Thread With Adapter for 1/4-Inch-20 Tripod Screws)

ANSI PH3.103 - Photography (Cameras) - Lens Barrel Attachment Threads for Lens Accessories

ANSI PH3.107 - Photography (Cameras) - Shutter Cable Release and Socket - Dimensions

SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS (SMPTE) PUBLICATION

ANSI/SMPTE 76 - Motion-Picture Cameras - 16- and 8- mm Threaded Lens Mounts

NATIONAL FIRE PROTECTION ASSOCIATION PUBLICATION

NFPA 1963 - Screw Threads and Gaskets for Fire Hose Connections

COMPRESSED GAS ASSOCIATION (CGA) PUBLICATION

ANSI/CSA/CGA V-1- Compressed Gas Cylinder Valve Outlet and Inlet Connections

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(Copies of the above documents are available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036-8002 or from the applicable publisher:

American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017-2392

or

Society of Motion Picture and Television Engineers, 595 West Hartsdale Avenue, White Plains, NY 10607-1824

or

National Fire Protection Association, One Batterymarch Park, Quincy, MA 02169-7473

or

Compressed Gas Association, 1725 Jefferson Davis Highway, Arlington, VA 22202-4102)

### COMPRESSED GAS ASSOCIATION PUBLICATION

CGA E-1 - Standard Connections for Regulator Outlets, Torches and Fitted Hose for Welding and Cutting Equipment

Copies of the above document are available from the Compressed Gas Association, 1725 Jefferson Davis Highway, Arlington, VA 22202-4102)

3. Definitions. The terms applicable to FED-STD-H28 are in accordance with FED-STD-H28/1 and the other individual FED-STD-H28 standard sections listed in 2.1.

4. General requirements. The applicable FED-STD-H28 section standards shall be selected from the listing in 2.1.

5. Detailed requirements. Not applicable.

6. Notes.

6.1 Related industry standards. The following is a listing of industry standards related to, but not necessarily identical to, the subjects covered in the section standards of FED-STD-H28. Industry standards incorporated, by reference, in the section standards, are indicated by an asterisk (\*).

FED-STD-H28/1 - ANSI/ASME B1.7M\*

FED-STD-H28/2 - ASME B1.1\*

FED-STD-H28/4 - ASME B1.15 (Not issued as of 15 December 1994)

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FED-STD-H28/5 - ANSI B1.10

FED-STD-H28/6 - ANSI/ASME B1.2\*

FED-STD-H28/7 - ANSI/ASME B1.20.1\*

FED-STD-H28/8 - ANSI B1.20.3\* and ASME B1.20.5\*

FED-STD-H28/9 - ANSI/CSA/CGA V-1\*

FED-STD-H28/10- ASME B1.20.7\* and NFPA 1963\*

FED-STD-H28/11- CGA E-1

FED-STD-H28/12 - ASME/ANSI B1.5\*

FED-STD-H28/13 - ASME/ANSI B1.8\*

FED-STD-H28/14 - ANSI B1.9\*

FED-STD-H28/15 - ANSI C81.61\*, C81.62\*, C81.63\*

FED-STD-H28/16 - ANSI B1.11

FED-STD-H28/17 -

FED-STD-H28/18 - ANSI PH3.101\*, 102\*, 103\*, 107\* and ANSI/SMPTE 76\*

FED-STD-H28/19 -

FED-STD-H28/20 - ASME B1.3M\*

FED-STD-H28/21 - ANSI/ASME B1.13M\* and ANSI B1.21M\*

FED-STD-H28/22 - ANSI/ASME B1.16M\*, B1.22M\*

FED-STD-H28/23 - ASME/ANSI B1.12\*



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6.2 Appendices. The following is a list of appendices which had been part of FED-STD-H28 or the cancelled Handbook H28. Their disposition and action date are indicated.

- A1 - American National Form of Thread Series for Bolts, Machine Screws, Nuts, Tapped Holes and General Applications (Superseded 20 August 1991 by FED-STD-H28/2)
- A2 - American National Screw Threads of Special Diameters, Pitches, and Lengths of Engagement (Deleted by the 1969 Issue of Handbook H28)
- A3 - Recommended Hole Size Limits Before Threading and Tap Drill Sizes (Superseded 20 April 1984 by FED-STD-H28/2)
- A4 - Methods of Wire Measurements of Pitch Diameter of 60° Threads (Superseded 5 March 1985 by FED-STD-H28/6, /7, and /8)
- A5 - Design of Special Threads (Superseded 20 April 1984 by FED-STD-H28/2)
- A6 - References (Deleted by the 1969 issue of Handbook H28)
- A7 - Supplementary Pipe Thread Information (Superseded 25 October 1984 by FED-STD-H28/7 and /8)
- A8 - Geometry of Taper Screw Threads (Deleted by this Issue of FED-STD-H28)
- A9 - Extent of Usage of the American National Fire-Hose Coupling Threads on Couplings and Nipples Used With 2 1/2 Inch Nominal Size Fire Hose (Cancelled 21 June 1993 by FED-STD-H28/10)
- A10 - Wrench Openings (Superseded 20 January 1989 - see ANSI B18.2.1, ASME/ANSI B18.2.2, ANSI B18.6.3, and ANSI B18.6.4)
- A11 - Class 5 Interference-Fit Threads (Superseded 20 January 1989 by FED-STD-H28/23)
- A12 - The Tightening of Threaded Fasteners to Proper Tension (Superseded 12 March 1990 by MIL-HDBK-60)
- A13 - Three-Wire Method of Measurement of Pitch Diameter of 29° Acme, 29° Stub Acme and Buttress Threads (Superseded 20 September 1989 by FED-STD-H28/12, /13 and /14)
- A14 - Metric Screw Thread Standards (Superseded 31 May 1977 by FED-STD-H28/21)

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MILITARY INTERESTS:

Custodians:

Army - AR  
Navy - AS  
Air Force - 99

CIVIL AGENCY COORDINATION ACTIVITY:

GSA - 7FXE

PREPARING ACTIVITY:

DLA - IS

(DoD Project THDS-0102)

## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

## INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

<b>1. RECOMMEND A CHANGE:</b>		1. DOCUMENT NUMBER FED-STD-H28A	2. DOCUMENT DATE (YYMMDD) 941228
3. DOCUMENT TITLE SCREW-THREAD STANDARDS FOR FEDERAL SERVICES			
4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach sheets if needed.)			
5. REASON FOR RECOMMENDATION			
<b>6. SUBMITTER</b>			
a. NAME (Last, First, Middle Initial)		b. ORGANIZATION	
c. ADDRESS (Include Zip Code)		d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)
<b>8. PREPARING ACTIVITY DLA-IS</b>			
a. NAME Eli Schwartz		b. TELEPHONE (Include Area Code) (1) Commercial (215) 697-3637 (2) AUTOVON 442-3637	
c. ADDRESS (Include Zip Code) DEFENSE INDUSTRIAL SUPPLY CENTER 700 ROBBINS AVENUE, BLDG. 3 (CODE DISC-ETT) PHILADELPHIA, PA 19111-5096		IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	