ASME B18.2.5M-2013
(Revision of ASME B18.2.5M-2009)

Metric 12-Point Flange Head Screws

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

INTENTIONALLY LEFT BLANK

ASME B18.2.5M-2013
(Revision of ASME B18.2.5M-2009)

Metric 12-Point Flange Head Screws

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers
Two Park Avenue • New York, NY • 10016 USA

Date of Issuance: May 22, 2013

This Standard will be revised when the Society approves the issuance of a new edition.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Periodically certain actions of the ASME B18 Committee may be published as Cases. Cases and interpretations are published on the ASME Web site under the Committee Pages at http://cstools.asme.org/ as they are issued.

Errata to codes and standards may be posted on the ASME Web site under the Committee Pages to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in codes and standards. Such errata shall be used on the date posted.

The Committee Pages can be found at http://cstools.asme.org/. There is an option available to automatically receive an e-mail notification when errata are posted to a particular code or standard. This option can be found on the appropriate Committee Page after selecting "Errata" in the "Publication Information" section.

The American Society of Mechanical Engineers
Two Park Avenue, New York, NY 10016-5990

CONTENTS

FOREWORD

The ASME B18 Standards Committee for the standardization of bolts, screws, nuts, rivets, and similar fasteners was organized in March 1922 as Sectional Committee B18 under the aegis of the American Engineering Standards Committee (later the American Standards Association, then the United States of America Standards Institute and, as of October 6, 1969, the American National Standards Institute, Inc.), with the Society of Automotive Engineers and the American Society of Mechanical Engineers (ASME) as joint sponsors. In subsequent years, the Committee came under the sole sponsorship of ASME.

Subcommittee 2 was established and charged with the responsibility for technical content of standards covering wrench head bolts and nuts. In the late 1980s, a draft of B18.2.5M was created and revised for approval. However, in April of 1995, efforts to finalize a draft of this Standard were abandoned. At its meeting on November 28, 2006, Subcommittee 2 again took to the development of this Standard, which was the result of those efforts.

During 2011, a number of issues that needed correcting were brought to the attention of the B18.2 Subcommittee, resulting in this revision. The changes that were made to this Standard conform with other B18 Standards and improve the quality assurance of ASME B18.18.4 through B18.18.

Additionally, the material references for steel screws were changed from ASTM F568M (which has been withdrawn) to ISO 898-1, and the reference for stainless steel was changed from ASTM F738M to ISO 3506-1. The drawings associated with Tables 1 and 2, and the L_G and L_S dimensions for M36 in Table 9, were corrected.

Suggestions for improvement of this Standard are welcome. They should be sent to The American Society of Mechanical Engineers; Attn: Secretary, B18 Standards Committee; Two Park Avenue; New York, NY 10016-5990.

This Standard was approved as an American National Standard on March 13, 2013.

ASME B18 COMMITTEE
Standardization of Bolts, Nuts, Rivets, Screws, Washers, and Similar Fasteners

(The following is the roster of the Committee at the time of approval of this Standard.)

STANDARDS COMMITTEE OFFICERS

J. Greenslade, *Chair*
D. S. George, *Vice Chair*
W. H. King, *Vice Chair*
C. J. Gomez, *Secretary*

STANDARDS COMMITTEE PERSONNEL

V. Cartina, Nylok
D. A. Clever, *Contributing Member,* Consultant
A. P. Cockman, Ford Motor Co.
C. D. de la Garza, TSP, Inc.
D. S. George, Ramco Specialties
C. J. Gomez, The American Society of Mechanical Engineers
J. Greenslade, Industrial Fasteners Institute
J. J. Grey, *Contributing Member,* Fastener Consulting Services, Inc.
A. Herskovitz, *Contributing Member,* Consultant
J. Hubbard, Leland-Powell Fasteners, Inc.
J. C. Jennings, *Contributing Member,* Naval Surface Warfare Center
W. H. King, Porteous Fastener Co.
M. D. Prasad, *Contributing Member,* Global M&F Solutions, Inc.
S. Savoji, *Contributing Member,* ITW Medalist
Q. M. Smith III, Oregon Department of Transportation
D. J. Soscia, General Dynamics Electric Boat Corp.
W. R. Stevens, Ramco
R. D. Strong, Doerken Corp.
C. B. Wackrow, MNP Corp.
W. K. Wilcox, Consultant
C. B. Williamson, Fastenal Co.
C. J. Wilson, Consultant
J. G. Zeratsky, *Contributing Member,* National Rivet and Manufacturing Co.

SUBCOMMITTEE 2 — EXTERNALLY DRIVEN FASTENERS

J. Greenslade, *Chair,* Industrial Fasteners Institute
C. B. Williamson, *Vice Chair,* Fastenal Co.
V. Cartina, Nylok
L. Claus, Consultant
D. A. Clever, Consultant
A. P. Cockman, Ford Motor Co.
C. D. de la Garza, TSP, Inc.
B. A. Dusina, Federal Screw Works
M. A. Elmi, Consultant
J. S. Foote, Trade Association Management, Inc.
D. S. George, Ramco Specialties
A. Herskovitz, Consultant
M. W. Holubecki, Electric Boat Corp.
J. Hubbard, Leland-Powell Fasteners, Inc.
J. C. Jennings, *Contributing Member,* Naval Surface Warfare Center
W. H. King, Porteous Fastener Co.
J. F. McCarrick, Defense Supply Center Philadelphia
D. A. McCrindle, Canadian Fasteners Institute
R. B. Meade, Atrona Material Testing Laboratories, Inc.
S. Savoji, ITW Medalist
R. M. Serabin, Freundlich Supply Co.
D. F. Sharp, GMS Structural Engineers
G. M. Simpson, Semblex Corp.
Q. M. Smith III, Oregon Department of Transportation
W. R. Stevens, Ramco
R. D. Strong, Doerken Corp.
R. L. Tennis, Consultant
S. W. Vass, Consultant
C. B. Wackrow, MNP Corp.
W. K. Wilcox, Consultant
C. J. Wilson, Consultant

CORRESPONDENCE WITH THE B18 COMMITTEE

General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B18 Standards Committee
The American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990
http://go.asme.org/Inquiry

Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Proposing a Case. Cases may be issued for the purpose of providing alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee Web page.

Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the Standard, the paragraph, figure or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the Standard to which the proposed Case applies.

Interpretations. Upon request, the B18 Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the B18 Standards Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

Subject: Cite the applicable paragraph number(s) and the topic of the inquiry.
Edition: Cite the applicable edition of the Standard for which the interpretation is being requested.
Question: Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in this format may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The B18 Standards Committee regularly holds meetings that are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B18 Standards Committee.

INTENTIONALLY LEFT BLANK

METRIC 12-POINT FLANGE HEAD SCREWS

1 SCOPE

This Standard covers the complete dimensional and general data for coarse thread metric series 12-point flange screws recognized as American National Standard. The inclusion of dimensional data in this Standard is not intended to imply that all products described are stock production items.

2 COMPARISONS WITH ISO STANDARDS

Letter symbols designating dimensional characteristics are in accord with ISO 225, except where capital letters instead of lowercase letters have been used in the ISO standards.

3 REFERENCED STANDARDS

The following is a list of publications referenced in this Standard. Unless otherwise specified, the standard(s) referenced shall be the most recently issued at the time of order placement.

ASME B1.3M, Screw Thread Gaging Systems for Dimensional Acceptability — Inch and Metric Threads (UN, UNR, UNJ, M, and MJ)

ASME B1.13M, Metric Screw Threads — M Profile

ASME B18.2.8, Clearance Holes for Bolts, Screws, and Studs

ASME B18.2.9, Straightness Gage and Gaging for Bolts and Screws

ASME B18.12, Glossary of Terms for Mechanical Fasteners

ASME B18.18, Quality Assurance for Fasteners

ASME B18.24, Part Identifying Number (PIN) Code System Standard for B18 Externally Threaded Fasteners

ASME Y14.5, Dimensioning and Tolerancing

Publisher: The American Society of Mechanical Engineers (ASME), Two Park Avenue, New York, NY 10016-5990; Order Department: 22 Law Drive, Box 2900, Fairfield, NJ 07007-2900 (www.asme.org)

ASTM F468M Standard Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use

ASTM F788/F788M, Standard Specification for Surface Discontinuities of Bolts, Screws and Studs, Inch and Metric Series

Publisher: American Society for Testing and Materials (ASTM International), 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2559 (www.astm.org)

ISO 225, Fasteners — Bolts, screws, studs, and nuts — Symbols and descriptions of dimensions

ISO 898-1, Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread

ISO 3506-1, Mechanical properties of corrosion-resistant stainless steel fasteners — Part 1: Bolts, screws and studs

Publisher: International Organization for Standardization (ISO), 1 ch. de la Voie-Creuse, Case postale 56, CH-1211 Genève 20, Switzerland/Suisse (www.iso.org)

4 TERMINOLOGY

For definitions of terms relating to fasteners or features thereof used in this Standard, refer to ASME B18.12.

5 DIMENSIONS

(a) All dimensions in this Standard are given in millimeters (mm), and apply before any coating, unless stated otherwise.

(b) Symbols specifying geometric characteristics are in accordance with ASME Y14.5.

6 TOP OF HEAD

The top of head shall be chamfered or rounded with diameter of chamfer circle or start of rounding being equal to maximum width across flats within a tolerance of −15% of maximum width across flats.

7 HEAD HEIGHT

The head height, K, is the distance, parallel to the axis of the screw, from the plane of the bearing circle to the top of the head, not including any raised markings (see section 21).

8 WRENCHING HEIGHT

Corners of the 12 points shall be fully formed and reasonably uniform over the wrenching height, K_w .