

ASME B18.16M-2004

# Prevailing-Torque Type Steel Metric Hex Nuts and Hex Flange Nuts

Revision and Consolidation of ASME B18.16.1M, B18.16.2M,  
and B18.16.3M

AN AMERICAN NATIONAL STANDARD



The American Society of  
Mechanical Engineers

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# FOREWORD

American National Standards Committee B18 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, 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 as joint sponsors. Subcommittee 16 was established in 1961 and charged with the responsibility for technical content of standards covering prevailing-torque nuts.

In 1972 the International Organization for Standardization published standards ISO 2320 and ISO 2358, covering the mechanical and performance properties and dimensions of metric series hexagon prevailing-torque type nuts, respectively.

In December 1974, Committee B18 directed Subcommittee 16 to discontinue work on standards for inch series prevailing-torque type hex nuts and to develop standards for metric series nuts.

As a result, ASME B18.16.1M-1979, ASME B18.16.2M-1979, and ASME B18.16.3M-1982 were approved. B18.16.3M was revised in 1998 to better meet the needs of conformance with Public Law 100-592. The revision defined those dimensions or characteristics which should be certified to assure product fit, form, and function. Other dimensions given would only be examined in the event of a dispute. Additionally, the Subcommittee removed the bearing surface finish requirement from the dimensional tables. It was felt that the torque at tension requirements of B18.16.2M-1979 adequately addressed the functional need for this characteristic.

This Standard, ASME B18.16M-2004, is a revision and consolidation of ASME B18.16.1M-1979, ASME B18.16.2M-1979, and ASME B18.16.3M-1998.

This Standard was approved as an American National Standard on September 9, 2004.

# ASME B18 STANDARDS 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.)

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# 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  
Three Park Avenue  
New York, NY 10016-5990

**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.

**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 which are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in this format will be rewritten in this 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, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B18 Standards Committee.

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# PREVAILING-TORQUE TYPE STEEL METRIC HEX NUTS AND HEX FLANGE NUTS

## 1 SCOPE

This Standard covers the complete general, dimensional, mechanical, and performance data for metric prevailing-torque hex nuts and hex flange nuts of property classes 5, 9, and 10 as defined in ASTM A563M.

The inclusion of dimensional data in this Standard is not intended to imply that all of the nut sizes in conjunction with the various options described herein are stock items. Consumers should consult with suppliers concerning lists of stock production prevailing-torque hex and hex flange nuts.

## 2 COMPARISON WITH ISO STANDARDS

### 2.1 Coordination With ISO Standards

Hex and hex flange nuts as covered in this Standard have been coordinated to the extent possible with ISO 2320, ISO 7040, ISO 7041, ISO 7042, ISO 7043, ISO 7044, ISO 7719, and ISO 7720. The dimensional differences are few, except those of the M10 size. None affect the functional interchangeability of nuts manufactured to the requirements of either. The clamp torque values in Table 4 of this Standard are significantly different compared to the applied torques in ISO 2320 Annex C. ISO 2320 does not make any coating distinctions.

### 2.2 Letter Symbols

Letter symbols designating dimensional characteristics are in accord with those used in ISO standards, except that capitals have been used instead of lower case letters used in ISO standards.

### 2.3 ISO Width Across Flats

M10 hex and hex flange nuts with 15 mm width across flats are currently being produced and used in the U.S. and many other countries. This width across flats is not ISO standard for hex nuts, but is ISO standard for hex flange nuts. The ISO standard for M10 hex nuts specifies 16 mm width across flats. Unless M10 hex nuts with 15 mm width across flats are specifically ordered, M10 hex nuts with 16 mm width across flats shall be furnished.

## 3 REFERENCE STANDARDS

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

- ASME B1.3M, Screw Thread Gaging Systems for Dimensional Acceptability—Inch and Metric Screw Threads (UN, UNR, UNJ, M and MJ)
- ASME B1.13M, Metric Screw Threads—M Profile
- ASME B18.2.3.1M, Metric Hex Cap Screws
- ASME B18.12, Glossary of Terms for Mechanical Fasteners
- ASME B18.18.1, Inspection and Quality Assurance for General Purpose Fasteners
- ASME B18.18.2, Inspection and Quality Assurance for High Volume Machine Assembly Fasteners
- ASME B18.24, Part Identifying Number (PIN) Code System Standard for B18 Fastener Products
- ASME Y14.5M, Dimensioning and Tolerancing  
Publisher: The American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990; Order Department: 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900
- ASTM A563M, Carbon and Alloy Steel Nuts (Metric)
- ASTM B487, Test Method for Measurement of Metal and Oxide Coating Thicknesses by Microscopical Examination of a Cross Section
- ASTM F467M, Nonferrous Nuts for General Use [Metric]
- ASTM F586M, Carbon and Alloy Steel Externally Threaded Metric Fasteners
- ASTM F812/F812M, Surface Discontinuities of Nuts
- ASTM F836M, Style 1 Stainless Steel Metric Nuts
- ASTM F1137, Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners  
Publisher: American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959
- ISO 2320, Prevailing torque type steel hexagon nuts—Mechanical and performance properties
- ISO 7040, Prevailing torque type hexagon nuts (with non-metallic insert), style 1—Property classes 5, 8 and 10
- ISO 7041, Prevailing torque type nuts (with non-metallic insert), style 2—Property classes 9 and 12