

ASME B1.7-2006
(Revision of ANSI/ASME B1.7M-1984)

Screw Threads: Nomenclature, Definitions, and Letter Symbols

AN AMERICAN NATIONAL STANDARD



The American Society of
Mechanical Engineers

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Three Park Avenue • New York, NY 10016

Date of Issuance: November 17, 2006

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FOREWORD

The first revision of ASA B1.7-1949, the first American Standard on Nomenclature, Definitions, and Letter Symbols for Screw Threads, was approved in January 1965. These earlier definitions and symbols were subsequently published as appendix material in ASA B1.1, B2.1, and B2.2. As such they underwent some revision over the years. A draft based on such revisions, dated July 1961, was prepared by Subcommittee 8 and widely circulated by the sponsors for comment. Extensive comments were received from members of Sectional Committee B1, B2, B4, and others, which were reviewed and acted upon at a meeting of Subcommittee 8, held November 28, 1961.

A second revised draft, dated July 1962, was prepared and submitted to the American-British-Canadian Conference on Engineering Standards, held in Harriman, New York on September 22-26, 1962. Suggested revisions agreed upon by the conference were embodied in the draft, which was then submitted to letter ballot by Sectional Committees B1 and B2 on July 9, 1963.

Further refinements were made in the proposal because of comments received from the sectional committee ballots, and a new draft was issued in May 1964. The draft was submitted to the American Standards Association for approval and designation as an American Standard. This was granted on January 19, 1965, and reaffirmed in 1972 by the American National Standards Institute as American National Standard ANSI B1.7.

Following the 1972 reaffirmation, comments from members of the American National Standards Committee B1, and others, indicated that a complete revision be undertaken. A new draft was prepared and submitted in March 1975 to Subcommittee 8 for review and approval. After numerous comments and subsequent changes, the proposed standard was submitted to and approved by American National Standards Committee B1. The document was then transmitted to the Secretariat and ANSI in October 1976. It was approved as an American National Standard, ANSI B1.7-1977, on September 16, 1977.

Within the period from 1977 to 1984 there was considerable B1 standards activity in the development of metric screw thread standards for U.S. usage. ISO standards were blended with ANSI standards, requiring many revisions in ANSI symbology and definitions of terms. ISO symbols were adopted, except those where a change from American practice would confuse the general understanding of the elements symbolized. Also, many ISO definitions were incorporated into American definitions in order to facilitate the correct interpretation of both ISO and ANSI terminology. These revisions were approved and designated as American National Standard ANSI/ASME B1.7M-1984, on November 2, 1984.

Screw thread standards are constantly being revised as required by the ASME B1 Committee. Additionally, the title of this document was changed to "Screw Threads: Nomenclature, Definitions, and Letter Symbols." This revision was approved and designated by the American National Standards Institute on September 11, 2006.

ASME B1 COMMITTEE

Screw Threads

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

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D. S. George, *Vice Chair*
A. L. Guzman, *Secretary*

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SCREW THREADS: NOMENCLATURE, DEFINITIONS, AND LETTER SYMBOLS

1 GENERAL

1.1 Scope

The purpose of this Standard is to establish a uniform practice for standard screw threads with regard to the following:

- (a) screw thread nomenclature
- (b) letter symbols for the designating features of a screw thread for use on drawings, in tables that set forth dimensional standards, in other records, and for expressing mathematical relationship

This Standard consists of: a glossary of terms, illustrations, an illustrated table showing the application of symbols, and a table of thread series designations. Many of the terms and symbols specified in this Standard vary considerably from those prior to the 1984 issue, because ISO terms and symbols have been adopted where the intended definition is the same.

1.2 References

The following is a list of publications referenced in this Standard.

- ANSI/CGA V-1, National Gas Screw Threads¹
 Publisher: Canadian Gas Association (CGA), 350 Sparks Street, Ottawa, Ontario K1R 7S8, Canada
- ASME B1.20.7, Hose Coupling Screw Threads
 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 2300, Fairfield, NJ 07007-2300
- ISO 7-1, Pipe Threads Where Pressure Tight Joints are Made on Threads—Part 1: Designation, Dimensions, and Tolerances
- ISO 228-1, Pipe Threads Where Pressure Tight Joints are Not Made on the Threads—Part 1: Designation, Dimensions, and Tolerances
- ISO 15001, ISO General Purpose Metric Screw Thread—Gating
- ISO 2901, ISO Metric Trapezoidal Screw Threads
- ISO 2902, ISO Metric Trapezoidal Screw Threads
- ISO 2903, ISO Metric Trapezoidal Screw Threads
- ISO 2904, ISO Metric Trapezoidal Screw Threads
- ISO/R1501, ISO Miniature Screw Threads

¹ May also be obtained from American National Standards Institute (ANSI), 25 West 43rd Street, New York, NY 10036.

Publisher: International Organization for Standardization (ISO), 1 rue de Varembe, Case Postal 56, CH-1211, Genève 20, Switzerland/Suisse

1.3 Federal Government Use

When this Standard is approved by the Department of Defense and Federal agencies, and is incorporated into FED-STD-H28/1, *Screw Thread Standards for Federal Services, Section 1*, the use of this Standard by the Federal Government is subject to all requirements and limitations of FED-STD-H28/1.

2 DEFINITION OF TERMS

The definitions presented herein are listed alphabetically and apply generally to all forms of screw threads, thread gages, and thread measurements. They relate to the following:

- (a) types of screw threads
- (b) size and fit of threaded parts in general
- (c) geometric elements, attributes, and dimensions of screw threads

ISO nomenclature is used where the exact meaning is coincident with the U.S. practice.

actual fit: the measured difference, subject to measurement uncertainty, before assembly, between the sizes of two mating parts that are to be assembled.

actual size: the measured size of a characteristic or element subject to measurement uncertainty.

addendum: the addendum of an external thread is the radial distance between the major and pitch cylinders or cones, respectively. The addendum of an internal thread is the radial distance between the minor and pitch cylinders or cones, respectively. This term applies to those threads having a recognized pitch cylinder or pitch cone.

allowance: a prescribed difference between the maximum material limits of mating parts. It is the minimum clearance (positive allowance) or maximum interference (negative allowance) between such parts. It is numerically equal to the absolute value of ISO term fundamental deviation (see Fig. 1).

attribute: nondimensional thread element(s) and characteristic(s), taken singly or in a group. Inspection/evaluation by limit gages is an attribute inspection.

axis of thread: the axis of the thread pitch cylinder or cone (see Fig. 2).