ASME B1.30-2002
(Revision of ASME B1.30M-1992)

REAFFIRMED 2022

SCREW THREADS: STANDARD PRACTICE FOR CALCULATING AND ROUNDING DIMENSIONS

AN AMERICAN NATIONAL STANDARD

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This Standard will be revised when the Society approves the issuance of a new edition. There will be no addenda or written interpretations of the requirements of this Standard issued to this edition.

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

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FOREWORD

The American National Standards Committee B1 for standardization of screw threads was organized in 1920 as sectional Committee B1 under the sponsorship 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 as joint sponsors. As a result, a great deal of effort was expended through the years toward development of several screw thread standards.

Recognizing the need to standardize the method of rounding decimal values in the calculation of screw thread dimemsions, the ASME Standards Committee B1 charged Subcommittee 30 with the responsibility for producing such a standard.

This Standard designated ASME B1.30 was developed only to serve as the basis for rounding of decimal values associated with the computation of screw thread dimensions.

The examples and formulas depicted within this Standard are for reference only and are presented only to clarify the rounding procedures described. When calculating the different thread characteristics for a particular thread form, refer to the appropriate ASME B1 standard for the formulas and methodology of calculation for that thread.

This Standard was originally approved as an American National Standard on June 29, 1992. This issue updates the 1992 issue and includes:

(a) the addition of a note to para. 1.2 for the clarification of the use of this Standard for metric applications;

(b) the addition of an exception in para. 3.1.3 to the number of decimal places for the allowance 2A when used in intermediate calculations as $Td_{2;}$

(c) the addition of the maximum external UN minor diameter, maximum and minimum internal pitch diameters and the minimum internal major diameter to the example in para. 3.2.1;

(d) removal of Appendix A containing various common values for 60 deg thread elements. This was done because the values are either listed or can be calculated by formulas in other existing B1 standards;

(e) the addition of an example for a standard metric size that is listed in ASME B1.13M and ISO 261;

(f) the addition of an example for a special inch size showing how to round numbers with an infinite number of digits after the decimal point;

(g) added a new Appendix A with a table listing the number of decimal places for each of the thread characteristics used in the examples in B1.30.

Suggestions for improvement of this Standard will be welcome. They should be sent to Secretary, ASME B1 Standards Committee, Three Park Avenue, New York, NY 10016-5990 U.S.A.

This revision was approved as an American National Standard on July 12, 2002.

ASME STANDARDS COMMITTEE B1
Standardization and Unification of Screw Threads

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

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SCREW THREADS: STANDARD PRACTICE FOR CALCULATING AND ROUNDING DIMENSIONS

1 GENERAL

1.1 Purpose

The purpose of this Standard is to establish uniform and specific practices for calculating and rounding the numeric values used for inch and metric screw thread design data dimensions only. No attempt is made to establish a policy of rounding actual thread characteristics measured by the manufacturer or user of thread gages. Covered is the Standard Rounding Policy regarding the last figure or decimal place to be retained by a numeric value and the number of decimal places to be retained by values used in intermediate calculations of thread design data dimensions. Values calculated to this Standard for inch and metric screw thread design data dimensions may vary slightly from values shown in existing issues of ASME B1 screw thread standards and are to take precedence in all new or future revisions of ASME B1 standards as applicable except as noted in para. 1.2.

1.2 Metric Application

Allowances (fundamental deviations) and tolerances for metric M and MJ screw threads are based upon formulas, which appear in applicable standards. Values of allowances for standard tolerance positions and values of tolerances for standard tolerance grades are tabulated in these standards for a selection of pitches. Rounding rules specified below have not been applied to these values but have followed practices of the International Organization for Standardization (ISO). For pitches, which are not included in the tables, standard formulas and the rounding rules specified herein are applicable.

NOTE: ISO rounding practices, for screw thread tolerances and allowances, use rounding to the nearest values in the R40 series of numbers in accordance with ISO 3. In some cases, the rounded values have been adjusted to produce a smooth progression. Since the ISO rounded values have been standardized internationally, for metric screw threads, it would lead to confusion if tolerances and allowances were recalculated using B1.30 rules, for use in the USA. B1.30 rounding rules are, therefore, only applicable to special threads where tabulated values do not exist in ISO standards. Values calculated using the ISO R40 series values may differ from those calculated using B1.30. In such a case the special thread values generated using B1.30 take precedence.

2 ROUNDING OF DECIMAL VALUES

The following rounding practice represents the method to be used in all new or future revisions of ASME B1 thread standards.

NOTE: It is recognized that this Standard is not in agreement with other published documents, e.g., ASME SI-9, Guide for Metrication of Codes and Standards SI (Metric) Units, and IEEE/ASTM SI 10, Standard for Metric Practice. The rounding practices used in the forenamed documents are designed to produce even distribution of numerical values. The purpose of this document is to define the most practical and common used method of rounding numerical thread form values. Considering today's technology, application of this method is far more practical in the rounding of thread form values.

2.1 Rounding Policy

2.1.1 When the figure next beyond the last figure or place retained is less than 5, the figure in the last place retained is kept unchanged.

EXAMPLE:

1.012342	1.01234
1.012342	1.0123
1.012342	1.012

2.1.2 When the figure next beyond the last figure or place retained is greater than 5, the figure in the last place retained is increased by 1.

EXAMPLE:

1.56789	1.5679
1.56789	1.568
1.56789	1.57

2.1.3 When the figure next beyond the last figure or place retained is 5, and:

(a) there are no figures, or only zeros, beyond this 5, the last figure should be increased by 1;

EXAMPLE:

1.01235	1.0124
1.0123500	1.0124
1.012345	1.01235
1.01234500	1.01235

(b) if the 5 next beyond the figure in the last place to be retained are followed by any figures other than zero,