ASME B1.1-2024

(Revision of ASME B1.1-2019)

Unified Inch Screw Threads (UN, UNR, and UNJ Thread Forms)

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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The American Society of Mechanical Engineers
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Date of Issuance: June 28, 2024

The next edition of this Standard is scheduled for publication in 2029. This Standard will become effective 1 yr after the Date of Issuance.

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FOREWORD

ASME B1.1, Unified Inch Screw Threads, is an integrated system of threads for fastening purposes in mechanisms and structures. Its outstanding characteristic is its general interchangeability of threads, achieved through the standardization of thread form, diameter-pitch combinations, and limits of size.

This Standard is the outgrowth of and supersedes previous editions that were published as ASME B1-1924, ASME B1.1-1935, ASME B1.1-1949, ASME B1.1-1960, ASME B1.1-1974, ASME B1.1-1982, ASME B1.1-1989, ASME B1.1-2003, and ASME B1.1-2019.

The achievements represented by ASME B1.1 in development, standardization, and unification are the result of the cooperation and coordination of many organizations, including The American Society of Mechanical Engineers (ASME), SAE International (formerly Society of Automotive Engineers), National Institute of Science and Technology (formerly National Bureau of Standards), Committee B1, the former National Screw Thread Commission, the former Interdepartmental Screw Thread Committee, British Standards Institution, CSA Group (formerly Canadian Standards Association), and American National Standards Institute (ANSI).

This Standard has its basis in the work done more than a century ago by William Sellers in the United States and Sir Joseph Whitworth in Great Britain. Through the intervening years, there have been many developments and revisions, culminating in the Unified Thread Standard approved and adopted for use by all inch-using countries.

The unification of screw thread standards meets the need for interchangeability among the billions of fasteners made in different countries and used in the complex equipment of modern technology. Unification is equally important for the international trade in mechanisms of all kinds and the servicing of transportation equipment that moves from country to country. Unification is therefore not only highly advantageous but also essential.

Complete unification of certain thread series and six tolerance classes in sizes $\frac{1}{4}$ in. and larger was achieved with the signing of an accord in Washington, D.C., on November 18, 1948. Since that time, unification has extended to smaller sizes.

Developed by Technical Committee No. 1 of the International Organization for Standardization (ISO), the unified inch standard that was adopted as ISO 5864 is parallel to the ISO metric screw thread system. Both systems have a common basic profile. The standard was subject to Quadripartite Standardization Agreement (QSTAG) 247 in the ABCA Army Standardization Program of America, Britain, Canada, and Australia.

Throughout this history, special attention has been given to the practical aspects of thread standardization, and many details of ASME B1.1 result from studies and tests based on real-world use. For example, users communicated the need for free assembly in high-production industries and the desirability of providing for threads that require a coating. The tolerance Classes 2A and 2B were developed to meet these two major requirements as well as to provide a general standard for externally and internally threaded fasteners. Thread symbols and nomenclature are now consistent with ASME B1.7. Thread acceptability now follows ASME B1.3.

In 1992, ASME B1.30 implemented eight-place decimal and rounding rules that are mandatory for all new editions and future revisions of ASME B1 documents. To comply with this decision, ASME B1.1-2003 revised some of the values in Table 2 and created Nonmandatory Appendix E, Table E-1, which identifies and lists the revised dimensions from Table 2 in ASME B1.1-1989. The majority of the dimensional changes are within ±0.0001 in. As stated in para. 8.2.1, the values in this former Table 2, now Tables 2A and 2B, and Table E-1 should be considered acceptable until a future revision of this Standard makes the values in Tables 2A and 2B the only acceptable values.

ASME B1.1-1992 also moved Table 3B, which provided calculated values for various UNS (unified specials), to Nonmandatory Appendix D. The ASME B1 Committee strongly urges users to adopt the standard thread sizes in Tables 2A and 2B instead of those listed in Table D-1. ASME B1.1-1992 also moved Tables 31 through 40, which include some values that differed from those derived by use of the formulas in sections 5 and 8, to Nonmandatory Appendix D and redesignated these Tables D-2 through D-11. (All future special threads should be based on calculations only.)

In addition, ASME B1.1-1992 eliminated all references to thread engagement. Past changes in the thread form designation of the "basic" thread height from 0.7500H to 0.62500H confused the calculation of percent of thread engagement.

The 1992 edition also included the definition of "functional diameter" and added the term to Table 2 in the same column as "pitch diameter," since both characteristics have the same limits of size.

Finally, the 1992 edition explained in greater depth the effects of coating on threads (see section 7).

Changes to the 2019 edition included the splitting of ASME B1.1-2003, Table 2, which contained values for both internal and external threads for UN and UNR only, into two tables, Table 2A, Limits of Size for Standard Series External Threads (UN, UNR, and UNJ), and Table 2B, Limits of Size for Standard Series Internal Threads (UN, UNR, and UNJ). The metric translation of this Standard was removed, as were Tables D-2 through D-11.

The UNJ thread profile, formerly defined in ASME B1.15, was added to ASME B1.1-2019. Following the U.S. Department of Defense (DoD) approval of SAE AS8879C-2003, ASME B1 Subcommittee 15 recognized it would become the standard used by the aerospace industry for this thread form. As a result, Subcommittee 15 recommended that the technical information from ASME B1.15 be included in ASME B1.1 for nonaerospace applications.

The UNJ thread form having the enlarged root radius in the external thread was introduced to minimize size and weight in parts for applications requiring high-fatigue strength under high working-stress levels, as in aerospace applications. It is also appropriate for designs in commercial products where stresses are critical. To meet these requirements, the UNJ external thread root radius is designed to be between $0.15011107P$ and $0.18042196P$ and the minor diameter of the mating internal thread is increased to ensure the necessary clearance.

This Standard includes Classes 2A and 2B UNJ screw threads. Either Class 2A or Class 3A UNJ threads are appropriate for commercial applications commensurate with the fatigue and stress levels required.

The UNJ thread form is the UN thread form modified to $0.48713929P$ ($0.562500H$), which allows the $0.18042196P$ maximum root radius in the external thread. The first known U.S. standard of similar thread form was SAE AS82, published in March 1942, which describes a modified American National thread form to 75%h basic thread depth and specifies $0.10800P$ to $0.1800P$ root radius in the external thread. This thread was symbolized NR, National Round, and was developed for aircraft engine applications.

Tension fatigue testing of aircraft fasteners in 1942 demonstrated the importance of the external thread root contour in the fatigue life of a screw thread rolled after heat treatment. Fatigue testing isolated the elements of good external thread root design. The root should be radiused, not sharp. Theoretically, it should be a continuous circular arc, blending smoothly with the thread flanks. The radius should be as large as possible within the allowable design form. The root contour should also be smooth throughout and free of any imperfections, tool marks, or other minor notches.

Recognizing the need for improved 160,000 psi tensile strength bolts, the DoD published MIL-B-7838A, the bolt procurement specification for aircraft applications based on the unified thread form of $0.62500H$, in April 1952, thus acknowledging that a larger external root radius requires a shallower internal thread depth to clear the flank tangency point.

The root radius of the external thread was increased to $0.15011107P$ minimum and $0.18042196P$ maximum for the 180,000 psi and higher tensile strength bolts. This external thread form was developed in 1955 by the aerospace fastener industry and was known as the “Hi R” thread form.

Through coordinated effort with the SAE E-25 Engine and Propeller Standard Utility Parts Committee and the Aerospace Industries Association National Aerospace Standards Committee (NASC), the DoD developed and published in September 1960 the thread specification MIL-S-8879, which features the “Hi R” thread root radius in the external thread and the internal thread modified to $0.48713929P$ ($0.562500H$) basic. In aircraft gas turbine engines, the high-temperature threaded fasteners exhibited better elevated temperature performance using MIL-S-8879 UNJ thread root radius, as the stress-rupture life of bolts was greatly improved.

The UNJ thread form has been adopted by the aerospace industry as the all-purpose thread standard, except for electrical hardware and thread sizes 0.1380 and smaller, which may use the UN thread form.

The UNJ profile as defined in this Standard is similar to SAE AS8879C-2003 (superseding MIL-S-8879C) and equivalent to ISO 3161:1977 for thread Classes 3A and 3B. British Standards Institution BS 4084:1978, including Amendment 1, is technically identical to ISO 3161:1977, except for Appendix A, which provides information for a 20-UNJ constant pitch series for diameters through 3 in.

Changes to ASME B1.1-2024 include the following:

(a) correction of TD_2 to Td_2 in four places.

(b) correction of six minimum PD values in Table 2A by 0.0001.

(c) changing values of UNR max. minor diameter in Table 2A, column 13, due to a change in the $2h_s$ constant from $1.19078493P$ to $1.22686932P$.

(d) correction to the formula at the bottom of Tables 6 through 16 for the area at the minor diameter. Values in the applicable column in the tables were correct; the formula was written incorrectly. Therefore, $\pi[(D - 2h_b/2)^2)]$ is corrected to $\pi\{[(D - 2h_b)/2]^2\}$.

(e) revision of three notes pertaining to UNR in Figure 8, for better explanation and clarification.

(f) changing the wording of para. 5.2 so the length of engagement to be used is now defined. Previously, there was no length of engagement stated for the calculation of Classes 1A and 1B for 4-UN, 6-UN, and 8-UN threads.

(g) addition of a dotted line to Figure 12, so “D min. = D bsc” is not interpreted as requiring a radius.

(h) the following corrections to Table 18A:

(1) TD_2 to Td_2 in one place

(2) use of four decimal places rather than six in line (4)

(3) correction of "0.5000-23" to "0.5000-28" in table header

(i) deletion of references to *H* in section 10. ASME B1 volumes stopped using references to *H* in 2003. If the equivalent *H* values are needed, they can be found in Table 5. Other errors related to the use of *H*, including wrong values, incorrect references, and formulas written incorrectly, are also corrected in section 10.

(j) revisions in para. 10(f), of UNR h_s from $0.59539247P$ to $0.61343466P$ and in para. 10(r) of UNR $2h_s$ from $1.19078493P$ to $1.22686932P$.

ASME B1.1-2024 was approved by ANSI on May 7, 2024.

ASME B1 COMMITTEE
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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Revisions and Errata. The committee processes revisions to this Standard on a continuous basis 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 in the next edition of the Standard.

In addition, the committee may post errata on the committee web page. Errata become effective on the date posted. Users can register on the committee web page to receive e-mail notifications of posted errata.

This Standard is always open for comment, and the committee welcomes proposals for revisions. Such proposals should be as specific as possible, citing the paragraph number, the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent background information and supporting documentation.

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(a) The most common applications for cases are

(1) to permit early implementation of a revision based on an urgent need

(2) to provide alternative requirements

(3) to allow users to gain experience with alternative or potential additional requirements prior to incorporation directly into the Standard

(4) to permit the use of a new material or process

(b) Users are cautioned that not all jurisdictions or owners automatically accept cases. Cases are not to be considered as approving, recommending, certifying, or endorsing any proprietary or specific design, or as limiting in any way the freedom of manufacturers, constructors, or owners to choose any method of design or any form of construction that conforms to the Standard.

(c) A proposed case shall be written as a question and reply in the same format as existing cases. The proposal shall also include the following information:

(1) a statement of need and background information

(2) the urgency of the case (e.g., the case concerns a project that is underway or imminent)

(3) the Standard and the paragraph, figure, or table number

(4) the editions of the Standard to which the proposed case applies

(d) A case is effective for use when the public review process has been completed and it is approved by the cognizant supervisory board. Approved cases are posted on the committee web page.

Interpretations. The committee does not issue interpretations for this Standard.

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UNIFIED INCH SCREW THREADS (UN, UNR, AND UNJ THREAD FORMS)

1 GENERAL

1.1 Scope

This Standard specifies the thread form, series, class, allowance, tolerance, and designation for unified screw threads. (In order to emphasize that unified screw threads are based on inch modules, they may be denoted unified inch screw threads.) Several variations in thread form have been developed for unified threads; however, this Standard covers only UN, UNR, and UNJ thread forms.

The metric translation of this Standard that was in the 2003 edition has been removed (see Nonmandatory Appendix C). Nonmandatory Appendices D through F contain information that is supplementary to the sections of this Standard.

1.2 Unified Screw Thread Standards

The standards for unified screw threads published in this Standard are in agreement with formal standards of the International Organization for Standardization (ISO) for diameter-pitch combinations, designations, and tolerances for 60-deg triangular form inch screw threads. The unified screw thread symbols UN, UNC, UNF, and UNEF were derived by the addition of the letter "U" preceding the thread symbols used for American National screw threads N, NC, NF, and NEF.

Unified screw threads have their origin in an accord signed in Washington, D.C., on November 18, 1948, by representatives of standardizing bodies of Canada, the United Kingdom, and the United States and have subsequently superseded American National screw threads.

1.3 Thread Forms

UN applies to both internal and external threads. UNR applies only to external threads; the difference between UN and UNR threads, in addition to designation, is that a flat or rounded root contour due to tool wear is specified for UN threads, while only a defined rounded root contour is specified for UNR threads. Basic thread height is $0.54126588P$.

The UNJ screw thread is designed for use on highly stressed applications requiring high-fatigue strength. For aerospace applications, only Classes 3A and 3B should be used. Basic thread height is only $0.48713929P$ to permit a root radius larger than that of the UN and UNR forms.

1.4 Interchangeability

1.4.1 UN and UNR. Unified (UN/UNR) and its predecessor American National (N) screw threads have substantially the same thread form, and threads of both standards having the same diameter and pitch are mechanically interchangeable. The principal differences between these standards relate to the application of allowances, the variation of tolerances with size, differences in the amounts of pitch diameter tolerances for external and internal threads, and differences in thread designations. Unified inch and ISO metric screw threads are not mechanically interchangeable.

1.4.2 UNJ. UN and UNJ threads are interchangeable with the exception of UNJ-3A external threads, which at maximum material condition will not assemble with a UN internal thread of any class at maximum material condition (see Figure 1).

1.5 Designations

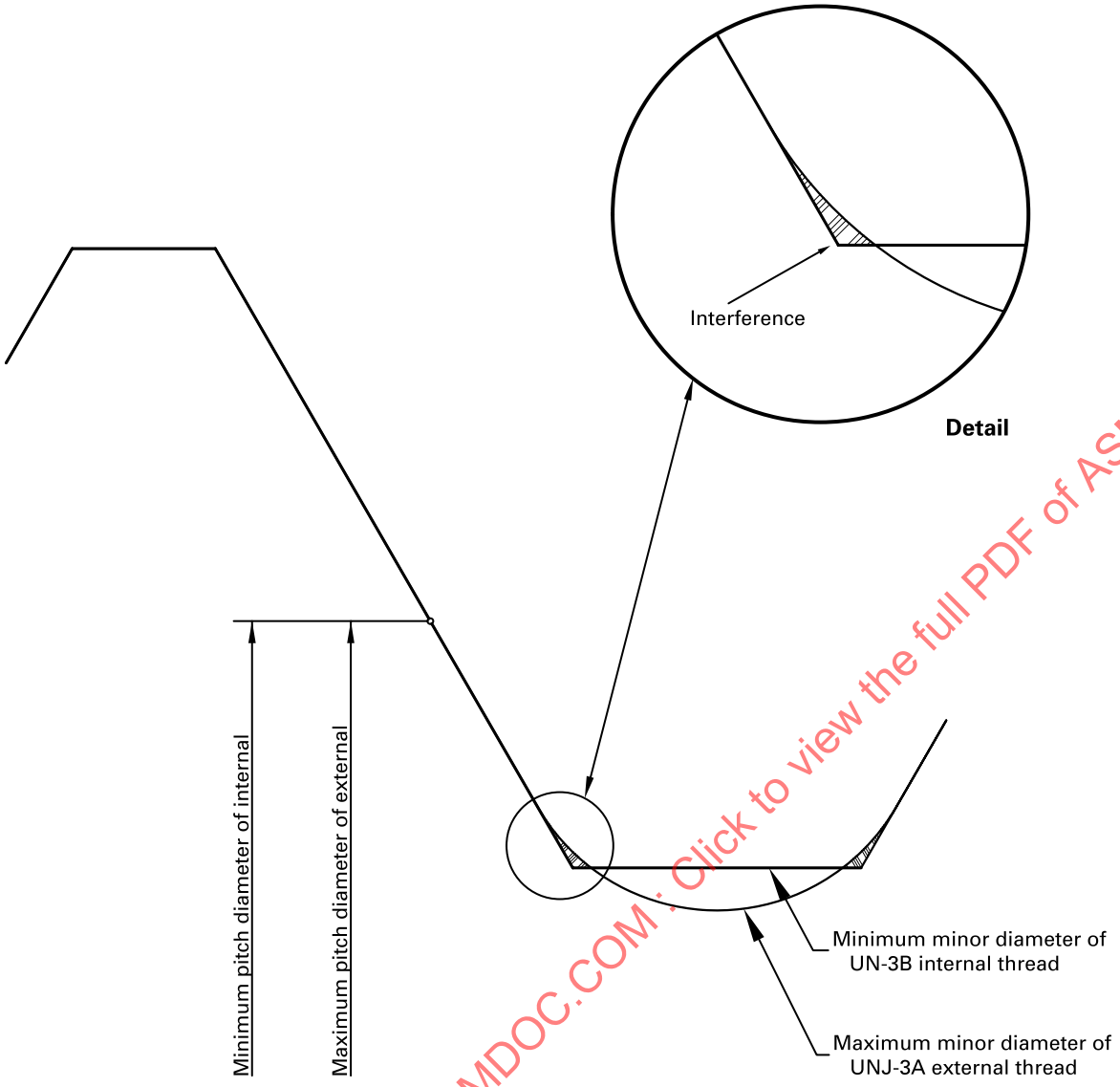
Unified thread sizes (specific combinations of diameter and pitch shown in Table 1) are identified by the letter combination "UN" in the thread symbol. In the unified standards, the pitch diameter tolerances for external threads differ from those for internal threads; for this reason the letter "A" is used in the thread symbol to denote an external thread and the letter "B," an internal thread. Where the letters "U," "A," or "B" do not appear in the thread designation, the threads conform to the outdated American National screw threads. Details regarding thread designations are given in section 6.

1.6 References

The following is a list of publications referenced in this Standard. Unless otherwise specified, the latest edition shall apply. The following documents form a part of this Standard to the extent specified herein.

ASME B1.2. Gages and Gaging for Unified Inch Screw Threads. The American Society of Mechanical Engineers.

Figure 1
Illustration of Assembly Interference of UNJ-3A Thread and UN-3B Thread in the Maximum Material Condition



ASME B1.3. Screw Thread Gaging Systems for Acceptability: Inch and Metric Screw Threads. The American Society of Mechanical Engineers.
ASME B1.7. Screw Threads: Nomenclature, Definitions, and Letter Symbols. The American Society of Mechanical Engineers.
ASME B1.30. Screw Threads: Standard Practice for Calculating and Rounding Dimensions. The American Society of Mechanical Engineers.
ASME B47.1. Gage Blanks. The American Society of Mechanical Engineers.
ASME B94.11M. Twist Drills. The American Society of Mechanical Engineers.
ASME Y14.5. Dimensioning and Tolerancing. The American Society of Mechanical Engineers.
FED-STD-H28/2. Screw-Thread Standards for Federal Services. U.S. Department of Defense.
ISO 68. General Purpose Screw Threads — Basic Profile. International Organization for Standardization.

1.7 Acceptability

Acceptability of product threads shall be in accordance with ASME B1.3. Gages and gaging shall be in accordance with ASME B1.2.

1.8 Reference Temperature

The reference temperature is 68°F for dimensions defined by this system.

1.9 Units of Measure

All dimensions in this Standard, including all tables, are in inches unless otherwise specified.

1.10 Federal Government Use

When this Standard is approved by the Department of Defense and federal agencies and is incorporated into FED-STD-H28/2, Screw-Thread Standards for Federal Services, para. 2, the use of this Standard by the federal government will be subject to all the requirements and limitations of FED-STD-H28/2.

2 SCREW THREAD PROFILE

2.1 Scope

The basic profile and design profiles are defined in this section and are the basis of all thread dimensions given in this Standard.

2.2 Basic Profile

2.2.1 UN and UNR. The basic profile for UN screw threads is identical to that for UNR screw threads and is shown in Figure 2. Profile applies to an axial plane.

For reference, the basic profile for UN and UNR screw threads is identical to that for ISO metric screw threads shown in ISO 68.

2.2.2 UNJ. The basic profile for UNJ screw threads is shown in Figure 3. It is the theoretical profile corresponding to the basic dimensions of the thread major diameter, pitch diameter, and minor diameter. This profile includes a 0.15011107*P* to 0.18042196*P* radius at the root of the external thread as shown in Figure 4. This also requires that the minor diameter of the external and internal threads be larger than the UN and UNR thread forms to accommodate the external thread maximum root radius. It is similar to but not the same as the profile for UN and UNR.

2.3 Design Profiles

The design profiles define the maximum material conditions for external and internal threads with no allowance and are derived from the basic profile. The design profiles of both external and internal screw threads vary from the basic profile.

2.3.1 Design Profiles of External Threads

2.3.1.1 UN and UNR. The design profiles of external UN and UNR screw threads are included in Figures 5 through 8. A flat root contour is specified for UN threads; however, it is permissible to provide for some threading tool crest wear. Therefore, a rounded root contour cleared beyond the 0.2500*P* flat width of the basic profile is optional. The rounded root also reduces the rate of threading tool crest wear and improves fatigue strength over that of a flat root thread.

(a) At the least material condition (LMC), the root form of the UNR external thread shall be a full root radius of not less than 0.10825318*P*. At maximum material condition (MMC), the root form of the UNR external thread may be one of the following types:

(1) a full root radius of not more than 0.14433757*P*, which makes the point of tangency between the radius and the flanks at a point 0.54126588*P* below the basic major diameter (the equivalent of a 0.2500*P* width of flat).

(2) a “rounded form” consisting of a combination of flats and radii not less than 0.10825318*P*, as shown in Figures 7 and 8. When the root is the rounded form, the radii may exceed 0.14433757*P* so long as the point of tangency between the radii and the flanks is no less than 0.54126588*P* below the basic major diameter (the equivalent of a 0.2500*P* width of flat).

(b) The design profiles of external UN and UNR screw threads have flat crests. However, in practice, product thread crests may be flat, partially rounded, or fully rounded. A rounded crest tangent at a 0.12500*P* flat is shown as an option in Figures 5 through 8.

Figure 2
Basic Profile for UN and UNR Screw Threads

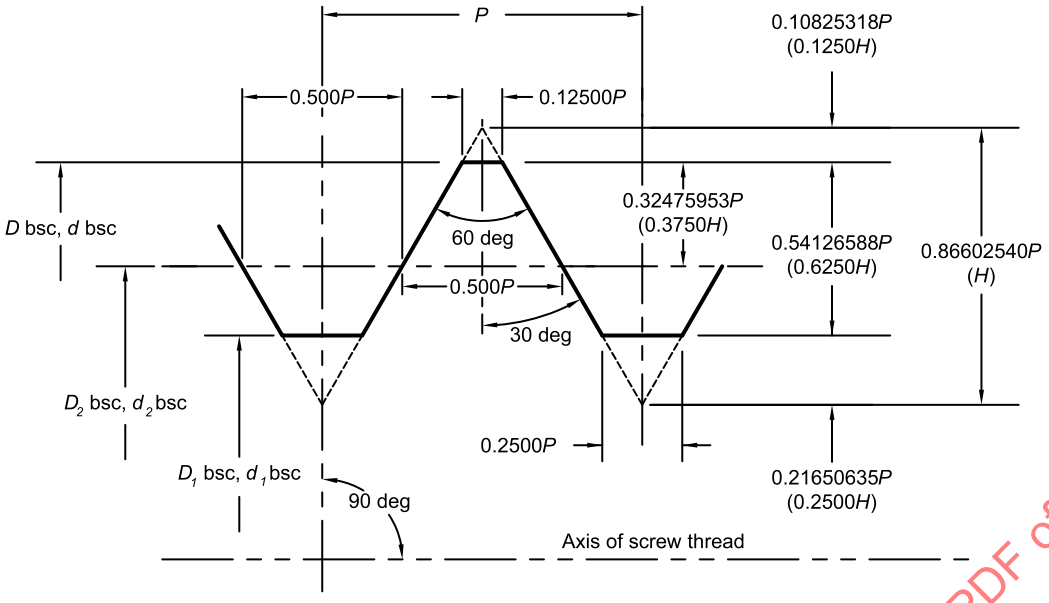


Figure 3
Basic Profile for UNJ Screw Threads

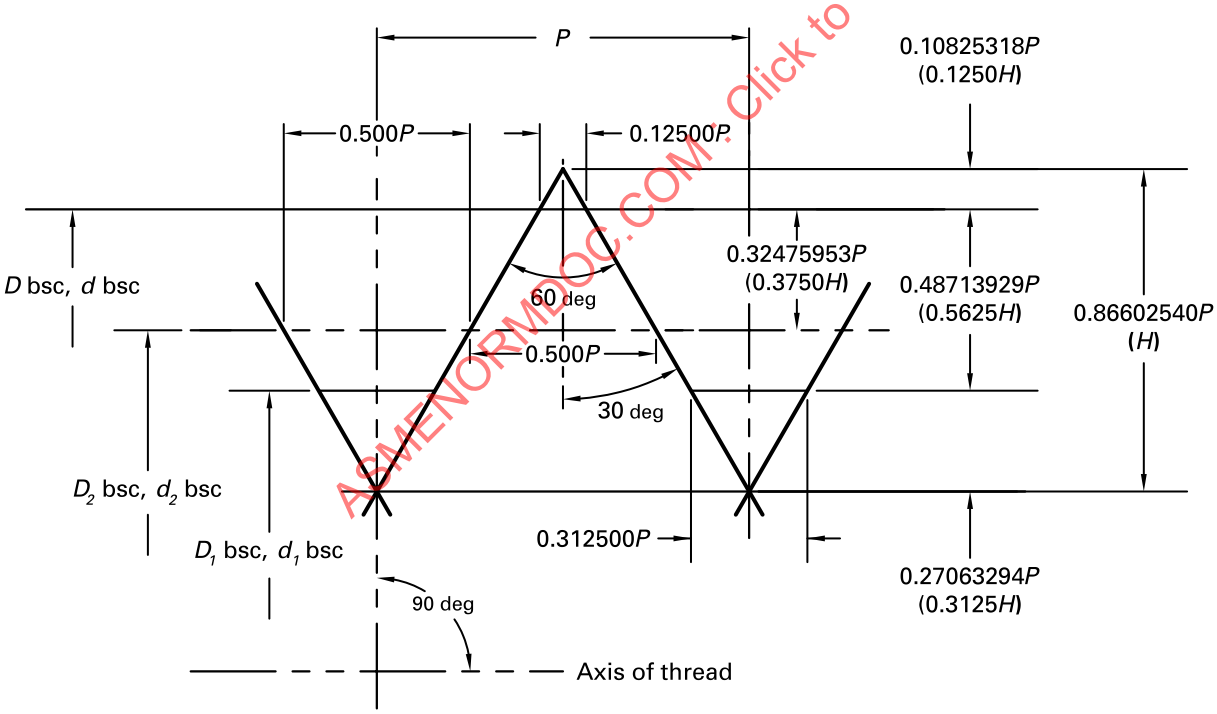
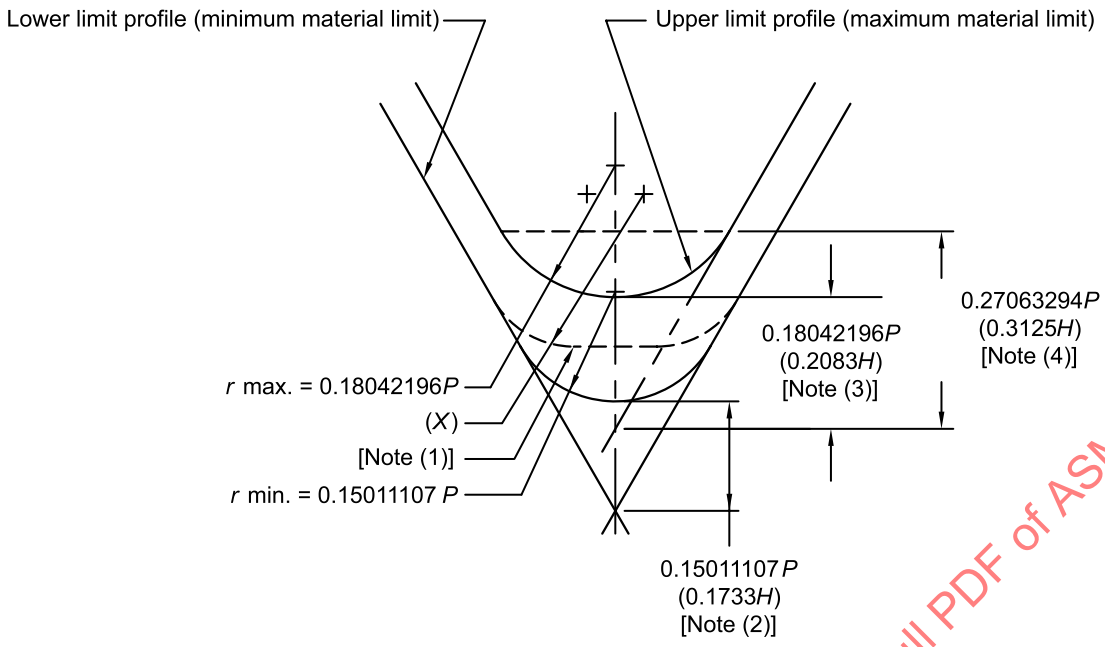
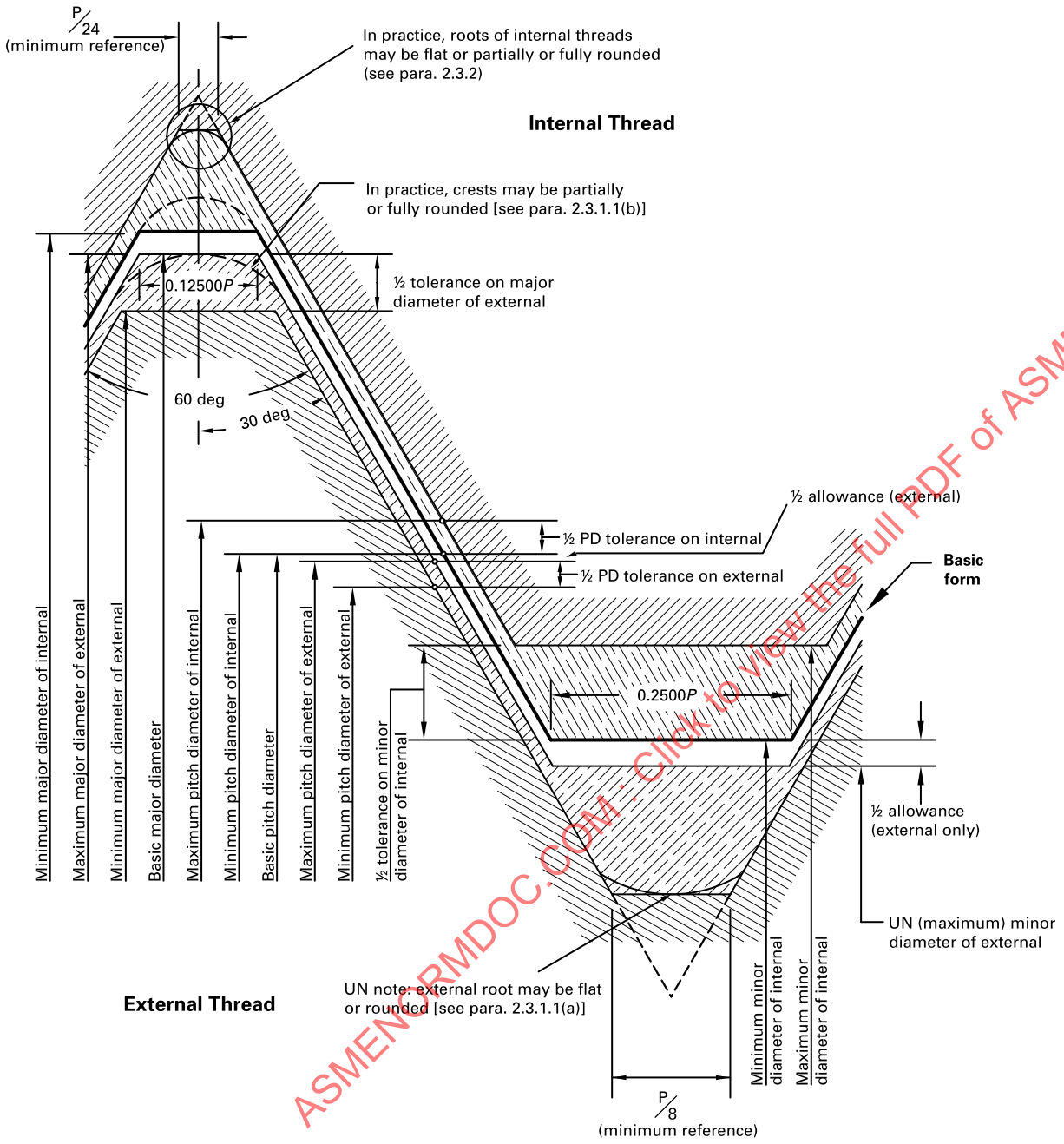


Figure 4
Root Radius of UNJ External Thread



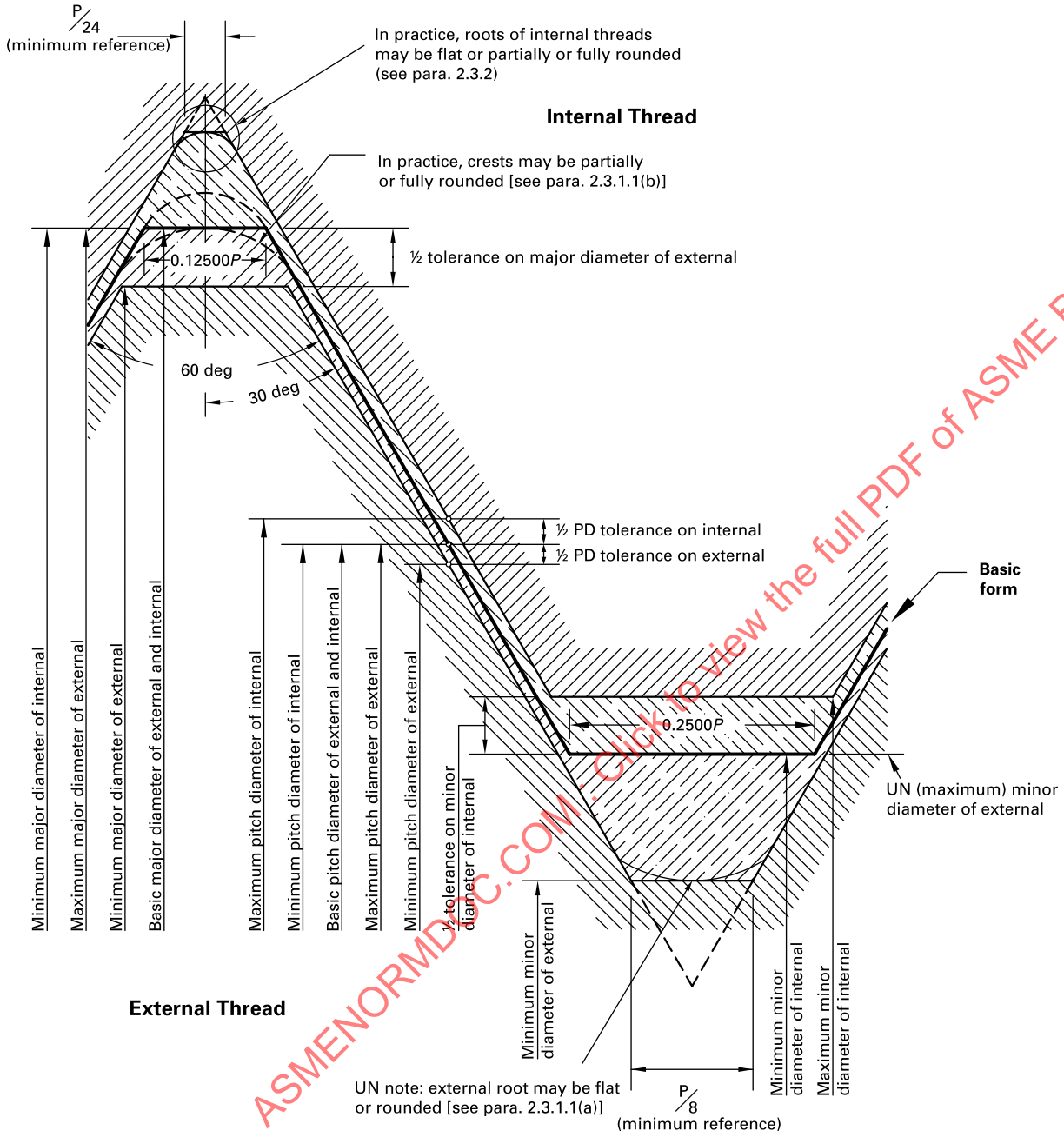
NOTES:
(1) Optional profile comprised of two circular arcs (*X*) tangential to the flanks and flat at the root.
(2) Minimum truncation.
(3) Maximum truncation.
(4) Tangent flank radii (minor diameter).

Figure 5
Disposition of Diametral Tolerances, Allowance, and Crest Clearance for Unified Inch Screw Thread Series UN, Classes 1A, 2A, 1B, and 2B



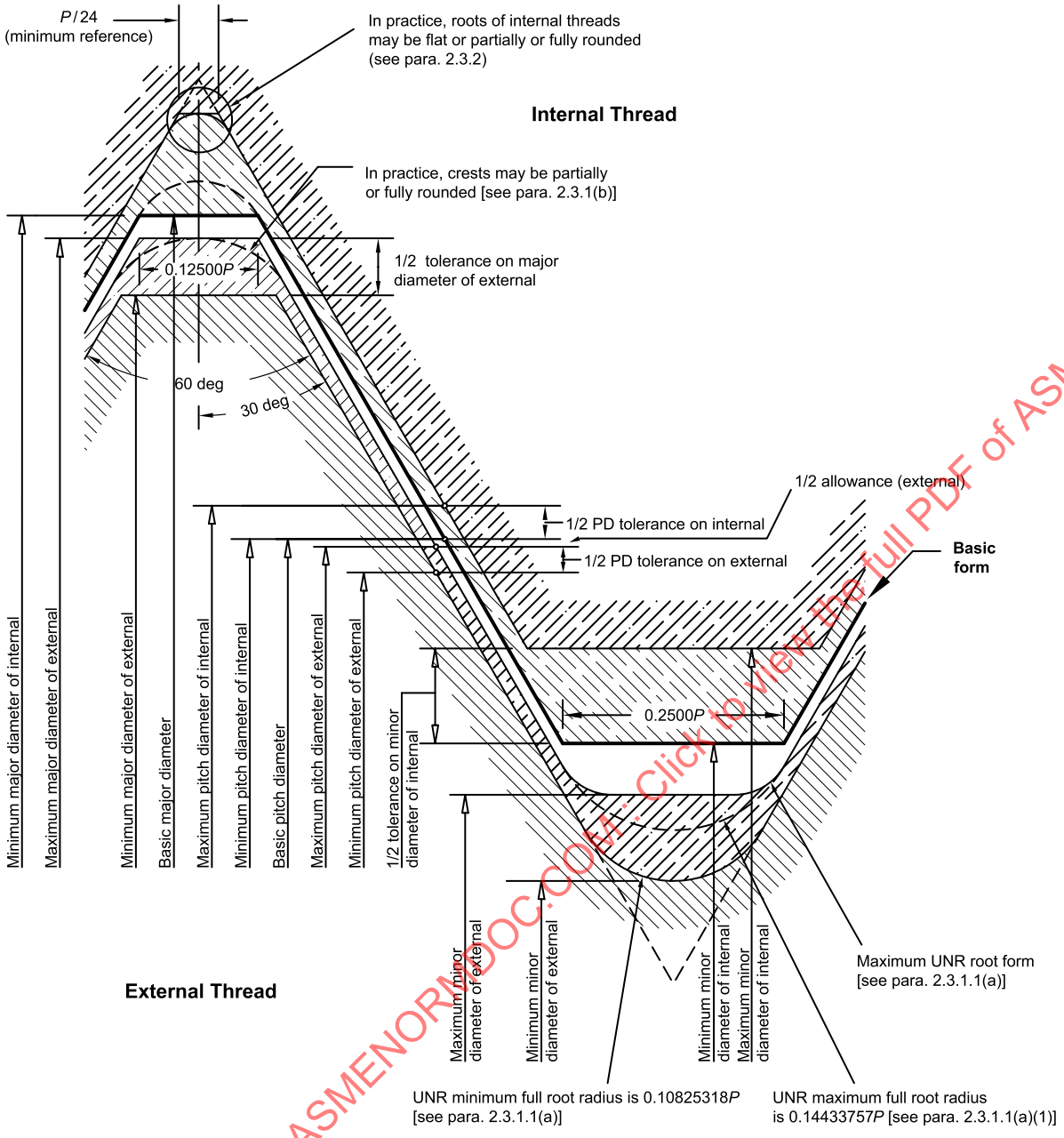
GENERAL NOTE: Lead and angle tolerances are defined in section 9.

Figure 6
Disposition of Diametral Tolerances and Crest Clearance for Unified Inch Screw Thread Series UN, Classes 3A and 3B



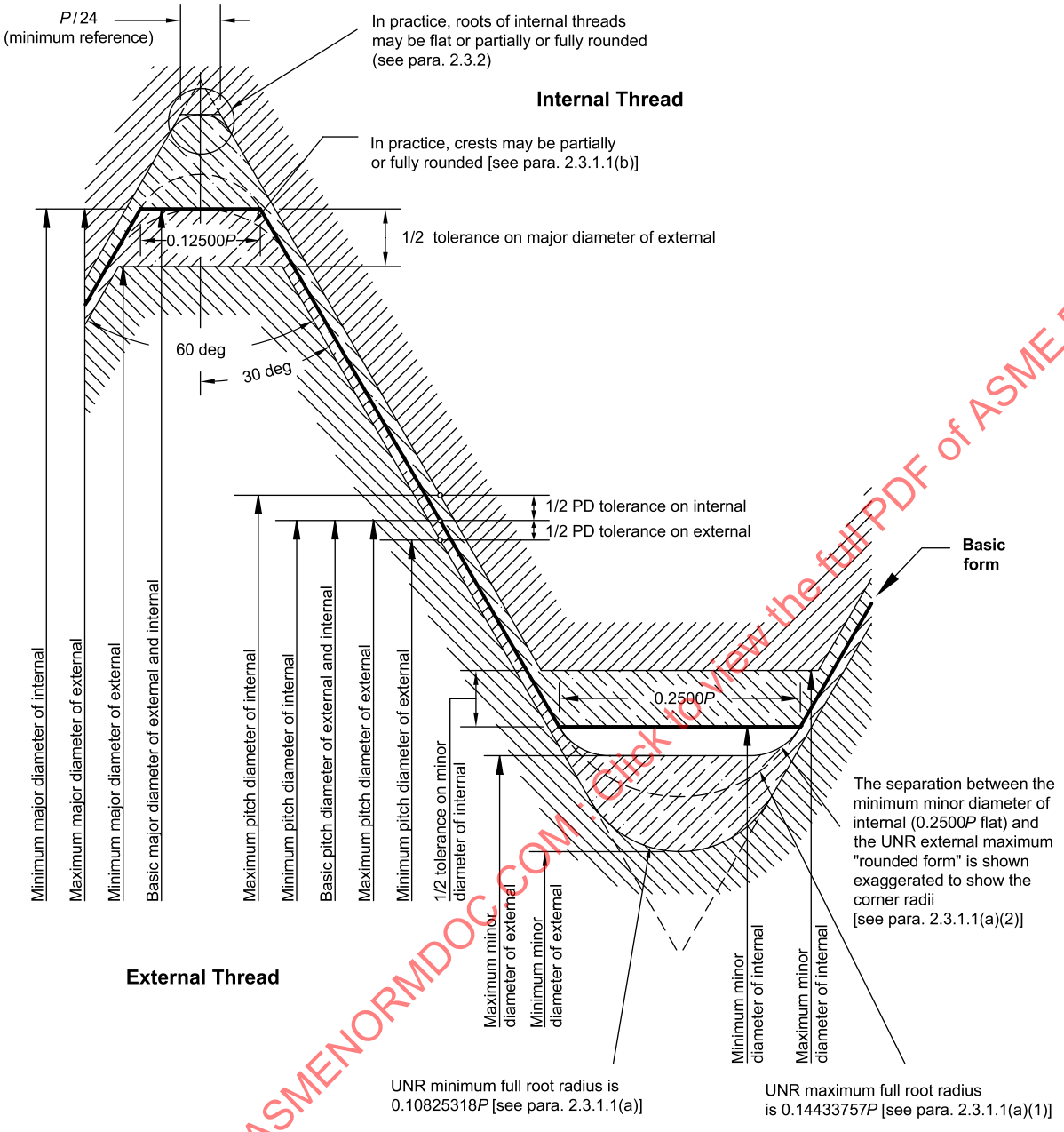
GENERAL NOTE: Lead and angle tolerances are defined in section 9.

Figure 7
Disposition of Diametral Tolerances, Allowance, and Crest Clearance for Unified Inch Screw Thread Series UNR, Classes 1A and 2A, and Series UN, Classes 1B and 2B



GENERAL NOTE: Lead and angle tolerances are defined in section 9.

Figure 8
Disposition of Diametral Tolerances and Crest Clearance for Unified Inch Screw Thread Series UNR, Class 3A and Series UN, Class 3B



GENERAL NOTE: Lead and angle tolerances are defined in section 9.

2.3.1.2 UNJ. The design profile of the external UNJ screw thread specifies that the actual root of the thread shall lie within the root radius tolerance zone shown in Figures 4 and 9. The limit dimensions of the root radius, r, are shown in Figures 10 and 11 and their values are specified in Table 2A. The profile shall be a continuous smoothly blended non-reversing curve, no part of which shall have a radius of less than $0.15011107P$ and which is tangent to the thread flanks at not less than $0.48713929P$ basic thread depth. The profile may comprise tangent flank circular arcs that are tangent to the flanks and a flat at the minor diameter provided that the minor diameter, d_3, is within the zone established in Figures 10 and 11. Unless otherwise specified, the runout or incomplete UNJ threads on externally threaded parts shall be no less than 1 pitch nor more than 2 pitches in length. The threads shall run out onto the shank without any abrupt change in cross-sectional area. The root radius shall be no less than the minimum radius of the full thread section.

2.3.2 Design Profile of Internal Threads. The design profiles of the internal UN and UNJ screw threads are included in Figures 2, 5 through 8, and 10 through 12 (there is no internal UNR screw thread). In practice, it is necessary to provide for some threading tool crest wear resulting in a profile that may be flat or partially or fully rounded; therefore, the root of the design profile is rounded and cleared beyond the $0.12500P$ flat width of the basic profile. No root radius is specified.

2.4 Formulas and Nomenclature

The formulas and nomenclature pertaining to the basic profile and the design profiles are given in section 10.

3 SCREW THREAD SERIES

3.1 Thread Series Definition

Thread series are groups of diameter-pitch combinations distinguished from each other by the number of threads per inch applied to a series of specific diameters. There are two general series classifications: standard and special.

3.1.1 Standard Series. The standard series consists of three series with graded pitches (coarse, fine, and extra fine) and eight series with constant pitches (4, 6, 8, 12, 16, 20, 28, and 32 threads per inch). The standard series is shown in Table 1. Limits of size are shown in Tables 2A and 2B and discussed in section 8.

3.1.2 Special Series. The special series consists of all threads with diameter-pitch combinations that are not included in the standard series. When allowances and tolerances of special series threads are derived from unified formulation as shown in section 5, the threads are designated UNS, UNJS, or UNRS. If allowance and tolerance are not derived from unified formulation, the threads are designated "SPL 60-deg Form." (See para. 6.1 and Figure 13 for details of designation.)

3.2 Order of Selection

Wherever possible, selection should be made from Table 1, preference being given to the coarse- and fine-thread series. As second choice, if the threads in the standard series in Table 1 do not meet the requirements of the design, special thread sizes should be selected from Table E-1 and their limits calculated using the formulas in section 8. The limits in Table D-1 are for reference only and are not recommended for new applications.

3.3 Coarse-Thread Series Applications

The coarse-thread series (UNC, UNRC, or UNJC) is generally used for the bulk production of screws, bolts, and nuts. It is commonly used in materials such as cast iron, aluminum, magnesium, brass, bronze, and plastic, because the coarse-thread series provides more resistance to internal thread stripping than the fine- or extra-fine-thread series. The coarse-thread series is advantageous where rapid assembly or disassembly is required, or if corrosion or damage from nicks due to handling or use is likely.

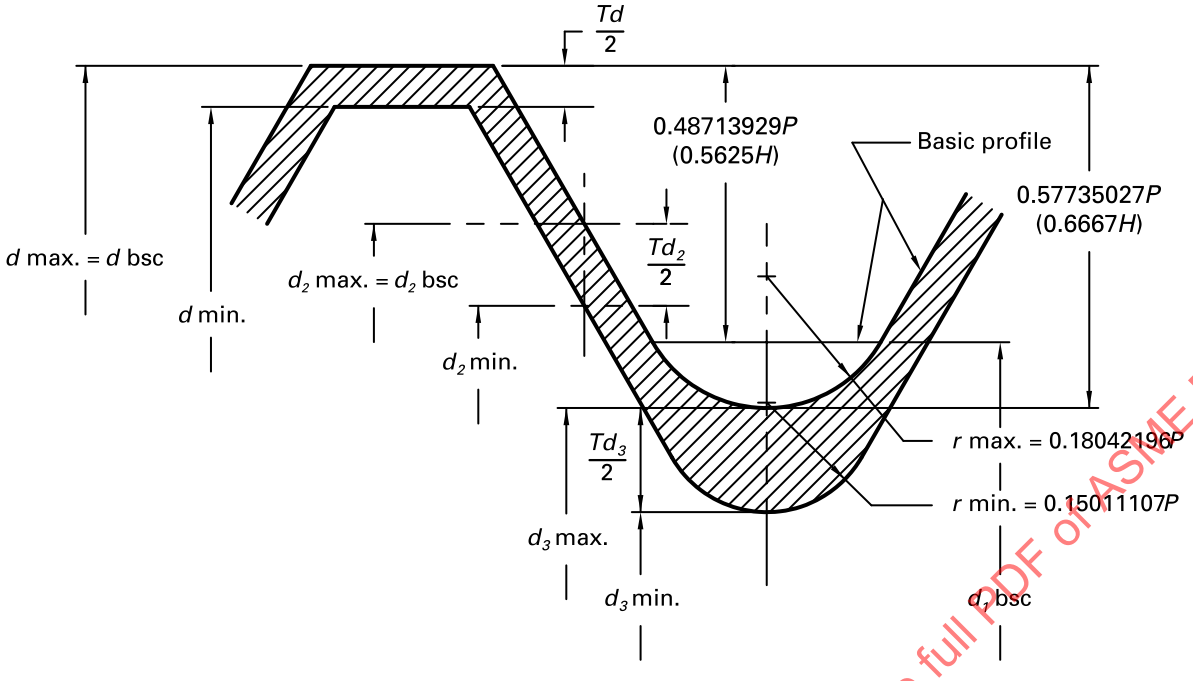
3.4 Fine-Thread Series Applications

The fine-thread series (UNF, UNRF, or UNJF) is commonly used for bolts and nuts in high-strength applications. This series has less thread depth and a larger minor diameter than the coarse-thread series. Consequently, thinner walls are permitted for internal threads and more strength is available to external threads than for coarse-thread series of the same nominal size. In order to prevent internal thread stripping, a longer length of engagement is required for fine-thread series than for coarse-thread series for thread materials of the same strength levels. However, for both fine- and coarse-thread series, length of engagement in tapped holes must be selected to meet strength requirements. This also allows for finer adjustment in cases such as a slotted nut and cotter pin assembly.

3.5 Extra-Fine-Thread Series Applications

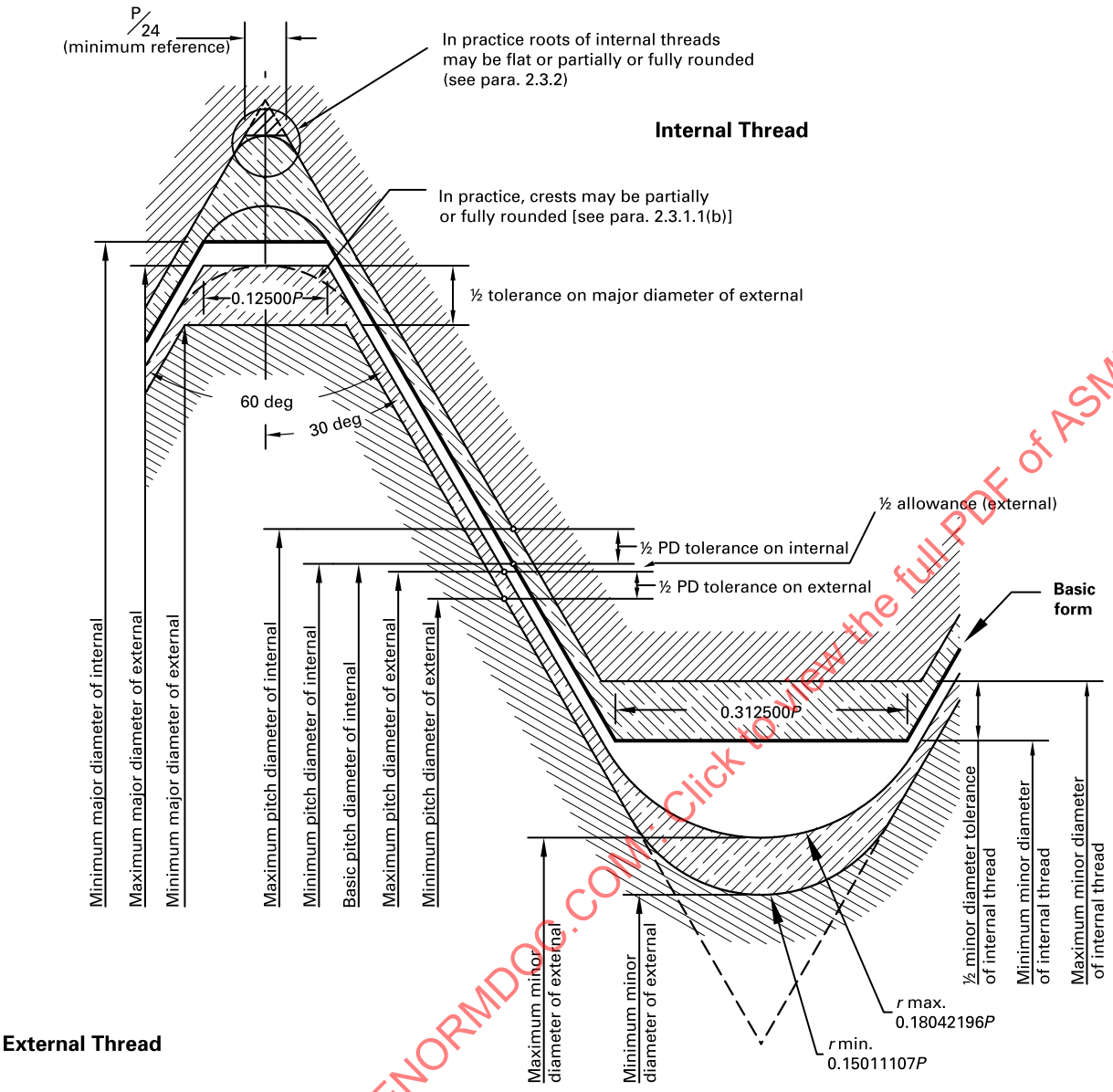
The extra-fine-thread series (UNEF, UNREF, or UNJEF) is used particularly for equipment and threaded parts that require fine adjustment, such as bearing retaining nuts, adjusting screws, etc., and for thin-wall tubing and thin nuts.

Figure 9
External UNJ Thread Design Profile and Tolerances



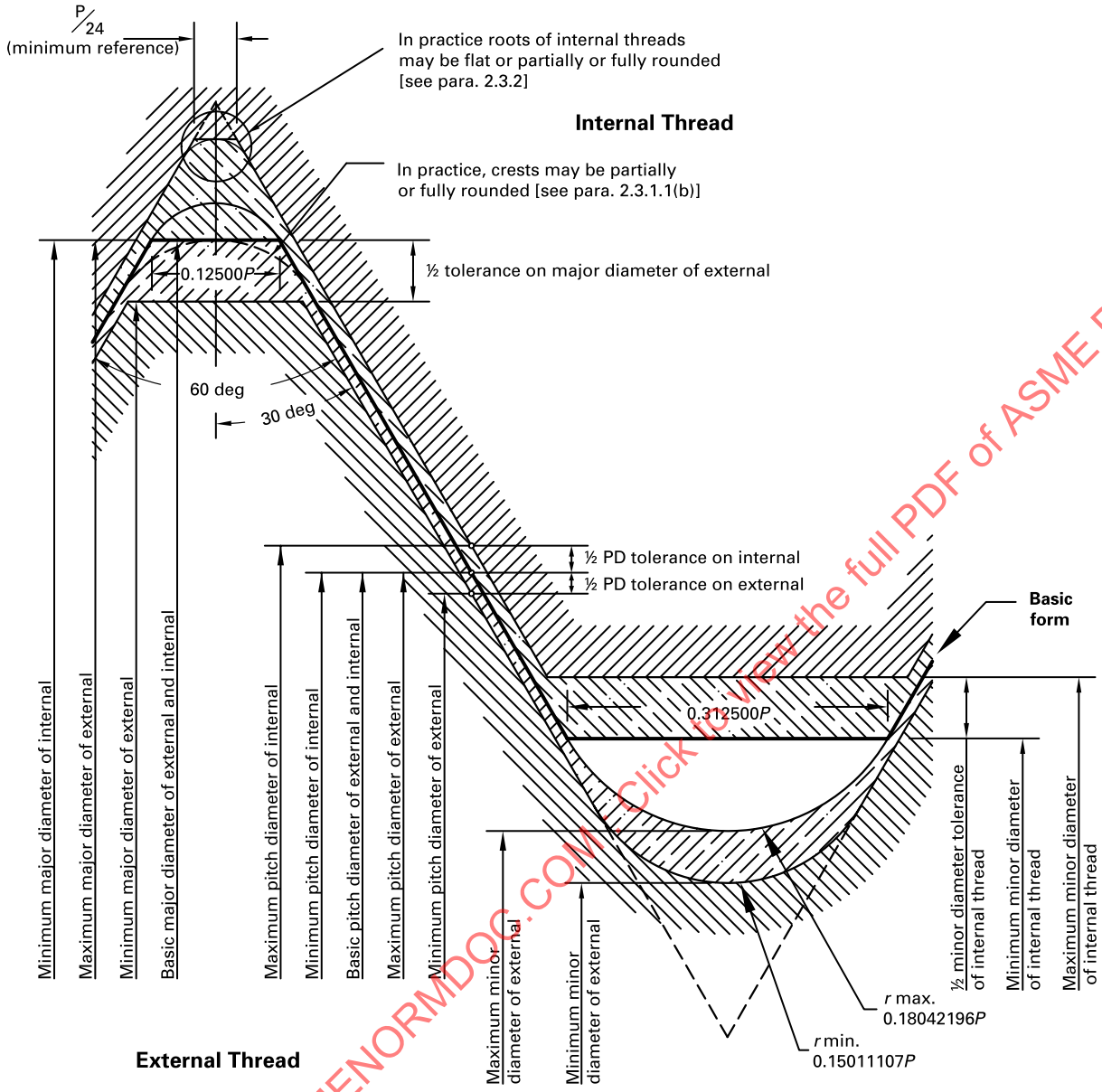
GENERAL NOTE: Rounded crest is optional (see para. 7.1.2.2).

Figure 10
Disposition of Diametral Tolerances, Allowance, and Crest Clearance for Unified Inch Screw Thread Series UNJ, Classes 2A and 2B



GENERAL NOTE: Lead and angle tolerances are defined in section 9.

Figure 11
Disposition of Diametral Tolerances and Crest Clearance for Unified Inch Screw Thread Series UNJ, Classes 3A and 3B



GENERAL NOTE: Lead and angle tolerances are defined in section 9.

Figure 12
Internal UNJ Thread Design Profile and Tolerances

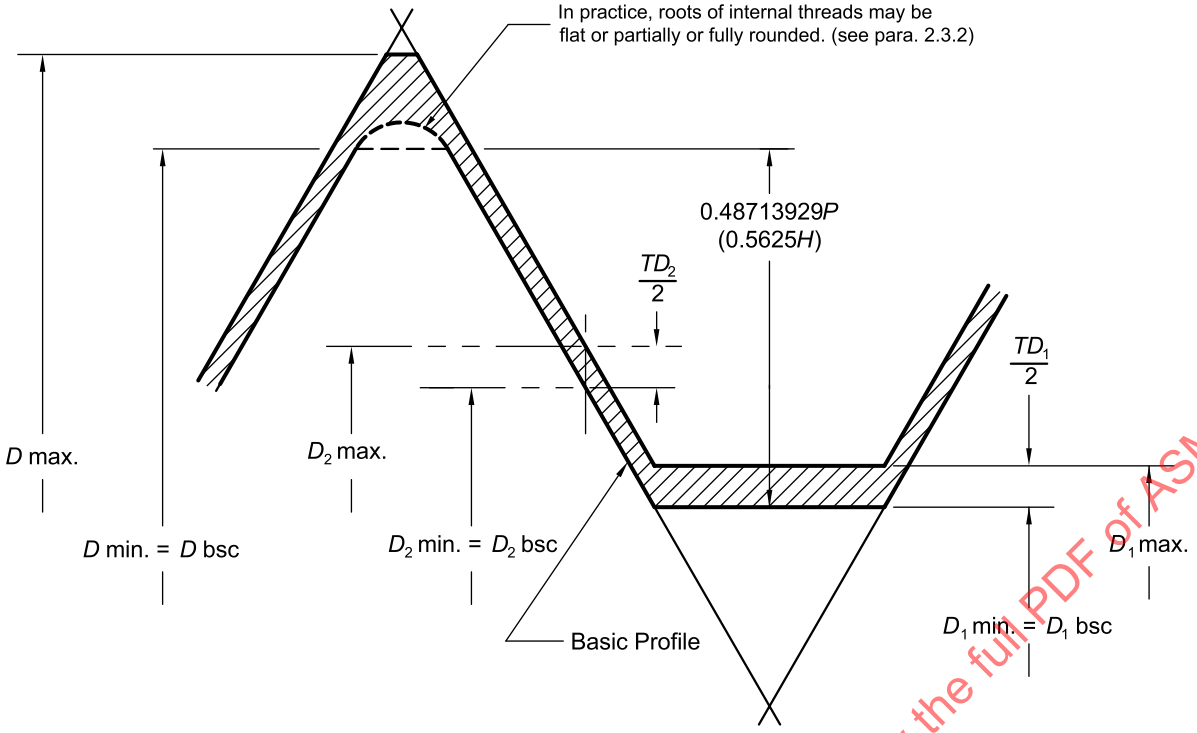
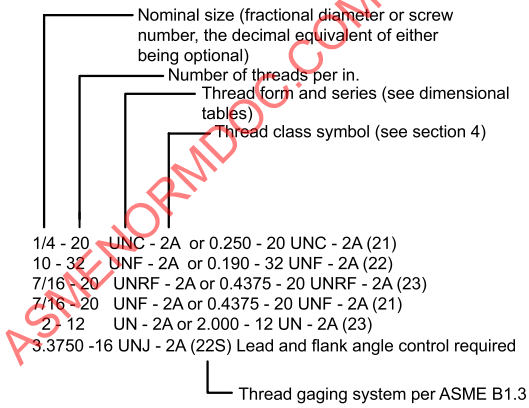


Figure 13
Basic Method of Designating Screw Threads



GENERAL NOTE: The thread acceptability gaging system requirement of ASME B1.3 may be added to the thread size designation as noted above or as specified in pertinent documentation, such as a drawing or procurement document.

3.6 Constant-Pitch-Thread Series Applications

The various constant-pitch series (UN, UNR, or UNJ) with 4, 6, 8, 12, 16, 20, 28, and 32 threads per inch (see Table 1) offer a comprehensive range of diameter–pitch combinations for those purposes where the threads in the coarse-, fine-, and extra-fine-thread series do not meet the particular requirements of the design. The primary sizes of the 8-UN, 12-UN, and 16-UN series shown in Table 1 are the most commonly used.

Whenever a thread in a constant-pitch series also appears in the UNC, UNF, or UNEF series, the symbols and tolerances for limits of size of those standard series are applicable.

3.6.1 8-Thread Series. The 8-thread series (8-UN) is a uniform-pitch series used for large diameters or as a compromise between coarse- and fine-thread series. Although originally intended for high-pressure-joint bolts and nuts, it is now widely used as a substitute for the coarse-thread series for diameters larger than 1 in.

3.6.2 12-Thread Series. The 12-thread series (12-UN) is a uniform-pitch series for large diameters requiring threads of medium-fine pitch. Although originally intended for boiler practice, it is now used as a continuation of the fine-thread series for diameters larger than $1\frac{1}{2}$ in.

3.6.3 16-Thread Series. The 16-thread series (16-UN) is a uniform-pitch series for large diameters requiring fine-pitch threads. It is suitable for adjusting collars and retaining nuts and also serves as a continuation of the extra-fine-thread series for diameters larger than $1\frac{11}{16}$ in.

3.7 Fine Threads for Thin-Wall Tubing

The limits of size for a 28-thread series, ranging from 0.216 in. to 1.5 in. nominal size, are included in Tables 2A and 2B. These threads are recommended for general use on thin-wall tubing. The 27-thread series is no longer standard but is included in Table D-1.

4 SCREW THREAD CLASSES

4.1 Thread Classes

Thread classes are distinguished from each other by the amounts of tolerance and allowance. Classes 1A, 2A, and 3A apply to external threads only, and Classes 1B, 2B, and 3B apply to internal threads only. Allowance is specified only for Classes 1A and 2A and the allowance is identical for both classes. Tolerance decreases as class number increases (e.g., tolerance for Class 3A is less than that for Class 2A, which is less than that for Class 1A). End-use applications dictate the requirements for selection of thread classes, but it should be understood that all internal classes will assemble with all external classes. For example, a Class 2A external thread may be used with a Class 1B, Class 2B, or Class 3B internal thread.

4.1.1 Classes 1A and 1B Threads. Classes 1A (external) and 1B (internal) threads replaced American National Class 1 screw threads. These classes provide for applications where a liberal tolerance and an allowance are required to permit easy assembly even with slightly nicked threads. These classes are intended for ordnance and other special uses. Maximum diameters of Class 1A threads are less than basic by the amount of the allowance (the allowance is identical to that for Class 2A). The allowance is not available for plating or coating; consequently, it will be necessary to make special provisions in thread manufacturing for accommodation of plating or coating. The minimum diameters of Class 1B threads, whether or not plated or coated, are basic and therefore afford no allowance or clearance for assembly at maximum material limits.

4.1.2 Classes 2A and 2B Threads. Classes 2A (external) and 2B (internal) threads are the most commonly used thread classes for general applications, including production of bolts, screws, nuts, and similar threaded fasteners.

The maximum diameters of Class 2A uncoated threads are less than basic by the amount of the allowance. The allowance minimizes galling and seizing in high-cycle wrench assembly, or it can be used to accommodate plated finishes or other coatings. However, for threads with additive finish, the maximum diameters of Class 2A may be exceeded by the amount of the allowance, i.e., the 2A maximum diameters apply to an unplated part or to a part before plating, whereas the basic diameters apply to a part after plating. The minimum diameters of Class 2B threads, whether or not plated or coated, are basic, affording no allowance or clearance for assembly at maximum material limits.

4.1.3 Classes 3A and 3B Threads. Classes 3A (external) and 3B (internal) threads provide for applications where closeness of fit, accuracy of thread elements, or both are important. The maximum diameters of Class 3A threads and the minimum diameters of Class 3B threads, whether or not plated or coated, are basic, affording no allowance or clearance for assembly at maximum material limits.

Table 1
Standard Series Threads (UN, UNR, and UNJ)

Nominal Size, in.		Basic Major Diameter	Threads/in.											Nominal Size, in.
			Series With Graded Pitches			Series With Constant Pitches								
Primary	Secondary		Coarse UNC	Fine UNF	Extra Fine UNEF	4–UN	6–UN	8–UN	12–UN	16–UN	20–UN	28–UN	32–UN	
0	...	0.0600	...	80	...	...	...	...	...	...	...	...	...	0
...	1	0.0730	64	72	...	...	...	...	...	...	...	...	...	1
2	...	0.0860	56	64	...	...	...	...	...	...	...	...	...	2
...	3	0.0990	48	56	...	...	...	...	...	...	...	...	...	3
4	...	0.1120	40	48	...	...	...	...	...	...	...	...	...	4
5	...	0.1250	40	44	...	...	...	...	...	...	...	...	...	5
6	...	0.1380	32	40	...	...	...	...	...	...	...	...	UNC	6
8	...	0.1640	32	36	...	...	...	...	...	...	...	...	UNC	8
10	...	0.1900	24	32	...	...	...	...	...	...	...	...	UNF	10
...	12	0.2160	24	28	32	...	...	...	...	...	...	UNF	UNEF	12
1/4	...	0.2500	20	28	32	...	...	...	...	...	UNC	UNF	UNEF	1/4
5/16	...	0.3125	18	24	32	...	...	...	...	...	20	28	UNEF	5/16
3/8	...	0.3750	16	24	32	...	...	...	...	UNC	20	28	UNEF	3/8
7/16	...	0.4375	14	20	28	...	...	...	...	16	UNF	UNEF	32	7/16
1/2	...	0.5000	13	20	28	...	...	...	...	16	UNF	UNEF	32	1/2
9/16	...	0.5625	12	I8	24	...	...	...	UNC	16	20	28	32	9/16
5/8	...	0.6250	11	18	24	...	...	...	12	16	20	28	32	5/8
...	11/16	0.6875	...	...	24	...	...	...	12	16	20	28	32	11/16
3/4		0.7500	10	16	20	...	...	...	12	UNF	UNEF	28	32	3/4
...	13/16	0.8125	...	...	20	...	...	...	12	16	UNEF	28	32	13/16
7/8	...	0.8750	9	14	20	...	...	...	12	16	UNEF	28	32	7/8
...	15/16	0.9375	...	...	20	...	...	...	12	16	UNEF	28	32	15/16
1	...	1.0000	8	12	20	...	...	UNC	UNF	16	UNEF	28	32	1
...	1 1/16	1.0625	...	...	18	...	...	8	12	16	20	28	...	1 1/16
1 1/8	...	1.1250	7	12	18	...	...	8	UNF	16	20	28	...	1 1/8
...	1 3/16	1.1875	...	...	18	...	...	8	12	16	20	28	...	1 3/16
1 1/4	...	1.2500	7	12	18	...	...	8	UNF	16	20	28	...	1 1/4
...	1 5/16	1.3125	...	...	18	...	...	8	12	16	20	28	...	1 5/16
1 3/8	...	1.3750	6	12	18	...	UNC	8	UNF	16	20	28	...	1 3/8
...	1 7/16	1.4375	...	...	18	...	6	8	12	16	20	28	...	1 7/16
1 1/2	...	1.5000	6	12	18	...	UNC	8	UNF	16	20	28	...	1 1/2
...	1 9/16	1.5625	...	...	18	...	6	8	12	16	20	...	...	1 9/16
1 5/8	...	1.6250	...	...	18	...	6	8	12	16	20	...	...	1 5/8
...	1 11/16	1.6875	...	...	18	...	6	8	12	16	20	...	...	1 11/16
1 3/4	...	1.7500	5	...	...	...	6	8	12	16	20	...	...	1 3/4
...	1 13/16	1.8125	...	...	...	...	6	8	12	16	20	...	...	1 13/16
1 7/8	...	1.8750	...	...	...	...	6	8	12	16	20	...	...	1 7/8
...	1 15/16	1.9375	...	...	...	...	6	8	12	16	20	...	...	1 15/16
2	...	2.0000	4 1/2	...	...	...	6	8	12	16	20	...	...	2
...	2 1/8	2.1250	...	...	...	...	6	8	12	16	20	...	...	2 1/8
2 1/4	...	2.2500	4 1/2	...	...	...	6	8	12	16	20	...	...	2 1/4
...	2 3/8	2.3750	...	...	...	...	6	8	12	16	20	...	...	2 3/8
2 1/2	...	2.5000	4	...	...	UNC	6	8	12	16	20	...	...	2 1/2
...	2 5/8	2.6250	...	...	...	4	6	8	12	16	20	...	...	2 5/8

Table 1
Standard Series Threads (UN, UNR, and UNJ) (Cont'd)

Nominal Size, in.		Basic Major Diameter	Threads/in.											Nominal Size, in.
			Series With Graded Pitches			Series With Constant Pitches								
Primary	Secondary		Coarse UNC	Fine UNF	Extra Fine UNEF	4–UN	6–UN	8–UN	12–UN	16–UN	20–UN	28–UN	32–UN	
2¾	...	2.7500	4	...	...	UNC	6	8	12	16	20	...	...	2¾
...	2⅞	2.8750	...	...	...	4	6	8	12	16	20	...	...	2⅞
3	...	3.0000	4	...	...	UNC	6	8	12	16	20	...	...	3
...	3⅛	3.1250	...	...	...	4	6	8	12	16	...	...	...	3⅛
3¼	...	3.2500	4	...	...	UNC	6	8	12	16	...	...	...	3¼
...	3⅜	3.3750	...	...	...	4	6	8	12	16	...	...	...	3⅜
3½	...	3.5000	4	...	...	UNC	6	8	12	16	...	...	...	3½
...	3⅝	3.6250	...	...	...	4	6	8	12	16	...	...	...	3⅝
3¾	...	3.7500	4	...	...	UNC	6	8	12	16	...	...	...	3¾
...	3⅞	3.8750	...	...	...	4	6	8	12	16	...	...	...	3⅞
4	...	4.0000	4	...	...	UNC	6	8	12	16	...	...	...	4
...	4⅛	4.1250	...	...	...	4	6	8	12	16	...	...	...	4⅛
4¼	...	4.2500	...	...	...	4	6	8	12	16	...	...	...	4¼
...	4⅜	4.3750	...	...	...	4	6	8	12	16	...	...	...	4⅜
4½	...	4.5000	...	...	...	4	6	8	12	16	...	...	...	4½
...	4⅝	4.6250	...	...	...	4	6	8	12	16	...	...	...	4⅝
4¾	...	4.7500	...	...	...	4	6	8	12	16	...	...	...	4¾
...	4⅞	4.8750	...	...	...	4	6	8	12	16	...	...	...	4⅞
5	...	5.0000	...	...	...	4	6	8	12	16	...	...	...	5
...	5⅛	5.1250	...	...	...	4	6	8	12	16	...	...	...	5⅛
5¼	...	5.2500	...	...	...	4	6	8	12	16	...	...	...	5¼
...	5⅜	5.3750	...	...	...	4	6	8	12	16	...	...	...	5⅜
5½	...	5.5000	...	...	...	4	6	8	12	16	...	...	...	5½
...	5⅝	5.6250	...	...	...	4	6	8	12	16	...	...	...	5⅝
5¾	...	5.7500	...	...	...	4	6	8	12	16	...	...	...	5¾
...	5⅞	5.8750	...	...	...	4	6	8	12	16	...	...	...	5⅞
6	...	6.0000	...	...	...	4	6	8	12	16	...	...	...	6

GENERAL NOTE: Series designation shown indicates the UN thread form; however, the UNJ thread form may be specified by substituting the applicable symbol in place of UN in all designations for both internal and external use and the UNR thread form may be specified by substituting the applicable symbol in place of UN in all designations for external use only.

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	0 – 80 or 0.0600 – 80	UNF	2A	0.0005	0.0595	0.0563	...	0.0514	0.0496	0.001762	0.0460	0.0415	0.0442	...	0.0018	0.0014	0.0451	0.0425	0.0023	0.0019
	80		3A	0.0000	0.0600	0.0568	...	0.0519	0.0506	0.0013	0.0465	0.0425	0.0447	...	0.0018	0.0014	0.0456	0.0435	0.0023	0.0019
(8)	1 – 64 or 0.0730 – 64	UNC	2A	0.0006	0.0724	0.0686	...	0.0623	0.0603	0.001970	0.0555	0.0502	0.0532	...	0.0023	0.0017	0.0544	0.0515	0.0028	0.0023
(8)	64		3A	0.0000	0.0730	0.0692	...	0.0629	0.0614	0.0015	0.0561	0.0513	0.0538	...	0.0023	0.0017	0.0550	0.0526	0.0028	0.0023
(8)	1 – 72 or 0.0730 – 72	UNF	2A	0.0006	0.0724	0.0689	...	0.0634	0.0615	0.001899	0.0574	0.0525	0.0554	...	0.0020	0.0015	0.0564	0.0536	0.0025	0.0021
(8)	72		3A	0.0000	0.0730	0.0695	...	0.0640	0.0626	0.0014	0.0580	0.0536	0.0560	...	0.0020	0.0015	0.0570	0.0547	0.0025	0.0021
	2 – 56 or 0.0860 – 56	UNC	2A	0.0006	0.0854	0.0813	...	0.0738	0.0717	0.002127	0.0661	0.0601	0.0635	...	0.0026	0.0019	0.0648	0.0616	0.0032	0.0027
	56		3A	0.0000	0.0860	0.0819	...	0.0744	0.0728	0.0016	0.0667	0.0612	0.0641	...	0.0026	0.0019	0.0654	0.0627	0.0032	0.0027
(8)	2 – 64 or 0.0860 – 64	UNF	2A	0.0006	0.0854	0.0816	...	0.0753	0.0733	0.002040	0.0685	0.0632	0.0662	...	0.0023	0.0017	0.0674	0.0645	0.0028	0.0023
(8)	64		3A	0.0000	0.0860	0.0822	...	0.0759	0.0744	0.0015	0.0691	0.0643	0.0668	...	0.0023	0.0017	0.0680	0.0656	0.0028	0.0023
	3 – 48 or 0.0990 – 48	UNC	2A	0.0007	0.0983	0.0938	...	0.0848	0.0825	0.002302	0.0757	0.0690	0.0727	...	0.0030	0.0023	0.0743	0.0707	0.0038	0.0031
	48		3A	0.0000	0.0990	0.0945	...	0.0855	0.0838	0.0017	0.0764	0.0703	0.0734	...	0.0030	0.0023	0.0750	0.0720	0.0038	0.0031
	3 – 56 or 0.0990 – 56	UNF	2A	0.0007	0.0983	0.0942	...	0.0867	0.0845	0.002191	0.0790	0.0729	0.0764	...	0.0026	0.0019	0.0777	0.0744	0.0032	0.0027
	56		3A	0.0000	0.0990	0.0949	...	0.0874	0.0858	0.0016	0.0797	0.0742	0.0771	...	0.0026	0.0019	0.0784	0.0757	0.0032	0.0027
	4 – 40 or 0.1120 – 40	UNC	2A	0.0008	0.1112	0.1061	...	0.095	0.0925	0.002507	0.0841	0.0763	0.0805	...	0.0036	0.0027	0.0824	0.0784	0.0045	0.0038
	40		3A	0.0000	0.1120	0.1069	...	0.0958	0.0939	0.0019	0.0849	0.0777	0.0813	...	0.0036	0.0027	0.0832	0.0798	0.0045	0.0038
	4 – 48 or 0.1120 – 48	UNF	2A	0.0007	0.1113	0.1068	...	0.0978	0.0954	0.002361	0.0887	0.0819	0.0857	...	0.0030	0.0023	0.0873	0.0836	0.0038	0.0031
	48		3A	0.0000	0.1120	0.1075	...	0.0985	0.0967	0.0018	0.0894	0.0832	0.0864	...	0.0030	0.0023	0.0880	0.0849	0.0038	0.0031
	5 – 40 or 0.1250 – 40	UNC	2A	0.0008	0.1242	0.1191	...	0.1080	0.1054	0.002562	0.0971	0.0892	0.0935	...	0.0036	0.0027	0.0954	0.0913	0.0045	0.0038
	40		3A	0.0000	0.1250	0.1199	...	0.1088	0.1069	0.0019	0.0979	0.0907	0.0943	...	0.0036	0.0027	0.0962	0.0928	0.0045	0.0038
	5 – 44 or 0.1250 – 44	UNF	2A	0.0007	0.1243	0.1195	...	0.1095	0.1070	0.002484	0.0997	0.0922	0.0964	...	0.0033	0.0025	0.0980	0.0941	0.0041	0.0034
	44		3A	0.0000	0.1250	0.1202	...	0.1102	0.1083	0.0019	0.1004	0.0935	0.0971	...	0.0033	0.0025	0.0987	0.0954	0.0041	0.0034
	6 – 32 or 0.1380 – 32	UNC	2A	0.0008	0.1372	0.1312	...	0.1169	0.1141	0.002820	0.1034	0.0938	0.0989	...	0.0045	0.0034	0.1011	0.0964	0.0056	0.0047
(8)	32		3A	0.0000	0.1380	0.1320	...	0.1177	0.1156	0.0021	0.1042	0.0953	0.0997	...	0.0045	0.0034	0.1019	0.0979	0.0056	0.0047
	6 – 40 or 0.1380 – 40	UNF	2A	0.0008	0.1372	0.1321	...	0.1210	0.1184	0.002614	0.1101	0.1022	0.1065	...	0.0036	0.0027	0.1084	0.1043	0.0045	0.0038
	40		3A	0.0000	0.1380	0.1329	...	0.1218	0.1198	0.0020	0.1109	0.1036	0.1073	...	0.0036	0.0027	0.1092	0.1057	0.0045	0.0038

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	8 – 32 or 0.1640 – 32	UNC	2A	0.0009	0.1631	0.1571	...	0.1428	0.1399	0.002916	0.1293	0.1196	0.1248	...	0.0045	0.0034	0.1270	0.1222	0.0056	0.0047
(8)	32		3A	0.0000	0.1640	0.1580	...	0.1437	0.1415	0.0022	0.1302	0.1212	0.1257	...	0.0045	0.0034	0.1279	0.1238	0.0056	0.0047
	8 – 36 or 0.1640 – 36	UNF	2A	0.0008	0.1632	0.1577	...	0.1452	0.1424	0.002804	0.1331	0.1244	0.1291	...	0.0040	0.0030	0.1312	0.1267	0.0050	0.0042
	36		3A	0.0000	0.1640	0.1585	...	0.1460	0.1439	0.0021	0.1339	0.1259	0.1299	...	0.0040	0.0030	0.1320	0.1282	0.0050	0.0042
(8)	10 – 24 or 0.1900 – 24	UNC	2A	0.0010	0.1890	0.1818	...	0.1619	0.1586	0.003319	0.1439	0.1315	0.1379	...	0.0060	0.0045	0.1409	0.1350	0.0075	0.0063
	24		3A	0.0000	0.190	0.1828	...	0.1629	0.1604	0.0025	0.1449	0.1333	0.1389	...	0.0060	0.0045	0.1419	0.1368	0.0075	0.0063
	10 – 32 or 0.1900 – 32	UNF	2A	0.0009	0.1891	0.1831	...	0.1688	0.1658	0.003004	0.1553	0.1455	0.1508	...	0.0045	0.0034	0.1530	0.1481	0.0056	0.0047
	32		3A	0.0000	0.1900	0.1840	...	0.1697	0.1674	0.0023	0.1562	0.1471	0.1517	...	0.0045	0.0034	0.1539	0.1497	0.0056	0.0047
	12 – 24 or 0.2160 – 24	UNC	2A	0.0010	0.2150	0.2078	...	0.1879	0.1845	0.003400	0.1699	0.1574	0.1639	...	0.0060	0.0045	0.1669	0.1609	0.0075	0.0063
	24		3A	0.0000	0.2160	0.2088	...	0.1889	0.1863	0.0026	0.1709	0.1592	0.1649	...	0.0060	0.0045	0.1679	0.1627	0.0075	0.0063
	12 – 28 or 0.2160 – 28	UNF	2A	0.0010	0.2150	0.2085	...	0.1918	0.1886	0.003224	0.1763	0.1654	0.1712	...	0.0052	0.0039	0.1738	0.1684	0.0064	0.0054
	28		3A	0.0000	0.2160	0.2095	...	0.1928	0.1904	0.0024	0.1773	0.1672	0.1722	...	0.0052	0.0039	0.1748	0.1702	0.0064	0.0054
(8)	12 – 32 or 0.2160 – 32	UNEF	2A	0.0010	0.2150	0.2090	...	0.1947	0.1915	0.003183	0.1812	0.1712	0.1767	...	0.0045	0.0034	0.1789	0.1738	0.0056	0.0047
	32		3A	0.0000	0.2160	0.2100	...	0.1957	0.1933	0.0024	0.1822	0.1730	0.1777	...	0.0045	0.0034	0.1799	0.1756	0.0056	0.0047
	1/4 – 20 or 0.2500 – 20	UNC	1A	0.0011	0.2489	0.2367	...	0.2164	0.2108	0.0056	0.1948	0.1783	0.1876	...	0.0072	0.0054	...	...	...	...
	20		2A	0.0011	0.2489	0.2408	0.2367	0.2164	0.2127	0.003731	0.1948	0.1802	0.1876	...	0.0072	0.0054	0.1911	0.1844	0.0090	0.0075
	20		3A	0.0000	0.2500	0.2419	...	0.2175	0.2147	0.0028	0.1959	0.1822	0.1887	...	0.0072	0.0054	0.1922	0.1864	0.009	0.0075
	1/4 – 28 or 0.2500 – 28	UNF	1A	0.0010	0.2490	0.2392	...	0.2258	0.2208	0.0050	0.2103	0.1976	0.2052	...	0.0052	0.0039	...	...	...	...
	28		2A	0.0010	0.2490	0.2425	...	0.2258	0.2225	0.003322	0.2103	0.1993	0.2052	...	0.0052	0.0039	0.2078	0.2023	0.0064	0.0054
	28		3A	0.0000	0.2500	0.2435	...	0.2268	0.2243	0.0025	0.2113	0.2011	0.2062	...	0.0052	0.0039	0.2088	0.2041	0.0064	0.0054
	1/4 – 32 or 0.2500 – 32	UNEF	2A	0.0010	0.2490	0.2430	...	0.2287	0.2255	0.003228	0.2152	0.2052	0.2107	...	0.0045	0.0034	0.2129	0.2078	0.0056	0.0047
	32		3A	0.0000	0.2500	0.2440	...	0.2297	0.2273	0.0024	0.2162	0.2070	0.2117	...	0.0045	0.0034	0.2139	0.2096	0.0056	0.0047
	5/16 – 18 or 0.3125 – 18	UNC	1A	0.0012	0.3113	0.2982	...	0.2752	0.2691	0.0061	0.2512	0.2330	0.2431	...	0.0080	0.0060	...	...	...	...
	18		2A	0.0012	0.3113	0.3026	0.2982	0.2752	0.2712	0.004041	0.2512	0.2351	0.2431	...	0.0080	0.0060	0.2471	0.2398	0.0100	0.0083
	18		3A	0.0000	0.3125	0.3038	...	0.2764	0.2734	0.0030	0.2524	0.2373	0.2443	...	0.0080	0.0060	0.2483	0.2420	0.0100	0.0083
(8)	5/16 – 20 or 0.3125 – 20	UN	2A	0.0012	0.3113	0.3032	...	0.2788	0.2747	0.004060	0.2572	0.2422	0.2500	...	0.0072	0.0054	0.2535	0.2464	0.0090	0.0075
(8)	20		3A	0.0000	0.3125	0.3044	...	0.2800	0.2770	0.0030	0.2584	0.2445	0.2512	...	0.0072	0.0054	0.2547	0.2487	0.0090	0.0075

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$^{5}/_{16}$ – 24 or 0.3125 – 24	UNF	1A	0.0011	0.3114	0.3006	...	0.2843	0.2788	0.0055	0.2663	0.2517	0.2603	...	0.0060	0.0045	...	...	...	...
	24		2A	0.0011	0.3114	0.3042	...	0.2843	0.2806	0.003660	0.2663	0.2535	0.2603	...	0.0060	0.0045	0.2633	0.2570	0.0075	0.0063
	24		3A	0.0000	0.3125	0.3053	...	0.2854	0.2827	0.0027	0.2674	0.2556	0.2614	...	0.0060	0.0045	0.2644	0.2591	0.0075	0.0063
(8)	$^{5}/_{16}$ – 28 or 0.3125 – 28	UN	2A	0.00100	0.3115	0.3050	...	0.2883	0.2848	0.003495	0.2728	0.2616	0.2677	...	0.0052	0.0039	0.2703	0.2646	0.0064	0.0054
(8)	28		3A	0.0000	0.3125	0.3060	...	0.2893	0.2867	0.0026	0.2738	0.2635	0.2687	...	0.0052	0.0039	0.2713	0.2665	0.0064	0.0054
(8)	$^{5}/_{16}$ – 32 or 0.3125 – 32	UNEF	2A	0.0010	0.3115	0.3055	...	0.2912	0.2879	0.003301	0.2777	0.2676	0.2732	...	0.0045	0.0034	0.2754	0.2702	0.0056	0.0047
(8)	32		3A	0.0000	0.3125	0.3065	...	0.2922	0.2897	0.0025	0.2787	0.2694	0.2742	...	0.0045	0.0034	0.2764	0.2720	0.0056	0.0047
	$^{3}/_{8}$ – 16 or 0.3750 – 16	UNC	1A	0.0013	0.3737	0.3595	...	0.3331	0.3266	0.0065	0.3060	0.2860	0.2970	...	0.0090	0.0068	...	...	...	...
	16		2A	0.0013	0.3737	0.3643	0.3595	0.3331	0.3287	0.004363	0.3060	0.2881	0.2970	...	0.0090	0.0068	0.3015	0.2933	0.0113	0.0094
	16		3A	0.0000	0.3750	0.3656	...	0.3344	0.3311	0.0033	0.3073	0.2905	0.2983	...	0.009	0.0068	0.3028	0.2957	0.0113	0.0094
	$^{3}/_{8}$ – 20 or 0.3750 – 20	UN	2A	0.0012	0.3738	0.3657	...	0.3413	0.3372	0.004124	0.3197	0.3047	0.3125	...	0.0072	0.0054	0.3160	0.3089	0.0090	0.0075
	20		3A	0.0000	0.3750	0.3669	...	0.3425	0.3394	0.0031	0.3209	0.3069	0.3137	...	0.0072	0.0054	0.3172	0.3111	0.0090	0.0075
	$^{3}/_{8}$ – 24 or 0.3750 – 24	UNF	1A	0.0011	0.3739	0.3631	...	0.3468	0.3411	0.0057	0.3288	0.3140	0.3228	...	0.0060	0.0045	...	...	...	...
	24		2A	0.0011	0.3739	0.3667	...	0.3468	0.3430	0.003804	0.3288	0.3159	0.3228	...	0.0060	0.0045	0.3258	0.3194	0.0075	0.0063
	24		3A	0.0000	0.3750	0.3678	...	0.3479	0.3450	0.0029	0.3299	0.3179	0.3239	...	0.0060	0.0045	0.3269	0.3214	0.0075	0.0063
	$^{3}/_{8}$ – 28 or 0.3750 – 28	UN	2A	0.0011	0.3739	0.3674	...	0.3507	0.3471	0.003559	0.3352	0.3239	0.3301	...	0.0052	0.0039	0.3327	0.3269	0.0064	0.0054
	28		3A	0.0000	0.3750	0.3685	...	0.3518	0.3491	0.0027	0.3363	0.3259	0.3312	...	0.0052	0.0039	0.3338	0.3289	0.0064	0.0054
	$^{3}/_{8}$ – 32 or 0.3750 – 32	UNEF	2A	0.0010	0.3740	0.3680	...	0.3537	0.3503	0.003365	0.3402	0.3300	0.3357	...	0.0045	0.0034	0.3379	0.3326	0.0056	0.0047
	32		3A	0.0000	0.3750	0.3690	...	0.3547	0.3522	0.0025	0.3412	0.3319	0.3367	...	0.0045	0.0034	0.3389	0.3345	0.0056	0.0047
	$^{7}/_{16}$ – 14 or 0.4375 – 14	UNC	1A	0.0014	0.4361	0.4206	...	0.3897	0.3826	0.0071	0.3588	0.3362	0.3485	...	0.0103	0.0077	...	...	...	...
	14		2A	0.0014	0.4361	0.4258	0.4206	0.3897	0.3850	0.004713	0.3588	0.3386	0.3485	...	0.0103	0.0077	0.3536	0.3446	0.0129	0.0107
	14		3A	0.0000	0.4375	0.4272	...	0.3911	0.3876	0.0035	0.3602	0.3412	0.3499	...	0.0103	0.0077	0.3550	0.3472	0.0129	0.0107
(8)	$^{7}/_{16}$ – 16 or 0.4375 – 16	UN	2A	0.0014	0.4361	0.4267	...	0.3955	0.3909	0.004626	0.3684	0.3503	0.3594	...	0.0090	0.0068	0.3639	0.3555	0.0113	0.0094
(8)	16		3A	0.0000	0.4375	0.4281	...	0.3969	0.3934	0.0035	0.3698	0.3528	0.3608	...	0.0090	0.0068	0.3653	0.3580	0.0113	0.0094
(8)	$^{7}/_{16}$ – 20 or 0.4375 – 20	UNF	1A	0.0013	0.4362	0.4240	...	0.4037	0.3974	0.0063	0.3821	0.3649	0.3749	...	0.0072	0.0054	...	...	...	...
	20		2A	0.0013	0.4362	0.4281	...	0.4037	0.3995	0.004167	0.3821	0.3670	0.3749	...	0.0072	0.0054	0.3784	0.3712	0.0090	0.0075
	20		3A	0.0000	0.4375	0.4294	...	0.4050	0.4019	0.0031	0.3834	0.3694	0.3762	...	0.0072	0.0054	0.3797	0.3736	0.0090	0.0075
(8)	$^{7}/_{16}$ – 28 or 0.4375 – 28	UNEF	2A	0.0011	0.4364	0.4299	...	0.4132	0.4096	0.003616	0.3977	0.3864	0.3926	...	0.0052	0.0039	0.3952	0.3894	0.0064	0.0054
	28		3A	0.0000	0.4375	0.4310	...	0.4143	0.4116	0.0027	0.3988	0.3884	0.3937	...	0.0052	0.0039	0.3963	0.3914	0.0064	0.0054

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(8)	7/16 – 32 or 0.4375 – 32	UN	2A	0.0010	0.4365	0.4305	...	0.4162	0.4128	0.003422	0.4027	0.3925	0.3982	...	0.0045	0.0034	0.4004	0.3951	0.0056	0.0047
	32		3A	0.0000	0.4375	0.4315	...	0.4172	0.4146	0.0026	0.4037	0.3943	0.3992	...	0.0045	0.0034	0.4014	0.3969	0.0056	0.0047
	1/2 – 13 or 0.5000 – 13	UNC	1A	0.0015	0.4985	0.4822	...	0.4485	0.4411	0.0074	0.4152	0.3911	0.4041	...	0.0111	0.0083	...	...	...	...
	13		2A	0.0015	0.4985	0.4876	0.4822	0.4485	0.4435	0.004965	0.4152	0.3935	0.4041	...	0.0111	0.0083	0.4096	0.4000	0.0139	0.0115
	13		3A	0.0000	0.5000	0.4891	...	0.4500	0.4463	0.0037	0.4167	0.3963	0.4056	...	0.0111	0.0083	0.4111	0.4028	0.0139	0.0115
	1/2 – 16 or 0.5000 – 16	UN	2A	0.0014	0.4986	0.4892	...	0.4580	0.4533	0.004678	0.4309	0.4127	0.4219	...	0.0090	0.0068	0.4264	0.4179	0.0113	0.0094
(8)	16		3A	0.0000	0.5000	0.4906	...	0.4594	0.4559	0.0035	0.4323	0.4153	0.4233	...	0.0090	0.0068	0.4278	0.4205	0.0113	0.0094
	1/2 – 20 or 0.5000 – 20	UNF	1A	0.0013	0.4987	0.4865	...	0.4662	0.4598	0.0064	0.4446	0.4273	0.4374	...	0.0072	0.0054	...	...	...	...
	20		2A	0.0013	0.4987	0.4906	...	0.4662	0.4619	0.004288	0.4446	0.4294	0.4374	...	0.0072	0.0054	0.4409	0.4336	0.0090	0.0075
	20		3A	0.0000	0.5000	0.4919	...	0.4675	0.4643	0.0032	0.4459	0.4318	0.4387	...	0.0072	0.0054	0.4422	0.4360	0.0090	0.0075
	1/2 – 28 or 0.5000 – 28	UNEF	2A	0.0011	0.4989	0.4924	...	0.4757	0.4720	0.003668	0.4602	0.4488	0.4551	...	0.0052	0.0039	0.4577	0.4518	0.0064	0.0054
	28		3A	0.0000	0.5000	0.4935	...	0.4768	0.4740	0.0028	0.4613	0.4508	0.4562	...	0.0052	0.0039	0.4588	0.4538	0.0064	0.0054
	1/2 – 32 or 0.5000 – 32	UN	2A	0.0010	0.4990	0.4930	...	0.4787	0.4752	0.003474	0.4652	0.4549	0.4607	...	0.0045	0.0034	0.4629	0.4575	0.0056	0.0047
	32		3A	0.0000	0.5000	0.4940	...	0.4797	0.4771	0.0026	0.4662	0.4568	0.4617	...	0.0045	0.0034	0.4639	0.4594	0.0056	0.0047
	9/16 – 12 or 0.5625 – 12	UNC	1A	0.0016	0.5609	0.5437	...	0.5068	0.4990	0.0078	0.4707	0.4449	0.4587	...	0.0120	0.0090	...	...	...	...
	12		2A	0.0016	0.5609	0.5495	0.5437	0.5068	0.5016	0.005225	0.4707	0.4475	0.4587	...	0.0120	0.0090	0.4647	0.4545	0.0150	0.0125
	12		3A	0.0000	0.5625	0.5511	...	0.5084	0.5045	0.0039	0.4723	0.4504	0.4603	...	0.0120	0.0090	0.4663	0.4574	0.0150	0.0125
	9/16 – 16 or 0.5625 – 16	UN	2A	0.0014	0.5611	0.5517	...	0.5205	0.5158	0.004725	0.4934	0.4752	0.4844	...	0.0090	0.0068	0.4889	0.4804	0.0113	0.0094
(8)	16		3A	0.0000	0.5625	0.5531	...	0.5219	0.5184	0.0035	0.4948	0.4778	0.4858	...	0.0090	0.0068	0.4903	0.4830	0.0113	0.0094
	9/16 – 18 or 0.5625 – 18	UNF	1A	0.0014	0.5611	0.5480	...	0.5250	0.5182	0.0068	0.5010	0.4821	0.4929	...	0.0080	0.0060	...	...	...	...
	18		2A	0.0014	0.5611	0.5524	...	0.5250	0.5205	0.004547	0.501	0.4844	0.4929	...	0.0080	0.0060	0.4969	0.4891	0.0100	0.0083
	18		3A	0.0000	0.5625	0.5538	...	0.5264	0.5230	0.0034	0.5024	0.4869	0.4943	...	0.0080	0.0060	0.4983	0.4916	0.0100	0.0083
(8)	9/16 – 20 or 0.5625 – 20	UN	2A	0.0013	0.5612	0.5531	...	0.5287	0.5244	0.004280	0.5071	0.4919	0.4999	...	0.0072	0.0054	0.5034	0.4961	0.0090	0.0075
(8)	20		3A	0.0000	0.5625	0.5544	...	0.5300	0.5268	0.0032	0.5084	0.4943	0.5012	...	0.0072	0.0054	0.5047	0.4985	0.0090	0.0075
(8)	9/16 – 24 or 0.5625 – 24	UNEF	2A	0.0012	0.5613	0.5541	...	0.5342	0.5302	0.003960	0.5162	0.5031	0.5102	...	0.0060	0.0045	0.5132	0.5066	0.0075	0.0063
(8)	24		3A	0.0000	0.5625	0.5553	...	0.5354	0.5324	0.0030	0.5174	0.5053	0.5114	...	0.0060	0.0045	0.5144	0.5088	0.0075	0.0063
	9/16 – 28 or 0.5625 – 28	UN	2A	0.0011	0.5614	0.5549	...	0.5382	0.5345	0.003715	0.5227	0.5113	0.5176	...	0.0052	0.0039	0.5202	0.5143	0.0064	0.0054
	28		3A	0.0000	0.5625	0.5560	...	0.5393	0.5365	0.0028	0.5238	0.5133	0.5187	...	0.0052	0.0039	0.5213	0.5163	0.0064	0.0054

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(8)	$^{9}/_{16}$ – 32 or 0.5625 – 32	UN	2A	0.0011	0.5614	0.5554	...	0.5411	0.5376	0.003521	0.5276	0.5173	0.5231	...	0.0045	0.0034	0.5253	0.5199	0.0056	0.0047
	32		3A	0.0000	0.5625	0.5565	...	0.5422	0.5396	0.0026	0.5287	0.5193	0.5242	...	0.0045	0.0034	0.5264	0.5219	0.0056	0.0047
(8)	$^{5}/_{8}$ – 11 or 0.625 – 11	UNC	1A	0.0017	0.6233	0.6051	...	0.5643	0.5560	0.0083	0.5249	0.4970	0.5118	...	0.0131	0.0098	...	...	...	...
(8)	11		2A	0.0017	0.6233	0.6112	0.6052	0.5643	0.5588	0.005501	0.5249	0.4998	0.5118	...	0.0131	0.0098	0.5184	0.5074	0.0164	0.0136
	11		3A	0.0000	0.6250	0.6129	...	0.5660	0.5619	0.0041	0.5266	0.5029	0.5135	...	0.0131	0.0098	0.5201	0.5105	0.0164	0.0136
	$^{5}/_{8}$ – 12 or 0.625 – 12	UN	2A	0.0016	0.6234	0.6120	...	0.5693	0.5639	0.005443	0.5332	0.5098	0.5212	...	0.0120	0.0090	0.5272	0.5168	0.0150	0.0125
	12		3A	0.0000	0.6250	0.6136	...	0.5709	0.5668	0.0041	0.5348	0.5127	0.5228	...	0.0120	0.0090	0.5288	0.5197	0.0150	0.0125
	$^{5}/_{8}$ – 16 or 0.6250 – 16	UN	2A	0.0014	0.6236	0.6142	...	0.5830	0.5782	0.004769	0.5559	0.5376	0.5469	...	0.0090	0.0068	0.5514	0.5428	0.0113	0.0094
	16		3A	0.0000	0.6250	0.6156	...	0.5844	0.5808	0.0036	0.5573	0.5402	0.5483	...	0.0090	0.0068	0.5528	0.5454	0.0113	0.0094
	$^{5}/_{8}$ – 18 or 0.6250 – 18	UNF	1A	0.0014	0.6236	0.6105	...	0.5875	0.5805	0.0070	0.5635	0.5444	0.5554	...	0.0080	0.0060	...	...	...	...
	18		2A	0.0014	0.6236	0.6149	...	0.5875	0.5828	0.004652	0.5635	0.5467	0.5554	...	0.0080	0.0060	0.5594	0.5514	0.0100	0.0083
	18		3A	0.0000	0.6250	0.6163	...	0.5889	0.5854	0.0035	0.5649	0.5493	0.5568	...	0.0080	0.0060	0.5608	0.5540	0.0100	0.0083
	$^{5}/_{8}$ – 20 or 0.6250 – 20	UN	2A	0.0013	0.6237	0.6156	...	0.5912	0.5869	0.004324	0.5696	0.5544	0.5624	...	0.0072	0.0054	0.5659	0.5586	0.0090	0.0075
	20		3A	0.0000	0.6250	0.6169	...	0.5925	0.5893	0.0032	0.5709	0.5568	0.5637	...	0.0072	0.0054	0.5672	0.5610	0.0090	0.0075
	$^{5}/_{8}$ – 24 or 0.6250 – 24	UNEF	2A	0.0012	0.6238	0.6166	...	0.5967	0.5927	0.004004	0.5787	0.5656	0.5727	...	0.0060	0.0045	0.5757	0.5691	0.0075	0.0063
	24		3A	0.0000	0.6250	0.6178	...	0.5979	0.5949	0.0030	0.5799	0.5678	0.5739	...	0.0060	0.0045	0.5769	0.5713	0.0075	0.0063
	$^{5}/_{8}$ – 28 or 0.6250 – 28	UN	2A	0.0011	0.6239	0.6174	...	0.6007	0.5969	0.003759	0.5852	0.5737	0.5801	...	0.0052	0.0039	0.5827	0.5767	0.0064	0.0054
	28		3A	0.0000	0.6250	0.6185	...	0.6018	0.5990	0.0028	0.5863	0.5758	0.5812	...	0.0052	0.0039	0.5838	0.5788	0.0064	0.0054
	$^{5}/_{8}$ – 32 or 0.6250 – 32	UN	2A	0.0011	0.6239	0.6179	...	0.6036	0.6000	0.003565	0.5901	0.5797	0.5856	...	0.0045	0.0034	0.5878	0.5823	0.0056	0.0047
	32		3A	0.0000	0.6250	0.6190	...	0.6047	0.6020	0.0027	0.5912	0.5817	0.5867	...	0.0045	0.0034	0.5889	0.5843	0.0056	0.0047
(8)	$^{11}/_{16}$ – 12 or 0.6875 – 12	UN	2A	0.0016	0.6859	0.6745	...	0.6318	0.6263	0.005485	0.5957	0.5722	0.5837	...	0.0120	0.0090	0.5897	0.5792	0.0150	0.0125
	12		3A	0.0000	0.6875	0.6761	...	0.6334	0.6293	0.0041	0.5973	0.5752	0.5853	...	0.0120	0.0090	0.5913	0.5822	0.0150	0.0125
(8)	$^{11}/_{16}$ – 16 or 0.6875 – 16	UN	2A	0.0014	0.6861	0.6767	...	0.6455	0.6407	0.004811	0.6184	0.6001	0.6094	...	0.0090	0.0068	0.6139	0.6053	0.0113	0.0094
	16		3A	0.0000	0.6875	0.6781	...	0.6469	0.6433	0.0036	0.6198	0.6027	0.6108	...	0.0090	0.0068	0.6153	0.6079	0.0113	0.0094
(8)	$^{11}/_{16}$ – 20 or 0.6875 – 20	UN	2A	0.0013	0.6862	0.6781	...	0.6537	0.6493	0.004366	0.6321	0.6168	0.6249	...	0.0072	0.0054	0.6284	0.6210	0.0090	0.0075
(8)	20		3A	0.0000	0.6875	0.6794	...	0.6550	0.6517	0.0033	0.6334	0.6192	0.6262	...	0.0072	0.0054	0.6297	0.6234	0.0090	0.0075
(8)	$^{11}/_{16}$ – 24 or 0.6875 – 24	UNEF	2A	0.0012	0.6863	0.6791	...	0.6592	0.6552	0.004046	0.6412	0.6281	0.6352	...	0.0060	0.0045	0.6382	0.6316	0.0075	0.0063
	24		3A	0.0000	0.6875	0.6803	...	0.6604	0.6574	0.0030	0.6424	0.6303	0.6364	...	0.0060	0.0045	0.6394	0.6338	0.0075	0.0063

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$^{11}/_{16}$ – 28 or 0.6875 – 28	UN	2A	0.0011	0.6864	0.6799	...	0.6632	0.6594	0.003801	0.6477	0.6362	0.6426	...	0.0052	0.0039	0.6452	0.6392	0.0064	0.0054
(8)	28		3A	0.0000	0.6875	0.6810	...	0.6643	0.6614	0.0029	0.6488	0.6382	0.6437	...	0.0052	0.0039	0.6463	0.6412	0.0064	0.0054
(8)	$^{11}/_{16}$ – 32 or 0.6875 – 32	UN	2A	0.0011	0.6864	0.6804	...	0.6661	0.6625	0.003607	0.6526	0.6422	0.6481	...	0.0045	0.0034	0.6503	0.6448	0.0056	0.0047
	32		3A	0.0000	0.6875	0.6815	...	0.6672	0.6645	0.0027	0.6537	0.6442	0.6492	...	0.0045	0.0034	0.6514	0.6468	0.0056	0.0047
	$^{3}/_{4}$ – 10 or 0.7500 – 10	UNC	1A	0.0018	0.7482	0.7288	...	0.6832	0.6744	0.0088	0.6399	0.6094	0.6255	...	0.0144	0.0108	...	...	...	...
	10		2A	0.0018	0.7482	0.7353	0.7288	0.6832	0.6773	0.005894	0.6399	0.6123	0.6255	...	0.0144	0.0108	0.6327	0.6207	0.0180	0.0150
	10		3A	0.0000	0.7500	0.7371	...	0.6850	0.6806	0.0044	0.6417	0.6156	0.6273	...	0.0144	0.0108	0.6345	0.6240	0.0180	0.0150
	$^{3}/_{4}$ – 12 or 0.7500 – 12	UN	2A	0.0017	0.7483	0.7369	...	0.6942	0.6887	0.005524	0.6581	0.6346	0.6461	...	0.0120	0.0090	0.6521	0.6416	0.0150	0.0125
	12		3A	0.0000	0.7500	0.7386	...	0.6959	0.6918	0.0041	0.6598	0.6377	0.6478	...	0.0120	0.0090	0.6538	0.6447	0.0150	0.0125
	$^{3}/_{4}$ – 16 or 0.7500 – 16	UNF	1A	0.0015	0.7485	0.7343	...	0.7079	0.7004	0.0075	0.6808	0.6598	0.6718	...	0.0090	0.0068	...	...	...	...
	16		2A	0.0015	0.7485	0.7391	...	0.7079	0.7029	0.005024	0.6808	0.6623	0.6718	...	0.0090	0.0068	0.6763	0.6675	0.0113	0.0094
(8)	16		3A	0.0000	0.7500	0.7406	...	0.7094	0.7056	0.0038	0.6823	0.6650	0.6733	...	0.0090	0.0068	0.6778	0.6702	0.0113	0.0094
	$^{3}/_{4}$ – 20 or 0.7500 – 20	UNEF	2A	0.0013	0.7487	0.7406	...	0.7162	0.7118	0.004405	0.6946	0.6793	0.6874	...	0.0072	0.0054	0.6909	0.6835	0.0090	0.0075
	20		3A	0.0000	0.7500	0.7419	...	0.7175	0.7142	0.0033	0.6959	0.6817	0.6887	...	0.0072	0.0054	0.6922	0.6859	0.0090	0.0075
	$^{3}/_{4}$ – 28 or 0.7500 – 28	UN	2A	0.0012	0.7488	0.7423	...	0.7256	0.7218	0.003840	0.7101	0.6986	0.7050	...	0.0052	0.0039	0.7076	0.7016	0.0064	0.0054
(8)	28		3A	0.0000	0.7500	0.7435	...	0.7268	0.7239	0.0029	0.7113	0.7007	0.7062	...	0.0052	0.0039	0.7088	0.7037	0.0064	0.0054
	$^{3}/_{4}$ – 32 or 0.7500 – 32	UN	2A	0.0011	0.7489	0.7429	...	0.7286	0.7250	0.003646	0.7151	0.7047	0.7106	...	0.0045	0.0034	0.7128	0.7073	0.0056	0.0047
	32		3A	0.0000	0.7500	0.7440	...	0.7297	0.7270	0.0027	0.7162	0.7067	0.7117	...	0.0045	0.0034	0.7139	0.7093	0.0056	0.0047
(8)	$^{13}/_{16}$ – 12 or 0.8125 – 12	UN	2A	0.0017	0.8108	0.7994	...	0.7567	0.7511	0.005561	0.7206	0.6970	0.7086	...	0.0120	0.0090	0.7146	0.7040	0.0150	0.0125
(8)	12		3A	0.0000	0.8125	0.8011	...	0.7584	0.7542	0.0042	0.7223	0.7001	0.7103	...	0.0120	0.0090	0.7163	0.7071	0.0150	0.0125
(8)	$^{13}/_{16}$ – 16 or 0.8125 – 16	UN	2A	0.0015	0.8110	0.8016	...	0.7704	0.7655	0.004887	0.7433	0.7249	0.7343	...	0.0090	0.0068	0.7388	0.7301	0.0113	0.0094
(8)	16		3A	0.0000	0.8125	0.8031	...	0.7719	0.7682	0.0037	0.7448	0.7276	0.7358	...	0.0090	0.0068	0.7403	0.7328	0.0113	0.0094
(8)	$^{13}/_{16}$ – 20 or 0.8125 – 20	UNEF	2A	0.0013	0.8112	0.8031	...	0.7787	0.7743	0.004442	0.7571	0.7418	0.7499	...	0.0072	0.0054	0.7534	0.7460	0.0090	0.0075
(8)	20		3A	0.0000	0.8125	0.8044	...	0.7800	0.7767	0.0033	0.7584	0.7442	0.7512	...	0.0072	0.0054	0.7547	0.7484	0.0090	0.0075
(8)	$^{13}/_{16}$ – 28 or 0.8125 – 28	UN	2A	0.0012	0.8113	0.8048	...	0.7881	0.7842	0.003877	0.7726	0.7610	0.7675	...	0.0052	0.0039	0.7701	0.7640	0.0064	0.0054
(8)	28		3A	0.0000	0.8125	0.8060	...	0.7893	0.7864	0.0029	0.7738	0.7632	0.7687	...	0.0052	0.0039	0.7713	0.7662	0.0064	0.0054
(8)	$^{13}/_{16}$ – 32 or 0.8125 – 32	UN	2A	0.0011	0.8114	0.8054	...	0.7911	0.7874	0.003683	0.7776	0.7671	0.7731	...	0.0045	0.0034	0.7753	0.7697	0.0056	0.0047
(8)	32		3A	0.0000	0.8125	0.8065	...	0.7922	0.7894	0.0028	0.7787	0.7691	0.7742	...	0.0045	0.0034	0.7764	0.7717	0.0056	0.0047

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	7/8 – 9 or 0.8750 – 9	UNC	1A	0.0019	0.8731	0.8523	...	0.8009	0.7914	0.0095	0.7528	0.7192	0.7368	...	0.0160	0.0120	...	...	...	...
	9		2A	0.0019	0.8731	0.8592	0.8523	0.8009	0.7946	0.006305	0.7528	0.7224	0.7368	...	0.0160	0.0120	0.7448	0.7317	0.0200	0.0167
	9		3A	0.0000	0.8750	0.8611	...	0.8028	0.7981	0.0047	0.7547	0.7259	0.7387	...	0.0160	0.0120	0.7467	0.7352	0.0200	0.0167
(8)	7/8 – 12 or 0.8750 – 12	UN	2A	0.0017	0.8733	0.8619	...	0.8192	0.8136	0.005596	0.7831	0.7595	0.7711	...	0.0120	0.0090	0.7771	0.7665	0.0150	0.0125
(8)	12		3A	0.0000	0.8750	0.8636	...	0.8209	0.8167	0.0042	0.7848	0.7626	0.7728	...	0.0120	0.0090	0.7788	0.7696	0.0150	0.0125
(8)	7/8 – 14 or 0.8750 – 14	UNF	1A	0.0016	0.8734	0.8579	...	0.8270	0.8189	0.0081	0.7961	0.7725	0.7858	...	0.0103	0.0077	...	...	...	...
(8)	14		2A	0.0016	0.8734	0.8631	...	0.8270	0.8216	0.005420	0.7961	0.7752	0.7858	...	0.0103	0.0077	0.7909	0.7812	0.0129	0.0107
(8)	14		3A	0.0000	0.8750	0.8647	...	0.8286	0.8245	0.0041	0.7977	0.7781	0.7874	...	0.0103	0.0077	0.7925	0.7841	0.0129	0.0107
(8)	7/8 – 16 or 0.8750 – 16	UN	2A	0.0015	0.8735	0.8641	...	0.8329	0.8280	0.004922	0.8058	0.7874	0.7968	...	0.0090	0.0068	0.8013	0.7926	0.0113	0.0094
(8)	16		3A	0.0000	0.8750	0.8656	...	0.8344	0.8307	0.0037	0.8073	0.7901	0.7983	...	0.0090	0.0068	0.8028	0.7953	0.0113	0.0094
(8)	7/8 – 20 or 0.8750 – 20	UNEF	2A	0.0013	0.8737	0.8656	...	0.8412	0.8367	0.004477	0.8196	0.8042	0.8124	...	0.0072	0.0054	0.8159	0.8084	0.0090	0.0075
(8)	20		3A	0.0000	0.8750	0.8669	...	0.8425	0.8391	0.0034	0.8209	0.8066	0.8137	...	0.0072	0.0054	0.8172	0.8108	0.0090	0.0075
(8)	7/8 – 28 or 0.8750 – 28	UN	2A	0.0012	0.8738	0.8673	...	0.8506	0.8467	0.003912	0.8351	0.8235	0.8300	...	0.0052	0.0039	0.8326	0.8265	0.0064	0.0054
(8)	28		3A	0.0000	0.8750	0.8685	...	0.8518	0.8489	0.0029	0.8363	0.8257	0.8312	...	0.0052	0.0039	0.8338	0.8287	0.0064	0.0054
(8)	7/8 – 32 or 0.8750 – 32	UN	2A	0.0011	0.8739	0.8679	...	0.8536	0.8499	0.003718	0.8401	0.8296	0.8356	...	0.0045	0.0034	0.8378	0.8322	0.0056	0.0047
(8)	32		3A	0.0000	0.8750	0.8690	...	0.8547	0.8519	0.0028	0.8412	0.8316	0.8367	...	0.0045	0.0034	0.8389	0.8342	0.0056	0.0047
(8)	15/16 – 12 or 0.9375 – 12	UN	2A	0.0017	0.9358	0.9244	...	0.8817	0.8761	0.005629	0.8456	0.8220	0.8336	...	0.0120	0.0090	0.8396	0.8290	0.0150	0.0125
(8)	12		3A	0.0000	0.9375	0.9261	...	0.8834	0.8792	0.0042	0.8473	0.8251	0.8353	...	0.0120	0.0090	0.8413	0.8321	0.0150	0.0125
(8)	15/16 – 16 or 0.9375 – 16	UN	2A	0.0015	0.9360	0.9266	...	0.8954	0.8904	0.004955	0.8683	0.8498	0.8593	...	0.0090	0.0068	0.8638	0.8550	0.0113	0.0094
(8)	16		3A	0.0000	0.9375	0.9281	...	0.8969	0.8932	0.0037	0.8698	0.8526	0.8608	...	0.0090	0.0068	0.8653	0.8578	0.0113	0.0094
	15/16 – 20 or 0.9375 – 20	UNEF	2A	0.0014	0.9361	0.9280	...	0.9036	0.8991	0.004510	0.8820	0.8666	0.8748	...	0.0072	0.0054	0.8783	0.8708	0.0090	0.0075
(8)	20		3A	0.0000	0.9375	0.9294	...	0.9050	0.9016	0.0034	0.8834	0.8691	0.8762	...	0.0072	0.0054	0.8797	0.8733	0.0090	0.0075
(8)	15/16 – 28 or 0.9375 – 28	UN	2A	0.0012	0.9363	0.9298	...	0.9131	0.9092	0.003945	0.8976	0.8860	0.8925	...	0.0052	0.0039	0.8951	0.8890	0.0064	0.0054
(8)	28		3A	0.0000	0.9375	0.9310	...	0.9143	0.9113	0.0030	0.8988	0.8881	0.8937	...	0.0052	0.0039	0.8963	0.8911	0.0064	0.0054
	15/16 – 32 or 0.9375 – 32	UN	2A	0.0011	0.9364	0.9304	...	0.9161	0.9123	0.003751	0.9026	0.8920	0.8981	...	0.0045	0.0034	0.9003	0.8946	0.0056	0.0047
	32		3A	0.0000	0.9375	0.9315	...	0.9172	0.9144	0.0028	0.9037	0.8941	0.8992	...	0.0045	0.0034	0.9014	0.8967	0.0056	0.0047

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	1– 8 or 1.0000 – 8	UNC	1A	0.0020	0.9980	0.9755	...	0.9168	0.9067	0.0101	0.8627	0.8255	0.8446	...	0.0180	0.0135	...	...	...	...
	8		2A	0.0020	0.9980	0.9830	0.9755	0.9168	0.9100	0.006750	0.8627	0.8289	0.8446	...	0.0180	0.0135	0.8537	0.8394	0.0226	0.0188
	8		3A	0.0000	1.0000	0.9850	...	0.9188	0.9137	0.0051	0.8647	0.8325	0.8466	...	0.0180	0.0135	0.8557	0.8430	0.0226	0.0188
	1 – 12 or 1.000 – 12	UNF	1A	0.0018	0.9982	0.9810	...	0.9441	0.9353	0.0088	0.9080	0.8812	0.8960	...	0.0120	0.0090	...	...	...	...
	12		2A	0.0018	0.9982	0.9868	...	0.9441	0.9382	0.005862	0.9080	0.8841	0.8960	...	0.0120	0.0090	0.9020	0.8911	0.0150	0.0125
	12		3A	0.0000	1.0000	0.9886	...	0.9459	0.9415	0.0044	0.9098	0.8874	0.8978	...	0.0120	0.0090	0.9038	0.8944	0.0150	0.0125
(8), (9)	1 – 14 or 1.0000 – 14	UNS	2A	0.0016	0.9984	0.9881	...	0.9520	0.9467	0.005285	0.9211	0.9003	0.9108	...	0.0103	0.0077	0.9159	0.9063	0.0129	0.0107
(8)	14		3A	0.0000	1.0000	0.9897	...	0.9536	0.9496	0.0040	0.9227	0.9032	0.9124	...	0.0103	0.0077	0.9175	0.9092	0.0129	0.0107
	1 – 16 or 1.0000 – 16	UN	2A	0.0015	0.9985	0.9891	...	0.9579	0.9529	0.004987	0.9308	0.9123	0.9218	...	0.0090	0.0068	0.9263	0.9175	0.0113	0.0094
	16		3A	0.0000	1.0000	0.9906	...	0.9594	0.9557	0.0037	0.9323	0.9151	0.9233	...	0.0090	0.0068	0.9278	0.9203	0.0113	0.0094
	1 – 20 or 1.0000 – 20	UNEF	2A	0.0014	0.9986	0.9905	...	0.9661	0.9616	0.004542	0.9445	0.9291	0.9373	...	0.0072	0.0054	0.9408	0.9333	0.0000	0.0075
	20		3A	0.0000	1.0000	0.9919	...	0.9675	0.9641	0.0034	0.9459	0.9316	0.9387	...	0.0072	0.0054	0.9422	0.9358	0.0090	0.0075
	1 – 28 or 1.0000 – 28	UN	2A	0.0012	0.9988	0.9923	...	0.9756	0.9716	0.003977	0.9601	0.9484	0.9550	...	0.0052	0.0039	0.9576	0.9514	0.0064	0.0054
	28		3A	0.0000	1.0000	0.9935	...	0.9768	0.9738	0.0030	0.9613	0.9506	0.9562	...	0.0052	0.0039	0.9588	0.9536	0.0064	0.0054
	1 – 32 or 1.0000 – 32	UN	2A	0.0011	0.9989	0.9929	...	0.9786	0.9748	0.003783	0.9651	0.9545	0.9606	...	0.0045	0.0034	0.9628	0.9571	0.0056	0.0047
	32		3A	0.0000	1.0000	0.9940	...	0.9797	0.9769	0.0028	0.9662	0.9566	0.9617	...	0.0045	0.0034	0.9639	0.9592	0.0056	0.0047
	$1\frac{1}{16}$ – 8 or 1.0625 – 8	UN	2A	0.0020	1.0605	1.0455	...	0.9793	0.9725	0.006827	0.9252	0.8913	0.9071	...	0.0180	0.0135	0.9162	0.9018	0.0226	0.0188
	8		3A	0.0000	1.0625	1.0475	...	0.9813	0.9762	0.0051	0.9272	0.8950	0.9091	...	0.0180	0.0135	0.9182	0.9055	0.0226	0.0188
	$1\frac{1}{16}$ – 12 or 1.0625 – 12	UN	2A	0.0017	1.0608	1.0494	...	1.0067	1.0010	0.005692	0.9706	0.9469	0.9586	...	0.0120	0.0090	0.9646	0.9539	0.0150	0.0125
(8)	12		3A	0.0000	1.0625	1.0511	...	1.0084	1.0041	0.0043	0.9723	0.9500	0.9603	...	0.0120	0.0090	0.9663	0.9570	0.0150	0.0125
	$1\frac{1}{16}$ – 16 or 1.0625 – 16	UN	2A	0.0015	1.0610	1.0516	...	1.0204	1.0154	0.005018	0.9933	0.9748	0.9843	...	0.0090	0.0068	0.9888	0.9800	0.0113	0.0094
(8)	16		3A	0.0000	1.0625	1.0531	...	1.0219	1.0181	0.0038	0.9948	0.9775	0.9858	...	0.0090	0.0068	0.9903	0.9827	0.0113	0.0094
(8)	$1\frac{1}{16}$ – 18 or 1.0625 – 18	UNEF	2A	0.0014	1.0611	1.0524	...	1.0250	1.0202	0.004776	1.0010	0.9841	0.9929	...	0.0080	0.0060	0.9969	0.9888	0.0100	0.0083
(8)	18		3A	0.0000	1.0625	1.0538	...	1.0264	1.0228	0.0036	1.0024	0.9867	0.9943	...	0.0080	0.0060	0.9983	0.9914	0.0100	0.0083
(8)	$1\frac{1}{16}$ – 20 or 1.0625 – 20	UN	2A	0.0014	1.0611	1.0530	...	1.0286	1.0240	0.004573	1.0070	0.9915	0.9998	...	0.0072	0.0054	1.0033	0.9957	0.0090	0.0075
(8)	20		3A	0.0000	1.0625	1.0544	...	1.0300	1.0266	0.0034	1.0084	0.9941	1.0012	...	0.0072	0.0054	1.0047	0.9983	0.0090	0.0075

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$1\frac{1}{16}$ – 28 or 1.0625 – 28	UN	2A	0.0012	1.0613	1.0548	...	1.0381	1.0341	0.004008	1.0226	1.0109	1.0175	...	0.0052	0.0039	1.0201	1.0139	0.0064	0.0054
	28		3A	0.0000	1.0625	1.0560	...	1.0393	1.0363	0.0030	1.0238	1.0131	1.0187	...	0.0052	0.0039	1.0213	1.0161	0.0064	0.0054
	$1\frac{1}{8}$ – 7 or 1.1250 – 7	UNC	1A	0.0022	1.1228	1.0982	...	1.0300	1.0191	0.0109	0.9682	0.9263	0.9475	...	0.0206	0.0155	...	...	...	...
(8)	7		2A	0.0022	1.1228	1.1064	1.0982	1.0300	1.0227	0.007250	0.9682	0.9300	0.9475	...	0.0206	0.0155	0.9578	0.9420	0.0258	0.0214
	7		3A	0.0000	1.1250	1.1086	...	1.0322	1.0268	0.0054	0.9704	0.9340	0.9497	...	0.0206	0.0155	0.9600	0.9460	0.0258	0.0214
	$1\frac{1}{8}$ – 8 or 1.1250 – 8	UN	2A	0.0021	1.1229	1.1079	1.1004	1.0417	1.0348	0.006901	0.9876	0.9536	0.9695	...	0.0180	0.0135	0.9786	0.9641	0.0226	0.0188
	8		3A	0.0000	1.1250	1.1100	...	1.0438	1.0386	0.0052	0.9897	0.9574	0.9716	...	0.0180	0.0135	0.9807	0.9679	0.0226	0.0188
	$1\frac{1}{8}$ – 12 or 1.1250 – 12	UNF	1A	0.0018	1.1232	1.1060	...	1.0691	1.0601	0.0090	1.0330	1.0060	1.0210	...	0.0120	0.0090	...	...	...	...
	12		2A	0.0018	1.1232	1.1118	...	1.0691	1.0631	0.006013	1.0330	1.0090	1.0210	...	0.0120	0.0090	1.0270	1.0160	0.0150	0.0125
	12		3A	0.0000	1.1250	1.1136	...	1.0709	1.0664	0.0045	1.0348	1.0123	1.0228	...	0.0120	0.0090	1.0288	1.0193	0.0150	0.0125
(8)	$1\frac{1}{8}$ – 16 or 1.1250 – 16	UN	2A	0.0015	1.1235	1.1141	...	1.0829	1.0779	0.005047	1.0558	1.0373	1.0468	...	0.0090	0.0068	1.0513	1.0425	0.0113	0.0094
(8)	16		3A	0.0000	1.1250	1.1156	...	1.0844	1.0806	0.0038	1.0573	1.0400	1.0483	...	0.0090	0.0068	1.0528	1.0452	0.0113	0.0094
	$1\frac{1}{8}$ – 18 or 1.1250 – 18	UNEF	2A	0.0014	1.1236	1.1149	...	1.0875	1.0827	0.004805	1.0635	1.0466	1.0554	...	0.0080	0.0060	1.0594	1.0513	0.0100	0.0083
(8)	18		3A	0.0000	1.1250	1.1163	...	1.0889	1.0853	0.0036	1.0649	1.0492	1.0568	...	0.0080	0.0060	1.0608	1.0539	0.0100	0.0083
(8)	$1\frac{1}{8}$ – 20 or 1.1250 – 20	UN	2A	0.0014	1.1236	1.1155	...	1.0911	1.0865	0.004602	1.0695	1.0540	1.0623	...	0.0072	0.0054	1.0658	1.0582	0.0090	0.0075
(8)	20		3A	0.0000	1.1250	1.1169	...	1.0925	1.0890	0.0035	1.0709	1.0565	1.0637	...	0.0072	0.0054	1.0672	1.0607	0.0090	0.0075
	$1\frac{1}{8}$ – 28 or 1.1250 – 28	UN	2A	0.0012	1.1238	1.1173	...	1.1006	1.0966	0.004037	1.0851	1.0734	1.0800	...	0.0052	0.0039	1.0826	1.0764	0.0064	0.0054
	28		3A	0.0000	1.1250	1.1185	...	1.1018	1.0988	0.0030	1.0863	1.0756	1.0812	...	0.0052	0.0039	1.0838	1.0786	0.0064	0.0054
	$1\frac{3}{16}$ – 8 or 1.1875 – 8	UN	2A	0.0021	1.1854	1.1704	...	1.1042	1.0972	0.006973	1.0501	1.0160	1.0320	...	0.0180	0.0135	1.0411	1.0265	0.0226	0.0188
	8		3A	0.0000	1.1875	1.1725	...	1.1063	1.1011	0.0052	1.0522	1.0199	1.0341	...	0.0180	0.0135	1.0432	1.0304	0.0226	0.0188
(8)	$1\frac{3}{16}$ – 12 or 1.1875 – 12	UN	2A	0.0017	1.1858	1.1744	...	1.1317	1.1260	0.005749	1.0956	1.0719	1.0836	...	0.0120	0.0090	1.0896	1.0789	0.0150	0.0125
	12		3A	0.0000	1.1875	1.1761	...	1.1334	1.1291	0.0043	1.0973	1.0750	1.0853	...	0.0120	0.0090	1.0913	1.0820	0.0150	0.0125
	$1\frac{3}{16}$ – 16 or 1.1875 – 16	UN	2A	0.0015	1.1860	1.1766	...	1.1454	1.1403	0.005075	1.1183	1.0997	1.1093	...	0.0090	0.0068	1.1138	1.1049	0.0113	0.0094
(8)	16		3A	0.0000	1.1875	1.1781	...	1.1469	1.1431	0.0038	1.1198	1.1025	1.1108	...	0.0090	0.0068	1.1153	1.1077	0.0113	0.0094
(8)	$1\frac{3}{16}$ – 18 or 1.1875 – 18	UNEF	2A	0.0014	1.1861	1.1774	...	1.1500	1.1452	0.004833	1.1260	1.1091	1.1179	...	0.0080	0.0060	1.1219	1.1138	0.0100	0.0083
	18		3A	0.0000	1.1875	1.1788	...	1.1514	1.1478	0.0036	1.1274	1.1117	1.1193	...	0.0080	0.0060	1.1233	1.1164	0.0100	0.0083
(8)	$1\frac{3}{16}$ – 20 or 1.1875 – 20	UN	2A	0.0014	1.1861	1.1780	...	1.1536	1.1490	0.004630	1.1320	1.1165	1.1248	...	0.0072	0.0054	1.1283	1.1207	0.0090	0.0075
(8)	20		3A	0.0000	1.1875	1.1794	...	1.1550	1.1515	0.0035	1.1334	1.1190	1.1262	...	0.0072	0.0054	1.1297	1.1232	0.0090	0.0075

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$1\frac{3}{16}$ – 28 or 1.1875 – 28	UN	2A	0.0012	1.1863	1.1798	...	1.1631	1.1590	0.004065	1.1476	1.1358	1.1425	...	0.0052	0.0039	1.1451	1.1388	0.0064	0.0054
	28		3A	0.0000	1.1875	1.1810	...	1.1643	1.1613	0.0031	1.1488	1.1380	1.1437	...	0.0052	0.0039	1.1463	1.1410	0.0064	0.0054
	$1\frac{1}{4}$ – 7 or 1.2500 – 7	UNC	1A	0.0022	1.2478	1.2232	...	1.1550	1.1439	0.0111	1.0932	1.0511	1.0725	...	0.0206	0.0155	...	...	...	...
	7		2A	0.0022	1.2478	1.2314	1.2232	1.1550	1.1476	0.007392	1.0932	1.0548	1.0725	...	0.0206	0.0155	1.0828	1.0668	0.0258	0.0214
	7		3A	0.0000	1.2500	1.2336	...	1.1572	1.1517	0.0055	1.0954	1.0589	1.0747	...	0.0206	0.0155	1.0850	1.0709	0.0258	0.0214
	$1\frac{1}{4}$ – 8 or 1.2500 – 8	UN	2A	0.0021	1.2479	1.2329	1.2254	1.1667	1.1597	0.007043	1.1126	1.0785	1.0945	...	0.0180	0.0135	1.1036	1.0890	0.0226	0.0188
	8		3A	0.0000	1.2500	1.2350	...	1.1688	1.1635	0.0053	1.1147	1.0823	1.0966	...	0.0180	0.0135	1.1057	1.0928	0.0226	0.0188
	$1\frac{1}{4}$ – 12 or 1.2500 – 12	UNF	1A	0.0018	1.2482	1.2310	...	1.1941	1.1849	0.0092	1.1580	1.1308	1.1460	...	0.0120	0.0090	...	...	...	...
	12		2A	0.0018	1.2482	1.2368	...	1.1941	1.1879	0.006155	1.1580	1.1338	1.1460	...	0.0120	0.0090	1.1520	1.1408	0.0150	0.0125
	12		3A	0.0000	1.2500	1.2386	...	1.1959	1.1913	0.0046	1.1598	1.1372	1.1478	...	0.0120	0.0090	1.1538	1.1442	0.0150	0.0125
	$1\frac{1}{4}$ – 16 or 1.2500 – 16	UN	2A	0.0015	1.2485	1.2391	...	1.2079	1.2028	0.005103	1.1808	1.1622	1.1718	...	0.0090	0.0068	1.1763	1.1674	0.0113	0.0094
(8)	16		3A	0.0000	1.2500	1.2406	...	1.2094	1.2056	0.0038	1.1823	1.1650	1.1733	...	0.0090	0.0068	1.1778	1.1702	0.0113	0.0094
	$1\frac{1}{4}$ – 18 or 1.2500 – 18	UNEF	2A	0.0015	1.2485	1.2398	...	1.2124	1.2075	0.004861	1.1884	1.1714	1.1803	...	0.0080	0.0060	1.1843	1.1761	0.0100	0.0083
	18		3A	0.0000	1.2500	1.2413	...	1.2139	1.2103	0.0036	1.1899	1.1742	1.1818	...	0.0080	0.0060	1.1858	1.1789	0.0100	0.0083
	$1\frac{1}{4}$ – 20 or 1.2500 – 20	UN	2A	0.0014	1.2486	1.2405	...	1.2161	1.2114	0.004658	1.1945	1.1789	1.1873	...	0.0072	0.0054	1.1908	1.1831	0.0090	0.0075
(8)	20		3A	0.0000	1.2500	1.2419	...	1.2175	1.2140	0.0035	1.1959	1.1815	1.1887	...	0.0072	0.0054	1.1922	1.1857	0.0090	0.0075
	$1\frac{1}{4}$ – 28 or 1.2500 – 28	UN	2A	0.0012	1.2488	1.2423	...	1.2256	1.2215	0.004093	1.2101	1.1983	1.2050	...	0.0052	0.0039	1.2076	1.2013	0.0064	0.0054
	28		3A	0.0000	1.2500	1.2435	...	1.2268	1.2237	0.0031	1.2113	1.2005	1.2062	...	0.0052	0.0039	1.2088	1.2035	0.0064	0.0054
	$1\frac{5}{16}$ – 8 or 1.3125 – 8	UN	2A	0.0021	1.3104	1.2954	...	1.2292	1.2221	0.007110	1.1751	1.1409	1.1570	...	0.0180	0.0135	1.1661	1.1514	0.0226	0.0188
	8		3A	0.0000	1.3125	1.2975	...	1.2313	1.2260	0.0053	1.1772	1.1448	1.1591	...	0.0180	0.0135	1.1682	1.1553	0.0226	0.0188
	$1\frac{5}{16}$ – 12 or 1.3125 – 12	UN	2A	0.0017	1.3108	1.2994	...	1.2567	1.2509	0.005803	1.2206	1.1968	1.2086	...	0.0120	0.0090	1.2146	1.2038	0.0150	0.0125
(8)	12		3A	0.0000	1.3125	1.3011	...	1.2584	1.2540	0.0044	1.2223	1.1999	1.2103	...	0.0120	0.0090	1.2163	1.2069	0.0150	0.0125
(8)	$1\frac{5}{16}$ – 16 or 1.3125 – 16	UN	2A	0.0015	1.3110	1.3016	...	1.2704	1.2653	0.005129	1.2433	1.2247	1.2343	...	0.0090	0.0068	1.2388	1.2299	0.0113	0.0094
(8)	16		3A	0.0000	1.3125	1.3031	...	1.2719	1.2681	0.0038	1.2448	1.2275	1.2358	...	0.0090	0.0068	1.2403	1.2327	0.0113	0.0094
(8)	$1\frac{5}{16}$ – 18 or 1.3125 – 18	UNEF	2A	0.0015	1.3110	1.3023	...	1.2749	1.2700	0.004887	1.2509	1.2339	1.2428	...	0.0080	0.0060	1.2468	1.2386	0.0100	0.0083
(8)	18		3A	0.0000	1.3125	1.3038	...	1.2764	1.2727	0.0037	1.2524	1.2366	1.2443	...	0.0080	0.0060	1.2483	1.2413	0.0100	0.0083
	$1\frac{5}{16}$ – 20 or 1.3125 – 20	UN	2A	0.0014	1.3111	1.3030	...	1.2786	1.2739	0.004684	1.2570	1.2414	1.2498	...	0.0072	0.0054	1.2533	1.2456	0.0090	0.0075
(8)	20		3A	0.0000	1.3125	1.3044	...	1.2800	1.2765	0.0035	1.2584	1.2440	1.2512	...	0.0072	0.0054	1.2547	1.2482	0.0090	0.0075

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(8)	$1\frac{5}{16}$ – 28 or 1.3125 – 28	UN	2A	0.0012	1.3113	1.3048	...	1.2881	1.2840	0.004119	1.2726	1.2608	1.2675	...	0.0052	0.0039	1.2701	1.2638	0.0064	0.0054
	28		3A	0.0000	1.3125	1.3060	...	1.2893	1.2862	0.0031	1.2738	1.263	1.2687	...	0.0052	0.0039	1.2713	1.2660	0.0064	0.0054
	$1\frac{3}{8}$ – 6 or 1.3750 – 6	UNC	1A	0.0024	1.3726	1.3453	...	1.2643	1.2523	0.012	1.1922	1.1440	1.1681	...	0.0241	0.0180	...	...	...	...
	6		2A	0.0024	1.3726	1.3544	1.3453	1.2643	1.2563	0.007970	1.1922	1.1480	1.1681	...	0.0241	0.0180	1.1801	1.1620	0.0301	0.0250
	6		3A	0.0000	1.3750	1.3568	...	1.2667	1.2607	0.0060	1.1946	1.1524	1.1705	...	0.0241	0.0180	1.1825	1.1664	0.0301	0.0250
	$1\frac{3}{8}$ – 8 or 1.3750 – 8	UN	2A	0.0022	1.3728	1.3578	1.3503	1.2916	1.2844	0.007177	1.2375	1.2032	1.2194	...	0.0180	0.0135	1.2285	1.2137	0.0226	0.0188
	8		3A	0.0000	1.3750	1.3600	...	1.2938	1.2884	0.0054	1.2397	1.2072	1.2216	...	0.0180	0.0135	1.2307	1.2177	0.0226	0.0188
	$1\frac{3}{8}$ – 12 or 1.3750 – 12	UNF	1A	0.0019	1.3731	1.3559	...	1.3190	1.3096	0.0094	1.2829	1.2555	1.2709	...	0.0120	0.0090	...	...	...	...
	12		2A	0.0019	1.3731	1.3617	...	1.3190	1.3127	0.006289	1.2829	1.2586	1.2709	...	0.0120	0.0090	1.2769	1.2656	0.0150	0.0125
	12		3A	0.0000	1.3750	1.3636	...	1.3209	1.3162	0.0047	1.2848	1.2621	1.2728	...	0.0120	0.0090	1.2788	1.2691	0.0150	0.0125
(8)	$1\frac{3}{8}$ – 16 or 1.3750 – 16	UN	2A	0.0015	1.3735	1.3641	...	1.3329	1.3277	0.005155	1.3058	1.2871	1.2968	...	0.0090	0.0068	1.3013	1.2923	0.0113	0.0094
(8)	16		3A	0.0000	1.3750	1.3656	...	1.3344	1.3305	0.0039	1.3073	1.2899	1.2983	...	0.0090	0.0068	1.3028	1.2951	0.0113	0.0094
(8)	$1\frac{3}{8}$ – 18 or 1.3750 – 18	UNEF	2A	0.0015	1.3735	1.3648	...	1.3374	1.3325	0.004913	1.3134	1.2964	1.3053	...	0.0080	0.0060	1.3093	1.3011	0.0100	0.0083
(8)	18		3A	0.0000	1.3750	1.3663	...	1.3389	1.3352	0.0037	1.3149	1.2991	1.3068	...	0.0080	0.0060	1.3108	1.3038	0.0100	0.0083
	$1\frac{3}{8}$ – 20 or 1.3750 – 20	UN	2A	0.0014	1.3736	1.3655	...	1.3411	1.3364	0.004710	1.3195	1.3039	1.3123	...	0.0072	0.0054	1.3158	1.3081	0.0090	0.0075
(8)	20		3A	0.0000	1.3750	1.3669	...	1.3425	1.3390	0.003500	1.3209	1.3065	1.3137	...	0.0072	0.0054	1.3172	1.3107	0.0090	0.0075
(8)	$1\frac{3}{8}$ – 28 or 1.3750 – 28	UN	2A	0.0012	1.3738	1.3673	...	1.3506	1.3465	0.004145	1.3351	1.3233	1.3300	...	0.0052	0.0039	1.3326	1.3263	0.0064	0.0054
	28		3A	0.0000	1.3750	1.3685	...	1.3518	1.3487	0.0031	1.3363	1.3255	1.3312	...	0.0052	0.0039	1.3338	1.3285	0.0064	0.0054
	$1\frac{7}{16}$ – 6 or 1.4375 – 6	UN	2A	0.0024	1.4351	1.4169	...	1.3268	1.3188	0.008034	1.2547	1.2105	1.2306	...	0.0241	0.0180	1.2426	1.2245	0.0301	0.0250
	6		3A	0.0000	1.4375	1.4193	...	1.3292	1.3232	0.0060	1.2571	1.2149	1.2330	...	0.0241	0.0180	1.2450	1.2289	0.0301	0.0250
	$1\frac{7}{16}$ – 8 or 1.4375 – 8	UN	2A	0.0022	1.4353	1.4203	...	1.3541	1.3469	0.007241	1.3000	1.2657	1.2819	...	0.0180	0.0135	1.2910	1.2762	0.0226	0.0188
	8		3A	0.0000	1.4375	1.4225	...	1.3563	1.3509	0.0054	1.3022	1.2697	1.2841	...	0.0180	0.0135	1.2932	1.2802	0.0226	0.0188
	$1\frac{7}{16}$ – 12 or 1.4375 – 12	UN	2A	0.0018	1.4357	1.4243	...	1.3816	1.3757	0.005854	1.3455	1.3216	1.3335	...	0.0120	0.0090	1.3395	1.3286	0.0150	0.0125
	12		3A	0.0000	1.4375	1.4261	...	1.3834	1.3790	0.0044	1.3473	1.3249	1.3353	...	0.0120	0.0090	1.3413	1.3319	0.0150	0.0125
(8)	$1\frac{7}{16}$ – 16 or 1.4375 – 16	UN	2A	0.0016	1.4359	1.4265	...	1.3953	1.3901	0.005180	1.3682	1.3495	1.3592	...	0.0090	0.0068	1.3637	1.3547	0.0113	0.0094
(8)	16		3A	0.0000	1.4375	1.4281	...	1.3969	1.3930	0.0039	1.3698	1.3524	1.3608	...	0.0090	0.0068	1.3653	1.3576	0.0113	0.0094
(8)	$1\frac{7}{16}$ – 18 or 1.4375 – 18	UNEF	2A	0.0015	1.4360	1.4273	...	1.3999	1.3950	0.004938	1.3759	1.3589	1.3678	...	0.0080	0.0060	1.3718	1.3636	0.0100	0.0083
	18		3A	0.0000	1.4375	1.4288	...	1.4014	1.3977	0.0037	1.3774	1.3616	1.3693	...	0.0080	0.0060	1.3733	1.3663	0.0100	0.0083

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(8)	$1\frac{7}{16}$ – 20 or 1.4375 – 20	UN	2A	0.0014	1.4361	1.4280	...	1.4036	1.3989	0.004735	1.3820	1.3664	1.3748	...	0.0072	0.0054	1.3783	1.3706	0.0090	0.0075
(8)	20		3A	0.0000	1.4375	1.4294	...	1.4050	1.4014	0.0036	1.3834	1.3689	1.3762	...	0.0072	0.0054	1.3797	1.3731	0.0090	0.0075
(8)	$1\frac{7}{16}$ – 28 or 1.4375 – 28	UN	2A	0.0013	1.4362	1.4297	...	1.4130	1.4088	0.004170	1.3975	1.3856	1.3924	...	0.0052	0.0039	1.3950	1.3886	0.0064	0.0054
	28		3A	0.0000	1.4375	1.4310	...	1.4143	1.4112	0.0031	1.3988	1.3880	1.3937	...	0.0052	0.0039	1.3963	1.3910	0.0064	0.0054
	$1\frac{1}{2}$ – 6 or 1.5000 – 6	UNC	1A	0.0024	1.4976	1.4703	...	1.3893	1.3772	0.0121	1.3172	1.2689	1.2931	...	0.0241	0.0180	...	...	...	...
	6		2A	0.0024	1.4976	1.4794	1.4703	1.3893	1.3812	0.008097	1.3172	1.2729	1.2931	...	0.0241	0.0180	1.3051	1.2869	0.0301	0.0250
	6		3A	0.0000	1.5000	1.4818	...	1.3917	1.3856	0.0061	1.3196	1.2773	1.2955	...	0.0241	0.0180	1.3075	1.2913	0.0301	0.0250
	$1\frac{1}{2}$ – 8 or 1.5000 – 8	UN	2A	0.0022	1.4978	1.4828	1.4753	1.4166	1.4093	0.007304	1.3625	1.3281	1.3444	...	0.0180	0.0135	1.3535	1.3386	0.0226	0.0188
	8		3A	0.0000	1.5000	1.4850	...	1.4188	1.4133	0.0055	1.3647	1.3321	1.3466	...	0.0180	0.0135	1.3557	1.3426	0.0226	0.0188
	$1\frac{1}{2}$ – 12 or 1.5000 – 12	UNF	1A	0.0019	1.4981	1.4809	...	1.4440	1.4344	0.0096	1.4079	1.3803	1.3959	...	0.0120	0.0090	...	...	...	...
	12		2A	0.0019	1.4981	1.4867	...	1.4440	1.4376	0.006416	1.4079	1.3835	1.3959	...	0.0120	0.0090	1.4019	1.3905	0.0150	0.0125
	12		3A	0.0000	1.5000	1.4886	...	1.4459	1.4411	0.0048	1.4098	1.3870	1.3978	...	0.0120	0.0090	1.4038	1.3940	0.0150	0.0125
(8)	$1\frac{1}{2}$ – 16 or 1.5000 – 16	UN	2A	0.0016	1.4984	1.4890	...	1.4578	1.4526	0.005204	1.4307	1.4120	1.4217	...	0.0090	0.0068	1.4262	1.4172	0.0113	0.0094
	16		3A	0.0000	1.5000	1.4906	...	1.4594	1.4555	0.0039	1.4323	1.4149	1.4233	...	0.0090	0.0068	1.4278	1.4201	0.0113	0.0094
(8)	$1\frac{1}{2}$ – 18 or 1.5000 – 18	UNEF	2A	0.0015	1.4985	1.4898	...	1.4624	1.4574	0.004962	1.4384	1.4213	1.4303	...	0.0080	0.0060	1.4343	1.4260	0.0100	0.0083
	18		3A	0.0000	1.5000	1.4913	...	1.4639	1.4602	0.0037	1.4399	1.4241	1.4318	...	0.0080	0.0060	1.4358	1.4288	0.0100	0.0083
	$1\frac{1}{2}$ – 20 or 1.5000 – 20	UN	2A	0.0014	1.4986	1.4905	...	1.4661	1.4613	0.004759	1.4445	1.4288	1.4373	...	0.0072	0.0054	1.4408	1.4330	0.0090	0.0075
(8)	20		3A	0.0000	1.5000	1.4919	...	1.4675	1.4639	0.0036	1.4459	1.4314	1.4387	...	0.0072	0.0054	1.4422	1.4356	0.0090	0.0075
	$1\frac{1}{2}$ – 28 or 1.5000 – 28	UN	2A	0.0013	1.4987	1.4922	...	1.4755	1.4713	0.004194	1.4600	1.4481	1.4549	...	0.0052	0.0039	1.4575	1.4511	0.0064	0.0054
	28		3A	0.0000	1.5000	1.4935	...	1.4768	1.4737	0.0031	1.4613	1.4505	1.4562	...	0.0052	0.0039	1.4588	1.4535	0.0064	0.0054
	$1\frac{9}{16}$ – 6 or 1.5625 – 6	UN	2A	0.0024	1.5601	1.5419	...	1.4518	1.4436	0.008159	1.3797	1.3353	1.3556	...	0.0241	0.0180	1.3676	1.3493	0.0301	0.0250
	6		3A	0.0000	1.5625	1.5443	...	1.4542	1.4481	0.0061	1.3821	1.3398	1.3580	...	0.0241	0.0180	1.3700	1.3538	0.0301	0.0250
	$1\frac{9}{16}$ – 8 or 1.5625 – 8	UN	2A	0.0022	1.5603	1.5453	...	1.4791	1.4717	0.007366	1.4250	1.3905	1.4069	...	0.0180	0.0135	1.4160	1.4010	0.0226	0.0188
	8		3A	0.0000	1.5625	1.5475	...	1.4813	1.4758	0.0055	1.4272	1.3946	1.4091	...	0.0180	0.0135	1.4182	1.4051	0.0226	0.0188
(8)	$1\frac{9}{16}$ – 12 or 1.5625 – 12	UN	2A	0.0018	1.5607	1.5493	...	1.5066	1.5007	0.005902	1.4705	1.4466	1.4585	...	0.0120	0.0090	1.4645	1.4536	0.0150	0.0125
(8)	12		3A	0.0000	1.5625	1.5511	...	1.5084	1.5040	0.0044	1.4723	1.4499	1.4603	...	0.0120	0.0090	1.4663	1.4569	0.0150	0.0125
	$1\frac{9}{16}$ – 16 or 1.5625 – 16	UN	2A	0.0016	1.5609	1.5515	...	1.5203	1.5151	0.005228	1.4932	1.4745	1.4842	...	0.0090	0.0068	1.4887	1.4797	0.0113	0.0094
(8)	16		3A	0.0000	1.5625	1.5531	...	1.5219	1.5180	0.0039	1.4948	1.4774	1.4858	...	0.0090	0.0068	1.4903	1.4826	0.0113	0.0094

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$1\frac{9}{16}$ – 18 or 1.5625 – 18	UNEF	2A	0.0015	1.5610	1.5523	...	1.5249	1.5199	0.004986	1.5009	1.4838	1.4928	...	0.0080	0.0060	1.4968	1.4885	0.0100	0.0083
(8)	18		3A	0.0000	1.5625	1.5538	...	1.5264	1.5227	0.0037	1.5024	1.4866	1.4943	...	0.0080	0.0060	1.4983	1.4913	0.0100	0.0083
	$1\frac{9}{16}$ – 20 or 1.5625 – 20	UN	2A	0.0014	1.5611	1.5530	...	1.5286	1.5238	0.004783	1.5070	1.4913	1.4998	...	0.0072	0.0054	1.5033	1.4955	0.0090	0.0075
(8)	20		3A	0.0000	1.5625	1.5544	...	1.5300	1.5264	0.0036	1.5084	1.4939	1.5012	...	0.0072	0.0054	1.5047	1.4981	0.0090	0.0075
	$1\frac{5}{8}$ – 6 or 1.6250 – 6	UN	2A	0.0025	1.6225	1.6043	...	1.5142	1.5060	0.008219	1.4421	1.3977	1.4180	...	0.0241	0.0180	1.4300	1.4117	0.0301	0.0250
	6		3A	0.0000	1.6250	1.6068	...	1.5167	1.5105	0.0062	1.4446	1.4022	1.4205	...	0.0241	0.0180	1.4325	1.4162	0.0301	0.0250
	$1\frac{5}{8}$ – 8 or 1.6250 – 8	UN	2A	0.0022	1.6228	1.6078	1.6003	1.5416	1.5342	0.007426	1.4875	1.4530	1.4694	...	0.0180	0.0135	1.4785	1.4635	0.0226	0.0188
	8		3A	0.0000	1.6250	1.6100	...	1.5438	1.5382	0.0056	1.4897	1.4570	1.4716	...	0.0180	0.0135	1.4807	1.4675	0.0226	0.0188
(8)	$1\frac{5}{8}$ – 12 or 1.6250 – 12	UN	2A	0.0018	1.6232	1.6118	...	1.5691	1.5632	0.005925	1.5330	1.5091	1.5210	...	0.0120	0.0090	1.5270	1.5161	0.0150	0.0125
(8)	12		3A	0.0000	1.6250	1.6136	...	1.5709	1.5665	0.0044	1.5348	1.5124	1.5228	...	0.0120	0.0090	1.5288	1.5194	0.0150	0.0125
(8)	$1\frac{5}{8}$ – 16 or 1.6250 – 16	UN	2A	0.0016	1.6234	1.6140	...	1.5828	1.5775	0.005251	1.5557	1.5369	1.5467	...	0.0090	0.0068	1.5512	1.5421	0.0113	0.0094
	16	...	3A	0.0000	1.6250	1.6156	...	1.5844	1.5805	0.0039	1.5573	1.5399	1.5483	...	0.0090	0.0068	1.5528	1.5451	0.0113	0.0094
(8)	$1\frac{5}{8}$ – 18 or 1.6250 – 18	UNEF	2A	0.0015	1.6235	1.6148	...	1.5874	1.5824	0.005009	1.5634	1.5463	1.5553	...	0.0080	0.0060	1.5593	1.5510	0.0100	0.0083
	18		3A	0.0000	1.6250	1.6163	...	1.5889	1.5851	0.0038	1.5649	1.5490	1.5568	...	0.0080	0.0060	1.5608	1.5537	0.0100	0.0083
(8)	$1\frac{5}{8}$ – 20 or 1.6250 – 20	UN	2A	0.0014	1.6236	1.6155	...	1.5911	1.5863	0.004806	1.5695	1.5538	1.5623	...	0.0072	0.0054	1.5658	1.5580	0.0090	0.0075
	20		3A	0.0000	1.6250	1.6169	...	1.5925	1.5889	0.0036	1.5709	1.5564	1.5637	...	0.0072	0.0054	1.5672	1.5606	0.0090	0.0075
	$1\frac{11}{16}$ – 6 or 1.6875 – 6	UN	2A	0.0025	1.6850	1.6668	...	1.5767	1.5684	0.008278	1.5046	1.4601	1.4805	...	0.0241	0.0180	1.4925	1.4741	0.0301	0.0250
	6		3A	0.0000	1.6875	1.6693	...	1.5792	1.5730	0.0062	1.5071	1.4647	1.4830	...	0.0241	0.0180	1.4950	1.4787	0.0301	0.0250
	$1\frac{11}{16}$ – 8 or 1.6875 – 8	UN	2A	0.0022	1.6853	1.6703	...	1.6041	1.5966	0.007485	1.5500	1.5154	1.5319	...	0.0180	0.0135	1.5410	1.5259	0.0226	0.0188
	8		3A	0.0000	1.6875	1.6725	...	1.6063	1.6007	0.0056	1.5522	1.5195	1.5341	...	0.0180	0.0135	1.5432	1.5300	0.0226	0.0188
(8)	$1\frac{11}{16}$ – 12 or 1.6875 – 12	UN	2A	0.0018	1.6857	1.6743	...	1.6316	1.6257	0.005947	1.5955	1.5716	1.5835	...	0.0120	0.0090	1.5895	1.5786	0.0150	0.0125
	12		3A	0.0000	1.6875	1.6761	...	1.6334	1.6289	0.0045	1.5973	1.5748	1.5853	...	0.0120	0.0090	1.5913	1.5818	0.0150	0.0125
	$1\frac{11}{16}$ – 16 or 1.6875 – 16	UN	2A	0.0016	1.6859	1.6765	...	1.6453	1.6400	0.005273	1.6182	1.5994	1.6092	...	0.0090	0.0068	1.6137	1.6046	0.0113	0.0094
(8)	16		3A	0.0000	1.6875	1.6781	...	1.6469	1.6429	0.0040	1.6198	1.6023	1.6108	...	0.0090	0.0068	1.6153	1.6075	0.0113	0.0094
(8)	$1\frac{11}{16}$ – 18 or 1.6875 – 18	UNEF	2A	0.0015	1.6860	1.6773	...	1.6499	1.6449	0.005031	1.6259	1.6088	1.6178	...	0.0080	0.0060	1.6218	1.6135	0.0100	0.0083
	18		3A	0.0000	1.6875	1.6788	...	1.6514	1.6476	0.0038	1.6274	1.6115	1.6193	...	0.0080	0.0060	1.6233	1.6162	0.0100	0.0083

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(8)	$1\frac{11}{16}$ – 20 or 1.6875 – 20	UN	2A	0.0014	1.6861	1.6780	...	1.6536	1.6488	0.004828	1.6320	1.6163	1.6248	...	0.0072	0.0054	1.6283	1.6205	0.0090	0.0075
(8)	20		3A	0.0000	1.6875	1.6794	...	1.6550	1.6514	0.0036	1.6334	1.6189	1.6262	...	0.0072	0.0054	1.6297	1.6231	0.0090	0.0075
(8)	$1\frac{3}{4}$ – 5 or 1.7500 – 5	UNC	1A	0.0027	1.7473	1.7165	...	1.6174	1.6040	0.0134	1.5308	1.4741	1.5019	...	0.0289	0.0217	...	...	...	...
(8)	5		2A	0.0027	1.7473	1.7268	1.7165	1.6174	1.6085	0.008922	1.5308	1.4786	1.5019	...	0.0289	0.0217	1.5164	1.4953	0.0361	0.0300
(8)	5		3A	0.0000	1.7500	1.7295	...	1.6201	1.6134	0.0067	1.5335	1.4835	1.5046	...	0.0289	0.0217	1.5191	1.5002	0.0361	0.0300
	$1\frac{3}{4}$ – 6 or 1.7500 – 6	UN	2A	0.0025	1.7475	1.7293	...	1.6392	1.6309	0.008335	1.5671	1.5226	1.5430	...	0.0241	0.0180	1.5550	1.5366	0.0301	0.0250
	6		3A	0.0000	1.7500	1.7318	...	1.6417	1.6354	0.0063	1.5696	1.5271	1.5455	...	0.0241	0.0180	1.5575	1.5411	0.0301	0.0250
	$1\frac{3}{4}$ – 8 or 1.7500 – 8	UN	2A	0.0023	1.7477	1.7327	1.7252	1.6665	1.6590	0.007542	1.6124	1.5778	1.5943	...	0.0180	0.0135	1.6034	1.5883	0.0226	0.0188
(8)	8		3A	0.0000	1.7500	1.7350	...	1.6688	1.6631	0.0057	1.6147	1.5819	1.5966	...	0.0180	0.0135	1.6057	1.5924	0.0226	0.0188
	$1\frac{3}{4}$ – 12 or 1.7500 – 12	UN	2A	0.0018	1.7482	1.7368	...	1.6941	1.6881	0.005969	1.6580	1.6340	1.6460	...	0.0120	0.0090	1.6520	1.6410	0.0150	0.0125
	12		3A	0.0000	1.7500	1.7386	...	1.6959	1.6914	0.0045	1.6598	1.6373	1.6478	...	0.0120	0.0090	1.6538	1.6443	0.0150	0.0125
	$1\frac{3}{4}$ – 16 or 1.7500 – 16	UN	2A	0.0016	1.7484	1.7390	...	1.7078	1.7025	0.005295	1.6807	1.6619	1.6717	...	0.0090	0.0068	1.6762	1.6671	0.0113	0.0094
(8)	16		3A	0.0000	1.7500	1.7406	...	1.7094	1.7054	0.00400	1.6823	1.6648	1.6733	...	0.0090	0.0068	1.6778	1.6700	0.0113	0.0094
	$1\frac{3}{4}$ – 20 or 1.7500 – 20	UN	2A	0.0015	1.7485	1.7404	...	1.7160	1.7111	0.004850	1.6944	1.6787	1.6872	...	0.0072	0.0054	1.6907	1.6829	0.0090	0.0075
(8)	20		3A	0.0000	1.7500	1.7419	...	1.7175	1.7139	0.0036	1.6959	1.6814	1.6887	...	0.0072	0.0054	1.6922	1.6856	0.0090	0.0075
	$1\frac{13}{16}$ – 6 or 1.8125 – 6	UN	2A	0.0025	1.8100	1.7918	...	1.7017	1.6933	0.008391	1.6296	1.5850	1.6055	...	0.0241	0.0180	1.6175	1.5990	0.0301	0.0250
	6		3A	0.0000	1.8125	1.7943	...	1.7042	1.6979	0.0063	1.6321	1.5896	1.6080	...	0.0241	0.0180	1.6200	1.6036	0.0301	0.0250
	$1\frac{13}{16}$ – 8 or 1.8125 – 8	UN	2A	0.0023	1.8102	1.7952	...	1.7290	1.7214	0.007598	1.6749	1.6402	1.6568	...	0.0180	0.0135	1.6659	1.6507	0.0226	0.0188
	8		3A	0.0000	1.8125	1.7975	...	1.7313	1.7256	0.0057	1.6772	1.6444	1.6591	...	0.0180	0.0135	1.6682	1.6549	0.0226	0.0188
	$1\frac{13}{16}$ – 12 or 1.8125 – 12	UN	2A	0.0018	1.8107	1.7993	...	1.7566	1.7506	0.005990	1.7205	1.6965	1.7085	...	0.0120	0.0090	1.7145	1.7035	0.0150	0.0125
	12		3A	0.0000	1.8125	1.8011	...	1.7584	1.7539	0.0045	1.7223	1.6998	1.7103	...	0.0120	0.0090	1.7163	1.7068	0.0150	0.0125
	$1\frac{13}{16}$ – 16 or 1.8125 – 16	UN	2A	0.0016	1.8109	1.8015	...	1.7703	1.7650	0.005316	1.7432	1.7244	1.7342	...	0.0090	0.0068	1.7387	1.7296	0.0113	0.0094
(8)	16		3A	0.0000	1.8125	1.8031	...	1.7719	1.7679	0.0040	1.7448	1.7273	1.7358	...	0.0090	0.0068	1.7403	1.7325	0.0113	0.0094
	$1\frac{13}{16}$ – 20 or 1.8125 – 20	UN	2A	0.0015	1.8110	1.8029	...	1.7785	1.7736	0.004871	1.7569	1.7411	1.7497	...	0.0072	0.0054	1.7532	1.7453	0.0090	0.0075
(8)	20		3A	0.0000	1.8125	1.8044	...	1.7800	1.7763	0.0037	1.7584	1.7438	1.7512	...	0.0072	0.0054	1.7547	1.7480	0.0090	0.0075
	$1\frac{7}{8}$ – 6 or 1.8750 – 6	UN	2A	0.0025	1.8725	1.8543	...	1.7642	1.7558	0.008447	1.6921	1.6475	1.6680	...	0.0241	0.0180	1.6800	1.6615	0.0301	0.0250
	6		3A	0.0000	1.8750	1.8568	...	1.7667	1.7604	0.0063	1.6946	1.6521	1.6705	...	0.0241	0.0180	1.6825	1.6661	0.0301	0.0250

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$1\frac{7}{8}$ – 8 or 1.8750 – 8	UN	2A	0.0023	1.8727	1.8577	1.8502	1.7915	1.7838	0.007654	1.7374	1.7026	1.7193	...	0.0180	0.0135	1.7284	1.7131	0.0226	0.0188
	8		3A	0.0000	1.8750	1.8600	...	1.7938	1.7881	0.0057	1.7397	1.7069	1.7216	...	0.0180	0.0135	1.7307	1.7174	0.0226	0.0188
	$1\frac{7}{8}$ – 12 or 1.8750 – 12	UN	2A	0.0018	1.8732	1.8618	...	1.8191	1.8131	0.006011	1.7830	1.7590	1.7710	...	0.0120	0.0090	1.7770	1.7660	0.0150	0.0125
(8)	12		3A	0.0000	1.8750	1.8636	...	1.8209	1.8164	0.0045	1.7848	1.7623	1.7728	...	0.0120	0.0090	1.7788	1.7693	0.0150	0.0125
	$1\frac{7}{8}$ – 16 or 1.8750 – 16	UN	2A	0.0016	1.8734	1.8640	...	1.8328	1.8275	0.005337	1.8057	1.7869	1.7967	...	0.0090	0.0068	1.8012	1.7921	0.0113	0.0094
(8)	16		3A	0.0000	1.8750	1.8656	...	1.8344	1.8304	0.0040	1.8073	1.7898	1.7983	...	0.0090	0.0068	1.8028	1.7950	0.0113	0.0094
(8)	$1\frac{7}{8}$ – 20 or 1.8750 – 20	UN	2A	0.0015	1.8735	1.8654	...	1.8410	1.8361	0.004892	1.8194	1.8036	1.8122	...	0.0072	0.0054	1.8157	1.8078	0.0090	0.0075
(8)	20		3A	0.0000	1.8750	1.8669	...	1.8425	1.8388	0.0037	1.8209	1.8063	1.8137	...	0.0072	0.0054	1.8172	1.8105	0.0090	0.0075
	$1\frac{15}{16}$ – 6 or 1.9375 – 6	UN	2A	0.0026	1.9349	1.9167	...	1.8266	1.8181	0.008501	1.7545	1.7098	1.7304	...	0.0241	0.0180	1.7424	1.7238	0.0301	0.0250
	6		3A	0.0000	1.9375	1.9193	...	1.8292	1.8228	0.0064	1.7571	1.7145	1.7330	...	0.0241	0.0180	1.7450	1.7285	0.0301	0.0250
	$1\frac{15}{16}$ – 8 or 1.9375 – 8	UN	2A	0.0023	1.9352	1.9202	...	1.8540	1.8463	0.007708	1.7999	1.7651	1.7818	...	0.0180	0.0135	1.7909	1.7756	0.0226	0.0188
	8		3A	0.0000	1.9375	1.9225	...	1.8563	1.8505	0.0058	1.8022	1.7693	1.7841	...	0.0180	0.0135	1.7932	1.7798	0.0226	0.0188
(8)	$1\frac{15}{16}$ – 12 or 1.9375 – 12	UN	2A	0.0018	1.9357	1.9243	...	1.8816	1.8756	0.006031	1.8455	1.8215	1.8335	...	0.0120	0.0090	1.8395	1.8285	0.0150	0.0125
	12		3A	0.0000	1.9375	1.9261	...	1.8834	1.8789	0.0045	1.8473	1.8248	1.8353	...	0.0120	0.0090	1.8413	1.8318	0.0150	0.0125
	$1\frac{15}{16}$ – 16 or 1.9375 – 16	UN	2A	0.0016	1.9359	1.9265	...	1.8953	1.8899	0.005357	1.8682	1.8493	1.8592	...	0.0090	0.0068	1.8637	1.8545	0.0113	0.0094
(8)	16		3A	0.0000	1.9375	1.9281	...	1.8969	1.8929	0.0040	1.8698	1.8523	1.8608	...	0.0090	0.0068	1.8653	1.8575	0.0113	0.0094
	$1\frac{15}{16}$ – 20 or 1.9375 – 20	UN	2A	0.0015	1.9360	1.9279	...	1.9035	1.8986	0.004912	1.8819	1.8661	1.8747	...	0.0072	0.0054	1.8782	1.8703	0.0090	0.0075
(8)	20		3A	0.0000	1.9375	1.9294	...	1.9050	1.9013	0.0037	1.8834	1.8688	1.8762	...	0.0072	0.0054	1.8797	1.8730	0.0090	0.0075
	2 – 4.5 or 2.0000 – 4.5	UNC	1A	0.0029	1.9971	1.9641	...	1.8528	1.8385	0.0143	1.7565	1.6942	1.7245	...	0.0321	0.0241	...	...	...	...
	4.5		2A	0.0029	1.9971	1.9751	1.9641	1.8528	1.8433	0.009514	1.7565	1.6990	1.7245	...	0.0321	0.0241	1.7405	1.7176	0.0401	0.0334
	4.5		3A	0.0000	2.0000	1.9780	...	1.8557	1.8486	0.0071	1.7594	1.7043	1.7274	...	0.0321	0.0241	1.7434	1.7229	0.0401	0.0334
	2 – 6 or 2.0000 – 6	UN	2A	0.0026	1.9974	1.9792	...	1.8891	1.8805	0.008554	1.8170	1.7722	1.7929	...	0.0241	0.0180	1.8049	1.7862	0.0301	0.0250
	6		3A	0.0000	2.0000	1.9818	...	1.8917	1.8853	0.0064	1.8196	1.7770	1.7955	...	0.0241	0.0180	1.8075	1.7910	0.0301	0.0250
	2 – 8 or 2.0000 – 8	UN	2A	0.0023	1.9977	1.9827	1.9752	1.9165	1.9087	0.007761	1.8624	1.8275	1.8443	...	0.0180	0.0135	1.8534	1.8380	0.0226	0.0188
	8		3A	0.0000	2.0000	1.9850	...	1.9188	1.9130	0.0058	1.8647	1.8318	1.8466	...	0.0180	0.0135	1.8557	1.8423	0.0226	0.0188
	2 – 12 or 2.0000 – 12	UN	2A	0.0018	1.9982	1.9868	...	1.9441	1.9380	0.006051	1.9080	1.8839	1.8960	...	0.0120	0.0090	1.9020	1.8909	0.0150	0.0125
	12		3A	0.0000	2.0000	1.9886	...	1.9459	1.9414	0.0045	1.9098	1.8873	1.8978	...	0.0120	0.0090	1.9038	1.8943	0.0150	0.0125

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	2 – 16 or 2.0000 – 16	UN	2A	0.0016	1.9984	1.9890	...	1.9578	1.9524	0.005377	1.9307	1.9118	1.9217	...	0.0090	0.0068	1.9262	1.9170	0.0113	0.0094
(8)	16		3A	0.0000	2.0000	1.9906	...	1.9594	1.9554	0.0040	1.9323	1.9148	1.9233	...	0.0090	0.0068	1.9278	1.9200	0.0113	0.0094
	2 – 20 or 2.0000 – 20	UN	2A	0.0015	1.9985	1.9904	...	1.9660	1.9611	0.004932	1.9444	1.9286	1.9372	...	0.0072	0.0054	1.9407	1.9328	0.0090	0.0075
(8)	20		3A	0.0000	2.0000	1.9919	...	1.9675	1.9638	0.0037	1.9459	1.9313	1.9387	...	0.0072	0.0054	1.9422	1.9355	0.0090	0.0075
	2⅛ – 6 or 2.1250 – 6	UN	2A	0.0026	2.1224	2.1042	...	2.0141	2.0054	0.008658	1.9420	1.8971	1.9179	...	0.0241	0.0180	1.9299	1.9111	0.0301	0.0250
	6		3A	0.0000	2.1250	2.1068	...	2.0167	2.0102	0.0065	1.9446	1.9019	1.9205	...	0.0241	0.0180	1.9325	1.9159	0.0301	0.0250
	2⅛ – 8 or 2.1250 – 8	UN	2A	0.0024	2.1226	2.1076	2.1001	2.0414	2.0335	0.007865	1.9873	1.9523	1.9692	...	0.0180	0.0135	1.9783	1.9628	0.0226	0.0188
	8		3A	0.0000	2.1250	2.1100	...	2.0438	2.0379	0.0059	1.9897	1.9567	1.9716	...	0.0180	0.0135	1.9807	1.9672	0.0226	0.0188
	2⅛ – 12 or 2.1250 – 12	UN	2A	0.0018	2.1232	2.1118	...	2.0691	2.0630	0.006089	2.0330	2.0089	2.0210	...	0.0120	0.0090	2.0270	2.0159	0.0150	0.0125
(8)	12		3A	0.0000	2.1250	2.1136	...	2.0709	2.0663	0.0046	2.0348	2.0122	2.0228	...	0.0120	0.0090	2.0288	2.0192	0.0150	0.0125
	2⅛ – 16 or 2.1250 – 16	UN	2A	0.0016	2.1234	2.1140	...	2.0828	2.0774	0.005415	2.0557	2.0368	2.0467	...	0.0090	0.0068	2.0512	2.0420	0.0113	0.0094
(8)	16		3A	0.0000	2.1250	2.1156	...	2.0844	2.0803	0.0041	2.0573	2.0397	2.0483	...	0.0090	0.0068	2.0528	2.0449	0.0113	0.0094
(8)	2⅛ – 20 or 2.1250 – 20	UN	2A	0.0015	2.1235	2.1154	...	2.0910	2.0860	0.004970	2.0694	2.0535	2.0622	...	0.0072	0.0054	2.0657	2.0577	0.0090	0.0075
(8)	20		3A	0.0000	2.1250	2.1169	...	2.0925	2.0888	0.0037	2.0709	2.0563	2.0637	...	0.0072	0.0054	2.0672	2.0605	0.0090	0.0075
	2¼ – 4.5 or 2.2500 – 4.5	UNC	1A	0.0029	2.2471	2.2141	...	2.1028	2.0882	0.0146	2.0065	1.9439	1.9745	...	0.0321	0.0241	...	...	...	...
	4.5		2A	0.0029	2.2471	2.2251	2.2141	2.1028	2.0931	0.009719	2.0065	1.9488	1.9745	...	0.0321	0.0241	1.9905	1.9674	0.0401	0.0334
	4.5		3A	0.0000	2.2500	2.2280	...	2.1057	2.0984	0.0073	2.0094	1.9541	1.9774	...	0.0321	0.0241	1.9934	1.9727	0.0401	0.0334
	2¼ – 6 or 2.2500 – 6	UN	2A	0.0026	2.2474	2.2292	...	2.1391	2.1303	0.008759	2.0670	2.0220	2.0429	...	0.0241	0.0180	2.0549	2.0360	0.0301	0.0250
	6		3A	0.0000	2.2500	2.2318	...	2.1417	2.1351	0.0066	2.0696	2.0268	2.0455	...	0.0241	0.0180	2.0575	2.0408	0.0301	0.0250
	2¼ – 8 or 2.2500 – 8	UN	2A	0.0024	2.2476	2.2326	2.2251	2.1664	2.1584	0.007966	2.1123	2.0772	2.0942	...	0.0180	0.0135	2.1033	2.0877	0.0226	0.0188
	8		3A	0.0000	2.2500	2.2350	...	2.1688	2.1628	0.0060	2.1147	2.0816	2.0966	...	0.0180	0.0135	2.1057	2.0921	0.0226	0.0188
(8)	2¼ – 12 or 2.2500 – 12	UN	2A	0.0018	2.2482	2.2368	...	2.1941	2.1880	0.006127	2.1580	2.1339	2.1460	...	0.0120	0.0090	2.1520	2.1409	0.0150	0.0125
(8)	12		3A	0.0000	2.2500	2.2386	...	2.1959	2.1913	0.0046	2.1598	2.1372	2.1478	...	0.0120	0.0090	2.1538	2.1442	0.0150	0.0125
(8)	2¼ – 16 or 2.2500 – 16	UN	2A	0.0016	2.2484	2.2390	...	2.2078	2.2023	0.005453	2.1807	2.1617	2.1717	...	0.0090	0.0068	2.1762	2.1669	0.0113	0.0094
(8)	16		3A	0.0000	2.2500	2.2406	...	2.2094	2.2053	0.0041	2.1823	2.1647	2.1733	...	0.0090	0.0068	2.1778	2.1699	0.0113	0.0094
(8)	2¼– 20 or 2.2500 – 20	UN	2A	0.0015	2.2485	2.2404	...	2.2160	2.2110	0.005008	2.1944	2.1785	2.1872	...	0.0072	0.0054	2.1907	2.1827	0.0090	0.0075
(8)	20		3A	0.0000	2.2500	2.2419	...	2.2175	2.2137	0.0038	2.1959	2.1812	2.1887	...	0.0072	0.0054	2.1922	2.1854	0.0090	0.0075

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(8)	$2\frac{3}{8}$ – 6 or 2.3750 – 6	UN	2A	0.0027	2.3723	2.3541	...	2.2640	2.2551	0.008856	2.1919	2.1468	2.1678	...	0.0241	0.0180	2.1798	2.1608	0.0301	0.0250
	6		3A	0.0000	2.3750	2.3568	...	2.2667	2.2601	0.0066	2.1946	2.1518	2.1705	...	0.0241	0.0180	2.1825	2.1658	0.0301	0.0250
	$2\frac{3}{8}$ – 8 or 2.3750 – 8	UN	2A	0.0024	2.3726	2.3576	...	2.2914	2.2833	0.008063	2.2373	2.2021	2.2192	...	0.0180	0.0135	2.2283	2.2126	0.0226	0.0188
	8		3A	0.0000	2.3750	2.3600	...	2.2938	2.2878	0.0060	2.2397	2.2066	2.2216	...	0.0180	0.0135	2.2307	2.2171	0.0226	0.0188
(8)	$2\frac{3}{8}$ – 12 or 2.3750 – 12	UN	2A	0.0018	2.3732	2.3618	...	2.3191	2.3129	0.006162	2.2830	2.2588	2.2710	...	0.0120	0.0090	2.2770	2.2658	0.0150	0.0125
	12		3A	0.0000	2.3750	2.3636	...	2.3209	2.3163	0.0046	2.2848	2.2622	2.2728	...	0.0120	0.0090	2.2788	2.2692	0.0150	0.0125
(8)	$2\frac{3}{8}$ – 16 or 2.3750 – 16	UN	2A	0.0016	2.3734	2.3640	...	2.3328	2.3273	0.005488	2.3057	2.2867	2.2967	...	0.0090	0.0068	2.3012	2.2919	0.0113	0.0094
(8)	16		3A	0.0000	2.3750	2.3656	...	2.3344	2.3303	0.0041	2.3073	2.2897	2.2983	...	0.0090	0.0068	2.3028	2.2949	0.0113	0.0094
(8)	$2\frac{3}{8}$ – 20 or 2.3750 – 20	UN	2A	0.0015	2.3735	2.3654	...	2.3410	2.3360	0.005043	2.3194	2.3035	2.3122	...	0.0072	0.0054	2.3157	2.3077	0.0090	0.0075
(8)	20		3A	0.0000	2.3750	2.3669	...	2.3425	2.3387	0.0038	2.3209	2.3062	2.3137	...	0.0072	0.0054	2.3172	2.3104	0.0090	0.0075
	$2\frac{1}{2}$ – 4 or 2.5000 – 4	UNC	1A	0.0031	2.4969	2.4612	...	2.3345	2.3190	0.0155	2.2263	2.1566	2.1902	...	0.0361	0.0271	...	...	...	...
	4		2A	0.0031	2.4969	2.4731	2.4612	2.3345	2.3241	0.010361	2.2263	2.1617	2.1902	...	0.0361	0.0271	2.2082	2.1827	0.0451	0.0375
	4		3A	0.0000	2.5000	2.4762	...	2.3376	2.3298	0.0078	2.2294	2.1674	2.1933	...	0.0361	0.0271	2.2113	2.1884	0.0451	0.0375
	$2\frac{1}{2}$ – 6 or 2.5000 – 6	UN	2A	0.0027	2.4973	2.4791	...	2.3890	2.3800	0.008951	2.3169	2.2717	2.2928	...	0.0241	0.0180	2.3048	2.2857	0.0301	0.0250
	6		3A	0.0000	2.5000	2.4818	...	2.3917	2.3850	0.0067	2.3196	2.2767	2.2955	...	0.0241	0.0180	2.3075	2.2907	0.0301	0.0250
	$2\frac{1}{2}$ – 8 or 2.5000 – 8	UN	2A	0.0024	2.4976	2.4826	2.4751	2.4164	2.4082	0.008158	2.3623	2.3270	2.3442	...	0.0180	0.0135	2.3533	2.3375	0.0226	0.0188
	8		3A	0.0000	2.5000	2.4850	...	2.4188	2.4127	0.0061	2.3647	2.3315	2.3466	...	0.0180	0.0135	2.3557	2.3420	0.0226	0.0188
	$2\frac{1}{2}$ – 12 or 2.5000 – 12	UN	2A	0.0019	2.4981	2.4867	...	2.4440	2.4378	0.006197	2.4079	2.3837	2.3959	...	0.0120	0.0090	2.4019	2.3907	0.0150	0.0125
	12		3A	0.0000	2.5000	2.4886	...	2.4459	2.4413	0.0046	2.4098	2.3872	2.3978	...	0.0120	0.0090	2.4038	2.3942	0.0150	0.0125
	$2\frac{1}{2}$ – 16 or 2.5000 – 16	UN	2A	0.0017	2.4983	2.4889	...	2.4577	2.4522	0.005523	2.4306	2.4116	2.4216	...	0.0090	0.0068	2.4261	2.4168	0.0113	0.0094
(8)	16		3A	0.0000	2.5000	2.4906	...	2.4594	2.4553	0.0041	2.4323	2.4147	2.4233	...	0.0090	0.0068	2.4278	2.4199	0.0113	0.0094
	$2\frac{1}{2}$ – 20 or 2.5000 – 20	UN	2A	0.0015	2.4985	2.4904	...	2.4660	2.4609	0.005078	2.4444	2.4284	2.4372	...	0.0072	0.0054	2.4407	2.4326	0.0090	0.0075
(8)	20		3A	0.0000	2.5000	2.4919	...	2.4675	2.4637	0.0038	2.4459	2.4312	2.4387	...	0.0072	0.0054	2.4422	2.4354	0.0090	0.0075
	$2\frac{5}{8}$ – 4 or 2.6250 – 4	UN	2A	0.0031	2.6219	2.5981	...	2.4595	2.4490	0.010452	2.3513	2.2866	2.3152	...	0.0361	0.0271	2.3332	2.3076	0.0451	0.0375
	4		3A	0.0000	2.6250	2.6012	...	2.4626	2.4548	0.0078	2.3544	2.2924	2.3183	...	0.0361	0.0271	2.3363	2.3134	0.0451	0.0375
	$2\frac{5}{8}$ – 6 or 2.6250 – 6	UN	2A	0.0027	2.6223	2.6041	...	2.5140	2.5050	0.009042	2.4419	2.3967	2.4178	...	0.0241	0.0180	2.4298	2.4107	0.0301	0.0250
	6		3A	0.0000	2.6250	2.6068	...	2.5167	2.5099	0.0068	2.4446	2.4016	2.4205	...	0.0241	0.0180	2.4325	2.4156	0.0301	0.0250

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$2\frac{5}{8}$ – 8 or 2.6250 – 8	UN	2A	0.0025	2.6225	2.6075	...	2.5413	2.5331	0.008249	2.4872	2.4519	2.4691	...	0.0180	0.0135	2.4782	2.4624	0.0226	0.0188
	8		3A	0.0000	2.6250	2.6100	...	2.5438	2.5376	0.0062	2.4897	2.4564	2.4716	...	0.0180	0.0135	2.4807	2.4669	0.0226	0.0188
(8)	$2\frac{5}{8}$ – 12 or 2.6250 – 12	UN	2A	0.0019	2.6231	2.6117	...	2.5690	2.5628	0.006230	2.5329	2.5087	2.5209	...	0.0120	0.0090	2.5269	2.5157	0.0150	0.0125
	12		3A	0.0000	2.6250	2.6136	...	2.5709	2.5662	0.0047	2.5348	2.5121	2.5228	...	0.0120	0.0090	2.5288	2.5191	0.0150	0.0125
(8)	$2\frac{5}{8}$ – 16 or 2.6250 – 16	UN	2A	0.0017	2.6233	2.6139	...	2.5827	2.5771	0.005556	2.5556	2.5365	2.5466	...	0.0090	0.0068	2.5511	2.5417	0.0113	0.0094
(8)	16		3A	0.0000	2.6250	2.6156	...	2.5844	2.5802	0.0042	2.5573	2.5396	2.5483	...	0.0090	0.0068	2.5528	2.5448	0.0113	0.0094
	$2\frac{5}{8}$ – 20 or 2.6250 – 20	UN	2A	0.0015	2.6235	2.6154	...	2.5910	2.5859	0.005111	2.5694	2.5534	2.5622	...	0.0072	0.0054	2.5657	2.5576	0.0090	0.0075
(8)	20		3A	0.0000	2.6250	2.6169	...	2.5925	2.5887	0.0038	2.5709	2.5562	2.5637	...	0.0072	0.0054	2.5672	2.5604	0.0090	0.0075
	$2\frac{3}{4}$ – 4 or 2.7500 – 4	UNC	1A	0.0032	2.7468	2.7111	...	2.5844	2.5686	0.0158	2.4762	2.4062	2.4401	...	0.0361	0.0271	...	...	...	...
	4		2A	0.0032	2.7468	2.7230	2.7111	2.5844	2.5739	0.010542	2.4762	2.4115	2.4401	...	0.0361	0.0271	2.4581	2.4325	0.0451	0.0375
	4		3A	0.0000	2.7500	2.7262	...	2.5876	2.5797	0.0079	2.4794	2.4173	2.4433	...	0.0361	0.0271	2.4613	2.4383	0.0451	0.0375
	$2\frac{3}{4}$ – 6 or 2.7500 – 6	UN	2A	0.0027	2.7473	2.7291	...	2.6390	2.6299	0.009132	2.5669	2.5216	2.5428	...	0.0241	0.0180	2.5548	2.5356	0.0301	0.0250
	6		3A	0.0000	2.7500	2.7318	...	2.6417	2.6349	0.0068	2.5696	2.5266	2.5455	...	0.0241	0.0180	2.5575	2.5406	0.0301	0.0250
	$2\frac{3}{4}$ – 8 or 2.7500 – 8	UN	2A	0.0025	2.7475	2.7325	2.7250	2.6663	2.6580	0.008339	2.6122	2.5768	2.5941	...	0.0180	0.0135	2.6032	2.5873	0.0226	0.0188
	8		3A	0.0000	2.7500	2.7350	...	2.6688	2.6625	0.0063	2.6147	2.5813	2.5966	...	0.0180	0.0135	2.6057	2.5918	0.0226	0.0188
(8)	$2\frac{3}{4}$ – 12 or 2.7500 – 12	UN	2A	0.0019	2.7481	2.7367	...	2.6940	2.6877	0.006263	2.6579	2.6336	2.6459	...	0.0120	0.0090	2.6519	2.6406	0.0150	0.0125
(8)	12		3A	0.0000	2.7500	2.7386	...	2.6959	2.6912	0.0047	2.6598	2.6371	2.6478	...	0.0120	0.0090	2.6538	2.6441	0.0150	0.0125
(8)	$2\frac{3}{4}$ – 16 or 2.7500 – 16	UN	2A	0.0017	2.7483	2.7389	...	2.7077	2.7021	0.005589	2.6806	2.6615	2.6716	...	0.0090	0.0068	2.6761	2.6667	0.0113	0.0094
(8)	16		3A	0.0000	2.7500	2.7406	...	2.7094	2.7052	0.0042	2.6823	2.6646	2.6733	...	0.0090	0.0068	2.6778	2.6698	0.0113	0.0094
(8)	$2\frac{3}{4}$ – 20 or 2.7500 – 20	UN	2A	0.0015	2.7485	2.7404	...	2.7160	2.7109	0.005144	2.6944	2.6784	2.6872	...	0.0072	0.0054	2.6907	2.6826	0.0090	0.0075
(8)	20		3A	0.0000	2.7500	2.7419	...	2.7175	2.7136	0.0039	2.6959	2.6811	2.6887	...	0.0072	0.0054	2.6922	2.6853	0.0090	0.0075
	$2\frac{7}{8}$ – 4 or 2.8750 – 4	UN	2A	0.0032	2.8718	2.8480	...	2.7094	2.6988	0.010629	2.6012	2.5364	2.5651	...	0.0361	0.0271	2.5831	2.5574	0.0451	0.0375
	4		3A	0.0000	2.8750	2.8512	...	2.7126	2.7046	0.0080	2.6044	2.5422	2.5683	...	0.0361	0.0271	2.5863	2.5632	0.0451	0.0375
	$2\frac{7}{8}$ – 6 or 2.8750 – 6	UN	2A	0.0028	2.8722	2.8540	...	2.7639	2.7547	0.009219	2.6918	2.6464	2.6677	...	0.0241	0.0180	2.6797	2.6604	0.0301	0.0250
	6		3A	0.0000	2.8750	2.8568	...	2.7667	2.7598	0.0069	2.6946	2.6515	2.6705	...	0.0241	0.0180	2.6825	2.6655	0.0301	0.0250
	$2\frac{7}{8}$ – 8 or 2.8750 – 8	UN	2A	0.0025	2.8725	2.8575	...	2.7913	2.7829	0.008426	2.7372	2.7017	2.7191	...	0.0180	0.0135	2.7282	2.7122	0.0226	0.0188
	8		3A	0.0000	2.8750	2.8600	...	2.7938	2.7875	0.0063	2.7397	2.7063	2.7216	...	0.0180	0.0135	2.7307	2.7168	0.0226	0.0188

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$2\frac{7}{8}$ – 12 or 2.8750 – 12	UN	2A	0.0019	2.8731	2.8617	...	2.8190	2.8127	0.006294	2.7829	2.7586	2.7709	...	0.0120	0.0090	2.7769	2.7656	0.0150	0.0125
	12		3A	0.0000	2.8750	2.8636	...	2.8209	2.8162	0.0047	2.7848	2.7621	2.7728	...	0.0120	0.0090	2.7788	2.7691	0.0150	0.0125
	$2\frac{7}{8}$ – 16 or 2.8750 – 16	UN	2A	0.0017	2.8733	2.8639	...	2.8327	2.8271	0.005620	2.8056	2.7865	2.7966	...	0.0090	0.0068	2.8011	2.7917	0.0113	0.0094
(8)	16		3A	0.0000	2.8750	2.8656	...	2.8344	2.8302	0.0042	2.8073	2.7896	2.7983	...	0.0090	0.0068	2.8028	2.7948	0.0113	0.0094
(8)	$2\frac{7}{8}$ – 20 or 2.8750 – 20	UN	2A	0.0016	2.8734	2.8653	...	2.8409	2.8357	0.005175	2.8193	2.8032	2.8121	...	0.0072	0.0054	2.8156	2.8074	0.0090	0.0075
(8)	20		3A	0.0000	2.8750	2.8669	...	2.8425	2.8386	0.0039	2.8209	2.8061	2.8137	...	0.0072	0.0054	2.8172	2.8103	0.0090	0.0075
	3 – 4 or 3.0000 – 4	UNC	1A	0.0032	2.9968	2.9611	...	2.8344	2.8183	0.0161	2.7262	2.6559	2.6901	...	0.0361	0.0271	...	...	...	...
	4		2A	0.0032	2.9968	2.9730	2.9611	2.8344	2.8237	0.010714	2.7262	2.6613	2.6901	...	0.0361	0.0271	2.7081	2.6823	0.0451	0.0375
	4		3A	0.0000	3.0000	2.9762	...	2.8376	2.8296	0.0080	2.7294	2.6672	2.6933	...	0.0361	0.0271	2.7113	2.6882	0.0451	0.0375
	3 – or 3.0000 – 6	UN	2A	0.0028	2.9972	2.9790	...	2.8889	2.8796	0.009304	2.8168	2.7713	2.7927	...	0.0241	0.0180	2.8047	2.7853	0.0301	0.0250
	6		3A	0.0000	3.0000	2.9818	...	2.8917	2.8847	0.0070	2.8196	2.7764	2.7955	...	0.0241	0.0180	2.8075	2.7904	0.0301	0.0250
	3 – 8 or 3.0000 – 8	UN	2A	0.0026	2.9974	2.9824	2.9749	2.9162	2.9077	0.008511	2.8621	2.8265	2.8440	...	0.0180	0.0135	2.8531	2.8370	0.0226	0.0188
	8		3A	0.0000	3.0000	2.9850	...	2.9188	2.9124	0.0064	2.8647	2.8312	2.8466	...	0.0180	0.0135	2.8557	2.8417	0.0226	0.0188
	3 – 12 or 3.0000 – 12	UN	2A	0.0019	2.9981	2.9867	...	2.9440	2.9377	0.006324	2.9079	2.8836	2.8959	...	0.0120	0.0090	2.9019	2.8906	0.0150	0.0125
	12		3A	0.0000	3.0000	2.9886	...	2.9459	2.9412	0.0047	2.9098	2.8871	2.8978	...	0.0120	0.0090	2.9038	2.8941	0.0150	0.0125
(8)	3 – 16 or 3.0000 – 16	UN	2A	0.0017	2.9983	2.9889	...	2.9577	2.9520	0.005650	2.9306	2.9115	2.9216	...	0.0090	0.0068	2.9261	2.9167	0.0113	0.0094
(8)	16		3A	0.0000	3.0000	2.9906	...	2.9594	2.9552	0.0042	2.9323	2.9146	2.9233	...	0.0090	0.0068	2.9278	2.9198	0.0113	0.0094
	3 – 20 or 3.0000 – 20	UN	2A	0.0016	2.9984	2.9903	...	2.9659	2.9607	0.005205	2.9443	2.9282	2.9371	...	0.0072	0.0054	2.9406	2.9324	0.0090	0.0075
(8)	20		3A	0.0000	3.0000	2.9919	...	2.9675	2.9636	0.0039	2.9459	2.9311	2.9387	...	0.0072	0.0054	2.9422	2.9353	0.0090	0.0075
	$3\frac{1}{8}$ – 4 or 3.1250 – 4	UN	2A	0.0032	3.1218	3.0980	...	2.9594	2.9486	0.010798	2.8512	2.7862	2.8151	...	0.0361	0.0271	2.8331	2.8072	0.0451	0.0375
	4		3A	0.0000	3.1250	3.1012	...	2.9626	2.9545	0.0081	2.8544	2.7921	2.8183	...	0.0361	0.0271	2.8363	2.8131	0.0451	0.0375
	$3\frac{1}{8}$ – 6 or 3.1250 – 6	UN	2A	0.0028	3.1222	3.1040	...	3.0139	3.0045	0.009388	2.9418	2.8962	2.9177	...	0.0241	0.0180	2.9297	2.9102	0.0301	0.0250
	6		3A	0.0000	3.1250	3.1068	...	3.0167	3.0097	0.0070	2.9446	2.9014	2.9205	...	0.0241	0.0180	2.9325	2.9154	0.0301	0.0250
	$3\frac{1}{8}$ – 8 or 3.1250 – 8	UN	2A	0.0026	3.1224	3.1074	...	3.0412	3.0326	0.008595	2.9871	2.9514	2.9690	...	0.0180	0.0135	2.9781	2.9619	0.0226	0.0188
	8		3A	0.0000	3.1250	3.1100	...	3.0438	3.0374	0.0064	2.9897	2.9562	2.9716	...	0.0180	0.0135	2.9807	2.9667	0.0226	0.0188
(8)	$3\frac{1}{8}$ – 12 or 3.1250 – 12	UN	2A	0.0019	3.1231	3.1117	...	3.0690	3.0626	0.006354	3.0329	3.0085	3.0209	...	0.0120	0.0090	3.0269	3.0155	0.0150	0.0125
(8)	12		3A	0.0000	3.1250	3.1136	...	3.0709	3.0661	0.0048	3.0348	3.0120	3.0228	...	0.0120	0.0090	3.0288	3.0190	0.0150	0.0125

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(8)	3 1/8 – 16 or 3.1250 – 16	UN	2A	0.0017	3.1233	3.1139	...	3.0827	3.0770	0.005680	3.0556	3.0364	3.0466	...	0.0090	0.0068	3.0511	3.0416	0.0113	0.0094
(8)	16		3A	0.0000	3.1250	3.1156	...	3.0844	3.0801	0.0043	3.0573	3.0395	3.0483	...	0.0090	0.0068	3.0528	3.0447	0.0113	0.0094
	3 1/4 – 4 or 3.2500 – 4	UNC	1A	0.0033	3.2467	3.2110	...	3.0843	3.0680	0.0163	2.9761	2.9056	2.9400	...	0.0361	0.0271	...	...	...	...
	4		2A	0.0033	3.2467	3.2229	3.2110	3.0843	3.0734	0.010879	2.9761	2.9110	2.9400	...	0.0361	0.0271	2.9580	2.9320	0.0451	0.0375
	4		3A	0.0000	3.2500	3.2262	...	3.0876	3.0794	0.0082	2.9794	2.9170	2.9433	...	0.0361	0.0271	2.9613	2.9380	0.0451	0.0375
	3 1/4 – 6 or 3.2500 – 6	UN	2A	0.0028	3.2472	3.2290	...	3.1389	3.1294	0.009469	3.0668	3.0211	3.0427	...	0.0241	0.0180	3.0547	3.0351	0.0301	0.0250
	6		3A	0.0000	3.2500	3.2318	...	3.1417	3.1346	0.0071	3.0696	3.0263	3.0455	...	0.0241	0.0180	3.0575	3.0403	0.0301	0.0250
	3 1/4 – 8 or 3.2500 – 8	UN	2A	0.0026	3.2474	3.2324	3.2249	3.1662	3.1575	0.008676	3.1121	3.0763	3.0940	...	0.0180	0.0135	3.1031	3.0868	0.0226	0.0188
	8		3A	0.0000	3.2500	3.2350	...	3.1688	3.1623	0.0065	3.1147	3.0811	3.0966	...	0.0180	0.0135	3.1057	3.0916	0.0226	0.0188
(8)	3 1/4 – 12 or 3.2500 – 12	UN	2A	0.0019	3.2481	3.2367	...	3.1940	3.1876	0.006383	3.1579	3.1335	3.1459	...	0.0120	0.0090	3.1519	3.1405	0.0150	0.0125
(8)	12		3A	0.0000	3.2500	3.2386	...	3.1959	3.1911	0.0048	3.1598	3.1370	3.1478	...	0.0120	0.0090	3.1538	3.1440	0.0150	0.0125
(8)	3 1/4 – 16 or 3.2500 – 16	UN	2A	0.0017	3.2483	3.2389	...	3.2077	3.2020	0.005709	3.1806	3.1614	3.1716	...	0.0090	0.0068	3.1761	3.1666	0.0113	0.0094
(8)	16		3A	0.0000	3.2500	3.2406	...	3.2094	3.2051	0.0043	3.1823	3.1645	3.1733	...	0.0090	0.0068	3.1778	3.1697	0.0113	0.0094
	3 3/8 – 4 or 3.3750 – 4	UN	2A	0.0033	3.3717	3.3479	...	3.2093	3.1983	0.010959	3.1011	3.0359	3.0650	...	0.0361	0.0271	3.0830	3.0569	0.0451	0.0375
	4		3A	0.0000	3.3750	3.3512	...	3.2126	3.2044	0.0082	3.1044	3.0420	3.0683	...	0.0361	0.0271	3.0863	3.0630	0.0451	0.0375
	3 3/8 – 6 or 3.3750 – 6	UN	2A	0.0029	3.3721	3.3539	...	3.2638	3.2543	0.009549	3.1917	3.1460	3.1676	...	0.0241	0.0180	3.1796	3.1600	0.0301	0.0250
	6		3A	0.0000	3.3750	3.3568	...	3.2667	3.2595	0.0072	3.1946	3.1512	3.1705	...	0.0241	0.0180	3.1825	3.1652	0.0301	0.0250
	3 3/8 – 8 or 3.3750 – 8	UN	2A	0.0026	3.3724	3.3574	...	3.2912	3.2824	0.008756	3.2371	3.2012	3.2190	...	0.0180	0.0135	3.2281	3.2117	0.0226	0.0188
	8		3A	0.0000	3.3750	3.3600	...	3.2938	3.2872	0.0066	3.2397	3.2060	3.2216	...	0.0180	0.0135	3.2307	3.2165	0.0226	0.0188
(8)	3 3/8 – 12 or 3.3750 – 12	UN	2A	0.0019	3.3731	3.3617	...	3.3190	3.3126	0.006411	3.2829	3.2585	3.2709	...	0.0120	0.0090	3.2769	3.2655	0.0150	0.0125
	12		3A	0.0000	3.3750	3.3636	...	3.3209	3.3161	0.0048	3.2848	3.2620	3.2728	...	0.0120	0.0090	3.2788	3.2690	0.0150	0.0125
(8)	3 3/8 – 16 or 3.3750 – 16	UN	2A	0.0017	3.3733	3.3639	...	3.3327	3.3270	0.005737	3.3056	3.2864	3.2966	...	0.0090	0.0068	3.3011	3.2916	0.0113	0.0094
(8)	16		3A	0.0000	3.3750	3.3656	...	3.3344	3.3301	0.0043	3.3073	3.2895	3.2983	...	0.0090	0.0068	3.3028	3.2947	0.0113	0.0094
	3 1/2 – 4 or 3.5000 – 4	UNC	1A	0.0033	3.4967	3.4610	...	3.3343	3.3177	0.0166	3.2261	3.1553	3.1900	...	0.0361	0.0271	...	...	...	...
	4		2A	0.0033	3.4967	3.4729	3.4610	3.3343	3.3233	0.011036	3.2261	3.1609	3.1900	...	0.0361	0.0271	3.2080	3.1819	0.0451	0.0375
	4		3A	0.0000	3.5000	3.4762	...	3.3376	3.3293	0.0083	3.2294	3.1669	3.1933	...	0.0361	0.0271	3.2113	3.1879	0.0451	0.0375
	3 1/2 – 6 or 3.5000 – 6	UN	2A	0.0029	3.4971	3.4789	...	3.3888	3.3792	0.009626	3.3167	3.2709	3.2926	...	0.0241	0.0180	3.3046	3.2849	0.0301	0.0250
	6		3A	0.0000	3.5000	3.4818	...	3.3917	3.3845	0.0072	3.3196	3.2762	3.2955	...	0.0241	0.0180	3.3075	3.2902	0.0301	0.0250

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$3\frac{1}{2}$ – 8 or 3.5000 – 8	UN	2A	0.0026	3.4974	3.4824	3.4749	3.4162	3.4074	0.008833	3.3621	3.3262	3.3440	...	0.0180	0.0135	3.3531	3.3367	0.0226	0.0188
	8		3A	0.0000	3.5000	3.4850	...	3.4188	3.4122	0.0066	3.3647	3.3310	3.3466	...	0.0180	0.0135	3.3557	3.3415	0.0226	0.0188
	$3\frac{1}{2}$ – 12 or 3.5000 – 12	UN	2A	0.0019	3.4981	3.4867	...	3.4440	3.4376	0.006438	3.4079	3.3835	3.3959	...	0.0120	0.0090	3.4019	3.3905	0.0150	0.0125
	12		3A	0.0000	3.5000	3.4886	...	3.4459	3.4411	0.0048	3.4098	3.3870	3.3978	...	0.0120	0.0090	3.4038	3.3940	0.0150	0.0125
	$3\frac{1}{2}$ – 16 or 3.5000 – 16	UN	2A	0.0017	3.4983	3.4889	...	3.4577	3.4519	0.005764	3.4306	3.4113	3.4216	...	0.0090	0.0068	3.4261	3.4165	0.0113	0.0094
(8)	16		3A	0.0000	3.5000	3.4906	...	3.4594	3.4551	0.0043	3.4323	3.4145	3.4233	...	0.0090	0.0068	3.4278	3.4197	0.0113	0.0094
	$3\frac{5}{8}$ – 4 or 3.6250 – 4	UN	2A	0.0033	3.6217	3.5979	...	3.4593	3.4482	0.011113	3.3511	3.2858	3.3150	...	0.0361	0.0271	3.3330	3.3068	0.0451	0.0375
	4		3A	0.0000	3.6250	3.6012	...	3.4626	3.4543	0.0083	3.3544	3.2919	3.3183	...	0.0361	0.0271	3.3363	3.3129	0.0451	0.0375
	$3\frac{5}{8}$ – 6 or 3.6250 – 6	UN	2A	0.0029	3.6221	3.6039	...	3.5138	3.5041	0.009703	3.4417	3.3958	3.4176	...	0.0241	0.0180	3.4296	3.4098	0.0301	0.0250
	6		3A	0.0000	3.6250	3.6068	...	3.5167	3.5094	0.0073	3.4446	3.4011	3.4205	...	0.0241	0.0180	3.4325	3.4151	0.0301	0.0250
	$3\frac{5}{8}$ – 8 or 3.6250 – 8	UN	2A	0.0027	3.6223	3.6073	...	3.5411	3.5322	0.008910	3.4870	3.4510	3.4689	...	0.0180	0.0135	3.4780	3.4615	0.0226	0.0188
	8		3A	0.0000	3.6250	3.6100	...	3.5438	3.5371	0.0067	3.4897	3.4559	3.4716	...	0.0180	0.0135	3.4807	3.4664	0.0226	0.0188
(8)	$3\frac{5}{8}$ – 12 or 3.6250 – 12	UN	2A	0.0019	3.6231	3.6117	...	3.5690	3.5625	0.006465	3.5329	3.5084	3.5209	...	0.0120	0.0090	3.5269	3.5154	0.0150	0.0125
	12		3A	0.0000	3.6250	3.6136	...	3.5709	3.5661	0.0048	3.5348	3.5120	3.5228	...	0.0120	0.0090	3.5288	3.5190	0.0150	0.0125
	$3\frac{5}{8}$ – 16 or 3.6250 – 16	UN	2A	0.0017	3.6233	3.6139	...	3.5827	3.5769	0.005791	3.5556	3.5363	3.5466	...	0.0090	0.0068	3.5511	3.5415	0.0113	0.0094
(8)	16		3A	0.0000	3.6250	3.6156	...	3.5844	3.5801	0.0043	3.5573	3.5395	3.5483	...	0.0090	0.0068	3.5528	3.5447	0.0113	0.0094
	$3\frac{3}{4}$ – 4 or 3.7500 – 4	UNC	1A	0.0034	3.7466	3.7109	...	3.5842	3.5674	0.0168	3.4760	3.4050	3.4399	...	0.0361	0.0271	...	...	...	...
	4		2A	0.0034	3.7466	3.7228	3.7109	3.5842	3.5730	0.011188	3.4760	3.4106	3.4399	...	0.0361	0.0271	3.4579	3.4316	0.0451	0.0375
	4		3A	0.0000	3.7500	3.7262	...	3.5876	3.5792	0.0084	3.4794	3.4168	3.4433	...	0.0361	0.0271	3.4613	3.4378	0.0451	0.0375
	$3\frac{3}{4}$ – 6 or 3.7500 – 6	UN	2A	0.0029	3.7471	3.7289	...	3.6388	3.6290	0.009778	3.5667	3.5207	3.5426	...	0.0241	0.0180	3.5546	3.5347	0.0301	0.0250
	6		3A	0.0000	3.7500	3.7318	...	3.6417	3.6344	0.0073	3.5696	3.5261	3.5455	...	0.0241	0.0180	3.5575	3.5401	0.0301	0.0250
	$3\frac{3}{4}$ – 8 or 3.7500 – 8	UN	2A	0.0027	3.7473	3.7323	3.7248	3.6661	3.6571	0.008985	3.6120	3.5759	3.5939	...	0.0180	0.0135	3.6030	3.5864	0.0226	0.0188
	8		3A	0.0000	3.7500	3.7350	...	3.6688	3.6621	0.0067	3.6147	3.5809	3.5966	...	0.0180	0.0135	3.6057	3.5914	0.0226	0.0188
(8)	$3\frac{3}{4}$ – 12 or 3.7500 – 12	UN	2A	0.0019	3.7481	3.7367	...	3.6940	3.6875	0.006491	3.6579	3.6334	3.6459	...	0.0120	0.0090	3.6519	3.6404	0.0150	0.0125
(8)	12		3A	0.0000	3.7500	3.7386	...	3.6959	3.6910	0.0049	3.6598	3.6369	3.6478	...	0.0120	0.0090	3.6538	3.6439	0.0150	0.0125
(8)	$3\frac{3}{4}$ – 16 or 3.7500 – 16	UN	2A	0.0017	3.7483	3.7389	...	3.7077	3.7019	0.005817	3.6806	3.6613	3.6716	...	0.0090	0.0068	3.6761	3.6665	0.0113	0.0094
(8)	16		3A	0.0000	3.7500	3.7406	...	3.7094	3.7050	0.0044	3.6823	3.6644	3.6733	...	0.0090	0.0068	3.6778	3.6696	0.0113	0.0094

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$3\frac{7}{8}$ – 4 or 3.8750 – 4	UN	2A	0.0034	3.8716	3.8478	...	3.7092	3.6979	0.011262	3.6010	3.5355	3.5649	...	0.0361	0.0271	3.5829	3.5565	0.0451	0.0375
	4		3A	0.0000	3.8750	3.8512	...	3.7126	3.7042	0.0084	3.6044	3.5418	3.5683	...	0.0361	0.0271	3.5863	3.5628	0.0451	0.0375
	$3\frac{7}{8}$ – 6 or 3.8750 – 6	UN	2A	0.0030	3.8720	3.8538	...	3.7637	3.7538	0.009852	3.6916	3.6455	3.6675	...	0.0241	0.0180	3.6795	3.6595	0.0301	0.0250
	6		3A	0.0000	3.8750	3.8568	...	3.7667	3.7593	0.0074	3.6946	3.6510	3.6705	...	0.0241	0.0180	3.6825	3.6650	0.0301	0.0250
	$3\frac{7}{8}$ – 8 or 3.8750 – 8	UN	2A	0.0027	3.8723	3.8573	...	3.7911	3.7820	0.009059	3.7370	3.7008	3.7189	...	0.0180	0.0135	3.7280	3.7113	0.0226	0.0188
	8		3A	0.0000	3.8750	3.8600	...	3.7938	3.7870	0.0068	3.7397	3.7058	3.7216	...	0.0180	0.0135	3.7307	3.7163	0.0226	0.0188
	$3\frac{7}{8}$ – 12 or 3.8750 – 12	UN	2A	0.0020	3.8730	3.8616	...	3.8189	3.8124	0.006517	3.7828	3.7583	3.7708	...	0.0120	0.0090	3.7768	3.7653	0.0150	0.0125
	12		3A	0.0000	3.8750	3.8636	...	3.8209	3.8160	0.0049	3.7848	3.7619	3.7728	...	0.0120	0.0090	3.7788	3.7689	0.0150	0.0125
(8)	$3\frac{7}{8}$ – 16 or 3.8750 – 16	UN	2A	0.0018	3.8732	3.8638	...	3.8326	3.8268	0.005843	3.8055	3.7862	3.7965	...	0.0090	0.0068	3.8010	3.7914	0.0113	0.0094
(8)	16		3A	0.0000	3.8750	3.8656	...	3.8344	3.8300	0.0044	3.8073	3.7894	3.7983	...	0.0090	0.0068	3.8028	3.7946	0.0113	0.0094
	4 – 4 or 4.0000 – 4	UNC	1A	0.0034	3.9966	3.9609	...	3.8342	3.8172	0.0170	3.7260	3.6548	3.6899	...	0.0361	0.0271	...	...	...	...
	4		2A	0.0034	3.9966	3.9728	3.9609	3.8342	3.8229	0.011334	3.7260	3.6605	3.6899	...	0.0361	0.0271	3.7079	3.6815	0.0451	0.0375
	4		3A	0.0000	4.0000	3.9762	...	3.8376	3.8291	0.0085	3.7294	3.6667	3.6933	...	0.0361	0.0271	3.7113	3.6877	0.0451	0.0375
	4 – 6 or 4.0000 – 6	UN	2A	0.0030	3.9970	3.9788	...	3.8887	3.8788	0.009924	3.8166	3.7705	3.7925	...	0.0241	0.0180	3.8045	3.7845	0.0301	0.0250
	6		3A	0.0000	4.0000	3.9818	...	3.8917	3.8843	0.0074	3.8196	3.7760	3.7955	...	0.0241	0.0180	3.8075	3.7900	0.0301	0.0250
	4 – 8 or 4.0000 – 8	UN	2A	0.0027	3.9973	3.9823	3.9748	3.9161	3.9070	0.009131	3.8620	3.8258	3.8439	...	0.0180	0.0135	3.8530	3.8363	0.0226	0.0188
	8		3A	0.0000	4.0000	3.9850	...	3.9188	3.9120	0.0068	3.8647	3.8308	3.8466	...	0.0180	0.0135	3.8557	3.8413	0.0226	0.0188
	4 – 12 or 4.0000 – 12	UN	2A	0.0020	3.9980	3.9866	...	3.9439	3.9374	0.006542	3.9078	3.8833	3.8958	...	0.0120	0.0090	3.9018	3.8903	0.0150	0.0125
	12		3A	0.0000	4.0000	3.9886	...	3.9459	3.9410	0.0049	3.9098	3.8869	3.8978	...	0.0120	0.0090	3.9038	3.8939	0.0150	0.0125
	4 – 16 or 4.0000 – 16	UN	2A	0.0018	3.9982	3.9888	...	3.9576	3.9517	0.005868	3.9305	3.9111	3.9215	...	0.0090	0.0068	3.9260	3.9163	0.0113	0.0094
(8)	16		3A	0.0000	4.0000	3.9906	...	3.9594	3.9550	0.0044	3.9323	3.9144	3.9233	...	0.0090	0.0068	3.9278	3.9196	0.0113	0.0094
	$4\frac{1}{8}$ – 4 or 4.1250 – 4	UN	2A	0.0034	4.1216	4.0978	...	3.9592	3.9478	0.011406	3.8510	3.7854	3.8149	...	0.0361	0.0271	3.8329	3.8064	0.0451	0.0375
	4		3A	0.0000	4.1250	4.1012	...	3.9626	3.9540	0.0086	3.8544	3.7916	3.8183	...	0.0361	0.0271	3.8363	3.8126	0.0451	0.0375
	$4\frac{1}{8}$ – 6 or 4.1250 – 6	UN	2A	0.0030	4.1220	4.1038	...	4.0137	4.0037	0.009996	3.9416	3.8954	3.9175	...	0.0241	0.0180	3.9295	3.9094	0.0301	0.0250
	6		3A	0.0000	4.1250	4.1068	...	4.0167	4.0092	0.0075	3.9446	3.9009	3.9205	...	0.0241	0.0180	3.9325	3.9149	0.0301	0.0250
	$4\frac{1}{8}$ – 8 or 4.1250 – 8	UN	2A	0.0028	4.1222	4.1072	...	4.0410	4.0318	0.009203	3.9869	3.9506	3.9688	...	0.0180	0.0135	3.9779	3.9611	0.0226	0.0188
	8		3A	0.0000	4.1250	4.1100	...	4.0438	4.0369	0.0069	3.9897	3.9570	3.9716	...	0.0180	0.0135	3.9807	3.9662	0.0226	0.0188

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(8)	4 1/8 – 12 or 4.1250 – 12	UN	2A	0.0020	4.1230	4.1116	...	4.0689	4.0623	0.006567	4.0328	4.0082	4.0208	...	0.0120	0.0090	4.0268	4.0152	0.0150	0.0125
	12		3A	0.0000	4.1250	4.1136	...	4.0709	4.0660	0.0049	4.0348	4.0119	4.0228	...	0.0120	0.0090	4.0288	4.0189	0.0150	0.0125
(8)	4 1/8 – 16 or 4.1250 – 16	UN	2A	0.0018	4.1232	4.1138	...	4.0826	4.0767	0.005893	4.0555	4.0361	4.0465	...	0.0090	0.0068	4.0510	4.0413	0.0113	0.0094
(8)	16		3A	0.0000	4.1250	4.1156	...	4.0844	4.0800	0.0044	4.0573	4.0394	4.0483	...	0.0090	0.0068	4.0528	4.0446	0.0113	0.0094
	4 1/4 – 4 or 4.2500 – 4	UNC	2A	0.0034	4.2466	4.2228	...	4.0842	4.0727	0.011475	3.9760	3.9103	3.9399	...	0.0361	0.0271	3.9579	3.9313	0.0451	0.0375
	4		3A	0.0000	4.2500	4.2262	...	4.0876	4.0790	0.0086	3.9794	3.9166	3.9433	...	0.0361	0.0271	3.9613	3.9376	0.0451	0.0375
	4 1/4 – 6 or 4.2500 – 6	UN	2A	0.0030	4.2470	4.2288	...	4.1387	4.1286	0.010065	4.0666	4.0203	4.0425	...	0.0241	0.0180	4.0545	4.0343	0.0301	0.0250
	6		3A	0.0000	4.2500	4.2318	...	4.1417	4.1342	0.0075	4.0696	4.0259	4.0455	...	0.0241	0.0180	4.0575	4.0399	0.0301	0.0250
(8)	4 1/4 – 8 or 4.2500 – 8	UN	2A	0.0028	4.2472	4.2322	...	4.1660	4.1567	0.009272	4.1119	4.0755	4.0938	...	0.0180	0.0135	4.1029	4.0860	0.0226	0.0188
(8)	8		3A	0.0000	4.2500	4.2350	...	4.1688	4.1618	0.0070	4.1147	4.0806	4.0966	...	0.0180	0.0135	4.1057	4.0911	0.0226	0.0188
(8)	4 1/4 – 12 or 4.2500 – 12	UN	2A	0.0020	4.2480	4.2366	...	4.1939	4.1873	0.006591	4.1578	4.1332	4.1458	...	0.0120	0.0090	4.1518	4.1402	0.0150	0.0125
	12		3A	0.0000	4.2500	4.2386	...	4.1959	4.1910	0.0049	4.1598	4.1369	4.1478	...	0.0120	0.0090	4.1538	4.1439	0.0150	0.0125
(8)	4 1/4 – 16 or 4.2500 – 16	UN	2A	0.0018	4.2482	4.2388	...	4.2076	4.2017	0.005917	4.1805	4.1611	4.1715	...	0.0090	0.0068	4.1760	4.1663	0.0113	0.0094
(8)	16		3A	0.0000	4.2500	4.2406	...	4.2094	4.2050	0.0044	4.1823	4.1644	4.1733	...	0.0090	0.0068	4.1778	4.1696	0.0113	0.0094
	4 3/8 – 4 or 4.3750 – 4	UN	2A	0.0035	4.3715	4.3477	...	4.2091	4.1976	0.011543	4.1009	4.0352	4.0648	...	0.0361	0.0271	4.0828	4.0562	0.0451	0.0375
	4		3A	0.0000	4.3750	4.3512	...	4.2126	4.2039	0.0087	4.1044	4.0415	4.0683	...	0.0361	0.0271	4.0863	4.0625	0.0451	0.0375
	4 3/8 – 6 or 4.3750 – 6	UN	2A	0.0030	4.3720	4.3538	...	4.2637	4.2536	0.010133	4.1916	4.1453	4.1675	...	0.0241	0.0180	4.1795	4.1593	0.0301	0.0250
	6		3A	0.0000	4.3750	4.3568	...	4.2667	4.2591	0.0076	4.1946	4.1508	4.1705	...	0.0241	0.0180	4.1825	4.1648	0.0301	0.0250
(8)	4 3/8 – 8 or 4.3750 – 8	UN	2A	0.0028	4.3722	4.3572	...	4.2910	4.2817	0.009340	4.2369	4.2005	4.2188	...	0.0180	0.0135	4.2279	4.2110	0.0226	0.0188
	8		3A	0.0000	4.3750	4.3600	...	4.2938	4.2868	0.0070	4.2397	4.2056	4.2216	...	0.0180	0.0135	4.2307	4.2161	0.0226	0.0188
(8)	4 3/8 – 12 or 4.3750 – 12	UN	2A	0.0020	4.3730	4.3616	...	4.3189	4.3123	0.006614	4.2828	4.2582	4.2708	...	0.0120	0.0090	4.2768	4.2652	0.0150	0.0125
(8)	12		3A	0.0000	4.3750	4.3636	...	4.3209	4.3159	0.0050	4.2848	4.2618	4.2728	...	0.0120	0.0090	4.2788	4.2688	0.0150	0.0125
(8)	4 3/8 – 16 or 4.3750 – 16	UN	2A	0.0018	4.3732	4.3638	...	4.3326	4.3267	0.005940	4.3055	4.2861	4.2965	...	0.0090	0.0068	4.3010	4.2913	0.0113	0.0094
(8)	16		3A	0.0000	4.3750	4.3656	...	4.3344	4.3299	0.0045	4.3073	4.2893	4.2983	...	0.0090	0.0068	4.3028	4.2945	0.0113	0.0094
	4 1/2 – 4 or 4.5000 – 4	UNC	2A	0.0035	4.4965	4.4727	...	4.3341	4.3225	0.011611	4.2259	4.1601	4.1898	...	0.0361	0.0271	4.2078	4.1811	0.0451	0.0375
	4		3A	0.0000	4.5000	4.4762	...	4.3376	4.3289	0.0087	4.2294	4.1665	4.1933	...	0.0361	0.0271	4.2113	4.1875	0.0451	0.0375

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$4\frac{1}{2}$ – 6 or 4.5000 – 6	UN	2A	0.0031	4.4969	4.4787	...	4.3886	4.3784	0.010201	4.3165	4.2701	4.2924	...	0.0241	0.0180	4.3044	4.2841	0.0301	0.0250
	6		3A	0.0000	4.5000	4.4818	...	4.3917	4.3840	0.0077	4.3196	4.2757	4.2955	...	0.0241	0.0180	4.3075	4.2897	0.0301	0.0250
	$4\frac{1}{2}$ – 8 or 4.5000 – 8	UN	2A	0.0028	4.4972	4.4822	...	4.4160	4.4066	0.009408	4.3619	4.3254	4.3438	...	0.0180	0.0135	4.3529	4.3359	0.0226	0.0188
	8		3A	0.0000	4.5000	4.4850	...	4.4188	4.4117	0.0071	4.3647	4.3305	4.3466	...	0.0180	0.0135	4.3557	4.3410	0.0226	0.0188
(8)	$4\frac{1}{2}$ – 12 or 4.5000 – 12	UN	2A	0.0020	4.4980	4.4866	...	4.4439	4.4373	0.006637	4.4078	4.3832	4.3958	...	0.0120	0.0090	4.4018	4.3902	0.0150	0.0125
(8)	12		3A	0.0000	4.5000	4.4886	...	4.4459	4.4409	0.0050	4.4098	4.3868	4.3978	...	0.0120	0.0090	4.4038	4.3938	0.0150	0.0125
(8)	$4\frac{1}{2}$ – 16 or 4.5000 – 16	UN	2A	0.0018	4.4982	4.4888	...	4.4576	4.4516	0.005963	4.4305	4.4110	4.4215	...	0.0090	0.0068	4.4260	4.4162	0.0113	0.0094
(8)	16		3A	0.0000	4.5000	4.4906	...	4.4594	4.4549	0.0045	4.4323	4.4143	4.4233	...	0.0090	0.0068	4.4278	4.4195	0.0113	0.0094
	$4\frac{5}{8}$ – 4 or 4.6250 – 4	UN	2A	0.0035	4.6215	4.5977	...	4.4591	4.4474	0.011678	4.3509	4.2850	4.3148	...	0.0361	0.0271	4.3328	4.3060	0.0451	0.0375
	4		3A	0.0000	4.6250	4.6012	...	4.4626	4.4538	0.0088	4.3544	4.2914	4.3183	...	0.0361	0.0271	4.3363	4.3124	0.0451	0.0375
	$4\frac{5}{8}$ – 6 or 4.6250 – 6	UN	2A	0.0031	4.6219	4.6037	...	4.5136	4.5033	0.010268	4.4415	4.3950	4.4174	...	0.0241	0.0180	4.4294	4.4090	0.0301	0.0250
	6		3A	0.0000	4.6250	4.6068	...	4.5167	4.5090	0.0077	4.4446	4.4007	4.4205	...	0.0241	0.0180	4.4325	4.4147	0.0301	0.0250
(8)	$4\frac{5}{8}$ – 8 or 4.6250 – 8	UN	2A	0.0028	4.6222	4.6072	...	4.5410	4.5315	0.009475	4.4869	4.4503	4.4688	...	0.0180	0.0135	4.4779	4.4608	0.0226	0.0188
(8)	8		3A	0.0000	4.6250	4.6100	...	4.5438	4.5367	0.0071	4.4897	4.4555	4.4716	...	0.0180	0.0135	4.4807	4.4660	0.0226	0.0188
(8)	$4\frac{5}{8}$ – 12 or 4.6250 – 12	UN	2A	0.0020	4.6230	4.6116	...	4.5689	4.5622	0.006660	4.5328	4.5081	4.5208	...	0.0120	0.0090	4.5268	4.5151	0.0150	0.0125
(8)	12		3A	0.0000	4.6250	4.6136	...	4.5709	4.5659	0.0050	4.5348	4.5118	4.5228	...	0.0120	0.0090	4.5288	4.5188	0.0150	0.0125
(8)	$4\frac{5}{8}$ – 16 or 4.6250 – 16	UN	2A	0.0018	4.6232	4.6138	...	4.5826	4.5766	0.005986	4.5555	4.5360	4.5465	...	0.0090	0.0068	4.5510	4.5412	0.0113	0.0094
(8)	16		3A	0.0000	4.6250	4.6156	...	4.5844	4.5799	0.0045	4.5573	4.5393	4.5483	...	0.0090	0.0068	4.5528	4.5445	0.0113	0.0094
	$4\frac{3}{4}$ – 4 or 4.7500 – 4	UNC	2A	0.0035	4.7465	4.7227	...	4.5841	4.5724	0.011743	4.4759	4.4100	4.4398	...	0.0361	0.0271	4.4578	4.4310	0.0451	0.0375
	4		3A	0.0000	4.7500	4.7262	...	4.5876	4.5788	0.0088	4.4794	4.4164	4.4433	...	0.0361	0.0271	4.4613	4.4374	0.0451	0.0375
	$4\frac{3}{4}$ – 6 or 4.7500 – 6	UN	2A	0.0031	4.7469	4.7287	...	4.6386	4.6283	0.010333	4.5665	4.5200	4.5424	...	0.0241	0.0180	4.5544	4.5340	0.0301	0.0250
	6		3A	0.0000	4.7500	4.7318	...	4.6417	4.6340	0.0077	4.5696	4.5257	4.5455	...	0.0241	0.0180	4.5575	4.5397	0.0301	0.0250
	$4\frac{3}{4}$ – 8 or 4.7500 – 8	UN	2A	0.0029	4.7471	4.7321	...	4.6659	4.6564	0.009540	4.6118	4.5752	4.5937	...	0.0180	0.0135	4.6028	4.5857	0.0226	0.0188
(8)	8		3A	0.0000	4.7500	4.7350	...	4.6688	4.6616	0.0072	4.6147	4.5804	4.5966	...	0.0180	0.0135	4.6057	4.5909	0.0226	0.0188

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$4\frac{3}{4}$ – 12 or 4.7500 – 12	UN	2A	0.0020	4.7480	4.7366	...	4.6939	4.6872	0.006682	4.6578	4.6331	4.6458	...	0.0120	0.0090	4.6518	4.6401	0.0150	0.0125
(8)	12		3A	0.0000	4.7500	4.7386	...	4.6959	4.6909	0.0050	4.6598	4.6368	4.6478	...	0.0120	0.0090	4.6538	4.6438	0.0150	0.0125
(8)	$4\frac{3}{4}$ – 16 or 4.7500 – 16	UN	2A	0.0018	4.7482	4.7388	...	4.7076	4.7016	0.006008	4.6805	4.6610	4.6715	...	0.0090	0.0068	4.6760	4.6662	0.0113	0.0094
(8)	16		3A	0.0000	4.7500	4.7406	...	4.7094	4.7049	0.0045	4.6823	4.6643	4.6733	...	0.0090	0.0068	4.6778	4.6695	0.0113	0.0094
	$4\frac{7}{8}$ – 4 or 4.8750 – 4	UN	2A	0.0035	4.8715	4.8477	...	4.7091	4.6973	0.011808	4.6009	4.5349	4.5648	...	0.0361	0.0271	4.5828	4.5559	0.0451	0.0375
	4		3A	0.0000	4.8750	4.8512	...	4.7126	4.7037	0.0089	4.6044	4.5413	4.5683	...	0.0361	0.0271	4.5863	4.5623	0.0451	0.0375
	$4\frac{7}{8}$ – 6 or 4.8750 – 6	UN	2A	0.0031	4.8719	4.8537	...	4.7636	4.7532	0.010398	4.6915	4.6449	4.6674	...	0.0241	0.0180	4.6794	4.6589	0.0301	0.0250
	6		3A	0.0000	4.8750	4.8568	...	4.7667	4.7589	0.0078	4.6946	4.6506	4.6705	...	0.0241	0.0180	4.6825	4.6646	0.0301	0.0250
	$4\frac{7}{8}$ – 8 or 4.8750 – 8	UN	2A	0.0029	4.8721	4.8571	...	4.7909	4.7813	0.009605	4.7368	4.7001	4.7187	...	0.0180	0.0135	4.7278	4.7106	0.0226	0.0188
	8		3A	0.0000	4.8750	4.8600	...	4.7938	4.7866	0.0072	4.7397	4.7054	4.7216	...	0.0180	0.0135	4.7307	4.7159	0.0226	0.0188
	$4\frac{7}{8}$ – 12 or 4.8750 – 12	UN	2A	0.0020	4.8730	4.8616	...	4.8189	4.8122	0.006704	4.7828	4.7581	4.7708	...	0.0120	0.0090	4.7768	4.7651	0.0150	0.0125
(8)	12		3A	0.0000	4.8750	4.8636	...	4.8209	4.8159	0.0050	4.7848	4.7618	4.7728	...	0.0120	0.0090	4.7788	4.7688	0.0150	0.0125
(8)	$4\frac{7}{8}$ – 16 or 4.8750 – 16	UN	2A	0.0018	4.8732	4.8638	...	4.8326	4.8266	0.006030	4.8055	4.7860	4.7965	...	0.0090	0.0068	4.8010	4.7912	0.0113	0.0094
(8)	16		3A	0.0000	4.8750	4.8656	...	4.8344	4.8299	0.0045	4.8073	4.7893	4.7983	...	0.0090	0.0068	4.8028	4.7945	0.0113	0.0094
	5 – 4 or 5.0000 – 4	UNC	2A	0.0036	4.9964	4.9726	...	4.8340	4.8221	0.011872	4.7258	4.6597	4.6897	...	0.0361	0.0271	4.7077	4.6807	0.0451	0.0375
	4		3A	0.0000	5.0000	4.9762	...	4.8376	4.8287	0.0089	4.7294	4.6663	4.6933	...	0.0361	0.0271	4.7113	4.6873	0.0451	0.0375
	5 – 6 or 5.0000 – 6	UN	2A	0.0031	4.9969	4.9787	...	4.8886	4.8781	0.010462	4.8165	4.7698	4.7924	...	0.0241	0.0180	4.8044	4.7838	0.0301	0.0250
	6		3A	0.0000	5.0000	4.9818	...	4.8917	4.8839	0.0078	4.8196	4.7756	4.7955	...	0.0241	0.0180	4.8075	4.7896	0.0301	0.0250
	5 – 8 or 5.0000 – 8	UN	2A	0.0029	4.9971	4.9821	...	4.9159	4.9062	0.009669	4.8618	4.8250	4.7955	...	0.0180	0.0135	4.8528	4.8355	0.0226	0.0188
(8)	8		3A	0.0000	5.0000	4.9850	...	4.9188	4.9115	0.0073	4.8647	4.8303	4.8466	...	0.0180	0.0135	4.8557	4.8408	0.0226	0.0188
	5 – 12 or 5.0000 – 12	UN	2A	0.0020	4.9980	4.9866	...	4.9439	4.9372	0.006726	4.9078	4.8831	4.8958	...	0.0120	0.0090	4.9018	4.8901	0.0150	0.0125
	12		3A	0.0000	5.0000	4.9886	...	4.9459	4.9409	0.0050	4.9098	4.8868	4.8978	...	0.0120	0.0090	4.9038	4.8938	0.0150	0.0125
	5 – 16 or 5.0000 – 16	UN	2A	0.0018	4.9982	4.9888	...	4.9576	4.9515	0.006052	4.9305	4.9109	4.9215	...	0.0090	0.0068	4.9260	4.9161	0.0113	0.0094
(8)	16		3A	0.0000	5.0000	4.9906	...	4.9594	4.9549	0.0045	4.9323	4.9143	4.9233	...	0.0090	0.0068	4.9278	4.9195	0.0113	0.0094
	$5\frac{1}{8}$ – 4 or 5.1250 – 4	UN	2A	0.0036	5.1214	5.0976	...	4.9590	4.9471	0.011935	4.8508	4.7847	4.8147	...	0.0361	0.0271	4.8327	4.8057	0.0451	0.0375
	4		3A	0.0000	5.1250	5.1012	...	4.9626	4.9536	0.0090	4.8544	4.7912	4.8183	...	0.0361	0.0271	4.8363	4.8122	0.0451	0.0375

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	5 1/8 – 6 or 5.1250 – 6	UN	2A	0.0032	5.1218	5.1036	...	5.0135	5.0030	0.010525	4.9414	4.8947	4.9173	...	0.0241	0.0180	4.9293	4.9087	0.0301	0.0250
	6		3A	0.0000	5.1250	5.1068	...	5.0167	5.0088	0.0079	4.9446	4.9005	4.9205	...	0.0241	0.0180	4.9325	4.9145	0.0301	0.0250
(8)	5 1/8 – 8 or 5.1250 – 8	UN	2A	0.0029	5.1221	5.1071	...	5.0409	5.0312	0.009732	4.9868	4.9500	4.9687	...	0.0180	0.0135	4.9778	4.9605	0.0226	0.0188
	8		3A	0.0000	5.1250	5.1100	...	5.0438	5.0365	0.0073	4.9897	4.9553	4.9716	...	0.0180	0.0135	4.9807	4.9658	0.0226	0.0188
(8)	5 1/8 – 12 or 5.1250 – 12	UN	2A	0.0020	5.1230	5.1116	...	5.0689	5.0622	0.006747	5.0328	5.0081	5.0208	...	0.0120	0.0090	5.0268	5.0151	0.0150	0.0125
(8)	12		3A	0.0000	5.1250	5.1136	...	5.0709	5.0658	0.0051	5.0348	5.0117	5.0228	...	0.0120	0.0090	5.0288	5.0187	0.0150	0.0125
	5 1/8 – 16 or 5.1250 – 16	UN	2A	0.0018	5.1232	5.1138	...	5.0826	5.0765	0.006073	5.0555	5.0359	5.0465	...	0.0090	0.0068	5.0510	5.0411	0.0113	0.0094
(8)	16		3A	0.0000	5.1250	5.1156	...	5.0844	5.0798	0.0046	5.0573	5.0392	5.0483	...	0.0090	0.0068	5.0528	5.0444	0.0113	0.0094
	5 1/4 – 4 or 5.2500 – 4	UNC	2A	0.0036	5.2464	5.2226	...	5.0840	5.0720	0.011997	4.9758	4.9096	4.9397	...	0.0361	0.0271	4.9577	4.9306	0.0451	0.0375
	4		3A	0.0000	5.2500	5.2262	...	5.0876	5.0786	0.0090	4.9794	4.9162	4.9433	...	0.0361	0.0271	4.9613	4.9372	0.0451	0.0375
	5 1/4 – 6 or 5.2500 – 6	UN	2A	0.0032	5.2468	5.2286	...	5.1385	5.1279	0.010587	5.0664	5.0196	5.0423	...	0.0241	0.0180	5.0543	5.0336	0.0301	0.0250
	6		3A	0.0000	5.2500	5.2318	...	5.1417	5.1338	0.0079	5.0696	5.0255	5.0455	...	0.0241	0.0180	5.0575	5.0395	0.0301	0.0250
	5 1/4 – 8 or 5.2500 – 8	UN	2A	0.0029	5.2471	5.2321	...	5.1659	5.1561	0.009794	5.1118	5.0749	5.0937	...	0.0180	0.0135	5.1028	5.0854	0.0226	0.0188
(8)	8		3A	0.0000	5.2500	5.2350	...	5.1688	5.1615	0.0073	5.1147	5.0803	5.0966	...	0.0180	0.0135	5.1057	5.0908	0.0226	0.0188
(8)	5 1/4 – 12 or 5.2500 – 12	UN	2A	0.0020	5.2480	5.2366	...	5.1939	5.1871	0.006768	5.1578	5.1330	5.1458	...	0.0120	0.0090	5.1518	5.1400	0.0150	0.0125
(8)	12		3A	0.0000	5.2500	5.2386	...	5.1959	5.1908	0.0051	5.1598	5.1367	5.1478	...	0.0120	0.0090	5.1538	5.1437	0.0150	0.0125
	5 1/4 – 16 or 5.2500 – 16	UN	2A	0.0018	5.2482	5.2388	...	5.2076	5.2015	0.006094	5.1805	5.1609	5.1715	...	0.0090	0.0068	5.1760	5.1661	0.0113	0.0094
(8)	16		3A	0.0000	5.2500	5.2406	...	5.2094	5.2048	0.0046	5.1823	5.1642	5.1733	...	0.0090	0.0068	5.1778	5.1694	0.0113	0.0094
	5 3/8 – 4 or 5.3750 – 4	UN	2A	0.0036	5.3714	5.3476	...	5.2090	5.1969	0.012059	5.1008	5.0345	5.0647	...	0.0361	0.0271	5.0827	5.0555	0.0451	0.0375
	4		3A	0.0000	5.3750	5.3512	...	5.2126	5.2036	0.0090	5.1044	5.0412	5.0683	...	0.0361	0.0271	5.0863	5.0622	0.0451	0.0375
	5 3/8 – 6 or 5.3750 – 6	UN	2A	0.0032	5.3718	5.3536	...	5.2635	5.2529	0.010649	5.1914	5.1446	5.1673	...	0.0241	0.0180	5.1793	5.1586	0.0301	0.0250
	6		3A	0.0000	5.3750	5.3568	...	5.2667	5.2587	0.0080	5.1946	5.1504	5.1705	...	0.0241	0.0180	5.1825	5.1644	0.0301	0.0250
(8)	5 3/8 – 8 or 5.3750 – 8	UN	2A	0.0030	5.3720	5.3570	...	5.2908	5.2809	0.009856	5.2367	5.1997	5.2186	...	0.0180	0.0135	5.2277	5.2102	0.0226	0.0188
(8)	8		3A	0.0000	5.3750	5.3600	...	5.2938	5.2864	0.0074	5.2397	5.2052	5.2216	...	0.0180	0.0135	5.2307	5.2157	0.0226	0.0188
(8)	5 3/8 – 12 or 5.3750 – 12	UN	2A	0.0020	5.3730	5.3616	...	5.3189	5.3121	0.006789	5.2828	5.2580	5.2708	...	0.0120	0.0090	5.2768	5.2650	0.0150	0.0125
(8)	12		3A	0.0000	5.3750	5.3636	...	5.3209	5.3158	0.0051	5.2848	5.2617	5.2728	...	0.0120	0.0090	5.2788	5.2687	0.0150	0.0125

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	$5\frac{3}{8}$ – 16 or 5.3750 – 16	UN	2A	0.0018	5.3732	5.3638	...	5.3326	5.3265	0.006115	5.3055	5.2859	5.2965	...	0.0090	0.0068	5.3010	5.2911	0.0113	0.0094
(8)	16		3A	0.0000	5.3750	5.3656	...	5.3344	5.3298	0.0046	5.3073	5.2892	5.2983	...	0.0090	0.0068	5.3028	5.2944	0.0113	0.0094
	$5\frac{1}{2}$ – 4 or 5.5000 – 4	UNC	2A	0.0036	5.4964	5.4726	...	5.3340	5.3219	0.012119	5.2258	5.1595	5.1897	...	0.0361	0.0271	5.2077	5.1805	0.0451	0.0375
	4		3A	0.0000	5.5000	5.4762	...	5.3376	5.3285	0.0091	5.2294	5.1661	5.1933	...	0.0361	0.0271	5.2113	5.1871	0.0451	0.0375
	$5\frac{1}{2}$ – 6 or 5.5000 – 6	UN	2A	0.0032	5.4968	5.4786	...	5.3885	5.3778	0.010709	5.3164	5.2695	5.2923	...	0.0241	0.0180	5.3043	5.2835	0.0301	0.0250
	6		3A	0.0000	5.5000	5.4818	...	5.3917	5.3837	0.0080	5.3196	5.2754	5.2955	...	0.0241	0.0180	5.3075	5.2894	0.0301	0.0250
	$5\frac{1}{2}$ – 8 or 5.5000 – 8	UN	2A	0.0030	5.4970	5.4820	...	5.4158	5.4059	0.009916	5.3617	5.3247	5.3436	...	0.0180	0.0135	5.3527	5.3352	0.0226	0.0188
	8		3A	0.0000	5.5000	5.4850	...	5.4188	5.4114	0.0074	5.3647	5.3302	5.3466	...	0.0180	0.0135	5.3557	5.3407	0.0226	0.0188
(8)	$5\frac{1}{2}$ – 12 or 5.5000 – 12	UN	2A	0.0020	5.4980	5.4866	...	5.4439	5.4371	0.006809	5.4078	5.3830	5.3958	...	0.0120	0.0090	5.4018	5.3900	0.0150	0.0125
(8)	12		3A	0.0000	5.5000	5.4886	...	5.4459	5.4408	0.0051	5.4098	5.3867	5.3978	...	0.0120	0.0090	5.4038	5.3937	0.0150	0.0125
(8)	$5\frac{1}{2}$ – 16 or 5.5000 – 16	UN	2A	0.0018	5.4982	5.4888	...	5.4576	5.4515	0.006135	5.4305	5.4109	5.4215	...	0.0090	0.0068	5.4260	5.4161	0.0113	0.0094
(8)	16		3A	0.0000	5.5000	5.4906	...	5.4594	5.4548	0.0046	5.4323	5.4142	5.4233	...	0.0090	0.0068	5.4278	5.4194	0.0113	0.0094
	$5\frac{5}{8}$ – 4 or 5.6250 – 4	UN	2A	0.0037	5.6213	5.5975	...	5.4589	5.4467	0.012179	5.3507	5.2843	5.3146	...	0.0361	0.0271	5.3326	5.3053	0.0451	0.0375
	4		3A	0.0000	5.6250	5.6012	...	5.4626	5.4535	0.0091	5.3544	5.2911	5.3183	...	0.0361	0.0271	5.3363	5.3121	0.0451	0.0375
	$5\frac{5}{8}$ – 6 or 5.6250 – 6	UN	2A	0.0032	5.6218	5.6036	...	5.5135	5.5027	0.010769	5.4414	5.3944	5.4173	...	0.0241	0.0180	5.4293	5.4084	0.0301	0.0250
	6		3A	0.0000	5.6250	5.6068	...	5.5167	5.5086	0.0081	5.4446	5.4003	5.4205	...	0.0241	0.0180	5.4325	5.4143	0.0301	0.0250
	$5\frac{5}{8}$ – 8 or 5.6250 – 8	UN	2A	0.0030	5.6220	5.6070	...	5.5408	5.5308	0.009976	5.4867	5.4496	5.4686	...	0.0180	0.0135	5.4777	5.4601	0.0226	0.0188
(8)	8		3A	0.0000	5.6250	5.6100	...	5.5438	5.5363	0.0075	5.4897	5.4551	5.4716	...	0.0180	0.0135	5.4807	5.4656	0.0226	0.0188
(8)	$5\frac{5}{8}$ – 12 or 5.6250 – 12	UN	2A	0.0020	5.6230	5.6116	...	5.5689	5.5621	0.006829	5.5328	5.5080	5.5208	...	0.0120	0.0090	5.5268	5.5150	0.0150	0.0125
(8)	12		3A	0.0000	5.6250	5.6136	...	5.5709	5.5658	0.0051	5.5348	5.5117	5.5228	...	0.0120	0.0090	5.5288	5.5187	0.0150	0.0125
(8)	$5\frac{5}{8}$ – 16 or 5.6250 – 16	UN	2A	0.0018	5.6232	5.6138	...	5.5826	5.5764	0.006155	5.5555	5.5358	5.5465	...	0.0090	0.0068	5.5510	5.5410	0.0113	0.0094
(8)	16		3A	0.0000	5.6250	5.6156	...	5.5844	5.5798	0.0046	5.5573	5.5392	5.5483	...	0.0090	0.0068	5.5528	5.5444	0.0113	0.0094
	$5\frac{3}{4}$ – 4 or 5.7500 – 4	UNC	2A	0.0037	5.7463	5.7225	...	5.5839	5.5717	0.012237	5.4757	5.4093	5.4396	...	0.0361	0.0271	5.4576	5.4303	0.0451	0.0375
	4		3A	0.0000	5.7500	5.7262	...	5.5876	5.5784	0.0092	5.4794	5.4160	5.4433	...	0.0361	0.0271	5.4613	5.4370	0.0451	0.0375
	$5\frac{3}{4}$ – 6 or 5.7500 – 6	UN	2A	0.0032	5.7468	5.7286	...	5.6385	5.6277	0.010827	5.5664	5.5194	5.5423	...	0.0241	0.0180	5.5543	5.5334	0.0301	0.0250
	6		3A	0.0000	5.7500	5.7318	...	5.6417	5.6336	0.0081	5.5696	5.5253	5.5455	...	0.0241	0.0180	5.5575	5.5393	0.0301	0.0250

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Allowance, *es*	Major Diameter, *d*			Pitch Diameter, d_2, and Functional Diameter [Note (4)]			Minor Diameter, d_1/Root Radius									
											UN		UNR				UNJ			
											Reference Diameter [Notes (6), (7)]		Reference Diameter [Note (6)]		Radius		Diameter		Radius	
					Max. [Note (2)]	Min.	Min. [Note (3)]	Max. [Note (2)]	Min.	Tolerance, Td_2 [Note (5)]	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(8)	$5\frac{3}{4}$ – 8 or 5.7500 – 8	UN	2A	0.0030	5.7470	5.7320	...	5.6658	5.6558	0.010034	5.6117	5.5746	5.5936	...	0.0180	0.0135	5.6027	5.5851	0.0226	0.0188
	8		3A	0.0000	5.7500	5.7350	...	5.6688	5.6613	0.0075	5.6147	5.5801	5.5966	...	0.0180	0.0135	5.6057	5.5906	0.0226	0.0188
(8)	$5\frac{3}{4}$ – 12 or 5.7500 – 12	UN	2A	0.0021	5.7479	5.7365	...	5.6938	5.6870	0.006848	5.6577	5.6329	5.6457	...	0.0120	0.0090	5.6517	5.6399	0.0150	0.0125
(8)	12		3A	0.0000	5.7500	5.7386	...	5.6959	5.6908	0.0051	5.6598	5.6367	5.6478	...	0.0120	0.0090	5.6538	5.6437	0.0150	0.0125
(8)	$5\frac{3}{4}$– 16 or 5.7500 – 16	UN	2A	0.0019	5.7481	5.7387	...	5.7075	5.7013	0.006174	5.6804	5.6607	5.6714	...	0.0090	0.0068	5.6759	5.6659	0.0113	0.0094
(8)	16		3A	0.0000	5.7500	5.7406	...	5.7094	5.7048	0.0046	5.6823	5.6642	5.6733	...	0.0090	0.0068	5.6778	5.6694	0.0113	0.0094
	$5\frac{7}{8}$ – 4 or 5.8750 – 4	UN	2A	0.0037	5.8713	5.8475	...	5.7089	5.6966	0.012296	5.6007	5.5342	5.5646	...	0.0361	0.0271	5.5826	5.5552	0.0451	0.0375
	4		3A	0.0000	5.8750	5.8512	...	5.7126	5.7034	0.0092	5.6044	5.5410	5.5683	...	0.0361	0.0271	5.5863	5.5620	0.0451	0.0375
	$5\frac{7}{8}$ – 6 or 5.8750 – 6	UN	2A	0.0033	5.8717	5.8535	...	5.7634	5.7525	0.010886	5.6913	5.6442	5.6672	...	0.0241	0.0180	5.6792	5.6582	0.0301	0.0250
	6		3A	0.0000	5.8750	5.8568	...	5.7667	5.7585	0.0082	5.6946	5.6502	5.6705	...	0.0241	0.0180	5.6825	5.6642	0.0301	0.0250
(8)	$5\frac{7}{8}$ – 8 or 5.8750 – 8	UN	2A	0.0030	5.8720	5.8570	...	5.7908	5.7807	0.010093	5.7367	5.6995	5.7186	...	0.0180	0.0135	5.7277	5.7100	0.0226	0.0188
	8		3A	0.0000	5.8750	5.8600	...	5.7938	5.7862	0.0076	5.7397	5.7050	5.7216	...	0.0180	0.0135	5.7307	5.7155	0.0226	0.0188
(8)	$5\frac{7}{8}$ – 12 or 5.8750 – 12	UN	2A	0.0021	5.8729	5.8615	...	5.8188	5.8119	0.006868	5.7827	5.7578	5.7707	...	0.0120	0.0090	5.7767	5.7648	0.0150	0.0125
	12		3A	0.0000	5.8750	5.8636	...	5.8209	5.8157	0.0052	5.7848	5.7616	5.7728	...	0.0120	0.0090	5.7788	5.7686	0.0150	0.0125
	$5\frac{7}{8}$ – 16 or 5.8750 – 16	UN	2A	0.0019	5.8731	5.8637	...	5.8325	5.8263	0.006194	5.8054	5.7857	5.7964	...	0.0090	0.0068	5.8009	5.7909	0.0113	0.0094
(8)	16		3A	0.0000	5.8750	5.8656	...	5.8344	5.8298	0.0046	5.8073	5.7892	5.7893	...	0.0090	0.0068	5.8028	5.7944	0.0113	0.0094
	6 – 4 or 6.0000 – 4	UN	2A	0.0037	5.9963	5.9725	...	5.8339	5.8215	0.012353	5.7257	5.6591	5.6896	...	0.0361	0.0271	5.7076	5.6801	0.0451	0.0375
	4		3A	0.0000	6.0000	5.9762	...	5.8376	5.8283	0.0093	5.7294	5.6659	5.6933	...	0.0361	0.0271	5.7113	5.6869	0.0451	0.0375
	6 – 6 or 6.0000 – 6	UN	2A	0.0033	5.9967	5.9785	...	5.8884	5.8775	0.010943	5.8163	5.7692	5.7922	...	0.0241	0.0180	5.8042	5.7832	0.0301	0.0250
	6		3A	0.0000	6.0000	5.9818	...	5.8917	5.8835	0.0082	5.8196	5.7752	5.7955	...	0.0241	0.0180	5.8075	5.7892	0.0301	0.0250
(8)	6 – 8 or 6.0000 – 8	UN	2A	0.0030	5.9970	5.9820	...	5.9158	5.9056	0.010150	5.8617	5.8245	5.8436	...	0.0180	0.0135	5.8527	5.8350	0.0226	0.0188
(8)	8		3A	0.0000	6.0000	5.9850	...	5.9188	5.9112	0.007600	5.8647	5.8300	5.8466	...	0.0180	0.0135	5.8557	5.8405	0.0226	0.0188
	6 – 12 or 6.0000 – 12	UN	2A	0.0021	5.9979	5.9865	...	5.9438	5.9369	0.006887	5.9077	5.8828	5.8957	...	0.0120	0.0090	5.9017	5.8898	0.0150	0.0125
	12		3A	0.0000	6.0000	5.9886	...	5.9459	5.9407	0.0052	5.9098	5.8866	5.8978	...	0.0120	0.0090	5.9038	5.8936	0.0150	0.0125
	6 – 16 or 6.0000 – 16	UN	2A	0.0019	5.9981	5.9887	...	5.9575	5.9513	0.006213	5.9304	5.9107	5.9214	...	0.0090	0.0068	5.9259	5.9159	0.0113	0.0094
(8)	16		3A	0.0000	6.0000	5.9906	...	5.9594	5.9547	0.0047	5.9323	5.9141	5.9233	...	0.0090	0.0068	5.9278	5.9193	0.0113	0.0094

Table 2A
Limits of Size for Standard Series External Threads (UN, UNR, and UNJ) (Cont'd)

GENERAL NOTES:

(a) Series designation shown in column 2 indicates the UN thread form; however, the UNR or UNJ thread form may be specified by substituting UNR or UNJ in place of UN in all designations.

(b) Thread classes may be combined. See para. 4.1.

NOTES:

(1) There is no Class 1A for the UNJ thread series.

(2) For Class 2A threads having an additive finish, the maximum major, d max., and pitch, d_2 max., diameters after coating may equal the basic sizes whose values are the same as maximum values shown for Class 3A in these columns. See para. 4.1.2.

(3) The minimum shown is for unfinished hot material, not including standard fasteners with rolled threads.

(4) See para. 5.2.1 for functional diameter.

(5) The 2A pitch diameter tolerance, Td_2, is used as a six-place decimal to calculate the Class 1A/1B, 2B, and 3A/3B tolerances; Class 1A/2A allowances; and all other dimensional limits that depend on them. The tolerance is rounded to four places when used for calculating the 2A minimum pitch diameter.

(6) These values are for reference only. The minimum minor diameter, d_1 min., is not normally specified. See paras. 5.4, 8.3.1(e), and 8.3.1(f).

(7) UN threads are allowed to have a rounded root contour but there is no root radius required. See para 2.3.1.

(8) One or more of the numbers listed in this row have been changed to correct for calculation and rounding errors. The original numbers from past issues of this Standard are listed in Nonmandatory Appendix E and are for reference only.

(9) Formerly NF; tolerances and allowances are based on 1 diameter length of engagement.

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	0 – 80 or 0.0600 – 80	UNF	2B	0.0600	...	0.0519	0.0542	0.0023	0.0465	0.0514	...	...	0.0478	0.0510
	80		3B	0.0600	...	0.0519	0.0536	0.0017	0.0465	0.0514	...	...	0.0478	0.0510
(6)	1 – 64 or 0.0730 – 64	UNC	2B	0.0730	...	0.0629	0.0655	0.0026	0.0561	0.0623	...	...	0.0578	0.0619
(6)	64		3B	0.0730	...	0.0629	0.0648	0.0019	0.0561	0.0623	...	...	0.0578	0.0619
(6)	1 – 72 or 0.0730 – 72	UNF	2B	0.0730	...	0.0640	0.0665	0.0025	0.0580	0.0635	...	...	0.0595	0.0631
(6)	72		3B	0.0730	...	0.0640	0.0659	0.0019	0.0580	0.0635	...	...	0.0595	0.0631
	2 – 56 or 0.0860 – 56	UNC	2B	0.0860	...	0.0744	0.0772	0.0028	0.0667	0.0737	...	...	0.0686	0.0732
	56		3B	0.0860	...	0.0744	0.0765	0.0021	0.0667	0.0737	...	...	0.0686	0.0732
(6)	2 – 64 or 0.0860 – 64	UNF	2B	0.0860	...	0.0759	0.0786	0.0027	0.0691	0.0753	...	...	0.0708	0.0749
(6)	64		3B	0.0860	...	0.0759	0.0779	0.0020	0.0691	0.0753	...	...	0.0708	0.0749
	3 – 48 or 0.0990 – 48	UNC	2B	0.0990	...	0.0855	0.0885	0.0030	0.0764	0.0845	...	...	0.0787	0.0841
	48		3B	0.0990	...	0.0855	0.0877	0.0022	0.0764	0.0845	...	...	0.0787	0.0841
	3 – 56 or 0.0990 – 56	UNF	2B	0.0990	...	0.0874	0.0902	0.0028	0.0797	0.0865	...	...	0.0816	0.0862
	56		3B	0.0990	...	0.0874	0.0895	0.0021	0.0797	0.0865	...	...	0.0816	0.0862
	4 – 40 or 0.1120 – 40	UNC	2B	0.1120	...	0.0958	0.0991	0.0033	0.0849	0.0939	...	...	0.0876	0.0941
	40		3B	0.1120	...	0.0958	0.0982	0.0024	0.0849	0.0939	...	...	0.0876	0.0941
	4 – 48 or 0.1120 – 48	UNF	2B	0.1120	...	0.0985	0.1016	0.0031	0.0894	0.0968	...	...	0.0917	0.0971
	48		3B	0.1120	...	0.0985	0.1008	0.0023	0.0894	0.0968	...	...	0.0917	0.0971
	5 – 40 or 0.1250 – 40	UNC	2B	0.1250	...	0.1088	0.1121	0.0033	0.0979	0.1062	...	...	0.1006	0.1071
	40		3B	0.1250	...	0.1088	0.1113	0.0025	0.0979	0.1062	...	...	0.1006	0.1071
	5 – 44 or 0.1250 – 44	UNF	2B	0.1250	...	0.1102	0.1134	0.0032	0.1004	0.1079	...	...	0.1029	0.1088
	44		3B	0.1250	...	0.1102	0.1126	0.0024	0.1004	0.1079	...	...	0.1029	0.1088
	6 – 32 or 0.1380 – 32	UNC	2B	0.1380	...	0.1177	0.1214	0.0037	0.104	0.114	...	...	0.108	0.116
(6)	32		3B	0.1380	...	0.1177	0.1204	0.0027	0.1040	0.1140	...	...	0.1076	0.1157

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	6 – 40 or 0.1380 – 40	UNF	2B	0.1380	...	0.1218	0.1252	0.0034	0.111	0.119	...	...	0.114	0.120
	40		3B	0.1380	...	0.1218	0.1243	0.0025	0.1110	0.1186	...	...	0.1136	0.1201
	8 – 32 or 0.1640 – 32	UNC	2B	0.1640	...	0.1437	0.1475	0.0038	0.130	0.139	...	...	0.134	0.142
(6)	32		3B	0.1640	...	0.1437	0.1465	0.0028	0.1300	0.1389	...	...	0.1336	0.1417
	8 – 36 or 0.1640 – 36	UNF	2B	0.1640	...	0.1460	0.1496	0.0036	0.134	0.142	...	...	0.137	0.144
	36		3B	0.1640	...	0.1460	0.1487	0.0027	0.1340	0.1416	...	...	0.1369	0.1441
(6)	10 – 24 or 0.1900 – 24	UNC	2B	0.1900	...	0.1629	0.1672	0.0043	0.145	0.155	...	...	0.149	0.160
	24		3B	0.1900	...	0.1629	0.1661	0.0032	0.1450	0.1555	...	...	0.1494	0.1600
	10 – 32 or 0.1900 – 32	UNF	2B	0.1900	...	0.1697	0.1736	0.0039	0.156	0.164	...	...	0.160	0.167
	32		3B	0.1900	...	0.1697	0.1726	0.0029	0.1560	0.1641	...	...	0.1596	0.1675
	12 – 24 or 0.2160 – 24	UNC	2B	0.2160	...	0.1889	0.1933	0.0044	0.171	0.181	...	...	0.175	0.185
	24		3B	0.2160	...	0.1889	0.1922	0.0033	0.1710	0.1807	...	...	0.1754	0.1852
	12 – 28 or 0.2160 – 28	UNF	2B	0.2160	...	0.1928	0.1970	0.0042	0.177	0.186	...	...	0.181	0.190
	28		3B	0.2160	...	0.1928	0.1959	0.0031	0.1770	0.1857	...	...	0.1812	0.1896
(6)	12 – 32 or 0.2160 – 32	UNEF	2B	0.2160	...	0.1957	0.1998	0.0041	0.182	0.190	...	...	0.186	0.193
	32		3B	0.2160	...	0.1957	0.1988	0.0031	0.1820	0.1895	...	...	0.1856	0.1929
	¼ – 20 or 0.2500 – 20	UNC	1B	0.2500	...	0.2175	0.2248	0.0073	0.196	0.207	...	...	...	...
	20		2B	0.2500	...	0.2175	0.2224	0.0049	0.196	0.207	...	...	0.201	0.212
	20		3B	0.2500	...	0.2175	0.2211	0.0036	0.1960	0.2067	...	...	0.2013	0.2121
	¼ – 28 or 0.2500 – 28	UNF	1B	0.2500	...	0.2268	0.2333	0.0065	0.211	0.220	...	...	...	...
	28		2B	0.2500	...	0.2268	0.2311	0.0043	0.211	0.220	...	...	0.215	0.223
	28		3B	0.2500	...	0.2268	0.2300	0.0032	0.2110	0.2190	...	...	0.2152	0.2229

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\frac{1}{4}$ – 32 or 0.2500 – 32	UNEF	2B	0.2500	...	0.2297	0.2339	0.0042	0.216	0.224	...	...	0.220	0.226
	32		3B	0.2500	...	0.2297	0.2328	0.0031	0.2160	0.2229	...	...	0.2196	0.2263
	$\frac{5}{16}$ – 18 or 0.3125 – 18	UNC	1B	0.3125	...	0.2764	0.2843	0.0079	0.252	0.265	...	...	...	...
	18		2B	0.3125	...	0.2764	0.2817	0.0053	0.252	0.265	...	...	0.258	0.269
	18		3B	0.3125	...	0.2764	0.2803	0.0039	0.2520	0.2630	...	...	0.2584	0.2690
(6)	$\frac{5}{16}$ – 20 or 0.3125 – 20	UN	2B	0.3125	...	0.2800	0.2853	0.0053	0.258	0.270	...	...	0.264	0.273
(6)	20		3B	0.3125	...	0.2800	0.2840	0.0040	0.2580	0.2680	...	...	0.2638	0.2734
	$\frac{5}{16}$ – 24 or 0.3125 – 24	UNF	1B	0.3125	...	0.2854	0.2925	0.0071	0.267	0.277	...	...	...	...
	24		2B	0.3125	...	0.2854	0.2902	0.0048	0.267	0.277	...	...	0.272	0.280
	24		3B	0.3125	...	0.2854	0.2890	0.0036	0.2670	0.2754	...	...	0.2719	0.2799
(6)	$\frac{5}{16}$ – 28 or 0.3125 – 28	UN	2B	0.3125	...	0.2893	0.2938	0.0045	0.274	0.282	...	...	0.278	0.285
(6)	28		3B	0.3125	...	0.2893	0.2927	0.0034	0.2740	0.2807	...	...	0.2777	0.2846
(6)	$\frac{5}{16}$ – 32 or 0.3125 – 32	UNEF	2B	0.3125	...	0.2922	0.2965	0.0043	0.279	0.286	...	...	0.282	0.288
(6)	32		3B	0.3125	...	0.2922	0.2954	0.0032	0.2790	0.2847	...	...	0.2821	0.2881
	$\frac{3}{8}$ – 16 or 0.3750 – 16	UNC	1B	0.3750	...	0.3344	0.3429	0.0085	0.307	0.321	...	...	...	...
	16		2B	0.3750	...	0.3344	0.3401	0.0057	0.307	0.321	...	...	0.314	0.325
	16		3B	0.3750	...	0.3344	0.3387	0.0043	0.3070	0.3182	...	...	0.3141	0.3250
	$\frac{3}{8}$ – 20 or 0.3750 – 20	UN	2B	0.3750	...	0.3425	0.3479	0.0054	0.321	0.332	...	...	0.326	0.335
	20		3B	0.3750	...	0.3425	0.3465	0.0040	0.3210	0.3297	...	...	0.3263	0.3351
	$\frac{3}{8}$ – 24 or 0.3750 – 24	UNF	1B	0.3750	...	0.3479	0.3553	0.0074	0.330	0.340	...	...	...	...
	24		2B	0.3750	...	0.3479	0.3528	0.0049	0.330	0.340	...	...	0.334	0.342
	24		3B	0.3750	...	0.3479	0.3516	0.0037	0.3300	0.3372	...	...	0.3344	0.3417
	$\frac{3}{8}$ – 28 or 0.3750 – 28	UN	2B	0.3750	...	0.3518	0.3564	0.0046	0.336	0.345	...	...	0.340	0.347
	28		3B	0.3750	...	0.3518	0.3553	0.0035	0.3360	0.3426	...	...	0.3402	0.3465

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$^{3}/_{8}$ – 32 or 0.3750 – 32	UNEF	2B	0.3750	...	0.3547	0.3591	0.0044	0.341	0.349	...	...	0.345	0.350
	32		3B	0.3750	...	0.3547	0.3580	0.0033	0.3410	0.3469	...	...	0.3446	0.3501
	$^{7}/_{16}$ – 14 or 0.4375 – 14	UNC	1B	0.4375	...	0.3911	0.4003	0.0092	0.360	0.376	...	...	...	...
	14		2B	0.4375	...	0.3911	0.3972	0.0061	0.360	0.376	...	...	0.368	0.379
	14		3B	0.4375	...	0.3911	0.3957	0.0046	0.3600	0.3717	...	...	0.3679	0.3794
(6)	$^{7}/_{16}$ – 16 or 0.4375 – 16	UN	2B	0.4375	...	0.3969	0.4029	0.0060	0.370	0.384	...	...	0.377	0.387
(6)	16		3B	0.4375	...	0.3969	0.4014	0.0045	0.3700	0.3800	...	...	0.3766	0.3868
(6)	$^{7}/_{16}$ – 20 or 0.4375 – 20	UNF	1B	0.4375	...	0.4050	0.4131	0.0081	0.383	0.395	...	...	...	...
	20		2B	0.4375	...	0.4050	0.4104	0.0054	0.383	0.395	...	...	0.389	0.397
	20		3B	0.4375	...	0.4050	0.4091	0.0041	0.3830	0.3916	...	...	0.3888	0.3970
(6)	$^{7}/_{16}$ – 28 or 0.4375 – 28	UNEF	2B	0.4375	...	0.4143	0.4190	0.0047	0.399	0.407	...	...	0.403	0.409
	28		3B	0.4375	...	0.4143	0.4178	0.0035	0.3990	0.4051	...	...	0.4027	0.4086
(6)	$^{7}/_{16}$ – 32 or 0.4375 – 32	UN	2B	0.4375	...	0.4172	0.4216	0.0044	0.404	0.411	...	...	0.407	0.412
	32		3B	0.4375	...	0.4172	0.4205	0.0033	0.4040	0.4094	...	...	0.4071	0.4122
	$^{1}/_{2}$ – 13 or 0.5000 – 13	UNC	1B	0.5000	...	0.4500	0.4597	0.0097	0.417	0.434	...	...	...	...
	13		2B	0.5000	...	0.4500	0.4565	0.0065	0.417	0.434	...	...	0.425	0.437
	13		3B	0.5000	...	0.4500	0.4548	0.0048	0.4170	0.4284	...	...	0.4251	0.4368
	$^{1}/_{2}$ – 16 or 0.5000 – 16	UN	2B	0.5000	...	0.4594	0.4655	0.0061	0.432	0.446	...	...	0.439	0.449
(6)	16		3B	0.5000	...	0.4594	0.4640	0.0046	0.4320	0.4419	...	...	0.4391	0.4487
	$^{1}/_{2}$ – 20 or 0.5000 – 20	UNF	1B	0.5000	...	0.4675	0.4759	0.0084	0.446	0.457	...	...	...	...
	20		2B	0.5000	...	0.4675	0.4731	0.0056	0.446	0.457	...	...	0.451	0.459
	20		3B	0.5000	...	0.4675	0.4717	0.0042	0.4460	0.4537	...	...	0.4513	0.4591
	$^{1}/_{2}$ – 28 or 0.5000 – 28	UNEF	2B	0.5000	...	0.4768	0.4816	0.0048	0.461	0.470	...	...	0.465	0.471
	28		3B	0.5000	...	0.4768	0.4804	0.0036	0.4610	0.4676	...	...	0.4652	0.4708

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\frac{1}{2}$ – 32 or 0.5000 – 32	UN	2B	0.5000	...	0.4797	0.4842	0.0045	0.466	0.474	...	...	0.470	0.474
	32		3B	0.5000	...	0.4797	0.4831	0.0034	0.4660	0.4719	...	...	0.4696	0.4744
	$\frac{9}{16}$ – 12 or 0.5625 – 12	UNC	1B	0.5625	...	0.5084	0.5186	0.0102	0.472	0.490	...	...	...	...
	12		2B	0.5625	...	0.5084	0.5152	0.0068	0.472	0.490	...	...	0.481	0.491
	12		3B	0.5625	...	0.5084	0.5135	0.0051	0.4720	0.4843	...	...	0.4813	0.4913
	$\frac{9}{16}$ – 16 or 0.5625 – 16	UN	2B	0.5625	...	0.5219	0.5280	0.0061	0.495	0.509	...	...	0.502	0.511
(6)	16		3B	0.5625	...	0.5219	0.5265	0.0046	0.4950	0.5040	...	...	0.5016	0.5108
	$\frac{9}{16}$ – 18 or 0.5625 – 18	UNF	1B	0.5625	...	0.5264	0.5353	0.0089	0.502	0.515	...	...	...	...
	18		2B	0.5625	...	0.5264	0.5323	0.0059	0.502	0.515	...	...	0.508	0.517
	18		3B	0.5625	...	0.5264	0.5308	0.0044	0.5020	0.5106	...	...	0.5084	0.5166
(6)	$\frac{9}{16}$ – 20 or 0.5625 – 20	UN	2B	0.5625	...	0.5300	0.5356	0.0056	0.508	0.520	...	...	0.514	0.521
(6)	20		3B	0.5625	...	0.5300	0.5342	0.0042	0.5080	0.5162	...	...	0.5138	0.5213
(6)	$\frac{9}{16}$ – 24 or 0.5625 – 24	UNEF	2B	0.5625	...	0.5354	0.5405	0.0051	0.517	0.527	...	...	0.522	0.528
(6)	24		3B	0.5625	...	0.5354	0.5393	0.0039	0.5170	0.5244	...	...	0.5219	0.5281
	$\frac{9}{16}$ – 28 or 0.5625 – 28	UN	2B	0.5625	...	0.5393	0.5441	0.0048	0.524	0.532	...	...	0.528	0.533
	28		3B	0.5625	...	0.5393	0.5429	0.0036	0.5240	0.5301	...	...	0.5277	0.5330
(6)	$\frac{9}{16}$ – 32 or 0.5625 – 32	UN	2B	0.5625	...	0.5422	0.5468	0.0046	0.529	0.536	...	...	0.532	0.537
	32		3B	0.5625	...	0.5422	0.5456	0.0034	0.5290	0.5344	...	...	0.5321	0.5367
(6)	$\frac{5}{8}$ – 11 or 0.6250 – 11	UNC	1B	0.6250	...	0.5660	0.5767	0.0107	0.527	0.546	...	...	...	...
(6)	11		2B	0.6250	...	0.5660	0.5732	0.0072	0.527	0.546	...	...	0.536	0.547
	11		3B	0.6250	...	0.5660	0.5714	0.0054	0.5270	0.5391	...	...	0.5364	0.5473
	$\frac{5}{8}$ – 12 or 0.6250 – 12	UN	2B	0.6250	...	0.5709	0.5780	0.0071	0.535	0.553	...	...	0.544	0.554
	12		3B	0.6250	...	0.5709	0.5762	0.0053	0.5350	0.5463	...	...	0.5438	0.5538

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$^{5}/_{8}$ – 16 or 0.6250 – 16	UN	2B	0.6250	...	0.5844	0.5906	0.0062	0.557	0.571	...	...	0.564	0.573
	16		3B	0.6250	...	0.5844	0.5890	0.0046	0.5570	0.5662	...	...	0.5641	0.5730
	$^{5}/_{8}$ – 18 or 0.6250 – 18	UNF	1B	0.6250	...	0.5889	0.5980	0.0091	0.565	0.578	...	...	...	...
	18		2B	0.6250	...	0.5889	0.5949	0.0060	0.565	0.578	...	...	0.571	0.579
	18		3B	0.6250	...	0.5889	0.5934	0.0045	0.5650	0.5730	...	...	0.5709	0.5788
	$^{5}/_{8}$ – 20 or 0.6250 – 20	UN	2B	0.6250	...	0.5925	0.5981	0.0056	0.571	0.582	...	...	0.576	0.583
	20		3B	0.6250	...	0.5925	0.5967	0.0042	0.5710	0.5787	...	...	0.5763	0.5835
	$^{5}/_{8}$ – 24 or 0.6250 – 24	UNEF	2B	0.6250	...	0.5979	0.6031	0.0052	0.580	0.590	...	...	0.584	0.590
	24		3B	0.6250	...	0.5979	0.6018	0.0039	0.5800	0.5869	...	...	0.5844	0.5904
	$^{5}/_{8}$ – 28 or 0.6250 – 28	UN	2B	0.6250	...	0.6018	0.6067	0.0049	0.586	0.595	...	...	0.590	0.595
	28		3B	0.6250	...	0.6018	0.6055	0.0037	0.5860	0.5926	...	...	0.5902	0.5953
	$^{5}/_{8}$ – 32 or 0.6250 – 32	UN	2B	0.6250	...	0.6047	0.6093	0.0046	0.591	0.599	...	...	0.595	0.599
	32		3B	0.6250	...	0.6047	0.6082	0.0035	0.5910	0.5969	...	...	0.5946	0.5991
(6)	$^{11}/_{16}$ – 12 or 0.6875 – 12	UN	2B	0.6875	...	0.6334	0.6405	0.0071	0.597	0.615	...	...	0.606	0.616
	12		3B	0.6875	...	0.6334	0.6387	0.0053	0.5970	0.6085	...	...	0.6063	0.6163
(6)	$^{11}/_{16}$ – 16 or 0.6875 – 16	UN	2B	0.6875	...	0.6469	0.6532	0.0063	0.620	0.634	...	...	0.627	0.635
	16		3B	0.6875	...	0.6469	0.6516	0.0047	0.6200	0.6284	...	...	0.6266	0.6352
(6)	$^{11}/_{16}$ – 20 or 0.6875 – 20	UN	2B	0.6875	...	0.6550	0.6607	0.0057	0.633	0.645	...	...	0.639	0.646
(6)	20		3B	0.6875	...	0.6550	0.6593	0.0043	0.6330	0.6412	...	...	0.6388	0.6458
(6)	$^{11}/_{16}$ – 24 or 0.6875 – 24	UNEF	2B	0.6875	...	0.6604	0.6657	0.0053	0.642	0.652	...	...	0.647	0.653
	24		3B	0.6875	...	0.6604	0.6643	0.0039	0.6420	0.6494	...	...	0.6469	0.6527

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$^{11}/_{16}$ – 28 or 0.6875 – 28	UN	2B	0.6875	...	0.6643	0.6692	0.0049	0.649	0.657	...	...	0.653	0.658
(6)	28		3B	0.6875	...	0.6643	0.6680	0.0037	0.6490	0.6551	...	...	0.6527	0.6577
(6)	$^{11}/_{16}$ – 32 or 0.6875 – 32	UN	2B	0.6875	...	0.6672	0.6719	0.0047	0.654	0.661	...	...	0.657	0.661
	32		3B	0.6875	...	0.6672	0.6707	0.0035	0.6540	0.6594	...	...	0.6571	0.6614
	$^{3}/_{4}$ – 10 or 0.7500 – 10	UNC	1B	0.7500	...	0.6850	0.6965	0.0115	0.642	0.663	...	...	...	...
	10		2B	0.7500	...	0.6850	0.6927	0.0077	0.642	0.663	...	...	0.653	0.665
	10		3B	0.7500	...	0.6850	0.6907	0.0057	0.6420	0.6545	...	...	0.6526	0.6646
	$^{3}/_{4}$ – 12 or 0.7500 – 12	UN	2B	0.7500	...	0.6959	0.7031	0.0072	0.660	0.678	...	...	0.669	0.679
	12		3B	0.7500	...	0.6959	0.7013	0.0054	0.6600	0.6707	...	...	0.6688	0.6788
	$^{3}/_{4}$ – 16 or 0.7500 – 16	UNF	1B	0.7500	...	0.7094	0.7192	0.0098	0.682	0.696	...	...	...	...
	16		2B	0.7500	...	0.7094	0.7159	0.0065	0.682	0.696	...	...	0.689	0.698
(6)	16		3B	0.7500	...	0.7094	0.7143	0.0049	0.6820	0.6908	...	...	0.6891	0.6976
	$^{3}/_{4}$ – 20 or 0.7500 – 20	UNEF	2B	0.7500	...	0.7175	0.7232	0.0057	0.696	0.707	...	...	0.701	0.708
	20		3B	0.7500	...	0.7175	0.7218	0.0043	0.6960	0.7037	...	...	0.7013	0.7081
	$^{3}/_{4}$ – 28 or 0.7500 – 28	UN	2B	0.7500	...	0.7268	0.7318	0.0050	0.711	0.720	...	...	0.715	0.720
(6)	28		3B	0.7500	...	0.7268	0.7305	0.0037	0.7110	0.7176	...	...	0.7152	0.7201
	$^{3}/_{4}$ – 32 or 0.7500 – 32	UN	2B	0.7500	...	0.7297	0.7344	0.0047	0.716	0.724	...	...	0.720	0.724
	32		3B	0.7500	...	0.7297	0.7333	0.0036	0.7160	0.7219	...	...	0.7196	0.7238
(6)	$^{13}/_{16}$ – 12 or 0.8125 – 12	UN	2B	0.8125	...	0.7584	0.7656	0.0072	0.722	0.740	...	...	0.731	0.741
(6)	12		3B	0.8125	...	0.7584	0.7638	0.0054	0.7220	0.7329	...	...	0.7313	0.7413
(6)	$^{13}/_{16}$ – 16 or 0.8125 – 16	UN	2B	0.8125	...	0.7719	0.7783	0.0064	0.745	0.759	...	...	0.752	0.760
(6)	16		3B	0.8125	...	0.7719	0.7767	0.0048	0.7450	0.7533	...	...	0.7516	0.7601
(6)	$^{13}/_{16}$ – 20 or 0.8125 – 20	UNEF	2B	0.8125	...	0.7800	0.7858	0.0058	0.758	0.770	...	...	0.764	0.771
(6)	20		3B	0.8125	...	0.7800	0.7843	0.0043	0.7580	0.7662	...	...	0.7638	0.7706

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(6)	$^{13}/_{16}$ – 28 or 0.8125 – 28	UN	2B	0.8125	...	0.7893	0.7943	0.0050	0.774	0.782	...	...	0.778	0.783
(6)	28		3B	0.8125	...	0.7893	0.7931	0.0038	0.7740	0.7801	...	...	0.7777	0.7825
(6)	$^{13}/_{16}$ – 32 or 0.8125 – 32	UN	2B	0.8125	...	0.7922	0.7970	0.0048	0.779	0.786	...	...	0.782	0.786
(6)	32		3B	0.8125	...	0.7922	0.7958	0.0036	0.7790	0.7844	...	...	0.7821	0.7863
	$^{7}/_{8}$ – 9 or 0.8750 – 9	UNC	1B	0.8750	...	0.8028	0.8151	0.0123	0.755	0.778	...	...	...	...
	9		2B	0.8750	...	0.8028	0.8110	0.0082	0.755	0.778	...	...	0.767	0.780
	9		3B	0.8750	...	0.8028	0.8089	0.0061	0.7550	0.7681	...	...	0.7667	0.7800
(6)	$^{7}/_{8}$ – 12 or 0.8750 – 12	UN	2B	0.8750	...	0.8209	0.8282	0.0073	0.785	0.803	...	...	0.794	0.804
(6)	12		3B	0.8750	...	0.8209	0.8264	0.0055	0.7850	0.7952	...	...	0.7938	0.8038
(6)	$^{7}/_{8}$ – 14 or 0.8750 – 14	UNF	1B	0.8750	...	0.8286	0.8392	0.0106	0.798	0.813	...	...	...	...
(6)	14		2B	0.8750	...	0.8286	0.8356	0.0070	0.798	0.813	...	...	0.805	0.815
(6)	14		3B	0.8750	...	0.8286	0.8339	0.0053	0.7980	0.8068	...	...	0.8054	0.8151
(6)	$^{7}/_{8}$ – 16 or 0.8750 – 16	UN	2B	0.8750	...	0.8344	0.8408	0.0064	0.807	0.821	...	...	0.814	0.823
(6)	16		3B	0.8750	...	0.8344	0.8392	0.0048	0.8070	0.8158	...	...	0.8141	0.8226
(6)	$^{7}/_{8}$ – 20 or 0.8750 – 20	UNEF	2B	0.8750	...	0.8425	0.8483	0.0058	0.821	0.832	...	...	0.826	0.833
(6)	20		3B	0.8750	...	0.8425	0.8469	0.0044	0.8210	0.8287	...	...	0.8263	0.8331
(6)	$^{7}/_{8}$ – 28 or 0.8750 – 28	UN	2B	0.8750	...	0.8518	0.8569	0.0051	0.836	0.845	...	...	0.840	0.845
(6)	28		3B	0.8750	...	0.8518	0.8556	0.0038	0.8360	0.8426	...	...	0.8402	0.8450
(6)	$^{7}/_{8}$ – 32 or 0.8750 – 32	UN	2B	0.8750	...	0.8547	0.8595	0.0048	0.841	0.849	...	...	0.845	0.849
(6)	32		3B	0.8750	...	0.8547	0.8583	0.0036	0.8410	0.8469	...	...	0.8446	0.8488
(6)	$^{15}/_{16}$ – 12 or 0.9375 – 12	UN	2B	0.9375	...	0.8834	0.8907	0.0073	0.847	0.865	...	...	0.856	0.866
(6)	12		3B	0.9375	...	0.8834	0.8889	0.0055	0.8470	0.8575	...	...	0.8563	0.8663
(6)	$^{15}/_{16}$ – 16 or 0.9375 – 16	UN	2B	0.9375	...	0.8969	0.9033	0.0064	0.870	0.884	...	...	0.877	0.885
(6)	16		3B	0.9375	...	0.8969	0.9017	0.0048	0.8700	0.8783	...	...	0.8766	0.8851

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$^{15}/_{16}$ – 20 or 0.9375 – 20	UNEF	2B	0.9375	...	0.9050	0.9109	0.0059	0.883	0.895	...	...	0.889	0.896
(6)	20		3B	0.9375	...	0.9050	0.9094	0.0044	0.8830	0.8912	...	...	0.8888	0.8956
(6)	$^{15}/_{16}$ – 28 or 0.9375 – 28	UN	2B	0.9375	...	0.9143	0.9194	0.0051	0.899	0.907	...	...	0.903	0.908
(6)	28		3B	0.9375	...	0.9143	0.9181	0.0038	0.8990	0.9051	...	...	0.9027	0.9075
	$^{15}/_{16}$ – 32 or 0.9375 – 32	UN	2B	0.9375	...	0.9172	0.9221	0.0049	0.904	0.911	...	...	0.907	0.911
	32		3B	0.9375	...	0.9172	0.9209	0.0037	0.9040	0.9094	...	...	0.9071	0.9113
	1 – 8 or 1.0000 – 8	UNC	1B	1.0000	...	0.9188	0.9320	0.0132	0.865	0.890	...	...	...	...
	8		2B	1.0000	...	0.9188	0.9276	0.0088	0.865	0.890	...	...	0.878	0.893
	8		3B	1.0000	...	0.9188	0.9254	0.0066	0.8650	0.8797	...	...	0.8782	0.8932
	1 – 12 or 1.0000 – 12	UNF	1B	1.0000	...	0.9459	0.9573	0.0114	0.910	0.928	...	...	...	...
	12		2B	1.0000	...	0.9459	0.9535	0.0076	0.910	0.928	...	...	0.919	0.929
	12		3B	1.0000	...	0.9459	0.9516	0.0057	0.9100	0.9198	...	...	0.9188	0.9288
(6), (7)	1 – 14 or 1.0000 – 14	UNS	2B	1.0000	...	0.9536	0.9605	0.0069	0.923	0.938	...	...	0.930	0.940
(6)	14		3B	1.0000	...	0.9536	0.9588	0.0052	0.9230	0.9315	...	...	0.9304	0.9401
	1 – 16 or 1.0000 – 16	UN	2B	1.0000	...	0.9594	0.9659	0.0065	0.932	0.946	...	...	0.939	0.948
	16		3B	1.0000	...	0.9594	0.9643	0.0049	0.9320	0.9408	...	...	0.9391	0.9476
	1 – 20 or 1.0000 – 20	UNEF	2B	1.0000	...	0.9675	0.9734	0.0059	0.946	0.957	...	...	0.951	0.958
	20		3B	1.0000	...	0.9675	0.9719	0.0044	0.9460	0.9537	...	...	0.9513	0.9581
	1 – 28 or 1.0000 – 28	UN	2B	1.0000	...	0.9768	0.9820	0.0052	0.961	0.970	...	...	0.965	0.970
	28		3B	1.0000	...	0.9768	0.9807	0.0039	0.9610	0.9676	...	...	0.9652	0.9700
	1 – 32 or 1.0000 – 32	UN	2B	1.0000	...	0.9797	0.9846	0.0049	0.966	0.974	...	...	0.970	0.974
	32		3B	1.0000	...	0.9797	0.9834	0.0037	0.9660	0.9719	...	...	0.9696	0.9738

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$1\frac{1}{16}$ – 8 or 1.0625 – 8	UN	2B	1.0625	...	0.9813	0.9902	0.0089	0.927	0.952	...	...	0.941	0.956
	8		3B	1.0625	...	0.9813	0.9880	0.0067	0.9270	0.9422	...	...	0.9407	0.9557
	$1\frac{1}{16}$ – 12 or 1.0625 – 12	UN	2B	1.0625	...	1.0084	1.0158	0.0074	0.972	0.990	...	...	0.981	0.991
(6)	12		3B	1.0625	...	1.0084	1.0139	0.0055	0.9720	0.9823	...	...	0.9813	0.9913
	$1\frac{1}{16}$ – 16 or 1.0625 – 16	UN	2B	1.0625	...	1.0219	1.0284	0.0065	0.995	1.009	...	...	1.002	1.010
(6)	16		3B	1.0625	...	1.0219	1.0268	0.0049	0.9950	1.0033	...	...	1.0016	1.0101
(6)	$1\frac{1}{16}$ – 18 or 1.0625 – 18	UNEF	2B	1.0625	...	1.0264	1.0326	0.0062	1.002	1.015	...	...	1.008	1.016
(6)	18		3B	1.0625	...	1.0264	1.0311	0.0047	1.0020	1.0105	...	...	1.0084	1.0159
(6)	$1\frac{1}{16}$ – 20 or 1.0625 – 20	UN	2B	1.0625	...	1.0300	1.0359	0.0059	1.008	1.020	...	...	1.014	1.021
(6)	20		3B	1.0625	...	1.0300	1.0345	0.0045	1.0080	1.0162	...	...	1.0138	1.0206
	$1\frac{1}{16}$ – 28 or 1.0625 – 28	UN	2B	1.0625	...	1.0393	1.0445	0.0052	1.024	1.032	...	...	1.028	1.033
	28		3B	1.0625	...	1.0393	1.0432	0.0039	1.0240	1.0301	...	...	1.0277	1.0325
	$1\frac{1}{8}$ – 7 or 1.1250 – 7	UNC	1B	1.1250	...	1.0322	1.0463	0.0141	0.970	0.998	...	...	...	...
(6)	7		2B	1.1250	...	1.0322	1.0416	0.0094	0.970	0.998	...	...	0.986	1.003
	7		3B	1.1250	...	1.0322	1.0393	0.0071	0.9700	0.9875	...	...	0.9858	1.0029
	$1\frac{1}{8}$ – 8 or 1.1250 – 8	UN	2B	1.1250	...	1.0438	1.0528	0.0090	0.990	1.015	...	...	1.003	1.018
	8		3B	1.1250	...	1.0438	1.0505	0.0067	0.9900	1.0047	...	...	1.0032	1.0182
	$1\frac{1}{8}$ – 12 or 1.1250 – 12	UNF	1B	1.1250	...	1.0709	1.0826	0.0117	1.035	1.053	...	...	...	...
	12		2B	1.1250	...	1.0709	1.0787	0.0078	1.035	1.053	...	...	1.044	1.054
	12		3B	1.1250	...	1.0709	1.0768	0.0059	1.0350	1.0448	...	...	1.0438	1.0538
(6)	$1\frac{1}{8}$ – 16 or 1.1250 – 16	UN	2B	1.1250	...	1.0844	1.0910	0.0066	1.057	1.071	...	...	1.064	1.073
(6)	16		3B	1.1250	...	1.0844	1.0893	0.0049	1.0570	1.0658	...	...	1.0641	1.0726
	$1\frac{1}{8}$ – 18 or 1.1250 – 18	UNEF	2B	1.1250	...	1.0889	1.0951	0.0062	1.065	1.078	...	...	1.071	1.078
(6)	18		3B	1.1250	...	1.0889	1.0936	0.0047	1.0650	1.0730	...	...	1.0709	1.0784

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(6)	$1\frac{1}{8}$ – 20 or 1.1250 – 20	UN	2B	1.1250	...	1.0925	1.0985	0.0060	1.071	1.082	...	...	1.076	1.083
(6)	20		3B	1.1250	...	1.0925	1.0970	0.0045	1.0710	1.0787	...	...	1.0763	1.0831
	$1\frac{1}{8}$ – 28 or 1.1250 – 28	UN	2B	1.1250	...	1.1018	1.1070	0.0052	1.086	1.095	...	...	1.090	1.095
	28		3B	1.1250	...	1.1018	1.1057	0.0039	1.0860	1.0926	...	...	1.0902	1.0950
	$1\frac{3}{16}$ – 8 or 1.1875 – 8	UN	2B	1.1875	...	1.1063	1.1154	0.0091	1.052	1.077	...	...	1.066	1.081
	8		3B	1.1875	...	1.1063	1.1131	0.0068	1.0520	1.0672	...	...	1.0657	1.0807
(6)	$1\frac{3}{16}$ – 12 or 1.1875 – 12	UN	2B	1.1875	...	1.1334	1.1409	0.0075	1.097	1.115	...	...	1.106	1.116
	12		3B	1.1875	...	1.1334	1.1390	0.0056	1.0970	1.1073	...	...	1.1063	1.1163
	$1\frac{3}{16}$ – 16 or 1.1875 – 16	UN	2B	1.1875	...	1.1469	1.1535	0.0066	1.120	1.134	...	...	1.127	1.135
(6)	16		3B	1.1875	...	1.1469	1.1518	0.0049	1.1200	1.1283	...	...	1.1266	1.1351
(6)	$1\frac{3}{16}$ – 18 or 1.1875 – 18	UNEF	2B	1.1875	...	1.1514	1.1577	0.0063	1.127	1.140	...	...	1.133	1.141
	18		3B	1.1875	...	1.1514	1.1561	0.0047	1.1270	1.1355	...	...	1.1334	1.1409
(6)	$1\frac{3}{16}$ – 20 or 1.1875 – 20	UN	2B	1.1875	...	1.1550	1.1610	0.0060	1.133	1.145	...	...	1.139	1.146
(6)	20		3B	1.1875	...	1.1550	1.1595	0.0045	1.1330	1.1412	...	...	1.1388	1.1456
	$1\frac{3}{16}$ – 28 or 1.1875 – 28	UN	2B	1.1875	...	1.1643	1.1696	0.0053	1.149	1.157	...	...	1.153	1.158
	28		3B	1.1875	...	1.1643	1.1683	0.0040	1.1490	1.1551	...	...	1.1527	1.1575
	$1\frac{1}{4}$ – 7 or 1.2500 – 7	UNC	1B	1.2500	...	1.1572	1.1716	0.0144	1.095	1.123	...	...	...	...
	7		2B	1.2500	...	1.1572	1.1668	0.0096	1.095	1.123	...	...	1.111	1.128
	7		3B	1.2500	...	1.1572	1.1644	0.0072	1.0950	1.1125	...	...	1.1108	1.1279
	$1\frac{1}{4}$ – 8 or 1.2500 – 8	UN	2B	1.2500	...	1.1688	1.1780	0.0092	1.115	1.140	...	...	1.128	1.143
	8		3B	1.2500	...	1.1688	1.1757	0.0069	1.1150	1.1297	...	...	1.1282	1.1432
	$1\frac{1}{4}$ – 12 or 1.2500 – 12	UNF	1B	1.2500	...	1.1959	1.2079	0.0120	1.160	1.178	...	...	...	...
	12		2B	1.2500	...	1.1959	1.2039	0.0080	1.160	1.178	...	...	1.169	1.179
	12		3B	1.2500	...	1.1959	1.2019	0.0060	1.1600	1.1698	...	...	1.1688	1.1788

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$1\frac{1}{4}$ – 16 or 1.2500 – 16	UN	2B	1.2500	...	1.2094	1.2160	0.0066	1.182	1.196	...	...	1.189	1.198
(6)	16		3B	1.2500	...	1.2094	1.2144	0.0050	1.1820	1.1908	...	...	1.1891	1.1976
	$1\frac{1}{4}$ – 18 or 1.2500 – 18	UNEF	2B	1.2500	...	1.2139	1.2202	0.0063	1.190	1.203	...	...	1.196	1.203
	18		3B	1.2500	...	1.2139	1.2186	0.0047	1.1900	1.1980	...	...	1.1959	1.2034
	$1\frac{1}{4}$ – 20 or 1.2500 – 20	UN	2B	1.2500	...	1.2175	1.2236	0.0061	1.196	1.207	...	...	1.201	1.208
(6)	20		3B	1.2500	...	1.2175	1.2220	0.0045	1.1960	1.2037	...	...	1.2013	1.2081
	$1\frac{1}{4}$ – 28 or 1.2500 – 28	UN	2B	1.2500	...	1.2268	1.2321	0.0053	1.211	1.220	...	...	1.215	1.220
	28		3B	1.2500	...	1.2268	1.2308	0.0040	1.2110	1.2176	...	...	1.2152	1.2200
	$1\frac{5}{16}$ – 8 or 1.3125 – 8	UN	2B	1.3125	...	1.2313	1.2405	0.0092	1.177	1.202	...	...	1.191	1.206
	8		3B	1.3125	...	1.2313	1.2382	0.0069	1.1770	1.1922	...	...	1.1907	1.2057
	$1\frac{5}{16}$ – 12 or 1.3125 – 12	UN	2B	1.3125	...	1.2584	1.2659	0.0075	1.222	1.240	...	...	1.231	1.241
(6)	12		3B	1.3125	...	1.2584	1.2641	0.0057	1.2220	1.2323	...	...	1.2313	1.2413
(6)	$1\frac{5}{16}$ – 16 or 1.3125 – 16	UN	2B	1.3125	...	1.2719	1.2786	0.0067	1.245	1.259	...	...	1.252	1.260
(6)	16		3B	1.3125	...	1.2719	1.2769	0.0050	1.2450	1.2533	...	...	1.2516	1.2601
(6)	$1\frac{5}{16}$ – 18 or 1.3125 – 18	UNEF	2B	1.3125	...	1.2764	1.2828	0.0064	1.252	1.265	...	...	1.258	1.266
(6)	18		3B	1.3125	...	1.2764	1.2812	0.0048	1.2520	1.2605	...	...	1.2584	1.2659
	$1\frac{5}{16}$ – 20 or 1.3125 – 20	UN	2B	1.3125	...	1.2800	1.2861	0.0061	1.258	1.270	...	...	1.264	1.271
(6)	20		3B	1.3125	...	1.2800	1.2846	0.0046	1.2580	1.2662	...	...	1.2638	1.2706
(6)	$1\frac{5}{16}$ – 28 or 1.3125 – 28	UN	2B	1.3125	...	1.2893	1.2947	0.0054	1.274	1.282	...	...	1.278	1.283
	28		3B	1.3125	...	1.2893	1.2933	0.0040	1.2740	1.2801	...	...	1.2777	1.2825
	$1\frac{3}{8}$ – 6 or 1.3750 – 6	UNC	1B	1.3750	...	1.2667	1.2822	0.0155	1.195	1.225	...	...	...	...
	6		2B	1.3750	...	1.2667	1.2771	0.0104	1.195	1.225	...	...	1.213	1.233
	6		3B	1.3750	...	1.2667	1.2745	0.0078	1.1950	1.2146	...	...	1.2126	1.2326

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$1\frac{3}{8}$ – 8 or 1.3750 – 8	UN	2B	1.3750	...	1.2938	1.3031	0.0093	1.240	1.265	...	...	1.253	1.268
	8		3B	1.3750	...	1.2938	1.3008	0.0070	1.2400	1.2547	...	...	1.2532	1.2682
	$1\frac{3}{8}$ – 12 or 1.3750 – 12	UNF	1B	1.3750	...	1.3209	1.3332	0.0123	1.285	1.303	...	...	...	...
	12		2B	1.3750	...	1.3209	1.3291	0.0082	1.285	1.303	...	...	1.294	1.304
	12		3B	1.3750	...	1.3209	1.3270	0.0061	1.2850	1.2948	...	...	1.2938	1.3038
(6)	$1\frac{3}{8}$ – 16 or 1.3750 – 16	UN	2B	1.3750	...	1.3344	1.3411	0.0067	1.307	1.321	...	...	1.314	1.323
(6)	16		3B	1.3750	...	1.3344	1.3394	0.0050	1.3070	1.3158	...	...	1.3141	1.3226
(6)	$1\frac{3}{8}$ – 18 or 1.3750 – 18	UNEF	2B	1.3750	...	1.3389	1.3453	0.0064	1.315	1.328	...	...	1.321	1.328
(6)	18		3B	1.3750	...	1.3389	1.3437	0.0048	1.3150	1.3230	...	...	1.3209	1.3284
	$1\frac{3}{8}$ – 20 or 1.3750 – 20	UN	2B	1.3750	...	1.3425	1.3486	0.0061	1.321	1.332	...	...	1.326	1.333
(6)	20		3B	1.3750	...	1.3425	1.3471	0.0046	1.3210	1.3287	...	...	1.3263	1.3331
(6)	$1\frac{3}{8}$ – 28 or 1.3750 – 28	UN	2B	1.3750	...	1.3518	1.3572	0.0054	1.336	1.345	...	...	1.340	1.345
	28		3B	1.3750	...	1.3518	1.3558	0.0040	1.3360	1.3426	...	...	1.3402	1.3450
	$1\frac{7}{16}$ – 6 or 1.4375 – 6	UN	2B	1.4375	...	1.3292	1.3396	0.0104	1.257	1.288	...	...	1.275	1.295
	6		3B	1.4375	...	1.3292	1.3370	0.0078	1.2570	1.2771	...	...	1.2751	1.2951
	$1\frac{7}{16}$ – 8 or 1.4375 – 8	UN	2B	1.4375	...	1.3563	1.3657	0.0094	1.302	1.327	...	...	1.316	1.331
	8		3B	1.4375	...	1.3563	1.3634	0.0071	1.3020	1.3172	...	...	1.3157	1.3307
	$1\frac{7}{16}$ – 12 or 1.4375 – 12	UN	2B	1.4375	...	1.3834	1.3910	0.0076	1.347	1.365	...	...	1.356	1.366
	12		3B	1.4375	...	1.3834	1.3891	0.0057	1.3470	1.3573	...	...	1.3563	1.3663
(6)	$1\frac{7}{16}$ – 16 or 1.4375 – 16	UN	2B	1.4375	...	1.3969	1.4036	0.0067	1.370	1.384	...	...	1.377	1.385
(6)	16		3B	1.4375	...	1.3969	1.4020	0.0051	1.3700	1.3783	...	...	1.3766	1.3851
(6)	$1\frac{7}{16}$ – 18 or 1.4375 – 18	UNEF	2B	1.4375	...	1.4014	1.4078	0.0064	1.377	1.390	...	...	1.383	1.391
	18		3B	1.4375	...	1.4014	1.4062	0.0048	1.3770	1.3855	...	...	1.3834	1.3909

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(6)	$1\frac{7}{16}$ – 20 or 1.4375 – 20	UN	2B	1.4375	...	1.4050	1.4112	0.0062	1.383	1.395	...	...	1.389	1.396
(6)	20		3B	1.4375	...	1.4050	1.4096	0.0046	1.3830	1.3912	...	...	1.3888	1.3956
(6)	$1\frac{7}{16}$ – 28 or 1.4375 – 28	UN	2B	1.4375	...	1.4143	1.4197	0.0054	1.399	1.407	...	...	1.403	1.408
	28		3B	1.4375	...	1.4143	1.4184	0.0041	1.3990	1.4051	...	...	1.4027	1.4075
	$1\frac{1}{2}$ – 6 or 1.5000 – 6	UNC	1B	1.5000	...	1.3917	1.4075	0.0158	1.320	1.350	...	...	...	...
	6		2B	1.5000	...	1.3917	1.4022	0.0105	1.320	1.350	...	...	1.338	1.358
	6		3B	1.5000	...	1.3917	1.3996	0.0079	1.3200	1.3396	...	...	1.3376	1.3576
	$1\frac{1}{2}$ – 8 or 1.5000 – 8	UN	2B	1.5000	...	1.4188	1.4283	0.0095	1.365	1.390	...	...	1.378	1.393
	8		3B	1.5000	...	1.4188	1.4259	0.0071	1.3650	1.3797	...	...	1.3782	1.3932
	$1\frac{1}{2}$ – 12 or 1.5000 – 12	UNF	1B	1.5000	...	1.4459	1.4584	0.0125	1.410	1.428	...	...	...	...
	12		2B	1.5000	...	1.4459	1.4542	0.0083	1.410	1.428	...	...	1.419	1.429
	12		3B	1.5000	...	1.4459	1.4522	0.0063	1.4100	1.4198	...	...	1.4188	1.4288
(6)	$1\frac{1}{2}$ – 16 or 1.5000 – 16	UN	2B	1.5000	...	1.4594	1.4662	0.0068	1.432	1.446	...	...	1.439	1.448
	16		3B	1.5000	...	1.4594	1.4645	0.0051	1.4320	1.4408	...	...	1.4391	1.4476
(6)	$1\frac{1}{2}$ – 18 or 1.5000 – 18	UNEF	2B	1.5000	...	1.4639	1.4704	0.0065	1.440	1.453	...	...	1.446	1.453
	18		3B	1.5000	...	1.4639	1.4687	0.0048	1.4400	1.4480	...	...	1.4459	1.4534
	$1\frac{1}{2}$ – 20 or 1.5000 – 20	UN	2B	1.5000	...	1.4675	1.4737	0.0062	1.446	1.457	...	...	1.451	1.458
(6)	20		3B	1.5000	...	1.4675	1.4721	0.0046	1.4460	1.4537	...	...	1.4513	1.4581
	$1\frac{1}{2}$ – 28 or 1.5000 – 28	UN	2B	1.5000	...	1.4768	1.4823	0.0055	1.461	1.470	...	...	1.465	1.470
	28		3B	1.5000	...	1.4768	1.4809	0.0041	1.4610	1.4676	...	...	1.4652	1.4700
	$1\frac{9}{16}$ – 6 or 1.5625 – 6	UN	2B	1.5625	...	1.4542	1.4648	0.0106	1.382	1.413	...	...	1.400	1.420
	6		3B	1.5625	...	1.4542	1.4622	0.0080	1.3820	1.4021	...	...	1.4001	1.4201
	$1\frac{9}{16}$ – 8 or 1.5625 – 8	UN	2B	1.5625	...	1.4813	1.4909	0.0096	1.427	1.452	...	...	1.441	1.456
	8		3B	1.5625	...	1.4813	1.4885	0.0072	1.4270	1.4422	...	...	1.4407	1.4557

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(6)	$1\frac{9}{16}$ – 12 or 1.5625 – 12	UN	2B	1.5625	...	1.5084	1.5161	0.0077	1.472	1.490	...	...	1.481	1.491
(6)	12		3B	1.5625	...	1.5084	1.5142	0.0058	1.4720	1.4823	...	...	1.4813	1.4913
	$1\frac{9}{16}$ – 16 or 1.5625 – 16	UN	2B	1.5625	...	1.5219	1.5287	0.0068	1.495	1.509	...	...	1.502	1.510
(6)	16		3B	1.5625	...	1.5219	1.5270	0.0051	1.4950	1.5033	...	...	1.5016	1.5101
	$1\frac{9}{16}$ – 18 or 1.5625 – 18	UNEF	2B	1.5625	...	1.5264	1.5329	0.0065	1.502	1.515	...	...	1.508	1.516
(6)	18		3B	1.5625	...	1.5264	1.5313	0.0049	1.5020	1.5105	...	...	1.5084	1.5159
	$1\frac{9}{16}$ – 20 or 1.5625 – 20	UN	2B	1.5625	...	1.5300	1.5362	0.0062	1.508	1.520	...	...	1.514	1.521
(6)	20		3B	1.5625	...	1.5300	1.5347	0.0047	1.5080	1.5162	...	...	1.5138	1.5206
	$1\frac{5}{8}$ – 6 or 1.6250 – 6	UN	2B	1.6250	...	1.5167	1.5274	0.0107	1.445	1.475	...	...	1.463	1.483
	6		3B	1.6250	...	1.5167	1.5247	0.0080	1.4450	1.4646	...	...	1.4626	1.4826
	$1\frac{5}{8}$ – 8 or 1.6250 – 8	UN	2B	1.6250	...	1.5438	1.5535	0.0097	1.490	1.515	...	...	1.503	1.518
	8		3B	1.6250	...	1.5438	1.5510	0.0072	1.4900	1.5047	...	...	1.5032	1.5182
(6)	$1\frac{5}{8}$ – 12 or 1.6250 – 12	UN	2B	1.6250	...	1.5709	1.5786	0.0077	1.535	1.553	...	...	1.544	1.554
(6)	12		3B	1.6250	...	1.5709	1.5767	0.0058	1.5350	1.5448	...	...	1.5438	1.5538
(6)	$1\frac{5}{8}$ – 16 or 1.6250 – 16	UN	2B	1.6250	...	1.5844	1.5912	0.0068	1.557	1.571	...	...	1.564	1.573
	16		3B	1.6250	...	1.5844	1.5895	0.0051	1.5570	1.5658	...	...	1.5641	1.5726
(6)	$1\frac{5}{8}$ – 18 or 1.6250 – 18	UNEF	2B	1.6250	...	1.5889	1.5954	0.0065	1.565	1.578	...	...	1.571	1.578
	18		3B	1.6250	...	1.5889	1.5938	0.0049	1.5650	1.5730	...	...	1.5709	1.5784
(6)	$1\frac{5}{8}$ – 20 or 1.6250 – 20	UN	2B	1.6250	...	1.5925	1.5987	0.0062	1.571	1.582	...	...	1.576	1.583
	20		3B	1.6250	...	1.5925	1.5972	0.0047	1.5710	1.5787	...	...	1.5763	1.5831
	$1\frac{11}{16}$ – 6 or 1.6875 – 6	UN	2B	1.6875	...	1.5792	1.5900	0.0108	1.507	1.538	...	...	1.525	1.545
	6		3B	1.6875	...	1.5792	1.5873	0.0081	1.5070	1.5271	...	...	1.5251	1.5451
	$1\frac{11}{16}$ – 8 or 1.6875 – 8	UN	2B	1.6875	...	1.6063	1.6160	0.0097	1.552	1.577	...	...	1.566	1.581
	8		3B	1.6875	...	1.6063	1.6136	0.0073	1.5520	1.5672	...	...	1.5657	1.5807

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(6)	$1\frac{11}{16}$ – 12 or 1.6875 – 12	UN	2B	1.6875	...	1.6334	1.6411	0.0077	1.597	1.615	...	...	1.606	1.616
	12		3B	1.6875	...	1.6334	1.6392	0.0058	1.5970	1.6073	...	...	1.6063	1.6163
	$1\frac{11}{16}$ – 16 or 1.6875 – 16	UN	2B	1.6875	...	1.6469	1.6538	0.0069	1.620	1.634	...	...	1.627	1.635
(6)	16		3B	1.6875	...	1.6469	1.6520	0.0051	1.6200	1.6283	...	...	1.6266	1.6351
(6)	$1\frac{11}{16}$ – 18 or 1.6875 – 18	UNEF	2B	1.6875	...	1.6514	1.6579	0.0065	1.627	1.640	...	...	1.633	1.641
	18		3B	1.6875	...	1.6514	1.6563	0.0049	1.6270	1.6355	...	...	1.6334	1.6409
(6)	$1\frac{11}{16}$ – 20 or 1.6875 – 20	UN	2B	1.6875	...	1.6550	1.6613	0.0063	1.633	1.645	...	...	1.639	1.646
(6)	20		3B	1.6875	...	1.6550	1.6597	0.0047	1.6330	1.6412	...	...	1.6388	1.6456
(6)	$1\frac{3}{4}$ – 5 or 1.7500 – 5	UNC	1B	1.7500	...	1.6201	1.6375	0.0174	1.533	1.567	...	...	...	...
(6)	5		2B	1.7500	...	1.6201	1.6317	0.0116	1.533	1.567	...	...	1.555	1.579
(6)	5		3B	1.7500	...	1.6201	1.6288	0.0087	1.5330	1.5575	...	...	1.5551	1.5791
	$1\frac{3}{4}$ – 6 or 1.7500 – 6	UN	2B	1.7500	...	1.6417	1.6525	0.0108	1.570	1.600	...	...	1.588	1.608
	6		3B	1.7500	...	1.6417	1.6498	0.0081	1.5700	1.5896	...	...	1.5876	1.6076
	$1\frac{3}{4}$ – 8 or 1.7500 – 8	UN	2B	1.7500	...	1.6688	1.6786	0.0098	1.615	1.640	...	...	1.628	1.643
(6)	8		3B	1.7500	...	1.6688	1.6762	0.0074	1.6150	1.6297	...	...	1.6282	1.6432
	$1\frac{3}{4}$ – 12 or 1.7500 – 12	UN	2B	1.7500	...	1.6959	1.7037	0.0078	1.660	1.678	...	...	1.669	1.679
	12		3B	1.7500	...	1.6959	1.7017	0.0058	1.6600	1.6698	...	...	1.6688	1.6788
	$1\frac{3}{4}$ – 16 or 1.7500 – 16	UN	2B	1.7500	...	1.7094	1.7163	0.0069	1.682	1.696	...	...	1.689	1.698
(6)	16		3B	1.7500	...	1.7094	1.7146	0.0052	1.6820	1.6908	...	...	1.6891	1.6976
	$1\frac{3}{4}$ – 20 or 1.7500 – 20	UN	2B	1.7500	...	1.7175	1.7238	0.0063	1.696	1.707	...	...	1.701	1.708
(6)	20		3B	1.7500	...	1.7175	1.7222	0.0047	1.6960	1.7037	...	...	1.7013	1.7081
	$1\frac{13}{16}$ – 6 or 1.8125 – 6	UN	2B	1.8125	...	1.7042	1.7151	0.0109	1.632	1.663	...	...	1.650	1.670
	6		3B	1.8125	...	1.7042	1.7124	0.0082	1.6320	1.6521	...	...	1.6501	1.6701

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$1\frac{13}{16}$ – 8 or 1.8125 – 8	UN	2B	1.8125	...	1.7313	1.7412	0.0099	1.677	1.702	...	...	1.691	1.706
	8		3B	1.8125	...	1.7313	1.7387	0.0074	1.6770	1.6922	...	...	1.6907	1.7057
	$1\frac{13}{16}$ – 12 or 1.8125 – 12	UN	2B	1.8125	...	1.7584	1.7662	0.0078	1.722	1.740	...	...	1.731	1.741
	12		3B	1.8125	...	1.7584	1.7642	0.0058	1.7220	1.7323	...	...	1.7313	1.7413
	$1\frac{13}{16}$ – 16 or 1.8125 – 16	UN	2B	1.8125	...	1.7719	1.7788	0.0069	1.745	1.759	...	...	1.752	1.760
(6)	16		3B	1.8125	...	1.7719	1.7771	0.0052	1.7450	1.7533	...	...	1.7516	1.7601
	$1\frac{13}{16}$ – 20 or 1.8125 – 20	UN	2B	1.8125	...	1.7800	1.7863	0.0063	1.758	1.770	...	...	1.764	1.771
(6)	20		3B	1.8125	...	1.7800	1.7847	0.0047	1.7580	1.7662	...	...	1.7638	1.7706
	$1\frac{7}{8}$ – 6 or 1.8750 – 6	UN	2B	1.8750	...	1.7667	1.7777	0.0110	1.695	1.725	...	...	1.713	1.733
	6		3B	1.8750	...	1.7667	1.7749	0.0082	1.6950	1.7146	...	...	1.7126	1.7326
	$1\frac{7}{8}$ – 8 or 1.8750 – 8	UN	2B	1.8750	...	1.7938	1.8038	0.0100	1.740	1.765	...	...	1.753	1.768
	8		3B	1.8750	...	1.7938	1.8013	0.0075	1.7400	1.7547	...	...	1.7532	1.7682
	$1\frac{7}{8}$ – 12 or 1.8750 – 12	UN	2B	1.8750	...	1.8209	1.8287	0.0078	1.785	1.803	...	...	1.794	1.804
(6)	12		3B	1.8750	...	1.8209	1.8268	0.0059	1.7850	1.7948	...	...	1.7938	1.8038
	$1\frac{7}{8}$ – 16 or 1.8750 – 16	UN	2B	1.8750	...	1.8344	1.8413	0.0069	1.807	1.821	...	...	1.814	1.823
(6)	16		3B	1.8750	...	1.8344	1.8396	0.0052	1.8070	1.8158	...	...	1.8141	1.8226
(6)	$1\frac{7}{8}$ – 20 or 1.8750 – 20	UN	2B	1.8750	...	1.8425	1.8489	0.0064	1.821	1.832	...	...	1.826	1.833
(6)	20		3B	1.8750	...	1.8425	1.8473	0.0048	1.8210	1.8287	...	...	1.8263	1.8331
	$1\frac{15}{16}$ – 6 or 1.9375 – 6	UN	2B	1.9375	...	1.8292	1.8403	0.0111	1.757	1.788	...	...	1.775	1.795
	6		3B	1.9375	...	1.8292	1.8375	0.0083	1.7570	1.7771	...	...	1.7751	1.7951
	$1\frac{15}{16}$ – 8 or 1.9375 – 8	UN	2B	1.9375	...	1.8563	1.8663	0.0100	1.802	1.827	...	...	1.816	1.831
	8		3B	1.9375	...	1.8563	1.8638	0.0075	1.8020	1.8172	...	...	1.8157	1.8307
(6)	$1\frac{15}{16}$ – 12 or 1.9375 – 12	UN	2B	1.9375	...	1.8834	1.8912	0.0078	1.847	1.865	...	...	1.856	1.866
	12		3B	1.9375	...	1.8834	1.8893	0.0059	1.8470	1.8573	...	...	1.8563	1.8663

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$1\frac{15}{16}$ – 16 or 1.9375 – 16	UN	2B	1.9375	...	1.8969	1.9039	0.0070	1.870	1.884	...	...	1.877	1.885
(6)	16		3B	1.9375	...	1.8969	1.9021	0.0052	1.8700	1.8783	...	...	1.8766	1.8851
	$1\frac{15}{16}$ – 20 or 1.9375 – 20	UN	2B	1.9375	...	1.9050	1.9114	0.0064	1.883	1.895	...	...	1.889	1.896
(6)	20		3B	1.9375	...	1.9050	1.9098	0.0048	1.8830	1.8912	...	...	1.8888	1.8956
	2 – 4.5 or 2.0000 – 4.5	UNC	1B	2.0000	...	1.8557	1.8743	0.0186	1.759	1.795	...	...	...	...
	4.5		2B	2.0000	...	1.8557	1.8681	0.0124	1.759	1.795	...	...	1.783	1.810
	4.5		3B	2.0000	...	1.8557	1.8650	0.0093	1.7590	1.7861	...	...	1.7835	1.8102
	2 – 6 or 2.0000 – 6	UN	2B	2.0000	...	1.8917	1.9028	0.0111	1.820	1.850	...	...	1.838	1.858
	6		3B	2.0000	...	1.8917	1.9000	0.0083	1.8200	1.8396	...	...	1.8376	1.8576
	2 – 8 or 2.0000 – 8	UN	2B	2.0000	...	1.9188	1.9289	0.0101	1.865	1.890	...	...	1.878	1.893
	8		3B	2.0000	...	1.9188	1.9264	0.0076	1.8650	1.8797	...	...	1.8782	1.8932
	2 – 12 or 2.0000 – 12	UN	2B	2.0000	...	1.9459	1.9538	0.0079	1.910	1.928	...	...	1.919	1.929
	12		3B	2.0000	...	1.9459	1.9518	0.0059	1.9100	1.9198	...	...	1.9188	1.9288
	2 – 16 or 2.0000 – 16	UN	2B	2.0000	...	1.9594	1.9664	0.0070	1.932	1.946	...	...	1.939	1.948
(6)	16		3B	2.0000	...	1.9594	1.9646	0.0052	1.9320	1.9408	...	...	1.9391	1.9476
	2 – 20 or 2.0000 – 20	UN	2B	2.0000	...	1.9675	1.9739	0.0064	1.946	1.957	...	...	1.951	1.958
(6)	20		3B	2.0000	...	1.9675	1.9723	0.0048	1.9460	1.9537	...	...	1.9513	1.9581
	$2\frac{1}{8}$ – 6 or 2.1250 – 6	UN	2B	2.1250	...	2.0167	2.0280	0.0113	1.945	1.975	...	...	1.963	1.983
	6		3B	2.1250	...	2.0167	2.0251	0.0084	1.9450	1.9646	...	...	1.9626	1.9826
	$2\frac{1}{8}$ – 8 or 2.1250 – 8	UN	2B	2.1250	...	2.0438	2.0540	0.0102	1.990	2.015	...	...	2.003	2.018
	8		3B	2.1250	...	2.0438	2.0515	0.0077	1.9900	2.0047	...	...	2.0032	2.0182
	$2\frac{1}{8}$ – 12 or 2.1250 – 12	UN	2B	2.1250	...	2.0709	2.0788	0.0079	2.035	2.053	...	...	2.044	2.054
(6)	12		3B	2.1250	...	2.0709	2.0768	0.0059	2.0350	2.0448	...	...	2.0438	2.0538

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$2\frac{1}{8}$ – 16 or 2.1250 – 16	UN	2B	2.1250	...	2.0844	2.0914	0.0070	2.057	2.071	...	...	2.064	2.073
(6)	16		3B	2.1250	...	2.0844	2.0897	0.0053	2.0570	2.0658	...	...	2.0641	2.0726
(6)	$2\frac{1}{8}$ – 20 or 2.1250 – 20	UN	2B	2.1250	...	2.0925	2.0990	0.0065	2.071	2.082	...	...	2.076	2.083
(6)	20		3B	2.1250	...	2.0925	2.0973	0.0048	2.0710	2.0787	...	...	2.0763	2.0831
	$2\frac{1}{4}$ – 4.5 or 2.2500 – 4.5	UNC	1B	2.2500	...	2.1057	2.1247	0.0190	2.009	2.045	...	...	...	...
	4.5		2B	2.2500	...	2.1057	2.1183	0.0126	2.009	2.045	...	...	2.033	2.060
	4.5		3B	2.2500	...	2.1057	2.1152	0.0095	2.0090	2.0361	...	...	2.0335	2.0602
	$2\frac{1}{4}$ – 6 or 2.2500 – 6	UN	2B	2.2500	...	2.1417	2.1531	0.0114	2.070	2.100	...	...	2.088	2.108
	6		3B	2.2500	...	2.1417	2.1502	0.0085	2.0700	2.0896	...	...	2.0876	2.1076
	$2\frac{1}{4}$ – 8 or 2.2500 – 8	UN	2B	2.2500	...	2.1688	2.1792	0.0104	2.115	2.140	...	...	2.128	2.143
	8		3B	2.2500	...	2.1688	2.1766	0.0078	2.1150	2.1297	...	...	2.1282	2.1432
(6)	$2\frac{1}{4}$ – 12 or 2.2500 – 12	UN	2B	2.2500	...	2.1959	2.2039	0.0080	2.160	2.178	...	...	2.169	2.179
(6)	12		3B	2.2500	...	2.1959	2.2019	0.0060	2.1600	2.1698	...	...	2.1688	2.1788
(6)	$2\frac{1}{4}$ – 16 or 2.2500 – 16	UN	2B	2.2500	...	2.2094	2.2165	0.0071	2.182	2.196	...	...	2.189	2.198
(6)	16		3B	2.2500	...	2.2094	2.2147	0.0053	2.1820	2.1908	...	...	2.1891	2.1976
(6)	$2\frac{1}{4}$ – 20 or 2.2500 – 20	UN	2B	2.2500	...	2.2175	2.2240	0.0065	2.196	2.207	...	...	2.201	2.208
(6)	20		3B	2.2500	...	2.2175	2.2224	0.0049	2.1960	2.2037	...	...	2.2013	2.2081
(6)	$2\frac{3}{8}$ – 6 or 2.3750 – 6	UN	2B	2.3750	...	2.2667	2.2782	0.0115	2.195	2.225	...	...	2.213	2.233
	6		3B	2.3750	...	2.2667	2.2753	0.0086	2.1950	2.2146	...	...	2.2126	2.2326
	$2\frac{3}{8}$ – 8 or 2.3750 – 8	UN	2B	2.3750	...	2.2938	2.3043	0.0105	2.240	2.265	...	...	2.253	2.268
	8		3B	2.3750	...	2.2938	2.3017	0.0079	2.2400	2.2547	...	...	2.2532	2.2682
(6)	$2\frac{3}{8}$ – 12 or 2.3750 – 12	UN	2B	2.3750	...	2.3209	2.3289	0.0080	2.285	2.303	...	...	2.294	2.304
	12		3B	2.3750	...	2.3209	2.3269	0.0060	2.2850	2.2948	...	...	2.2938	2.3038

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(6)	$2\frac{3}{8}$ – 16 or 2.3750 – 16	UN	2B	2.3750	...	2.3344	2.3415	0.0071	2.307	2.321	...	...	2.314	2.323
(6)	16		3B	2.3750	...	2.3344	2.3398	0.0054	2.3070	2.3158	...	...	2.3141	2.3226
(6)	$2\frac{3}{8}$ – 20 or 2.3750 – 20	UN	2B	2.3750	...	2.3425	2.3491	0.0066	2.321	2.332	...	...	2.326	2.333
(6)	20		3B	2.3750	...	2.3425	2.3474	0.0049	2.3210	2.3287	...	...	2.3263	2.3331
	$2\frac{1}{2}$ – 4 or 2.5000 – 4	UNC	1B	2.5000	...	2.3376	2.3578	0.0202	2.229	2.267	...	...	...	...
	4		2B	2.5000	...	2.3376	2.3511	0.0135	2.229	2.267	...	...	2.256	2.286
	4		3B	2.5000	...	2.3376	2.3477	0.0101	2.2290	2.2594	...	...	2.2564	2.2864
	$2\frac{1}{2}$ – 6 or 2.5000 – 6	UN	2B	2.5000	...	2.3917	2.4033	0.0116	2.320	2.350	...	...	2.338	2.358
	6		3B	2.5000	...	2.3917	2.4004	0.0087	2.3200	2.3396	...	...	2.3376	2.3576
	$2\frac{1}{2}$ – 8 or 2.5000 – 8	UN	2B	2.5000	...	2.4188	2.4294	0.0106	2.365	2.390	...	...	2.378	2.393
	8		3B	2.5000	...	2.4188	2.4268	0.0080	2.3650	2.3797	...	...	2.3782	2.3932
	$2\frac{1}{2}$ – 12 or 2.5000 – 12	UN	2B	2.5000	...	2.4459	2.4540	0.0081	2.410	2.428	...	...	2.419	2.429
	12		3B	2.5000	...	2.4459	2.4519	0.0060	2.4100	2.4198	...	...	2.4188	2.4288
	$2\frac{1}{2}$ – 16 or 2.5000 – 16	UN	2B	2.5000	...	2.4594	2.4666	0.0072	2.432	2.446	...	...	2.439	2.448
(6)	16		3B	2.5000	...	2.4594	2.4648	0.0054	2.4320	2.4408	...	...	2.4391	2.4476
	$2\frac{1}{2}$ – 20 or 2.5000 – 20	UN	2B	2.5000	...	2.4675	2.4741	0.0066	2.446	2.457	...	...	2.451	2.458
(6)	20		3B	2.5000	...	2.4675	2.4725	0.0050	2.4460	2.4537	...	...	2.4513	2.4581
	$2\frac{5}{8}$ – 4 or 2.6250 – 4	UN	2B	2.6250	...	2.4626	2.4762	0.0136	2.354	2.392	...	...	2.381	2.411
	4		3B	2.6250	...	2.4626	2.4727	0.0101	2.3540	2.3844	...	...	2.3814	2.4114
	$2\frac{5}{8}$ – 6 or 2.6250 – 6	UN	2B	2.6250	...	2.5167	2.5285	0.0118	2.445	2.475	...	...	2.463	2.483
	6		3B	2.6250	...	2.5167	2.5255	0.0088	2.4450	2.4646	...	...	2.4626	2.4826
	$2\frac{5}{8}$ – 8 or 2.6250 – 8	UN	2B	2.6250	...	2.5438	2.5545	0.0107	2.490	2.515	...	...	2.503	2.518
	8		3B	2.6250	...	2.5438	2.5518	0.0080	2.4900	2.5047	...	...	2.5032	2.5182

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(6)	$2\frac{5}{8}$ – 12 or 2.6250 – 12	UN	2B	2.6250	...	2.5709	2.5790	0.0081	2.535	2.553	...	...	2.544	2.554
	12		3B	2.6250	...	2.5709	2.5770	0.0061	2.5350	2.5448	...	...	2.5438	2.5538
(6)	$2\frac{5}{8}$ – 16 or 2.6250 – 16	UN	2B	2.6250	...	2.5844	2.5916	0.0072	2.557	2.571	...	...	2.564	2.573
(6)	16		3B	2.6250	...	2.5844	2.5898	0.0054	2.5570	2.5658	...	...	2.5641	2.5726
	$2\frac{5}{8}$ – 20 or 2.6250 – 20	UN	2B	2.6250	...	2.5925	2.5991	0.0066	2.571	2.582	...	...	2.576	2.583
(6)	20		3B	2.6250	...	2.5925	2.5975	0.0050	2.5710	2.5787	...	...	2.5763	2.5831
	$2\frac{3}{4}$ – 4 or 2.7500 – 4	UNC	1B	2.7500	...	2.5876	2.6082	0.0206	2.479	2.517	...	...	...	...
	4		2B	2.7500	...	2.5876	2.6013	0.0137	2.479	2.517	...	...	2.506	2.536
	4		3B	2.7500	...	2.5876	2.5979	0.0103	2.4790	2.5094	...	...	2.5064	2.5364
	$2\frac{3}{4}$ – 6 or 2.7500 – 6	UN	2B	2.7500	...	2.6417	2.6536	0.0119	2.570	2.600	...	...	2.588	2.608
	6		3B	2.7500	...	2.6417	2.6506	0.0089	2.5700	2.5896	...	...	2.5876	2.6076
	$2\frac{3}{4}$ – 8 or 2.7500 – 8	UN	2B	2.7500	...	2.6688	2.6796	0.0108	2.615	2.640	...	...	2.628	2.643
	8		3B	2.7500	...	2.6688	2.6769	0.0081	2.6150	2.6297	...	...	2.6282	2.6432
(6)	$2\frac{3}{4}$ – 12 or 2.7500 – 12	UN	2B	2.7500	...	2.6959	2.7040	0.0081	2.660	2.678	...	...	2.669	2.679
(6)	12		3B	2.7500	...	2.6959	2.7020	0.0061	2.6600	2.6698	...	...	2.6688	2.6788
(6)	$2\frac{3}{4}$ – 16 or 2.7500 – 16	UN	2B	2.7500	...	2.7094	2.7167	0.0073	2.682	2.696	...	...	2.689	2.698
(6)	16		3B	2.7500	...	2.7094	2.7148	0.0054	2.6820	2.6908	...	...	2.6891	2.6976
(6)	$2\frac{3}{4}$ – 20 or 2.7500 – 20	UN	2B	2.7500	...	2.7175	2.7242	0.0067	2.696	2.707	...	...	2.701	2.708
(6)	20		3B	2.7500	...	2.7175	2.7225	0.0050	2.6960	2.7037	...	...	2.7013	2.7081
	$2\frac{7}{8}$ – 4 or 2.8750 – 4	UN	2B	2.8750	...	2.7126	2.7264	0.0138	2.604	2.642	...	...	2.631	2.661
	4		3B	2.8750	...	2.7126	2.7230	0.0104	2.6040	2.6344	...	...	2.6314	2.6614
	$2\frac{7}{8}$ – 6 or 2.8750 – 6	UN	2B	2.8750	...	2.7667	2.7787	0.0120	2.695	2.725	...	...	2.713	2.733
	6		3B	2.8750	...	2.7667	2.7757	0.0090	2.6950	2.7146	...	...	2.7126	2.7326

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$2\frac{7}{8}$ – 8 or 2.8750 – 8	UN	2B	2.8750	...	2.7938	2.8048	0.0110	2.740	2.765	...	...	2.753	2.768
	8		3B	2.8750	...	2.7938	2.8020	0.0082	2.7400	2.7547	...	...	2.7532	2.7682
	$2\frac{7}{8}$ – 12 or 2.8750 – 12	UN	2B	2.8750	...	2.8209	2.8291	0.0082	2.785	2.803	...	...	2.794	2.804
	12		3B	2.8750	...	2.8209	2.8270	0.0061	2.7850	2.7948	...	...	2.7938	2.8038
	$2\frac{7}{8}$ – 16 or 2.8750 – 16	UN	2B	2.8750	...	2.8344	2.8417	0.0073	2.807	2.821	...	...	2.814	2.823
(6)	16		3B	2.8750	...	2.8344	2.8399	0.0055	2.8070	2.8158	...	...	2.8141	2.8226
(6)	$2\frac{7}{8}$ – 20 or 2.8750 – 20	UN	2B	2.8750	...	2.8425	2.8492	0.0067	2.821	2.832	...	...	2.826	2.833
(6)	20		3B	2.8750	...	2.8425	2.8475	0.0050	2.8210	2.8287	...	...	2.8263	2.8331
	3 – 4 or 3.0000 – 4	UNC	1B	3.0000	...	2.8376	2.8585	0.0209	2.729	2.767	...	...	...	...
	4		2B	3.0000	...	2.8376	2.8515	0.0139	2.729	2.767	...	...	2.756	2.786
	4		3B	3.0000	...	2.8376	2.8480	0.0104	2.7290	2.7594	...	...	2.7564	2.7864
	3 – 6 or 3.0000 – 6	UN	2B	3.0000	...	2.8917	2.9038	0.0121	2.820	2.850	...	...	2.838	2.858
	6		3B	3.0000	...	2.8917	2.9008	0.0091	2.8200	2.8396	...	...	2.8376	2.8576
	3 – 8 or 3.0000– 8	UN	2B	3.0000	...	2.9188	2.9299	0.0111	2.865	2.890	...	...	2.878	2.893
	8		3B	3.0000	...	2.9188	2.9271	0.0083	2.8650	2.8797	...	...	2.8782	2.8932
	3 – 12 or 3.0000– 12	UN	2B	3.0000	...	2.9459	2.9541	0.0082	2.910	2.928	...	...	2.919	2.929
	12		3B	3.0000	...	2.9459	2.9521	0.0062	2.9100	2.9198	...	...	2.9188	2.9880
(6)	3 – 16 or 3.0000– 16	UN	2B	3.0000	...	2.9594	2.9667	0.0073	2.932	2.946	...	...	2.939	2.948
(6)	16		3B	3.0000	...	2.9594	2.9649	0.0055	2.9320	2.9408	...	...	2.9391	2.9476
	3 – 20 or 3.0000– 20	UN	2B	3.0000	...	2.9675	2.9743	0.0068	2.946	2.957	...	...	2.951	2.958
(6)	20		3B	3.0000	...	2.9675	2.9726	0.0051	2.9460	2.9537	...	...	2.9513	2.9581
	$3\frac{1}{8}$ – 4 or 3.1250 – 4	UN	2B	3.1250	...	2.9626	2.9766	0.0140	2.854	2.892	...	...	2.881	2.911
	4		3B	3.1250	...	2.9626	2.9731	0.0105	2.8540	2.8844	...	...	2.8814	2.9114

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$3\frac{1}{8}$ – 6 or 3.1250 – 6	UN	2B	3.1250	...	3.0167	3.0289	0.0122	2.945	2.975	...	...	2.963	2.983
	6		3B	3.1250	...	3.0167	3.0259	0.0092	2.9450	2.9646	...	...	2.9626	2.9826
	$3\frac{1}{8}$ – 8 or 3.1250 – 8	UN	2B	3.1250	...	3.0438	3.0550	0.0112	2.990	3.015	...	...	3.003	3.018
	8		3B	3.1250	...	3.0438	3.0522	0.0084	2.9900	3.0047	...	...	3.0032	3.0182
(6)	$3\frac{1}{8}$ – 12 or 3.1250 – 12	UN	2B	3.1250	...	3.0709	3.0792	0.0083	3.035	3.053	...	...	3.044	3.054
(6)	12		3B	3.1250	...	3.0709	3.0771	0.0062	3.0350	3.0448	...	...	3.0438	3.0538
(6)	$3\frac{1}{8}$ – 16 or 3.1250 – 16	UN	2B	3.1250	...	3.0844	3.0918	0.0074	3.057	3.071	...	...	3.064	3.073
(6)	16		3B	3.1250	...	3.0844	3.0899	0.0055	3.0570	3.0658	...	...	3.0641	3.0726
	$3\frac{1}{4}$ – 4 or 3.2500 – 4	UNC	1B	3.2500	...	3.0876	3.1088	0.0212	2.979	3.017	...	...	...	...
	4		2B	3.2500	...	3.0876	3.1017	0.0141	2.979	3.017	...	...	3.006	3.036
	4		3B	3.2500	...	3.0876	3.0982	0.0106	2.9790	3.0094	...	...	3.0064	3.0364
	$3\frac{1}{4}$ – 6 or 3.2500 – 6	UN	2B	3.2500	...	3.1417	3.1540	0.0123	3.070	3.100	...	...	3.088	3.108
	6		3B	3.2500	...	3.1417	3.1509	0.0092	3.0700	3.0896	...	...	3.0876	3.1076
	$3\frac{1}{4}$ – 8 or 3.2500 – 8	UN	2B	3.2500	...	3.1688	3.1801	0.0113	3.115	3.140	...	...	3.128	3.143
	8		3B	3.2500	...	3.1688	3.1773	0.0085	3.1150	3.1297	...	...	3.1282	3.1432
(6)	$3\frac{1}{4}$ – 12 or 3.2500 – 12	UN	2B	3.2500	...	3.1959	3.2042	0.0083	3.160	3.178	...	...	3.169	3.179
(6)	12		3B	3.2500	...	3.1959	3.2021	0.0062	3.1600	3.1698	...	...	3.1688	3.1788
(6)	$3\frac{1}{4}$ – 16 or 3.2500 – 16	UN	2B	3.2500	...	3.2094	3.2168	0.0074	3.182	3.196	...	...	3.189	3.198
(6)	16		3B	3.2500	...	3.2094	3.2150	0.0056	3.1820	3.1908	...	...	3.1891	3.1976
	$3\frac{3}{8}$ – 4 or 3.3750 – 4	UN	2B	3.3750	...	3.2126	3.2268	0.0142	3.104	3.142	...	...	3.131	3.161
	4		3B	3.3750	...	3.2126	3.2233	0.0107	3.1040	3.1344	...	...	3.1314	3.1614
	$3\frac{3}{8}$ – 6 or 3.3750 – 6	UN	2B	3.3750	...	3.2667	3.2791	0.0124	3.195	3.225	...	...	3.213	3.233
	6		3B	3.3750	...	3.2667	3.2760	0.0093	3.1950	3.2146	...	...	3.2126	3.2326

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$3\frac{3}{8}$ – 8 or 3.3750 – 8	UN	2B	3.3750	...	3.2938	3.3052	0.0114	3.240	3.265	...	...	3.253	3.268
	8		3B	3.3750	...	3.2938	3.3023	0.0085	3.2400	3.2547	...	...	3.2532	3.2682
(6)	$3\frac{3}{8}$ – 12 or 3.3750 – 12	UN	2B	3.3750	...	3.3209	3.3292	0.0083	3.285	3.303	...	...	3.294	3.304
	12		3B	3.3750	...	3.3209	3.3272	0.0063	3.2850	3.2948	...	...	3.2938	3.3038
(6)	$3\frac{3}{8}$ – 16 or 3.3750 – 16	UN	2B	3.3750	...	3.3344	3.3419	0.0075	3.307	3.321	...	...	3.314	3.323
(6)	16		3B	3.3750	...	3.3344	3.3400	0.0056	3.3070	3.3158	...	...	3.3141	3.3226
	$3\frac{1}{2}$ – 4 or 3.5000 – 4	UNC	1B	3.5000	...	3.3376	3.3591	0.0215	3.229	3.267	...	...	...	...
	4		2B	3.5000	...	3.3376	3.3519	0.0143	3.229	3.267	...	...	3.256	3.286
	4		3B	3.5000	...	3.3376	3.3484	0.0108	3.2290	3.2594	...	...	3.2564	3.2864
	$3\frac{1}{2}$ – 6 or 3.5000 – 6	UN	2B	3.5000	...	3.3917	3.4042	0.0125	3.320	3.350	...	...	3.338	3.358
	6		3B	3.5000	...	3.3917	3.4011	0.0094	3.3200	3.3396	...	...	3.3376	3.3576
	$3\frac{1}{2}$ – 8 or 3.5000 – 8	UN	2B	3.5000	...	3.4188	3.4303	0.0115	3.365	3.390	...	...	3.378	3.393
	8		3B	3.5000	...	3.4188	3.4274	0.0086	3.3650	3.3797	...	...	3.3782	3.3932
	$3\frac{1}{2}$ – 12 or 3.5000 – 12	UN	2B	3.5000	...	3.4459	3.4543	0.0084	3.410	3.428	...	...	3.419	3.429
	12		3B	3.5000	...	3.4459	3.4522	0.0063	3.4100	3.4198	...	...	3.4188	3.4288
	$3\frac{1}{2}$ – 16 or 3.5000 – 16	UN	2B	3.5000	...	3.4594	3.4669	0.0075	3.432	3.446	...	...	3.439	3.448
(6)	16		3B	3.5000	...	3.4594	3.4650	0.0056	3.4320	3.4408	...	...	3.4391	3.4476
	$3\frac{5}{8}$ – 4 or 3.6250 – 4	UN	2B	3.6250	...	3.4626	3.4770	0.0144	3.354	3.392	...	...	3.381	3.411
	4		3B	3.6250	...	3.4626	3.4734	0.0108	3.3540	3.3844	...	...	3.3814	3.4114
	$3\frac{5}{8}$ – 6 or 3.6250 – 6	UN	2B	3.6250	...	3.5167	3.5293	0.0126	3.445	3.475	...	...	3.463	3.483
	6		3B	3.6250	...	3.5167	3.5262	0.0095	3.4450	3.4646	...	...	3.4626	3.4826
	$3\frac{5}{8}$ – 8 or 3.6250 – 8	UN	2B	3.6250	...	3.5438	3.5554	0.0116	3.490	3.515	...	...	3.503	3.518
	8		3B	3.6250	...	3.5438	3.5525	0.0087	3.4900	3.5047	...	...	3.5032	3.5182

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(6)	$3\frac{5}{8}$ – 12 or 3.6250 – 12	UN	2B	3.6250	...	3.5709	3.5793	0.0084	3.535	3.553	...	...	3.544	3.554
	12		3B	3.6250	...	3.5709	3.5772	0.0063	3.5350	3.5448	...	...	3.5438	3.5538
	$3\frac{5}{8}$ – 16 or 3.6250 – 16	UN	2B	3.6250	...	3.5844	3.5919	0.0075	3.557	3.571	...	...	3.564	3.573
(6)	16		3B	3.6250	...	3.5844	3.5900	0.0056	3.5570	3.5658	...	...	3.5641	3.5726
	$3\frac{3}{4}$ – 4 or 3.7500 – 4	UNC	1B	3.7500	...	3.5876	3.6094	0.0218	3.479	3.517	...	...	...	...
	4		2B	3.7500	...	3.5876	3.6021	0.0145	3.479	3.517	...	...	3.506	3.536
	4		3B	3.7500	...	3.5876	3.5985	0.0109	3.4790	3.5094	...	...	3.5064	3.5364
	$3\frac{3}{4}$ – 6 or 3.7500 – 6	UN	2B	3.7500	...	3.6417	3.6544	0.0127	3.570	3.600	...	...	3.588	3.608
	6		3B	3.7500	...	3.6417	3.6512	0.0095	3.5700	3.5896	...	...	3.5876	3.6076
	$3\frac{3}{4}$ – 8 or 3.7500 – 8	UN	2B	3.7500	...	3.6688	3.6805	0.0117	3.615	3.640	...	...	3.628	3.643
	8		3B	3.7500	...	3.6688	3.6776	0.0088	3.6150	3.6297	...	...	3.6282	3.6432
(6)	$3\frac{3}{4}$ – 12 or 3.7500 – 12	UN	2B	3.7500	...	3.6959	3.7043	0.0084	3.660	3.678	...	...	3.669	3.679
(6)	12		3B	3.7500	...	3.6959	3.7022	0.0063	3.6600	3.6698	...	...	3.6688	3.6788
(6)	$3\frac{3}{4}$ – 16 or 3.7500 – 16	UN	2B	3.7500	...	3.7094	3.7170	0.0076	3.682	3.696	...	...	3.689	3.698
(6)	16		3B	3.7500	...	3.7094	3.7151	0.0057	3.6820	3.6908	...	...	3.6891	3.6976
	$3\frac{7}{8}$ – 4 or 3.8750 – 4	UN	2B	3.8750	...	3.7126	3.7272	0.0146	3.604	3.642	...	...	3.631	3.661
	4		3B	3.8750	...	3.7126	3.7235	0.0109	3.6040	3.6344	...	...	3.6314	3.6614
	$3\frac{7}{8}$ – 6 or 3.8750 – 6	UN	2B	3.8750	...	3.7667	3.7795	0.0128	3.695	3.725	...	...	3.713	3.733
	6		3B	3.8750	...	3.7667	3.7763	0.0096	3.6950	3.7146	...	...	3.7126	3.7326
	$3\frac{7}{8}$ – 8 or 3.8750 – 8	UN	2B	3.8750	...	3.7938	3.8056	0.0118	3.740	3.765	...	...	3.753	3.768
	8		3B	3.8750	...	3.7938	3.8026	0.0088	3.7400	3.7547	...	...	3.7532	3.7682
	$3\frac{7}{8}$ – 12 or 3.8750 – 12	UN	2B	3.8750	...	3.8209	3.8294	0.0085	3.785	3.803	...	...	3.794	3.804
	12		3B	3.8750	...	3.8209	3.8273	0.0064	3.7850	3.7948	...	...	3.7938	3.8038

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(6)	$3\frac{7}{8}$ – 16 or 3.8750 – 16	UN	2B	3.8750	...	3.8344	3.8420	0.0076	3.807	3.821	...	...	3.814	3.823
(6)	16		3B	3.8750	...	3.8344	3.8401	0.0057	3.8070	3.8158	...	...	3.8141	3.8226
	4 – 4 or 4.0000 – 4	UNC	1B	4.0000	...	3.8376	3.8597	0.0221	3.729	3.767	...	...	...	...
	4		2B	4.0000	...	3.8376	3.8523	0.0147	3.729	3.767	...	...	3.7560	3.7860
	4		3B	4.0000	...	3.8376	3.8487	0.0111	3.7290	3.7594	...	...	3.7564	3.7864
	4 – 6 or 4.0000 – 6	UN	2B	4.0000	...	3.8917	3.9046	0.0129	3.820	3.850	...	...	3.838	3.858
	6		3B	4.0000	...	3.8917	3.9014	0.0097	3.8200	3.8396	...	...	3.8376	3.8576
	4 – 8 or 4.0000 – 8	UN	2B	4.0000	...	3.9188	3.9307	0.0119	3.865	3.890	...	...	3.878	3.893
	8		3B	4.0000	...	3.9188	3.9277	0.0089	3.8650	3.8797	...	...	3.8782	3.8932
	4 – 12 or 4.0000 – 12	UN	2B	4.0000	...	3.9459	3.9544	0.0085	3.910	3.928	...	...	3.919	3.929
	12		3B	4.0000	...	3.9459	3.9523	0.0064	3.9100	3.9198	...	...	3.9188	3.9288
	4 – 16 or 4.0000 – 16	UN	2B	4.0000	...	3.9594	3.9670	0.0076	3.932	3.946	...	...	3.939	3.948
(6)	16		3B	4.0000	...	3.9594	3.9651	0.0057	3.9320	3.9408	...	...	3.9391	3.9476
	$4\frac{1}{8}$ – 4 or 4.1250 – 4	UN	2B	4.1250	...	3.9626	3.9774	0.0148	3.854	3.892	...	...	3.881	3.911
	4		3B	4.1250	...	3.9626	3.9738	0.0112	3.8540	3.8844	...	...	3.8814	3.9114
	$4\frac{1}{8}$ – 6 or 4.1250 – 6	UN	2B	4.1250	...	4.0167	4.0297	0.0130	3.945	3.975	...	...	3.963	3.983
	6		3B	4.1250	...	4.0167	4.0264	0.0097	3.9450	3.9646	...	...	3.9626	3.9826
	$4\frac{1}{8}$ – 8 or 4.1250 – 8	UN	2B	4.1250	...	4.0438	4.0558	0.0120	3.990	4.015	...	...	4.003	4.018
	8		3B	4.1250	...	4.0438	4.0528	0.0090	3.9900	4.0047	...	...	4.0032	4.0182
(6)	$4\frac{1}{8}$ – 12 or 4.1250 – 12	UN	2B	4.1250	...	4.0709	4.0794	0.0085	4.035	4.053	...	...	4.044	4.054
	12		3B	4.1250	...	4.0709	4.0773	0.0064	4.0350	4.0448	...	...	4.0438	4.0538
(6)	$4\frac{1}{8}$ – 16 or 4.1250 – 16	UN	2B	4.1250	...	4.0844	4.0921	0.0077	4.057	4.071	...	...	4.064	4.073
(6)	16		3B	4.1250	...	4.0844	4.0901	0.0057	4.0570	4.0658	...	...	4.0641	4.0726

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$4\frac{1}{4}$ – 4 or 4.2500 – 4	UNC	2B	4.2500	...	4.0876	4.1025	0.0149	3.979	4.017	...	...	4.006	4.036
	4		3B	4.2500	...	4.0876	4.0988	0.0112	3.9790	4.0094	...	...	4.0064	4.0364
	$4\frac{1}{4}$ – 6 or 4.2500 – 6	UN	2B	4.2500	...	4.1417	4.1548	0.0131	4.070	4.100	...	...	4.088	4.108
	6		3B	4.2500	...	4.1417	4.1515	0.0098	4.0700	4.0896	...	...	4.0876	4.1076
(6)	$4\frac{1}{4}$ – 8 or 4.2500 – 8	UN	2B	4.2500	...	4.1688	4.1809	0.0121	4.115	4.140	...	...	4.128	4.143
(6)	8		3B	4.2500	...	4.1688	4.1778	0.0090	4.1150	4.1297	...	...	4.1282	4.1432
(6)	$4\frac{1}{4}$ – 12 or 4.2500 – 12	UN	2B	4.2500	...	4.1959	4.2045	0.0086	4.160	4.178	...	...	4.169	4.179
	12		3B	4.2500	...	4.1959	4.2023	0.0064	4.1600	4.1698	...	...	4.1688	4.1788
(6)	$4\frac{1}{4}$ – 16 or 4.2500 – 16	UN	2B	4.2500	...	4.2094	4.2171	0.0077	4.182	4.196	...	...	4.189	4.198
(6)	16		3B	4.2500	...	4.2094	4.2152	0.0058	4.1820	4.1908	...	...	4.1891	4.1976
	$4\frac{3}{8}$ – 4 or 4.3750 – 4	UN	2B	4.3750	...	4.2126	4.2276	0.0150	4.104	4.142	...	...	4.131	4.161
	4		3B	4.3750	...	4.2126	4.2239	0.0113	4.1040	4.1344	...	...	4.1314	4.1614
	$4\frac{3}{8}$ – 6 or 4.3750 – 6	UN	2B	4.3750	...	4.2667	4.2799	0.0132	4.195	4.225	...	...	4.213	4.233
	6		3B	4.3750	...	4.2667	4.2766	0.0099	4.1950	4.2146	...	...	4.2126	4.2326
(6)	$4\frac{3}{8}$ – 8 or 4.3750 – 8	UN	2B	4.3750	...	4.2938	4.3059	0.0121	4.240	4.265	...	...	4.253	4.268
	8		3B	4.3750	...	4.2938	4.3029	0.0091	4.2400	4.2547	...	...	4.2532	4.2682
(6)	$4\frac{3}{8}$ – 12 or 4.3750 – 12	UN	2B	4.3750	...	4.3209	4.3295	0.0086	4.285	4.303	...	...	4.294	4.304
(6)	12		3B	4.3750	...	4.3209	4.3273	0.0064	4.2850	4.2948	...	...	4.2938	4.3038
(6)	$4\frac{3}{8}$ – 16 or 4.3750 – 16	UN	2B	4.3750	...	4.3344	4.3421	0.0077	4.307	4.321	...	...	4.314	4.323
(6)	16		3B	4.3750	...	4.3344	4.3402	0.0058	4.3070	4.3158	...	...	4.3141	4.3226
	$4\frac{1}{2}$ – 4 or 4.5000 – 4	UNC	2B	4.5000	...	4.3376	4.3527	0.0151	4.229	4.267	...	...	4.256	4.286
	4		3B	4.5000	...	4.3376	4.3489	0.0113	4.2290	4.2594	...	...	4.2564	4.2864
	$4\frac{1}{2}$ – 6 or 4.5000 – 6	UN	2B	4.5000	...	4.3917	4.4050	0.0133	4.320	4.350	...	...	4.338	4.358
	6		3B	4.5000	...	4.3917	4.4016	0.0099	4.3200	4.3396	...	...	4.3376	4.3576

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$4\frac{1}{2}$ – 8 or 4.5000 – 8	UN	2B	4.5000	...	4.4188	4.4310	0.0122	4.365	4.390	...	...	4.378	4.393
	8		3B	4.5000	...	4.4188	4.4280	0.0092	4.3650	4.3797	...	...	4.3782	4.3932
(6)	$4\frac{1}{2}$ – 12 or 4.5000 – 12	UN	2B	4.5000	...	4.4459	4.4545	0.0086	4.410	4.428	...	...	4.419	4.429
(6)	12		3B	4.5000	...	4.4459	4.4524	0.0065	4.4100	4.4198	...	...	4.4188	4.4288
(6)	$4\frac{1}{2}$ – 16 or 4.5000 – 16	UN	2B	4.5000	...	4.4594	4.4672	0.0078	4.432	4.446	...	...	4.439	4.448
(6)	16		3B	4.5000	...	4.4594	4.4652	0.0058	4.4320	4.4408	...	...	4.4391	4.4476
	$4\frac{5}{8}$ – 4 or 4.6250 – 4	UN	2B	4.6250	...	4.4626	4.4778	0.0152	4.354	4.392	...	...	4.381	4.411
	4		3B	4.6250	...	4.4626	4.4740	0.0114	4.3540	4.3844	...	...	4.3814	4.4114
	$4\frac{5}{8}$ – 6 or 4.6250 – 6	UN	2B	4.6250	...	4.5167	4.5300	0.0133	4.445	4.475	...	...	4.463	4.483
	6		3B	4.6250	...	4.5167	4.5267	0.0100	4.4450	4.4646	...	...	4.4626	4.4826
(6)	$4\frac{5}{8}$ – 8 or 4.6250 – 8	UN	2B	4.6250	...	4.5438	4.5561	0.0123	4.490	4.515	...	...	4.503	4.518
(6)	8		3B	4.6250	...	4.5438	4.5530	0.0092	4.4900	4.5047	...	...	4.5032	4.5182
(6)	$4\frac{5}{8}$ – 12 or 4.6250 – 12	UN	2B	4.6250	...	4.5709	4.5796	0.0087	4.535	4.553	...	...	4.544	4.554
(6)	12		3B	4.6250	...	4.5709	4.5774	0.0065	4.5350	4.5448	...	...	4.5438	4.5538
(6)	$4\frac{5}{8}$ – 16 or 4.6250 – 16	UN	2B	4.6250	...	4.5844	4.5922	0.0078	4.557	4.571	...	...	4.564	4.573
(6)	16		3B	4.6250	...	4.5844	4.5902	0.0058	4.5570	4.5658	...	...	4.5641	4.5726
	$4\frac{3}{4}$ – 4 or 4.7500 – 4	UNC	2B	4.7500	...	4.5876	4.6029	0.0153	4.479	4.517	...	...	4.506	4.536
	4		3B	4.7500	...	4.5876	4.5990	0.0114	4.4790	4.5094	...	...	4.5064	4.5364
	$4\frac{3}{4}$ – 6 or 4.7500 – 6	UN	2B	4.7500	...	4.6417	4.6551	0.0134	4.570	4.600	...	...	4.588	4.608
	6		3B	4.7500	...	4.6417	4.6518	0.0101	4.5700	4.5896	...	...	4.5876	4.6076
	$4\frac{3}{4}$ – 8 or 4.7500 – 8	UN	2B	4.7500	...	4.6688	4.6812	0.0124	4.615	4.640	...	...	4.628	4.643
(6)	8		3B	4.7500	...	4.6688	4.6781	0.0093	4.6150	4.6297	...	...	4.6282	4.6432

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$4\frac{3}{4}$ – 12 or 4.7500 – 12	UN	2B	4.7500	...	4.6959	4.7046	0.0087	4.660	4.678	...	...	4.669	4.679
(6)	12		3B	4.7500	...	4.6959	4.7024	0.0065	4.6600	4.6698	...	...	4.6688	4.6788
(6)	$4\frac{3}{4}$ – 16 or 4.7500 – 16	UN	2B	4.7500	...	4.7094	4.7172	0.0078	4.682	4.696	...	...	4.689	4.698
(6)	16		3B	4.7500	...	4.7094	4.7153	0.0059	4.6820	4.6908	...	...	4.6891	4.6976
	$4\frac{3}{4}$ – 4 or 4.8750 – 4	UN	2B	4.8750	...	4.7126	4.7280	0.0154	4.604	4.642	...	...	4.631	4.661
	4		3B	4.8750	...	4.7126	4.7242	0.0116	4.6040	4.6344	...	...	4.6314	4.6614
	$4\frac{7}{8}$ – 6 or 4.8750 – 6	UN	2B	4.8750	...	4.7667	4.7802	0.0135	4.695	4.725	...	...	4.713	4.733
	6		3B	4.8750	...	4.7667	4.7768	0.0101	4.6950	4.7146	...	...	4.7126	4.7326
	$4\frac{7}{8}$ – 8 or 4.8750 – 8	UN	2B	4.8750	...	4.7938	4.8063	0.0125	4.740	4.765	...	...	4.753	4.768
	8		3B	4.8750	...	4.7938	4.8032	0.0094	4.7400	4.7547	...	...	4.7532	4.7682
	$4\frac{7}{8}$ – 12 or 4.8750 – 12	UN	2B	4.8750	...	4.8209	4.8296	0.0087	4.785	4.803	...	...	4.794	4.804
(6)	12		3B	4.8750	...	4.8209	4.8274	0.0065	4.7850	4.7948	...	...	4.7938	4.8038
(6)	$4\frac{7}{8}$ – 16 or 4.8750 – 16	UN	2B	4.8750	...	4.8344	4.8422	0.0078	4.807	4.821	...	...	4.814	4.823
(6)	16		3B	4.8750	...	4.8344	4.8403	0.0059	4.8070	4.8158	...	...	4.8141	4.8226
	5 – 4 or 5.0000 – 4	UNC	2B	5.0000	...	4.8376	4.8530	0.0154	4.729	4.767	...	...	4.756	4.786
	4		3B	5.0000	...	4.8376	4.8492	0.0116	4.7290	4.7594	...	...	4.7546	4.7864
	5 – 6 or 5.0000 – 6	UN	2B	5.0000	...	4.8917	4.9053	0.0136	4.820	4.850	...	...	4.838	4.858
	6		3B	5.0000	...	4.8917	4.9019	0.0102	4.8200	4.8396	...	...	4.8376	4.8576
	5 – 8 or 5.0000 – 8	UN	2B	5.0000	...	4.9188	4.9314	0.0126	4.865	4.890	...	...	4.878	4.893
(6)	8		3B	5.0000	...	4.9188	4.9282	0.0094	4.8650	4.8797	...	...	4.8782	4.8932
	5 – 12 or 5.0000 – 12	UN	2B	5.0000	...	4.9459	4.9546	0.0087	4.910	4.928	...	...	4.919	4.929
	12		3B	5.0000	...	4.9459	4.9525	0.0066	4.9100	4.9198	...	...	4.9188	4.9288
	5 – 16 or 5.0000 – 16	UN	2B	5.0000	...	4.9594	4.9673	0.0079	4.932	4.946	...	...	4.939	4.948
(6)	16		3B	5.0000	...	4.9594	4.9653	0.0059	4.9320	4.9408	...	...	4.9391	4.9476

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$5\frac{1}{8}$ – 4 or 5.1250 – 4	UN	2B	5.1250	...	4.9626	4.9781	0.0155	4.854	4.892	...	...	4.881	4.911
	4		3B	5.1250	...	4.9626	4.9743	0.0117	4.8540	4.8844	...	...	4.8814	4.9114
	$5\frac{1}{8}$ – 6 or 5.1250 – 6	UN	2B	5.1250	...	5.0167	5.0304	0.0137	4.945	4.975	...	...	4.963	4.983
	6		3B	5.1250	...	5.0167	5.0270	0.0103	4.9450	4.9646	...	...	4.9626	4.9826
(6)	$5\frac{1}{8}$ – 8 or 5.1250 – 8	UN	2B	5.1250	...	5.0438	5.0565	0.0127	4.990	5.015	...	...	5.003	5.018
	8		3B	5.1250	...	5.0438	5.0533	0.0095	4.9900	5.0047	...	...	5.0032	5.0182
(6)	$5\frac{1}{8}$ – 12 or 5.1250 – 12	UN	2B	5.1250	...	5.0709	5.0797	0.0088	5.035	5.053	...	...	5.044	5.054
(6)	12		3B	5.1250	...	5.0709	5.0775	0.0066	5.0350	5.0448	...	...	5.0438	5.0538
	$5\frac{1}{8}$ – 16 or 5.1250 – 16	UN	2B	5.1250	...	5.0844	5.0923	0.0079	5.057	5.071	...	...	5.064	5.073
(6)	16		3B	5.1250	...	5.0844	5.0903	0.0059	5.0570	5.0658	...	...	5.0641	5.0726
	$5\frac{1}{4}$ – 4 or 5.2500 – 4	UNC	2B	5.2500	...	5.0876	5.1032	0.0156	4.979	5.017	...	...	5.006	5.036
	4		3B	5.2500	...	5.0876	5.0993	0.0117	4.9790	5.0094	...	...	5.0064	5.0364
	$5\frac{1}{4}$ – 6 or 5.2500 – 6	UN	2B	5.2500	...	5.1417	5.1555	0.0138	5.070	5.100	...	...	5.088	5.108
	6		3B	5.2500	...	5.1417	5.1520	0.0103	5.0700	5.0896	...	...	5.0876	5.1076
	$5\frac{1}{8}$ – 8 or 5.2500 – 8	UN	2B	5.2500	...	5.1688	5.1815	0.0127	5.115	5.140	...	...	5.128	5.143
(6)	8		3B	5.2500	...	5.1688	5.1783	0.0095	5.1150	5.1297	...	...	5.1282	5.1432
(6)	$5\frac{1}{8}$ – 12 or 5.2500 – 12	UN	2B	5.2500	...	5.1959	5.2047	0.0088	5.160	5.178	...	...	5.169	5.179
(6)	12		3B	5.2500	...	5.1959	5.2025	0.0066	5.1600	5.1698	...	...	5.1688	5.1788
	$5\frac{1}{4}$ – 16 or 5.2500 – 16	UN	2B	5.2500	...	5.2094	5.2173	0.0079	5.182	5.196	...	...	5.189	5.198
(6)	16		3B	5.2500	...	5.2094	5.2153	0.0059	5.1820	5.1908	...	...	5.1891	5.1976
	$5\frac{3}{8}$ – 4 or 5.3875 – 4	UN	2B	5.3875	...	5.2251	5.2408	0.0157	5.117	5.154	...	...	5.144	5.174
	4		3B	5.3875	...	5.2251	5.2368	0.0117	5.1170	5.1469	...	...	5.1439	5.1739
	$5\frac{3}{8}$ – 6 or 5.3750 – 6	UN	2B	5.3750	...	5.2667	5.2805	0.0138	5.195	5.225	...	...	5.213	5.233
	6		3B	5.3750	...	5.2667	5.2771	0.0104	5.1950	5.2146	...	...	5.2126	5.2326

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(6)	$5\frac{3}{8}$ – 8 or 5.3750 – 8	UN	2B	5.3750	...	5.2938	5.3066	0.0128	5.240	5.265	...	...	5.253	5.268
(6)	8		3B	5.3750	...	5.2938	5.3034	0.0096	5.2400	5.2547	...	...	5.2532	5.2682
(6)	$5\frac{3}{8}$ – 12 or 5.3750 – 12	UN	2B	5.3750	...	5.3209	5.3297	0.0088	5.285	5.303	...	...	5.294	5.304
(6)	12		3B	5.3750	...	5.3209	5.3275	0.0066	5.2850	5.2948	...	...	5.2938	5.3038
	$5\frac{3}{8}$ – 16 or 5.3750 – 16	UN	2B	5.3750	...	5.3344	5.3423	0.0079	5.307	5.321	...	...	5.314	5.323
(6)	16		3B	5.3750	...	5.3344	5.3404	0.0060	5.3070	5.3158	...	...	5.3141	5.3226
	$5\frac{1}{2}$ – 4 or 5.5000 – 4	UNC	2B	5.5000	...	5.3376	5.3534	0.0158	5.229	5.267	...	...	5.256	5.286
	4		3B	5.5000	...	5.3376	5.3494	0.0118	5.2290	5.2594	...	...	5.2564	5.2864
	$5\frac{1}{2}$ – 6 or 5.5000 – 6	UN	2B	5.5000	...	5.3917	5.4056	0.0139	5.320	5.350	...	...	5.338	5.358
	6		3B	5.5000	...	5.3917	5.4021	0.0104	5.3200	5.3396	...	...	5.3376	5.3576
	$5\frac{1}{2}$ – 8 or 5.5000 – 8	UN	2B	5.5000	...	5.4188	5.4317	0.0129	5.365	5.390	...	...	5.378	5.393
	8		3B	5.5000	...	5.4188	5.4285	0.0097	5.3650	5.3797	...	...	5.3782	5.3932
(6)	$5\frac{1}{2}$ – 12 or 5.5000 – 12	UN	2B	5.5000	...	5.4459	5.4548	0.0089	5.410	5.428	...	...	5.419	5.429
(6)	12		3B	5.5000	...	5.4459	5.4525	0.0066	5.4100	5.4198	...	...	5.4188	5.4288
(6)	$5\frac{1}{2}$ – 16 or 5.5000 – 16	UN	2B	5.5000	...	5.4594	5.4674	0.0080	5.432	5.446	...	...	5.439	5.448
(6)	16		3B	5.5000	...	5.4594	5.4654	0.0060	5.4320	5.4408	...	...	5.4391	5.4476
	$5\frac{5}{8}$ – 4 or 5.6250 – 4	UN	2B	5.6250	...	5.4626	5.4784	0.0158	5.354	5.392	...	...	5.381	5.411
	4		3B	5.6250	...	5.4626	5.4744	0.0118	5.3540	5.3844	...	...	5.3814	5.4114
	$5\frac{5}{8}$ – 6 or 5.6250 – 6	UN	2B	5.6250	...	5.5167	5.5307	0.0140	5.445	5.475	...	...	5.463	5.483
	6		3B	5.6250	...	5.5167	5.5272	0.0105	5.4450	5.4646	...	...	5.4626	5.4826
	$5\frac{5}{8}$ – 8 or 5.6250 – 8	UN	2B	5.6250	...	5.5438	5.5568	0.0130	5.490	5.515	...	...	5.503	5.518
(6)	8		3B	5.6250	...	5.5438	5.5535	0.0097	5.4900	5.5047	...	...	5.5032	5.5182
(6)	$5\frac{5}{8}$ – 12 or 5.6250 – 12	UN	2B	5.6250	...	5.5709	5.5798	0.0089	5.535	5.553	...	...	5.544	5.554
(6)	12		3B	5.6250	...	5.5709	5.5776	0.0067	5.5350	5.5448	...	...	5.5438	5.5538

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(6)	$5\frac{5}{8}$ – 16 or 5.6250 – 16	UN	2B	5.6250	...	5.5844	5.5924	0.0080	5.557	5.571	...	...	5.564	5.573
(6)	16		3B	5.6250	...	5.5844	5.5904	0.0060	5.5570	5.5658	...	...	5.5641	5.5726
	$5\frac{3}{4}$ – 4 or 5.7500 – 4	UNC	2B	5.7500	...	5.5876	5.6035	0.0159	5.479	5.517	...	...	5.506	5.536
	4		3B	5.7500	...	5.5876	5.5995	0.0119	5.4790	5.5094	...	...	5.5064	5.5364
	$5\frac{3}{4}$ – 6 or 5.7500 – 6	UN	2B	5.7500	...	5.6417	5.6558	0.0141	5.570	5.600	...	...	5.588	5.608
	6		3B	5.7500	...	5.6417	5.6523	0.0106	5.5700	5.5896	...	...	5.5876	5.6076
(6)	$5\frac{3}{4}$ – 8 or 5.7500 – 8	UN	2B	5.7500	...	5.6688	5.6818	0.0130	5.615	5.640	...	...	5.628	5.643
	8		3B	5.7500	...	5.6688	5.6786	0.0098	5.6150	5.6297	...	...	5.6282	5.6432
(6)	$5\frac{3}{4}$ – 12 or 5.7500 – 12	UN	2B	5.7500	...	5.6959	5.7048	0.0089	5.660	5.678	...	...	5.669	5.679
(6)	12		3B	5.7500	...	5.6959	5.7026	0.0067	5.6600	5.6698	...	...	5.6688	5.6788
(6)	$5\frac{3}{4}$ – 16 or 5.7500 – 16	UN	2B	5.7500	...	5.7094	5.7174	0.0080	5.682	5.696	...	...	5.689	5.698
(6)	16		3B	5.7500	...	5.7094	5.7154	0.0060	5.6820	5.6908	...	...	5.6891	5.6976
	$5\frac{7}{8}$ – 4 or 5.8750 – 4	UN	2B	5.8750	...	5.7126	5.7286	0.0160	5.604	5.642	...	...	5.631	5.661
	4		3B	5.8750	...	5.7126	5.7246	0.0120	5.6040	5.6344	...	...	5.6314	5.6614
	$5\frac{7}{8}$ – 6 or 5.8750 – 6	UN	2B	5.8750	...	5.7667	5.7809	0.0142	5.695	5.725	...	...	5.713	5.733
	6		3B	5.8750	...	5.7667	5.7773	0.0106	5.6950	5.7146	...	...	5.7126	5.7326
(6)	$5\frac{7}{8}$ – 8 or 5.8750 – 8	UN	2B	5.8750	...	5.7938	5.8069	0.0131	5.740	5.765	...	...	5.753	5.768
	8		3B	5.8750	...	5.7938	5.8036	0.0098	5.7400	5.7547	...	...	5.7532	5.7682
(6)	$5\frac{7}{8}$ – 12 or 5.8750 – 12	UN	2B	5.8750	...	5.8209	5.8298	0.0089	5.785	5.803	...	...	5.794	5.804
	12		3B	5.8750	...	5.8209	5.8276	0.0067	5.7850	5.7948	...	...	5.7938	5.8038
	$5\frac{7}{8}$ – 16 or 5.8750 – 16	UN	2B	5.8750	...	5.8344	5.8425	0.0081	5.807	5.821	...	...	5.814	5.823
(6)	16		3B	5.8750	...	5.8344	5.8404	0.0060	5.8070	5.8158	...	...	5.8141	5.8226

Table 2B
Limits of Size for Standard Series Internal Threads (UN and UNJ) (Cont'd)

	Nominal Size and Threads/in.	Series Designation	Class [Note (1)]	Major Diameter, D		Pitch Diameter, D_2, and Functional Diameter [Note (3)]			Minor Diameter, D_1					
									UN [Note (4)]		UNR [Note (5)]		UNJ	
				Min.	Max. [Note (2)]	Min.	Max.	Tolerance, TD_2	Min.	Max.	Min.	Max.	Min.	Max.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	6 – 4 or 6.0000 – 4	UN	2B	6.0000	...	5.8376	5.8537	0.0161	5.729	5.767	...	...	5.756	5.786
	4		3B	6.0000	...	5.8376	5.8496	0.0120	5.7290	5.7594	...	...	5.7564	5.7864
	6 – 6 or 6.0000 – 6	UN	2B	6.0000	...	5.8917	5.9059	0.0142	5.820	5.850	...	...	5.838	5.858
	6		3B	6.0000	...	5.8917	5.9024	0.0107	5.8200	5.8396	...	...	5.8376	5.8576
(6)	6 – 8 or 6.0000 – 8	UN	2B	6.0000	...	5.9188	5.9320	0.0132	5.865	5.890	...	...	5.878	5.893
(6)	8		3B	6.0000	...	5.9188	5.9287	0.0099	5.8650	5.8797	...	...	5.8782	5.8932
	6 – 12 or 6.0000 – 12	UN	2B	6.0000	...	5.9459	5.9549	0.0090	5.910	5.928	...	...	5.919	5.929
	12		3B	6.0000	...	5.9459	5.9526	0.0067	5.9100	5.9198	...	...	5.9188	5.9288
	6 – 16 or 6.0000 – 16	UN	2B	6.0000	...	5.9594	5.9675	0.0081	5.932	5.946	...	...	5.939	5.948
(6)	16		3B	6.0000	...	5.9594	5.9655	0.0061	5.9320	5.9408	...	...	5.9391	5.9476

GENERAL NOTES:

(a) Series designation shown in column 2 indicates the UN thread form; however, the UNR or UNJ thread form may be specified.

(b) Thread classes may be combined. See para. 4.1.

NOTES:

(1) There is no Class 1B for the UNJ thread series.

(2) Maximum major diameter, D, is not specified. See paras. 5.5 and 8.3.2(a).

(3) See para. 5.2.1 for functional diameter.

(4) Values for UN minor diameter are shown as three or four decimal places. See paras. 8.3.2(e) and 8.3.2(f).

(5) There is no UNR internal thread, only an external UNR that is intended to assemble with an internal UN thread.

(6) One or more of the numbers listed in this row have been changed to correct for calculation and rounding errors. The original numbers from past issues of this Standard are listed in Nonmandatory Appendix E and are for reference only.

(7) Formerly NF; tolerances and allowances are based on 1 diameter length of engagement.

5 SCREW THREAD ALLOWANCE AND TOLERANCE

5.1 Allowance

Allowance is specified only for Classes 1A and 2A external threads. For Class 1A threads, the purpose of the allowance is to preclude the possibility of surface-to-surface fit between mating parts and it cannot be used to accommodate plating or coating. For Class 2A threads, the allowance may be used to accommodate plating or coating. Allowance for Classes 1A and 2A is identical: it is based on Class 2A pitch diameter tolerance, Td_2, for the respective series' standard length of engagement and is applicable for all lengths of engagement.

Formulas for allowance are given in para. 5.8.1(a). Applications of allowances to the basic thread form are shown in Figures 5, 7, and 10.

EXAMPLE: 2.0625-12-UNS-2A
From para. 5.8.1(a): Allowance, es = 0.300 Td_2 (2A)
From para. 5.2: Td_2 (2A) = 0.006070
Therefore, es = 0.300 × 0.006070 = 0.001821, or 0.0018 in. when rounded.

5.2 Pitch Diameter Tolerance, All Classes

NOTE: Refer to Table 1 for the standard series of diameter–pitch combinations. Allowances and tolerances for standard series threads are applied in Tables 2A and 2B. All other diameter–pitch combinations are considered nonstandard. Allowances and tolerances for nonstandard threads must be calculated using the appropriate formulas contained in this Standard.

The pitch diameter tolerances for external threads specified for all classes of the UNC/UNRC/UNJC and UNF/UNRF/UNJF series are based on a length of engagement equal to the basic major (nominal) diameter and are applicable for lengths of engagement from 5 pitches up to 1.5 diameters. For the 4-UN/UNR/UNJ, 6-UN/UNR/UNJ, and 8-UN/UNR/UNJ series, the pitch diameter tolerances for external threads specified for all classes are based on a length of engagement equal to the basic major (nominal) diameter and are applicable for lengths of engagement up to 1.5 diameters.

The pitch diameter tolerances specified for external threads for all classes of the UNEF/UNREF/UNJEF, 12-UN/UNR/UNJ, 16-UN/UNR/UNJ, 20-UN/UNR/UNJ, 28-UN/UNR/UNJ, and 32-UN/UNR/UNJ series are based on a length of engagement of 9 pitches and are applicable for lengths of engagement from 5 pitches to 15 pitches.

The pitch diameter tolerances specified for internal threads for all classes of the UNC/UNJC and UNF/UNJF series are based on a length of engagement equal to the basic major (nominal) diameter and are applicable for lengths of engagement from 5 pitches up to 1.5 diameters. For the 4-UN/UNJ, 6-UN/UNJ, and 8-UN/UNJ series, the pitch diameter tolerances specified for internal threads for all classes are based on a length of engagement equal to the basic major (nominal) diameter and are applicable for lengths of engagement up to 1.5 diameters.

The pitch diameter tolerances specified for internal threads for all classes of the UNEF/UNJEF, 12-UN/UNJ, 16-UN/UNJ, 20-UN/UNJ, 28-UN/UNJ, and 32-UN/UNJ series are based on a length of engagement of 9 pitches and are applicable for lengths of engagement from 5 pitches to 15 pitches.

The pitch diameter tolerances specified in Table D-1 for all classes of the UNS series are based on a length of engagement of 9 pitches and are applicable for lengths of engagement from 5 pitches to 15 pitches.

Formulas for pitch diameter tolerance are given in paras. 5.8.1(c) and 5.8.2(b).

Applications of tolerances to the thread form are shown in Figures 5 through 12.

For special threads, tolerances and allowances shall be computed from the formulas in paras. 5.8.1 and 5.8.2. If the length of engagement is between 5 pitches and 15 pitches or is unknown, use 9 pitches in the applicable formulas. For all other lengths of engagement, use the known values.

EXAMPLE 1: 2.0625-12-UNS-2A (length of engagement, LE, not specified)

$$Td_2 = 0.0015\sqrt[3]{D} + 0.0015\sqrt{LE} + 0.015\sqrt[3]{P^2}$$
$$Td_2 = 0.0015\sqrt[3]{2.0625} + 0.0015\sqrt{9P} + 0.015\sqrt[3]{0.08333333^2}$$
$$Td_2 = 0.0015\sqrt[3]{2.0625} + 0.0015\sqrt{0.750} + 0.015\sqrt[3]{0.83333333^2}$$
$$Td_2 = 0.001909 + 0.001299 + 0.002862$$
$$Td_2 = 0.006070$$

EXAMPLE 2: 2.0625-12-UNS-SE2A (18 pitches length of engagement, LE)

$$Td_2 = 0.0015\sqrt[3]{D} + 0.0015\sqrt{LE} + 0.015\sqrt[3]{P^2}$$
$$Td_2 = 0.0015\sqrt[3]{2.0625} + 0.0015\sqrt{18P} + 0.015\sqrt[3]{0.08333333^2}$$
$$Td_2 = 0.0015\sqrt[3]{2.0625} + 0.0015\sqrt{1.500} + 0.015\sqrt[3]{0.08333333^2}$$
$$Td_2 = 0.001909 + 0.001837 + 0.002862$$
$$Td_2 = 0.006608$$

5.2.1 Functional Diameter. Functional diameter size includes the effects of all variations in pitch diameter, thread form, and profile. The variations in the individual thread characteristics such as flank angle, lead, taper, and roundness on a given thread cause the measurements of the pitch diameter and functional diameter to vary from one another on most threads. The pitch diameter and functional diameter on a given thread are equal to one another only when the thread form is perfect.

When required to inspect or evaluate the pitch diameter or the functional diameter or both for thread acceptance (see ASME B1.3), use the same limits of size for the appropriate thread size and class.

5.3 Special Lengths of Engagement, *LE*

Length of engagement is the actual length of thread that is engaged when internal and external mated threads are fully assembled, and is equal to the shorter of the two thread lengths.

For example, a ½-in.-wide threaded nut when fully assembled with a 2-in.-long threaded bolt has ½ in. (0.500 in.) of thread engagement. However, a 2-in.-wide threaded nut when fully assembled with a ½-in.-long threaded bolt also has ½ in. (0.500 in.) of thread engagement.

Length of engagement can have an effect on the functional diameter size (see para 5.2.1) due to the cumulative effects of variations in lead and flank angles (see Table 3). On internal threads these variations will reduce functional diameter size and on external threads they will increase it, resulting in a reduction in allowance (clearance) when assembled. The longer the engagement, the greater this effect, and the less the clearance can be. Using longer than standard lengths of engagements can result in the external and internal threads not assembling.

In many cases, part producers are required to manufacture only the internal thread or only the external thread without information about the corresponding thread length, so the length of engagement is unknown. In these cases, it may be necessary to obtain more information identifying the length of engagement so the proper formulas (for allowances or tolerances or both) and gaging are used to result in full assembly.

The allowances or tolerances or both as well as the resulting thread elements listed in Tables 2A and 2B are for what are considered standard lengths of engagement as outlined in para. 5.2. Special lengths of engagement are ones that are longer or shorter than those identified in para. 5.2.

The required length of engagement may be the determining factor in the proper selection of thread allowances and tolerances. When design considerations require lengths of engagement less than or greater than those covered by the tables, the allowances or tolerances or both should be adjusted using formulas in para 5.8. When using longer than standard lengths of engagement, it is particularly important that changes in allowances or tolerances or both be considered for external threads designated Class 3A or Class 2A coated to basic limits (see para. 7.2). This is because there is no allowance as with a Class 2A (uncoated) thread and the functional effects of lead variation may prevent full assembly.

Determining the product or manufacturing specifications for special lengths of engagement is application dependent and is therefore outside the scope of this Standard. It is the responsibility of the designer of the parts to determine these specifications.

NOTE: Past editions of this Standard provided examples of how to handle special lengths of engagement. These were examples only and not requirements. Because of this, they are no longer part of this Standard and have been moved to Nonmandatory Appendix F for historical and reference purposes.

5.4 Minor Diameter Tolerance and Allowance for External Threads

The tolerance for minor diameter is for reference only. In dimensioning external threads, the minimum minor diameter is not specified, being established by the crest of an unworn tool. In practice, the minor diameter of an external thread is satisfactory when accepted by a gage or gaging method that represents the maximum material condition of the internal thread less the allowance, if any. A formula for the minor diameter tolerance of external threads is given in para. 5.8.1(d).

5.5 Major Diameter Tolerance for Internal Threads

The tolerance for major diameter is for reference only. In dimensioning internal threads, the maximum major diameter is not specified, being established by the crest of an unworn tool. In practice, the major diameter of an internal thread is satisfactory when accepted by a gage or gaging method that represents the maximum material condition of an external thread that has no allowance. A formula for the major diameter tolerance of internal threads is given in para. 5.8.2(a).

5.6 Minor Diameter Tolerance and Length of Engagement for Internal Threads

Formulas for the minor diameter tolerance for internal threads are given in para. 5.8.2(c).

Internal thread minor diameter tolerances are suitable for lengths of engagement up to 1.5 diameters. For applications having shorter or longer lengths of engagement, it may be advantageous to decrease or increase the tolerance as explained in para. 5.6.1.

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
0-80 or 0.0600-80	UNF	2A	0.00052	0.00090	2B	0.00066	0.00115
		3A	0.00038	0.00065	3B	0.00048	0.00085
1-64 or 0.0730-64	UNC	2A	0.00058	0.00100	2B	0.00075	0.00130
		3A	0.00043	0.00075	3B	0.00055	0.00095
1-72 or 0.0730-72	UNF	2A	0.00055	0.00095	2B	0.00072	0.00125
		3A	0.00040	0.00070	3B	0.00055	0.00095
2-56 or 0.0860-56	UNC	2A	0.00061	0.00105	2B	0.00081	0.00140
		3A	0.00046	0.00080	3B	0.00061	0.00105
2-64 or 0.0860-64	UNF	2A	0.00058	0.00100	2B	0.00078	0.00135
		3A	0.00043	0.00075	3B	0.00058	0.00100
3-48 or 0.0990-48	UNC	2A	0.00066	0.00115	2B	0.00087	0.00150
		3A	0.00049	0.00085	3B	0.00064	0.00110
3-56 or 0.0990-56	UNF	2A	0.00064	0.00110	2B	0.00081	0.00140
		3A	0.00046	0.00080	3B	0.00061	0.00105
4-40 or 0.1120-40	UNC	2A	0.00072	0.00125	2B	0.00095	0.00165
		3A	0.00055	0.00095	3B	0.00069	0.00120
4-48 or 0.1120-48	UNF	2A	0.00069	0.00120	2B	0.00089	0.00155
		3A	0.00052	0.00090	3B	0.00066	0.00115
5-40 or 0.1250-40	UNC	2A	0.00075	0.00130	2B	0.00095	0.00165
		3A	0.00055	0.00095	3B	0.00072	0.00125
5-44 or 0.1250-44	UNF	2A	0.00072	0.00125	2B	0.00092	0.00160
		3A	0.00055	0.00095	3B	0.00069	0.00120
6-32 or 0.1380-32	UNC	2A	0.00081	0.00140	2B	0.00107	0.00185
		3A	0.00061	0.00105	3B	0.00078	0.00135
6-40 or 0.1380-40	UNF	2A	0.00075	0.00130	2B	0.00098	0.00170
		3A	0.00058	0.00100	3B	0.00072	0.00125
8-32 or 0.1640-32	UNC	2A	0.00084	0.00145	2B	0.00110	0.00190
		3A	0.00064	0.00110	3B	0.00081	0.00140
8-36 or 0.1640-36	UNF	2A	0.00081	0.00140	2B	0.00104	0.00180
		3A	0.00061	0.00105	3B	0.00078	0.00135
10-24 or 0.1900-24	UNC	2A	0.00095	0.00165	2B	0.00124	0.00215
		3A	0.00072	0.00125	3B	0.00092	0.00160
10-32 or 0.1900-32	UNF	2A	0.00087	0.00150	2B	0.00113	0.00195
		3A	0.00066	0.00115	3B	0.00084	0.00145
12-24 or 0.2160-24	UNC	2A	0.00098	0.00170	2B	0.00127	0.00220
		3A	0.00075	0.00130	3B	0.00095	0.00165

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
12-28 or 0.2160-28	UNF	2A	0.00092	0.00160	2B	0.00121	0.00210
		3A	0.00069	0.00120	3B	0.00089	0.00155
12-32 or 0.2160-32	UNEF	2A	0.00089	0.00155	2B	0.00118	0.00205
		3A	0.00069	0.00120	3B	0.00089	0.00155
1/4-20 or 0.2500-20	UNC	1A	0.00162	0.00280	1B	0.00211	0.00365
		2A	0.00107	0.00185	2B	0.00141	0.00245
		3A	0.00081	0.00140	3B	0.00104	0.00180
1/4-28 or 0.2500-28	UNF	1A	0.00144	0.00250	1B	0.00188	0.00325
		2A	0.00095	0.00165	2B	0.00124	0.00215
		3A	0.00072	0.00125	3B	0.00092	0.00160
1/4-32 or 0.2500-32	UNEF	2A	0.00092	0.00160	2B	0.00121	0.00210
		3A	0.00069	0.00120	3B	0.00089	0.00155
5/16-18 or 0.3125-18	UNC	1A	0.00176	0.00305	1B	0.00223	0.00395
		2A	0.00115	0.00200	2B	0.00153	0.00265
		3A	0.00087	0.00150	3B	0.00113	0.00195
5/16-20 or 0.3125-20	UN	2A	0.00115	0.00200	2B	0.0015	0.00260
		3A	0.00087	0.00150	3B	0.00113	0.00195
5/16-24 or 0.3125-24	UNF	1A	0.00159	0.00275	1B	0.00205	0.00355
		2A	0.00107	0.00185	2B	0.00139	0.00240
		3A	0.00078	0.00135	3B	0.00104	0.00180
5/16-28 or 0.3125-28	UN	2A	0.00098	0.00170	2B	0.00127	0.00220
		3A	0.00075	0.00130	3B	0.00095	0.00165
5/16-32 or 0.3125-32	UNEF	2A	0.00092	0.00160	2B	0.00121	0.00210
		3A	0.00069	0.00120	3B	0.00089	0.00155
3/8-16 or 0.3750-16	UNC	1A	0.00188	0.00325	1B	0.00245	0.00425
		2A	0.00127	0.00220	2B	0.00165	0.00285
		3A	0.00095	0.00165	3B	0.00124	0.00215
3/8-20 or 0.3750-20	UN	2A	0.00118	0.00205	2B	0.00156	0.00270
		3A	0.00089	0.00155	3B	0.00115	0.00200
3/8-24 or 0.3750-24	UNF	1A	0.00165	0.00285	1B	0.00214	0.00370
		2A	0.00110	0.00190	2B	0.00141	0.00245
		3A	0.00084	0.00145	3B	0.00107	0.00185
3/8-28 or 0.3750-28	UN	2A	0.00104	0.00180	2B	0.00133	0.00230
		3A	0.00078	0.00135	3B	0.00101	0.00175
3/8-32 or 0.3750-32	UNEF	2A	0.00098	0.00170	2B	0.00127	0.00220
		3A	0.00072	0.00125	3B	0.00095	0.00165

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
7/16-14 or 0.4375-14	UNC	1A	0.00205	0.00355	1B	0.00266	0.00460
		2A	0.00136	0.00235	2B	0.00176	0.00305
		3A	0.00101	0.00175	3B	0.00133	0.00230
7/16-16 or 0.4375-16	UN	2A	0.00133	0.00230	2B	0.0017	0.00295
		3A	0.00098	0.00170	3B	0.00130	0.00225
7/16-20 or 0.4375-20	UNF	1A	0.00182	0.00315	1B	0.00234	0.00405
		2A	0.00121	0.00210	2B	0.00156	0.00270
		3A	0.00089	0.00155	3B	0.00118	0.00205
7/16-28 or 0.4375-28	UNEF	2A	0.00104	0.00180	2B	0.00133	0.00230
		3A	0.00078	0.00135	3B	0.00101	0.00175
7/16-32 or 0.4375-32	UN	2A	0.00098	0.00170	2B	0.00127	0.00220
		3A	0.00072	0.00125	3B	0.00095	0.00165
1/2-13 or 0.5000-13	UNC	1A	0.00214	0.00370	1B	0.00280	0.00485
		2A	0.00144	0.00250	2B	0.00188	0.00325
		3A	0.00107	0.00185	3B	0.00139	0.00240
1/2-16 or 0.5000-16	UN	2A	0.00136	0.00235	2B	0.00176	0.00305
		3A	0.00101	0.00175	3B	0.00133	0.00230
1/2-20 or 0.5000-20	UNF	1A	0.00185	0.00320	1B	0.00242	0.00420
		2A	0.00124	0.00215	2B	0.00162	0.00280
		3A	0.00092	0.00160	3B	0.00121	0.00210
1/2-28 or 0.5000-28	UNEF	2A	0.00107	0.00185	2B	0.00139	0.00240
		3A	0.00081	0.00140	3B	0.00104	0.0018
1/2-32 or 0.5000-32	UN	2A	0.00101	0.00175	2B	0.00130	0.00225
		3A	0.00075	0.00130	3B	0.00098	0.00170
9/16-12 or 0.5625-12	UNC	1A	0.00225	0.00390	1B	0.00294	0.00510
		2A	0.00150	0.00260	2B	0.00196	0.00340
		3A	0.00113	0.00195	3B	0.00147	0.00255
9/16-16 or 0.5625-16	UN	2A	0.00136	0.00235	2B	0.00176	0.00305
		3A	0.00101	0.00175	3B	0.00133	0.00230
9/16-18 or 0.5625-18	UNF	1A	0.00196	0.00340	1B	0.00257	0.00445
		2A	0.00130	0.00225	2B	0.00170	0.00295
		3A	0.00098	0.00170	3B	0.00127	0.00220
9/16-20 or 0.5625-20	UN	2A	0.00121	0.00210	2B	0.00159	0.00275
		3A	0.00092	0.00160	3B	0.00118	0.00205
9/16-24 or 0.5625-24	UNEF	2A	0.00113	0.00195	2B	0.00147	0.00255
		3A	0.00084	0.00145	3B	0.00110	0.00190
9/16-28 or 0.5625-28	UN	2A	0.00107	0.00185	2B	0.00139	0.00240
		3A	0.00081	0.00140	3B	0.00104	0.00180

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
9/16-32 or 0.5625-32	UN	2A	0.00101	0.00175	2B	0.00130	0.00225
		3A	0.00075	0.00130	3B	0.00098	0.00170
5/8-11 or 0.6250-11	UNC	1A	0.00240	0.00415	1B	0.00309	0.00535
		2A	0.00159	0.00275	2B	0.00208	0.00360
		3A	0.00118	0.00205	3B	0.00156	0.00270
5/8-12 or 0.6250-12	UN	2A	0.00156	0.00270	2B	0.00205	0.00355
		3A	0.00118	0.00205	3B	0.00153	0.00265
5/8-16 or 0.6250-16	UN	2A	0.00139	0.00240	2B	0.00179	0.00310
		3A	0.00104	0.00180	3B	0.00133	0.00230
5/8-18 or 0.6250-18	UNF	1A	0.00202	0.00350	1B	0.00263	0.00455
		2A	0.00136	0.00235	2B	0.00173	0.00300
		3A	0.00101	0.00175	3B	0.00130	0.00255
5/8-20 or 0.6250-20	UN	2A	0.00124	0.00215	2B	0.00162	0.00280
		3A	0.00092	0.00160	3B	0.00121	0.00210
5/8-24 or 0.6250-24	UNEF	2A	0.00115	0.00200	2B	0.00150	0.00260
		3A	0.00087	0.00150	3B	0.00113	0.00195
5/8-28 or 0.6250-28	UN	2A	0.00110	0.00190	2B	0.00141	0.00245
		3A	0.00081	0.00140	3B	0.00107	0.00185
5/8-32 or 0.6250-32	UN	2A	0.00104	0.00180	2B	0.00133	0.00230
		3A	0.00078	0.00135	3B	0.00101	0.00175
11/16-12 or 0.6875-12	UN	2A	0.00156	0.00270	2B	0.00205	0.00355
		3A	0.00118	0.00205	3B	0.00153	0.00265
11/16-16 or 0.6875-16	UN	2A	0.00139	0.00240	2B	0.00179	0.00310
		3A	0.00104	0.00130	3B	0.00133	0.00230
11/16-20 or 0.6875-20	UN	2A	0.00124	0.00215	2B	0.00162	0.00280
		3A	0.00092	0.00160	3B	0.00121	0.00210
11/16-24 or 0.6875-24	UNEF	2A	0.00115	0.00200	2B	0.00150	0.00260
		3A	0.00087	0.00150	3B	0.00113	0.00195
11/16-28 or 0.6875-28	UN	2A	0.00110	0.00190	2B	0.00141	0.00245
		3A	0.00081	0.00140	3B	0.00107	0.00185
11/16-32 or 0.6875-32	UN	2A	0.00104	0.00180	2B	0.00133	0.00230
		3A	0.00078	0.00135	3B	0.00101	0.00175
3/4-10 or 0.7500-10	UNC	1A	0.00254	0.00440	1B	0.00332	0.00575
		2A	0.00170	0.00295	2B	0.00222	0.00385
		3A	0.00127	0.00220	3B	0.00165	0.00285
3/4-12 or 0.7500-12	UN	2A	0.00159	0.00275	2B	0.00208	0.00360
		3A	0.00118	0.00205	3B	0.00156	0.00270

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
3/4-16 or 0.7500-16	UNF	1A	0.00217	0.00375	1B	0.00283	0.00490
		2A	0.00144	0.00250	2B	0.00188	0.00325
		3A	0.00110	0.00190	3B	0.00141	0.00245
3/4-20 or 0.7500-20	UNEF	2A	0.00127	0.00220	2B	0.00165	0.00285
		3A	0.00095	0.00165	3B	0.00124	0.00215
3/4-28 or 0.7500-28	UN	2A	0.00110	0.00190	2B	0.00144	0.00250
		3A	0.00084	0.00145	3B	0.00107	0.00185
3/4-32 or 0.7500-32	UN	2A	0.00104	0.00180	2B	0.00136	0.00235
		3A	0.00078	0.00135	3B	0.00104	0.00180
13/16-12 or 0.8125-12	UN	2A	0.00159	0.00275	2B	0.00208	0.00360
		3A	0.00118	0.00205	3B	0.00156	0.00270
13/16-16 or 0.8125-16	UN	2A	0.00141	0.00245	2B	0.00182	0.00315
		3A	0.00104	0.00180	3B	0.00136	0.00235
13/16-20 or 0.8125-20	UNEF	2A	0.00127	0.00220	2B	0.00165	0.00285
		3A	0.00095	0.00165	3B	0.00124	0.00215
13/16-28 or 0.8125-28	UN	2A	0.00110	0.00190	2B	0.00144	0.00250
		3A	0.00084	0.00145	3B	0.00107	0.00185
13/16-32 or 0.8125-32	UN	2A	0.00104	0.00180	2B	0.00136	0.00235
		3A	0.00078	0.00135	3B	0.00104	0.00180
7/8-9 or 0.8750-9	UNC	1A	0.00274	0.00475	1B	0.00355	0.00615
		2A	0.00182	0.00315	2B	0.00237	0.00410
		3A	0.00136	0.00235	3B	0.00176	0.00305
7/8-12 or 0.8750-12	UN	2A	0.00159	0.00275	2B	0.00208	0.00360
		3A	0.00118	0.00205	3B	0.00156	0.00270
7/8-14 or 0.8750-14	UNF	1A	0.00234	0.00405	1B	0.00306	0.00530
		2A	0.00156	0.00270	2B	0.00202	0.00350
		3A	0.00118	0.00205	3B	0.00153	0.00265
7/8-16 or 0.8750-16	UN	2A	0.00141	0.00245	2B	0.00182	0.00315
		3A	0.00104	0.00180	3B	0.00136	0.00235
7/8-20 or 0.8750-20	UNEF	2A	0.00127	0.00220	2B	0.00165	0.00285
		3A	0.00095	0.00165	3B	0.00124	0.00215
7/8-28 or 0.8750-28	UN	2A	0.00110	0.00190	2B	0.00144	0.00250
		3A	0.00084	0.00145	3B	0.00107	0.00185
7/8-32 or 0.8750-32	UN	2A	0.00104	0.00180	2B	0.00136	0.00235
		3A	0.00078	0.00135	3B	0.00104	0.00180
15/16-12 or 0.9375-12	UN	2A	0.00165	0.00255	2B	0.00214	0.00370
		3A	0.00121	0.00210	3B	0.00159	0.00275

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
$^{15}/_{16}$-16 or 0.9375-16	UN	2A	0.00144	0.00250	2B	0.00188	0.00325
		3A	0.00107	0.00185	3B	0.00141	0.00245
$^{15}/_{16}$-20 or 0.9375-20	UNEF	2A	0.00130	0.00225	2B	0.00170	0.00295
		3A	0.00098	0.00170	3B	0.00127	0.00220
$^{15}/_{16}$-28 or 0.9375-28	UN	2A	0.00115	0.00200	2B	0.00150	0.00260
		3A	0.00087	0.00150	3B	0.00113	0.00195
$^{15}/_{16}$-32 or 0.9375-32	UN	2A	0.00110	0.00190	2B	0.00141	0.00245
		3A	0.00081	0.00140	3B	0.00107	0.00185
1-8 or 1.0000-8	UNC	1A	0.00292	0.00505	1B	0.00381	0.0066
		2A	0.00196	0.00340	2B	0.00254	0.00440
		3A	0.00147	0.00255	3B	0.00191	0.00330
1-12 or 1.0000-12	UNF	1A	0.00254	0.00440	1B	0.00329	0.00570
		2A	0.0017	0.00295	2B	0.00219	0.00380
		3A	0.00127	0.00220	3B	0.00165	0.00285
1-14 or 1.0000-14	UNS	1A	0.00242	0.00420	1B	0.00315	0.00545
		2A	0.00162	0.00280	2B	0.00211	0.00365
		3A	0.00121	0.00210	3B	0.00156	0.00270
1-16 or 1.0000-16	UN	2A	0.00144	0.00250	2B	0.00188	0.00325
		3A	0.00107	0.001850	3B	0.00141	0.00245
1-20 or 1.0000-20	UNEF	2A	0.0013	0.00225	2B	0.00170	0.00295
		3A	0.00098	0.00170	3B	0.00127	0.00220
1-28 or 1.0000-28	UN	2A	0.00115	0.00200	2B	0.00150	0.00260
		3A	0.00087	0.00150	3B	0.00113	0.00195
1-32 or 1.0000-32	UN	2A	0.00110	0.00190	2B	0.00141	0.00245
		3A	0.00081	0.00140	3B	0.00107	0.00185
$1^{1}/_{16}$-8 or 1.0625-8	UN	2A	0.00196	0.00340	2B	0.00257	0.00445
		3A	0.00147	0.00255	3B	0.00193	0.00335
$1^{1}/_{16}$-12 or 1.0625-12	UN	2A	0.00165	0.00285	2B	0.00214	0.00370
		3A	0.00121	0.00210	3B	0.00159	0.00275
$1^{1}/_{16}$-16 or 1.0625-16	UN	2A	0.00144	0.00250	2B	0.00188	0.00325
		3A	0.00107	0.00185	3B	0.00141	0.00245
$1^{1}/_{16}$-18 or 1.0625-18	UNEF	2A	0.00136	0.00235	2B	0.00179	0.00310
		3A	0.00104	0.00180	3B	0.00133	0.00230
$1^{1}/_{16}$-20 or 1.0625-20	UN	2A	0.00130	0.00225	2B	0.00170	0.00295
		3A	0.00098	0.00170	3B	0.00127	0.00220
$1^{1}/_{16}$-28 or 1.0625-28	UN	2A	0.00115	0.00200	2B	0.00150	0.00260
		3A	0.00087	0.00150	3B	0.00113	0.00195

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
1⅛-7 or 1.1250-7	UNC	1A	0.00315	0.00545	1B	0.00407	0.00705
		2A	0.00208	0.00360	2B	0.00271	0.00470
		3A	0.00156	0.00270	3B	0.00205	0.00355
1⅛-8 or 1.1250-8	UN	2A	0.00199	0.00345	2B	0.00260	0.00450
		3A	0.00150	0.00260	3B	0.00193	0.00335
1⅛-12 or 1.1250-12	UNF	1A	0.00260	0.00450	1B	0.00338	0.00585
		2A	0.00173	0.00300	2B	0.00225	0.00390
		3A	0.00130	0.00225	3B	0.00170	0.00295
1⅛-16 or 1.1250-16	UN	2A	0.00144	0.00250	2B	0.00188	0.00325
		3A	0.00107	0.00185	3B	0.00141	0.00245
1⅛-18 or 1.1250-18	UNEF	2A	0.00136	0.00235	2B	0.00179	0.00310
		3A	0.00104	0.00180	3B	0.00133	0.00230
1⅛-20 or 1.1250-20	UN	2A	0.00130	0.00225	2B	0.00170	0.00295
		3A	0.00098	0.00170	3B	0.00127	0.00220
1⅛-28 or 1.1250-28	UN	2A	0.00115	0.00200	2B	0.0015	0.00260
		3A	0.00087	0.00150	3B	0.00113	0.00195
1³⁄₁₆-8 or 1.1875-8	UN	2A	0.00202	0.00350	2B	0.00263	0.00455
		3A	0.00150	0.00260	3B	0.00196	0.00340
1³⁄₁₆-12 or 1.1875-12	UN	2A	0.00167	0.00290	2B	0.00217	0.00375
		3A	0.00124	0.002150	3B	0.00162	0.00280
1³⁄₁₆-16 or 1.1875-16	UN	2A	0.00147	0.002550	2B	0.00191	0.00330
		3A	0.00110	0.00190	3B	0.00144	0.00250
1³⁄₁₆-18 or 1.1875-18	UNEF	2A	0.00141	0.00245	2B	0.00182	0.00315
		3A	0.00104	0.00180	3B	0.00136	0.00235
1³⁄₁₆-20 or 1.1875-20	UN	2A	0.00136	0.00235	2B	0.00176	0.00305
		3A	0.00101	0.00175	3B	0.00130	0.00225
1³⁄₁₆-28 or 1.1875-28	UN	2A	0.00118	0.00205	2B	0.00153	0.00265
		3A	0.00089	0.00155	3B	0.00115	0.00200
1¼-7 or 1.2500-7	UNC	1A	0.00320	0.00555	1B	0.00416	0.00720
		2A	0.00214	0.00370	2B	0.00277	0.00480
		3A	0.00159	0.00275	3B	0.00208	0.00360
1¼-8 or 1.2500-8	UN	2A	0.00202	0.00350	2B	0.00266	0.00460
		3A	0.00153	0.00265	3B	0.00199	0.00345
1¼-12 or 1.2500-12	UNF	1A	0.00266	0.00460	1B	0.00346	0.00600
		2A	0.00179	0.00310	2B	0.00231	0.00400
		3A	0.00133	0.00230	3B	0.00173	0.00300
1¼-16 or 1.2500-16	UN	2A	0.00147	0.00255	2B	0.00191	0.00330
		3A	0.00100	0.00190	3B	0.00144	0.00250

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
1¼-18 or 1.2500-18	UNEF	2A	0.00141	0.00245	2B	0.00182	0.00315
		3A	0.00104	0.00180	3B	0.00136	0.00235
1¼-20 or 1.2500-20	UN	2A	0.00136	0.00235	2B	0.00176	0.00305
		3A	0.00101	0.00175	3B	0.00130	0.00225
1¼-28 or 1.2500-28	UN	2A	0.00118	0.00205	2B	0.00153	0.00265
		3A	0.00089	0.00155	3B	0.00115	0.00200
1⅝-8 or 1.3125-8	UN	2A	0.00205	0.00355	2B	0.00266	0.00460
		3A	0.00153	0.00265	3B	0.00199	0.00345
1⅝-12 or 1.3125-12	UN	2A	0.00167	0.00290	2B	0.00217	0.00375
		3A	0.00124	0.00215	3B	0.00162	0.00280
1⅝-16 or 1.3125-16	UN	2A	0.00147	0.00255	2B	0.00191	0.00330
		3A	0.00110	0.00190	3B	0.00144	0.00250
1⅝-18 or 1.3125-18	UNEF	2A	0.00141	0.00245	2B	0.00182	0.00315
		3A	0.00104	0.00180	3B	0.00136	0.00235
1⅝-20 or 1.3125-20	UN	2A	0.00136	0.00235	2B	0.00176	0.00305
		3A	0.00101	0.00175	3B	0.00130	0.00225
1⅝-28 or 1.3125-28	UN	2A	0.00118	0.00205	2B	0.00153	0.00265
		3A	0.00089	0.00155	3B	0.00115	0.00200
1⅜-6 or 1.3750-6	UNC	1A	0.00346	0.00600	1B	0.00447	0.00775
		2A	0.00231	0.00400	2B	0.00300	0.00520
		3A	0.00173	0.00300	3B	0.00225	0.00390
1⅜-8 or 1.3750-8	UN	2A	0.00208	0.00360	2B	0.00268	0.00465
		3A	0.00156	0.00270	3B	0.00202	0.00350
1⅜-12 or 1.3750-12	UNF	1A	0.00271	0.00470	1B	0.00355	0.00615
		2A	0.00182	0.00315	2B	0.00237	0.00410
		3A	0.00136	0.00235	3B	0.00176	0.00305
1⅜-16 or 1.3750-16	UN	2A	0.00147	0.00255	2B	0.00191	0.00330
		3A	0.00110	0.00190	3B	0.00144	0.00250
1⅜-18 or 1.3750-18	UNEF	2A	0.00141	0.00245	2B	0.00182	0.00315
		3A	0.00104	0.00180	3B	0.00136	0.00235
1⅜-20 or 1.3750-20	UN	2A	0.00136	0.00235	2B	0.00176	0.00305
		3A	0.00101	0.00175	3B	0.00130	0.00225
1⅜-28 or 1.3750-28	UN	2A	0.00118	0.00205	2B	0.00153	0.00265
		3A	0.00089	0.00155	3B	0.00115	0.00200
1⅞-6 or 1.4375-6	UN	2A	0.00231	0.00400	2B	0.00300	0.00520
		3A	0.00173	0.00300	3B	0.00225	0.00390

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
$1\frac{7}{16}$-8 or 1.4375-8	UN	2A	0.00208	0.00360	2B	0.00271	0.00470
		3A	0.00156	0.00270	3B	0.00205	0.00355
$1\frac{7}{16}$-12 or 1.4375-12	UN	2A	0.00170	0.00295	2B	0.00219	0.0038
		3A	0.00127	0.00220	3B	0.00165	0.00285
$1\frac{7}{16}$-16 or 1.4375-16	UN	2A	0.00150	0.00260	2B	0.00196	0.00340
		3A	0.00113	0.00195	3B	0.00147	0.00255
$1\frac{7}{16}$-18 or 1.4375-18	UNEF	2A	0.00144	0.00250	2B	0.00188	0.00325
		3A	0.00107	0.00185	3B	0.00139	0.00240
$1\frac{7}{16}$-20 or 1.4375-20	UN	2A	0.00139	0.00240	2B	0.00179	0.00310
		3A	0.00104	0.00180	3B	0.00133	0.00230
$1\frac{7}{16}$-28 or 1.4375-28	UN	2A	0.00121	0.00210	2B	0.00159	0.00275
		3A	0.00089	0.00155	3B	0.00118	0.00205
$1\frac{1}{2}$-6 or 1.5000-6	UNC	1A	0.00349	0.00605	1B	0.00456	0.00790
		2A	0.00234	0.00405	2B	0.00303	0.00525
		3A	0.00176	0.00305	3B	0.00228	0.00305
$1\frac{1}{2}$-8 or 1.5000-8	UN	2A	0.00211	0.00365	2B	0.00274	0.00475
		3A	0.00159	0.00275	3B	0.00205	0.00355
$1\frac{1}{2}$-12 or 1.5000-12	UNF	1A	0.00277	0.00480	1B	0.00361	0.00625
		2A	0.00185	0.00320	2B	0.00240	0.00415
		3A	0.00139	0.00240	3B	0.00182	0.00315
$1\frac{1}{2}$-16 or 1.5000-16	UN	2A	0.00150	0.00260	2B	0.00196	0.00340
		3A	0.00113	0.00195	3B	0.00147	0.00255
$1\frac{1}{2}$-18 or 1.5000-18	UNEF	2A	0.00144	0.00250	2B	0.00188	0.00325
		3A	0.00107	0.00185	3B	0.00139	0.00240
$1\frac{1}{2}$-20 or 1.5000-20	UN	2A	0.00139	0.00240	2B	0.00179	0.0031
		3A	0.00104	0.00180	3B	0.00133	0.00230
$1\frac{1}{2}$-28 or 1.5000-28	UN	2A	0.00121	0.00210	2B	0.00159	0.00275
		3A	0.00089	0.00155	3B	0.00118	0.00205
$1\frac{9}{16}$-6 or 1.5625-6	UN	2A	0.00237	0.00410	2B	0.00306	0.00530
		3A	0.00176	0.00305	3B	0.00231	0.00400
$1\frac{9}{16}$-8 or 1.5625-8	UN	2A	0.00214	0.00370	2B	0.00277	0.00480
		3A	0.00159	0.00275	3B	0.00208	0.00360
$1\frac{9}{16}$-12 or 1.5625-12	UN	2A	0.00170	0.00295	2B	0.00219	0.00380
		3A	0.00127	0.00220	3B	0.00165	0.00285
$1\frac{9}{16}$-16 or 1.5625-16	UN	2A	0.00150	0.00260	2B	0.00196	0.00340
		3A	0.00113	0.00195	3B	0.00147	0.00255

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
$1\frac{9}{16}$-18 or 1.5625-18	UNEF	2A	0.00144	0.00250	2B	0.00188	0.00325
		3A	0.00107	0.00185	3B	0.00139	0.00240
$1\frac{9}{16}$-20 or 1.5625-20	UN	2A	0.00139	0.00240	2B	0.00179	0.00310
		3A	0.00104	0.00180	3B	0.00133	0.00230
$1\frac{5}{8}$-6 or 1.6250-6	UN	2A	0.00237	0.00410	2B	0.00309	0.00535
		3A	0.00179	0.00310	3B	0.00231	0.00400
$1\frac{5}{8}$-8 or 1.6250-8	UN	2A	0.00214	0.00370	2B	0.00280	0.00485
		3A	0.00162	0.00280	3B	0.00208	0.00360
$1\frac{5}{8}$-12 or 1.6250-12	UN	2A	0.00170	0.00295	2B	0.00219	0.0038
		3A	0.00127	0.00220	3B	0.00165	0.00285
$1\frac{5}{8}$-16 or 1.6250-16	UN	2A	0.00150	0.00260	2B	0.00196	0.00340
		3A	0.00113	0.00195	3B	0.00147	0.00255
$1\frac{5}{8}$-18 or 1.6250-18	UNEF	2A	0.00144	0.00250	2B	0.00188	0.00325
		3A	0.00107	0.00185	3B	0.00130	0.00240
$1\frac{5}{8}$-20 or 1.6250-20	UN	2A	0.00139	0.00240	2B	0.00179	0.00310
		3A	0.00104	0.00180	3B	0.00133	0.00230
$1\frac{11}{16}$-6 or 1.6875-6	UN	2A	0.00240	0.00415	2B	0.00312	0.00540
		3A	0.00179	0.00310	3B	0.00234	0.00405
$1\frac{11}{16}$-8 or 1.6875-8	UN	2A	0.00217	0.00375	2B	0.00280	0.00485
		3A	0.00162	0.00280	3B	0.00211	0.00365
$1\frac{11}{16}$-12 or 1.6875-12	UN	2A	0.00173	0.00300	2B	0.00225	0.00390
		3A	0.00130	0.00225	3B	0.00167	0.00290
$1\frac{11}{16}$-16 or 1.6875-16	UN	2A	0.00153	0.00265	2B	0.00199	0.00345
		3A	0.00115	0.00200	3B	0.00150	0.00260
$1\frac{11}{16}$-18 or 1.6875-18	UNEF	2A	0.00147	0.00255	2B	0.00191	0.00330
		3A	0.00110	0.00190	3B	0.00141	0.00245
$1\frac{11}{16}$-20 or 1.6875-20	UN	2A	0.00139	0.00240	2B	0.00182	0.00315
		3A	0.00104	0.00180	3B	0.00136	0.00235
$1\frac{3}{4}$-5 or 1.7500-5	UNC	1A	0.00387	0.00670	1B	0.00502	0.00870
		2A	0.00257	0.00445	2B	0.00335	0.00580
		3A	0.00193	0.00335	3B	0.00251	0.00435
$1\frac{3}{4}$-6 or 1.7500-6	UN	2A	0.00240	0.00415	2B	0.00312	0.00540
		3A	0.00182	0.00315	3B	0.00234	0.00405
$1\frac{3}{4}$-8 or 1.7500-8	UN	2A	0.00217	0.00375	2B	0.00283	0.00490
		3A	0.00165	0.00285	3B	0.00214	0.00370
$1\frac{3}{4}$-12 or 1.7500-12	UN	2A	0.00173	0.00300	2B	0.00225	0.00390
		3A	0.00130	0.00225	3B	0.00167	0.00290

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
1¾-16 or 1.7500-16	UN	2A	0.00153	0.00265	2B	0.00199	0.00345
		3A	0.00115	0.00200	3B	0.00150	0.00260
1¾-20 or 1.7500-20	UN	2A	0.00139	0.00240	2B	0.00182	0.00315
		3A	0.00104	0.00180	3B	0.00136	0.00235
1 13/16-6 or 1.8125-6	UN	2A	0.00242	0.00420	2B	0.00315	0.00545
		3A	0.00182	0.00315	3B	0.00237	0.00410
1 13/16-8 or 1.8125-8	UN	2A	0.00219	0.00380	2B	0.00286	0.00495
		3A	0.00165	0.00285	3B	0.00214	0.00370
1 13/16-12 or 1.8125-12	UN	2A	0.00173	0.00300	2B	0.00225	0.00390
		3A	0.00130	0.00225	3B	0.00167	0.00290
1 13/16-16 or 1.8125-16	UN	2A	0.00153	0.00265	2B	0.00199	0.00345
		3A	0.00115	0.00200	3B	0.00150	0.00260
1 13/16-20 or 1.8125-20	UN	2A	0.00139	0.00240	2B	0.00182	0.00315
		3A	0.00104	0.00180	3B	0.00136	0.00235
1⅞-6 or 1.8750-6	UN	2A	0.00242	0.00420	2B	0.00318	0.00550
		3A	0.00182	0.00315	3B	0.00237	0.00410
1⅞-8 or 1.8750-8	UN	2A	0.00222	0.00385	2B	0.00289	0.00500
		3A	0.00165	0.00285	3B	0.00217	0.00375
1⅞-12 or 1.8750-12	UN	2A	0.00173	0.00300	2B	0.00225	0.00390
		3A	0.00130	0.00225	3B	0.00167	0.00290
1⅞-16 or 1.8750-16	UN	2A	0.00153	0.00265	2B	0.00199	0.00345
		3A	0.00115	0.00200	3B	0.00150	0.00260
1⅞-20 or 1.8750-20	UN	2A	0.00139	0.00240	2B	0.00182	0.00315
		3A	0.00104	0.001800	3B	0.00136	0.00235
1 15/16-6 or 1.9375-6	UN	2A	0.00245	0.00425	2B	0.00320	0.00555
		3A	0.00185	0.00320	3B	0.00240	0.00415
1 15/16-8 or 1.9375-8	UN	2A	0.00222	0.00385	2B	0.00289	0.00500
		3A	0.00167	0.00290	3B	0.00217	0.00375
1 15/16-12 or 1.9375-12	UN	2A	0.00176	0.00305	2B	0.00228	0.00395
		3A	0.0013	0.00225	3B	0.00170	0.00295
1 15/16-16 or 1.9375-16	UN	2A	0.00156	0.00270	2B	0.00202	0.00350
		3A	0.00115	0.00200	3B	0.00150	0.00260
1 15/16-20 or 1.9375-20	UN	2A	0.00141	0.00245	2B	0.00185	0.00320
		3A	0.00107	0.00185	3B	0.00139	0.00240
2-4½ or 2.0000-4.5	UNC	1A	0.00413	0.00715	1B	0.00537	0.00930
		2A	0.00274	0.00475	2B	0.00358	0.00620
		3A	0.00205	0.00355	3B	0.00268	0.00465

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
2-6 or 2.0000-6	UN	2A	0.00248	0.00430	2B	0.00320	0.00555
		3A	0.00185	0.00320	3B	0.00240	0.00415
2-8 or 2.0000-8	UN	2A	0.00225	0.00390	2B	0.00292	0.00505
		3A	0.00167	0.00290	3B	0.00219	0.00380
2-12 or 2.0000-12	UN	2A	0.00176	0.00305	2B	0.00223	0.00395
		3A	0.00130	0.00225	3B	0.0017	0.00295
2-16 or 2.0000-16	UN	2A	0.00156	0.00270	2B	0.00202	0.00350
		3A	0.00115	0.00200	3B	0.00150	0.00260
2-20 or 2.0000-20	UN	2A	0.00141	0.00245	2B	0.00185	0.00320
		3A	0.00107	0.00185	3B	0.00139	0.00240
2⅛-6 or 2.1250-6	UN	2A	0.00251	0.00435	2B	0.00326	0.00565
		3A	0.00188	0.00325	3B	0.00242	0.00420
2⅛-8 or 2.1250-8	UN	2A	0.00228	0.00395	2B	0.00294	0.00510
		3A	0.00170	0.00295	3B	0.00212	0.00385
2⅛-12 or 2.1250-12	UN	2A	0.00176	0.00305	2B	0.00228	0.00395
		3A	0.00130	0.00225	3B	0.00170	0.00295
2⅛-16 or 2.1250-16	UN	2A	0.00156	0.00270	2B	0.00202	0.00350
		3A	0.00115	0.00200	3B	0.00150	0.00260
2⅛-20 or 2.1250-20	UN	2A	0.00141	0.00245	2B	0.00185	0.00320
		3A	0.00107	0.00185	3B	0.00139	0.00240
2¼-4½ or 2.2500-4.5	UNC	1A	0.00421	0.00730	1B	0.00548	0.00950
		2A	0.00280	0.00485	2B	0.00364	0.00630
		3A	0.00211	0.00365	3B	0.00274	0.00475
2¼-6 or 2.2500-6	UN	2A	0.00254	0.00440	2B	0.00329	0.00570
		3A	0.00191	0.00330	3B	0.00214	0.00425
2¼-8 or 2.2500-8	UN	2A	0.00231	0.00400	2B	0.00300	0.00520
		3A	0.00173	0.00300	3B	0.00225	0.00390
2¼-12 or 2.2500-12	UN	2A	0.00176	0.00305	2B	0.00228	0.00395
		3A	0.00130	0.00225	3B	0.00170	0.00295
2¼-16 or 2.2500-16	UN	2A	0.00156	0.00270	2B	0.00202	0.00350
		3A	0.00115	0.00200	3B	0.00150	0.00260
2¼-20 or 2.2500-20	UN	2A	0.00141	0.00245	2B	0.00185	0.00320
		3A	0.00107	0.00185	3B	0.00139	0.00240
2⅜-6 or 2.3750-6	UN	2A	0.00257	0.00445	2B	0.00332	0.00575
		3A	0.00191	0.00330	3B	0.00248	0.00430
2⅜-8 or 2.3750-8	UN	2A	0.00234	0.00405	2B	0.00303	0.00525
		3A	0.00173	0.00300	3B	0.00228	0.00395

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
2 3/8-12 or 2.3750-12	UN	2A	0.00179	0.00310	2B	0.00234	0.00405
		3A	0.00133	0.00230	3B	0.00173	0.00300
2 3/8-16 or 2.3750-16	UN	2A	0.00159	0.00275	2B	0.00208	0.00360
		3A	0.00118	0.00205	3B	0.00155	0.00270
2 3/8-20 or 2.3750-20	UN	2A	0.00147	0.00255	2B	0.00191	0.00330
		3A	0.00110	0.00190	3B	0.00144	0.00250
2 1/2-4 or 2.5000-4	UNC	1A	0.00447	0.00775	1B	0.00583	0.0101
		2A	0.00300	0.00520	2B	0.0039	0.00675
		3A	0.00225	0.00390	3B	0.00292	0.00505
2 1/2-6 or 2.5000-6	UN	2A	0.00260	0.00450	2B	0.00335	0.00580
		3A	0.00193	0.00335	3B	0.00251	0.00435
2 1/2-8 or 2.5000-8	UN	2A	0.00237	0.00410	2B	0.00306	0.00530
		3A	0.00176	0.00305	3B	0.00231	0.00400
2 1/2-12 or 2.5000-12	UN	2A	0.00179	0.00310	2B	0.00234	0.00405
		3A	0.00133	0.00230	3B	0.00173	0.00300
2 1/2-16 or 2.5000-16	UN	2A	0.00159	0.00275	2B	0.00208	0.00360
		3A	0.00118	0.00205	3B	0.00156	0.00270
2 1/2-20 or 2.5000-20	UN	2A	0.00147	0.00255	2B	0.00191	0.00330
		3A	0.0011	0.00190	3B	0.00144	0.00250
2 5/8-6 or 2.6250-6	UN	2A	0.00260	0.00450	2B	0.00341	0.00590
		3A	0.00196	0.00340	3B	0.00254	0.00440
2 5/8-8 or 2.6250-8	UN	2A	0.00237	0.00410	2B	0.00309	0.00535
		3A	0.00179	0.00310	3B	0.00231	0.00400
2 5/8-12 or 2.6250-12	UN	2A	0.00179	0.00310	2B	0.00234	0.00405
		3A	0.00133	0.00230	3B	0.00173	0.00300
2 5/8-16 or 2.6250-16	UN	2A	0.00159	0.00275	2B	0.00208	0.00360
		3A	0.00118	0.00205	3B	0.00156	0.00270
2 5/8-20 or 2.6250-20	UN	2A	0.00147	0.00255	2B	0.00191	0.00330
		3A	0.00110	0.00190	3B	0.00144	0.00250
2 3/4-4 or 2.7500-4	UNC	1A	0.00456	0.00790	1B	0.00595	0.01030
		2A	0.00303	0.00525	2B	0.00395	0.00685
		3A	0.00228	0.00395	3B	0.00297	0.00515
2 3/4-6 or 2.7500-6	UN	2A	0.00263	0.00455	2B	0.00344	0.00595
		3A	0.00196	0.00340	3B	0.00257	0.00445
2 3/4-8 or 2.7500-8	UN	2A	0.00240	0.00415	2B	0.00312	0.00540
		3A	0.00182	0.00315	3B	0.00234	0.00405

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
2¾-12 or 2.7500-12	UN	2A	0.00179	0.00310	2B	0.00234	0.00405
		3A	0.00133	0.00230	3B	0.00173	0.00300
2¾-16 or 2.7500-16	UN	2A	0.00159	0.00275	2B	0.00208	0.00360
		3A	0.00118	0.00205	3B	0.00156	0.00270
2¾-20 or 2.7500-20	UN	2A	0.00147	0.00255	2B	0.00191	0.00330
		3A	0.00110	0.00190	3B	0.00144	0.00250
2⅞-6 or 2.8750-6	UN	2A	0.00266	0.00460	2B	0.00346	0.00600
		3A	0.00199	0.00345	3B	0.00280	0.00450
2⅞-8 or 2.8750-8	UN	2A	0.00242	0.00420	2B	0.00318	0.00550
		3A	0.00182	0.00315	3B	0.00237	0.00410
2⅞-12 or 2.8750-12	UN	2A	0.00182	0.00315	2B	0.00237	0.00410
		3A	0.00136	0.00235	3B	0.00179	0.00310
2⅞-16 or 2.8750-16	UN	2A	0.00162	0.00280	2B	0.00211	0.00365
		3A	0.00121	0.00210	3B	0.00159	0.00275
2⅞-20 or 2.8750-20	UN	2A	0.00150	0.00260	2B	0.00196	0.00340
		3A	0.00113	0.00195	3B	0.00147	0.00255
3-4 or 3.0000-4	UNC	1A	0.00465	0.00805	1B	0.00603	0.01045
		2A	0.00309	0.00535	2B	0.00401	0.00695
		3A	0.00231	0.00400	3B	0.00300	0.00520
3-6 or 3.0000-6	UN	2A	0.00268	0.00465	2B	0.00349	0.00605
		3A	0.00202	0.00350	3B	0.00263	0.00455
3-8 or 3.0000-8	UN	2A	0.00245	0.00425	2B	0.00320	0.00555
		3A	0.00185	0.00320	3B	0.00240	0.00415
3-12 or 3.0000-12	UN	2A	0.00182	0.00315	2B	0.00237	0.00410
		3A	0.00136	0.00235	3B	0.00179	0.00310
3-16 or 3.0000-16	UN	2A	0.00162	0.00280	2B	0.00211	0.00365
		3A	0.00121	0.00210	3B	0.00159	0.00275
3-20 or 3.0000-20	UN	2A	0.00150	0.00260	2B	0.00196	0.00340
		3A	0.00113	0.00195	3B	0.00147	0.00255
3⅛-6 or 3.1250-6	UN	2A	0.00271	0.00470	2B	0.00352	0.00610
		3A	0.00202	0.00350	3B	0.00266	0.00460
3⅛-8 or 3.1250-8	UN	2A	0.00248	0.00430	2B	0.00323	0.00560
		3A	0.00185	0.00320	3B	0.00242	0.00420
3⅛-12 or 3.1250-12	UN	2A	0.00182	0.00315	2B	0.00237	0.00410
		3A	0.00136	0.00235	3B	0.00179	0.00310
3⅛-16 or 3.1250-16	UN	2A	0.00162	0.00280	2B	0.00211	0.00365
		3A	0.00121	0.00210	3B	0.00159	0.00275

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
3¼-4 or 3.2500-4	UNC	1A	0.00471	0.00815	1B	0.00612	0.01060
		2A	0.00315	0.00545	2B	0.00407	0.00705
		3A	0.00237	0.00410	3B	0.00306	0.00530
3¼-6 or 3.2500-6	UN	2A	0.00274	0.00475	2B	0.00355	0.00615
		3A	0.00205	0.00355	3B	0.00266	0.00460
3¼-8 or 3.2500-8	UN	2A	0.00251	0.00435	2B	0.00326	0.00565
		3A	0.00188	0.00325	3B	0.00245	0.00425
3¼-12 or 3.2500-12	UN	2A	0.00182	0.00315	2B	0.00237	0.00410
		3A	0.00136	0.00235	3B	0.00179	0.00310
3¼-16 or 3.2500-16	UN	2A	0.00162	0.00280	2B	0.00211	0.00365
		3A	0.00121	0.00210	3B	0.00159	0.00275
3⅜-6 or 3.3750-6	UN	2A	0.00274	0.00475	2B	0.00358	0.00620
		3A	0.00208	0.00360	3B	0.00258	0.00465
3⅜-8 or 3.3750-8	UN	2A	0.00254	0.00440	2B	0.00329	0.00570
		3A	0.00191	0.00330	3B	0.00245	0.00425
3⅜-12 or 3.3750-12	UN	2A	0.00185	0.00320	2B	0.00242	0.00420
		3A	0.00139	0.00242	3B	0.00182	0.00315
3⅜-16 or 3.3750-16	UN	2A	0.00167	0.00290	2B	0.00217	0.00375
		3A	0.00124	0.00215	3B	0.00162	0.00280
3½-4 or 3.5000-4	UNC	1A	0.00479	0.00830	1B	0.00621	0.01075
		2A	0.00318	0.00550	2B	0.00413	0.00715
		3A	0.00240	0.00415	3B	0.00312	0.00540
3½-6 or 3.5000-6	UN	2A	0.00277	0.00480	2B	0.00361	0.00625
		3A	0.00208	0.00360	3B	0.00271	0.00470
3½-8 or 3.5000-8	UN	2A	0.00254	0.00440	2B	0.00332	0.00575
		3A	0.00191	0.00330	3B	0.00248	0.00430
3½-12 or 3.5000-12	UN	2A	0.00185	0.00320	2B	0.00242	0.00420
		3A	0.00139	0.00240	3B	0.00182	0.00315
3½-16 or 3.5000-16	UN	2A	0.00167	0.00290	2B	0.00217	0.00375
		3A	0.00124	0.00215	3B	0.00162	0.00280
3⅝-6 or 3.6250-6	UN	2A	0.00280	0.00485	2B	0.00364	0.00630
		3A	0.00211	0.00365	3B	0.00274	0.00475
3⅝-8 or 3.6250-8	UN	2A	0.00257	0.00445	2B	0.00335	0.00580
		3A	0.00193	0.00335	3B	0.00251	0.00435
3⅝-12 or 3.6250-12	UN	2A	0.00185	0.00320	2B	0.00242	0.00420
		3A	0.00139	0.00240	3B	0.00182	0.00315

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
$3\frac{5}{8}$-16 or 3.6250-16	UN	2A	0.00167	0.00290	2B	0.00217	0.00375
		3A	0.00214	0.00215	3B	0.00162	0.00280
$3\frac{3}{4}$-4 or 3.7500-4	UNC	1A	0.00485	0.00840	1B	0.00629	0.01090
		2A	0.00323	0.00560	2B	0.00419	0.00725
		3A	0.00242	0.00420	3B	0.00315	0.00545
$3\frac{3}{4}$-6 or 3.7500-6	UN	2A	0.00283	0.00490	2B	0.00367	0.00635
		3A	0.00211	0.00365	3B	0.00274	0.00475
$3\frac{3}{4}$-8 or 3.7500-8	UN	2A	0.00260	0.00450	2B	0.00338	0.00585
		3A	0.00193	0.00335	3B	0.00254	0.00440
$3\frac{3}{4}$-12 or 3.7500-12	UN	2A	0.00185	0.00320	2B	0.00242	0.00420
		3A	0.00139	0.00240	3B	0.00182	0.00315
$3\frac{3}{4}$-16 or 3.7500-16	UN	2A	0.00167	0.00290	2B	0.00217	0.00375
		3A	0.00124	0.00215	3B	0.00162	0.00280
$3\frac{7}{8}$-6 or 3.8750-6	UN	2A	0.00286	0.00495	2B	0.00369	0.00640
		3A	0.00214	0.00370	3B	0.00277	0.00480
$3\frac{7}{8}$-8 or 3.8750-8	UN	2A	0.00263	0.00455	2B	0.00341	0.00590
		3A	0.00196	0.00340	3B	0.00254	0.00440
$3\frac{7}{8}$-12 or 3.8750-12	UN	2A	0.00188	0.00325	2B	0.00245	0.00425
		3A	0.00141	0.00245	3B	0.00185	0.00320
$3\frac{7}{8}$-16 or 3.8750-16	UN	2A	0.00170	0.00295	2B	0.00219	0.00380
		3A	0.00127	0.00220	3B	0.00165	0.00285
4-4 or 4.0000-4	UNC	1A	0.00491	0.00850	1B	0.00638	0.01105
		2A	0.00326	0.00565	2B	0.00424	0.00735
		3A	0.00245	0.00425	3B	0.00320	0.00555
4-6 or 4.0000-6	UN	2A	0.00286	0.00495	2B	0.00372	0.00645
		3A	0.00214	0.00370	3B	0.00280	0.00485
4-8 or 4.0000-8	UN	2A	0.00263	0.00455	2B	0.00344	0.00595
		3A	0.00196	0.00340	3B	0.00257	0.00445
4-12 or 4.0000-12	UN	2A	0.00188	0.00325	2B	0.00245	0.00425
		3A	0.00141	0.00245	3B	0.00185	0.00320
4-16 or 4.0000-16	UN	2A	0.00170	0.00295	2B	0.00219	0.00380
		3A	0.00127	0.00220	3B	0.00165	0.00285
$4\frac{1}{8}$-6 or 4.1250-6	UN	2A	0.00289	0.00500	2B	0.00375	0.00650
		3A	0.00217	0.00375	3B	0.00280	0.00485
$4\frac{1}{8}$-8 or 4.1250-8	UN	2A	0.00266	0.00460	2B	0.00346	0.00600
		3A	0.00199	0.00345	3B	0.00260	0.00450

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
4 1/8-12 or 4.1250-12	UN	2A	0.00188	0.00325	2B	0.00245	0.00425
		3A	0.00141	0.00245	3B	0.00185	0.00320
4 1/8-16 or 4.1250-16	UN	2A	0.00170	0.00295	2B	0.00219	0.00380
		3A	0.00127	0.00220	3B	0.00165	0.00285
4 1/4-4 or 4.2500-4	UN	2A	0.00332	0.00575	2B	0.00430	0.00745
		3A	0.00248	0.00430	3B	0.00323	0.00560
4 1/4-6 or 4.2500-6	UN	2A	0.00292	0.00505	2B	0.00378	0.00655
		3A	0.00217	0.00375	3B	0.00283	0.00490
4 1/4-8 or 4.2500-8	UN	2A	0.00268	0.00465	2B	0.00346	0.00600
		3A	0.00202	0.00350	3B	0.00263	0.00455
4 1/4-12 or 4.2500-12	UN	2A	0.00188	0.00325	2B	0.00245	0.00425
		3A	0.00141	0.00245	3B	0.00185	0.00320
4 1/4-16 or 4.2500-16	UN	2A	0.00170	0.00295	2B	0.00219	0.00380
		3A	0.00127	0.00220	3B	0.00165	0.00285
4 3/8-6 or 4.3750-6	UN	2A	0.00292	0.00505	2B	0.00381	0.00660
		3A	0.00219	0.00380	3B	0.00286	0.00495
4 3/8-8 or 4.3750-8	UN	2A	0.00268	0.00465	2B	0.00346	0.00600
		3A	0.00202	0.00350	3B	0.00263	0.00455
4 3/8-12 or 4.3750-12	UN	2A	0.00188	0.00325	2B	0.00245	0.00425
		3A	0.00141	0.00245	3B	0.00185	0.00320
4 3/8-16 or 4.3750-16	UN	2A	0.00170	0.00295	2B	0.00219	0.00380
		3A	0.00127	0.00220	3B	0.00165	0.00285
4 1/2-4 or 4.5000-4	UN	2A	0.00335	0.00580	2B	0.00436	0.00755
		3A	0.00251	0.00435	3B	0.00326	0.00565
4 1/2-6 or 4.5000-6	UN	2A	0.00294	0.00510	2B	0.00384	0.00665
		3A	0.00222	0.00385	3B	0.00286	0.00495
4 1/2-8 or 4.5000-8	UN	2A	0.00271	0.00470	2B	0.00352	0.00610
		3A	0.00205	0.00355	3B	0.00266	0.00460
4 1/2-12 or 4.5000-12	UN	2A	0.00188	0.00325	2B	0.00245	0.00425
		3A	0.00141	0.00245	3B	0.00185	0.00320
4 1/2-16 or 4.5000-16	UN	2A	0.00170	0.00295	2B	0.00219	0.00380
		3A	0.00127	0.00220	3B	0.00165	0.00285
4 5/8-6 or 4.6250-6	UN	2A	0.00297	0.00515	2B	0.00384	0.00665
		3A	0.00222	0.00385	3B	0.00289	0.00500
4 5/8-8 or 4.6250-8	UN	2A	0.00274	0.00475	2B	0.00358	0.00620
		3A	0.00205	0.00355	3B	0.00268	0.00465

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
$4\frac{5}{8}$-12 or 4.6250-12	UN	2A	0.00193	0.00335	2B	0.00251	0.00435
		3A	0.00144	0.00250	3B	0.00191	0.00330
$4\frac{5}{8}$-16 or 4.6250-16	UN	2A	0.00176	0.00305	2B	0.00228	0.00395
		3A	0.00130	0.00225	3B	0.00170	0.00295
$4\frac{3}{4}$-4 or 4.7500-4	UN	2A	0.00338	0.00585	2B	0.00442	0.00765
		3A	0.00254	0.00440	3B	0.00329	0.00570
$4\frac{3}{4}$-6 or 4.7500-6	UN	2A	0.00297	0.00515	2B	0.00387	0.00670
		3A	0.00222	0.00385	3B	0.00292	0.00505
$4\frac{3}{4}$-8 or 4.7500-8	UN	2A	0.00274	0.00475	2B	0.00358	0.00620
		3A	0.00205	0.00355	3B	0.00268	0.00465
$4\frac{3}{4}$-12 or 4.7500-12	UN	2A	0.00193	0.00335	2B	0.00251	0.00435
		3A	0.00144	0.00250	3B	0.00191	0.00330
$4\frac{3}{4}$-16 or 4.7500-16	UN	2A	0.00176	0.00305	2B	0.00228	0.00395
		3A	0.00130	0.00225	3B	0.00170	0.00295
$4\frac{7}{8}$-6 or 4.8750-6	UN	2A	0.00300	0.00520	2B	0.00390	0.00675
		3A	0.00225	0.00390	3B	0.00292	0.00505
$4\frac{7}{8}$-8 or 4.8750-8	UN	2A	0.00277	0.00480	2B	0.00361	0.00625
		3A	0.00208	0.00360	3B	0.00271	0.00470
$4\frac{7}{8}$-12 or 4.8750-12	UN	2A	0.00193	0.00335	2B	0.00251	0.00435
		3A	0.00144	0.00250	3B	0.00101	0.00330
$4\frac{7}{8}$-16 or 4.8750-16	UN	2A	0.00176	0.00305	2B	0.00228	0.00395
		3A	0.00130	0.00225	3B	0.00170	0.00295
5-4 or 5.0000-4	UN	2A	0.00344	0.00595	2B	0.00445	0.00770
		3A	0.00257	0.00445	3B	0.00335	0.00580
5-6 or 5.0000-6	UN	2A	0.00303	0.00525	2B	0.00393	0.00680
		3A	0.00225	0.00390	3B	0.00294	0.00510
5-8 or 5.0000-8	UN	2A	0.00280	0.00485	2B	0.00364	0.00630
		3A	0.00211	0.00365	3B	0.00274	0.00475
5-12 or 5.0000-12	UN	2A	0.00193	0.00335	2B	0.00251	0.00435
		3A	0.00144	0.00250	3B	0.00191	0.00330
5-16 or 5.0000-16	UN	2A	0.00176	0.00305	2B	0.00228	0.00305
		3A	0.00130	0.00225	3B	0.00170	0.00295
$5\frac{1}{8}$-8 or 5.1250-8	UN	2A	0.00280	0.00485	2B	0.00364	0.00630
		3A	0.00211	0.00365	3B	0.00274	0.00475
$5\frac{1}{8}$-12 or 5.1250-12	UN	2A	0.00193	0.00335	2B	0.00251	0.00435
		3A	0.00144	0.00250	3B	0.00191	0.00330

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
5 1/8-16 or 5.1250-16	UN	2A	0.00176	0.00305	2B	0.00228	0.00395
		3A	0.00130	0.00225	3B	0.00170	0.00295
5 1/4-4 or 5.2500-4	UN	2A	0.00346	0.00600	2B	0.00450	0.00780
		3A	0.00260	0.00450	3B	0.00385	0.00585
5 1/4-8 or 5.2500-8	UN	2A	0.00283	0.00490	2B	0.00367	0.00635
		3A	0.00214	0.00370	3B	0.00277	0.00480
5 1/4-12 or 5.2500-12	UN	2A	0.00193	0.00335	2B	0.00251	0.00435
		3A	0.00144	0.00250	3B	0.00191	0.00330
5 1/4-16 or 5.2500-16	UN	2A	0.00176	0.00305	2B	0.00228	0.00395
		3A	0.00130	0.00225	3B	0.00170	0.00295
5 3/8-8 or 5.3750-8	UN	2A	0.00286	0.00495	2B	0.00372	0.00645
		3A	0.00214	0.00370	3B	0.00280	0.00485
5 3/8-12 or 5.3750-12	UN	2A	0.00193	0.00335	2B	0.00251	0.00435
		3A	0.00144	0.00250	3B	0.00191	0.00330
5 3/8-16 or 5.3750-16	UN	2A	0.00176	0.00305	2B	0.00231	0.00395
		3A	0.00130	0.00225	3B	0.00170	0.00295
5 1/2-4 or 5.5000-4	UN	2A	0.00349	0.00605	2B	0.00456	0.00790
		3A	0.00263	0.00455	3B	0.00341	0.00500
5 1/2-8 or 5.5000-8	UN	2A	0.00286	0.00495	2B	0.00372	0.00645
		3A	0.00214	0.00370	3B	0.00280	0.00485
5 1/2-12 or 5.5000-12	UN	2A	0.00193	0.00335	2B	0.00251	0.00435
		3A	0.00144	0.00250	3B	0.00191	0.00330
5 1/2-16 or 5.5000-16	UN	2A	0.00176	0.00305	2B	0.00228	0.00395
		3A	0.00130	0.00225	3B	0.00170	0.00295
5 5/8-8 or 5.6250-8	UN	2A	0.00289	0.00500	2B	0.00375	0.00650
		3A	0.00217	0.00375	3B	0.00283	0.00490
5 5/8-12 or 5.6250-12	UN	2A	0.00199	0.00345	2B	0.00260	0.00450
		3A	0.00150	0.00260	3B	0.00193	0.00335
5 5/8-16 or 5.6250-16	UN	2A	0.00179	0.00310	2B	0.00234	0.00405
		3A	0.00136	0.00235	3B	0.00176	0.00305
5 3/4-4 or 5.7500-4	UN	2A	0.00352	0.00610	2B	0.00459	0.00795
		3A	0.00266	0.00460	3B	0.00344	0.00595
5 3/4-8 or 5.7500-8	UN	2A	0.00289	0.00500	2B	0.00375	0.00650
		3A	0.00217	0.00375	3B	0.00283	0.00490
5 3/4-12 or 5.7500-12	UN	2A	0.00199	0.00345	2B	0.00260	0.00450
		3A	0.00150	0.00260	3B	0.00193	0.00335

Table 3
Allowable Variations in Lead and Equivalent Change in Functional Diameter (Cont'd)

		External			Internal		
Nominal Size and Threads/in.	Series Designation	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}Td_2$ (+)	Class	Allowable Variation in Lead, in. (±)	Equivalent Change in Functional Diameter, in., $\frac{1}{2}TD_2$ (−)
1	2	3	4	5	6	7	8
$5\frac{3}{4}$-16 or 5.7500-16	UN	2A	0.00179	0.00310	2B	0.00234	0.00405
		3A	0.00136	0.00235	3B	0.00176	0.00305
$5\frac{7}{8}$-8 or 5.8750-8	UN	2A	0.00292	0.00505	2B	0.00378	0.00655
		3A	0.00219	0.00380	3B	0.00283	0.00490
$5\frac{7}{8}$-12 or 5.8750-12	UN	2A	0.00199	0.00345	2B	0.00260	0.00450
		3A	0.00150	0.00260	3B	0.00193	0.00335
$5\frac{7}{8}$-16 or 5.8750-16	UN	2A	0.00179	0.00310	2B	0.00234	0.00405
		3A	0.00136	0.00235	3B	0.00176	0.00305
6-4 or 6.0000-4	UN	2A	0.00358	0.00620	2B	0.00455	0.00805
		3A	0.00268	0.00465	3B	0.00346	0.00600
6-8 or 6.0000-8	UN	2A	0.00294	0.00510	2B	0.00384	0.00665
		3A	0.00222	0.00385	3B	0.00286	0.00495
6-12 or 6.0000-12	UN	2A	0.00199	0.00315	2B	0.00260	0.00450
		3A	0.00150	0.00260	3B	0.00193	0.00335
6-16 or 6.0000-16	UN	2A	0.00179	0.00310	2B	0.00234	0.00405
		3A	0.00136	0.00235	3B	0.00176	0.00305

GENERAL NOTE: See paras. 9.2.2 through 9.2.5 for applicability.

5.6.1 The principal practical factors that govern minor diameter tolerance are ease of tapping, standard drill sizes, and height of engagement.

NOTE: Height of engagement is measured in a radial direction, while length of engagement is measured in an axial direction.

Height of engagement correlates with the stripping strength of the thread assembly and, therefore, with the length of engagement. It also correlates with the tendency toward disengagement of the threads on one side when assembly is eccentric. The amount of possible eccentricity is one-half of the sum of the allowance and pitch diameter tolerances on both mating threads. For a given pitch, or height of thread, this sum increases with the diameter and, accordingly, this factor would require a decrease in minor diameter tolerance with an increase in thread diameter. However, such a decrease in tolerance often is not feasible without requiring special drill sizes; in order to better accommodate available standard drill sizes listed in ASME B94.11M, the minor diameter tolerance for Classes 1B and 2B of a given pitch for $\frac{1}{4}$-in. diameter and larger is constant.

There may be applications where the lengths of engagement of the mating threads or the combination of materials used for mating threads are such that the maximum tolerance may not provide the desired strength of the fastening. Experience has shown that for lengths of engagement less than $0.67D$ (the minimum thickness of standard nuts), the minor diameter tolerance may be reduced without causing tapping difficulties.

In other applications, the length of engagement of mating threads may be long because of design considerations or the combination of materials used for mating threads. As the threads engaged increase in number, their height of engagement may be shallower and still develop stripping strength greater than the external thread breaking strength. In these cases, the maximum limit should be increased to reduce the possibility of tapping difficulties.

It is particularly important to reduce the number of minor diameter tolerances to a practical minimum. This reduction is usually obvious to the producer of longer internally threaded components, but sometimes is not understood by the user.

The tolerances for lengths of engagement less than $0.33D$ are 0.50 times the formula values in para. 5.8.2(c). For lengths of engagement from $0.33D$ to $0.67D$, the tolerances are 0.75 times the formula values; for lengths of engagement from $0.67D$ to $1.5D$, the tolerances are equal to the formula values; and for lengths of engagement over $1.5D$, the tolerances are 1.25 times the formula values. Where the tolerance value so computed is more than $0.39400P$, the value is adjusted to equal $0.39400P$.

5.7 Disposition of Allowance and Tolerance

The disposition of allowance, tolerance, and crest clearances for the various thread classes is shown in Figures 5 through 8, 10, and 11.

5.8 Formulas for Allowance and Tolerance

The following formulas for allowance, *es*, and tolerance are used for unified formulation and apply to standard and special series screw threads.

Calculations shall use Class 2A pitch diameter tolerance, Td_2, with six decimal places. Final values shall be rounded to four decimal places.

The following nomenclature is used in the equations:

D = diameter
es = allowance, external threads
H = height of fundamental triangle
= $0.86602540P$
LE = length of engagement, in.
n = threads per inch
P = pitch, in.
= $1/n$
TD = major diameter tolerance, internal thread
Td = major diameter tolerance, external thread
TD_1 = minor diameter tolerance, internal thread
Td_1 = minor diameter tolerance, external thread
TD_2 = pitch diameter tolerance, internal thread
Td_2 = pitch diameter tolerance, external thread

5.8.1 External Thread

(a) Allowance (External Threads)

(1) for Classes 1A and 2A[1]

$$es = 0.300 \times \text{Class 2A } Td_2$$

(2) for Class 3A, there is no allowance

(b) Major Diameter Tolerance (External Threads)

(1) for Class 1A

$$Td = 0.0900\ \sqrt[3]{P^2}$$

(2) for Classes 2A and 3A

$$Td = 0.0600\ \sqrt[3]{P^2}$$

(c) Pitch Diameter Tolerance (External Threads)

(1) for Class 1A[1]

$$Td_2 = 1.5000 \times \text{Class 2A } Td_2$$

(2) for Class 2A

$$Td_2 = 0.0015\ \sqrt[3]{D}\ + 0.0015\ \sqrt{LE}\ + 0.0150\ \sqrt[3]{P^2}$$

NOTE: See Table 4 for the values of these terms corresponding to given values of diameter and length of engagement.

(3) for Class 3A[1]

$$Td_2 = 0.7500 \times \text{Class 2A } Td_2$$

(d) Minor Diameter Tolerance (External Threads)

(1) for UNR classes, to intersection of rounded root with its centerline (see Figures 7 and 8),

$$Td_1 = Td_2 \text{ for class of thread specified} + 0.10825318P$$

(see Table 5)

(2) for UN Classes 1A, 2A, and 3A, to intersection of flat root with flanks of threads (see Figures 5 and 6), threads

$$Td_1 = Td_2 \text{ for class of thread specified} + 0.21650635P$$

(see Table 5)

(3) for UNJ Classes 2A and 3A, see Figures 7 and 8, para. 8.3.1(f), and Table 5

5.8.2 Internal Thread

(a) Major Diameter Tolerance (Internal Threads) for Classes 1B, 2B, and 3B

$$TD = 0.14433757 + TD_2 \text{ of the class of thread under consideration}$$

(see Table 5)

(b) Pitch Diameter Tolerance (Internal Threads)

(1) for Class 1B[1]

$$TD_2 = 1.9500 \times \text{Class 2A } Td_2$$

(2) for Class 2B[1]

$$TD_2 = 1.3000 \times \text{Class 2A } Td_2$$

[1] Calculations shall use Class 2A pitch diameter tolerance, Td_2, with six decimal places. Final values shall be rounded to four decimal places.

(3) for Class 3B[1]

$$TD_2 = 0.9750 \times \text{Class 2A } Td_2$$

(c) *Minor Diameter Tolerance (Internal Threads)*

(1) for UN Classes 1B and 2B

(-a) for all thread series and special threads in sizes less than ¼ in.

$$Td_1 = \left(0.0500\sqrt[3]{P^2} + 0.030 - P/D\right) - 0.002 \text{ in.}$$

within the following limitations:[2]

(-1) tolerances shall not be greater than $0.39400P$

(-2) tolerances shall not be less than $0.2500P - 0.400P^2$

The formulas are suitable for general applications having lengths of engagement up to 1.5 diameters.

(-b) for all thread series and special threads ¼ in. and larger with

(-1) 80 threads/in. to 4 threads/in., inclusive

$$TD_1 = 0.2500P - 0.400P^2$$

(-2) less than 4 threads/in.

$$TD_1 = 0.1500P$$

(2) for UNJ, Class 2B

(-a) 13 threads/in. and finer

$$TD_1 = \left(0.0500\sqrt[3]{P^2} + 0.0300P/D\right) - 0.002 \text{ in.}$$

within the following limitations:[2]

(-1) tolerances shall not be greater than $0.25980762P$

(-2) tolerances shall not be less than $0.13531647P$

(-b) 12 threads/in. and coarser

$$TD_1 = 0.1200P$$

The formulas are suitable for general applications having lengths of engagement up to 1.5 diameters.

(3) for UN, Class 3B

(-a) for all thread series

$$TD_1 = \left(0.0500\sqrt[3]{P^2} + 0.0300P/D\right) - 0.002 \text{ in.}$$

within the following limitations:[2]

(-1) tolerance shall be not greater than $0.39400P$

(-2) tolerance shall be not less than

(+a) for 80 threads/in. to 13 threads/in., inclusive, $0.2300P - 1.500P^2$

(+b) for 12 threads/in. and coarser, $0.1200P$

The formulas are suitable for general applications having lengths of engagement up to 1.5 diameters.

(4) for UNJ, Class 3B

(-a) 13 threads/in. and finer

$$TD_1 = \left(0.0500\sqrt[3]{P^2} + 0.0300P/D\right) - 0.002 \text{ in.}$$

within the following limitations:[2]

(-1) tolerances shall not be greater than $0.25980762P$

(-2) tolerances shall not be less than $0.13531647P$

(-b) 12 threads/in. and coarser

$$TD_1 = 0.1200P$$

5.9 Lead and Flank Angle Tolerances

See section 9.

5.10 Coated or Plated Threads

See section 7 for dimensional accommodation and limits for coated threads.

5.11 Circular Runout

5.11.1 Circular Runout Is the Full Indicator Movement (FIM) (See ASME Y14.5). Runout of the crest (minor diameter of internal thread or major diameter of external thread) relative to the functional diameter cylinder shall not be so great that the basic profile is transgressed.

5.11.2 Internal Thread. Maximum runout, which will maintain the crest inside the basic thread profile, is the difference between the measured minor diameter and the basic minor diameter. An out-of-round functional diameter cylinder may reduce the available runout.

5.11.3 External Thread. Maximum runout, which will maintain the crest inside the basic thread profile, is the difference between the measured major diameter and the basic major diameter. An out-of-round functional diameter cylinder may reduce the available runout.

[2] Six-decimal-place values are used for the comparison of limitation values to the calculated TD_1 value; then the final determination is rounded to four places.

Table 4
Increments in Pitch Diameter Tolerance — Class 2A
(PD Tolerance = 0.0015 $\sqrt[3]{D}$ + 0.0015$\sqrt{LE}$ + 0.015 $\sqrt[3]{P^2}$)

D	Increments in Td_2 0.0015 $\sqrt[3]{D}$	D	Increments in Td_2 due to D 0.0015 $\sqrt[3]{D}$	$1D$ for sizes	$9P$ for TPI	$20P$ for TPI	LE	Increments in Td_2 due to LE 0.0015 $\sqrt{LE}$	$1D$ for sizes	$9P$ for TPI	$20P$ for TPI	LE	Increments in Td_2 due to LE 0.0015 $\sqrt{LE}$	$1D$ for sizes	$20P$ for TPI	LE	Increments in Td_2 due to LE 0.0015 $\sqrt{LE}$	TPI	Increments in Td_2 due to TPI 0.015 $\sqrt[3]{P^2}$
0.0600	0.000587	1.9375	0.001870	0	...	...	0.060000	0.000367	1/2	18	40	0.500000	0.001061	2 3/8	...	2.375000	0.002312	80	0.000808
0.0625	0.000595	2.0000	0.001890	1/16	...	...	0.062500	0.000375	...	...	36	0.555556	0.001118	2 1/2	8	2.500000	0.002372	72	0.000867
0.0730	0.000627	2.1250	0.001928	#1	...	...	0.073000	0.000405	9/16	16	...	0.562500	0.001125	2 5/8	...	2.625000	0.002430	64	0.000938
0.0860	0.000662	2.2500	0.001966	5/64	...	...	0.078125	0.000419	5/8	...	32	0.625000	0.001186	2 3/4	...	2.750000	0.002487	60	0.000979
0.0938	0.000682	2.3750	0.002001	#2	...	...	0.086000	0.000440	...	14	...	0.642857	0.001203	...	7	2.857143	0.002535	56	0.001025
0.0990	0.000694	2.5000	0.002036	3/32	...	...	0.093800	0.000459	11/16	...	...	0.687500	0.001244	2 7/8	...	2.875000	0.002543	50	0.001105
0.1120	0.000723	2.6250	0.002069	#3	...	...	0.099000	0.000472	...	13	...	0.692308	0.001248	3	...	3.000000	0.002598	48	0.001136
0.1250	0.000750	2.7500	0.002102	7/64	...	...	0.109400	0.000496	...	...	28	0.714286	0.001268	3 1/8	...	3.125000	0.002652	44	0.001204
0.1380	0.000775	2.8750	0.002133	#4	...	...	0.112000	0.000502	...	...	27	0.740741	0.001291	3 1/4	...	3.250000	0.002704	42	0.001241
0.1640	0.000821	3.0000	0.002163	...	80	...	0.112500	0.000503	3/4	12	...	0.750000	0.001299	...	6	3.333333	0.002739	40	0.001282
0.1875	0.000859	3.1250	0.002193	#5	72	...	0.125000	0.000530	...	11.5	...	0.782609	0.001327	3 3/8	...	3.375000	0.002756	36	0.001376
0.1900	0.000862	3.2500	0.002222	#6	...	...	0.138000	0.000557	13/16	...	...	0.812500	0.001352	3 1/2	...	3.500000	0.002806	34	0.001429
0.2160	0.000900	3.3750	0.002250	...	64	...	0.140625	0.000563	...	11	...	0.818182	0.001357	3 5/8	...	3.625000	0.002856	32	0.001488
0.2500	0.000945	3.5000	0.002277	5/32	...	...	0.156300	0.000593	...	...	24	0.833333	0.001369	3 3/4	...	3.750000	0.002905	30	0.001554
0.3125	0.001018	3.6250	0.002304	...	56	...	0.160714	0.000601	7/8	...	...	0.875000	0.001403	3 7/8	...	3.875000	0.002953	28	0.001627
0.3750	0.001082	3.7500	0.002330	#8	...	...	0.164000	0.000607	...	10	...	0.900000	0.001423	4	5	4.000000	0.003000	27	0.001667
0.4375	0.001139	3.8750	0.002356	11/64	...	...	0.171900	0.000622	15/16	...	...	0.937500	0.001452	4 1/8	...	4.125000	0.003047	26	0.001709
0.5000	0.001191	4.0000	0.002381	3/16	48	...	0.187500	0.000650	1"	9	20	1.000000	0.001500	4 1/4	...	4.250000	0.003092	24	0.001803
0.5625	0.001238	4.1250	0.002406	#10	...	...	0.190000	0.000654	1 1/16	...	...	1.062500	0.001546	4 3/8	...	4.375000	0.003137	22	0.001910
0.6250	0.001282	4.2500	0.002430	13/64	...	...	0.203100	0.000676	...	...	18	1.111111	0.001581	...	4.5	4.444444	0.003162	20	0.002036
0.6875	0.001324	4.3750	0.002453	...	44	...	0.204545	0.000678	1 1/8	8	...	1.125000	0.001591	4 1/2	...	4.500000	0.003182	18	0.002184
0.7500	0.001363	4.5000	0.002476	#12	...	...	0.216000	0.000697	1 3/16	...	...	1.187500	0.001635	4 5/8	...	4.625000	0.003226	16	0.002362
0.8125	0.001400	4.6250	0.002499	7/32	...	...	0.218800	0.000702	1 1/4	...	16	1.250000	0.001677	4 3/4	...	4.750000	0.003269	14	0.002582
0.8750	0.001435	4.7500	0.002521	...	40	...	0.225000	0.000712	...	7	...	1.285714	0.001701	4 7/8	...	4.875000	0.003312	13	0.002713
0.9375	0.001468	4.8750	0.002543	15/64	...	...	0.234400	0.000726	1 5/16	...	...	1.312500	0.001718	5	4	5.000000	0.003354	12	0.002862
1.0000	0.001500	5.0000	0.002565	1/4	36	80	0.250000	0.000750	1 3/8	...	...	1.375000	0.001759	5 1/8	...	5.125000	0.003396	11.5	0.002944
1.0625	0.001531	5.1250	0.002586	17/64	...	...	0.265600	0.000773	...	...	14	1.428571	0.001793	5 1/4	...	5.250000	0.003437	11	0.003033
1.1250	0.001560	5.2500	0.002607	...	...	72	0.277778	0.000791	1 7/16	...	...	1.437500	0.001798	5 3/8	...	5.375000	0.003478	10	0.003232
1.1875	0.001588	5.3750	0.002628	...	32	...	0.281250	0.000795	1 1/2	6	...	1.500000	0.001837	5 1/2	...	5.500000	0.003518	9	0.003467
1.2500	0.001616	5.5000	0.002648	19/64	...	...	0.296900	0.000817	...	...	13	1.538462	0.001861	5 5/8	...	5.625000	0.003558	8	0.003750

Table 4
Increments in Pitch Diameter Tolerance — Class 2A
(PD Tolerance = 0.0015 $\sqrt[3]{D}$ + 0.0015$\sqrt{LE}$ + 0.015 $\sqrt[3]{P^2}$) (Cont'd)

D	Increments in Td_2 0.0015 $\sqrt[3]{D}$	*D*	Increments in Td_2 due to *D* 0.0015 $\sqrt[3]{D}$	1*D* for sizes	9*P* for TPI	20-*P* for TPI	*LE*	Increments in Td_2 due to *LE* 0.0015 $\sqrt{LE}$	1*D* for sizes	9*P* for TPI	20*P* for TPI	*LE*	Increments in Td_2 due to *LE* 0.0015 $\sqrt{LE}$	1*D* for sizes	20*P* for TPI	*LE*	Increments in Td_2 due to *LE* 0.0015 $\sqrt{LE}$	TPI	Increments in Td_2 due to TPI 0.015 $\sqrt[3]{P^2}$
1.3125	0.001642	5.6250	0.002668	5⁄16	...	64	0.312500	0.000839	1 9⁄16	...	...	1.562500	0.001875	5 3⁄4	...	5.750000	0.003597	7	0.004099
1.3750	0.001668	5.7500	0.002687	...	28	...	0.321429	0.000850	1 5⁄8	...	...	1.625000	0.001912	5 7⁄8	...	5.875000	0.003636	6	0.004543
1.4375	0.001693	5.8750	0.002707	21⁄64	...	...	0.328100	0.000859	...	...	12	1.666667	0.001936	6	...	6.000000	0.003674	5.5	0.004814
1.5000	0.001717	6.0000	0.002726	...	27	60	0.333333	0.000866	1 11⁄16	...	...	1.687500	0.001949	6 1⁄2	...	6.500000	0.003824	5	0.005130
1.5625	0.001741	7.0000	0.002869	11⁄32	...	...	0.343800	0.000880	...	...	11.5	1.739130	0.001978	7	...	7.000000	0.003969	4.5	0.005503
1.6250	0.001764	8.0000	0.003000	...	...	56	0.357143	0.000896	1 3⁄4	...	...	1.750000	0.001984	7 1⁄2	...	7.500000	0.004108	4	0.005953
1.6875	0.001786	9.0000	0.003120	23⁄64	...	...	0.359400	0.000899	...	5	...	1.800000	0.002012	8	...	8.000000	0.004243	...	...
1.7500	0.001808	10.00-00	0.003232	3⁄8	24	...	0.375000	0.000919	1 13⁄16	...	...	1.812500	0.002019	8 1⁄2	...	8.500000	0.004373	...	...
1.8125	0.001829	12.00-00	0.003434	25⁄64	...	...	0.390600	0.000937	...	...	11	1.818182	0.002023	9	...	9.000000	0.004500	...	...
1.8750	0.001850	14.00-00	0.003615	13⁄32	...	...	0.406300	0.000956	1 7⁄8	...	...	1.875000	0.002054	9 1⁄2	...	9.500000	0.004623	...	...
...	...	16.00-00	0.003780	...	...	48	0.416667	0.000968	1 15⁄16	...	...	1.937500	0.002088	10	...	10.000000	0.004743	...	...
...	...	18.00-00	0.003931	27⁄64	...	...	0.421900	0.000974	2	4.5	10	2.000000	0.002121	10 1⁄2	...	10.500000	0.004861	...	...
...	...	20.00-00	0.004072	7⁄16	...	...	0.437500	0.000992	2 1⁄8	...	...	2.125000	0.002187	11	...	11.000000	0.004975	...	...
...	...	24.00-00	0.004327	...	20	...	0.450000	0.001006	...	...	9	2.222222	0.002236	11 1⁄2	...	11.500000	0.005087	...	...
...	...			...	...	44	0.454545	0.001011	2 1⁄4	4		2.250000	0.002250	12	...	12.000000	0.005196	...	...

Legend:
D = diameter
LE = length of engagement
P = pitch
Td_2 = pitch diameter tolerance, external
TPI = threads per inch

NOTE: (1) For example: *LE* = 0.5000 is equivalent to one diameter for the ½ in. size, 9 pitches for 18 threads per inch, or 20 pitches for 40 threads per inch.

Table 5
Basic Profile and Constants for Calculation Formulas of Thread Dimensions, in.

Reference Only [Note (1)]		0.1250H	0.1443H	0.1667H	0.17333333H	0.1875H
Threads/in.	Pitch, $P = 1/n$	UN/UNJ Truncation of Internal Thread Root and External Thread Crest, $f_{rn} = f_{es} =$ 0.10825318P	UN/UNJ Flat at Internal Thread Root and External Thread Crest, $F_{rn} = F_{cs} = P/8 =$ 0.12500000P	UN/UNR External Thread Root Full Radius, Max., $r_{rs} =$ 0.14433757P	UNJ Min. External Thread Root Radius, r min. = 0.15011107P	Truncation of UNR Design Profile External Thread Root and Half Addendum of UNR/UNJ External Thread, $S_{rs} =$ 0.16237976P
1	2	3 [Note (2)]	4	5	6	7
80	0.01250000	0.001353	0.001563	0.001804	0.0019	0.002030
72	0.01388889	0.001504	0.001736	0.002005	0.0021	0.002255
64	0.01562500	0.001691	0.001953	0.002255	0.0023	0.002537
56	0.01785714	0.001933	0.002232	0.002577	0.0027	0.002900
48	0.02083333	0.002255	0.002604	0.003007	0.0031	0.003383
44	0.02272727	0.002460	0.002841	0.003280	0.0034	0.003690
40	0.02500000	0.002706	0.003125	0.003608	0.0038	0.004059
36	0.02777778	0.003007	0.003472	0.004009	0.0042	0.004511
32	0.03125000	0.003383	0.003906	0.004511	0.0047	0.005074
28	0.03571429	0.003866	0.004464	0.005155	0.0054	0.005799
27	0.03703704	0.004009	0.004630	0.005346	0.0056	0.006014
24	0.04166667	0.004511	0.005208	0.006014	0.0063	0.006766
20	0.05000000	0.005413	0.006250	0.007217	0.0075	0.008119
18	0.05555556	0.006014	0.006944	0.008019	0.0083	0.009021
16	0.06250000	0.006766	0.007813	0.009021	0.0094	0.010149
14	0.07142857	0.007732	0.008929	0.010310	0.0107	0.011599
13	0.07692308	0.008327	0.009615	0.011103	0.0115	0.012491
12	0.08333333	0.009021	0.010417	0.012028	0.0125	0.013532
11.5	0.08695652	0.009413	0.010870	0.012551	0.0131	0.014120
11	0.09090909	0.009841	0.011364	0.013122	0.0136	0.014762
10	0.10000000	0.010825	0.012500	0.014434	0.0150	0.016238
9	0.11111111	0.012028	0.013889	0.016038	0.0167	0.018042
8	0.12500000	0.013532	0.015625	0.018042	0.0188	0.020297
7	0.14285714	0.015465	0.017857	0.020620	0.0214	0.023197
6	0.16666667	0.018042	0.020833	0.024056	0.0250	0.027063
5	0.20000000	0.021651	0.025000	0.028868	0.0300	0.032476
4.5	0.22222222	0.024056	0.027778	0.032075	0.0334	0.036084
4	0.25000000	0.027063	0.031250	0.036084	0.0375	0.040595

Table 5
Basic Profile and Constants for Calculation Formulas of Thread Dimensions, in.

Reference Only [Note (1)]		0.20833333H	0.2500H	0.2887H	0.3125H	0.3608H	0.375H	0.5000H
Threads/in.	Pitch, $P = 1/n$	UNJ Max. External Thread Root Radius, r max. = 0.18042196P	UN External Thread Root and Truncation of Internal Thread Crest, $f_{rs} = f_{cn}$ = 0.21650635P	UN Basic Flat at Internal Thread Crest and External UN Thread Root, $F_{rs} = F_{cn}$ = $P/4$ = 0.25000000P	Truncation of UNJ Internal Thread Crest 0.27063294P	Flat at UNJ Internal Thread Crest 0.31250000P	UN, UNR, UNJ Addendum of External Thread, h_{as} = 0.32475953P	Half the Height of Sharp V-UN, UNR, and UNJ Thread 0.43301270P
1	2	8	9 [Note (3)]	10	11	12	13 [Notes (4), (5)]	14
80	0.01250000	0.0023	0.002706	0.003125	0.003383	0.003906	0.004059	0.005413
72	0.01388889	0.0025	0.003007	0.003472	0.003759	0.004340	0.004511	0.006014
64	0.01562500	0.0028	0.003383	0.003906	0.004229	0.004883	0.005074	0.006766
56	0.01785714	0.0032	0.003866	0.004464	0.004833	0.005580	0.005799	0.007732
48	0.02083333	0.0038	0.004511	0.005208	0.005638	0.006510	0.006766	0.009021
44	0.02272727	0.0041	0.004921	0.005682	0.006151	0.007102	0.007381	0.009841
40	0.02500000	0.0045	0.005413	0.006250	0.006766	0.007813	0.008119	0.010825
36	0.02777778	0.0050	0.006014	0.006944	0.007518	0.008681	0.009021	0.012028
32	0.03125000	0.0056	0.006766	0.007813	0.008457	0.009766	0.010149	0.013532
28	0.03571429	0.0064	0.007732	0.008929	0.009665	0.011161	0.011599	0.015465
27	0.03703704	0.0067	0.008019	0.009259	0.010023	0.011574	0.012028	0.016038
24	0.04166667	0.0075	0.009021	0.010417	0.011276	0.013021	0.013532	0.018042
20	0.05000000	0.0090	0.010825	0.012500	0.013532	0.015625	0.016238	0.021651
18	0.05555556	0.0100	0.012028	0.013889	0.015035	0.017361	0.018042	0.024056
16	0.06250000	0.0113	0.013532	0.015625	0.016915	0.019531	0.020297	0.027063
14	0.07142857	0.0129	0.015465	0.017857	0.019331	0.022321	0.023197	0.030929
13	0.07692308	0.0139	0.016654	0.019231	0.020818	0.024038	0.024982	0.033309
12	0.08333333	0.0150	0.018042	0.020833	0.022553	0.026042	0.027063	0.036084
11.5	0.08695652	0.0157	0.018827	0.021739	0.023533	0.027174	0.028240	0.037653
11	0.09090909	0.0164	0.019682	0.022727	0.024603	0.028409	0.029524	0.039365
10	0.10000000	0.0180	0.021651	0.025000	0.027063	0.031250	0.032476	0.043301
9	0.11111111	0.0200	0.024056	0.027778	0.030070	0.034722	0.036084	0.048113
8	0.12500000	0.0226	0.027063	0.031250	0.033829	0.039063	0.040595	0.054127
7	0.14285714	0.0258	0.030929	0.035714	0.038662	0.044643	0.046394	0.061859
6	0.16666667	0.0301	0.036084	0.041667	0.045105	0.052083	0.054127	0.072169
5	0.20000000	0.0361	0.043301	0.050000	0.054127	0.062500	0.064952	0.086603
4.5	0.22222222	0.0401	0.048113	0.055556	0.060141	0.069444	0.072169	0.096225
4	0.25000000	0.0451	0.054127	0.062500	0.067658	0.078125	0.081190	0.108253

Table 5
Basic Profile and Constants for Calculation Formulas of Thread Dimensions, in.

Reference Only [Note (1)]		0.5625H	0.57735H	0.58333H	0.625H	0.65336H	0.66667H
Threads/in.	Pitch, $P = 1/n$	UNJ Height of Internal Thread and Depth of Thread Engagement 0.48713929P	UN, UNR, and UNJ Pitch Line 0.50000000P	UNJ Difference Between Max. Pitch Dia. and Max. Minor Dia. of Ext. Thread 0.50518149P	Height of UN External Thread, h_s, Height of UN/UNR Internal Thread, h_n, and Depth of UN/UNR Thread Engagement, h_e = 0.54126588P	UNJ Difference Between Min. Pitch Dia. and Min. Minor Dia. of Ext. Thread = 0.56580540P	UNJ Height of External Thread, h_s = 0.57735027P
1	2	15	16	17	18 [Note (5)]	19	20 [Note (5)]
80	0.01250000	0.006089	0.006250	0.006315	0.006766	0.007073	0.007217
72	0.01388889	0.006766	0.006944	0.007016	0.007518	0.007858	0.008019
64	0.01562500	0.007612	0.007813	0.007893	0.008457	0.008841	0.009021
56	0.01785714	0.008699	0.008929	0.009021	0.009665	0.010104	0.010310
48	0.02083333	0.010149	0.010417	0.010525	0.011276	0.011788	0.012028
44	0.02272727	0.011071	0.011364	0.011481	0.012301	0.012859	0.013122
40	0.02500000	0.012178	0.012500	0.012630	0.013532	0.014145	0.014434
36	0.02777778	0.013532	0.013889	0.014033	0.015035	0.015717	0.016038
32	0.03125000	0.015223	0.015625	0.015787	0.016915	0.017681	0.018042
28	0.03571429	0.017398	0.017857	0.018042	0.019331	0.020207	0.020620
27	0.03703704	0.018042	0.018519	0.018710	0.020047	0.020956	0.021383
24	0.04166667	0.020297	0.020833	0.021049	0.022553	0.023575	0.024056
20	0.05000000	0.024357	0.025000	0.025259	0.027063	0.028290	0.028868
18	0.05555556	0.027063	0.027778	0.028066	0.030070	0.031434	0.032075
16	0.06250000	0.030446	0.031250	0.031574	0.033829	0.035363	0.036084
14	0.07142857	0.034796	0.035714	0.036084	0.038662	0.040415	0.041239
13	0.07692308	0.037472	0.038462	0.038860	0.041636	0.043523	0.044412
12	0.08333333	0.040595	0.041667	0.042098	0.045105	0.047150	0.048113
11.5	0.08695652	0.042360	0.043478	0.043929	0.047067	0.049200	0.050204
11	0.09090909	0.044285	0.045455	0.045926	0.049206	0.051437	0.052486
10	0.10000000	0.048714	0.050000	0.050518	0.054127	0.056581	0.057735
9	0.11111111	0.054127	0.055556	0.056131	0.060141	0.062867	0.064150
8	0.12500000	0.060892	0.062500	0.063148	0.067658	0.070726	0.072169
7	0.14285714	0.069591	0.071429	0.072169	0.077324	0.080829	0.082479
6	0.16666667	0.081190	0.083333	0.084197	0.090211	0.094301	0.096225
5	0.20000000	0.097428	0.100000	0.101036	0.108253	0.113161	0.115470
4.5	0.22222222	0.108253	0.111111	0.112263	0.120281	0.125735	0.128300
4	0.25000000	0.121785	0.125000	0.126295	0.135316	0.141451	0.144338

Table 5
Basic Profile and Constants for Calculation Formulas of Thread Dimensions, in.

Reference Only [Note (1)]			0.7500H	0.9167H	H	1.125H	1.2500H	
Threads/in.	Pitch, $P = 1/n$	Height of UNR External Thread, h_s = 0.61343466P	UN, UNR, and UNJ Twice the External Thread Addendum, $h_b = 2h_{as}$ = 0.64951905P	UN, UNR, and UNJ Difference Between Max. Major and Pitch Diameters of Internal Thread = 0.79385662P	UN, UNR, and UNJ Height of Sharp V-Thread = 0.86602540P	Double Height of UNJ Internal Thread 0.97427858P	Double Height of Internal Thread and External UN Thread, $2h_n$ = 1.08253175P	Double Height of External UNR Thread, $2h_s$ = 1.22686932P
1	2	21	22	23	24	25	26	27
80	0.01250000	0.007668	0.008119	0.009923	0.010825	0.012178	0.013532	0.015336
72	0.01388889	0.008520	0.009021	0.011026	0.012028	0.013532	0.015035	0.017040
64	0.01562500	0.009585	0.010149	0.012404	0.013532	0.015223	0.016915	0.019170
56	0.01785714	0.010954	0.011599	0.014176	0.015465	0.017398	0.019331	0.021908
48	0.02083333	0.012780	0.013532	0.016539	0.018042	0.020297	0.022553	0.025560
44	0.02272727	0.013942	0.014762	0.018042	0.019682	0.022143	0.024603	0.027883
40	0.02500000	0.015336	0.016238	0.019846	0.021651	0.024357	0.027063	0.030672
36	0.02777778	0.017040	0.018042	0.022052	0.024056	0.027063	0.030070	0.034080
32	0.03125000	0.019170	0.020297	0.024808	0.027063	0.030446	0.033829	0.038340
28	0.03571429	0.021908	0.023197	0.028352	0.030929	0.034796	0.038662	0.043817
27	0.03703704	0.022720	0.024056	0.029402	0.032075	0.036084	0.040094	0.045440
24	0.04166667	0.025560	0.027063	0.033077	0.036084	0.040595	0.045105	0.051120
20	0.05000000	0.030672	0.032476	0.039693	0.043301	0.048714	0.054127	0.061343
18	0.05555556	0.034080	0.036084	0.044103	0.048113	0.054127	0.060141	0.068159
16	0.06250000	0.038340	0.040595	0.049616	0.054127	0.060892	0.067658	0.076679
14	0.07142857	0.043817	0.046394	0.056704	0.061859	0.069591	0.077324	0.087634
13	0.07692308	0.047187	0.049963	0.061066	0.066617	0.074945	0.083272	0.094375
12	0.08333333	0.051120	0.054127	0.066155	0.072169	0.081190	0.090211	0.102239
11.5	0.08695652	0.053342	0.056480	0.069031	0.075307	0.084720	0.094133	0.106684
11	0.09090909	0.055767	0.059047	0.072169	0.078730	0.088571	0.098412	0.111534
10	0.10000000	0.061343	0.064952	0.079386	0.086603	0.097428	0.108253	0.122687
9	0.11111111	0.068159	0.072169	0.088206	0.096225	0.108253	0.120281	0.136319
8	0.12500000	0.076679	0.081190	0.099232	0.108253	0.121785	0.135316	0.153359
7	0.14285714	0.087634	0.092788	0.113408	0.123718	0.139183	0.154647	0.175267
6	0.16666667	0.102239	0.108253	0.132309	0.144338	0.162380	0.180422	0.204478
5	0.20000000	0.122687	0.129904	0.158771	0.173205	0.194856	0.216506	0.245374
4.5	0.22222222	0.136319	0.144338	0.176413	0.192450	0.216506	0.240563	0.272638
4	0.25000000	0.153359	0.162380	0.198464	0.216506	0.243570	0.270633	0.306717

Table 5
Basic Profile and Constants for Calculation Formulas of Thread Dimensions, in. (Cont'd)

GENERAL NOTE: All thread calculations are to be performed using a function of pitch, *P*; the use of thread height, *H*, is for reference only, as stated in ASME B1.30.

NOTES:
(1) The thread values based on function of height, *H*, are used for reference only. On June 29, 1992, ASME B1.30M was approved as an American National Standard, stating that all thread calculations are to be performed using a function of pitch, *P*, not a function of thread height, *H*. As the *H* functions shown here are for reference only, the number of decimal places shown for each does not necessarily follow the ASME B1.30 rules, but for consistency they are shown with the same number of decimal places as used in previous versions of ASME B1.1 and ASME B1.15.
(2) The values tabulated in Column 3 also pertain to the minimum root radius of UNR screw threads. See paras. 2.3.1.1 and 2.3.1.1(a).
(3) $h_{an} = f_{cn} = 0.250H = 0.21650635P$.
(4) $h_{dn} = f_{as} = 0.375H = 0.32475953P$.
(5) The constants in Columns 13, 18, and 20 are the rounded value of half their respective values in Columns 22, 26, and 27. The values in Columns 22, 26, and 27 must be used in calculations to avoid the possible difference due to rounding.

6 SCREW THREAD DESIGNATION

6.1 Basic Method of Designating

The designation specifies in sequence the nominal size, number of threads per inch, thread series symbol, thread class symbol, and gaging system per ASME B1.3 (see Figure 13). The nominal size is the basic major diameter and is specified as a fractional diameter, machine screw number, or the decimal equivalent. Where decimal equivalents are used for size callout, they shall be shown in four-place decimals (omitting the cipher in the fourth place) for fractional sizes, and in three-place decimals for number sizes. They shall be interpreted as being nominal size designations only and shall have no dimensional significance beyond the fractional size or number designation. The thread series symbol indicates the thread form, series, and tolerance formulation. The thread series symbols for the UN thread form are UNC, UNF, UNEF, or UN for only those sizes of the various series shown in Table 1 and UNS for any other diameter–pitch combination having tolerances to unified formulation.

The thread series symbols for the UNR thread form are UNRC, UNRF, UNREF, or UNR for only those sizes of the various series shown in Table 1 and UNRS for any other diameter–pitch combination having tolerances to unified formulation.

The thread series symbols for the UNJ thread form are UNJC, UNJF, UNJEF, or UNJ for only those sizes of the various series shown in Table 1 and UNJS for any other diameter–pitch combination having tolerances to unified formulation.

The basic method of designating a screw thread is used where the standard tolerances or limits of size based on the standard length of engagement are applicable, as indicated in Figure 13.

6.2 Method of Designating Coated Threads

Specification on drawings of the before- and after-coating dimensions for screw threads is sometimes dictated by an engineering or production consideration that the size before and after coating be controlled. This results from coated screw threads having two stages of design, the before-coating stage and the after-coating stage. The threaded product may be produced by a supplier and coated by a user. In this case, it is necessary that a clear understanding of the coating requirements and the allowance for coating buildup be agreed upon by both supplier and user (see section 7).

The before-coating (plating) dimensions have a definite bearing on the strength of the screw threads. The before-coating stage is, therefore, decidedly an engineering consideration; it is also a production consideration when requiring that proper allowance be made for the specified coating thickness. The finished parts should be of a size after coating that will allow them to be assembled with their coating components as intended.

Recommended methods for designating coated thread under various conditions are described in para. 6.2.1.

6.2.1 For coated (or plated) Class 2A external threads, the basic (maximum) major and basic (maximum) pitch diameters shall be given, preceded by the words AFTER COATING. The major and pitch diameter limits of size before coating shall also be given, preceded by the words BEFORE COATING.

EXAMPLE: $\frac{3}{4}$-10-UNC-2A (21)

AFTER COATING (from Table 2A for Class 3A)
Maximum major diameter 0.7500
Maximum pitch diameter (PD) 0.6850

BEFORE COATING (from Table 2A for Class 2A)
Major diameter 0.7482 – 0.7353
PD 0.6832 – 0.6773

Threads accepted to Class 2A limits before coating are accepted after coating by basic size Class 3A GO thread gages. The allowance given in the dimensional tables

for Class 2A thread is sufficient to allow for a limited amount of coating as described in section 7. However, if a greater coating thickness is required, it will be necessary to calculate the before-coating limits in accordance with section 7.

6.2.2 For coated (or plated) Class 3A external threads, the maximum major and maximum pitch diameters may optionally be given, preceded by the words AFTER COATING, thereby indicating that the thread before coating must have special provisions to allow for coating thickness. The major and pitch diameter limits of size before coating (calculated in accordance with section 7) shall be given, followed by the letters "SPL" (special) and preceded by the words BEFORE COATING.

EXAMPLE: $\frac{1}{4}$-28-UNF-3A (21), given a thickness of coating 0.0002 in. to 0.0003 in.

AFTER COATING (use of maximum major diameter and PD optional)
Maximum major diameter 0.2500
Maximum PD 0.2268

BEFORE COATING
Major diameter 0.2494 – 0.2431 SPL
PD 0.2256 – 0.2235 SPL

6.2.3 For coated (or plated) Class 1A external threads, the maximum major and maximum pitch diameters may optionally be given, preceded by the words AFTER COATING, thereby indicating that the thread before coating must have special provisions to allow for coating thickness. The major and pitch diameter limits of size before coating (calculated in accordance with section 7) shall be given, followed by the letters "SPL" (special) and preceded by the words BEFORE COATING.

EXAMPLE: $\frac{1}{4}$-20-UNC-1A (21), given a thickness of coating 0.0002 in. to 0.0003 in.

AFTER COATING (use of maximum major diameter and PD optional)
Maximum major diameter 0.2489
Maximum PD 0.2164

BEFORE COATING
Major diameter 0.2483 – 0.2363 SPL
PD 0.2152 – 0.2100 SPL

6.2.4 Where an allowance is required to accommodate coating (or plating) on Class 1B, Class 2B, or Class 3B internal threads, the minimum minor and minimum pitch diameters may optionally be given, preceded by the words AFTER COATING. The minor and pitch diameter limits of size before coating (calculated in accordance with section 7) shall be given, followed by the letters "SPL" (special) and preceded by the words BEFORE COATING.

EXAMPLE 1: $\frac{1}{4}$-20-UNC-1B (21), given a thickness of coating 0.0002 in. to 0.0003 in.

AFTER COATING Minimum minor diameter 0.196
Minimum PD 0.2175
(This information optional)

BEFORE COATING
Minor diameter 0.197 to 0.207 SPL
PD 0.2187 – 0.2256 SPL

EXAMPLE 2: $\frac{3}{4}$-10-UNC-2B (22), given a thickness of coating 0.0002 in. to 0.0003 in.

AFTER COATING Minimum minor diameter 0.642
Minimum PD 0.6850
(This information optional)

BEFORE COATING
Minor diameter 0.643 to 0.663 SPL
PD 0.6862 – 0.6935 SPL

EXAMPLE 3:
$\frac{1}{4}$-28-UNF-3B (23), given a thickness of coating 0.0002 in. to 0.0003 in.

AFTER COATING Minimum minor diameter 0.2110
Minimum PD 0.2268
(This information optional)

BEFORE COATING
Minor diameter 0.2116 to 0.2194 SPL
PD 0.2280 – 0.2308 SPL

NOTE: The after-coating limits for all of the examples above are the minor and PD values in Table 2B for the respective class of thread.

6.3 Method of Designating Left-Hand Threads

Unless otherwise specified, threads are right hand; a left-hand thread shall be designated LH as shown in the following example: $\frac{1}{4}$-20-UNC-3A-LH (21).

6.4 Method of Designating Special Unified Threads

UNS, UNRS, and UNJS threads are special combinations of diameter and pitch with tolerance to unified formulation.

EXAMPLE 1: 1/4-24-UNS-3A (21)
Major diameter 0.2500 – 0.2428
PD 0.2229 – 0.2201
Maximum minor diameter 0.2049

EXAMPLE 2: 0.4950-20-UNS-3A (21)
Major diameter 0.4950 – 0.4869
PD 0.4625 – 0.4593
Maximum minor diameter 0.4409

EXAMPLE 3: 1.200-10-UNS-2B (21)
Minor diameter 1.092 to 1.113
PD 1.1350 to 1.1432
Minimum major diameter 1.200

EXAMPLE 4: 0.2800-28-UNJS-3A (22)
Major diameter 0.2735 to 0.2800
PD 0.2542 to 0.2568
Minor diameter 0.2340 to 0.2388
Root radius 0.0054 to 0.0064

EXAMPLE 5: 0.2800-28-UNJS-3B (22)
Major diameter 0.2800 min.
PD 0.2568 to 0.2601
Minor diameter 0.2452 to 0.2529
Root radius 0.0054 to 0.0064

6.5 Designations for Other Threads

Threads having tolerances that do not conform to unified formulation and threads having multiple start or lead or special form also require additional considerations in the thread designation. The recommended methods of designating these threads are described in paras. 6.5.1 through 6.5.3.

6.5.1 Method of Designating Threads Having Tolerances Not to Unified Formulation. If a standard series thread is altered in any respect other than revised pitch diameter limits for a special length of engagement, the modification of crests, or the adjustment of the limits of size to accommodate coating, as shown above, it is designated in accordance with the example herein.

EXAMPLE: 1/2-13 Unified Form SPL-INT (22)
Minor diameter 0.424 to 0.434 SPL
PD 0.4500 to 0.4580 SPL
Minimum major diameter 0.5000
LE 0.50

6.5.2 Method of Designating Multiple Start Threads. If a thread is required with a multiple start or lead, it is designated by specifying in sequence the nominal size, pitch (in decimals or threads per inch), and lead (in decimals or number of starts), thread series, class, and gaging system in parenthesis if required as in the examples herein.

EXAMPLE 1: 3/4-0.0625*P* -0.1875*L*-UNF SPL-EXT (23)
Major diameter 0.7485 – 0.7391
PD 0.7079 SPL – 0.7003 SPL
Maximum minor diameter 0.6808
LE 0.75

EXAMPLE 2: 3/4-16-0.1875*L*-UNF-2A (21)

Specifying the threads per inch (TPI) will help ensure the determination of the proper decimal pitch value. When converting TPI to decimal pitch, the values may need to be carried out to eight decimal places in order to state the proper decimal value for pitch and lead. For example, 3/4-16-(3 START)-UNF-2B means the same thing as 0.7500-0.0625*P*-0.1875*L*-UNF-2B. If the decimal pitch is properly stated, the decimal lead should mathematically be equal to the decimal pitch times the number of starts.

Premature rounding of decimal pitch or lead values or both may yield improper results; for example, 0.7500-0.063*P*-0.188*L*-UNF-2B is incorrect.

6.5.3 Method of Designating Special Form Threads. If a thread for design consideration requires a variation from unified standard thread contour and is not covered by another recognized standard, such as when the detail of the root differs from that for the standard thread form, the designation shall not include either the letter "U" or the word "Unified."

EXAMPLE: 7/8-18 SPL 60-deg Form-EXT (22)
Major diameter 0.8750 – 0.8668
PD 0.8384 – 0.8343
Maximum minor diameter 0.8068
LE 0.69

6.6 Method of Designating Threads Having Special Length of Engagement

In the assembly of threads in mating parts, the length of engagement varies according to the design requirements. It should be noted that the length of engagement is not necessarily the same as the full thread length provided on the part, but is the amount or length of thread engaged when mating parts are assembled.

Where a standard series thread has a special length of engagement differing from that for which the standard pitch diameter tolerances are applicable as indicated in section 5, the thread class symbol is qualified by the addition of the letters SE (special engagement) preceding the class symbol. The specification of the special pitch diameter limits of size and the length of engagement,

rounded to a two-place decimal, are a requirement, as shown in the examples herein.

EXAMPLE 1: 1/2-13-UNC-SE2A (23)
PD 0.4485 – 0.4431
LE 1.00

EXAMPLE 2: 1/4-24-UNS-SE3A (23)
Major diameter 0.2500 – 0.2428
PD 0.2229 – 0.2198
LE 0.88

NOTE: Past editions of this Standard provided examples of how some situations previously included in para. 5.3 were designated. These were examples only and not requirements. Because of this, they are no longer part of this Standard and have been moved to Nonmandatory Appendix F for historical and reference purposes.

6.7 Method of Designating Threads Having Modified Crests

It is occasionally necessary to modify the limits of size of the major diameter of an external thread or the minor diameter of an internal thread within the maximum material limits established for standard series and special threads in order to fit a specific purpose, but without change in class of thread or pitch diameter limits. (It should be noted that standard thread gages may be used to accept such threads.) Such threads shall be specified with the established thread designation, followed by a statement of the modified diameter limits and the designation MOD. This practice also applies to modifications of internal thread minor diameters described in para. 5.6.1.

NOTE: Threads having modified roots can be designated in a similar way but cannot be inspected or evaluated with standard gages.

EXAMPLE 1: 3/8-24-UNF-3A MOD (21)
Major diameter 0.3720 – 0.3648 MOD

EXAMPLE 2: 1 1/2-10-UNS-3B MOD (21)
Minor diameter 1.3980 to 1.4090 MOD
PD 1.4350 to 1.4412
Minimum major diameter 1.5000

7 DIMENSIONAL ACCOMMODATION OF COATING OR PLATING FOR 60-DEG THREADS

7.1 Introduction

It is not within the scope of this Standard to make recommendations for thickness of, or to specify limits for, coatings. However, this Standard will aid mechanical interchangeability if certain principles are followed wherever conditions permit. The guidelines in paras. 7.7 through 7.9 should be helpful in determining the amount and direction of the alterations to establish applicable limits of before-coating thread size with a 60-deg included angle.

Some commonly used and firmly established processes for heavy coatings do not fall within the scope of this Standard.

When coating threads with dry film lubricant, an adjustment in pitch diameter to accommodate the thickness of solid film lubricant is not in addition to that specified in paras 7.7 through 7.9. The product thread, before application of solid film lubricant, shall comply with after-coated dimensions.

NOTE: The term “coating” refers to one or more applications of additive material to threads including, but not limited to, electroplated deposits, dip-spin applied materials, and mechanically applied plating. It does not include soft or liquid lubricants that are readily displaced in assembly.

7.1.1 Coated UN and UNR Threads. This Standard specifies limits of size that pertain whether threads are coated or uncoated. Only in Class 2A external threads is the allowance available to accommodate coatings. Thus, in all classes of internal threads and in Class 3A external threads, limits of size must be adjusted before plating to provide suitable provision for the desired coating.

7.1.2 Coated UNJ Threads. The general rules for calculation of coating allowance are defined in paras. 7.7 through 7.9. Restrictions in paras. 7.1.2.1 through 7.1.2.3 also apply.

7.1.2.1 Coated UNJ External Threads — Class 3A. Unless otherwise specified, coated or plated external threads with a pitch diameter tolerance of 0.0035 in. or less may have the minimum pitch diameter specified in Table 2A reduced by not more than 0.0010 in. The minimum major and minor diameter limits specified in Table 2A may be reduced by 2 times the minimum coating or plating thickness. When the pitch diameter tolerance exceeds 0.0035 in., the minimum pitch diameter may be reduced by 0.3 times the pitch diameter tolerance, but this reduction shall not exceed 0.0015 in. The material limits for coated external threads shall be as specified herein. All thread elements shall be within the size limits specified in Table 2A.

7.1.2.2 Coated UNJ External Threads — Class 2A. Unless otherwise specified, the external thread material limits may not be reduced beyond the minimum material limits to accommodate coating. After coating, the threads shall be no larger than Class 3A material limits specified in Table 2A.

7.1.2.3 Coated UNJ Internal Threads — Classes 2B and 3B. Unless otherwise specified for coated or plated internal threads, the maximum values of minor diameter and pitch diameter specified in Table 2B may be increased by the same amount permitted in para. 7.1.2.1 for external thread decrease. The limits for coated or plated internal threads shall be within the values specified in Table 2B.

7.2 Strength

There is a possibility that coating thickness adjustments will result in a before-plate condition that may significantly affect the strength of externally threaded parts. Limitations on coating thickness or part redesign may be necessary.

7.3 Electrodeposited Coatings

Electroplated coatings may not cover threads uniformly. Deposits build up more on thread crests than on thread flanks and coating thickness is greater on the lead end of a thread than on threads in the center of a part. The guidelines for calculating before-coating thread sizes for uniformly coated threads can be used as a starting place in determining the before-coating thread sizes on a given part, but the exact sizes for any given part may have to be determined by trial and error.

7.4 Other Considerations

It is essential to adequately review all possibilities and consider limitations in the threading and coating production processes before finalizing the coating process and the allowance required to accommodate the coating. A thread with no allowance after coating shall not transgress the basic maximum material limits and is therefore subject to acceptance using a maximum material limit thread gage for Class 3A, Class 1B, Class 2B, or Class 3B.

7.5 Material Limits for Coated Threads

Unless otherwise specified, size limits for standard external thread Class 2A apply prior to coating. The external thread allowance may thus be used to accommodate the coating thickness on coated parts, provided that the maximum coating thickness is no more than one-fourth of the allowance (see Figures 5, 7, and 10). Thus, the thread after coating is subject to acceptance using a Class 3A maximum material limit and/or size thread gage.

Where UN and UNR external threads have no allowance, or allowance must be maintained after coating, and for standard internal threads, sufficient allowance must be provided prior to coating to ensure that finished product threads do not exceed the maximum material limits specified. For thread Class 3A, Class 2A allowances should be applied whenever possible in accordance with calculations in section 5. For UNJ threads, see paras. 7.1.2.1 and 7.1.2.2.

7.6 Dimensional Effects of Coating

7.6.1 On a cylindrical surface, the effect of coating is to change the diameter by twice the coating thickness (2:1 ratio), one coating thickness on each side of the cylinder. On a screw thread, this would apply to the major and minor diameters.

7.6.2 Because the coating thickness is measured perpendicular to the coated surface while the pitch diameter is measured perpendicular to the thread axis, the effect of a uniformly coated thread flank on the pitch diameter is a change of 4 times the thickness of coating on the flank (4:1 ratio) (see Figure 14). The diameters of external threads before coating will be smaller while the diameters of internal threads before coating will be larger than the coated diameters.

7.6.3 On uniformly coated threads, the effect on a thread root radius reduces the radius by the coating thickness (1:1 ratio).

7.6.4 Depending on the type and amount of plating, some coatings and plating do not apply uniformly on threads (see Figure 15). Different coating materials and processes have different application characteristics. The threaded part's overall length and other configuration characteristics also affect the way the coatings build up on the threads. Paragraphs 7.7 through 7.9 provide general guidelines for calculating precoating thread size to allow for coating buildup while preventing interference in assembly. The exact precoating thread size for a given part with a given type of coating may have to be developed by the producer experimentally.

7.7 External Thread With Allowance Available for Coating

7.7.1 Maximum and Minimum Coating Thickness Specified. The amount of the allowance on the pitch diameter is sufficient if 4 times the maximum coating thickness is equal to or less than the allowance tabulated in Table 2A or calculated per formula in para. 5.8.1(a).

7.7.2 Only Nominal or Minimum Coating Thickness Specified. If no thickness tolerance is given, it is recommended that a tolerance of +50% of the nominal or minimum thickness be assumed. Then the amount of the allowance on the pitch diameter is sufficient if 6 times the specified coating thickness is equal to or less than the allowance tabulated in Table 2A or calculated per formula in para. 5.8.1(a).

7.8 External Thread With No Allowance for Coating

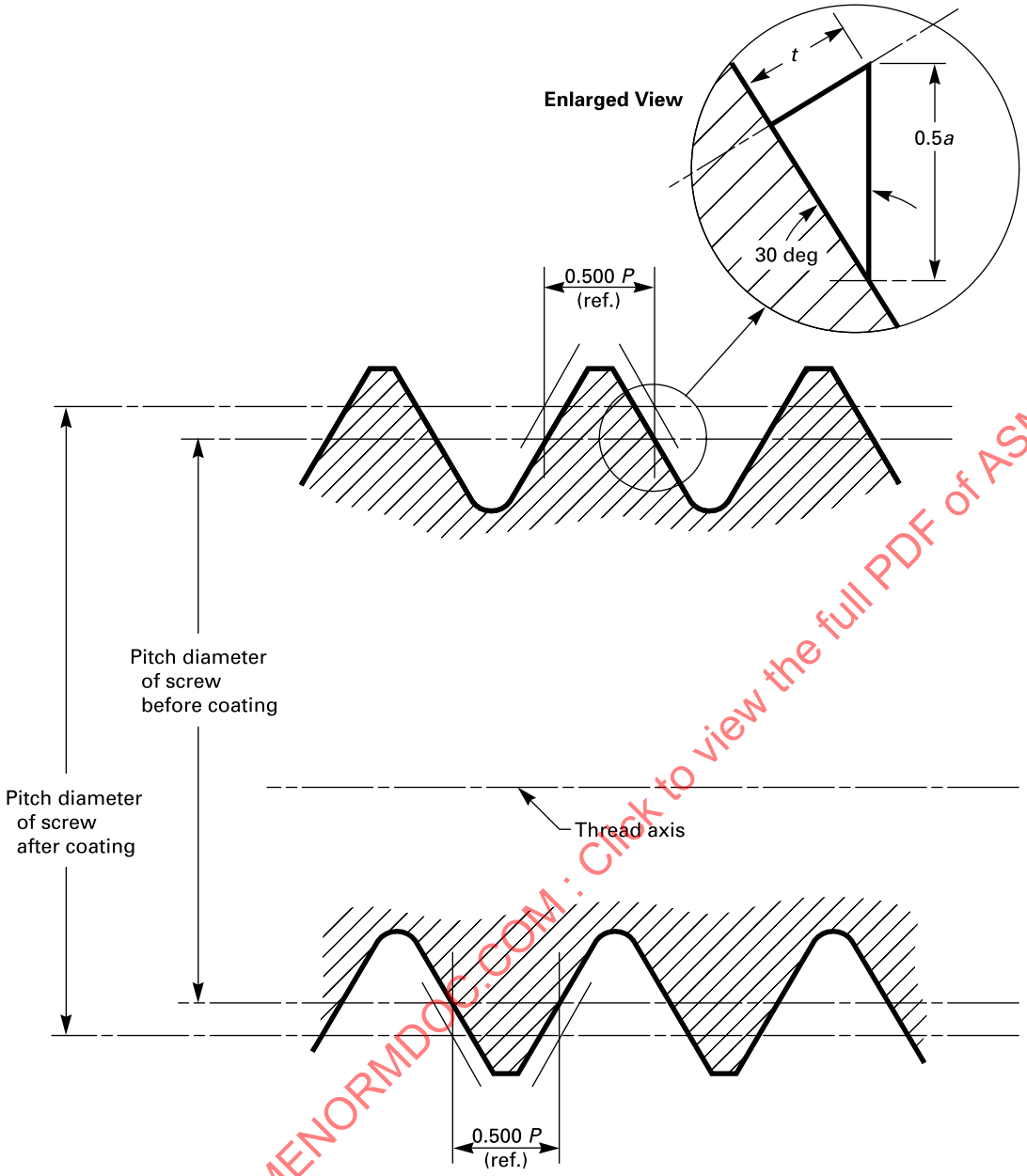
7.8.1 Maximum and Minimum Coating Thickness Specified

(a) To determine before-coating product limits, decrease

(1) the maximum major diameter by 2 times the maximum coating thickness

(2) the minimum major diameter by 2 times the minimum coating thickness

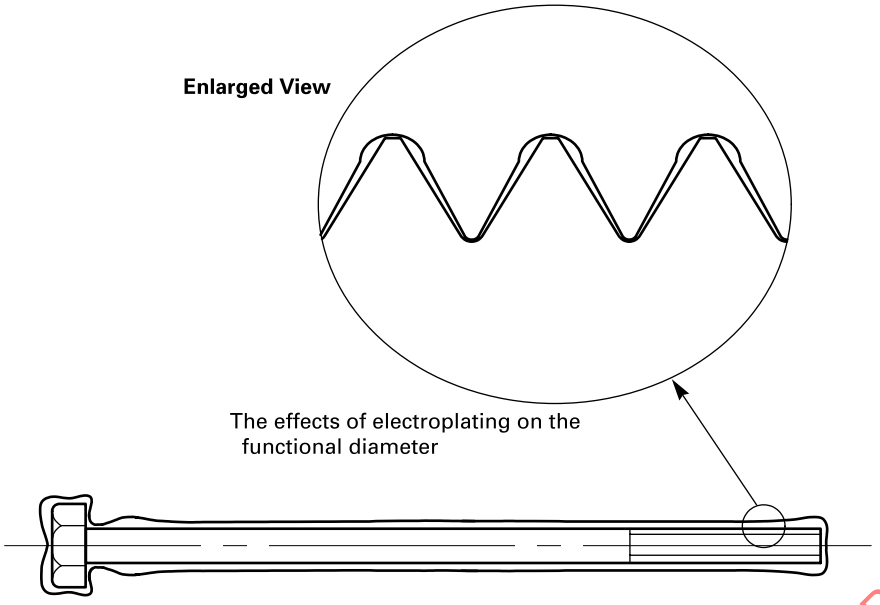
Figure 14
Ratio of Pitch Diameter Change to Thickness of Coating on 60-deg Threads



GENERAL NOTE: In the enlarged view,

$0.25a$ = t and a
= $4t$ or the pitch diameter of a 60-deg thread changes 4 times the thickness of coating
a = pitch diameter change due to coating
t = thickness of coating
Sine 30 deg = $t/0.5a$
= 0.5

Figure 15
Effect of Electrodeposited Coating on 60-deg External Threads



GENERAL NOTE: Electrodeposited coatings build up more heavily at sharp corners, are greater at the extreme ends and edges, and are least in the center and recessed areas.

(3) the maximum pitch diameter by 4 times the maximum coating thickness

(4) the minimum pitch diameter by 4 times the minimum coating thickness

(5) the maximum minor diameter by 2 times the maximum coating thickness

(6) the minimum minor diameter by 2 times the minimum coating thickness

(b) To determine before-coating product limits for root radius, increase

(1) the maximum root radius by the minimum coating thickness

(2) the minimum root radius by the maximum coating thickness

NOTE: (a)(1) through (a)(6) apply to all (UN/UNR/UNJ) threads; (b)(1) and (b)(2) apply only to UNR and UNJ threads.

Following the above rules will generate after-coating product dimensions that fall within the minimum and maximum product limits.

7.8.1.1 EXAMPLE: $^{3}/_{8}$-16-UNC-2A AFTER COATING

Coating thickness 0.0002 in. to 0.0003 in.

To determine the before-coating maximum material sizes:

0.3737 after coating maximum major diameter
− 0.0006 (2 × 0.0003 maximum coating thickness)
= 0.3731 before coating maximum major diameter

0.3331 after coating maximum pitch diameter
− 0.0012 (4 × 0.0003 maximum coating thickness)
= 0.3319 before coating maximum pitch diameter

To determine the before-coating minimum material sizes:

0.3643 after coating minimum major diameter
− 0.0004 (2 × 0.0002 minimum coating thickness)
= 0.3639 before coating minimum major diameter

0.3287 after coating minimum pitch diameter
− 0.0008 (4 × .0002 minimum coating thickness)
= 0.3279 before coating minimum pitch diameter

The before-coating sizes should be included in the thread designation (see para. 6.2.1).

7.8.1.2 EXAMPLE: $^{3}/_{8}$-16-UNJC-2A AFTER COATING

Coating thickness 0.0002 in. to 0.0003 in.

To determine the before-coating maximum material sizes:

0.3737 after coating maximum major diameter
− 0.0006 (2 × 0.0003 maximum coating thickness)
= 0.3731 before coating maximum major diameter

0.3331 after coating maximum pitch diameter
− 0.0012 (4 × 0.0003 maximum coating thickness)
= 0.3319 before coating maximum pitch diameter

0.3015 after coating maximum minor diameter
− 0.0006 (2 × 0.0003 maximum coating thickness)
= 0.3009 before coating maximum minor diameter

0.0113 after coating maximum root radius
+ 0.0002 (1 × 0.0002 minimum coating thickness)
= 0.0115 before coating maximum root radius

To determine the before-coating minimum material sizes:

0.3643 after coating minimum major diameter
− 0.0004 (2 × 0.0002 minimum coating thickness)
= 0.3639 before coating minimum major diameter

0.3287 after coating minimum pitch diameter
− 0.0008 (4 × 0.0002 minimum coating thickness)
= 0.3279 before coating minimum pitch diameter

0.2933 after coating minimum minor diameter
− 0.0004 (2 × 0.0002 minimum coating thickness)
= 0.2929 before coating minimum minor diameter

0.0094 after coating minimum root radius
+ 0.0003 (1 × 0.0003 maximum coating thickness)
= 0.0097 before coating minimum root radius

The before-coating sizes should be included in the thread designation (see para. 6.2.1).

7.8.2 Only Nominal or Minimum Coating Thickness Specified. If no coating thickness tolerance is given, it is recommended that a tolerance of +50% of the nominal or minimum thickness be assumed. Then

(a) to determine before-coating product limits for a coated thread, decrease

(1) the maximum major diameter by 3 times the coating thickness

(2) the minimum major diameter by 2 times the coating thickness

(3) the maximum pitch diameter by 6 times the coating thickness

(4) the minimum pitch diameter by 4 times the coating thickness

(5) the maximum minor diameter by 3 times the coating thickness

(6) the minimum minor diameter by 2 times the coating thickness

(b) to determine before-coating product limits for root radius increase

(1) the maximum root radius by the coating thickness

(2) the minimum root radius by 1.5 times the coating thickness

NOTE: (a)(1) through (a)(6) apply to all (UN/UNR/UNJ) threads; (b)(1) and (b)(2) apply only to UNR and UNJ threads.

Following the above rules will generate after-coating product dimensions that fall within the minimum and maximum product limits.

7.8.2.1 EXAMPLE: ½-13-UNC-3A Coating thickness: 0.0004 in.

(a) Since the allowance for Class 2A thread is 0.0015 in., the nominal or minimum coating thickness that may be applied is equal to 0.0015 in. divided by 6, or 0.00025 in. (the maximum thickness of coating that may be applied is equal to 0.0015 divided by 4 or 0.00038 in.). This is not sufficient for the required nominal or minimum coating of 0.0004 in. specified, so additional adjustments to the before-coating pitch and major diameters must be made.

(b) To determine the before-coating maximum material sizes:

0.5000 after coating maximum major diameter
− 0.0012 (3 × 0.0004 coating thickness)
= 0.4988 before coating maximum major diameter

0.4500 after coating maximum pitch diameter
− 0.0024 (6 × 0.0004 coating thickness)
= 0.4476 before coating maximum pitch diameter

(c) To determine the before-coating minimum material sizes:

0.4891 after coating minimum major diameter
− 0.0008 (2 × 0.0004 coating thickness)
= 0.4883 before coating minimum major diameter

0.4463 after coating minimum pitch diameter
− 0.0016 (4 × .0004 coating thickness)
= 0.4447 before coating minimum pitch diameter

The before-coating sizes should be included in the thread designation (see para. 6.2.1).

7.8.2.2 EXAMPLE: ½-13-UNJC-3A Coating Thickness 0.0002 in.

To determine the before-coating maximum material sizes:

0.5000 after coating maximum major diameter
− 0.0006 (3 × 0.0002 coating thickness)
= 0.4994 before coating maximum major diameter

0.4500 after coating maximum pitch diameter
− 0.0012 (6 × 0.0002 coating thickness)
= 0.4488 before coating maximum pitch diameter

0.4111 after coating maximum minor diameter
− 0.0006 (3 × 0.0002 coating thickness)
= 0.4105 before coating maximum minor diameter

0.0139 after coating maximum root radius
+ 0.0002 (1 × 0.0002 coating thickness)
= 0.0141 before coating maximum root radius

To determine the before-coating minimum material sizes:

0.4891 after coating minimum major diameter
− 0.0004 (2 × 0.0002 coating thickness)
= 0.4887 before coating minimum major diameter

0.4463 after coating minimum pitch diameter
− 0.0008 (4 × 0.0002 coating thickness)
= 0.4455 before coating minimum pitch diameter

0.4028 after coating minimum minor diameter
− 0.0004 2 × 0.0002 coating thickness)
= 0.4024 before coating minimum minor diameter

0.0115 after coating minimum root radius
+ 0.0003 (1.5 × 0.0002 coating thickness)
= 0.0118 before coating minimum root radius

The before-coating sizes should be included in the thread designation (see para. 6.2.1).

7.8.3 Adjusted Size Limits. It should be noted in the preceding examples that the before-coating material limit tolerances are less than the tolerances after coating. This is because the coating tolerance consumes some of the product tolerance. In some instances, there may be insufficient pitch diameter tolerance available for manufacturing in the before-coating condition and additional adjustments and controls will be necessary and shall be agreed upon between supplier and purchaser.

7.9 Internal Threads

Standard internal threads provide no allowance for coating thickness like external threads in para 7.7.

7.9.1 Maximum and Minimum Coating Thicknesses Specified. To determine before-coating product limits for a coated thread, increase

(a) the minimum major diameter by 2 times the maximum coating thickness
(b) the minimum pitch diameter by 4 times the maximum coating thickness
(c) the maximum pitch diameter by 4 times the minimum coating thickness
(d) the minimum minor diameter by 2 times the maximum coating thickness
(e) the maximum minor diameter by 2 times the minimum coating thickness

7.9.1.1 EXAMPLE: $\frac{3}{8}$-16 UNC-2B AFTER COATING
Coating thickness: 0.0002 in. to 0.0003 in.
To determine the before-coating maximum material sizes:

0.3750 after coating minimum major diameter
+ 0.0006 (2 × 0.0003 maximum coating thickness)
= 0.3756 before coating minimum major diameter

0.3344 after coating minimum pitch diameter
+ 0.0012 (4 × 0.0003 maximum coating thickness)
= 0.3356 before coating minimum pitch diameter

0.3070 after coating minimum minor diameter
+ 0.0006 (2 × 0.0003 maximum coating thickness)
= 0.3076 before coating minimum minor diameter

To determine the before-coating maximum material sizes:

0.3401 after coating maximum pitch diameter
+ 0.0008 (4 × 0.0002 minimum coating thickness)
= 0.3409 before coating maximum pitch diameter

0.3210 after coating maximum minor diameter
+ 0.0004 (2 × 0.0002 minimum coating thickness)
= 0.3214 before coating maximum minor diameter

The before-coating sizes should be included in the thread designation (see para. 6.2.1).

7.9.2 Only Nominal or Minimum Coating Thickness Specified. If no coating thickness tolerance is given, it is recommended that a tolerance of +50% of the nominal or minimum thickness be assumed. Then, to determine before-coating product limits for a coated thread, increase

(a) the minimum major diameter by 3 times the minimum or nominal coating thickness
(b) the minimum pitch diameter by 6 times the minimum or nominal coating thickness
(c) the maximum pitch diameter by 4 times the minimum or nominal coating thickness
(d) the minimum minor diameter by 3 times the minimum or nominal coating thickness
(e) the maximum minor diameter by 2 times the minimum or nominal coating thickness

7.9.2.1 Example: $\frac{1}{2}$-13-UNJC-3B
Coating thickness: 0.0002 in.
To determine the before-coating maximum material sizes:

0.5000 after coating minimum major diameter
+ 0.0006 (3 × 0.0002 coating thickness)
= 0.5006 before coating minimum major diameter

0.4500 after coating minimum pitch diameter
+ 0.0012 (6 × 0.0002 coating thickness)
= 0.4512 before coating minimum pitch diameter

0.4251 after coating minimum minor diameter
+ 0.0006 (3 × 0.0002 coating thickness)
= 0.4257 before coating minimum minor diameter

To determine the before-coating minimum material sizes:

0.4548 after coating maximum pitch diameter
+ 0.0008 (4 × 0.0002 coating thickness)
= 0.4556 before coating maximum pitch diameter

0.4368 after coating maximum minor diameter
+ 0.0004 (2 × 0.0002 coating thickness)
= 0.4372 before coating maximum minor diameter

The before-coating sizes should be included in the thread designation (see para. 6.2.1).

8 LIMITS OF SIZE FOR STANDARD (UN, UNR, AND UNJ) AND SPECIAL (UNS, UNRS, AND UNJS) SERIES OF THREADS

8.1 Standard Series

The standard series for unified inch screw threads is listed in Table 1. Although the designations shown are for the UN thread form, UNR and UNJ designations may be used in all cases.

8.2 Limits of Size

The limits of size are defined by the design profile at its maximum material condition and the minimum profile at the minimum material condition. The limits are specified as diameters (major diameter, minor diameter, pitch diameter), and the practical interpretation of these limits on a three-dimensional threaded product depends on the method of inspection or evaluation or both. These dimensions serve as a basis for measurement and gaging of the thread, but the methods, techniques, and equipment used for thread evaluation establish the degree of thread conformance to the tabulated dimensions. Current techniques for measuring and gaging do not necessarily verify exact conformance of a thread to its specified maximum and minimum envelope. See ASME B1.3 for gaging systems for dimensional acceptability.

8.2.1 Limits of size for the majority of the standard series are shown in Tables 2A, 2B, and E-1. Until this Standard is revised to require the calculated and rounded values per ASME B1.30 shown in Tables 2A and 2B, both these and the values in Table E-1 will be equally acceptable. It is recommended that all users prepare for the eventual adoption of only the values in Tables 2A and 2B.

8.2.2 Limits of size not given may be calculated from the formulas given in paras. 8.3 through 8.3.2. Formulas and symbols for thread form are given in section 10.

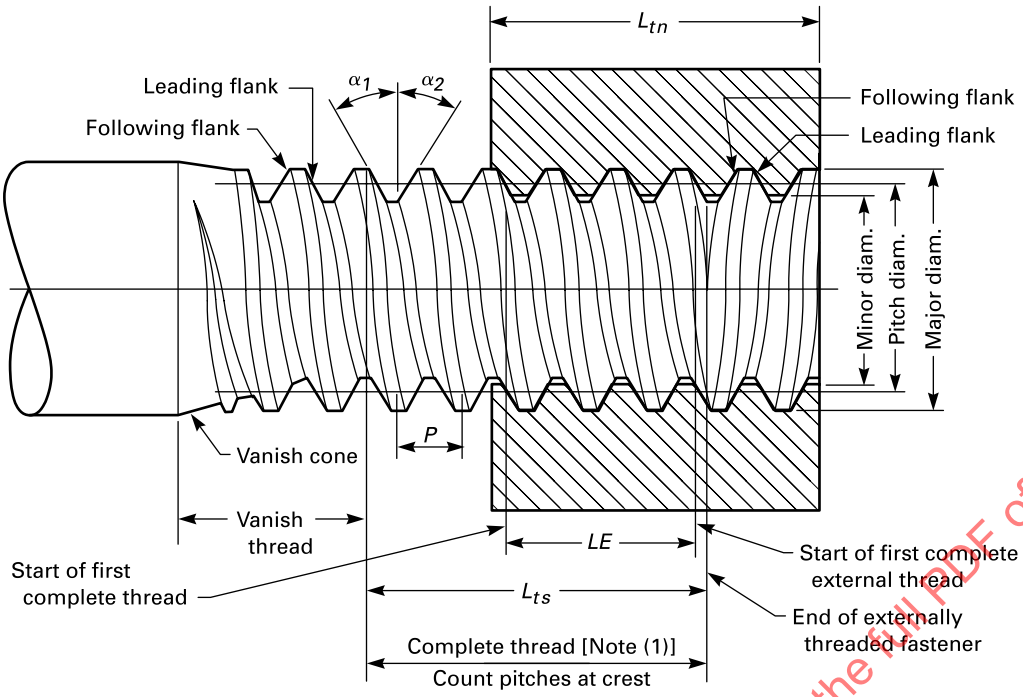
8.3 Formulas for Limits of Size

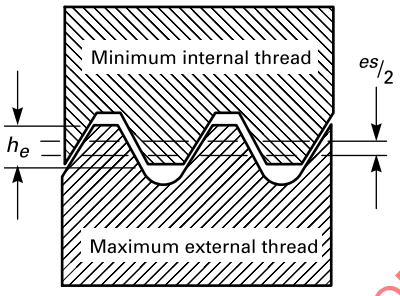
The formulas in these paragraphs were used to calculate the values shown in Tables 2A and 2B for standard series. The following symbols and nomenclature are used in the equations (see Figures 2, 3, and 16):

D = major diameter, internal
d = major diameter, external
D_1 = minor diameter, internal
d_1 = minor diameter, external
D_1 bsc = basic minor diameter, internal (see Tables 6 through 16)
= $D - 2h_n$
D_1 max. = maximum minor diameter, internal
d_1 max. = maximum minor diameter, external
D_1 min. = minimum minor diameter, internal
d_1 min. = minimum minor diameter, external
D_2 = pitch diameter, internal
d_2 = pitch diameter, external
D_2 bsc = basic pitch diameter, internal (see Tables 6 through 16)
= $D - h_b$
D_2 max. = maximum pitch diameter, internal
d_2 max. = maximum pitch diameter, external
D_2 min. = minimum pitch diameter, internal
d_2 min. = minimum pitch diameter, external
d_3 max. = maximum minor diameter, external
d_3 min. = minimum minor diameter, external
D bsc = basic major (nominal) diameter, internal
d max. = maximum major diameter, external
D min. = minimum major diameter, internal
d min. = minimum major diameter, external
es = allowance at the major, pitch, and minor diameter of the external thread
h_b = $2h_{as}$ (see Table 5)
h_n = height of internal thread (see Table 5)
P = pitch, in.
r max. = maximum root radius, external thread
r min. = minimum root radius, external thread
Td = major diameter tolerance, external thread
TD_1 = minor diameter tolerance, internal thread
Td_2 = pitch diameter tolerance, external thread

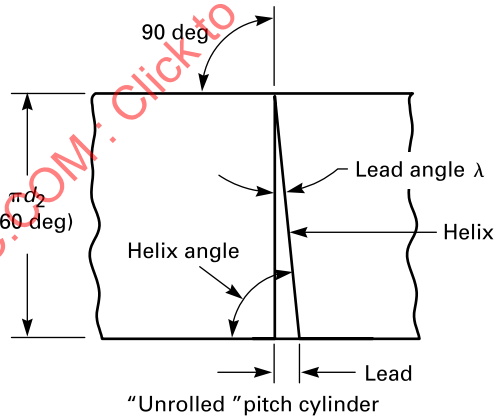
To obtain limits of size using the formulas, see Table 5 for basic thread form data, section 11 for basic dimensions, and section 5 for formulas of allowance and tolerance. For easy reference, outline guides for determining limits of size of external and internal threads are given in Tables 17A and 17B.

Figure 16
Application of General Thread Symbols



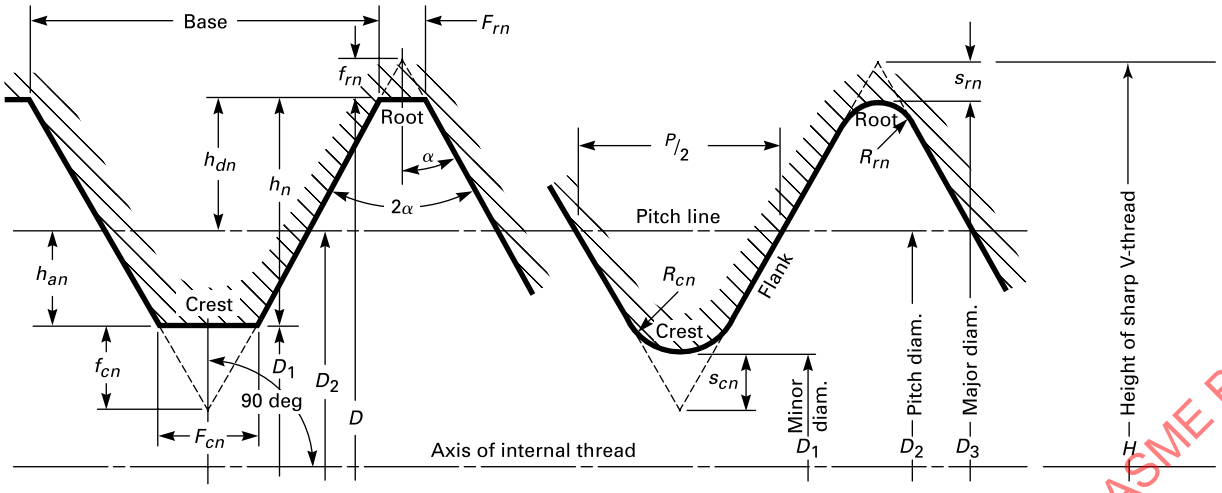


Thread With an Allowance

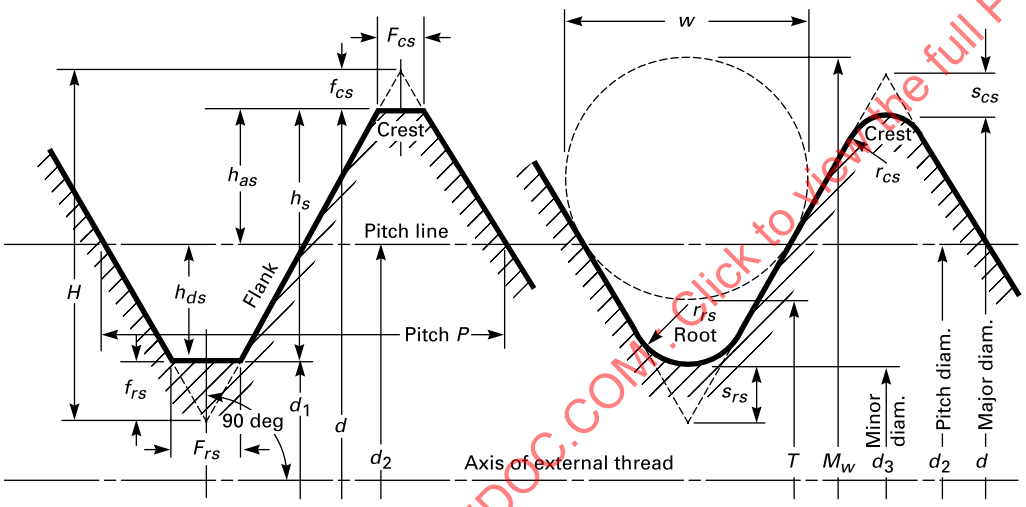


Lead and Helix Angles

Figure 16
Application of General Thread Symbols (Cont'd)



Internal Thread



External Thread

GENERAL NOTE: These diagrams are not intended to show standard thread forms, but only to illustrate the application of symbols.

NOTE: (1) Portion of thread fully formed at crest and root.

8.3.1 External Thread

(a) Maximum Major Diameter (External Threads)

(1) for Classes 1A and 2A

$$d \text{ max.} = D \text{ bsc} - es$$

(2) for Class 3A

$$d \text{ max.} = D \text{ bsc}$$

(b) Minimum Major Diameter (External Threads)

(1) for all classes

$$d \text{ min.} = d \text{ max.} - Td \text{ for respective class of thread}$$

(c) Maximum Pitch Diameter (External Threads)

(1) for Classes 1A and 2A

$$d_2 = D_2 \text{ bsc} - es$$

(2) for Class 3A

$$d_2 = D_2 \text{ bsc}$$

(d) Minimum Pitch Diameter (External Threads)

(1) for all classes

$$d_2 \text{ min.} = d_2 \text{ max.} - Td_2 \text{ for respective class of thread}$$

(e) Maximum Minor Diameter (External Threads)

(1) in dimensioning UN series external threads, the minor diameter is not specified. In practice, the minor diameter is satisfactory when accepted by a standard GO thread gage in accordance with ASME B1.2. When minor diameter values for reference purposes are desired, they are calculated as follows:

(-a) for Classes 1A and 2A

$$d_1 \text{ max.} = D_1 \text{ bsc} - es$$

(-b) for Class 3A

$$d_1 \text{ max.} = D_1 \text{ bsc}$$

(2) for UNR series threads, the formulas are

(-a) for Classes 1A and 2A

$$d_3 \text{ max.} = D_1 \text{ bsc} - es - 0.10825318P$$

(-b) for Class 3A

$$d_3 \text{ max.} = D_1 \text{ bsc} - 0.10825318P$$

(3) for UNJ series threads, the formulas are

(-a) for Class 2A

$$d_3 \text{ max.} = d_2 \text{ max.(for Class 2A UN)} - 0.5051800P$$

(see Table 5)

(-b) for Class 3A

$$d_3 \text{ max.} = d_2 \text{ max.(for Class 3A UN)} - 0.5051800P$$

(see Table 5)

(-c) r max. = $0.18042196P$

(f) Minimum Minor Diameter (External Threads)

(1) for UN and UNR series threads, when the minimum diameter is desirable for design purposes, it can be calculated for all classes by

$$d_1 \text{ min.} = d_2 \text{ min.} - 0.64951905P$$

(2) for UNJ series threads, the formulas are

(-a) for Class 2A

$$d_3 \text{ min.} = d_2 \text{ min.(for Class 2A UN)} - 0.565800P$$

(see Table 5)

(-b) for Class 3A

$$d_3 \text{ min.} = d_2 \text{ min.(for Class 3A UN)} - 0.565800P$$

(see Table 5)

(-c) r min. = $0.15011107P$

8.3.2 Internal Thread

(a) Maximum Major Diameter (Internal Threads). In dimensioning internal threads, the maximum major diameter is established by the crest of an unworn tool and therefore is not specified. In practice, the major diameter of an internal thread is satisfactory when accepted by a gage or gaging method that represents the maximum material condition of an external thread that has no allowance.

(b) Minimum Major Diameter (Internal Threads)

(1) For all classes

$$D \text{ min.} = D \text{ bsc}$$

(c) Minimum Pitch Diameter (Internal Threads)

(1) For all classes

$$D_2 \text{ min.} = D_2 \text{ bsc}$$

(d) Maximum Pitch Diameter (Internal Threads)

(1) For all classes

$$D_2 \text{ max.} = D_2 \text{ min.} + TD_2 \text{ for respective class of thread}$$

(e) Minimum Minor Diameter (Internal Threads)

(1) for UN and UNR series threads, for all classes

$$D_1 \text{ min.} = D \text{ bsc} - 2h_n \text{ or } D \text{ bsc} - 1.08253175P$$

rounded as follows:

(-a) for all classes, less than 0.1380 (#6) nominal size, round to four decimal places

(-b) for Classes 1B and 2B, equal to or greater than 0.1380 (#6) nominal size, round to three decimal places

(-c) for Class 3B, equal to or greater than 0.1380 (#6) nominal size, round to three decimal places and add a zero to yield a four-decimal-place value

(2) for UNJ series threads, for all classes

$$D_1 \text{ min.} = D \text{ min.} - 0.97427858P$$

rounded as follows:

(-a) for all classes, less than 0.1380 (#6) nominal size, round to four decimal places

(-b) for Class 2B, equal to or greater than 0.1380 (#6) nominal size, round to three decimal places

(-c) for Class 3B, equal to or greater than 0.1380 (#6) nominal size, round to four decimal places

(f) Maximum Minor Diameter (Internal Threads)

(1) For all classes

$$D_1 \text{ max.} = D_1 \text{ min.}(\text{six decimal-place value} + TD_1$$

[see para. 5.8.2(c)], rounded as follows:

(-a) for Classes 1B and 2B, less than 0.1380 (#6) nominal size, round to four decimal places

(-b) for Classes 1B and 2 B, equal to or greater than 0.1380 (#6) nominal size, round to three decimal places

(-c) for Class 3B, all sizes, round to four decimal places

8.4 Example of Calculations From Formulas

Tables 18A through 18D are based on the practices for calculating and rounding screw thread dimensions as specified in ASME B1.30; see ASME B1.30 for additional examples.

9 THREAD FORM TOLERANCES

9.1 Form Variation

Form variation is the combined effect on functional size of individual thread form variations in lead (pitch), helix, flank angle, taper, and roundness.

9.2 Lead and Flank Angle Acceptance

Acceptance of lead and flank angles of product screw threads shall be in accordance with paras 9.2.1 through 9.2.6. These factors also contribute to visual identification of gross defects in thread profile.

9.2.1 When Thread Gaging System 21 of ASME B1.3 is specified, product thread lead (including helix) and flank angle variations are not considered as separate elements.

9.2.2 When Thread Gaging System 22 of ASME B1.3 is specified, with the pitch diameter or thread-groove diameter inspection or evaluation required, the product thread lead (including helix) and flank angles shall be considered acceptable when the minimum material characteristic (pitch diameter or thread-groove diameter in ASME B1.3, Tables 1 and 2, columns C and D) and the maximum material characteristic (GO in ASME B1.3, Tables 1 and 2, column A) are accepted by the gages specified for System 22, over the standard GO thread gage length.

When Thread Gaging System 22 is specified with NO GO functional diameter combined with inspection or evaluation of lead and flank option, agreements must be reached between the purchaser and the supplier on lead and flank angle limits and method of evaluation.

9.2.3 When Thread Gaging System 23 of ASME B1.3 is specified, product thread lead and flank angles shall be acceptable if within the allowable variations specified in Tables 3 and 19. Also, the minimum material characteristic (pitch diameter or thread-groove diameter in ASME B1.3, Tables 1 and 2, columns C and D) and the maximum material characteristic (GO in ASME B1.3, Tables 1 and 2, column A) must be accepted by the gages specified for System 23 over the standard GO thread gage length.

Allowable variations in lead and flank angles are maximum values. Maximum variation in these and pitch diameter tolerance cannot be taken simultaneously (see paras. 9.2.5 and 9.2.6).

9.2.4 When individual inspection or evaluation of lead (including helix) or flank angle or both variations are required in addition to Thread Gaging System 21 or 22 of ASME B1.3, the allowable variations for these characteristics shall be as specified in Tables 3 and 19.

9.2.5 For sizes not included in Tables 3 and 19, the allowable lead variation is equal to one-half the pitch diameter tolerance divided by 1.732051. This is the lead variation that causes a change in functional diameter equal to one half the pitch diameter tolerance, external thread, Td_2. The allowable flank half-angle variation in minutes of arc is equal to 30 plus 1.875 times the number of threads per inch, rounded to the nearest 5 min for UN threads and UNJ threads 32 threads/in. and coarser. For UNJ threads finer than 32 threads/in., this is equal to 62 plus 0.775 times the number of threads/in. rounded to the nearest 5 min.

(a) EXAMPLE: 0.945-8.5-UNJS or UNS-3A; lead and angle control required

No lead and angle tolerances were specified nor do default values appear in Tables 6 and 7. Values are calculated as follows:

Lead tolerance = $(0.5Td_2)/1.732051$

Td_2 = 0.0050

Lead tolerance = (0.5 × 0.0050)/1.732051 = 0.0014 in.

Angle tolerance (for 32 TPI and coarser) = 30 + (1.875 × TPI)
Angle tolerance = 30 + (1.875 × 8.5)
= 45.94 min
= 45 min when rounded to nearest 5 min

(b) EXAMPLE: 0.500-41-UNJS-3B; lead and angle control required
Lead tolerance = $(0.5Td_2)/1.732051$
Pitch diameter tolerance, Td_2 = 0.0031
Lead tolerance = (0.5 × 0.0031)/1.732051 = 0.0009 in.
Angle tolerance (for finer than 32 TPI) = 62 + (0.775 × TPI)
Angle tolerance = 62 + (0.775 × 41)
= 93.78 min
= 1 deg and 35 min when rounded to nearest 5 min

(c) For UNJ, if lead and angle tolerances are specified as a pitch diameter equivalent in terms of pitch diameter tolerance, tolerances in accordance with para. 9.2.3 or para. 9.2.4 may be adjusted proportionately using 0.5 times pitch diameter tolerance as a basis.

(1) EXAMPLE: 0.5000-20-UNJF-3A (22S); lead and angle control required – 0.4 PD tolerance

From Table 3, allowable lead variation is 0.0009 in. This would be adjusted to 0.4/0.5 times 0.0009, which is 0.0007 in.

From Table 19, allowable angle variation is 1 deg 10 min or 70 min. This would be adjusted to 0.4/0.5 times 70, which is 56 min, or 55 min when rounded.

9.2.6 For the requirements of paras. 9.2.4 and 9.2.5, lead variation values tabulated or calculated are the maximum variations from specified lead between any two points not farther apart than the length of the standard GO thread gage. Flank angle variation values are maximum variations from the basic 30-deg angle between thread flanks and perpendicular to the thread axis.

10 FORMULAS AND NOMENCLATURE FOR THREAD FORM

Formulas are given below; data are tabulated in Table 5.

The nomenclature is defined in Table 20 and application of the symbols is shown in Figure 16. Formulas that are a function of H are for reference only.

(a) Included angle of thread

$$2\alpha = 60 \text{ deg}$$

(b) Half angle of thread

$$\alpha = 30 \text{ deg}$$

(c) Threads per inch (TPI), the number of thread pitches per inch. TPI is the reciprocal of the pitch value in inches (1/P)

(d) Pitch of thread

$$P = 1/\text{TPI}$$

(see Table 5, column 2)

(e) Height of sharp V thread (fundamental triangle)

$$H = 0.86602540P$$

(see Table 5, column 24)

(f) Height of UNR external thread, design form

$$h_s \text{ (for UNR)} = 0.61343466P$$

(see Table 5, column 21)

(g) Height of internal thread and UN external thread

$$h_s \text{ (for UN)} = h_n = 0.54126588P$$

(see Table 5, column 18)

(h) Height of thread engagement

$$h_s \text{ (for UN)} = 0.54126588P$$

(see Table 5, column 18)

(i) Flat at crest of external thread

$$F_{cs} = 0.12500P$$

(see Table 5, column 4)

(j) Truncation of UN external thread crest

$$f_{cs} = 0.10825318P$$

(see Table 5, column 3)

(k) Truncation of UNR external thread (for calculating minor diameter values in tables)

$$S_{rs} = 0.16237976P$$

(see Table 5, column 7)

(l) Basic flat at crest of internal thread and root of external thread

$$F_{rs} = F_{cn} = 0.2500P$$

(see Table 5, column 10)

(m) Truncation of internal thread crest

$$f_{cn} = 0.21650635P$$

(see Table 5, column 9)

(n) Flat at root of internal thread

$$F_{rn} = 0.12500P$$

(see Table 5, column 4)

(o) Truncation of internal thread root

$$f_{rn} = 0.10825318P$$

(see Table 5, column 3)

(p) Addendum of external thread

$$h_{as} = 0.32475953P$$

(see Table 5, column 13)

(q) Major diameter of external thread

$$d = D - es$$

(r) Pitch diameter of external thread

$$d_2 = d - 2h_b = d - 0.64951905P$$

(see Table 5, column 22)

(s) Minor diameter of UNR external thread

$$d_3 = d - 2h_s = d - 1.22686932P$$

(see Table 5, column 27)

(t) Minor diameter of UN external thread

$$d_1 = d - 2h_n = d - 1.08253175P$$

(see Table 5, column 26)

(u) Major diameter of internal thread is D

$$D = D \text{ bsc}$$

(v) Pitch diameter of internal thread is D_2

$$D_2 = D - h_b = D - 0.64951905P$$

(see Table 5, column 22)

(w) Minor diameter of internal thread D_1

$$D_1 = D - 2h_n = D - 1.08253175P$$

(see Table 5, column 26)

11 TABLES OF BASIC DIMENSIONS

11.1 Table Content

The basic dimensions tabulated in Tables 6 through 16 include major diameter, pitch diameter, minor diameter of external threads, minor diameter of internal threads, lead angle, cross-sectional area at the minor diameter, and the tensile stress area.

11.2 Thread Series

Basic dimensions are given for each of the standard series threads.

Table 6
Basic Dimensions for Coarse-Thread Series (UNC, UNRC, and UNJC)

Nominal Size		Basic Major Diam., D bsc	Threads/ in.	Basic Pitch Diam., D_2 bsc	UNR Design Minor Diam. External, d_3 (Ref.)	UNJ Design Minor Diam. External, d_3 (Ref.)	Basic UN Minor Diam. Internal, D_1 bsc	Basic UNJ Minor Diam. Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diam., λ		Area at Minor Diam., in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary								deg	Min.		
...	1	0.0730	64	0.0629	0.0544	0.0550	0.0561	0.0578	4	32	0.00218	0.00263
2	...	0.0860	56	0.0744	0.0647	0.0654	0.0667	0.0686	4	23	0.00310	0.00370
...	3	0.0990	48	0.0855	0.0742	0.0750	0.0764	0.0787	4	27	0.00406	0.00487
4	...	0.1120	40	0.0958	0.0822	0.0832	0.0849	0.0876	4	46	0.00497	0.00604
5	...	0.1250	40	0.1088	0.0952	0.0962	0.0979	0.1006	4	11	0.00672	0.00796
6	...	0.1380	32	0.1177	0.1008	0.1019	0.1042	0.1076	4	51	0.00745	0.00908
8	...	0.1640	32	0.1437	0.1268	0.1279	0.1302	0.1336	3	58	0.01200	0.01400
10	...	0.1900	24	0.1629	0.1404	0.1419	0.1449	0.1494	4	40	0.01450	0.01750
...	12	0.2160	24	0.1889	0.1664	0.1679	0.1709	0.1754	4	1	0.02060	0.02420
1/4	...	0.2500	20	0.2175	0.1905	0.1922	0.1959	0.2013	4	12	0.02690	0.03180
5/16	...	0.3125	18	0.2764	0.2463	0.2483	0.2524	0.2584	3	40	0.04540	0.05240
3/8	...	0.3750	16	0.3344	0.3006	0.3028	0.3073	0.3141	3	25	0.06780	0.07750
7/16	...	0.4375	14	0.3911	0.3524	0.3550	0.3602	0.3679	3	20	0.09330	0.10630
1/2	...	0.5000	13	0.4500	0.4084	0.4111	0.4167	0.4251	3	7	0.12570	0.14190
9/16	...	0.5625	12	0.5084	0.4633	0.4663	0.4723	0.4813	2	59	0.16200	0.18200
5/8	...	0.6250	11	0.5660	0.5167	0.5201	0.5266	0.5364	2	56	0.20200	0.22600
3/4	...	0.7500	10	0.6850	0.6309	0.6345	0.6417	0.6526	2	40	0.30200	0.33400
7/8	...	0.8750	9	0.8028	0.7427	0.7467	0.7547	0.7667	2	31	0.41900	0.46200
1	...	1.0000	8	0.9188	0.8512	0.8557	0.8647	0.8782	2	29	0.55100	0.60600
1 1/8	...	1.1250	7	1.0322	0.9549	0.9600	0.9704	0.9858	2	31	0.69300	0.76300
1 1/4	...	1.2500	7	1.1572	1.0799	1.0850	1.0954	1.1108	2	15	0.89000	0.96900
1 3/8	...	1.3750	6	1.2667	1.1766	1.1825	1.1946	1.2126	2	24	1.05400	1.15500
1 1/2	...	1.5000	6	1.3917	1.3015	1.3075	1.3196	1.3376	2	11	1.29400	1.40500
1 3/4	...	1.7500	5	1.6201	1.5118	1.5191	1.5335	1.5551	2	15	1.74000	1.90000
2	...	2.0000	4 1/2	1.8557	1.7354	1.7434	1.7594	1.7835	2	11	2.30000	2.50000
2 1/4	...	2.2500	4	2.0876	1.9523	1.9613	1.9794	2.0064	2	11	2.91000	3.16000
2 1/2	...	2.5000	4	2.3376	2.2023	2.2113	2.2294	2.2564	1	57	3.72000	4.00000

Table 6
Basic Dimensions for Coarse-Thread Series (UNC, UNRC, and UNJC) (Cont'd)

Nominal Size		Basic Major Diam., D bsc	Threads/ in.	Basic Pitch Diam., D_2 bsc	UNR Design Minor Diam. External, d_3 (Ref.)	UNJ Design Minor Diam. External, d_3 (Ref.)	Basic UN Minor Diam. Internal, D_1 bsc	Basic UNJ Minor Diam. Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diam., λ		Area at Minor Diam., in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary								deg	Min.		
$2\frac{3}{4}$	...	2.7500	4	2.5876	2.4523	2.4613	2.4794	2.5064	1	46	4.62000	4.93000
3	...	3.0000	4	2.8376	2.7023	2.7113	2.7294	2.7564	1	36	5.62000	5.97000
$3\frac{1}{4}$	...	3.2500	4	3.0876	2.9523	2.9613	2.9794	3.0064	1	29	6.72000	7.10000
$3\frac{1}{2}$	...	3.5000	4	3.3376	3.2023	3.2113	3.2294	3.2564	1	22	7.92000	8.33000
$3\frac{3}{4}$	...	3.7500	4	3.5876	3.4523	3.4613	3.4794	3.5064	1	16	9.21000	9.66000
4	...	4.0000	4	3.8376	3.7023	3.7113	3.7294	3.7564	1	11	10.61000	11.08000

NOTES:
(1) For information only.
(2) Minor diameter location for the calculation of area = $D - 2h_b$.
(3) Area at minor diameter = $\pi\{[(D - 2h_b)/2]^2\}$.
(4) For tensile stress area for UNJ threads, see applicable fastener standard such as SAE AS7251C, SAE AS7455A, SAE AS7459B, SAE AS7466E, SAE AS7477F, and SAE AS7478D.
(5) See formulas in Nonmandatory Appendix B, section B-1.

Table 7
Basic Dimensions for Fine-Thread Series (UNF, UNRF, and UNJF)

Nominal Size		Basic Major Diam., D bsc	Threads/ in.	Basic Pitch Diam., D_2 bsc	UNR Design Minor Diam. External, d_3 (Ref.)	UNJ Design Minor Diam. External, d_3 (Ref.)	Basic UN Minor Diam. Internal, D_1 bsc	Basic UNJ Minor Diam. Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diam., λ		Area at Minor Diam., in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary								deg	Min.		
0	...	0.0600	80	0.0519	0.0451	0.0456	0.0465	0.0478	4	24	0.00150	0.00180
...	1	0.0730	72	0.0640	0.0565	0.0570	0.0580	0.0595	3	57	0.00237	0.00278
2	...	0.0860	64	0.0759	0.0674	0.0680	0.0691	0.0708	3	45	0.00339	0.00394
...	3	0.0990	56	0.0874	0.0777	0.0784	0.0797	0.0816	3	44	0.00451	0.00523
4	...	0.1120	48	0.0985	0.0872	0.0880	0.0894	0.0917	3	51	0.00567	0.00661
5	...	0.1250	44	0.1102	0.0979	0.0987	0.1004	0.1029	3	46	0.00716	0.00830
6	...	0.1380	40	0.1218	0.1082	0.1092	0.1109	0.1136	3	45	0.00875	0.01015
8	...	0.1640	36	0.1460	0.1309	0.1320	0.1339	0.1369	3	28	0.01285	0.01474
10	...	0.1900	32	0.1697	0.1528	0.1539	0.1562	0.1596	3	22	0.01750	0.02000
...	12	0.2160	28	0.1928	0.1735	0.1748	0.1773	0.1812	3	23	0.02260	0.02580
1/4	...	0.2500	28	0.2268	0.2075	0.2088	0.2113	0.2152	2	52	0.03260	0.03640
5/16	...	0.3125	24	0.2854	0.2629	0.2644	0.2674	0.2719	2	40	0.05240	0.05810
3/8	...	0.3750	24	0.3479	0.3254	0.3269	0.3299	0.3344	2	11	0.08090	0.08780
7/16	...	0.4375	20	0.4050	0.3780	0.3797	0.3834	0.3888	2	15	0.10900	0.11870
1/2	...	0.5000	20	0.4675	0.4405	0.4422	0.4459	0.4513	1	57	0.14860	0.15990
9/16	...	0.5625	18	0.5264	0.4963	0.4983	0.5024	0.5084	1	55	0.18900	0.20300
5/8	...	0.6250	18	0.5889	0.5588	0.5608	0.5649	0.5709	1	43	0.24000	0.25600
3/4	...	0.7500	16	0.7094	0.6756	0.6778	0.6823	0.6891	1	36	0.35100	0.37300
7/8	...	0.8750	14	0.8286	0.7899	0.7925	0.7977	0.8054	1	34	0.48100	0.50900
1	...	1.0000	12	0.9459	0.9008	0.9038	0.9098	0.9188	1	36	0.62500	0.66300
1 1/8	...	1.1250	12	1.0709	1.0258	1.0288	1.0348	1.0438	1	25	0.81200	0.85600
1 1/4	...	1.2500	12	1.1959	1.1508	1.1538	1.1598	1.1688	1	16	1.02400	1.07300
1 3/8	...	1.3750	12	1.3209	1.2758	1.2788	1.2848	1.2938	1	9	1.26000	1.31500
1 1/2	...	1.5000	12	1.4459	1.4008	1.4038	1.4098	1.4188	1	3	1.52100	1.58100

NOTES:
(1) For information only.
(2) Minor diameter location for the calculation of area = $D - 2h_b$.
(3) Area at minor diameter = $\pi\{[(D - 2h_b)/2]^2\}$.
(4) For tensile stress area for UNJ threads, see applicable fastener standard such as SAE AS7251C, SAE AS7455A, SAE AS7459B, SAE AS7466E, SAE AS7477F, and SAE AS7478D.
(5) See formulas in Nonmandatory Appendix B, section B-1.

Table 8
Basic Dimensions for Extra-Fine-Thread Series (UNEF, UNREF, and UNJEF)

Nominal Size		Basic Major Diam., D bsc	Threads/ in.	Basic Pitch Diam., D_2 bsc	UNR Design Minor Diam. External, d_3 (Ref.)	UNJ Design Minor Diam. External, d_3 (Ref.)	Basic UN Minor Diam. Internal, D_1 bsc	Basic UNJ Minor Diam. Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diam., λ		Area at Minor Diam., in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary								deg	Min.		
...	12	0.2160	32	0.1957	0.1788	0.1799	0.1822	0.1856	2	55	0.0242	0.0270
1/4	...	0.2500	32	0.2297	0.2128	0.2139	0.2162	0.2196	2	29	0.0344	0.0379
5/16	...	0.3125	32	0.2922	0.2753	0.2764	0.2787	0.2821	1	57	0.0581	0.0625
3/8	...	0.3750	32	0.3547	0.3378	0.3389	0.3412	0.3446	1	36	0.0878	0.0932
7/16	...	0.4375	28	0.4143	0.3950	0.3963	0.3988	0.4027	1	34	0.1201	0.1274
1/2	...	0.5000	28	0.4768	0.4575	0.4588	0.4613	0.4652	1	22	0.1620	0.1700
9/16	...	0.5625	24	0.5354	0.5129	0.5144	0.5174	0.5219	1	25	0.2030	0.2140
5/8	...	0.6250	24	0.5979	0.5754	0.5769	0.5799	0.5844	1	16	0.2560	0.2680
...	11/16	0.6875	24	0.6604	0.6379	0.6394	0.6424	0.6469	1	9	0.3150	0.3290
3/4	...	0.7500	20	0.7175	0.6905	0.6922	0.6959	0.7013	1	16	0.3690	0.3860
...	13/16	0.8125	20	0.7800	0.7530	0.7547	0.7584	0.7638	1	10	0.4390	0.4580
7/8	...	0.8750	20	0.8425	0.8155	0.8172	0.8209	0.8263	1	5	0.5150	0.5360
...	15/16	0.9375	20	0.9050	0.8780	0.8797	0.8834	0.8888	1	0	0.5980	0.6200
1	...	1.0000	20	0.9675	0.9405	0.9422	0.9459	0.9513	0	57	0.6870	0.7110
...	1 1/16	1.0625	18	1.0264	0.9963	0.9983	1.0024	1.0084	0	59	0.7700	0.7990
1 1/8	...	1.1250	18	1.0889	1.0588	1.0608	1.0649	1.0709	0	56	0.8710	0.9010
...	1 3/16	1.1875	18	1.1514	1.1213	1.1233	1.1274	1.1334	0	53	0.9770	1.0090
1 1/4	...	1.2500	18	1.2139	1.1838	1.1858	1.1899	1.1959	0	50	1.0900	1.1230
...	1 5/16	1.3125	18	1.2764	1.2463	1.2483	1.2524	1.2584	0	48	1.2080	1.2440
1 3/8	...	1.3750	18	1.3389	1.3088	1.3108	1.3149	1.3209	0	45	1.3330	1.3700
...	1 7/16	1.4375	18	1.4014	1.3713	1.3733	1.3774	1.3834	0	43	1.4640	1.5030
1 1/2	...	1.5000	18	1.4639	1.4338	1.4358	1.4399	1.4459	0	42	1.6000	1.6400
...	1 9/16	1.5625	18	1.5264	1.4963	1.4983	1.5024	1.5084	0	40	1.7400	1.7900
1 5/8	...	1.6250	18	1.5889	1.5588	1.5608	1.5649	1.5709	0	38	1.8900	1.9400
...	1 11/16	1.6875	18	1.6514	1.6213	1.6233	1.6274	1.6334	0	37	2.0500	2.1000

NOTES:
(1) For information only.
(2) Minor diameter location for the calculation of area = $D - 2h_b$.

Table 8
Basic Dimensions for Extra-Fine-Thread Series (UNEF, UNREF, and UNJEF) (Cont'd)

NOTES: (Cont'd)
(3) Area at minor diameter = $\pi\{[(D - 2h_b)/2]^2\}$.
(4) For tensile stress area for UNJ threads, see applicable fastener standard such as SAE AS7251C, SAE AS7455A, SAE AS7459B, SAE AS7466E, SAE AS7477F, and SAE AS7478D.
(5) See formulas in Nonmandatory Appendix B, section B-1.

Table 9
Basic Dimensions for 4-Thread Series (UN, UNR, and UNJ)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
2½ [Note (6)]	...	2.5000	2.3376	2.2023	2.2113	2.2294	2.2564	1	57	3.72	4.00
...	2⅝	2.6250	2.4626	2.3273	2.3363	2.3544	2.3814	1	51	4.16	4.45
2¾ [Note (6)]	...	2.7500	2.5876	2.4523	2.4613	2.4794	2.5064	1	46	4.62	4.93
...	2⅞	2.8750	2.7126	2.5773	2.5863	2.6044	2.6314	1	41	5.11	5.44
3 [Note (6)]	...	3.0000	2.8376	2.7023	2.7113	2.7294	2.7564	1	36	5.62	5.97
...	3⅛	3.1250	2.9626	2.8273	2.8363	2.8544	2.8814	1	32	6.16	6.52
3¼ [Note (6)]	...	3.2500	3.0876	2.9523	2.9613	2.9794	3.0064	1	29	6.72	7.10
...	3⅜	3.3750	3.2126	3.0773	3.0863	3.1044	3.1314	1	25	7.31	7.70
3½ [Note (6)]	...	3.5000	3.3376	3.2023	3.2113	3.2294	3.2564	1	22	7.92	8.33
...	3⅝	3.6250	3.4626	3.3273	3.3363	3.3544	3.3814	1	19	8.55	8.98
3¾ [Note (6)]	...	3.7500	3.5876	3.4523	3.4613	3.4794	3.5064	1	16	9.21	9.66
...	3⅞	3.8750	3.7126	3.5773	3.5863	3.6044	3.6314	1	14	9.90	10.36
4	...	4.0000	3.8376	3.7023	3.7113	3.7294	3.7564	1	11	10.61	11.08
...	4⅛	4.1250	3.9626	3.8273	3.8363	3.8544	3.8814	1	9	11.34	11.83
4¼	...	4.2500	4.0876	3.9523	3.9613	3.9794	4.0064	1	7	12.10	12.61
...	4⅜	4.3750	4.2126	4.0773	4.0863	4.1044	4.1314	1	5	12.88	13.41
4½	...	4.5000	4.3376	4.2023	4.2113	4.2294	4.2564	1	3	13.69	14.23
...	4⅝	4.6250	4.4626	4.3273	4.3363	4.3544	4.3814	1	1	14.52	15.08
4¾	...	4.7500	4.5876	4.4523	4.4613	4.4794	4.5064	0	60	15.38	15.95
...	4⅞	4.8750	4.7126	4.5773	4.5863	4.6044	4.6314	0	58	16.26	16.85
5	...	5.0000	4.8376	4.7023	4.7113	4.7294	4.7564	0	57	17.17	17.77
...	5⅛	5.1250	4.9626	4.8273	4.8363	4.8544	4.8814	0	55	18.10	18.71
5¼	...	5.2500	5.0876	4.9523	4.9613	4.9794	5.0064	0	54	19.05	19.69
...	5⅜	5.3750	5.2126	5.0773	5.0863	5.1044	5.1314	0	52	20.03	20.68
5½	...	5.5000	5.3376	5.2023	5.2113	5.2294	5.2564	0	51	21.04	21.70
...	5⅝	5.6250	5.4626	5.3273	5.3363	5.3544	5.3814	0	50	22.06	22.74
5¾	...	5.7500	5.5876	5.4523	5.4613	5.4794	5.5064	0	49	23.12	23.81

Table 9
Basic Dimensions for 4-Thread Series (UN, UNR, and UNJ) (Cont'd)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
...	$5\frac{7}{8}$	5.8750	5.7126	5.5773	5.5863	5.6044	5.6314	0	48	24.19	24.91
6	...	6.0000	5.8376	5.7023	5.7113	5.7294	5.7564	0	47	25.30	26.03

NOTES:
(1) For information only.
(2) Minor diameter location for the calculation of area = $D - 2h_b$.
(3) Area at minor diameter = $\pi\{[(D - 2h_b)/2]^2\}$.
(4) For tensile stress area for UNJ threads, see applicable fastener standard such as SAE AS7251C, SAE AS7455A, SAE AS7459B, SAE AS7466E, SAE AS7477F, and SAE AS7478D.
(5) See formulas in Nonmandatory Appendix B, section B-1.
(6) Standard sizes of the UNC, UNF, or UNEF series.

Table 10
Basic Dimensions for 6-Thread Series (UN, UNR, and UNJ)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
1 3/8 [Note (6)]	...	1.3750	1.2667	1.1765	1.1825	1.1946	1.2126	2	24	1.0541	1.1548
...	1 7/16	1.4375	1.3292	1.2390	1.2450	1.2571	1.2751	2	17	1.1709	1.2769
1 1/2 [Note (6)]	...	1.5000	1.3917	1.3015	1.3075	1.3196	1.3376	2	11	1.2938	1.4052
...	1 9/16	1.5625	1.4542	1.3640	1.3700	1.3821	1.4001	2	5	1.4229	1.5395
1 5/8	...	1.6250	1.5167	1.4265	1.4325	1.4446	1.4626	2	0	1.5581	1.6801
...	1 11/16	1.6875	1.5792	1.4890	1.4950	1.5071	1.5251	1	55	1.6995	1.8267
1 3/4	...	1.7500	1.6417	1.5515	1.5575	1.5696	1.5876	1	51	1.8469	1.9795
...	1 13/16	1.8125	1.7042	1.6140	1.6200	1.6321	1.6501	1	47	2.0006	2.1384
1 7/8	...	1.8750	1.7667	1.6765	1.6825	1.6946	1.7126	1	43	2.1603	2.3035
...	1 15/16	1.9375	1.8292	1.7390	1.7450	1.7571	1.7751	1	40	2.3262	2.4747
2	...	2.0000	1.8917	1.8015	1.8075	1.8196	1.8376	1	36	2.4982	2.6520
...	2 1/8	2.1250	2.0167	1.9265	1.9325	1.9446	1.9626	1	30	2.8607	3.0251
2 1/4	...	2.2500	2.1417	2.0515	2.0575	2.0696	2.0876	1	25	3.2477	3.4227
...	2 3/8	2.3750	2.2667	2.1765	2.1825	2.1946	2.2126	1	20	3.6592	3.8449
2 1/2	...	2.5000	2.3917	2.3015	2.3075	2.3196	2.3376	1	16	4.0953	4.2916
...	2 5/8	2.6250	2.5167	2.4265	2.4325	2.4446	2.4626	1	12	4.5560	4.7629
2 3/4	...	2.7500	2.6417	2.5515	2.5575	2.5696	2.5876	1	9	5.0411	5.2587
...	2 7/8	2.8750	2.7667	2.6765	2.6825	2.6946	2.7126	1	6	5.5509	5.7790
3	...	3.0000	2.8917	2.8015	2.8075	2.8196	2.8376	1	3	6.0851	6.3239
...	3 1/8	3.1250	3.0167	2.9265	2.9325	2.9446	2.9626	1	0	6.6439	6.8933
3 1/4	...	3.2500	3.1417	3.0515	3.0575	3.0696	3.0876	0	58	7.2273	7.4873
...	3 3/8	3.3750	3.2667	3.1765	3.1825	3.1946	3.2126	0	56	7.8352	8.1058
3 1/2	...	3.5000	3.3917	3.3015	3.3075	3.3196	3.3376	0	54	8.4676	8.7489
...	3 5/8	3.6250	3.5167	3.4265	3.4325	3.4446	3.4626	0	52	9.1246	9.4165
3 3/4	...	3.7500	3.6417	3.5515	3.5575	3.5696	3.5876	0	50	9.8061	10.1086
...	3 7/8	3.8750	3.7667	3.6765	3.6825	3.6946	3.7126	0	48	10.5122	10.8253
4	...	4.0000	3.8917	3.8015	3.8075	3.8196	3.8376	0	47	11.2428	11.5665
...	4 1/8	4.1250	4.0167	3.9265	3.9325	3.9446	3.9626	0	45	11.9980	12.3323

Table 10
Basic Dimensions for 6-Thread Series (UN, UNR, and UNJ) (Cont'd)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
4 1/4	...	4.2500	4.1417	4.0515	4.0575	4.0696	4.0876	0	44	12.7777	13.1226
...	4 3/8	4.3750	4.2667	4.1765	4.1825	4.1946	4.2126	0	43	13.5819	13.9375
4 1/2	...	4.5000	4.3917	4.3015	4.3075	4.3196	4.3376	0	42	14.4107	14.7769
...	4 5/8	4.6250	4.5167	4.4265	4.4325	4.4446	4.4626	0	40	15.2641	15.6409
4 3/4	...	4.7500	4.6417	4.5515	4.5575	4.5696	4.5876	0	39	16.1419	16.5294
...	4 7/8	4.8750	4.7667	4.6765	4.6825	4.6946	4.7126	0	38	17.0444	17.4424
5	...	5.0000	4.8917	4.8015	4.8075	4.8196	4.8376	0	37	17.9713	18.3800
...	5 1/8	5.1250	5.0167	4.9265	4.9325	4.9446	4.9626	0	36	18.9228	19.3421
5 1/4	...	5.2500	5.1417	5.0515	5.0575	5.0696	5.0876	0	35	19.8989	20.3288
...	5 3/8	5.3750	5.2667	5.1765	5.1825	5.1946	5.2126	0	35	20.8995	21.3400
5 1/2	...	5.5000	5.3917	5.3015	5.3075	5.3196	5.3376	0	34	21.9246	22.3758
...	5 5/8	5.6250	5.5167	5.4265	5.4325	5.4446	5.4626	0	33	22.9743	23.4361
5 3/4	...	5.7500	5.6417	5.5515	5.5575	5.5696	5.5876	0	32	24.0485	24.5209
...	5 7/8	5.8750	5.7667	5.6765	5.6825	5.6946	5.7126	0	32	25.1473	25.6303
6	...	6.0000	5.8917	5.8015	5.8075	5.8196	5.8376	0	31	26.2706	26.7642

NOTES:
(1) For information only.
(2) Minor diameter location for the calculation of area = $D - 2h_b$.
(3) Area at minor diameter = $\pi\{[(D - 2h_b)/2]^2\}$.
(4) For tensile stress area for UNJ threads, see applicable fastener standard such as SAE AS7251C, SAE AS7455A, SAE AS7459B, SAE AS7466E, SAE AS7477F, and SAE AS7478D.
(5) See formulas in Nonmandatory Appendix B, section B-1.
(6) Standard sizes of the UNC, UNF, or UNEF series.

Table 11
Basic Dimensions for 8-Thread Series (UN, UNR, and UNJ)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
1 [Note (6)]	...	1.0000	0.9188	0.8512	0.8557	0.8647	0.8782	2	29	0.551	0.606
...	1 1/16	1.0625	0.9813	0.9137	0.9182	0.9272	0.9407	2	19	0.636	0.695
1 1/8	...	1.1250	1.0438	0.9762	0.9807	0.9897	1.0032	2	11	0.728	0.790
...	1 3/16	1.1875	1.1063	1.0387	1.0432	1.0522	1.0657	2	4	0.825	0.892
1 1/4	...	1.2500	1.1688	1.1012	1.1057	1.1147	1.1282	1	57	0.929	1.000
...	1 5/16	1.3125	1.2313	1.1637	1.1682	1.1772	1.1907	1	51	1.039	1.114
1 3/8	...	1.3750	1.2938	1.2262	1.2307	1.2397	1.2532	1	46	1.155	1.233
...	1 7/16	1.4375	1.3563	1.2887	1.2932	1.3022	1.3157	1	41	1.277	1.360
1 1/2	...	1.5000	1.4188	1.3512	1.3557	1.3647	1.3782	1	36	1.41	1.49
...	1 9/16	1.5625	1.4813	1.4137	1.4182	1.4272	1.4407	1	32	1.54	1.63
1 5/8	...	1.6250	1.5438	1.4762	1.4807	1.4897	1.5032	1	29	1.68	1.77
...	1 11/16	1.6875	1.6063	1.5387	1.5432	1.5522	1.5657	1	25	1.83	1.93
1 3/4	...	1.7500	1.6688	1.6012	1.6057	1.6147	1.6282	1	22	1.98	2.08
...	1 13/16	1.8125	1.7313	1.6637	1.6682	1.6772	1.6907	1	19	2.14	2.25
1 7/8	...	1.8750	1.7938	1.7262	1.7307	1.7397	1.7532	1	16	2.30	2.41
...	1 15/16	1.9375	1.8563	1.7887	1.7932	1.8022	1.8157	1	14	2.47	2.59
2	...	2.0000	1.9188	1.8512	1.8557	1.8647	1.8782	1	11	2.65	2.77
...	2 1/8	2.1250	2.0438	1.9762	1.9807	1.9897	2.0032	1	7	3.03	3.15
2 1/4	...	2.2500	2.1688	2.1012	2.1057	2.1147	2.1282	1	3	3.42	3.56
...	2 3/8	2.3750	2.2938	2.2262	2.2307	2.2397	2.2532	0	60	3.85	3.99
2 1/2	...	2.5000	2.4188	2.3512	2.3557	2.3647	2.3782	0	57	4.29	4.44
...	2 5/8	2.6250	2.5438	2.4762	2.4807	2.4897	2.5032	0	54	4.76	4.92
2 3/4	...	2.7500	2.6688	2.6012	2.6057	2.6147	2.6282	0	51	5.26	5.43
...	2 7/8	2.8750	2.7938	2.7262	2.7307	2.7397	2.7532	0	49	5.78	5.95
3	...	3.0000	2.9188	2.8512	2.8557	2.8647	2.8782	0	47	6.32	6.51
...	3 1/8	3.1250	3.0438	2.9762	2.9807	2.9897	3.0032	0	45	6.89	7.08
3 1/4	...	3.2500	3.1688	3.1012	3.1057	3.1147	3.1282	0	43	7.49	7.69
...	3 3/8	3.3750	3.2938	3.2262	3.2307	3.2397	3.2532	0	42	8.11	8.31

Table 11
Basic Dimensions for 8-Thread Series (UN, UNR, and UNJ) (Cont'd)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
3 1/2	...	3.5000	3.4188	3.3512	3.3557	3.3647	3.3782	0	40	8.75	8.96
...	3 5/8	3.6250	3.5438	3.4762	3.4807	3.4897	3.5032	0	39	9.42	9.64
3 3/4	...	3.7500	3.6688	3.6012	3.6057	3.6147	3.6282	0	37	10.11	10.34
...	3 7/8	3.8750	3.7938	3.7262	3.7307	3.7397	3.7532	0	36	10.83	11.06
4	...	4.0000	3.9188	3.8512	3.8557	3.8647	3.8782	0	35	11.57	11.81
...	4 1/8	4.1250	4.0438	3.9762	3.9807	3.9897	4.0032	0	34	12.33	12.59
4 1/4	...	4.2500	4.1688	4.1012	4.1057	4.1147	4.1282	0	33	13.12	13.38
...	4 3/8	4.3750	4.2938	4.2262	4.2307	4.2397	4.2532	0	32	13.94	14.21
4 1/2	...	4.5000	4.4188	4.3512	4.3557	4.3647	4.3782	0	31	14.8	15.1
...	4 5/8	4.6250	4.5438	4.4762	4.4807	4.4897	4.5032	0	30	15.6	15.9
4 3/4	...	4.7500	4.6688	4.6012	4.6057	4.6147	4.6282	0	29	16.5	16.8
...	4 7/8	4.8750	4.7938	4.7262	4.7307	4.7397	4.7532	0	29	17.4	17.7
5	...	5.0000	4.9188	4.8512	4.8557	4.8647	4.8782	0	28	18.4	18.7
...	5 1/8	5.1250	5.0438	4.9762	4.9807	4.9897	5.0032	0	27	19.3	19.7
5 1/4	...	5.2500	5.1688	5.1012	5.1057	5.1147	5.1282	0	26	20.3	20.7
...	5 3/8	5.3750	5.2938	5.2262	5.2307	5.2397	5.2532	0	26	21.3	21.7
5 1/2	...	5.5000	5.4188	5.3512	5.3557	5.3647	5.3782	0	25	22.4	22.7
...	5 5/8	5.6250	5.5438	5.4762	5.4807	5.4897	5.5032	0	25	23.4	23.8
5 3/4	...	5.7500	5.6688	5.6012	5.6057	5.6147	5.6282	0	24	24.5	24.9
...	5 7/8	5.8750	5.7938	5.7262	5.7307	5.7397	5.7532	0	24	25.6	26.0
6	...	6.0000	5.9188	5.8512	5.8557	5.8647	5.8782	0	23	26.8	27.1

NOTES:
(1) For information only.
(2) Minor diameter location for the calculation of area = $D - 2h_b$.
(3) Area at minor diameter = $\pi\{[(D - 2h_b)/2]^2\}$.
(4) For tensile stress area for UNJ threads, see applicable fastener standard such as SAE AS7251C, SAE AS7455A, SAE AS7459B, SAE AS7466E, SAE AS7477F, and SAE AS7478D.
(5) See formulas in Nonmandatory Appendix B, section B-1.
(6) Standard sizes of the UNC, UNF, or UNEF series.

Table 12
Basic Dimensions for 12-Thread Series (UN, UNR, and UNJ)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
9/16 [Note (6)]	...	0.5625	0.5084	0.4633	0.4663	0.4723	0.4813	2	59	0.162	0.182
5/8	...	0.6250	0.5709	0.5258	0.5288	0.5348	0.5438	2	40	0.210	0.232
...	11/16	0.6875	0.6334	0.5883	0.5913	0.5973	0.6063	2	24	0.264	0.289
3/4	...	0.7500	0.6959	0.6508	0.6538	0.6598	0.6688	2	11	0.323	0.351
...	13/16	0.8125	0.7584	0.7133	0.7163	0.7223	0.7313	2	0	0.390	0.420
7/8	...	0.8750	0.8209	0.7758	0.7788	0.7848	0.7938	1	51	0.462	0.495
...	15/16	0.9375	0.8834	0.8383	0.8413	0.8473	0.8563	1	43	0.540	0.576
1 [Note (6)]	...	1.0000	0.9459	0.9008	0.9038	0.9098	0.9188	1	36	0.625	0.663
...	1 1/16	1.0625	1.0084	0.9633	0.9663	0.9723	0.9813	1	30	0.715	0.756
1 1/8 [Note (6)]	...	1.1250	1.0709	1.0258	1.0288	1.0348	1.0438	1	25	0.812	0.856
...	1 3/16 [Note (6)]	1.1875	1.1334	1.0883	1.0913	1.0973	1.1063	1	20	0.915	0.961
1 1/4 [Note (6)]	...	1.2500	1.1959	1.1508	1.1538	1.1598	1.1688	1	16	1.024	1.073
...	1 5/16	1.3125	1.2584	1.2133	1.2163	1.2223	1.2313	1	12	1.139	1.191
1 3/8 [Note (6)]	...	1.3750	1.3209	1.2758	1.2788	1.2848	1.2938	1	9	1.260	1.315
...	1 7/16	1.4375	1.3834	1.3383	1.3413	1.3473	1.3563	1	6	1.388	1.445
1 1/2 [Note (6)]	...	1.5000	1.4459	1.4008	1.4038	1.4098	1.4188	1	3	1.520	1.580
...	1 9/16	1.5625	1.5084	1.4633	1.4663	1.4723	1.4813	1	0	1.660	1.720
1 5/8	...	1.6250	1.5709	1.5258	1.5288	1.5348	1.5438	0	58	1.810	1.870
...	1 11/16	1.6875	1.6334	1.5883	1.5913	1.5973	1.6063	0	56	1.960	2.030
1 3/4	...	1.7500	1.6959	1.6508	1.6538	1.6598	1.6688	0	54	2.120	2.190
...	1 13/16	1.8125	1.7584	1.7133	1.7163	1.7223	1.7313	0	52	2.280	2.350
1 7/8	...	1.8750	1.8209	1.7758	1.7788	1.7848	1.7938	0	50	2.450	2.530
...	1 15/16	1.9375	1.8834	1.8383	1.8413	1.8473	1.8563	0	48	2.630	2.710
2	...	2.0000	1.9459	1.9008	1.9038	1.9098	1.9188	0	47	2.810	2.890
...	2 1/8	2.1250	2.0709	2.0258	2.0288	2.0348	2.0438	0	44	3.190	3.280
2 1/4	...	2.2500	2.1959	2.1508	2.1538	2.1598	2.1688	0	42	3.600	3.690

Table 12
Basic Dimensions for 12-Thread Series (UN, UNR, and UNJ) (Cont'd)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
...	2 3/8	2.3750	2.3209	2.2758	2.2788	2.2848	2.2938	0	39	4.040	4.130
2 1/2	...	2.5000	2.4459	2.4008	2.4038	2.4098	2.4188	0	37	4.490	4.600
...	2 5/8	2.6250	2.5709	2.5258	2.5288	2.5348	2.5438	0	35	4.970	5.080
2 3/4	...	2.7500	2.6959	2.6508	2.6538	2.6598	2.6688	0	34	5.480	5.590
...	2 7/8	2.8750	2.8209	2.7758	2.7788	2.7848	2.7938	0	32	6.010	6.130
3	...	3.0000	2.9459	2.9008	2.9038	2.9098	2.9188	0	31	6.570	6.690
...	3 1/8	3.1250	3.0709	3.0258	3.0288	3.0348	3.0438	0	30	7.150	7.280
3 1/4	...	3.2500	3.1959	3.1508	3.1538	3.1598	3.1688	0	29	7.800	7.900
...	3 3/8	3.3750	3.3209	3.2758	3.2788	3.2848	3.2938	0	27	8.400	8.500
3 1/2	...	3.5000	3.4459	3.4008	3.4038	3.4098	3.4188	0	26	9.000	9.200
...	3 5/8	3.6250	3.5709	3.5258	3.5288	3.5348	3.5438	0	26	9.700	9.900
3 3/4	...	3.7500	3.6959	3.6508	3.6538	3.6598	3.6688	0	25	10.400	10.600
...	3 7/8	3.8750	3.8209	3.7758	3.7788	3.7848	3.7938	0	24	11.100	11.300
4	...	4.0000	3.9459	3.9008	3.9038	3.9098	3.9188	0	23	11.900	12.100
...	4 1/8	4.1250	4.0709	4.0258	4.0288	4.0348	4.0438	0	22	12.700	12.800
4 1/4	...	4.2500	4.1959	4.1508	4.1538	4.1598	4.1688	0	22	13.500	13.600
	4 3/8	4.3750	4.3209	4.2758	4.2788	4.2848	4.2938	0	21	14.300	14.500
4 1/2	...	4.5000	4.4459	4.4008	4.4038	4.4098	4.4188	0	21	15.100	15.300
...	4 5/8	4.6250	4.5709	4.5258	4.5288	4.5348	4.5438	0	20	16.000	16.200
4 3/4	...	4.7500	4.6959	4.6508	4.6538	4.6598	4.6688	0	19	16.900	17.100
...	4 7/8	4.8750	4.8209	4.7758	4.7788	4.7848	4.7938	0	19	17.800	18.000
5	...	5.0000	4.9459	4.9008	4.9038	4.9098	4.9188	0	18	18.800	19.000
...	5 1/8	5.1250	5.0709	5.0258	5.0288	5.0348	5.0438	0	18	19.800	20.000
5 1/4	...	5.2500	5.1959	5.1508	5.1538	5.1598	5.1688	0	18	20.800	21.000
...	5 3/8	5.3750	5.3209	5.2758	5.2788	5.2848	5.2938	0	17	21.800	22.000
5 1/2	...	5.5000	5.4459	5.4008	5.4038	5.4098	5.4188	0	17	22.800	23.100
...	5 5/8	5.6250	5.5709	5.5258	5.5288	5.5348	5.5438	0	16	23.900	24.100

Table 12
Basic Dimensions for 12-Thread Series (UN, UNR, and UNJ) (Cont'd)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
$5\frac{3}{4}$	...	5.7500	5.6959	5.6508	5.6538	5.6598	5.6688	0	16	25.000	25.200
	$5\frac{7}{8}$	5.8750	5.8209	5.7758	5.7788	5.7848	5.7938	0	16	26.100	26.400
6	...	6.0000	5.9459	5.9008	5.9038	5.9098	5.9188	0	15	27.300	27.500

NOTES:
(1) For information only.
(2) Minor diameter location for the calculation of area = $D - 2h_b$.
(3) Area at minor diameter = $\pi\{[(D - 2h_b)/2]^2\}$.
(4) For tensile stress area for UNJ threads, see applicable fastener standard such as SAE AS7251C, SAE AS7455A, SAE AS7459B, SAE AS7466E, SAE AS7477F, and SAE AS7478D.
(5) See formulas in Nonmandatory Appendix B, section B-1.
(6) Standard sizes of the UNC, UNF, or UNEF series.

Table 13
Basic Dimensions for 16-Thread Series (UN, UNR, and UNJ)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
3/8 [Note (6)]	...	0.3750	0.3344	0.3006	0.3028	0.3073	0.3141	3	25	0.0678	0.0775
7/16	...	0.4375	0.3969	0.3631	0.3653	0.3698	0.3766	2	52	0.0997	0.1114
1/2	...	0.5000	0.4594	0.4256	0.4278	0.4323	0.4391	2	29	0.1378	0.1514
9/16	...	0.5625	0.5219	0.4881	0.4903	0.4948	0.5016	2	11	0.1819	0.1976
5/8	...	0.6250	0.5844	0.5506	0.5528	0.5573	0.5641	1	57	0.2320	0.2500
...	11/16	0.6875	0.6469	0.6131	0.6153	0.6198	0.6266	1	46	0.2890	0.3080
3/4 [Note (6)]	...	0.7500	0.7094	0.6756	0.6778	0.6823	0.6891	1	36	0.3510	0.3730
...	13/16	0.8125	0.7719	0.7381	0.7403	0.7448	0.7516	1	29	0.4200	0.4440
7/8	...	0.8750	0.8344	0.8006	0.8028	0.8073	0.8141	1	22	0.4950	0.5210
...	15/16	0.9375	0.8969	0.8631	0.8653	0.8698	0.8766	1	16	0.5760	0.6040
1	...	1.0000	0.9594	0.9256	0.9278	0.9323	0.9391	1	11	0.6630	0.6930
...	1 1/16	1.0625	1.0219	0.9881	0.9903	0.9948	1.0016	1	7	0.7560	0.7880
1 1/8	...	1.1250	1.0844	1.0506	1.0528	1.0573	1.0641	1	3	0.8560	0.8890
...	1 3/16	1.1875	1.1469	1.1131	1.1153	1.1198	1.1266	0	60	0.9610	0.9970
1 1/4	...	1.2500	1.2094	1.1756	1.1778	1.1823	1.1891	0	57	1.0730	1.1110
...	1 5/16	1.3125	1.2719	1.2381	1.2403	1.2448	1.2516	0	54	1.1910	1.2300
1 3/8	...	1.3750	1.3344	1.3006	1.3028	1.3073	1.3141	0	51	1.3150	1.3560
...	1 7/16	1.4375	1.3969	1.3631	1.3653	1.3698	1.3766	0	49	1.4450	1.4880
1 1/2	...	1.5000	1.4594	1.4256	1.4278	1.4323	1.4391	0	47	1.5800	1.6300
...	1 9/16	1.5625	1.5219	1.4881	1.4903	1.4948	1.5016	0	45	1.7200	1.7700
1 5/8	...	1.6250	1.5844	1.5506	1.5528	1.5573	1.5641	0	43	1.8700	1.9200
...	1 11/16	1.6875	1.6469	1.6131	1.6153	1.6198	1.6266	0	42	2.0300	2.0800
1 3/4		1.7500	1.7094	1.6756	1.6778	1.6823	1.6891	0	40	2.1900	2.2400
...	1 13/16	1.8125	1.7719	1.7381	1.7403	1.7448	1.7516	0	39	2.3500	2.4100
1 7/8	...	1.8750	1.8344	1.8006	1.8028	1.8073	1.8141	0	37	2.5300	2.5800
...	1 15/16	1.9375	1.8969	1.8631	1.8653	1.8698	1.8766	0	36	2.7100	2.7700
2	...	2.0000	1.9594	1.9256	1.9278	1.9323	1.9391	0	35	2.8900	2.9500
...	2 1/8	2.1250	2.0844	2.0506	2.0528	2.0573	2.0641	0	33	3.2800	3.3500

Table 13
Basic Dimensions for 16-Thread Series (UN, UNR, and UNJ) (Cont'd)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
2 1/4	...	2.2500	2.2094	2.1756	2.1778	2.1823	2.1891	0	31	3.6900	3.7600
...	2 3/8	2.3750	2.3344	2.3006	2.3028	2.3073	2.3141	0	29	4.1300	4.2100
2 1/2	...	2.5000	2.4594	2.4256	2.4278	2.4323	2.4391	0	28	4.6000	4.6700
...	2 5/8	2.6250	2.5844	2.5506	2.5528	2.5573	2.5641	0	26	5.0800	5.1600
2 3/4	...	2.7500	2.7094	2.6756	2.6778	2.6823	2.6891	0	25	5.5900	5.6800
...	2 7/8	2.8750	2.8344	2.8006	2.8028	2.8073	2.8141	0	24	6.1300	6.2200
3	...	3.0000	2.9594	2.9256	2.9278	2.9323	2.9391	0	23	6.6900	6.7800
...	3 1/8	3.1250	3.0844	3.0506	3.0528	3.0573	3.0641	0	22	7.2800	7.3700
3 1/4	...	3.2500	3.2094	3.1756	3.1778	3.1823	3.1891	0	21	7.8900	7.9900
...	3 3/8	3.3750	3.3344	3.3006	3.3028	3.3073	3.3141	0	21	8.5200	8.6300
3 1/2	...	3.5000	3.4594	3.4256	3.4278	3.4323	3.4391	0	20	9.1800	9.2900
...	3 5/8	3.6250	3.5844	3.5506	3.5528	3.5573	3.5641	0	19	9.8600	9.9800
3 3/4	...	3.7500	3.7094	3.6756	3.6778	3.6823	3.6891	0	18	10.5700	10.6900
...	3 7/8	3.8750	3.8344	3.8006	3.8028	3.8073	3.8141	0	18	11.3000	11.4300
4	...	4.0000	3.9594	3.9256	3.9278	3.9323	3.9391	0	17	12.0600	12.1900
...	4 1/8	4.1250	4.0844	4.0506	4.0528	4.0573	4.0641	0	17	12.8400	12.9700
4 1/4	...	4.2500	4.2094	4.1756	4.1778	4.1823	4.1891	0	16	13.6500	13.7800
...	4 3/8	4.3750	4.3344	4.3006	4.3028	4.3073	4.3141	0	16	14.4800	14.6200
4 1/2	...	4.5000	4.4594	4.4256	4.4278	4.4323	4.4391	0	15	15.3000	15.5000
...	4 5/8	4.6250	4.5844	4.5506	4.5528	4.5573	4.5641	0	15	16.2000	16.4000
4 3/4	...	4.7500	4.7094	4.6756	4.6778	4.6823	4.6891	0	15	17.1000	17.3000
...	4 7/8	4.8750	4.8344	4.8006	4.8028	4.8073	4.8141	0	14	18.0000	18.2000
5	...	5.0000	4.9594	4.9256	4.9278	4.9323	4.9391	0	14	19.0000	19.2000
...	5 1/8	5.1250	5.0844	5.0506	5.0528	5.0573	5.0641	0	13	20.0000	20.1000
5 1/4	...	5.2500	5.2094	5.1756	5.1778	5.1823	5.1891	0	13	21.0000	21.1000
...	5 3/8	5.3750	5.3344	5.3006	5.3028	5.3073	5.3141	0	13	22.0000	22.2000
5 1/2	...	5.5000	5.4594	5.4256	5.4278	5.4323	5.4391	0	13	23.1000	23.2000

Table 13
Basic Dimensions for 16-Thread Series (UN, UNR, and UNJ) (Cont'd)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
...	$5\frac{5}{8}$	5.6250	5.5844	5.5506	5.5528	5.5573	5.5641	0	12	24.1000	24.3000
$5\frac{3}{4}$	...	5.7500	5.7094	5.6756	5.6778	5.6823	5.6891	0	12	25.2000	25.4000
...	$5\frac{7}{8}$	5.8750	5.8344	5.8006	5.8028	5.8073	5.8141	0	12	26.4000	26.5000
6	...	6.0000	5.9594	5.9256	5.9278	5.9323	5.9391	0	11	27.5000	27.7000

NOTES:
(1) For information only.
(2) Minor diameter location for the calculation of area = $D - 2h_b$.
(3) Area at minor diameter = $\pi\{[(D - 2h_b)/2]^2\}$.
(4) For tensile stress area for UNJ threads, see applicable fastener standard such as SAE AS7251C, SAE AS7455A, SAE AS7459B, SAE AS7466E, SAE AS7477F, and SAE AS7478D.
(5) See formulas in Nonmandatory Appendix B, section B-1.
(6) Standard sizes of the UNC, UNF, or UNEF series.

Table 14
Basic Dimensions for 20-Thread Series (UN, UNR, and UNJ)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
1/4 [Note (6)]	...	0.2500	0.2175	0.1905	0.1922	0.1959	0.2013	4	12	0.0269	0.0318
5/16	...	0.3125	0.2800	0.2530	0.2547	0.2584	0.2638	3	15	0.0481	0.0546
3/8	...	0.3750	0.3425	0.3155	0.3172	0.3209	0.3263	2	40	0.0755	0.0836
7/16 [Note (6)]	...	0.4375	0.4050	0.3780	0.3797	0.3834	0.3888	2	15	0.1090	0.1187
1/2 [Note (6)]		0.5000	0.4675	0.4405	0.4422	0.4459	0.4513	1	57	0.1486	0.1599
9/16	...	0.5625	0.5300	0.5030	0.5047	0.5084	0.5138	1	43	0.1944	0.2073
5/8	...	0.6250	0.5925	0.5655	0.5672	0.5709	0.5763	1	32	0.2463	0.2608
...	11/16	0.6875	0.6550	0.6280	0.6297	0.6334	0.6388	1	24	0.3044	0.3205
3/4 [Note (6)]	...	0.7500	0.7175	0.6905	0.6922	0.6959	0.7013	1	16	0.3686	0.3862
...	13/16 [Note (6)]	0.8125	0.7800	0.7530	0.7547	0.7584	0.7638	1	10	0.4389	0.4581
7/8 [Note (6)]	...	0.8750	0.8425	0.8155	0.8172	0.8209	0.8263	1	5	0.5154	0.5362
...	15/16 [Note (6)]	0.9375	0.9050	0.8780	0.8797	0.8834	0.8888	1	0	0.5980	0.6204
1 [Note (6)]	...	1.0000	0.9675	0.9405	0.9422	0.9459	0.9513	0	57	0.6867	0.7107
...	1 1/16	1.0625	1.0300	1.0030	1.0047	1.0084	1.0138	0	53	0.7816	0.8072
1 1/8	...	1.1250	1.0925	1.0655	1.0672	1.0709	1.0763	0	50	0.8826	0.9098
...	1 3/16	1.1875	1.1550	1.1280	1.1297	1.1334	1.1388	0	47	0.9897	1.0185
1 1/4	...	1.2500	1.2175	1.1905	1.1922	1.1959	1.2013	0	45	1.1030	1.1334
...	1 5/16	1.3125	1.2800	1.2530	1.2547	1.2584	1.2638	0	43	1.2224	1.2544
1 3/8	...	1.3750	1.3425	1.3155	1.3172	1.3209	1.3263	0	41	1.3479	1.3815
...	1 7/16	1.4375	1.4050	1.3780	1.3797	1.3834	1.3888	0	39	1.4796	1.5148
1 1/2	...	1.5000	1.4675	1.4405	1.4422	1.4459	1.4513	0	37	1.6174	1.6542
...	1 9/16	1.5625	1.5300	1.5030	1.5047	1.5084	1.5138	0	36	1.7614	1.7997
1 5/8	...	1.6250	1.5925	1.5655	1.5672	1.5709	1.5763	0	34	1.9115	1.9514
...	1 11/16	1.6875	1.6550	1.6280	1.6297	1.6334	1.6388	0	33	2.0677	2.1092
1 3/4	...	1.7500	1.7175	1.6905	1.6922	1.6959	1.7013	0	32	2.2300	2.2732
...	1 13/16	1.8125	1.7800	1.7530	1.7547	1.7584	1.7638	0	31	2.3985	2.4433
1 7/8	...	1.8750	1.8425	1.8155	1.8172	1.8209	1.8263	0	30	2.5732	2.6195

Table 14
Basic Dimensions for 20-Thread Series (UN, UNR, and UNJ) (Cont'd)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
...	$1\frac{15}{16}$	1.9375	1.9050	1.8780	1.8797	1.8834	1.8888	0	29	2.7539	2.8018
2	...	2.0000	1.9675	1.9405	1.9422	1.9459	1.9513	0	28	2.9409	2.9903
...	$2\frac{1}{8}$	2.1250	2.0925	2.0655	2.0672	2.0709	2.0763	0	26	3.3331	3.3857
$2\frac{1}{4}$	...	2.2500	2.2175	2.1905	2.1922	2.1959	2.2013	0	25	3.7498	3.8057
...	$2\frac{3}{8}$	2.3750	2.3425	2.3155	2.3172	2.3209	2.3263	0	23	4.1911	4.2502
$2\frac{1}{2}$	...	2.5000	2.4675	2.4405	2.4422	2.4459	2.4513	0	22	4.6570	4.7192
...	$2\frac{5}{8}$	2.6250	2.5925	2.5655	2.5672	2.5709	2.5763	0	21	5.1474	5.2128
$2\frac{3}{4}$	...	2.7500	2.7175	2.6905	2.6922	2.6959	2.7013	0	20	5.6623	5.7309
...	$2\frac{7}{8}$	2.8750	2.8425	2.8155	2.8172	2.8209	2.8263	0	19	6.2018	6.2736
3	...	3.0000	2.9675	2.9405	2.9422	2.9459	2.9513	0	18	6.7658	6.8408

NOTES:
(1) For information only.
(2) Minor diameter location for the calculation of area = $D - 2h_b$.
(3) Area at minor diameter = $\pi\{[(D - 2h_b)/2]^2\}$.
(4) For tensile stress area for UNJ threads, see applicable fastener standard such as SAE AS7251C, SAE AS7455A, SAE AS7459B, SAE AS7466E, SAE AS7477F, and SAE AS7478D.
(5) See formulas in Nonmandatory Appendix B, section B-1.
(6) Standard sizes of the UNC, UNF, or UNEF series.

Table 15
Basic Dimensions for 28-Thread Series (UN, UNR, and UNJ)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
...	12 [Note (6)]	0.2160	0.1928	0.1735	0.1748	0.1773	0.1812	3	23	0.0226	0.0258
1/4 [Note (6)]	...	0.2500	0.2268	0.2075	0.2088	0.2113	0.2152	2	52	0.0326	0.0364
5/16	...	0.3125	0.2893	0.2700	0.2713	0.2738	0.2777	2	15	0.0556	0.0606
3/8	...	0.3750	0.3518	0.3325	0.3338	0.3363	0.3402	1	51	0.0848	0.0909
7/16 [Note (6)]	...	0.4375	0.4143	0.3950	0.3963	0.3988	0.4027	1	34	0.1201	0.1274
1/2 [Note (6)]	...	0.5000	0.4768	0.4575	0.4588	0.4613	0.4652	1	22	0.1616	0.1700
9/16	...	0.5625	0.5393	0.5200	0.5213	0.5238	0.5277	1	12	0.2092	0.2187
5/8	...	0.6250	0.6018	0.5825	0.5838	0.5863	0.5902	1	5	0.2629	0.2736
...	11/16	0.6875	0.6643	0.6450	0.6463	0.6488	0.6527	0	59	0.3228	0.3346
3/4	...	0.7500	0.7268	0.7075	0.7088	0.7113	0.7152	0	54	0.3888	0.4017
...	13/16	0.8125	0.7893	0.7700	0.7713	0.7738	0.7777	0	50	0.4610	0.4750
7/8	...	0.8750	0.8518	0.8325	0.8338	0.8363	0.8402	0	46	0.5392	0.5544
...	15/16	0.9375	0.9143	0.8950	0.8963	0.8988	0.9027	0	43	0.6237	0.6400
1	...	1.0000	0.9768	0.9575	0.9588	0.9613	0.9652	0	40	0.7142	0.7317
...	1 1/16	1.0625	1.0393	1.0200	1.0213	1.0238	1.0277	0	38	0.8109	0.8295
1 1/8	...	1.1250	1.1018	1.0825	1.0838	1.0863	1.0902	0	35	0.9137	0.9335
...	1 3/16	1.1875	1.1643	1.1450	1.1463	1.1488	1.1527	0	34	1.0227	1.0436
1 1/4	...	1.2500	1.2268	1.2075	1.2088	1.2113	1.2152	0	32	1.1378	1.1598
...	1 5/16	1.3125	1.2893	1.2700	1.2713	1.2738	1.2777	0	30	1.2590	1.2822
1 3/8	...	1.3750	1.3518	1.3325	1.3338	1.3363	1.3402	0	29	1.3864	1.4107
...	1 7/16	1.4375	1.4143	1.3950	1.3963	1.3988	1.4027	0	28	1.5199	1.5453
1 1/2	...	1.5000	1.4768	1.4575	1.4588	1.4613	1.4652	0	26	1.6595	1.6861

NOTES:
(1) For information only.
(2) Minor diameter location for the calculation of area = $D - 2h_b$.
(3) Area at minor diameter = $\pi\{[(D - 2h_b)/2]^2\}$.
(4) For tensile stress area for UNJ threads, see applicable fastener standard such as SAE AS7251C, SAE AS7455A, SAE AS7459B, SAE AS7466E, SAE AS7477F, and SAE AS7478D.
(5) See formulas in Nonmandatory Appendix B, section B-1.
(6) Standard sizes of the UNC, UNF, or UNEF series.

Table 16
Basic Dimensions for 32-Thread Series (UN, UNR, and UNJ)

Nominal Size		Basic Major Diameter, D bsc	Basic Pitch Diameter, D_2 bsc	UNR Design Minor Diameter External, d_3 (Ref.)	UNJ Design Minor Diameter External, d_3 (Ref.)	Basic UN Minor Diameter Internal, D_1 bsc	Basic UNJ Minor Diameter Internal, D_1 min. = D_1 bsc	Lead Angle at Basic Pitch Diameter, λ		Area at Minor Diameter, in.^{2} [Notes (1)–(4)]	UN/UNR Tensile Stress Area, in.^{2} [Notes (1), (4), (5)]
Primary	Secondary							deg	Min.		
6 [Note (6)]	...	0.1380	0.1177	0.1008	0.1019	0.1042	0.1076	4	51	0.00745	0.00908
8 [Note (6)]	...	0.1640	0.1437	0.1268	0.1279	0.1302	0.1336	3	58	0.01196	0.01401
10 [Note (6)]	...	0.1900	0.1697	0.1528	0.1539	0.1562	0.1596	3	22	0.01753	0.01999
...	12 [Note (6)]	0.2160	0.1957	0.1788	0.1799	0.1822	0.1856	2	55	0.02420	0.02700
1/4 [Note (6)]	...	0.2500	0.2297	0.2128	0.2139	0.2162	0.2196	2	29	0.03440	0.03790
5/16 [Note (6)]	...	0.3125	0.2922	0.2753	0.2764	0.2787	0.2821	1	57	0.05810	0.06250
3/8 [Note (6)]	...	0.3750	0.3547	0.3378	0.3389	0.3412	0.3446	1	36	0.08780	0.09320
7/16	...	0.4375	0.4172	0.4003	0.4014	0.4037	0.4071	1	22	0.12370	0.13010
1/2	...	0.5000	0.4797	0.4628	0.4639	0.4662	0.4696	1	11	0.16600	0.17300
9/16	...	0.5625	0.5422	0.5253	0.5264	0.5287	0.5321	1	3	0.21400	0.22200
5/8	...	0.6250	0.6047	0.5878	0.5889	0.5912	0.5946	0	57	0.26800	0.27800
...	11/16	0.6875	0.6672	0.6503	0.6514	0.6537	0.6571	0	51	0.32900	0.33900
3/4	...	0.7500	0.7297	0.7128	0.7139	0.7162	0.7196	0	47	0.39500	0.40700
...	13/16	0.8125	0.7922	0.7753	0.7764	0.7787	0.7821	0	43	0.46800	0.48000
7/8	...	0.8750	0.8547	0.8378	0.8389	0.8412	0.8446	0	40	0.54700	0.56000
...	15/16	0.9375	0.9172	0.9003	0.9014	0.9037	0.9071	0	37	0.63200	0.64600
1	...	1.0000	0.9797	0.9628	0.9639	0.9662	0.9696	0	35	0.72300	0.73800

NOTES:
(1) For information only.
(2) Minor diameter location for the calculation of area = $D - 2h_b$.
(3) Area at minor diameter = $\pi\{[(D - 2h_b)/2]^2\}$.
(4) For tensile stress area for UNJ threads, see applicable fastener standard such as SAE AS7251C, SAE AS7455A, SAE AS7459B, SAE AS7466E, SAE AS7477F, and SAE AS7478D.
(5) See formulas in Nonmandatory Appendix B, section B-1.
(6) Standard sizes of the UNC, UNF, or UNEF series.

Table 17A
Outline Guide for Determining Limits of Size of External Threads

Thread Class	Major Diameter, d		Pitch Diameter, d_2		Minor Diameter, d_1
	Max.	Min.	Max.	Min.	
1A	Nominal size – allowance	Maximum – tolerance	Max. major diameter – h_b (see Table 5, col. 22 for h_b values)	Maximum – tolerance	See para. 8.3.1(e) for max. and para. 8.3.1(f) for min.; established by crest of new tool and minimum minor diameter of GO thread gage
2A	Nominal size – allowance	Maximum – tolerance	Max. major diameter – h_b (see Table 5, col. 22 for h_b values)	Maximum – tolerance	See para. 8.3.1(e) for max. and para. 8.3.1(f) for min.; established by crest of new tool and minimum minor diameter of GO thread gage
3A	Nominal size	Maximum – tolerance	Max. major diameter – h_b (see Table 5, col. 22 for h_b values)	Maximum – tolerance	See para. 8.3.1(e) for max. and para. 8.3.1(f) for min.; established by crest of new tool and minimum minor diameter of GO thread gage

Table 17B
Outline Guide for Determining Limits of Size of Internal Threads

Thread Class	Minor Diameter, D_1		Pitch Diameter, D_2		Major Diameter, D
	Min.	Max.	Min.	Max.	
1B	Nominal size $-2h_n$ [see Table 5, col. 26 (UN) or 25 (UNJ) for h_b values; see para. 8.3.2(e) for formulas]	Minimum, 6 decimal place value + tolerance [see para. 8.3.2(f)]	Nominal size $-h_b$ [see Table 5, col. 22 for h_b values and para. 8.3.2(c) for formula]	Minimum + tolerance	See para. 8.3.2(a) for max. and para. 8.3.2(b) for min.; established by crest of new tool and maximum major diameter of GO thread gage
2B	Nominal size $-2h_n$ [see Table 5, col. 26 (UN) or 25 (UNJ) for h_b values; see para. 8.3.2(e) for formulas]	Minimum, 6 decimal place value + tolerance [see para. 8.3.2(f)]	Nominal size $-h_b$ [see Table 5, col. 22 for h_b values and para. 8.3.2(c) for formula]	Minimum + tolerance	See para. 8.3.2(a) for max. and para. 8.3.2(b) for min.; established by crest of new tool and maximum major diameter of GO thread gage
3B	Nominal size $-2h_n$ [see Table 5, col. 26 (UN) or 25 (UNJ) for h_b values; see para. 8.3.2(e) for formulas]	Minimum, 6 decimal place value + tolerance [see para. 8.3.2(f)]	Nominal size $-h_b$ [see Table 5, col. 22 for h_b values and para. 8.3.2(c) for formula]	Minimum + tolerance	See para. 8.3.2(a) for max. and para. 8.3.2(b) for min.; established by crest of new tool and maximum major diameter of GO thread gage

Table 18A
Examples of External 2A Screw Threads

Characteristic Description	Example of Size Calculation	Additional Information
Thread Size = ½-28 or 0.5000-28 UNEF-2A		
(1) Maximum external major diameter, d max. = Basic major diameter, d bsc − allowance, es	d max. = d bsc − es	...
	d bsc = 0.5000	This is the final value of the basic major diameter, which is rounded to four decimal places.
	es = 0.300 (Td_2 for Class 2A)	For the Class 2A pitch diameter tolerance, see (4).
	es = 0.300 (0.003668)	The six-decimal place value for Class 2A pitch diameter tolerance, Td_2, is used in this calculation.
	es = 0.001100	This figure is rounded to four decimal places to obtain the final value of es.
	es = 0.0011	...
	d max. = 0.5000 − 0.0011	...
	d max. = 0.4989	...
(2) Minimum external major diameter, d min. = Maximum external major diameter, d max. − major diameter tolerance, Td	d min. = d max. − Td	...
	$Td = 0.060 \sqrt[3]{P^2}$	...
	$Td = 0.060 \sqrt[3]{(0.03571429)^2}$	All thread calculations should be performed using the 10-decimal-place truncated value of P rounded to 8 decimal places.
	$Td = 0.060 \sqrt[3]{0.001276}$	...
	Td = 0.060 (0.108463)	...
	Td = 0.006508	This figure is rounded to four decimal places to obtain the final value of Td.
	Td = 0.0065	...
	d min. = 0.4989 − 0.0065	...
	d min. = 0.4924	...
(3) Maximum external pitch diameter, d_2 max. = Maximum external major diameter, d max. − twice the external thread addendum, h_b	d_2 max. = d max. − h_b	...
	h_b = 0.64951905P	...
	h_b = 0.64951905(0.03571429)	All thread calculations should be performed using the 10-decimal-place truncated value of P rounded to 8 decimal places.
	h_b = 0.023197	...
	d_2 max. = 0.4989 − 0.023197	...
	d_2 max. = 0.475703	This figure is rounded to four decimal places to obtain the final value of d_2 max.
	d_2 max. = 0.4757	...

Table 18A
Examples of External 2A Screw Threads (Cont'd)

Thread Size = ½-28 or 0.5000-28 UNEF-2A		
Characteristic Description	**Example of Size Calculation**	**Additional Information**
(4) Minimum external pitch diameter, d_2 min. = Maximum external pitch diameter, d_2 max. – external pitch diameter tolerance, Td_2	d_2 min. = d$_2$ max. – Td_2	...
	$Td_2 = 0.0015\sqrt[3]{d\ \text{bsc}} + 0.0015\sqrt{LE} + 0.015\sqrt[3]{P^2}$	Length of engagement, LE, required in this example is equal to $9P$. See para. 5.2 for LE applications for other thread series.
	$Td_2 = 0.0015\sqrt[3]{0.5000} + 0.0015\sqrt{9(0.03571429)} + 0.015\sqrt[3]{(0.03571429)^2}$	...
	$Td_2 = 0.0015\sqrt[3]{0.5000} + 0.0015\sqrt{0.321429} + 0.015\sqrt[3]{0.001276}$	...
	Td_2 = (0.0015)(0.793701) + (0.0015)(0.566947) + (0.015)(0.108463)	...
	Td_2 = 0.001191 + 0.000850 + 0.001627	...
	Td_2 = 0.003668	This figure is rounded to four decimal places to obtain the final value of the external pitch diameter tolerance Td_2.
	Td_2 = 0.0037	...
	d_2 min. = 0.4757 – 0.0037	...
	d_2 min. = 0.4720	This figure is the four-decimal-place final value of d_2 min.
(5) Maximum external UN minor diameter, d_1 max. = Maximum external major diameter, d max. – double height of external UN thread, $2h_s$	d_1 max. = d max. – $2h_s$	...
	$2h_s = 1.08253175P$	For UN threads, $2h_s = 2h_n$
	$2h_s$ = 1.08253175(0.03571429)	All thread calculations should be performed using P rounded to eight decimal places.
	$2h_s$ = 0.038662	...
	d_1 max. = 0.4989 – 0.038662	...
	d_1 max. = 0.460238	This figure is rounded to four decimal places to obtain the final value of d_1 max.
	d_1 max. = 0.4602	...

GENERAL NOTES:
(a) All dimensions expressed in inches for calculations in this table.
(b) $P = 1/n = 1/28 = 0.03571429$.

Table 18B
Example of External 3A Screw Threads

Thread Size = $^{7}/_{16}$-14 or 0.4375-14 UNC 3A		
Characteristic Description	**Example of Size Calculation**	**Additional Information**
(1) Maximum external major diameter, d max. = Basic major diameter, d bsc	d max. = D bsc	...
	D bsc = 0.4375	This is the final value of the basic major diameter, which is expressed in four decimal places.
	d max. = 0.4375	...
(2) Minimum external major diameter, d min. = Maximum external major diameter, d max. − major diameter tolerance, Td	d min. = d max. − Td	...
	$Td = 0.060\sqrt[3]{P^2}$	...
	$Td = 0.060\sqrt[3]{0.07142857^2}$	All thread calculations should be performed using the 10-decimal-place truncated value of P rounded to 8 decimal places.
	$Td = 0.060\sqrt[3]{0.005102}$	...
	Td = 0.060 (0.172153)	...
	Td = 0.010329	This figure is rounded to four decimal places to obtain the final value of Td.
	Td = 0.0103	...
	d min. = 0.4375 − 0.0103	...
	d min. = 0.4272	...
(3) Maximum external pitch diameter, d_2 max. = Maximum external major diameter, d max. − twice the external thread addendum, h_b	d_2 max = d max - h_b	...
	$h_b = 0.64951905P$	...
	h_b = 0.64951905 (0.07142857)	All thread calculations should be performed using the 10-decimal-place truncated value of P rounded to 8 decimal places.
	h_b = 0.046394	...
	d_2 max. = 0.4375 − 0.046394	...
	d_2 max. = 0.391106	This figure is rounded to four decimal places to obtain the final value of d_2 max.
	d_2 max. = 0.3911	...

Table 18B
Example of External 3A Screw Threads (Cont'd)

Thread Size = $^{7}/_{16}$-14 or 0.4375-14 UNC 3A		
Characteristic Description	**Example of Size Calculation**	**Additional Information**
(4) Minimum external pitch diameter, d_2 min. = Maximum external pitch diameter, d_2 max. – external pitch diameter tolerance, Td_2	d_2 min. = d_2 max. – Td_2	...
	$Td_2 = 0.7500[0.0015\sqrt[3]{D \text{ bsc}} + 0.0015\sqrt{LE} + 0.015\sqrt[3]{P^2}]$	*LE* required in this example is equal to 1 Dia. See para. 5.2 for *LE* applications for other thread series.
	$Td_2 = 0.7500[0.0015\sqrt[3]{0.4375} + 0.0015\sqrt{0.4375} + 0.015\sqrt[3]{(0.07142857)^2}]$	...
	$Td_2 = 0.7500[0.0015\sqrt[3]{0.4375} + 0.0015\sqrt{0.4375} + 0.015\sqrt[3]{0.005102}]$	...
	$Td_2 = 0.7500[(0.0015)(0.759147) + (0.0015)(0.661438) + (0.015)(0.172153)]$	...
	$Td_2 = 0.7500(0.001139 + 0.000992 + 0.002582)$	...
	$Td_2 = 0.7500(0.004713)$	...
	$Td_2 = 0.003535$	This figure is rounded to four decimal places to obtain the final value of the external pitch diameter tolerance, Td_2.
	$Td_2 = 0.0035$	...
	d_2 min. = 0.3911 – 0.0035	...
	d_2 min. = 0.3876	...
(5) Maximum external UNR minor diameter, d_3 max. = Maximum external major diameter, d max. – double height of external UNR thread, $2h_s$	d_3 max. = d max. – $2h_s$	...
	$2h_s = 1.22686932P$	...
	$2h_s = 1.22686932$ (0.07142857)	All thread calculations should be performed using the 10-decimal-place truncated value of P rounded to 8 decimal places.
	$2h_s = 0.087634$	...
	d_3 max. = 0.4375 – 0.087634	...
	d_3 max. = 0.349866	This figure is rounded to four decimal places to obtain the final value of d_3 max.
	d_3 max. = 0.3499	...

Table 18B
Example of External 3A Screw Threads (Cont'd)

Thread Size = $^{7}/_{16}$-14 or 0.4375-14 UNC 3A		
Characteristic Description	**Example of Size Calculation**	**Additional Information**
(6) Maximum external UN minor diameter, d_1 max. = Maximum external major diameter, d max. − double height of external UN thread, $2h_n$	d_1 max. = d max. − $2h_n$	...
	$2h_n = 1.08253175P$	...
	$2h_n = 1.08253175\ (0.07142857)$	All thread calculations should be performed using the 10-decimal-place truncated value of P rounded to 8 decimal places.
	$2h_n = 0.077324$	...
	d_1 max. = 0.4375 − 0.077324	...
	d_1 max. = 0.360176	This figure is rounded to four decimal places to obtain the final value of d_1 max.
	d_1 max. = 0.3602	...

GENERAL NOTES:
(a) All dimensions expressed in inches for calculations in this table.
(b) $P = 1/n = 1/14 = 0.07142857$.

Table 18C
Examples of Internal 2B Screw Threads

Thread Size = ½-28 or 0.5000-28 UNEF-2B			
	Characteristic Description	**Example of Size Calculation**	**Additional Information**
(1)	Minimum internal minor diameter, D_1 min.	D_1 min. = D bsc − $2h_n$	...
	= Basic major diameter, D bsc − double height of internal thread, $2h_n$	$2h_n$ = 1.08253175P	...
		$2h_n$ = 1.08253175 (0.03571429)	All thread calculations should be performed using the 10-decimal-place truncated value of P rounded to 8 decimal places.
		$2h_n$ = 0.038662	...
		D_1 min. = 0.5000 − 0.038662	...
		D_1 min. = 0.461338	For the Class 2B thread used in this example, this figure is rounded to three decimal places to obtain the final value of D_1 min. Other sizes and classes may be expressed in a four-place decimal. See para. 8.3.2(e).
		D_1 min. = 0.461	...
(2)	Maximum internal minor diameter, D_1 max.	D_1 max. = 0.008929 − 0.000510D_1 min. (to six decimal plates) + TD_1	See para. 5.8.2(c) for limitations on use of this formula.
	= Minimum internal minor diameter, D_1 min., rounded to six decimal places + internal minor diameter tolerance, TD_1	TD_1 = 0.25P − 0.4P^2	...
		TD_1 = 0.25 (0.03571429) − 0.4 (0.03571429)^2	All thread calculations should be performed using the 10-decimal-place truncated value of P rounded to 8 decimal places.
		TD_1 = 0.25 (0.03571429) − 0.4 (0.001276)	...
		TD_1 = 0.008929 − 0.000510	...
		TD_1 = 0.008419	...
		TD_1 = 0.0084	This figure is rounded to four decimal places to obtain the final value of TD_1.
		D_1 max. = 0.461338 + 0.0084	...
		D_1 max. = 0.469738	For the Class 2B thread used in this example, this figure is rounded to three decimal places to obtain the final value of D_1 max. Other sizes and classes may be expressed in a four-place decimal. See para. 8.3.2(f).
		D_1 max. = 0.470	...

Table 18C
Examples of Internal 2B Screw Threads (Cont'd)

Thread Size = ½-28 or 0.5000-28 UNEF-2B		
Characteristic Description	**Example of Size Calculation**	**Additional Information**
(3) Minimum internal pitch diameter, D_2 min. = Basic major diameter, D bsc − twice the external thread addendum, h_b	D_2 min. = D bsc − h_b	...
	h_b = 0.64951905P	...
	h_b = 0.64951905(0.03571429)	All thread calculations should be performed using the 10-decimal-place truncated value of P rounded to 8 decimal places.
	h_b = 0.023197	...
	D_2 min. = 0.5000 − 0.023197	...
	D_2 min. = 0.476803	This figure is rounded to four decimal places to obtain the final value of D_2 min.
	D_2 min. = 0.4768	...
(4) Maximum internal pitch diameter, D_2 max. = Minimum internal pitch diameter, D_2 min. + internal pitch diameter tolerance, TD_2	D_2 max. = D_2 min. + TD_2	...
	TD_2 = 1.300 (Td_2 for Class 2A)	The constant 1.300 is for this Class 2B example and will be different for Classes 1B and 3B. See para. 5.8.2.
	TD_2 = 1.300 (0.003668)	For Td_2, the six-place-decimal value of the Class 2A pitch diameter tolerance is used; see Table 18A, (4).
	TD_2 = 0.004768	...
	TD_2 = 0.0048	This figure is rounded to four decimal places to obtain the final value of TD_2.
	D_2 max. = 0.4768 + 0.0048	...
	D_2 max. = 0.4816	...
(5) Minimum internal major diameter, D min. = Basic major diameter, D bsc	D min. = D bsc	...
	D bsc = 0.5000	...
	D min. = 0.5000	...

GENERAL NOTES:
(a) All dimensions expressed in inches for calculations in this table.
(b) $P = 1/n = 1/28 = 0.03571429$.

Table 18D
Example of Internal 3B Screw Threads

Thread Size = $^{7}/_{16}$-14 or 0.4375-14 UNC 3B		
Characteristic Description	**Example of Size Calculation**	**Additional Information**
(1) Minimum internal minor diameter, D_1 min. = Basic major diameter, D bsc − double height of internal thread, $2h_n$	D_1 min. = D bsc − $2h_n$	...
	$2h_n$ = 1.08253175P	All thread calculations should be performed using the 10-decimal-place truncated value of P rounded to 8 decimal places.
	$2h_n$ = 1.08253175 (0.07142857)	...
	$2h_n$ = 0.077324	This value is used in an intermediate calculation and therefore is rounded to six decimal places; see ASME B1.30.
	D_1 min. = 0.4375 − 0.077324	...
	D_1 min. = 0.360176 D_1 min. = 0.360 D_1 min. = 0.3600	For the Class 3B thread used in this example, this figure is rounded to three decimal places and a zero is added to yield a four-decimal-place final value of D_1 min. See para. 8.3.2(e)(1)(-c). Other sizes and classes may be expressed in a three-place decimal. See para 8.3.2(e)(1).

Table 18D
Example of Internal 3B Screw Threads (Cont'd)

Thread Size = $^{7}/_{16}$-14 or 0.4375-14 UNC 3B

Characteristic Description	Example of Size Calculation	Additional Information
(2) Maximum internal minor diameter, D_1 max. = Minimum internal minor diameter, D_1 min. rounded to six decimal places + internal minor diameter tolerance, TD_1	D_1 max. = D_1 min. (to 6 decimal places) + TD_1	See para. 8.3.2(f)(1) for exception rule when calculating D_1 max.
	TD_1 =	The value used for TD_1 is determined by one of three calculations based on certain limitations. See para. 5.8.2(c)(3) for limitations.
	$= [0.05\sqrt[3]{P^2} + (0.03P)/D - 0.002]$ $= [0.05\sqrt[3]{0.07142857^2} + (0.03)(0.07142857/0.4375) - 0.002]$ $= [0.05\sqrt[3]{0.005102} + (0.002143/0.4375) - 0.002)]$ $= [(0.05(0.172153) + (0.004898 - 0.002)]$ $= 0.008608 + 0.004898 - 0.002$ $= 0.011506$	See para. 5.8.2(c)(3) for limitations on the use of this formula. All thread calculations should be performed using the 10-decimal-place truncated value of P rounded to 8 decimal places. Limitation on the use of this value is based on the next two calculations.
	$= 0.394P$ $= 0.394(0.07142857)$ $= 0.028143$	Limitation as listed in para. 5.8.2(c)(3)(-a)(-1). Tolerance shall be not greater than $0.39400P$.
	$= 0.23P - 1.5P^2$	Limitation as listed in para. 5.8.2(c)(3)(-a)(-2)(+a). Tolerance shall be not less than $0.2300P - 1.500P^2$ for 80 to 13 threads per inch, inclusive.
	$= 0.23(0.07142857) - 1.5(0.071428572)^2$	...
	$= 0.016429 - 1.5(0.005102)$ $= 0.016429 - 0.007653$	...
	$= 0.008776$	...
	$TD_1 = 0.011506$	For TD_1 in the example, 0.011506 is not greater than 0.028143 and not less than 0.008776, so the value of 0.011506 is used. NOTE: Six-decimal-place values are used for the comparison of limitation values to the calculated TD_1 value, then the final determination is rounded to four places.
	$TD_1 = 0.0115$	This figure is rounded to four decimal places to obtain the final value of TD_1.
	D_1 max. = 0.360176 + 0.0115	...

Table 18D
Example of Internal 3B Screw Threads (Cont'd)

Thread Size = $^{7}/_{16}$-14 or 0.4375-14 UNC 3B

Characteristic Description	Example of Size Calculation	Additional Information
(2) cont'd	D_1 max. = 0.371676	For the Class 3B thread used in the example, this figure is rounded to four decimal places to obtain the final value of D_1 max. Other sizes and classes may be expressed in a three-place decimal. See para. 8.3.2(f)(1)(-c).
	D_1 max. = 0.3717	...
(3) Minimum internal pitch diameter, D_2 min. = Basic major diameter, D bsc − twice the external thread addendum, h_b	D_2 min. = D bsc − h_b	...
	h_b = 0.64951905P	...
	h_b = 0.64951905 (0.07142857)	All thread calculations should be performed using the 10-decimal-place truncated value of P rounded to 8 decimal places.
	h_b = 0.046394	...
	D_2 min. = 0.4375 − 0.046394	...
	D_2 min. = 0.391106	This figure is rounded to four decimal places to obtain the final value of D_2 min.
	D_2 min. = 0.3911	...
(4) Maximum internal pitch diameter, D_2 max. = Minimum internal pitch diameter, D_2 min. + internal pitch diameter tolerance, TD_2	D_2 max. = D_2 min. + TD_2	...
	TD_2 = 0.9750 (TD_2 for Class 2A)	The constant 0.9750 is for this Class 3B example and will be different for Classes 1B and 2B. See para. 5.8.2(b).
	TD_2 = 0.9750 (0.004713)	For the TD_2 Class 2A pitch diameter tolerance, see para. 5.8.1(c). The six-place decimal place value is used.
	TD_2 = 0.004595 TD_2 = 0.0046	This figure is rounded to four decimal places to obtain the final value of TD_2.
	D_2 max. = 0.3911 + 0.0046	...
	D_2 max. = 0.3957	...
(5) Minimum internal major diameter, D min. = Basic major diameter, D bsc	D min. = D bsc	...
	D bsc = 0.4375	...
	D min. = 0.4375	...

GENERAL NOTES:
(a) All dimensions expressed in inches for calculations in this table.
(b) $P = 1/n = 1/14 = 0.07142857$.