Handbook H28 (1969)

Part 2 of 6

Pitch increments

Threads per inch	$0.015\sqrt[3]{p^2}$	Threads per inch	$0.015\sqrt[3]{p^2}$	Threads per inch	$(0.015)\sqrt[3]{p^2}$	Threads per inch	$0.015\sqrt[3]{p^2}$	Threads per inch	$0.015\sqrt[3]{p^2}$	Threads per inch	$0.015\sqrt[3]{p^2}$	Threads per inch	$0.015\sqrt[3]{p^2}$
	in		*in*		*in*		*in*		*in*		*in*		*in*
80	0.000808	50	0.001105	36	0.001376	27	0.001667	18	0.002184	11.5	0.002944	7	0.004099
72	.000867	48	.001136	34	.001429	26	.001709	16	.002362	11	.003033	6	.004543
64	.000938	44	.001204	32	.001488	24	.001803	14	.002582	10	.003232	5.5	.004814
60	.000979	42	.001241	30	.001554	22	.001910	13	.002713	9	.003467	5	.005130
56	.001025	40	.001282	28	.001627	20	.002036	12	.002862	8	.003750	4.5	.005503
												4	.005953

[a] For class 2A, $C = 1$. For other classes, values of C are given in the table on p. 2.20.
[b] For example: $L_e = 0.5000$ is equivalent to one diameter for the .500 inch size, 9 pitches for 18 threads per inch, and 20 pitches for 40 threads per inch.

where

C = a factor which differs for each class,
D = basic major (nominal) diameter of thread,
L_e = length of thread engagement,
p = pitch of thread.

The values of the factor C for the various thread classes are:

Class	Factor C	Class	Factor C
1A	1.5	1B	1.95
2A	1.0	2B	1.30
3A	0.75	3B	0.975

The incremental values of the above formula are shown in table 2.19. The P. D. tolerances obtained by the use of the formulas are shown in table 2.21. The length of thread engagement (L_e) used in the formula is $1D$ (diameter) or 9 pitches, depending on the series. (See par. 7, Length of engagement, p. 2.21, for the L_e for the various standard series of Unified threads.)

The factor C is 30 percent greater for internal than for external threads of a given class on account of the greater difficulties encountered in the manufacture of internal threads.

6.2. Major Diameter Tolerances.—The class 1A major diameter tolerance is $0.090\sqrt[3]{p^2}$ and that for classes 2A and 3A is $0.060\sqrt[3]{p^2}$. The tolerance for class 2A coarse and the 8-thread series threads of unfinished, hot-rolled material is $0.090\sqrt[3]{p^2}$.

The internal thread major diameter tolerance for all classes is $H/6$ plus the pitch diameter tolerance of the class of thread involved. The maximum major diameter of the internal thread may be determined by adding $0.793857p$ ($= 11H/12$, table 2.1, p. 2.02) to the maximum pitch diameter of the internal thread. 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 which has no allowance.

6.3. Minor Diameter Tolerances.—*External thread* minor diameter tolerances are for reference only. At the nominal minor diameter, that is, at the intersection of the rounded root with its center line (see fig. 2.3, p. 2.04):

$$\text{tolerance} = \text{P.D. tolerance} + H/12$$

and applies only when the rounded root is a design requirement. Otherwise:

$$\text{tolerance} = \text{P.D. tolerance} + 0.25H.$$

The external thread minimum minor diameter is:

$$\text{ext. thread min. P.D.} - 0.649519\,p.$$

$$(0.649519\,p = 0.75H;\ \text{see table 2.1.})$$

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. *Internal thread* minor diameter tolerances are as shown in table 2.20.

Table 2.20. *Minor diameter tolerances for internal threads*

Nominal Size (diameter)	Internal thread minor diameter tolerances for all standard thread series	
	Classes 1B and 2B	Class 3B (all sizes)
in Less than 0.25	$0.05\sqrt[3]{p^2}+0.03p/D-0.002$ in *EXCEPT:* Tolerances shall not exceed $0.394p$ Tolerances shall not be less than $0.25p-0.4p^2$	$0.05\sqrt[3]{p^2}+0.03p/D-0.002$ in.
0.25 and larger	$0.25p-0.4p^2$ *EXCEPT:* The formula is not applicable to threads coarser than 4 tpi. For such threads the tolerance is $0.15p$	*EXCEPT:* Tolerances shall not exceed $0.394p$. Tolerances shall not be less than, For 80 to 13 tpi, inclusive: $0.23-1.5p^2$ For 12 tpi and coarser: $0.120p$.

The tolerance of $0.394p$ corresponds to 53 percent of the basic thread height and applies in the range of the smallest sizes of the UNC and UNF thread series.

The tolerance of $0.120p$ corresponds to 74 percent of the basic thread height.

The formulas are suitable for general applications having lengths of engagement up to $1.5D$. However, some thread applications require lengths of engagement which are greater than $1.5D$ or less than D. For such applications it may be advantageous to increase or decrease tolerances, as explained in section 3, or to use recommended hole size limits for different lengths of engagement as specified in appendix A3.

7. LENGTH OF ENGAGEMENT

The pitch diameter tolerances specified in table 2.21 for the UNC, UNF, 4UN, 6UN, and 8UN series 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.

Where the length of engagement exceeds that for which these tolerances are applicable, the pitch diameter tolerances should be computed from the formula (table 2.21) values for the standard lengths of engagement of one diameter, as follows: for lengths of engagement over 1.5 to 3 diameters, the pitch diameter tolerances are 125 percent of the formula values; and for lengths of engagement over 3 diameters, the tolerances are 150 percent of the formula values.

The pitch diameter tolerances specified in table 2.21 for the UNEF, 12UN, 16UN, 20UN, 28UN, and 32UN series are based on a length of engagement of 9 pitches and are applicable for lengths of engagement up to 15 pitches.

Where the length of engagement exceeds that for which these tolerances are applicable, the pitch diameter tolerances should be computed from the formula (table 2.21) values for the standard lengths of engagement of 9 pitches, as follows: for lengths of engagement over 15 to 30 pitches, the pitch diameter tolerances are 125 percent of the formula values; and for lengths of engagement over 30 pitches, the tolerances are 150 percent of the formula values.

8. LIMITS OF SIZE

(For aeronautical applications, practices may deviate from those here specified. See Military Specification MIL-S-7742.)

With respect to the pitch diameter limits of size, it is intended, except as hereinafter qualified, that no portion of the complete thread be permitted to project beyond the envelope defined by the maximum-material limits on the one hand, or beyond that defined by the minimum-material limits on the other, and thus be outside of the tolerance zone as illustrated in figures 2.5 and 2.6.

NOTE: The full tolerance cannot, therefore, be used on pitch diameter unless deviations in all other thread elements are zero.

Diameter equivalents of variations in lead, uniformity of helix, and flank angle are in the direction toward maximum material. Also included in pitch-diameter limits are other variations from size and profile, such as taper, out-of-round, and surface defects. Thus the maximum-material pitch diameter limits are a limitation of the virtual diameter (effective size) *and are so specified herein for all thread classes*. It is intended that diameter equivalents of deviations in any given element except pitch diameter should not exceed 0.5 of the pitch-diameter tolerance. Values are given in table 2.22 for deviations in lead and half-angle equivalent to 0.5 of pitch diameter tolerances. Flank angle equivalents should be based on a depth of thread engagement of $0.625H$.

Variations in taper and roundness of the pitch diameter, together with variations of the pitch diameter as a whole, may be in the direction of minimum material and thus the minimum-material pitch diameter limit may be specified as a limitation of the pitch diameter as a single element. However, in view of the interrelation of the pitch diameter, variations in lead and flank angle, etc., together with practical considerations relating to established production processes, product application and inspection procedures, except for class 3A, for fasteners and some custom threaded parts, it is customary to base acceptance at the minimum-material condition (minimum pitch diameter of the external thread and maximum pitch diameter of the internal thread) on threaded plug and ring gaging, with gages to the thread form and length specified in section 6. See paragraph on Dimensional acceptability of threads in section 6.

8.1. DIAMETER EQUIVALENT OF ANGLE DEVIATION.—The general formula expressing the relation between deviation in the half angle of thread and its diameter equivalent—that is, the amount of the pitch diameter tolerance absorbed by such a deviation—is:

$$\cot \delta\alpha = \frac{h_e}{\delta E \sin \alpha \cos \alpha} \pm \cot \alpha,$$

in which

δE = pitch diameter increment due to deviation in half angle
h_e = depth of thread engagement
α = basic half angle of thread
$\delta\alpha$ = deviation in half angle of thread.

In solving for δE the average value of $\delta\alpha$ for two sides of the thread, regardless of their sign, should be taken. The sign of $\cot \alpha$ is plus when the half angle of thread is less than basic, minus when the half angle is greater than basic. By omitting $\pm \cot \alpha$ from the formula an approximate mean value for $\delta\alpha$ or δE is obtained which differs very little from either extreme value. The Committee has, therefore, adopted for general use the formula

$$\cot \delta\alpha = \frac{h_e}{\delta E \sin \alpha \cos \alpha}.$$

For threads of Unified, American, or American National form, where $h_e = 0.625H$, this formula reduces to

$$\cot \delta\alpha = \frac{5p}{4\delta E} \text{ or } \delta E = 1.25p \tan \delta\alpha.$$

8.2. DIAMETER EQUIVALENT OF LEAD DEVIATION.—The formula expressing the relation between lead deviation between any two threads within the length of engagement, and its diameter equivalent is as follows:

$$\delta E = (\pm \delta p) \cot \alpha,$$

in which

δE = pitch diameter increment due to lead deviation

δp = the maximum pitch deviation between any two of the threads engaged

α = half angle of thread.

The quantity δE is always added to the measured pitch diameter in the case of an external thread, and it is always subtracted in the case of an internal thread, regardless of the sign introduced by the lead deviation δp.

For threads of Unified, American, or American National form, the above formula reduces to

$$\delta E = 1.7321\ \delta p.$$

9. COATED THREADS

It is not within the scope of this standard to make recommendations for thickness of, or to specify limits for, coatings. However, it will aid mechanical interchangeability if certain principles are followed whenever conditions permit.

It is desirable that the finished threads be within the limits of size established herein. To that end, external threads should not exceed the basic size after coating and internal threads should not be below the basic size after coating. However, it is recognized that there are some commonly used processes, such as hot-dip galvanizing, which are firmly established, and threads coated by such processes do not fall within the scope of this recommendation.

9.1. Guide For Relieving External Threads.—(This does not apply to extremes of diameter, length, and pitch.) Class 2A provides both a tolerance and an allowance. Many requirements are such as those for coatings deposited by electroplating processes. In general the 2A allowance provides adequate relief for coatings up to a minimum thickness[1] of one-sixth of the 2A pitch diameter allowance, inasmuch as there are variables in thickness of coating and symmetry of coating resulting from commercial processes. See par. 4.2, p. 2.17. It should be stressed that threads after coating should be accepted by a basic size GO thread ring gage or equivalent functional gage.

Class 1A provides an allowance, but in this case the allowance is maintained for both coated and uncoated product. Special provisions before coating are necessary where (1) the design requires that the class 2A allowance be available after coating, or (2) the design requires that an allowance be provided for class 3A threads, or (3) the thickness of coating is too great to be accomodated by the class 2A allowance. In these cases it is recommended that the limits of size before coating be reduced by the amount of the 2A allowance whenever that allowance is adequate, or that the maximum limits of the major and pitch diameters be decreased by an amount equal to six times the minimum coating thickness and the minimum limits be decreased by an amount equal to four times the minimum coating thickness.

9.2. Relief Of Internal Threads.—No provision is made for relieving internal threads as coatings on such threads are not generally required. Further, it is very difficult to deposit a significant thickness of coating on the flanks of internal threads. However, where a specific thickness of coating is required in an internal thread, it is suggested that the thread be relieved so that the thread after coating will be accepted by a GO thread plug gage of basic size. It is recommended that (1) the limits of size before coating be increased by the amount of the 2A allowance whenever that allowance is adequate, or (2) the minimum limits of the minor and pitch diameters be increased by an amount equal to six times the minimum coating thickness and the maximum limits be increased by an amount equal to four times the minimum coating thickness.

10. METHOD OF DESIGNATING SCREW THREADS

The basic method of designating screw threads is used when the standard tolerances or limits of size based on the standard length of engagement are applicable as indicated in par. 7, Length of engagement, p. 2.21. The designation specifies in sequence the nominal size in decimals, number of threads per inch, thread series symbol, and thread class symbol. The *nominal size* is the basic major diameter. The nominal size shall be shown in four place decimals unless there is a cipher in the fourth place. A cipher in the fourth place shall be omitted.

The *thread series symbol* is UNC, UNF, UNEF, or UN for any of the series shown in table 2.7 and UNS for any other diameter-pitch combination having tolerances to Unified formulation.

The *thread class symbol* is 1A, 1B, 2A, 2AG, 2B, 3A, or 3B in which the suffixes A and B relate to external and internal threads, respectively. Suffix G in the 2AG symbol indicates that the 2A dimensions are to be met after coating.

Examples:

Nominal size (basic major diameter in decimals)
| *Number of threads per inch*
| | *Thread series symbol (see dimensional tables)*
| | | *Thread class symbol (see par. 4 Thread classes, p. 2.17.)*
| | | | |

.250-20 UNC-2A formerly 1/4–20 UNC-2A
.190-32 UNF-2A formerly 10-32 UNF-2A
.4375-20 UNF-2A formerly 7/16-20 UNF-2A.
.4375-20 UNF-3A formerly 7/16-20 UNF-3A.

For uncoated standard series threads (table 2.7) these designations may optionally be supplemented by the addition of the pitch diameter limits of size.

[1] The maximum allowance at the maximum material condition of six times the minimum coating thickness is derived by dividing the deposit on the flank of the thread by the sine of the 30 degree half angle and multiplying the result by two for the diameter equivalent, then adding 50 percent for the plater's tolerance. The minimum allowance at the minimum material condition of four times the minimum coating thickness is two-thirds the maximum allowance, inasmuch as the thickness of coating will bring the limits of size within standard limits with the additional allowance for the plater's tolerance omitted.

Example: (PD limits are those in table 2.21 for class 2A.)

.250-20 UNC-2A
PD .2164-2127 (*Optional for uncoated threads*).

UNS threads and threads having special length of engagement require certain additional information as shown on the following pages.

10.1. Designating Coated (Or Plated) 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.

The before coating dimensions have a definite bearing on the strength of the screw threads. The after coating dimensions must allow the threads to assemble with their mating threads, as intended.

Recommended methods for designating coated threads under various conditions are described below:

For coated (or plated) class 1A external threads the max major and max pitch diameters may optionally be given followed 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 footnote 1, p. 2.22, shall be given followed by the words "BEFORE COATING."

Example: (Major and PD limits are those in table 2.21 for class 1A for AFTER COATING and for class 1A minus allowance for BEFORE COATING.)

.250-20 UNC-1A
MAJOR DIA .2489 MAX } AFTER COATING
PD .2164 MAX } (*Optional*)
MAJOR DIA .2478-.2356 SPL } BEFORE
PD .2153-.2097 SPL } COATING

For coated (or plated) class 2A external threads the basic (max) major and basic (max) pitch diameters shall be given followed by the words "AFTER COATING." The major and pitch diameter limits of size before coating shall also be given followed by the words "BEFORE COATING."

Example:[2] (Major and PD limits are those in table 2.21 for class 3A (basic) for AFTER COATING and for class 2A for BEFORE COATING.)

.750-10 UNC-2A
MAJOR DIA .7500 MAX } AFTER COATING
PD .6850 MAX }
MAJOR DIA .7482-.7353 } BEFORE COATING
PD .6832-.6773 }

Certain applications require an allowance for rapid assembly to permit application of the proper lubricant or for residual growth due to high temperature expansion. In these applications, when the thread is coated and the 2A allowance is not permitted to be consumed by such coating, the thread class symbol is qualified by the addition of the letter G (symbol for allowance) following the class symbol and the max major and max pitch diameters are reduced below basic size by the amount of the 2A allowance and followed by the words "AFTER COATING," thereby ensuring that the allowance is maintained. 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 par 9, p. 2.22) shall also be given followed by the words "BEFORE COATING."

Example: (Major and PD limits are those in table 2.21 for class 2A for AFTER COATING and for class 2A minus the allowance for BEFORE COATING.)

.750-10 UNC-2AG
MAJOR DIA .7482 MAX } AFTER COATING
PD .6832 MAX }
MAJOR DIA .7464-.7335 SPL } BEFORE
PD .6814-.6755 SPL } COATING

For coated (or plated) class 3A external threads, the max major and max pitch diameters may optionally be given followed 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 par. 9, p. 2.22) shall be given followed by the words "BEFORE COATING."

Example: (Major and PD limits for AFTER COATING are those in table 2.21 for class 3A.)

.250-28 UNF-3A
MAJOR DIA. .2500 MAX } AFTER COATING
PD .2268 MAX } (*Optional*)
MAJOR DIA .2488-.2427 SPL } BEFORE
PD .2256-.2235 SPL } COATING

For coated (or plated) class 1B, 2B, or 3B internal threads the min minor diameter and min pitch diameter may optionally be given followed by the words "AFTER COATING." The minor and pitch diameter limits of size before coating (calculated in accordance with par. 9, p. 2.22) shall be given followed by the words "BEFORE COATING."

[2] Threads accepted to class 2A limits before coating are accepted after coating by basic size thread gages. The allowance given in the dimensional tables for class 2A threads is sufficient to allow for a limited amount of coating as described in par. 9. Coated threads, p. 2.22, but if a greater coating thickness is required, it will be necessary to calculate the before coating limits in accordance with that paragraph.

Examples: (The after coating limits for all of the examples given are the minor and PD limits in table 2.21 for the respective class of thread. The before coating limits for all of the examples are calculated using the 2A allowance where it is suitable for a minimum coating (or plating) thickness of 0.0002 in. on the thread flanks.)

.250-20 UNC-1B
MINOR DIA .196 MIN \ AFTER COATING
PD .2175 MIN / (*Optional*)
MINOR DIA .197-.208 SPL \ BEFORE
PD .2186-.2259 SPL / COATING

.750-10 UNC-2B
MINOR DIA .642 MIN \ AFTER COATING
PD .6850 MIN / (*Optional*)
MINOR DIA .644-.665 SPL \ BEFORE
PD .6868-.6945 SPL / COATING

.250-28 UNF-3B
MINOR DIA .2110 MIN \ AFTER COATING
PD .2268 MIN / (*Optional*)
MINOR DIA .2122-.2198 SPL \ BEFORE
PD .2280-.2308 SPL / COATING

10.2. Designating Left Hand Threads.—Unless otherwise specified, threads are right-hand; a left-hand thread shall be designated LH as follows:

.250-20 UNC-3A-LH

10.3. Designating UNS Threads (With Unified Tolerance Formulations).—UNS threads have the basic form of designation set out above, supplemented always by the limits of size.

Examples:

.250-24 UNS-3A
MAJOR DIA .2500-.2428
PD .2229-.2201

.495-20 UNS-3A
MAJOR DIA .4950-.4869
PD .4625-.4593

1.200-10 UNS-2B
MINOR DIA 1.092-1.113
PD 1.1350-1.1432

10.4. Designating Threads Having Special Length Of Engagement.—When 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 par. 7, Length of engagement, p. 2.21, 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 (LE) rounded to a two-place decimal are a requirement.

Examples:

.500-13 UNC-SE2A
PD .4485-.4431
LE 1.00

.250-24 UNS-SE3A
MAJOR DIA .2500-.2428
PD .2229-.2198
LE .88

10.5. 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 to fit a specific application but without change in class of thread or pitch diameter limits. (It should be noted that standard pitch diameter gages may be used to accept such threads). Such threads shall be specified with the established thread designation followed by the designation "MOD" and a statement of the modified diameter limits.

Examples:

.375-24 UNF-3A MOD
MAJOR DIA .3720–.3648 MOD

1.500-10 UNS-3B MOD
MINOR DIA 1.398-1.409 MOD
PD 1.4350-1.4412

10.6. Designating Threads For Acceptance By Other Than General Practice.—Threads to be accepted by gaging practices deviating from those outlined in section 6 require additional notes in the thread designation. The recommended methods of designating these threads are described in the following:

10.6.1. *Designating class 3A threads for LO functional (virtual) diameters.*—When it is desired to gage the minimum pitch diameter limits of class 3A external threads as functional (virtual) diameter, instead of as specified in section 6, the words "LO FUNCTIONAL DIAMETER" following the pitch diameter limits should be included in addition to the information normally given, as follows:

.375-24 UNF-3A
PD .3468-.3430
LO FUNCTIONAL DIAMETER

10.6.2. *Designating class 2A threads for LO pitch diameters.*—When it is desired to gage the minimum pitch diameter limits of class 2A external threads as a single element instead of as specified in section 6, the words "LO PITCH DIAMETER" following the pitch diameter limits should be included in addition to the information normally given, as follows:

.375-16 UNC-2A
PD .3331-.3287
LO PITCH DIAMETER

10.7. Designating Other Threads.—Threads having tolerances that do not conform to Unified formulation, and threads having multiple starts or special form, also require additional data in the thread designation. The recommended methods of designating these threads are described in the following:

10.7.1. *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 previously, it is designated in accordance with the following examples:

.500-13 UNIFIED FORM SPECIAL-INT
MINOR DIA .424-.434 SPL
PD .4500-.4580 SPL
LE .50

.4375-24 UNIFIED FORM SPECIAL-EXT
MAJOR DIA .4340-.4280 SPL
PD .4065-.4025 SPL
LE .38

10.7.2. *Designating multiple-start threads.*—If a thread is required with a multiple start, it is designated by specifying sequentially in decimals the nominal size, pitch, and lead as follows: (The number of starts is obtained by dividing the lead by the pitch.)

.75-.0625P-.1875L-(3 START)-UNIFIED
FORM SPECIAL-EXT
MAJOR DIA .7485-.7391
PD .7079-.7003 SPL
LE .75

10.7.3. *Designating special form threads.*—If a thread for design considerations requires a deviation 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 neither include the letters "UN" nor the word "UNIFIED" but shall be as follows:

.875-18 SPECIAL FORM-EXT
THREAD ANGLE 60°
MAJOR DIA .8750-.8668
PD .8384-.8343
MAX MINOR DIA .8068 (as gaged)
LE .69

Note. The "as gaged" diameter describes the maximum minor diameter of the GO thread ring gage.

10.7.4. *Designating threads with long lengths 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 length of assembled thread in the mating parts.

In some instances, the length of engagement may be longer than that which is applicable to the tolerances for the standard length of engagement and additional precautions are necessary to assure proper assembly. In the case of custom parts, this may be taken into consideration when designing the parts. The proper pitch diameter tolerance may be obtained from the step tables in section 3 or computed from the formulas. The length of engagement shall be included in the designation as specified previously.

11. LIMITS OF SIZE FOR UNIFIED STANDARD SCREW THREAD SERIES

The limits of size, allowances, and pitch diameter tolerances for the Unified standard screw thread series are given in table 2.21. The sizes listed in table 2.21 are those shown in table 2.7 except for the omission of the secondary sizes over 2.5 in nominal size in the 4UN series, all sizes over 5 in. in the 6UN series, and all sizes over 4 in. in the 8UN series. However, the basic dimensions for these sizes omitted from table 2.21 are given in tables 2.11, 2.12, and 2.13.

The maximum-material pitch diameter limits (maximum external and minimum internal threads) are a limitation of the virtual diameter (effective size) for all thread classes. The minimum-material pitch diameter limits are to be interpreted in accordance with par. 8 Limits of size, p. 2.21.

Concerning class 2A threads with an additive finish, footnote b of table 2.21 on p. 2.37 should be specifically noted.

12. GAGES

Threads covered by this section shall be gaged in accordance with section 6.

TABLE 2.21. *Standard series limits of size—Unified screw threads*

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
.060-80	UNF	2A	0.0005	0.0595	0.0563	--------	0.0514	0.0496	0.0018	0.0442	2B	0.0465	0.0514	0.0519	0.0542	0.0023	0.0600
		3A	.0000	.0600	.0568	--------	.0519	.0506	.0013	.0447	3B	.0465	.0514	.0519	.0536	.0017	.0600
.073-64	UNC	2A	.0006	.0724	.0686	--------	.0623	.0603	.0020	.0532	2B	.0561	.0623	.0629	.0655	.0026	.0730
		3A	.0000	.0730	.0692	--------	.0629	.0614	.0015	.0538	3B	.0561	.0623	.0629	.0648	.0019	.0730
.073-72	UNF	2A	.0006	.0724	.0689	--------	.0634	.0615	.0019	.0554	2B	.0580	.0635	.0640	.0665	.0025	.0730
		3A	.0000	.0730	.0695	--------	.0640	.0626	.0014	.0560	3B	.0580	.0635	.0640	.0659	.0019	.0730
.086-56	UNC	2A	.0006	.0854	.0813	--------	.0738	.0717	.0021	.0635	2B	.0667	.0737	.0744	.0772	.0028	.0860
		3A	.0000	.0860	.0819	--------	.0744	.0728	.0016	.0641	3B	.0667	.0737	.0744	.0765	.0021	.0860
.086-64	UNF	2A	.0006	.0854	.0816	--------	.0753	.0733	.0020	.0662	2B	.0691	.0753	.0759	.0786	.0027	.0860
		3A	.0000	.0860	.0822	--------	.0759	.0744	.0015	.0668	3B	.0691	.0753	.0759	.0779	.0020	.0860
.099-48	UNC	2A	.0007	.0983	.0938	--------	.0848	.0825	.0023	.0727	2B	.0764	.0845	.0855	.0885	.0030	.0990
		3A	.0000	.0990	.0945	--------	.0855	.0838	.0017	.0734	3B	.0764	.0845	.0855	.0877	.0022	.0990
.099-56	UNF	2A	.0007	.0983	.0942	--------	.0867	.0845	.0022	.0764	2B	.0797	.0865	.0874	.0902	.0028	.0990
		3A	.0000	.0990	.0949	--------	.0874	.0858	.0016	.0771	3B	.0797	.0865	.0874	.0895	.0021	.0990
.112-40	UNC	2A	.0008	.1112	.1061	--------	.0950	.0925	.0025	.0805	2B	.0849	.0939	.0958	.0991	.0033	.1120
		3A	.0000	.1120	.1069	--------	.0958	.0939	.0019	.0813	3B	.0849	.0939	.0958	.0982	.0024	.1120
.112-48	UNF	2A	.0007	.1113	.1068	--------	.0978	.0954	.0024	.0857	2B	.0894	.0968	.0985	.1016	.0031	.1120
		3A	.0000	.1120	.1075	--------	.0985	.0967	.0018	.0864	3B	.0894	.0968	.0985	.1008	.0023	.1120
.125-40	UNC	2A	.0008	.1242	.1191	--------	.1080	.1054	.0026	.0935	2B	.0979	.1062	.1088	.1121	.0033	.1250
		3A	.0000	.1250	.1199	--------	.1088	.1069	.0019	.0943	3B	.0979	.1062	.1088	.1113	.0025	.1250
.125-44	UNF	2A	.0007	.1243	.1195	--------	.1095	.1070	.0025	.0964	2B	.1004	.1079	.1102	.1134	.0032	.1250
		3A	.0000	.1250	.1202	--------	.1102	.1083	.0019	.0971	3B	.1004	.1079	.1102	.1126	.0024	.1250
.138-32	UNC	2A	.0008	.1372	.1312	--------	.1169	.1141	.0028	.0989	2B	.104	.114	.1177	.1214	.0037	.1380
		3A	.0000	.1380	.1320	--------	.1177	.1156	.0021	.0997	3B	.1040	.1140	.1177	.1204	.0027	.1380
.138-40	UNF	2A	.0008	.1372	.1321	--------	.1210	.1184	.0026	.1065	2B	.111	.119	.1218	.1252	.0034	.1380
		3A	.0000	.1380	.1329	--------	.1218	.1198	.0020	.1073	3B	.1110	.1186	.1218	.1243	.0025	.1380
.164-32	UNC	2A	.0009	.1631	.1571	--------	.1428	.1399	.0029	.1248	2B	.130	.139	.1437	.1475	.0038	.1640
		3A	.0000	.1640	.1580	--------	.1437	.1415	.0022	.1257	3B	.1300	.1389	.1437	.1465	.0028	.1640
.164-36	UNF	2A	.0008	.1632	.1577	--------	.1452	.1424	.0028	.1291	2B	.134	.142	.1460	.1496	.0036	.1640
		3A	.0000	.1640	.1585	--------	.1460	.1439	.0021	.1299	3B	.1340	.1416	.1460	.1487	.0027	.1640
.190-24	UNC	2A	.0010	.1890	.1818	--------	.1619	.1586	.0033	.1379	2B	.145	.156	.1629	.1672	.0043	.1900
		3A	.0000	.1900	.1828	--------	.1629	.1604	.0025	.1389	3B	.1450	.1555	.1629	.1661	.0032	.1900
.190-32	UNF	2A	.0009	.1891	.1831	--------	.1688	.1658	.0030	.1508	2B	.156	.164	.1697	.1736	.0039	.1900
		3A	.0000	.1900	.1840	--------	.1697	.1674	.0023	.1517	3B	.1560	.1641	.1697	.1726	.0029	.1900
.216-24	UNC	2A	.0010	.2150	.2078	--------	.1879	.1845	.0034	.1639	2B	.171	.181	.1889	.1933	.0044	.2160
		3A	.0000	.2160	.2088	--------	.1889	.1863	.0026	.1649	3B	.1710	.1807	.1889	.1922	.0033	.2160
.216-28	UNF	2A	.0010	.2150	.2085	--------	.1918	.1886	.0032	.1712	2B	.177	.186	.1928	.1970	.0042	.2160
		3A	.0000	.2160	.2095	--------	.1928	.1904	.0024	.1722	3B	.1770	.1857	.1928	.1959	.0031	.2160
.216-32	UNEF	2A	.0009	.2151	.2091	--------	.1948	.1917	.0031	.1768	2B	.182	.190	.1957	.1998	.0041	.2160
		3A	.0000	.2160	.2100	--------	.1957	.1933	.0024	.1777	3B	.1820	.1895	.1957	.1988	.0031	.2160
.250-20	UNC	1A	.0011	.2489	.2367	--------	.2164	.2108	.0056	.1876	1B	.196	.207	.2175	.2248	.0073	.2500
		2A	.0011	.2489	.2408	0.2367	.2164	.2127	.0037	.1876	2B	.196	.207	.2175	.2224	.0049	.2500
		3A	.0000	.2500	.2419	--------	.2175	.2147	.0028	.1887	3B	.1960	.2067	.2175	.2211	.0036	.2500
.250-28	UNF	1A	.0010	.2490	.2392	--------	.2258	.2208	.0050	.2052	1B	.211	.220	.2268	.2333	.0065	.2500
		2A	.0010	.2490	.2425	--------	.2258	.2225	.0033	.2052	2B	.211	.220	.2268	.2311	.0043	.2500
		3A	.0000	.2500	.2435	--------	.2268	.2243	.0025	.2062	3B	.2110	.2190	.2268	.2300	.0032	.2500
.250-32	UNEF	2A	.0010	.2490	.2430	--------	.2287	.2255	.0032	.2107	2B	.216	.224	.2297	.2339	.0042	.2500
		3A	.0000	.2500	.2440	--------	.2297	.2273	.0024	.2117	3B	.2160	.2229	.2297	.2328	.0031	.2500
.3125-18	UNC	1A	.0012	.3113	.2982	--------	.2752	.2691	.0061	.2431	1B	.252	.265	.2764	.2843	.0079	.3125
		2A	.0012	.3113	.3026	.2982	.2752	.2712	.0040	.2431	2B	.252	.265	.2764	.2817	.0053	.3125
		3A	.0000	.3125	.3038	--------	.2764	.2734	.0030	.2443	3B	.2520	.2630	.2764	.2803	.0039	.3125
.3125-20	UN	2A	.0012	.3113	.3032	--------	.2788	.2748	.0040	.2500	2B	.258	.270	.2800	.2852	.0052	.3125
		3A	.0000	.3125	.3044	--------	.2800	.2770	.0030	.2512	3B	.2580	.2680	.2800	.2839	.0039	.3125
.3125-24	UNF	1A	.0011	.3114	.3006	--------	.2843	.2788	.0055	.2603	1B	.267	.277	.2854	.2925	.0071	.3125
		2A	.0011	.3114	.3042	--------	.2843	.2806	.0037	.2603	2B	.267	.277	.2854	.2902	.0048	.3125
		3A	.0000	.3125	.3053	--------	.2854	.2827	.0027	.2614	3B	.2670	.2754	.2854	.2890	.0036	.3125
.3125-28	UN	2A	.0010	.3115	.3050	--------	.2883	.2849	.0034	.2677	2B	.274	.282	.2893	.2937	.0044	.3125
		3A	.0000	.3125	.3060	--------	.2893	.2867	.0026	.2687	3B	.2740	.2807	.2893	.2926	.0033	.3125

See footnotes at end of table.

TABLE 2.21. *Standard series limits of size—Unified screw threads—Continued*

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
.3125-32	UNEF	2A	0.0010	0.3115	0.3055	--------	0.2912	0.2880	0.0032	0.2732	2B	0.279	0.286	0.2922	0.2964	0.0042	0.3125
		3A	.0000	.3125	.3065	--------	.2922	.2898	.0024	.2742	3B	.2790	.2847	.2922	.2953	.0031	.3125
.375-16	UNC	1A	.0013	.3737	.3595	--------	.3331	.3266	.0065	.2970	1B	.307	.321	.3344	.3429	.0085	.3750
		2A	.0013	.3737	.3643	0.3595	.3331	.3287	.0044	.2970	2B	.307	.321	.3344	.3401	.0057	.3750
		3A	.0000	.3750	.3656	--------	.3344	.3311	.0033	.2983	3B	.3070	.3182	.3344	.3387	.0043	.3750
.375-20	UN	2A	.0012	.3738	.3657	--------	.3413	.3372	.0041	.3125	2B	.321	.332	.3425	.3479	.0054	.3750
		3A	.0000	.3750	.3669	--------	.3425	.3394	.0031	.3137	3B	.3210	.3297	.3425	.3465	.0040	.3750
.375-24	UNF	1A	.0011	.3739	.3631	--------	.3468	.3411	.0057	.3228	1B	.330	.340	.3479	.3553	.0074	.3750
		2A	.0011	.3739	.3667	--------	.3468	.3430	.0038	.3228	2B	.330	.340	.3479	.3528	.0049	.3750
		3A	.0000	.3750	.3678	--------	.3479	.3450	.0029	.3239	3B	.3300	.3372	.3479	.3516	.0037	.3750
.375-28	UN	2A	.0011	.3739	.3674	--------	.3507	.3471	.0036	.3301	2B	.336	.345	.3518	.3564	.0046	.3750
		3A	.0000	.3750	.3685	--------	.3518	.3491	.0027	.3312	3B	.3360	.3426	.3518	.3553	.0035	.3750
.375-32	UNEF	2A	.0010	.3740	.3680	--------	.3557	.3503	.0034	.3357	2B	.341	.349	.3547	.3591	.0044	.3750
		3A	.0000	.3750	.3690	--------	.3547	.3522	.0025	.3367	3B	.3410	.3469	.3547	.3580	.0033	.3750
.4375-14	UNC	1A	.0014	.4361	.4206	--------	.3897	.3826	.0071	.3485	1B	.360	.376	.3911	.4003	.0092	.4375
		2A	.0014	.4361	.4258	.4206	.3897	.3850	.0047	.3485	2B	.360	.376	.3911	.3972	.0061	.4375
		3A	.0000	.4375	.4272	--------	.3911	.3876	.0035	.3499	3B	.3600	.3717	.3911	.3957	.0046	.4375
.4375-16	UN	2A	.0014	.4361	.4267	--------	.3955	.3909	.0046	.3594	2B	.370	.384	.3969	.4028	.0059	.4375
		3A	.0000	.4375	.4281	--------	.3969	.3935	.0034	.3608	3B	.3700	.3800	.3969	.4014	.0045	.4375
.4375-20	UNF	1A	.0013	.4362	.4240	--------	.4037	.3974	.0063	.3749	1B	.383	.395	.4050	.4131	.0081	.4375
		2A	.0013	.4362	.4281	--------	.4037	.3995	.0042	.3749	2B	.383	.395	.4050	.4104	.0054	.4375
		3A	.0000	.4375	.4294	--------	.4050	.4019	.0031	.3762	3B	.3830	.3916	.4050	.4091	.0041	.4375
.4375-28	UNEF	2A	.0011	.4364	.4299	--------	.4132	.4096	.0036	.3926	2B	.399	.407	.4143	.4189	.0046	.4375
		3A	.0000	.4375	.4310	--------	.4143	.4116	.0027	.3937	3B	.3990	.4051	.4143	.4178	.0035	.4375
.4375-32	UN	2A	.0010	.4365	.4305	--------	.4162	.4128	.0034	.3982	2B	.404	.411	.4172	.4216	.0044	.4375
		3A	.0000	.4375	.4315	--------	.4172	.4147	.0025	.3992	3B	.4040	.4094	.4172	.4205	.0033	.4375
.500-13	UNC	1A	.0015	.4985	.4822	--------	.4485	.4411	.0074	.4041	1B	.417	.434	.4500	.4597	.0097	.5000
		2A	.0015	.4985	.4876	.4822	.4485	.4435	.0050	.4041	2B	.417	.434	.4500	.4565	.0065	.5000
		3A	.0000	.5000	.4891	--------	.4500	.4463	.0037	.4056	3B	.4170	.4284	.4500	.4548	.0048	.5000
.500-16	UN	2A	.0014	.4986	.4892	--------	.4580	.4533	.0047	.4219	2B	.432	.446	.4594	.4655	.0061	.5000
		3A	.0000	.5000	.4906	--------	.4594	.4559	.0035	.4233	3B	.4320	.4419	.4594	.4640	.0046	.5000
.500-20	UNF	1A	.0013	.4987	.4865	--------	.4662	.4598	.0064	.4374	1B	.446	.457	.4675	.4759	.0084	.5000
		2A	.0013	.4987	.4906	--------	.4662	.4619	.0043	.4374	2B	.446	.457	.4675	.4731	.0056	.5000
		3A	.0000	.5000	.4919	--------	.4675	.4643	.0032	.4387	3B	.4460	.4537	.4675	.4717	.0042	.5000
.500-28	UNEF	2A	.0011	.4989	.4924	--------	.4757	.4720	.0037	.4551	2B	.461	.470	.4768	.4816	.0048	.5000
		3A	.0000	.5000	.4935	--------	.4768	.4740	.0028	.4562	3B	.4610	.4676	.4768	.4804	.0036	.5000
.500-32	UN	2A	.0010	.4990	.4930	--------	.4787	.4752	.0035	.4607	2B	.466	.474	.4797	.4842	.0045	.5000
		3A	.0000	.5000	.4940	--------	.4797	.4771	.0026	.4617	3B	.4660	.4719	.4797	.4831	.0034	.5000
.5625-12	UNC	1A	.0016	.5609	.5437	--------	.5068	.4990	.0078	.4587	1B	.472	.490	.5084	.5186	.0102	.5625
		2A	.0016	.5609	.5495	.5437	.5068	.5016	.0052	.4587	2B	.472	.490	.5084	.5152	.0068	.5625
		3A	.0000	.5625	.5511	--------	.5084	.5045	.0039	.4603	3B	.4720	.4843	.5084	.5135	.0051	.5625
.5625-16	UN	2A	.0014	.5611	.5517	--------	.5205	.5158	.0047	.4844	2B	.495	.509	.5219	.5280	.0061	.5625
		3A	.0000	.5625	.5531	--------	.5219	.5184	.0035	.4858	3B	.4950	.5040	.5219	.5265	.0046	.5625
.5625-18	UNF	1A	.0014	.5611	.5480	--------	.5250	.5182	.0068	.4929	1B	.502	.515	.5264	.5353	.0089	.5625
		2A	.0014	.5611	.5524	--------	.5250	.5205	.0045	.4929	2B	.502	.515	.5264	.5323	.0059	.5625
		3A	.0000	.5625	.5538	--------	.5264	.5230	.0034	.4943	3B	.5020	.5106	.5664	.5308	.0044	.5625
.5625-20	UN	2A	.0013	.5612	.5531	--------	.5287	.5245	.0042	.4999	2B	.508	.520	.5300	.5355	.0055	.5625
		3A	.0000	.5625	.5544	--------	.5300	.5268	.0032	.5012	3B	.5080	.5162	.5300	.5341	.0041	.5625
.5625-24	UNEF	2A	.0012	.5613	.5541	--------	.5342	.5303	.0039	.5102	2B	.517	.527	.5354	.5405	.0051	.5625
		3A	.0000	.5625	.5553	--------	.5354	.5325	.0029	.5114	3B	.5170	.5244	.5354	.5392	.0038	.5625
.5625-28	UN	2A	.0011	.5614	.5549	--------	.5382	.5345	.0037	.5176	2B	.524	.532	.5393	.5441	.0048	.5625
		3A	.0000	.5625	.5560	--------	.5393	.5365	.0028	.5187	3B	.5240	.5301	.5393	.5429	.0036	.5625
.5625-32	UN	2A	.0010	.5615	.5555	--------	.5412	.5377	.0035	.5232	2B	.529	.536	.5422	.5467	.0045	.5625
		3A	.0000	.5625	.5565	--------	.5422	.5396	.0026	.5242	3B	.5290	.5344	.5422	.5456	.0034	.5625
.625-11	UNC	1A	.0016	.6234	.6052	--------	.5644	.5561	.0083	.5119	1B	.527	.546	.5660	.5767	.0107	.6250
		2A	.0016	.6234	.6113	.6052	.5644	.5589	.0055	.5119	2B	.527	.546	.5660	.5732	.0072	.6250
		3A	.0000	.6250	.6129	--------	.5660	.5619	.0041	.5135	3B	.5270	.5391	.5660	.5714	.0054	.6250
.625-12	UN	2A	.0016	.6234	.6120	--------	.5693	.5639	.0054	.5112	2B	.535	.553	.5709	.5780	.0071	.6250
		3A	.0000	.6250	.6136	--------	.5709	.5668	.0041	.5228	3B	.5350	.5463	.5709	.5762	.0053	.6250

See footnotes at end of table.

TABLE 2.21. *Standard series limits of size—Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
.625-16	UN	2A	0.0014	0.6236	0.6142	--------	0.5830	0.5782	0.0048	0.5469	2B	0.557	0.571	0.5844	0.5906	0.0062	0.6250
		3A	.0000	.6250	.6156	--------	.5844	.5808	.0036	.5483	3B	.5570	.5662	.5844	.5890	.0046	.6250
.625-18	UNF	1A	.0014	.6236	.6105	--------	.5875	.5805	.0070	.5554	1B	.565	.578	.5889	.5980	.0091	.6250
		2A	.0014	.6236	.6149	--------	.5875	.5828	.0047	.5554	2B	.565	.578	.5889	.5949	.0060	.6250
		3A	.0000	.6250	.6163	--------	.5889	.5854	.0035	.5568	3B	.5650	.5730	.5889	.5934	.0045	.6250
.625-20	UN	2A	.0013	.6237	.6156	--------	.5912	.5869	.0043	.5624	2B	.571	.582	.5925	.5981	.0056	.6250
		3A	.0000	.6250	.6169	--------	.5925	.5893	.0032	.5637	3B	.5710	.5787	.5925	.5967	.0042	.6250
.625-24	UNEF	2A	.0012	.6238	.6166	--------	.5967	.5927	.0040	.5727	2B	.580	.590	.5979	.6031	.0052	.6250
		3A	.0000	.6250	.6178	--------	.5979	.5949	.0030	.5739	3B	.5800	.5869	.5879	.6018	.0039	.6250
.625-28	UN	2A	.0011	.6239	.6174	--------	.6007	.5969	.0038	.5801	2B	.586	.595	.6018	.6067	.0049	.6250
		3A	.0000	.6250	.6185	--------	.6018	.5990	.0028	.5812	3B	.5860	.5926	.6018	.6055	.0037	.6250
.625-32	UN	2A	.0011	.6239	.6179	--------	.6036	.6000	.0036	.5856	2B	.591	.599	.6047	.6093	.0046	.6250
		3A	.0000	.6250	.6190	--------	.6047	.6020	.0027	.5867	3B	.5910	.5969	.6047	.6082	.0035	.6250
.6875-12	UN	2A	.0016	.6859	.6745	--------	.6318	.6264	.0054	.5837	2B	.597	.615	.6334	.6405	.0071	.6875
		3A	.0000	.6875	.6761	--------	.6334	.6293	.0041	.5853	3B	.5970	.6085	.6334	.6387	.0053	.6875
.6875-16	UN	2A	.0014	.6861	.6767	--------	.6455	.6407	.0048	.6094	2B	.620	.634	.6469	.6531	.0062	.6875
		3A	.0000	.6875	.6781	--------	.6469	.6433	.0036	.6108	3B	.6200	.6284	.6469	.6515	.0046	.6875
.6875-20	UN	2A	.0013	.6862	.6781	--------	.6537	.6494	.0043	.6249	2B	.633	.645	.6550	.6606	.0056	.6875
		3A	.0000	.6875	.6794	--------	.6550	.6518	.0032	.6262	3B	.6330	.6412	.6550	.6592	.0042	.6875
.6875-24	UNEF	2A	.0012	.6863	.6791	--------	.6592	.6552	.0040	.6352	2B	.642	.652	.6604	.6656	.0052	.6875
		3A	.0000	.6875	.6803	--------	.6604	.6574	.0030	.6364	3B	.6420	.6494	.6604	.6643	.0039	.6875
.6875-28	UN	2A	.0011	.6864	.6799	--------	.6632	.6594	.0038	.6426	2B	.649	.657	.6643	.6692	.0049	.6875
		3A	.0000	.6875	.6810	--------	.6643	.6615	.0028	.6437	3B	.6490	.6551	.6643	.6680	.0037	.6875
.6875-32	UN	2A	.0011	.6864	.6804	--------	.6661	.6625	.0036	.6481	2B	.654	.661	.6672	.6718	.0046	.6875
		3A	.0000	.6875	.6815	--------	.6672	.6645	.0027	.6492	3B	.6540	.6594	.6672	.6707	.0035	.6875
.750-10	UNC	1A	.0018	.7482	.7288	--------	.6832	.6744	.0088	.6255	1B	.642	.663	.6850	.6965	.0115	.7500
		2A	.0018	.7482	.7353	0.7288	.6832	.6773	.0059	.6255	2B	.642	.663	.6850	.6927	.0077	.7500
		3A	.0000	.7500	.7371	--------	.6850	.6806	.0044	.6273	3B	.6420	.6545	.6850	.6907	.0057	.7500
.750-12	UN	2A	.0017	.7483	.7369	--------	.6942	.6887	.0055	.6461	2B	.660	.678	.6959	.7031	.0072	.7500
		3A	.0000	.7500	.7386	--------	.6959	.6918	.0041	.6478	3B	.6600	.6707	.6959	.7013	.0054	.7500
.750-16	UNF	1A	.0015	.7485	.7343	--------	.7079	.7004	.0075	.6718	1B	.682	.696	.7094	.7192	.0098	.7500
		2A	.0015	.7485	.7391	--------	.7079	.7029	.0050	.6718	2B	.682	.696	.7094	.7159	.0065	.7500
		3A	.0000	.7500	.7406	--------	.7094	.7056	.0038	.6733	3B	.6820	.6908	.7094	.7143	.0049	.7500
.750-20	UNEF	2A	.0013	.7487	.7406	--------	.7162	.7118	.0044	.6874	2B	.696	.707	.7175	.7232	.0057	.7500
		3A	.0000	.7500	.7419	--------	.7175	.7142	.0033	.6887	3B	.6960	.7037	.7175	.7218	.0043	.7500
.750-28	UN	2A	.0012	.7488	.7423	--------	.7256	.7218	.0038	.7050	2B	.711	.720	.7268	.7318	.0050	.7500
		3A	.0000	.7500	.7435	--------	.7268	.7239	.0029	.7062	3B	.7110	.7176	.7268	.7305	.0037	.7500
.750-32	UN	2A	.0011	.7489	.7429	--------	.7286	.7250	.0036	.7106	2B	.716	.724	.7297	.7344	.0047	.7500
		3A	.0000	.7500	.7440	--------	.7297	.7270	.0027	.7117	3B	.7160	.7219	.7297	.7333	.0036	.7500
.8125-12	UN	2A	.0017	.8108	.7994	--------	.7567	.7512	.0055	.7086	2B	.722	.740	.7584	.7656	.0072	.8125
		3A	.0000	.8125	.8011	--------	.7584	.7543	.0041	.7103	3B	.7220	.7329	.7584	.7638	.0054	.8125
.8125-16	UN	2A	.0015	.8110	.8016	--------	.7704	.7655	.0049	.7343	2B	.745	.759	.7719	.7782	.0063	.8125
		3A	.0000	.8125	.8031	--------	.7719	.7683	.0036	.7358	3B	.7450	.7533	.7719	.7766	.0047	.8125
.8125-20	UNEF	2A	.0013	.8112	.8031	--------	.7787	.7743	.0044	.7499	2B	.758	.770	.7800	.7857	.0057	.8125
		3A	.0000	.8125	.8044	--------	.7800	.7767	.0033	.7512	3B	.7580	.7662	.7800	.7843	.0043	.8125
.8125-28	UN	2A	.0012	.8113	.8048	--------	.7881	.7843	.0038	.7675	2B	.774	.782	.7893	.7943	.0050	.8125
		3A	.0000	.8125	.8060	--------	.7893	.7864	.0029	.7687	3B	.7740	.7801	.7893	.7930	.0037	.8125
.8125-32	UN	2A	.0011	.8114	.8054	--------	.7911	.7875	.0036	.7731	2B	.779	.786	.7922	.7969	.0047	.8125
		3A	.0000	.8125	.8065	--------	.7922	.7895	.0027	.7742	3B	.7790	.7844	.7922	.7958	.0036	.8125
.875-9	UNC	1A	.0019	.8731	.8523	--------	.8009	.7914	.0095	.7368	1B	.755	.778	.8028	.8151	.0123	.8750
		2A	.0019	.8731	.8592	.8523	.8009	.7946	.0063	.7368	2B	.755	.778	.8028	.8110	.0082	.8750
		3A	.0000	.8750	.8611	--------	.8028	.7981	.0047	.7387	3B	.7550	.7681	.8028	.8089	.0061	.8750
.875-12	UN	2A	.0017	.8733	.8619	--------	.8192	.8137	.0055	.7711	2B	.785	.803	.8209	.8281	.0072	.8750
		3A	.0000	.8750	.8636	--------	.8209	.8168	.0041	.7728	3B	.7850	.7952	.8209	.8263	.0054	.8750
.875-14	UNF	1A	.0016	.8734	.8579	--------	.8270	.8189	.0081	.7858	1B	.798	.814	.8286	.8392	.0106	.8750
		2A	.0016	.8734	.8631	--------	.8270	.8216	.0054	.7858	2B	.798	.814	.8286	.8356	.0070	.8750
		3A	.0000	.8750	.8647	--------	.8286	.8245	.0041	.7874	3B	.7980	.8068	.8286	.8339	.0053	.8750

See footnotes at end of table.

TABLE 2.21. *Standard series limits of size—Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
.875-16	UN	2A	0.0015	0.8735	0.8641	--------	0.8329	0.8280	0.0049	0.7968	2B	0.807	0.821	0.8344	0.8407	0.0063	0.8750
		3A	.0000	.8750	.8656	--------	.8344	.8308	.0036	.7983	3B	.8070	.8158	.8344	.8391	.0047	.8750
.875-20	UNEF	2A	.0013	.8737	.8656	--------	.8412	.8368	.0044	.8124	2B	.821	.832	.8425	.8482	.0057	.8750
		3A	.0000	.8750	.8669	--------	.8425	.8392	.0033	.8137	3B	.8210	.8287	.8425	.8466	.0043	.8750
.875-28	UN	2A	.0012	.8738	.8673	--------	.8506	.8468	.0038	.8300	2B	.836	.845	.8518	.8568	.0050	.8750
		3A	.0000	.8750	.8685	--------	.8518	.8489	.0029	.8312	3B	.8360	.8426	.8518	.8555	.0037	.8750
.875-32	UN	2A	.0011	.8739	.8679	--------	.8536	.8500	.0036	.8356	2B	.841	.849	.8547	.8594	.0047	.8750
		3A	.0000	.8750	.8690	--------	.8547	.8520	.0027	.8367	3B	.8410	.8469	.8547	.8583	.0036	.8750
.9375-12	UN	2A	.0017	.9358	.9244	--------	.8817	.8760	.0057	.8336	2B	.847	.865	.8834	.8908	.0074	.9375
		3A	.0000	.9375	.9261	--------	.8834	.8792	.0042	.8353	3B	.8470	.8575	.8834	.8889	.0055	.9375
.9375-16	UN	2A	.0015	.9360	.9266	--------	.8954	.8904	.0050	.8593	2B	.870	.884	.8969	.9034	.0065	.9375
		3A	.0000	.9375	.9281	--------	.8969	.8932	.0037	.8608	3B	.8700	.8783	.8969	.9018	.0049	.9375
.9375-20	UNEF	2A	.0014	.9361	.9280	--------	.9036	.8991	.0045	.8748	2B	.883	.895	.9050	.9109	.0059	.9375
		3A	.0000	.9375	.9294	--------	.9050	.9016	.0034	.8762	3B	.8830	.8912	.9050	.9094	.0044	.9375
.9375-28	UN	2A	.0012	.9363	.9298	--------	.9131	.9091	.0040	.8925	2B	.899	.907	.9143	.9195	.0052	.9375
		3A	.0000	.9375	.9310	--------	.9143	.9113	.0030	.8937	3B	.8990	.9051	.9143	.9182	.0039	.9375
.9375-32	UN	2A	.0011	.9364	.9304	--------	.9161	.9123	.0038	.8981	2B	.904	.911	.9172	.9221	.0049	.9375
		3A	.0000	.9375	.9315	--------	.9172	.9144	.0028	.8992	3B	.9040	.9094	.9172	.9209	.0037	.9375
1.000-8	UNC	1A	.0020	.9980	.9755	--------	.9168	.9067	.0101	.8446	1B	.865	.890	.9188	.9320	.0132	1.0000
		2A	.0020	.9980	.9830	0.9755	.9168	.9100	.0068	.8446	2B	.865	.890	.9188	.9276	.0088	1.0000
		3A	.0000	1.0000	.9850	--------	.9188	.9137	.0051	.8466	3B	.8650	.8797	.9188	.9254	.0066	1.0000
1.000-12	UNF	1A	.0018	.9982	.9810	--------	.9441	.9353	.0088	.8960	1B	.910	.928	.9459	.9573	.0114	1.0000
		2A	.0018	.9982	.9868	--------	.9441	.9382	.0059	.8960	2B	.910	.928	.9459	.9535	.0076	1.0000
		3A	.0000	1.0000	.9886	--------	.9459	.9415	.0044	.8978	3B	.9100	.9198	.9459	.9516	.0057	1.0000
1.000-16	UN	2A	.0015	.9985	.9891	--------	.9579	.9529	.0050	.9218	2B	.932	.946	.9594	.9659	.0065	1.0000
		3A	.0000	1.0000	.9906	--------	.9594	.9557	.0037	.9233	3B	.9320	.9408	.9594	.9643	.0049	1.0000
1.000-20	UNEF	2A	.0014	.9986	.9905	--------	.9661	.9616	.0045	.9373	2B	.946	.957	.9675	.9734	.0059	1.0000
		3A	.0000	1.0000	.9919	--------	.9675	.9641	.0034	.9387	3B	.9460	.9537	.9675	.9719	.0044	1.0000
1.000-28	UN	2A	.0012	.9988	.9923	--------	.9756	.9716	.0040	.9550	2B	.961	.970	.9768	.9820	.0052	1.0000
		3A	.0000	1.0000	.9935	--------	.9768	.9738	.0030	.9562	3B	.9610	.9676	.9768	.9807	.0039	1.0000
1.000-32	UN	2A	.0011	.9989	.9929	--------	.9786	.9748	.0038	.9606	2B	.966	.974	.9797	.9846	.0049	1.0000
		3A	.0000	1.0000	.9940	--------	.9797	.9769	.0028	.9617	3B	.9660	.9719	.9797	.9834	.0037	1.0000
1.0625-8	UN	2A	.0020	1.0605	1.0455	--------	.9793	.9725	.0068	.9071	2B	.927	.952	.9813	.9902	.0089	1.0625
		3A	.0000	1.0625	1.0475	--------	.9813	.9762	.0051	.9091	3B	.9270	.9422	.9813	.9880	.0067	1.0625
1.0625-12	UN	2A	.0017	1.0608	1.0494	--------	1.0067	1.0010	.0057	.9586	2B	.972	.990	1.0084	1.0158	.0074	1.0625
		3A	.0000	1.0625	1.0511	--------	1.0084	1.0042	.0042	.9603	3B	.9720	.9823	1.0084	1.0139	.0055	1.0625
1.0625-16	UN	2A	.0015	1.0610	1.0516	--------	1.0204	1.0154	.0050	.9843	2B	.995	1.009	1.0219	1.0284	.0065	1.0625
		3A	.0000	1.0625	1.0531	--------	1.0219	1.0182	.0037	.9858	3B	.9950	1.0033	1.0219	1.0268	.0049	1.0625
1.0625-18	UNEF	2A	.0014	1.0611	1.0524	--------	1.0250	1.0203	.0047	.9929	2B	1.002	1.015	1.0264	1.0326	.0062	1.0625
		3A	.0000	1.0625	1.0538	--------	1.0264	1.0228	.0036	.9943	3B	1.0020	1.0105	1.0264	1.0310	.0046	1.0625
1.0625-20	UN	2A	.0014	1.0611	1.0530	--------	1.0286	1.0241	.0045	.9998	2B	1.008	1.020	1.0300	1.0359	.0059	1.0625
		3A	.0000	1.0625	1.0544	--------	1.0300	1.0266	.0034	1.0012	3B	1.0080	1.0162	1.0300	1.0344	.0044	1.0625
1.0625-28	UN	2A	.0012	1.0613	1.0548	--------	1.0381	1.0341	.0040	1.0175	2B	1.024	1.032	1.0393	1.0445	.0052	1.0625
		3A	.0000	1.0625	1.0560	--------	1.0393	1.0363	.0030	1.0187	3B	1.0240	1.0301	1.0393	1.0432	.0039	1.0625
1.125-7	UNC	1A	.0022	1.1228	1.0982	--------	1.0300	1.0191	.0109	.9475	1B	0.970	0.998	1.0322	1.0463	.0141	1.1250
		2A	.0022	1.1228	1.1064	1.0982	1.0300	1.0228	.0072	.9475	2B	.970	.998	1.0322	1.0416	.0094	1.1250
		3A	.0000	1.1250	1.1086	--------	1.0322	1.0268	.0054	.9497	3B	.9700	.9875	1.0322	1.0393	.0071	1.1250
1.125-8	UN	2A	.0021	1.1229	1.1079	1.1004	1.0417	1.0348	.0069	.9695	2B	.990	1.015	1.0438	1.0528	.0090	1.1250
		3A	.0000	1.1250	1.1100	--------	1.0438	1.0386	.0052	.9716	3B	.9900	1.0047	1.0438	1.0505	.0067	1.1250
1.125-12	UNF	1A	.0018	1.1232	1.1060	--------	1.0691	1.0601	.0090	1.0210	1B	1.035	1.053	1.0709	1.0826	.0117	1.1250
		2A	.0018	1.1232	1.1118	--------	1.0691	1.0631	.0060	1.0210	2B	1.035	1.053	1.0709	1.0787	.0078	1.1250
		3A	.0000	1.1250	1.1136	--------	1.0709	1.0664	.0045	1.0228	3B	1.0350	1.0448	1.0709	1.0768	.0059	1.1250
1.125-16	UN	2A	.0015	1.1235	1.1141	--------	1.0829	1.0779	.0050	1.0468	2B	1.057	1.071	1.0844	1.0909	.0065	1.1250
		3A	.0000	1.1250	1.1156	--------	1.0844	1.0807	.0037	1.0483	3B	1.0570	1.0658	1.0844	1.0893	.0049	1.1250
1.125-18	UNEF	2A	.0014	1.1236	1.1149	--------	1.0875	1.0828	.0047	1.0554	2B	1.065	1.078	1.0889	1.0951	.0062	1.1250
		3A	.0000	1.1250	1.1163	--------	1.0889	1.0853	.0036	1.0568	3B	1.0650	1.0730	1.0889	1.0935	.0046	1.1250
1.125-20	UN	2A	.0014	1.1236	1.1155	--------	1.0911	1.0866	.0045	1.0623	2B	1.071	1.082	1.0925	1.0984	.0059	1.1250
		3A	.0000	1.1250	1.1169	--------	1.0925	1.0891	.0034	1.0637	3B	1.0710	1.0787	1.0925	1.0969	.0044	1.1250

see footnotes at end of table.

TABLE 2.21. *Standard series limits of size—Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
1.125–28	UN	2A	0.0012	1.1238	1.1173	--------	1.1006	1.0966	0.0040	1.0800	2B	1.086	1.095	1.1018	1.1070	0.0052	1.1250
		3A	.0000	1.1250	1.1185	--------	1.1018	1.0988	.0030	1.0812	3B	1.0860	1.0926	1.1018	1.1057	.0039	1.1250
1.1875–8	UN	2A	.0021	1.1854	1.1704	--------	1.1042	1.0972	.0070	1.0320	2B	1.052	1.077	1.1063	1.1154	.0091	1.1875
		3A	.0000	1.1875	1.1725	--------	1.1063	1.1011	.0052	1.0341	3B	1.0520	1.0672	1.1063	1.1131	.0068	1.1875
1.1875–12	UN	2A	.0017	1.1858	1.1744	--------	1.1317	1.1259	.0058	1.0836	2B	1.097	1.115	1.1334	1.1409	.0075	1.1875
		3A	.0000	1.1875	1.1761	--------	1.1334	1.1291	.0043	1.0853	3B	1.0970	1.1073	1.1334	1.1390	.0056	1.1875
1.1875–16	UN	2A	.0015	1.1860	1.1766	--------	1.1454	1.1403	.0051	1.1093	2B	1.120	1.134	1.1469	1.1535	.0066	1.1875
		3A	.0000	1.1875	1.1781	--------	1.1469	1.1431	.0038	1.1108	3B	1.1200	1.1283	1.1469	1.1519	.0050	1.1875
1.1875–18	UNEF	2A	.0015	1.1860	1.1773	--------	1.1499	1.1450	.0049	1.1178	2B	1.127	1.140	1.1514	1.1577	.0063	1.1875
		3A	.0000	1.1875	1.1788	--------	1.1514	1.1478	.0036	1.1193	3B	1.1270	1.1355	1.1514	1.1561	.0047	1.1875
1.1875–20	UN	2A	.0014	1.1861	1.1780	--------	1.1536	1.1489	.0047	1.1248	2B	1.133	1.145	1.1550	1.1611	.0061	1.1875
		3A	.0000	1.1875	1.1794	--------	1.1550	1.1515	.0035	1.1262	3B	1.1330	1.1412	1.1550	1.1595	.0045	1.1875
1.1875–28	UN	2A	.0012	1.1863	1.1798	--------	1.1631	1.1590	.0041	1.1425	2B	1.149	1.157	1.1643	1.1696	.0053	1.1875
		3A	.0000	1.1875	1.1810	--------	1.1643	1.1612	.0031	1.1437	3B	1.1490	1.1551	1.1643	1.1683	.0040	1.1875
1.250–7	UNC	1A	.0022	1.2478	1.2232	--------	1.1550	1.1439	.0111	1.0725	1B	1.095	1.123	1.1572	1.1716	.0144	1.2500
		2A	.0022	1.2478	1.2314	1.2232	1.1550	1.1476	.0074	1.0725	2B	1.095	1.123	1.1572	1.1668	.0096	1.2500
		3A	.0000	1.2500	1.2336	--------	1.1572	1.1517	.0055	1.0747	3B	1.0950	1.1125	1.1572	1.1644	.0072	1.2500
1.250–8	UN	2A	.0021	1.2479	1.2329	1.2254	1.1667	1.1597	.0070	1.0945	2B	1.115	1.140	1.1688	1.1780	.0092	1.2500
		3A	.0000	1.2500	1.2350	--------	1.1688	1.1635	.0053	1.0966	3B	1.1150	1.1297	1.1688	1.1757	.0069	1.2500
1.250–12	UNF	1A	.0018	1.2482	1.2310	--------	1.1941	1.1849	.0092	1.1460	1B	1.160	1.178	1.1959	1.2079	.0120	1.2500
		2A	.0018	1.2482	1.2368	--------	1.1941	1.1879	.0062	1.1460	2B	1.160	1.178	1.1959	1.2039	.0080	1.2500
		3A	.0000	1.2500	1.2386	--------	1.1959	1.1913	.0046	1.1478	3B	1.1600	1.1698	1.1959	1.2019	.0060	1.2500
1.250–16	UN	2A	.0015	1.2485	1.2391	--------	1.2079	1.2028	.0051	1.1718	2B	1.182	1.196	1.2094	1.2160	.0066	1.2500
		3A	.0000	1.2500	1.2406	--------	1.2094	1.2056	.0038	1.1733	3B	1.1820	1.1908	1.2094	1.2144	.0050	1.2500
1.250–18	UNEF	2A	.0015	1.2485	1.2398	--------	1.2124	1.2075	.0049	1.1803	2B	1.190	1.203	1.2139	1.2202	.0063	1.2500
		3A	.0000	1.2500	1.2413	--------	1.2139	1.2103	.0036	1.1818	3B	1.1990	1.1980	1.2139	1.2186	.0047	1.2500
1.250–20	UN	2A	.0014	1.2486	1.2405	--------	1.2161	1.2114	.0047	1.1873	2B	1.196	1.207	1.2175	1.2236	.0061	1.2500
		3A	.0000	1.2500	1.2419	--------	1.2175	1.2140	.0035	1.1887	3B	1.1960	1.2037	1.2175	1.2220	.0045	1.2500
1.250–28	UN	2A	.0012	1.2488	1.2423	--------	1.2256	1.2215	.0041	1.2050	2B	1.211	1.220	1.2268	1.2321	.0053	1.2500
		3A	.0000	1.2500	1.2435	--------	1.2268	1.2237	.0031	1.2062	3B	1.2110	1.2176	1.2268	1.2308	.0040	1.2500
1.3125–8	UN	2A	.0021	1.3104	1.2954	--------	1.2292	1.2221	.0071	1.1570	2B	1.177	1.202	1.2313	1.2405	.0092	1.3125
		3A	.0000	1.3125	1.2975	--------	1.2313	1.2260	.0053	1.1591	3B	1.1770	1.1922	1.2313	1.2382	.0069	1.3125
1.3125–12	UN	2A	.0017	1.3108	1.2994	--------	1.2567	1.2509	.0058	1.2086	2B	1.222	1.240	1.2584	1.2659	.0075	1.3125
		3A	.0000	1.3125	1.3011	--------	1.2584	1.2541	.0043	1.2103	3B	1.2220	1.2323	1.2584	1.2640	.0056	1.3125
1.3125–16	UN	2A	.0015	1.3110	1.3016	--------	1.2704	1.2653	.0051	1.2343	2B	1.245	1.259	1.2719	1.2785	.0066	1.3125
		3A	.0000	1.3125	1.3031	--------	1.2719	1.2681	.0038	1.2358	3B	1.2450	1.2533	1.2719	1.2769	.0050	1.3125
1.3125–18	UNEF	2A	.0015	1.3110	1.3023	--------	1.2749	1.2700	.0049	1.2428	2B	1.252	1.265	1.2764	1.2827	.0063	1.3125
		3A	.0000	1.3125	1.3038	--------	1.2764	1.2728	.0036	1.2443	3B	1.2520	1.2605	1.2764	1.2811	.0047	1.3125
1.3125–20	UN	2A	.0014	1.3111	1.3030	--------	1.2786	1.2739	.0047	1.2498	2B	1.258	1.270	1.2800	1.2861	.0061	1.3125
		3A	.0000	1.3125	1.3044	--------	1.2800	1.2765	.0035	1.2512	3B	1.2580	1.2662	1.2800	1.2845	.0045	1.3125
1.3125–28	UN	2A	.0012	1.3113	1.3048	--------	1.2881	1.2840	.0041	1.2675	2B	1.274	1.282	1.2893	1.2946	.0053	1.3125
		3A	.0000	1.3125	1.3060	--------	1.2893	1.2862	.0031	1.2687	3B	1.2740	1.2801	1.2893	1.2933	.0040	1.3125
1.375–6	UNC	1A	.0024	1.3726	1.3453	--------	1.2643	1.2523	.0120	1.1681	1B	1.195	1.225	1.2667	1.2822	.0155	1.3750
		2A	.0024	1.3726	1.3544	1.3453	1.2643	1.2563	.0080	1.1681	2B	1.195	1.225	1.2667	1.2771	.0104	1.3750
		3A	.0000	1.3750	1.3568	--------	1.2667	1.2607	.0060	1.1705	3B	1.1950	1.2146	1.2667	1.2745	.0078	1.3750
1.375–8	UN	2A	.0022	1.3728	1.3578	1.3503	1.2916	1.2844	.0072	1.2194	2B	1.240	1.265	1.2938	1.3031	.0093	1.3750
		3A	.0000	1.3750	1.3600	--------	1.2938	1.2884	.0054	1.2216	3B	1.2400	1.2547	1.2938	1.3008	.0070	1.3750
1.375–12	UNF	1A	.0019	1.3731	1.3559	--------	1.3190	1.3096	.0094	1.2709	1B	1.285	1.303	1.3209	1.3332	.0123	1.3750
		2A	.0019	1.3731	1.3617	--------	1.3190	1.3127	.0063	1.2709	2B	1.285	1.303	1.3209	1.3291	.0082	1.3750
		3A	.0000	1.3750	1.3636	--------	1.3209	1.3162	.0047	1.2728	3B	1.2850	1.2948	1.3209	1.3270	.0061	1.3750
1.375–16	UN	2A	.0015	1.3735	1.3641	--------	1.3329	1.3278	.0051	1.2968	2B	1.307	1.321	1.3344	1.3410	.0066	1.3750
		3A	.0000	1.3750	1.3656	--------	1.3344	1.3306	.0038	1.2983	3B	1.3070	1.3158	1.3344	1.3394	.0050	1.3750
1.375–18	UNEF	2A	.0015	1.3735	1.3648	--------	1.3374	1.3325	.0049	1.3053	2B	1.315	1.328	1.3389	1.3452	.0063	1.3750
		3A	.0000	1.3750	1.3663	--------	1.3389	1.3353	.0036	1.3068	3B	1.3150	1.3230	1.3389	1.3436	.0047	1.3750
1.375–20	UN	2A	.0014	1.3736	1.3655	--------	1.3411	1.3364	.0047	1.3123	2B	1.321	1.332	1.3425	1.3486	.0061	1.3750
		3A	.0000	1.3750	1.3669	--------	1.3425	1.3390	.0035	1.3137	3B	1.3210	1.3287	1.3425	1.3470	.0045	1.3750

See footnotes at end of table.

TABLE 2.21. *Standard series limits of size—Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
1.375-28	UN	2A	0.0012	1.3738	1.3673	--------	1.3506	1.3465	0.0041	1.3300	2B	1.336	1.345	1.3518	1.3571	0.0053	1.3750
		3A	.0000	1.3750	1.3685	--------	1.3518	1.3487	.0031	1.3312	3B	1.3360	1.3426	1.3518	1.3558	.0040	1.3750
1.4375-6	UN	2A	.0024	1.4351	1.4169	--------	1.3268	1.3188	.0080	1.2306	2B	1.257	1.288	1.3292	1.3396	.0104	1.4375
		3A	.0000	1.4375	1.4193	--------	1.3292	1.3232	.0060	1.2330	3B	1.2570	1.2771	1.3292	1.3370	.0078	1.4375
1.4375-8	UN	2A	.0022	1.4353	1.4203	--------	1.3541	1.3469	.0072	1.2819	2B	1.302	1.327	1.3563	1.3657	.0094	1.4375
		3A	.0000	1.4375	1.4225	--------	1.3563	1.3509	.0054	1.2841	3B	1.3020	1.3172	1.3563	1.3634	.0071	1.4375
1.4375-12	UN	2A	.0018	1.4357	1.4243	--------	1.3816	1.3757	.0059	1.3335	2B	1.347	1.365	1.3834	1.3910	.0076	1.4375
		3A	.0000	1.4375	1.4261	--------	1.3834	1.3790	.0044	1.3353	3B	1.3470	1.3573	1.3834	1.3891	.0057	1.4375
1.4375-16	UN	2A	.0016	1.4359	1.4265	--------	1.3953	1.3901	.0052	1.3592	2B	1.370	1.384	1.3969	1.4037	.0068	1.4375
		3A	.0000	1.4375	1.4281	--------	1.3969	1.3930	.0039	1.3608	3B	1.3700	1.3783	1.3969	1.4020	.0051	1.4375
1.4375-18	UNEF	2A	.0015	1.4360	1.4273	--------	1.3999	1.3949	.0050	1.3678	2B	1.377	1.390	1.4014	1.4079	.0065	1.4375
		3A	.0000	1.4375	1.4288	--------	1.4014	1.3977	.0037	1.3693	3B	1.3770	1.3855	1.4014	1.4062	.0048	1.4375
1.4375-20	UN	2A	.0014	1.4361	1.4280	--------	1.4036	1.3988	.0048	1.3748	2B	1.383	1.395	1.4050	1.4112	.0062	1.4375
		3A	.0000	1.4375	1.4294	--------	1.4050	1.4014	.0036	1.3762	3B	1.3830	1.3912	1.4050	1.4096	.0046	1.4375
1.4375-28	UN	2A	.0013	1.4362	1.4297	--------	1.4130	1.4088	.0042	1.3924	2B	1.399	1.407	1.4143	1.4198	.0055	1.4375
		3A	.0000	1.4375	1.4310	--------	1.4143	1.4112	.0031	1.3937	3B	1.3990	1.4051	1.4143	1.4184	.0041	1.4375
1.500-6	UNC	1A	.0024	1.4976	1.4703	--------	1.3893	1.3772	.0121	1.2931	1B	1.320	1.350	1.3917	1.4075	.0158	1.5000
		2A	.0024	1.4976	1.4794	1.4703	1.3893	1.3812	.0081	1.2931	2B	1.320	1.350	1.3917	1.4022	.0105	1.5000
		3A	.0000	1.5000	1.4818	--------	1.3917	1.3856	.0061	1.2955	3B	1.3200	1.3396	1.3917	1.3996	.0079	1.5000
1.500-8	UN	2A	.0022	1.4978	1.4828	1.4753	1.4166	1.4093	.0073	1.3444	2B	1.365	1.390	1.4188	1.4283	.0095	1.5000
		3A	.0000	1.5000	1.4850	--------	1.4188	1.4133	.0055	1.3466	3B	1.3650	1.3797	1.4188	1.4259	.0071	1.5000
1.500-12	UNF	1A	.0019	1.4981	1.4809	--------	1.4440	1.4344	.0096	1.3959	1B	1.410	1.428	1.4459	1.4584	.0125	1.5000
		2A	.0019	1.4981	1.4867	--------	1.4440	1.4376	.0064	1.3959	2B	1.410	1.428	1.4459	1.4542	.0083	1.5000
		3A	.0000	1.5000	1.4886	--------	1.4459	1.4411	.0048	1.3978	3B	1.4100	1.4198	1.4459	1.4522	.0063	1.5000
1.500-16	UN	2A	.0016	1.4984	1.4890	--------	1.4578	1.4526	.0052	1.4217	2B	1.432	1.446	1.4594	1.4662	.0068	1.5000
		3A	.0000	1.5000	1.4906	--------	1.4594	1.4555	.0039	1.4233	3B	1.4320	1.4408	1.4594	1.4645	.0051	1.5000
1.500-18	UNEF	2A	.0015	1.4985	1.4898	--------	1.4624	1.4574	.0050	1.4303	2B	1.440	1.452	1.4639	1.4704	.0065	1.5000
		3A	.0000	1.5000	1.4913	--------	1.4639	1.4602	.0037	1.4318	3B	1.4400	1.4480	1.4639	1.4687	.0048	1.5000
1.500-20	UN	2A	.0014	1.4986	1.4905	--------	1.4661	1.4613	.0048	1.4373	2B	1.446	1.457	1.4675	1.4737	.0062	1.5000
		3A	.0000	1.5000	1.4919	--------	1.4675	1.4639	.0036	1.4387	3B	1.4460	1.4537	1.4675	1.4721	.0046	1.5000
1.500-28	UN	2A	.0013	1.4987	1.4922	--------	1.4755	1.4713	.0042	1.4549	2B	1.461	1.470	1.4768	1.4823	.0055	1.5000
		3A	.0000	1.5000	1.4935	--------	1.4768	1.4737	.0031	1.4562	3B	1.4610	1.4676	1.4768	1.4809	.0041	1.5000
1.5625-6	UN	2A	.0024	1.5601	1.5419	--------	1.4518	1.4436	.0082	1.3556	2B	1.382	1.413	1.4542	1.4648	.0106	1.5625
		3A	.0000	1.5625	1.5443	--------	1.4542	1.4481	.0061	1.3580	3B	1.3820	1.4021	1.4542	1.4622	.0080	1.5625
1.5625-8	UN	2A	.0022	1.5603	1.5453	--------	1.4791	1.4717	.0074	1.4069	2B	1.427	1.452	1.4813	1.4909	.0096	1.5625
		3A	.0000	1.5625	1.5475	--------	1.4813	1.4758	.0055	1.4091	3B	1.4270	1.4422	1.4813	1.4885	.0072	1.5625
1.5625-12	UN	2A	.0018	1.5607	1.5493	--------	1.5066	1.5007	.0059	1.4585	2B	1.472	1.490	1.5084	1.5160	.0076	1.5625
		3A	.0000	1.5625	1.5511	--------	1.5084	1.5040	.0044	1.4603	3B	1.4720	1.4823	1.5084	1.5141	.0057	1.5625
1.5625-16	UN	2A	.0016	1.5609	1.5515	--------	1.5203	1.5151	.0052	1.4842	2B	1.495	1.509	1.5219	1.5287	.0068	1.5625
		3A	.0000	1.5625	1.5531	--------	1.5219	1.5180	.0039	1.4858	3B	1.4950	1.5033	1.5219	1.5270	.0051	1.5625
1.5625-18	UNEF	2A	.0015	1.5610	1.5523	--------	1.5249	1.5199	.0050	1.4928	2B	1.502	1.515	1.5264	1.5329	.0065	1.5625
		3A	.0000	1.5625	1.5538	--------	1.5264	1.5227	.0037	1.4943	3B	1.5020	1.5105	1.5264	1.5312	.0048	1.5625
1.5625-20	UN	2A	.0014	1.5611	1.5530	--------	1.5286	1.5238	.0048	1.4998	2B	1.508	1.520	1.5300	1.5362	.0062	1.5625
		3A	.0000	1.5625	1.5544	--------	1.5300	1.5264	.0036	1.5012	3B	1.5080	1.5162	1.5300	1.5346	.0046	1.5625
1.625-6	UN	2A	.0025	1.6225	1.6043	--------	1.5142	1.5060	.0082	1.4180	2B	1.445	1.475	1.5167	1.5274	.0107	1.6250
		3A	.0000	1.6250	1.6068	--------	1.5167	1.5105	.0062	1.4205	3B	1.4450	1.4646	1.5167	1.5247	.0080	1.6250
1.625-8	UN	2A	.0022	1.6228	1.6078	1.6003	1.5416	1.5342	.0074	1.4694	2B	1.490	1.515	1.5438	1.5535	.0097	1.6250
		3A	.0000	1.6250	1.6100	--------	1.5438	1.5382	.0056	1.4716	3B	1.4900	1.5047	1.5438	1.5510	.0072	1.6250
1.625-12	UN	2A	.0018	1.6232	1.6118	--------	1.5691	1.5632	.0059	1.5210	2B	1.535	1.553	1.5709	1.5785	.0076	1.6250
		3A	.0000	1.6250	1.6136	--------	1.5709	1.5665	.0044	1.5228	3B	1.5350	1.5448	1.5709	1.5766	.0057	1.6250
1.625-16	UN	2A	.0016	1.6234	1.6140	--------	1.5828	1.5776	.0052	1.5467	2B	1.557	1.571	1.5844	1.5912	.0068	1.6250
		3A	.0000	1.6250	1.6156	--------	1.5844	1.5805	.0039	1.5483	3B	1.5570	1.5658	1.5844	1.5895	.0051	1.6250
1.625-18	UNEF	2A	.0015	1.6235	1.6148	--------	1.5874	1.5824	.0050	1.5553	2B	1.565	1.578	1.5889	1.5954	.0065	1.6250
		3A	.0000	1.6250	1.6163	--------	1.5889	1.5852	.0037	1.5568	3B	1.5650	1.5730	1.5889	1.5937	.0048	1.6250
1.625-20	UN	2A	.0014	1.6236	1.6155	--------	1.5911	1.5863	.0048	1.5623	2B	1.571	1.582	1.5925	1.5987	.0062	1.6250
		3A	.0000	1.6250	1.6169	--------	1.5925	1.5889	.0036	1.5637	3B	1.5710	1.5787	1.5925	1.5971	.0046	1.6250

See footnotes at end of table.

TABLE 2.21. *Standard series limits of size—Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
1.6875-6	UN	2A	.0025	1.6850	1.6668	--------	1.5767	1.5684	0.0083	1.4805	2B	1.507	1.538	1.5792	1.5900	0.0108	1.6875
		3A	.0000	1.6875	1.6693	--------	1.5792	1.5730	.0062	1.4830	3B	1.5070	1.5271	1.5792	1.5873	.0081	1.6875
1.6875-8	UN	2A	.0022	1.6853	1.6703	--------	1.6041	1.5966	.0075	1.5319	2B	1.552	1.577	1.6063	1.6160	.0097	1.6875
		3A	.0000	1.6875	1.6725	--------	1.6063	1.6007	.0056	1.5341	3B	1.5520	1.5672	1.6063	1.6136	.0073	1.6875
1.6875-12	UN	2A	.0018	1.6857	1.6743	--------	1.6316	1.6256	.0060	1.5835	2B	1.597	1.615	1.6334	1.6412	.0078	1.6875
		3A	.0000	1.6875	1.6761	--------	1.6334	1.6289	.0045	1.5853	3B	1.5970	1.6073	1.6334	1.6392	.0058	1.6875
1.6875-16	UN	2A	.0016	1.6859	1.6765	--------	1.6453	1.6400	.0053	1.6092	2B	1.620	1.634	1.6469	1.6538	.0069	1.6875
		3A	.0000	1.6875	1.6781	--------	1.6469	1.6429	.0040	1.6108	3B	1.6200	1.6283	1.6469	1.6521	.0052	1.6875
1.6875-18	UNEF	2A	.0015	1.6860	1.6773	--------	1.6499	1.6448	.0051	1.6178	2B	1.627	1.640	1.6514	1.6580	.0066	1.6875
		3A	.0000	1.6875	1.6788	--------	1.6514	1.6476	.0038	1.6193	3B	1.6270	1.6355	1.6514	1.6563	.0049	1.6875
1.6875-20	UN	2A	.0015	1.6860	1.6779	--------	1.6535	1.6487	.0048	1.6247	2B	1.633	1.645	1.6550	1.6613	.0063	1.6875
		3A	.0000	1.6875	1.6794	--------	1.6550	1.6514	.0036	1.6262	3B	1.6330	1.6412	1.6550	1.6597	.0047	1.6875
1.750-5		1A	.0027	1.7473	1.7165	--------	1.6174	1.6040	.0134	1.5019	1B	1.534	1.568	1.6201	1.6375	.0174	1.7500
	UNC	2A	.0027	1.7473	1.7268	1.7165	1.6174	1.6085	.0089	1.5019	2B	1.534	1.568	1.6201	1.6317	.0116	1.7500
		3A	.0000	1.7500	1.7295	--------	1.6201	1.6134	.0067	1.5046	3B	1.5340	1.5575	1.6201	1.6288	.0087	1.7500
1.750-6	UN	2A	.0025	1.7475	1.7293	--------	1.6392	1.6309	.0083	1.5430	2B	1.570	1.600	1.6417	1.6525	.0108	1.7500
		3A	.0000	1.7500	1.7318	--------	1.6417	1.6354	.0063	1.5455	3B	1.5700	1.5896	1.6417	1.6498	.0081	1.7500
1.750-8	UN	2A	.0023	1.7477	1.7327	1.7252	1.6665	1.6590	.0075	1.5943	2B	1.615	1.640	1.6688	1.6786	.0098	1.7500
		3A	.0000	1.7500	1.7350	--------	1.6688	1.6631	.0057	1.5966	3B	1.6150	1.6297	1.6688	1.6762	.0074	1.7500
1.750-12	UN	2A	.0018	1.7482	1.7368	--------	1.6941	1.6881	.0060	1.6460	2B	1.660	1.678	1.6959	1.7037	.0078	1.7500
		3A	.0000	1.7500	1.7386	--------	1.6959	1.6914	.0045	1.6478	3B	1.6600	1.6698	1.6959	1.7017	.0058	1.7500
1.750-16	UN	2A	.0016	1.7484	1.7390	--------	1.7078	1.7025	.0053	1.6717	2B	1.682	1.696	1.7094	1.7163	.0069	1.7500
		3A	.0000	1.7500	1.7406	--------	1.7094	1.7054	.0040	1.6733	3B	1.6820	1.6908	1.7094	1.7146	.0052	1.7500
1.750-20	UN	2A	.0015	1.7485	1.7404	--------	1.7160	1.7112	.0048	1.6872	2B	1.696	1.707	1.7175	1.7238	.0063	1.7500
		3A	.0000	1.7500	1.7419	--------	1.7175	1.7139	.0036	1.6887	3B	1.6960	1.7037	1.7175	1.7222	.0047	1.7500
1.8125-6	UN	2A	.0025	1.8100	1.7918	--------	1.7017	1.6933	.0084	1.6055	2B	1.632	1.663	1.7042	1.7151	.0109	1.8125
		3A	.0000	1.8125	1.7943	--------	1.7042	1.6979	.0063	1.6080	3B	1.6320	1.6521	1.7042	1.7124	.0082	1.8125
1.8125-8	UN	2A	.0023	1.8102	1.7952	--------	1.7290	1.7214	.0076	1.6568	2B	1.677	1.702	1.7313	1.7412	.0099	1.8125
		3A	.0000	1.8125	1.7975	--------	1.7313	1.7256	.0057	1.6591	3B	1.6770	1.6922	1.7313	1.7387	.0074	1.8125
1.8125-12	UN	2A	.0018	1.8107	1.7993	--------	1.7566	1.7506	.0060	1.7085	2B	1.722	1.740	1.7584	1.7662	.0078	1.8125
		3A	.0000	1.8125	1.8011	--------	1.7584	1.7539	.0045	1.7103	3B	1.7220	1.7323	1.7584	1.7642	.0058	1.8125
1.8125-16	UN	2A	.0016	1.8109	1.8015	--------	1.7703	1.7650	.0053	1.7342	2B	1.745	1.759	1.7719	1.7788	.0069	1.8125
		3A	.0000	1.8125	1.8031	--------	1.7719	1.7679	.0040	1.7358	3B	1.7450	1.7533	1.7719	1.7771	.0052	1.8125
1.8125-20	UN	2A	.0015	1.8110	1.8029	--------	1.7785	1.7737	.0048	1.7497	2B	1.758	1.770	1.7800	1.7863	.0063	1.8125
		3A	.0000	1.8125	1.8044	--------	1.7800	1.7764	.0036	1.7512	3B	1.7580	1.7662	1.7800	1.7847	.0047	1.8125
1.875-6	UN	2A	.0025	1.8725	1.8543	--------	1.7642	1.7558	.0084	1.6680	2B	1.695	1.725	1.7667	1.7777	.0110	1.8750
		3A	.0000	1.8750	1.8568	--------	1.7667	1.7604	.0063	1.6705	3B	1.6950	1.7146	1.7667	1.7749	.0082	1.8750
1.875-8	UN	2A	.0023	1.8727	1.8577	1.8502	1.7915	1.7838	.0077	1.7193	2B	1.740	1.765	1.7938	1.8038	.0100	1.8750
		3A	.0000	1.8750	1.8600	--------	1.7938	1.7881	.0057	1.7216	3B	1.7400	1.7547	1.7938	1.8013	.0075	1.8750
1.875-12	UN	2A	.0018	1.8732	1.8618	--------	1.8191	1.8131	.0060	1.7710	2B	1.785	1.803	1.8209	1.8287	.0078	1.8750
		3A	.0000	1.8750	1.8636	--------	1.8209	1.8164	.0045	1.7728	3B	1.7850	1.7948	1.8209	1.8267	.0058	1.8750
1.875-16	UN	2A	.0016	1.8734	1.8640	--------	1.8328	1.8275	.0053	1.7967	2B	1.807	1.821	1.8344	1.8413	.0069	1.8750
		3A	.0000	1.8750	1.8656	--------	1.8344	1.8304	.0040	1.7983	3B	1.8070	1.8158	1.8344	1.8396	.0052	1.8750
1.875-20	UN	2A	.0015	1.8735	1.8654	--------	1.8410	1.8362	.0048	1.8122	2B	1.821	1.832	1.8425	1.8488	.0063	1.8750
		3A	.0000	1.8750	1.8669	--------	1.8425	1.8389	.0036	1.8137	3B	1.8210	1.8287	1.8425	1.8472	.0047	1.8750
1.9375-6	UN	2A	.0026	1.9349	1.9167	--------	1.8266	1.8181	.0085	1.7304	2B	1.757	1.788	1.8292	1.8403	.0111	1.9375
		3A	.0000	1.9375	1.9193	--------	1.8292	1.8228	.0064	1.7330	3B	1.7570	1.7771	1.8292	1.8375	.0083	1.9375
1.9375-8	UN	2A	.0023	1.9352	1.9202	--------	1.8540	1.8463	.0077	1.7818	2B	1.802	1.827	1.8563	1.8663	.0100	1.9375
		3A	.0000	1.9375	1.9225	--------	1.8563	1.8505	.0058	1.7841	3B	1.8020	1.8172	1.8563	1.8638	.0075	1.9375
1.9375-12	UN	2A	.0018	1.9357	1.9243	--------	1.8816	1.8755	.0061	1.8335	2B	1.847	1.865	1.8834	1.8913	.0079	1.9375
		3A	.0000	1.9375	1.9261	--------	1.8834	1.8789	.0045	1.8353	3B	1.8470	1.8573	1.8834	1.8893	.0059	1.9375
1.9375-16	UN	2A	.0016	1.9359	1.9265	--------	1.8953	1.8899	.0054	1.8592	2B	1.870	1.884	1.8969	1.9039	.0070	1.9375
		3A	.0000	1.9375	1.9281	--------	1.8969	1.8929	.0040	1.8608	3B	1.8700	1.8783	1.8969	1.9021	.0052	1.9375
1.9375-20	UN	2A	.0015	1.9360	1.9279	--------	1.9035	1.8986	.0049	1.8747	2B	1.883	1.895	1.9050	1.9114	.0064	1.9375
		3A	.0000	1.9375	1.9294	--------	1.9050	1.9013	.0037	1.8762	3B	1.8830	1.8912	1.9050	1.9098	.0048	1.9375

See footnotes at end of table.

TABLE 2.21. *Standard series limits of size—Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
		1A	0.0029	1.9971	1.9641	.....	1.8528	1.8385	0.0143	1.7245	1B	1.759	1.795	1.8557	1.8743	0.0186	2.0000
2.000-4.5	UNC	2A	.0029	1.9971	1.9751	1.9641	1.8528	1.8433	.0095	1.7245	2B	1.759	1.795	1.8557	1.8681	.0124	2.0000
		3A	.0000	2.0000	1.9780	.....	1.8557	1.8486	.0071	1.7274	3B	1.7590	1.7861	1.8557	1.8650	.0093	2.0000
2.000-6	UN	2A	.0026	1.9974	1.9792	.....	1.8891	1.8805	.0086	1.7929	2B	1.820	1.850	1.8917	1.9028	.0111	2.0000
		3A	.0000	2.0000	1.9818	.....	1.8917	1.8853	.0064	1.7955	3B	1.8200	1.8396	1.8917	1.9000	.0083	2.0000
2.000-8	UN	2A	.0023	1.9977	1.9827	1.9752	1.9165	1.9087	.0078	1.8443	2B	1.865	1.890	1.9188	1.9289	.0101	2.0000
		3A	.0000	2.0000	1.9850	.....	1.9188	1.9130	.0058	1.8466	3B	1.8650	1.8797	1.9188	1.9264	.0076	2.0000
2.000-12	UN	2A	.0018	1.9982	1.9868	.....	1.9441	1.9380	.0061	1.8960	2B	1.910	1.928	1.9459	1.9538	.0079	2.0000
		3A	.0000	2.0000	1.9886	.....	1.9459	1.9414	.0045	1.8978	3B	1.9100	1.9198	1.9459	1.9518	.0059	2.0000
2.000-16	UN	2A	.0016	1.9984	1.9890	.....	1.9578	1.9524	.0054	1.9217	2B	1.932	1.946	1.9594	1.9664	.0070	2.0000
		3A	.0000	2.0000	1.9906	.....	1.9594	1.9554	.0040	1.9233	3B	1.9320	1.9408	1.9594	1.9646	.0052	2.0000
2.000-20	UN	2A	.0015	1.9985	1.9904	.....	1.9660	1.9611	.0049	1.9372	2B	1.946	1.957	1.9675	1.9739	.0064	2.0000
		3A	.0000	2.0000	1.9919	.....	1.9675	1.9638	.0037	1.9387	3B	1.9460	1.9537	1.9675	1.9723	.0048	2.0000
2.125-6	UN	2A	.0026	2.1224	2.1042	.....	2.0141	2.0054	.0087	1.9179	2B	1.945	1.975	2.0167	2.0280	.0113	2.1250
		3A	.0000	2.1250	2.1068	.....	2.0167	2.0102	.0065	1.9205	3B	1.9450	1.9646	2.0167	2.0251	.0084	2.1250
2.125-8	UN	2A	.0024	2.1226	2.1076	2.1001	2.0414	2.0335	.0079	1.9692	2B	1.990	2.015	2.0438	2.0540	.0102	2.1250
		3A	.0000	2.1250	2.1100	.....	2.0438	2.0379	.0059	1.9716	3B	1.9900	2.0047	2.0438	2.0515	.0077	2.1250
2.125-12	UN	2A	.0018	2.1232	2.1118	.....	2.0691	2.0630	.0061	2.0210	2B	2.035	2.053	2.0709	2.0788	.0079	2.1250
		3A	.0000	2.1250	2.1136	.....	2.0709	2.0664	.0045	2.0228	3B	2.0350	2.0448	2.0709	2.0768	.0059	2.1250
2.125-16	UN	2A	.0016	2.1234	2.1140	.....	2.0828	2.0774	.0054	2.0467	2B	2.057	2.071	2.0844	2.0914	.0070	2.1250
		3A	.0000	2.1250	2.1156	.....	2.0844	2.0804	.0040	2.0483	3B	2.0570	2.0658	2.0844	2.0896	.0052	2.1250
2.125-20	UN	2A	.0015	2.1235	2.1154	.....	2.0910	2.0861	.0049	2.0622	2B	2.071	2.082	2.0925	2.0989	.0064	2.1250
		3A	.0000	2.1250	2.1169	.....	2.0925	2.0888	.0037	2.0637	3B	2.0710	2.0787	2.0925	2.0973	.0048	2.1250
2.250-4.5		1A	.0029	2.2471	2.2141	.....	2.1028	2.0882	.0146	1.9745	1B	2.009	2.045	2.1057	2.1247	.0190	2.2500
	UNC	2A	.0029	2.2471	2.2251	2.2141	2.1028	2.0931	.0097	1.9745	2B	2.009	2.045	2.1057	2.1183	.0126	2.2500
		3A	.0000	2.2500	2.2280	.....	2.1057	2.0984	.0073	1.9774	3B	2.0090	2.0361	2.1057	2.1152	.0095	2.2500
2.250-6	UN	2A	.0026	2.2474	2.2292	.....	2.1391	2.1303	.0088	2.0429	2B	2.070	2.100	2.1417	2.1531	.0114	2.2500
		3A	.0000	2.2500	2.2318	.....	2.1417	2.1351	.0066	2.0455	3B	2.0700	2.0896	2.1417	2.1502	.0085	2.2500
2.250-8	UN	2A	.0024	2.2476	2.2326	2.2251	2.1664	2.1584	.0080	2.0942	2B	2.115	2.140	2.1688	2.1792	.0104	2.2500
		3A	.0000	2.2500	2.2350	.....	2.1688	2.1628	.0060	2.0966	3B	2.1150	2.1297	2.1688	2.1766	.0078	2.2500
2.250-12	UN	2A	.0018	2.2482	2.2368	.....	2.1941	2.1880	.0061	2.1460	2B	2.160	2.178	2.1959	2.2038	.0079	2.2500
		3A	.0000	2.2500	2.2386	.....	2.1959	2.1914	.0045	2.1478	3B	2.1600	2.1698	2.1959	2.2018	.0059	2.2500
2.250-16	UN	2A	.0016	2.2484	2.2390	.....	2.2078	2.2024	.0054	2.1717	2B	2.182	2.196	2.2094	2.2164	.0070	2.2500
		3A	.0000	2.2500	2.2406	.....	2.2094	2.2054	.0040	2.1733	3B	2.1820	2.1908	2.2094	2.2146	.0052	2.2500
2.250-20	UN	2A	.0015	2.2485	2.2404	.....	2.2160	2.2111	.0049	2.1872	2B	2.196	2.207	2.2175	2.2239	.0064	2.2500
		3A	.0000	2.2500	2.2419	.....	2.2175	2.2138	.0037	2.1887	3B	2.1960	2.2037	2.2175	2.2223	.0048	2.2500
2.375-6	UN	2A	.0027	2.3723	2.3541	.....	2.2640	2.2551	.0089	2.1678	2B	2.195	2.226	2.2667	2.2782	.0115	2.3750
		3A	.0000	2.3750	2.3568	.....	2.2667	2.2601	.0066	2.1705	3B	2.1950	2.2146	2.2667	2.2753	.0086	2.3750
2.375-8	UN	2A	.0024	2.3726	2.3576	.....	2.2914	2.2833	.0081	2.2192	2B	2.240	2.265	2.2938	2.3043	.0105	2.3750
		3A	.0000	2.3750	2.3600	.....	2.2938	2.2878	.0060	2.2216	3B	2.2400	2.2547	2.2938	2.3017	.0079	2.3750
2.375-12	UN	2A	.0019	2.3731	2.3617	.....	2.3190	2.3128	.0062	2.2709	2B	2.285	2.303	2.3209	2.3290	.0081	2.3750
		3A	.0000	2.3750	2.3636	.....	2.3209	2.3163	.0046	2.2728	3B	2.2850	2.2948	2.3209	2.3269	.0060	2.3750
2.375-16	UN	2A	.0017	2.3733	2.3639	.....	2.3327	2.3272	.0055	2.2966	2B	2.307	2.321	2.3344	2.3416	.0072	2.3750
		3A	.0000	2.3750	2.3656	.....	2.3344	2.3303	.0041	2.2983	3B	2.3070	2.3158	2.3344	2.3398	.0054	2.3750
2.375-20	UN	2A	.0015	2.3735	2.3654	.....	2.3410	2.3359	.0051	2.3122	2B	2.321	2.332	2.3425	2.3491	.0066	2.3750
		3A	.0000	2.3750	2.3669	.....	2.3425	2.3387	.0038	2.3137	3B	2.3210	2.3287	2.3425	2.3475	.0050	2.3750
		1A	.0031	2.4969	2.4612	.....	2.3345	2.3190	.0155	2.1902	1B	2.229	2.267	2.3376	2.3578	.0202	2.5000
2.500-4	UNC	2A	.0031	2.4969	2.4731	2.4612	2.3345	2.3241	.0104	2.1902	2B	2.229	2.267	2.3376	2.3511	.0135	2.5000
		3A	.0000	2.5000	2.4762	.....	2.3376	2.3298	.0078	2.1933	3B	2.2290	2.2594	2.3376	2.3477	.0101	2.5000
2.500-6	UN	2A	.0027	2.4973	2.4791	.....	2.3890	2.3800	.0090	2.2928	2B	2.320	2.350	2.3917	2.4033	.0116	2.5000
		3A	.0000	2.5000	2.4818	.....	2.3917	2.3850	.0067	2.2955	3B	2.3200	2.3396	2.3917	2.4004	.0087	2.5000
2.500-8	UN	2A	.0024	2.4976	2.4826	2.4751	2.4164	2.4082	.0082	2.3442	2B	2.365	2.390	2.4188	2.4294	.0106	2.5000
		3A	.0000	2.5000	2.4850	.....	2.4188	2.4127	.0061	2.3466	3B	2.3650	2.3797	2.4188	2.4268	.0080	2.5000
2.500-12	UN	2A	.0019	2.4981	2.4867	.....	2.4440	2.4378	.0062	2.3959	2B	2.410	2.428	2.4459	2.4540	.0081	2.5000
		3A	.0000	2.5000	2.4886	.....	2.4459	2.4413	.0046	2.3978	3B	2.4100	2.4198	2.4459	2.4519	.0060	2.5000
2.500-16	UN	2A	.0017	2.4983	2.4889	.....	2.4577	2.4522	.0055	2.4216	2B	2.432	2.446	2.4594	2.4666	.0072	2.5000
		3A	.0000	2.5000	2.4906	.....	2.4594	2.4553	.0041	2.4233	3B	2.4320	2.4408	2.4594	2.4648	.0054	2.5000

See footnotes at end of table.

212-951 O - 76 - 5

TABLE 2.21. *Standard series limits of size—Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
2.500-20	UN	2A	0.0015	2.4985	2.4904	--------	2.4660	2.4609	0.0051	2.4372	2B	2.446	2.457	2.4675	2.4741	0.0066	2.5000
		3A	.0000	2.5000	2.4919	--------	2.4675	2.4637	.0038	2.4387	3B	2.4460	2.4537	2.4675	2.4725	.0050	2.5000
2.625-6	UN	2A	.0027	2.6223	2.6041	--------	2.5140	2.5050	.0090	2.4178	2B	2.445	2.475	2.5167	2.5285	.0118	2.6250
		3A	.0000	2.6250	2.6068	--------	2.5167	2.5099	.0068	2.4205	3B	2.4450	2.4616	2.5167	2.5255	.0088	2.6250
2.625-8	UN	2A	.0025	2.6225	2.6075	--------	2.5413	2.5331	.0082	2.4691	2B	2.490	2.515	2.5438	2.5545	.0107	2.6250
		3A	.0000	2.6250	2.6100	--------	2.5438	2.5376	.0062	2.4716	3B	2.4900	2.5047	2.5438	2.5518	.0080	2.6250
2.625-12	UN	2A	.0019	2.6231	2.6117	--------	2.5690	2.5628	.0062	2.5209	2B	2.535	2.553	2.5709	2.5790	.0081	2.6250
		3A	.0000	2.6250	2.6136	--------	2.5709	2.5663	.0046	2.5228	3B	2.5350	2.5448	2.5709	2.5769	.0060	2.6250
2.625-16	UN	2A	.0017	2.6233	2.6139	--------	2.5827	2.5772	.0055	2.5466	2B	2.557	2.571	2.5844	2.5916	.0072	2.6250
		3A	.0000	2.6250	2.6156	--------	2.5844	2.5803	.0041	2.5483	3B	2.5570	2.5658	2.5844	2.5898	.0054	2.6250
2.625-20	UN	2A	.0015	2.6235	2.6154	--------	2.5910	2.5859	.0051	2.5622	2B	2.571	2.582	2.5925	2.5991	.0066	2.6250
		3A	.0000	2.6250	2.6169	--------	2.5925	2.5887	.0038	2.5637	3B	2.5710	2.5787	2.5925	2.5975	.0050	2.6250
2.750-4	UNC	1A	.0032	2.7468	2.7111	--------	2.5844	2.5686	.0158	2.4401	1B	2.479	2.517	2.5876	2.6082	.0206	2.7500
		2A	.0032	2.7468	2.7230	2.7111	2.5844	2.5739	.0105	2.4401	2B	2.479	2.517	2.5876	2.6013	.0137	2.7500
		3A	.0000	2.7500	2.7262	--------	2.5876	2.5797	.0079	2.4433	3B	2.4790	2.5094	2.5876	2.5979	.0103	2.7500
2.750-6	UN	2A	.0027	2.7473	2.7291	--------	2.6390	2.6299	.0091	2.5428	2B	2.570	2.600	2.6417	2.6536	.0119	2.7500
		3A	.0000	2.7500	2.7318	--------	2.6417	2.6349	.0068	2.5455	3B	2.5700	2.5896	2.6417	2.6506	.0089	2.7500
2.750-8	UN	2A	.0025	2.7475	2.7325	2.7250	2.6663	2.6580	.0083	2.5941	2B	2.615	2.640	2.6688	2.6796	.0108	2.7500
		3A	.0000	2.7500	2.7350	--------	2.6688	2.6625	.0063	2.5966	3B	2.6150	2.6297	2.6688	2.6769	.0081	2.7500
2.750-12	UN	2A	.0019	2.7481	2.7367	--------	2.6940	2.6878	.0062	2.6459	2B	2.660	2.678	2.6959	2.7040	.0081	2.7500
		3A	.0000	2.7500	2.7386	--------	2.6959	2.6913	.0046	2.6478	3B	2.6600	2.6698	2.6959	2.7019	.0060	2.7500
2.750-16	UN	2A	.0017	2.7483	2.7389	--------	2.7077	2.7022	.0055	2.6716	2B	2.682	2.696	2.7094	2.7166	.0072	2.7500
		3A	.0000	2.7500	2.7406	--------	2.7094	2.7053	.0041	2.6733	3B	2.6820	2.6908	2.7094	2.7148	.0054	2.7500
2.750-20	UN	2A	.0015	2.7485	2.7404	--------	2.7160	2.7109	.0051	2.6872	2B	2.696	2.707	2.7175	2.7241	.0066	2.7500
		3A	.0000	2.7500	2.7419	--------	2.7175	2.7137	.0038	2.6887	3B	2.6960	2.7037	2.7175	2.7225	.0050	2.7500
2.875-6	UN	2A	.0028	2.8722	2.8540	--------	2.7639	2.7547	.0092	2.6677	2B	2.695	2.725	2.7667	2.7787	.0120	2.8750
		3A	.0000	2.8750	2.8568	--------	2.7667	2.7598	.0069	2.6705	3B	2.6950	2.7146	2.7667	2.7757	.0090	2.8750
2.875-8	UN	2A	.0025	2.8725	2.8575	--------	2.7913	2.7829	.0084	2.7191	2B	2.740	2.765	2.7938	2.8048	.0110	2.8750
		3A	.0000	2.8750	2.8600	--------	2.7938	2.7875	.0063	2.7216	3B	2.7400	2.7547	2.7938	2.8020	.0082	2.8750
2.875-12	UN	2A	.0019	2.8731	2.8617	--------	2.8190	2.8127	.0063	2.7709	2B	2.785	2.803	2.8209	2.8291	.0082	2.8750
		3A	.0000	2.8750	2.8636	--------	2.8209	2.8162	.0047	2.7728	3B	2.7850	2.7948	2.8209	2.8271	.0062	2.8750
2.875-16	UN	2A	.0017	2.8733	2.8639	--------	2.8327	2.8271	.0056	2.7966	2B	2.807	2.821	2.8344	2.8417	.0073	2.8750
		3A	.0000	2.8750	2.8656	--------	2.8344	2.8302	.0042	2.7983	3B	2.8070	2.8158	2.8344	2.8399	.0055	2.8750
2.875-20	UN	2A	.0016	2.8734	2.8653	--------	2.8409	2.8357	.0052	2.8121	2B	2.821	2.832	2.8425	2.8493	.0068	2.8750
		3A	.0000	2.8750	2.8669	--------	2.8425	2.8386	.0039	2.8137	3B	2.8210	2.8287	2.8425	2.8476	.0051	2.8750
3.000-4	UNC	1A	.0032	2.9968	2.9611	--------	2.8344	2.8183	.0161	2.6901	1B	2.729	2.767	2.8376	2.8585	.0209	3.0000
		2A	.0032	2.9968	2.9730	2.9611	2.8344	2.8237	.0107	2.6901	2B	2.729	2.767	2.8376	2.8515	.0139	3.0000
		3A	.0000	3.0000	2.9762	--------	2.8376	2.8296	.0080	2.6933	3B	2.7290	2.7594	2.8376	2.8480	.0104	3.0000
3.000-6	UN	2A	.0028	2.9972	2.9790	--------	2.8889	2.8796	.0093	2.7927	2B	2.820	2.850	2.8917	2.9038	.0121	3.0000
		3A	.0000	3.0000	2.9818	--------	2.8917	2.8847	.0070	2.7955	3B	2.8200	2.8396	2.8917	2.9008	.0091	3.0000
3.000-8	UN	2A	.0026	2.9974	2.9824	2.9749	2.9162	2.9077	.0085	2.8440	2B	2.865	2.890	2.9188	2.9299	.0111	3.0000
		3A	.0000	3.0000	2.9850	--------	2.9188	2.9124	.0064	2.8466	3B	2.8650	2.8797	2.9188	2.9271	.0083	3.0000
3.000-12	UN	2A	.0019	2.9981	2.9867	--------	2.9440	2.9377	.0063	2.8959	2B	2.910	2.928	2.9459	2.9541	.0082	3.0000
		3A	.0000	3.0000	2.9886	--------	2.9459	2.9412	.0047	2.8978	3B	2.9100	2.9198	2.9459	2.9521	.0062	3.0000
3.000-16	UN	2A	.0017	2.9983	2.9889	--------	2.9577	2.9521	.0056	2.9216	2B	2.932	2.946	2.9594	2.9667	.0073	3.0000
		3A	.0000	3.0000	2.9906	--------	2.9594	2.9552	.0042	2.9233	3B	2.9320	2.9408	2.9594	2.9649	.0055	3.0000
3.000-20	UN	2A	.0016	2.9984	2.9903	--------	2.9659	2.9607	.0052	2.9371	2B	2.946	2.957	2.9675	2.9743	.0068	3.0000
		3A	.0000	3.0000	2.9919	--------	2.9675	2.9636	.0039	2.9387	3B	2.9460	2.9537	2.9675	2.9726	.0051	3.0000
3.125-6	UN	2A	.0028	3.1222	3.1040	--------	3.0139	3.0045	.0094	2.9177	2B	2.945	2.975	3.0167	3.0289	.0122	3.1250
		3A	.0000	3.1250	3.1068	--------	3.0167	3.0097	.0070	2.9205	3B	2.9450	2.9646	3.0167	3.0259	.0092	3.1250
3.125-8	UN	2A	.0026	3.1224	3.1074	--------	3.0412	3.0326	.0086	2.9690	2B	2.990	3.015	3.0438	3.0550	.0112	3.1250
		3A	.0000	3.1250	3.1100	--------	3.0438	3.0374	.0064	2.9716	3B	2.9900	3.0047	3.0438	3.0522	.0084	3.1250
3.125-12	UN	2A	.0019	3.1231	3.1117	--------	3.0690	3.0627	.0063	3.0209	2B	3.035	3.053	3.0709	3.0791	.0082	3.1250
		3A	.0000	3.1250	3.1136	--------	3.0709	3.0662	.0047	3.0228	3B	3.0350	3.0448	3.0709	3.0771	.0062	3.1250
3.125-16	UN	2A	.0017	3.1233	3.1139	--------	3.0827	3.0771	.0056	3.0466	2B	3.057	3.071	3.0844	3.0917	.0073	3.1250
		3A	.0000	3.1250	3.1156	--------	3.0844	3.0802	.0042	3.0483	3B	3.0570	3.0658	3.0844	3.0899	.0055	3.1250

See footnotes at end of table.

TABLE 2.21. *Standard series limits of size—Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
		1A	0.0033	3.2467	3.2110	--------	3.0843	3.0680	0.0163	2.9400	1B	2.979	3.017	3.0876	3.1088	0.0212	3.2500
3.250–4	UNC	2A	.0033	3.2467	3.2229	3.2110	3.0843	3.0734	.0109	2.9400	2B	2.979	3.017	3.0876	3.1017	.0141	3.2500
		3A	.0000	3.2500	3.2262	--------	3.0876	3.0794	.0082	2.9433	3B	2.9790	3.0094	3.0876	3.0982	.0106	3.2500
3.250–6	UN	2A	.0028	3.2472	3.2290	--------	3.1389	3.1294	.0095	3.0427	2B	3.070	3.100	3.1417	3.1540	.0123	3.2500
		3A	.0000	3.2500	3.2318	--------	3.1417	3.1346	.0071	3.0455	3B	3.0700	3.0896	3.1417	3.1509	.0092	3.2500
3.250–8	UN	2A	.0026	3.2474	3.2324	3.2249	3.1662	3.1575	.0087	3.0940	2B	3.115	3.140	3.1688	3.1801	.0113	3.2500
		3A	.0000	3.2500	3.2350	--------	3.1688	3.1623	.0065	3.0966	3B	3.1150	3.1297	3.1688	3.1773	.0085	3.2500
3.250–12	UN	2A	.0019	3.2481	3.2367	--------	3.1940	3.1877	.0063	3.1459	2B	3.160	3.178	3.1959	3.2041	.0082	3.2500
		3A	.0000	3.2500	3.2386	--------	3.1959	3.1912	.0047	3.1478	3B	3.1600	3.1698	3.1959	3.2021	.0062	3.2500
3.250–16	UN	2A	.0017	3.2483	3.2389	--------	3.2077	3.2021	.0056	3.1716	2B	3.182	3.196	3.2094	3.2167	.0073	3.2500
		3A	.0000	3.2500	3.2406	--------	3.2094	3.2052	.0042	3.1733	3B	3.1820	3.1908	3.2094	3.2149	.0055	3.2500
3.375–6	UN	2A	.0029	3.3721	3.3539	--------	3.2638	3.2543	.0095	3.1676	2B	3.195	3.225	3.2667	3.2791	.0124	3.3750
		3A	.0000	3.3750	3.3568	--------	3.2667	3.2595	.0072	3.1705	3B	3.1950	3.2146	3.2667	3.2760	.0093	3.3750
3.375–8	UN	2A	.0026	3.3724	3.3574	--------	3.2912	3.2824	.0088	3.2190	2B	3.240	3.265	3.2938	3.3052	.0114	3.3750
		3A	.0000	3.3750	3.3600	--------	3.2938	3.2872	.0066	3.2216	3B	3.2400	3.2547	3.2938	3.3023	.0085	3.3750
3.375–12	UN	2A	.0019	3.3731	3.3617	--------	3.3190	3.3126	.0064	3.2709	2B	3.285	3.303	3.3209	3.3293	.0084	3.3750
		3A	.0000	3.3750	3.3636	--------	3.3209	3.3161	.0048	3.2728	3B	3.2850	3.2948	3.3209	3.3272	.0063	3.3750
3.375–16	UN	2A	.0017	3.3733	3.3639	--------	3.3327	3.3269	.0058	3.2966	2B	3.307	3.321	3.3344	3.3419	.0075	3.3750
		3A	.0000	3.3750	3.3656	--------	3.3344	3.3301	.0043	3.2983	3B	3.3070	3.3158	3.3344	3.3400	.0056	3.3750
		1A	.0033	3.4967	3.4610	--------	3.3343	3.3177	.0166	3.1900	1B	3.229	3.267	3.3376	3.3591	.0215	3.5000
3.500–4	UNC	2A	.0033	3.4967	3.4729	3.4610	3.3343	3.3233	.0110	3.1900	2B	3.229	3.267	3.3376	3.3519	.0143	3.5000
		3A	.0000	3.5000	3.4762	--------	3.3376	3.3293	.0083	3.1933	3B	3.2290	3.2594	3.3376	3.3484	.0108	3.5000
3.500–6	UN	2A	.0029	3.4971	3.4789	--------	3.3888	3.3792	.0096	3.2926	2B	3.320	3.350	3.3917	3.4042	.0125	3.5000
		3A	.0000	3.5000	3.4818	--------	3.3917	3.3845	.0072	3.2955	3B	3.3200	3.3396	3.3917	3.4011	.0094	3.5000
3.500–8	UN	2A	.0026	3.4974	3.4824	3.4749	3.4162	3.4074	.0088	3.3440	2B	3.365	3.390	3.4188	3.4303	.0115	3.5000
		3A	.0000	3.5000	3.4850	--------	3.4188	3.4122	.0066	3.3466	3B	3.3650	3.3797	3.4188	3.4274	.0086	3.5000
3.500–12	UN	2A	.0019	3.4981	3.4867	--------	3.4440	3.4376	.0064	3.3959	2B	3.410	3.428	3.4459	3.4543	.0084	3.5000
		3A	.0000	3.5000	3.4886	--------	3.4459	3.4411	.0048	3.3978	3B	3.4100	3.4198	3.4459	3.4522	.0063	3.5000
3.500–16	UN	2A	.0017	3.4983	3.4889	--------	3.4577	3.4519	.0058	3.4216	2B	3.432	3.446	3.4594	3.4669	.0075	3.5000
		3A	.0000	3.5000	3.4906	--------	3.4594	3.4551	.0043	3.4233	3B	3.4320	3.4408	3.4594	3.4650	.0056	3.5000
3.625–6	UN	2A	.0029	3.6221	3.6039	--------	3.5138	3.5041	.0097	3.4176	2B	3.445	3.475	3.5167	4.5293	.0126	3.6250
		3A	.0000	3.6250	3.6068	--------	3.5167	3.5094	.0073	3.4205	3B	3.4450	3.4646	3.5167	3.5262	.0095	3.6250
3.625–8	UN	2A	.0027	3.6223	3.6073	--------	3.5411	3.5322	.0089	3.4689	2B	3.490	3.515	3.5438	3.5554	.0116	3.6250
		3A	.0000	3.6250	3.6100	--------	3.5438	3.5371	.0067	3.4716	3B	3.4900	3.5047	3.5438	3.5525	.0087	3.6250
3.625–12	UN	2A	.0019	3.6231	3.6117	--------	3.5690	3.5626	.0064	3.5209	2B	3.535	3.553	3.5709	3.5793	.0084	3.6250
		3A	.0000	3.6250	3.6136	--------	3.5709	3.5661	.0048	3.5228	3B	3.5350	3.5448	3.5709	3.5772	.0063	3.6250
3.625–16	UN	2A	.0017	3.6233	3.6139	--------	3.5827	3.5769	.0058	3.5466	2B	3.557	3.571	3.5844	3.5919	.0075	3.6250
		3A	.0000	3.6250	3.6156	--------	3.5844	3.5801	.0043	3.5483	3B	3.5570	3.5658	3.5844	3.5900	.0056	3.6250
		1A	.0034	3.7466	3.7109	--------	3.5842	3.5674	.0168	3.4399	1B	3.479	3.517	3.5876	3.6094	.0218	3.7500
3.750–4	UNC	2A	.0034	3.7466	3.7228	3.7109	3.5842	3.5730	.0112	3.4399	2B	3.479	3.517	3.5876	3.6021	.0145	3.7500
		3A	.0000	3.7500	3.7262	--------	3.5876	3.5792	.0084	3.4433	3B	3.4790	3.5094	3.5876	3.5985	.0109	3.7500
3.750–6	UN	2A	.0029	3.7471	3.7289	--------	3.6388	3.6290	.0098	3.5426	2B	3.570	3.600	3.6417	3.6544	.0127	3.7500
		3A	.0000	3.7500	3.7318	--------	3.6417	3.6344	.0073	3.5455	3B	3.5700	3.5896	3.6417	3.6512	.0095	3.7500
3.750–8	UN	2A	.0027	3.7473	3.7323	3.7248	3.6661	3.6571	.0090	3.5939	2B	3.615	3.640	3.6688	3.6805	.0117	3.7500
		3A	.0000	3.7500	3.7350	--------	3.6688	3.6621	.0067	3.5966	3B	3.6150	3.6297	3.6688	3.6776	.0088	3.7500
3.750–12	UN	2A	.0019	3.7481	3.7367	--------	3.6940	3.6876	.0064	3.6459	2B	3.660	3.678	3.6959	3.7043	.0084	3.7500
		3A	.0000	3.7500	3.7386	--------	3.6959	3.6911	.0048	3.6478	3B	3.6600	3.6698	3.6959	3.7022	.0063	3.7500
3.750–16	UN	2A	.0017	3.7483	3.7389	--------	3.7077	3.7019	.0058	3.6716	2B	3.682	3.696	3.7094	3.7169	.0075	3.7500
		3A	.0000	3.7500	3.7406	--------	3.7094	3.7051	.0043	3.6733	3B	3.6820	3.6908	3.7094	3.7150	.0056	3.7500
3.875–6	UN	2A	.0030	3.8720	3.8538	--------	3.7637	3.7538	.0099	3.6675	2B	3.695	3.725	3.7667	3.7795	.0128	3.8750
		3A	.0000	3.8750	3.8568	--------	3.7667	3.7593	.0074	3.6705	3B	3.6950	3.7146	3.7667	3.7763	.0096	3.8750
3.875–8	UN	2A	.0027	3.8723	3.8573	--------	3.7911	3.7820	.0091	3.7189	2B	3.740	3.765	3.7938	3.8056	.0118	3.8750
		3A	.0000	3.8750	3.8600	--------	3.7938	3.7870	.0068	3.7216	3B	3.7400	3.7547	3.7938	3.8026	.0088	3.8750
3.875–12	UN	2A	.0020	3.8730	3.8616	--------	3.8189	3.8124	.0065	3.7708	2B	3.785	3.803	3.8209	3.8294	.0085	3.8750
		3A	.0000	3.8750	3.8636	--------	3.8209	3.8160	.0049	3.7728	3B	3.7850	3.7948	3.8209	3.8273	.0064	3.8750
3.875–16	UN	2A	.0018	3.8732	3.8638	--------	3.8326	3.8267	.0059	3.7965	2B	3.807	3.821	3.8344	3.8420	.0076	3.8750
		3A	.0000	3.8750	3.8656	--------	3.8344	3.8300	.0044	3.7983	3B	3.8070	3.8158	3.8344	3.8401	.0057	3.8750

See footnotes at end of table.

TABLE 2.21. *Standard series limits of size—Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
4.000-4	UNC	1A	0.0034	3.9966	3.9609	--------	3.8342	3.8172	0.0170	3.6899	1B	3.729	3.767	3.8376	3.8597	0.0221	4.0000
		2A	.0034	3.9966	3.9728	3.9609	3.8342	3.8229	.0113	3.6899	2B	3.729	3.767	3.8376	3.8523	.0147	4.0000
		3A	.0000	4.0000	3.9762	--------	3.8376	3.8291	.0085	3.6933	3B	3.7290	3.7594	3.8376	3.8487	.0111	4.0000
4.000-6	UN	2A	.0030	3.9970	3.9788	--------	3.8887	3.8788	.0099	3.7925	2B	3.820	3.850	3.8917	3.9046	.0129	4.0000
		3A	.0000	4.0000	3.9818	--------	3.8917	3.8843	.0074	3.7955	3B	3.8200	3.8396	3.8917	3.9014	.0097	4.0000
4.000-8	UN	2A	.0027	3.9973	3.9823	3.9748	3.9161	3.9070	.0091	3.8439	2B	3.865	3.890	3.9188	3.9307	.0119	4.0000
		3A	.0000	4.0000	3.9850	--------	3.9188	3.9120	.0068	3.8466	3B	3.8650	3.8798	3.9188	3.9277	.0089	4.0000
4.000-12	UN	2A	.0020	3.9980	3.9866	--------	3.9439	3.9374	.0065	3.8958	2B	3.910	3.928	3.9459	3.9544	.0085	4.0000
		3A	.0000	4.0000	3.9886	--------	3.9459	3.9410	.0049	3.8978	3B	3.9100	3.9198	3.9459	3.9523	.0064	4.0000
4.000-16	UN	2A	.0018	3.9982	3.9888	--------	3.9576	3.9517	.0059	3.9215	2B	3.932	3.946	3.9594	3.9670	.0076	4.0000
		3A	.0000	4.0000	3.9906	--------	3.9594	3.9550	.0044	3.9233	3B	3.9320	3.9408	3.9594	3.9651	.0057	4.0000
4.125-6	UN	2A	.0030	4.1220	4.1038	--------	4.0137	4.0037	.0100	3.9175	2B	3.945	3.975	4.0167	4.0297	.0130	4.1250
		3A	.0000	4.1250	4.1068	--------	4.0167	4.0092	.0075	3.9205	3B	3.9450	3.9646	4.0167	4.0264	.0097	4.1250
4.125-12	UN	2A	.0020	4.1230	4.1116	--------	4.0689	4.0624	.0065	4.0208	2B	4.035	4.053	4.0709	4.0794	.0085	4.1250
		3A	.0000	4.1250	4.1136	--------	4.0709	4.0660	.0049	4.0228	3B	4.0350	4.0448	4.0709	4.0773	.0064	4.1250
4.125-16	UN	2A	.0018	4.1232	4.1138	--------	4.0826	4.0767	.0059	4.0465	2B	4.057	4.071	4.0844	4.0920	.0076	4.1250
		3A	.0000	4.1250	4.1156	--------	4.0844	4.0800	.0044	4.0483	3B	4.0570	4.0658	4.0844	4.0901	.0057	4.1250
4.250-4	UN	2A	.0034	4.2466	4.2228	--------	4.0842	4.0727	.0115	3.9399	2B	3.979	4.017	4.0876	4.1025	.0149	4.2500
		3A	.0000	4.2500	4.2262	--------	4.0876	4.0790	.0086	3.9433	3B	3.9790	4.0094	4.0876	4.0988	.0112	4.2500
4.250-6	UN	2A	.0030	4.2470	4.2288	--------	4.1387	4.1286	.0101	4.0425	2B	4.070	4.100	4.1417	4.1548	.0131	4.2500
		3A	.0000	4.2500	4.2318	--------	4.1417	4.1342	.0075	4.0455	3B	4.0700	4.0896	4.1417	4.1515	.0098	4.2500
4.250-12	UN	2A	.0020	4.2480	4.2366	--------	4.1939	4.1874	.0065	4.1458	2B	4.160	4.178	4.1959	4.2044	.0085	4.2500
		3A	.0000	4.2500	4.2386	--------	4.1959	4.1910	.0049	4.1478	3B	4.1600	4.1698	4.1959	4.2023	.0064	4.2500
4.250-16	UN	2A	.0018	4.2482	4.2388	--------	4.2076	4.2017	.0059	4.1715	2B	4.182	4.196	4.2094	4.2170	.0076	4.2500
		3A	.0000	4.2500	4.2406	--------	4.2094	4.2050	.0044	4.1733	3B	4.1820	4.1908	4.2094	4.2151	.0057	4.2500
4.375-6	UN	2A	.0030	4.3720	4.3538	--------	4.2637	4.2536	.0101	4.1675	2B	4.195	4.225	4.2667	4.2799	.0132	4.3750
		3A	.0000	4.3750	4.3568	--------	4.2667	4.2591	.0076	4.1705	3B	4.1950	4.2146	4.2667	4.2766	.0099	4.3750
4.375-12	UN	2A	.0020	4.3730	4.3616	--------	4.3189	4.3124	.0065	4.2708	2B	4.285	4.303	4.3209	4.3294	.0085	4.3750
		3A	.0000	4.3750	4.3636	--------	4.3209	4.3160	.0049	4.2728	3B	4.2850	4.2948	4.3209	4.3273	.0064	4.3750
4.375-16	UN	2A	.0018	4.3732	4.3638	--------	4.3326	4.3267	.0059	4.2965	2B	4.307	4.321	4.3344	4.3420	.0076	4.3750
		3A	.0000	4.3750	4.3656	--------	4.3344	4.3300	.0044	4.2983	3B	4.3070	4.3158	4.3344	4.3401	.0057	4.3750
4.500-4	UN	2A	.0035	4.4965	4.4727	--------	4.3341	4.3225	.0116	4.1898	2B	4.229	4.267	4.3376	4.3527	.0151	4.5000
		3A	.0000	4.5000	4.4762	--------	4.3376	4.3289	.0087	4.1933	3B	4.2290	4.2594	4.3376	4.3489	.0113	4.5000
4.500-6	UN	2A	.0031	4.4969	4.4787	--------	4.3886	4.3784	.0102	4.2924	2B	4.320	4.350	4.3917	4.4050	.0133	4.5000
		3A	.0000	4.5000	4.4818	--------	4.3917	4.3840	.0077	4.2955	3B	4.3200	4.3396	4.3917	4.4016	.0099	4.5000
4.500-12	UN	2A	.0020	4.4980	4.4866	--------	4.4439	4.4374	.0065	4.3958	2B	4.410	4.428	4.4459	4.4544	.0085	4.5000
		3A	.0000	4.5000	4.4886	--------	4.4459	4.4410	.0049	4.3978	3B	4.4100	4.4198	4.4459	4.4523	.0064	4.5000
4.500-16	UN	2A	.0018	4.4982	4.4888	--------	4.4576	4.4517	.0059	4.4215	2B	4.432	4.446	4.4594	4.4670	.0076	4.5000
		3A	.0000	4.5000	4.4906	--------	4.4594	4.4550	.0044	4.4233	3B	4.4320	4.4408	4.4594	4.4651	.0057	4.5000
4.625-6	UN	2A	.0031	4.6219	4.6037	--------	4.5136	4.5033	.0103	4.4174	2B	4.445	4.475	4.5167	4.5300	.0133	4.6250
		3A	.0000	4.6250	4.6068	--------	4.5167	4.5090	.0077	4.4205	3B	4.4450	4.4646	4.5167	4.5267	.0100	4.6250
4.625-12	UN	2A	.0020	4.6230	4.6116	--------	4.5689	4.5622	.0067	4.5208	2B	4.535	4.553	4.5709	4.5796	.0087	4.6250
		3A	.0000	4.6250	4.6136	--------	4.5709	4.5659	.0050	4.5228	3B	4.5350	4.5448	4.5709	4.5775	.0066	4.6250
4.625-16	UN	2A	.0018	4.6232	4.6138	--------	4.5826	4.5765	.0061	4.5465	2B	4.557	4.571	4.5844	4.5923	.0079	4.6250
		3A	.0000	4.6250	4.6156	--------	4.5844	4.5799	.0045	4.5483	3B	4.5570	4.5658	4.5844	4.5903	.0059	4.6250
4.750-4	UN	2A	.0035	4.7465	4.7227	--------	4.5841	4.5724	.0117	4.4398	2B	4.479	4.517	4.5876	4.6029	.0153	4.7500
		3A	.0000	4.7500	4.7262	--------	4.5876	4.5788	.0088	4.4433	3B	4.4790	4.5094	4.5876	4.5990	.0114	4.7500
4.750-6	UN	2A	.0031	4.7469	4.7287	--------	4.6386	4.6283	.0103	4.5424	2B	4.570	4.600	4.6417	4.6551	.0134	4.7500
		3A	.0000	4.7500	4.7318	--------	4.6417	4.6340	.0077	4.5455	3B	4.5700	4.5896	4.6417	4.6518	.0101	4.7500
4.750-12	UN	2A	.0020	4.7480	4.7366	--------	4.6939	4.6872	.0067	4.6458	2B	4.660	4.678	4.6959	4.7046	.0087	4.7500
		3A	.0000	4.7500	4.7386	--------	4.6959	4.6909	.0050	4.6478	3B	4.6600	4.6698	4.6959	4.7025	.0066	4.7500
4.750-16	UN	2A	.0018	4.7482	4.7388	--------	4.7076	4.7015	.0061	4.6715	2B	4.682	4.696	4.7094	4.7173	.0079	4.7500
		3A	.0000	4.7500	4.7406	--------	4.7094	4.7049	.0045	4.6733	3B	4.6820	4.6908	4.7094	4.7153	.0059	4.7500
4.875-6	UN	2A	.0031	4.8719	4.8537	--------	4.7636	4.7532	.0104	4.6674	2B	4.695	4.725	4.7667	4.7802	.0135	4.8750
		3A	.0000	4.8750	4.8568	--------	4.7667	4.7589	.0078	4.6705	3B	4.6950	4.7146	4.7667	4.7768	.0101	4.8750
4.875-12	UN	2A	.0020	4.8730	4.8616	--------	4.8189	4.8122	.0067	4.7708	2B	4.785	4.803	4.8209	4.8296	.0087	4.8750
		3A	.0000	4.8750	4.8636	--------	4.8209	4.8159	.0050	4.7728	3B	4.7850	4.7948	4.8209	4.8275	.0066	4.8750

See footnotes at end of table.

TABLE 2.21. *Standard series limits of size—Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
4.875-16	UN	2A	0.0018	4.8732	4.8638	--------	4.8326	4.8265	0.0061	4.7965	2B	4.807	4.821	4.8344	4.8423	0.0079	4.8750
		3A	.0000	4.8750	4.8656	--------	4.8344	4.8299	.0045	4.7983	3B	4.8070	4.8158	4.8344	4.8403	.0059	4.8750
5.000-4	UN	2A	.0036	4.9964	4.9726	--------	4.8340	4.8221	.0119	4.6897	2B	4.729	4.767	4.8376	4.8530	.0154	5.0000
		3A	.0000	5.0000	4.9762	--------	4.8376	4.8287	.0089	4.6933	3B	4.7290	4.7594	4.8376	4.8492	.0116	5.0000
5.000-6	UN	2A	.0031	4.9969	4.9787	--------	4.8886	4.8781	.0105	4.7924	2B	4.820	4.850	4.8917	4.9053	.0136	5.0000
		3A	.0000	5.0000	4.9818	--------	4.8917	4.8839	.0078	4.7955	3B	4.8200	4.8396	4.8917	4.9019	.0102	5.0000
5.000-12	UN	2A	.0020	4.9980	4.9866	--------	4.9439	4.9372	.0067	4.8958	2B	4.910	4.928	4.9459	4.9546	.0087	5.0000
		3A	.0000	5.0000	4.9886	--------	4.9459	4.9409	.0050	4.8978	3B	4.9100	4.9198	4.9459	4.9525	.0066	5.0000
5.000-16	UN	2A	.0018	4.9982	4.9888	--------	4.9576	4.9515	.0061	4.9215	2B	4.932	4.946	4.9594	4.9673	.0079	5.0000
		3A	.0000	5.0000	4.9906	--------	4.9594	4.9549	.0045	4.9233	3B	4.9320	4.9408	4.9594	4.9653	.0059	5.0000
5.125-12	UN	2A	.0020	5.1230	5.1116	--------	5.0689	5.0622	.0067	5.0208	2B	5.035	5.053	5.0709	5.0796	.0087	5.1250
		3A	.0000	5.1250	5.1136	--------	5.0709	5.0659	.0050	5.0228	3B	5.0350	5.0448	5.0709	5.0775	.0066	5.1250
5.125-16	UN	2A	.0018	5.1232	5.1138	--------	5.0826	5.0765	.0061	5.0465	2B	5.057	5.071	5.0844	5.0923	.0079	5.1250
		3A	.0000	5.1250	5.1156	--------	5.0844	5.0799	.0045	5.0483	3B	5.0570	5.0658	4.0844	5.0903	.0059	5.1250
5.250-4	UN	2A	.0036	5.2464	5.2226	--------	5.0840	5.0720	.0120	4.9397	2B	4.979	5.017	5.0876	5.1032	.0156	5.2500
		3A	.0000	5.2500	5.2262	--------	5.0876	5.0786	.0090	4.9433	3B	4.9790	5.0094	5.0876	5.0993	.0117	5.2500
5.250-12	UN	2A	.0020	5.2480	5.2366	--------	5.1939	5.1872	.0067	5.1458	2B	5.160	5.178	5.1959	5.2046	.0087	5.2500
		3A	.0000	5.2500	5.2386	--------	5.1959	5.1909	.0050	5.1478	3B	5.1600	5.1698	5.1959	5.2025	.0066	5.2500
5.250-16	UN	2A	.0018	5.2482	5.2388	--------	5.2076	5.2015	.0061	5.1715	2B	5.182	5.196	5.2094	5.2173	.0079	5.2500
		3A	.0000	5.2500	5.2406	--------	5.2094	5.2049	.0045	5.1733	3B	5.1820	5.1908	5.2094	5.2153	.0059	5.2500
5.375-12	UN	2A	.0020	5.3730	5.3616	--------	5.3189	5.3122	.0067	5.2708	2B	5.285	5.303	5.3209	5.3296	.0087	5.3750
		3A	.0000	5.3750	5.3636	--------	5.3209	5.3159	.0050	5.2728	3B	5.2850	5.2948	5.3209	5.3275	.0066	5.3750
5.375-16	UN	2A	.0018	5.3732	5.3638	--------	5.3326	5.3265	.0061	5.2965	2B	5.307	5.321	5.3344	5.3423	.0079	5.3750
		3A	.0000	5.3750	5.3656	--------	5.3344	5.3299	.0045	5.2983	3B	5.3070	5.3158	5.3344	5.3403	.0059	5.3750
5.500-4	UN	2A	.0036	5.4964	5.4726	--------	5.3340	5.3219	.0121	5.1897	2B	5.229	5.267	5.3376	5.3534	.0158	5.5000
		3A	.0000	5.5000	5.4762	--------	5.3376	5.3285	.0091	5.1933	3B	5.2290	5.2594	5.3376	5.3494	.0118	5.5000
5.500-12	UN	2A	.0020	5.4980	5.4866	--------	5.4439	5.4372	.0067	5.3958	2B	5.410	5.428	5.4459	5.4546	.0087	5.5000
		3A	.0000	5.5000	5.4886	--------	5.4459	5.4409	.0050	5.3978	3B	5.4100	5.4198	5.4459	5.4525	.0066	5.5000
5.500-16	UN	2A	.0018	5.4982	5.4888	--------	5.4576	5.4515	.0061	5.4215	2B	5.432	5.446	5.4594	5.4673	.0079	5.5000
		3A	.0000	5.5000	5.4906	--------	5.4594	5.4549	.0045	5.4233	3B	5.4320	5.4408	5.4594	5.4653	.0059	5.5000
5.625-12	UN	2A	.0021	5.6229	5.6115	--------	5.5688	5.5619	.0069	5.5207	2B	5.535	5.553	5.5709	5.5799	.0090	5.6250
		3A	.0000	5.6250	5.6136	--------	5.5709	5.5657	.0052	5.5228	3B	5.5350	5.5448	5.5709	5.5776	.0067	5.6250
5.625-16	UN	2A	.0019	5.6231	5.6137	--------	5.5825	5.5763	.0062	5.5464	2B	5.557	5.571	5.5844	5.5925	.0081	5.6250
		3A	.0000	5.6250	5.6156	--------	5.5844	5.5797	.0047	5.5483	2B	5.5570	5.5658	5.5844	5.5905	.0061	5.6250
5.750-4	UN	2A	.0037	5.7463	5.7225	--------	5.5839	5.5717	.0122	5.4396	2B	5.479	5.517	5.5876	5.6035	.0159	5.7500
		3A	.0000	5.7500	5.7262	--------	5.5876	5.5784	.0092	5.4433	3B	5.4790	5.5094	5.5876	5.5995	.0119	5.7500
5.750-12	UN	2A	.0021	5.7479	5.7365	--------	5.6938	5.6869	.0069	5.6457	2B	5.660	5.678	5.6959	5.7049	.0090	5.7500
		3A	.0000	5.7500	5.7386	--------	5.6959	5.6907	.0052	5.6478	3B	5.6600	5.6698	5.6959	5.7026	.0067	5.7500
5.750-16	UN	2A	.0019	5.7481	5.7387	--------	5.7075	5.7013	.0062	5.6714	2B	5.682	5.696	5.7094	5.7175	.0081	5.7500
		3A	.0000	5.7500	5.7406	--------	5.7094	5.7047	.0047	5.6733	3B	5.6820	5.6908	5.7094	5.7155	.0061	5.7500
5.875-12	UN	2A	.0021	5.8729	5.8615	--------	5.8188	5.8119	.0069	5.7707	2B	5.785	5.803	5.8209	5.8299	.0090	5.8750
		3A	.0000	5.8750	5.8636	--------	5.8209	5.8157	.0052	5.7728	3B	5.7850	5.7948	5.8200	5.8276	.0067	5.8750
5.875-16	UN	2A	.0019	5.8731	5.8637	--------	5.8325	5.8263	.0062	5.7964	2B	5.807	5.821	5.8344	5.8425	.0081	5.8750
		3A	.0000	5.8750	5.8656	--------	5.8344	5.8297	.0047	5.7983	3B	5.8070	5.8158	5.8344	5.8405	.0061	5.8750
6.000-4	UN	2A	.0037	5.9963	5.9725	--------	5.8338	5.8215	.0124	5.6896	2B	5.729	5.767	5.8376	5.8537	.0161	6.0000
		3A	.0000	6.0000	5.9762	--------	5.8376	5.8283	.0093	5.6933	3B	5.7290	5.7594	5.8376	5.8496	.0120	6.0000
6.000-12	UN	2A	.0021	5.9979	5.9865	--------	5.9438	5.9369	.0069	5.8957	2B	5.910	5.928	5.9459	5.9549	.0090	6.0000
		3A	.0000	6.0000	5.9886	--------	5.9459	5.9407	.0052	5.8978	3B	5.9100	5.9198	5.9459	5.9526	.0067	6.0000
6.000-16	UN	2A	.0019	5.9981	5.9887	--------	5.9575	5.9513	.0062	5.9214	2B	5.932	5.946	5.9594	5.9675	.0081	6.0000
		3A	.0000	6.0000	5.9906	--------	5.9594	5.9547	.0047	5.9233	3B	5.9320	5.9408	5.9594	5.9655	.0061	6.0000

[a] Regarding combinations of thread classes, see par. 4, Thread classes, p. 2.17.
[b] For class 2A threads having an additive finish the maximum is increased to the basic size, the value being the same as for class 3A shown in this column. See par. 4.2, p. 2.17, and par. 9, p. 2.22.
[c] For unfinished hot-rolled material.
[d] See figs. 2.3, 2.5, and 2.6.
NOTE: See par. 11 Limits of Size, p. 2.25.

TABLE 2.22. *Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified screw threads*

Nominal size and threads per inch	Series designation	External					Internal				
		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
			in	*in*	*deg*	*min*		*in*	*in*	*deg*	*min*
.060-80	UNF	2A	0.00090	0.00052	3	18	2B	0.00115	0.00066	4	13
		3A	.00065	.00038	2	23	3B	.00085	.00049	3	7
.073-64	UNC	2A	.00100	.00058	2	56	2B	.00130	.00075	3	48
		3A	.00075	.00043	2	12	3B	.00095	.00055	2	47
.073-72	UNF	2A	.00095	.00055	3	8	2B	.00125	.00072	4	7
		3A	.00070	.00040	2	19	3B	.00095	.00055	3	8
.086-56	UNC	2A	.00105	.00061	2	42	2B	.00140	.00081	3	35
		3A	.00080	.00046	2	3	3B	.00105	.00061	2	42
.086-64	UNF	2A	.00100	.00058	2	56	2B	.00135	.00078	3	57
		3A	.00075	.00043	2	12	3B	.00100	.00058	2	56
.099-48	UNC	2A	.00115	.00066	2	32	2B	.00150	.00087	3	18
		3A	.00085	.00049	1	52	3B	.00110	.00064	2	25
.099-56	UNF	2A	.00110	.00064	2	49	2B	.00140	.00081	3	35
		3A	.00080	.00046	2	3	3B	.00105	.00061	2	42
.112-40	UNC	2A	.00125	.00072	2	17	2B	.00165	.00095	3	1
		3A	.00095	.00055	1	44	3B	.00120	.00069	2	12
.112-48	UNF	2A	.00120	.00069	2	38	2B	.00155	.00089	3	24
		3A	.00090	.00052	1	59	3B	.00115	.00066	2	32
.125-40	UNC	2A	.00130	.00075	2	23	2B	.00165	.00095	3	1
		3A	.00095	.00055	1	44	3B	.00125	.00072	2	17
.125-44	UNF	2A	.00125	.00072	2	31	2B	.00160	.00092	3	13
		3A	.00095	.00055	1	55	3B	.00120	.00069	2	25
.138-32	UNC	2A	.00140	.00081	2	3	2B	.00185	.00107	2	43
		3A	.00105	.00061	1	32	3B	.00135	.00078	1	59
.138-40	UNF	2A	.00130	.00075	2	23	2B	.00170	.00098	3	7
		3A	.00100	.00058	1	50	3B	.00125	.00072	2	17
.164-32	UNC	2A	.00145	.00084	2	8	2B	.00190	.00110	2	47
		3A	.00110	.00064	1	37	3B	.00140	.00081	2	3
.164-36	UNF	2A	.00140	.00081	2	19	2B	.00180	.00104	2	58
		3A	.00105	.00061	1	44	3B	.00135	.00078	2	14
.190-24	UNC	2A	.00165	.00095	1	49	2B	.00215	.00124	2	22
		3A	.00125	.00072	1	22	3B	.00160	.00092	1	46
.190-32	UNF	2A	.00150	.00087	2	12	2B	.00195	.00113	2	51
		3A	.00115	.00066	1	41	3B	.00145	.00084	2	8
.216-24	UNC	2A	.00170	.00098	1	52	2B	.00220	.00127	2	25
		3A	.00130	.00075	1	26	3B	.00165	.00095	1	49
.216-28	UNF	2A	.00160	.00092	2	3	2B	.00210	.00121	2	42
		3A	.00120	.00069	1	32	3B	.00155	.00089	1	59
.216-32	UNEF	2A	.00155	.00089	2	16	2B	.00205	.00118	3	0
		3A	.00120	.00069	1	46	3B	.00155	.00089	2	16
.250-20	UNC	1A	.00280	.00162	2	34	1B	.00365	.00211	3	21
		2A	.00185	.00107	1	42	2B	.00245	.00141	2	15
		3A	.00140	.00081	1	17	3B	.00180	.00104	1	39
.250-28	UNF	1A	.00250	.00144	3	12	1B	.00325	.00188	4	10
		2A	.00165	.00095	2	7	2B	.00215	.00124	2	45
		3A	.00125	.00072	1	36	3B	.00160	.00092	2	3
.250-32	UNEF	2A	.00160	.00092	2	21	2B	.00210	.00121	3	5
		3A	.00120	.00069	1	46	3B	.00155	.00089	2	16
.3125-18	UNC	1A	.00305	.00176	2	31	1B	.00395	.00228	3	15
		2A	.00200	.00115	1	39	2B	.00265	.00153	2	11
		3A	.00150	.00087	1	14	3B	.00195	.00113	1	37
.3125-20	UN	2A	.00200	.00115	1	50	2B	.00260	.00150	2	23
		3A	.00150	.00087	1	22	3B	.00195	.00113	1	47
.3125-24	UNF	1A	.00275	.00159	3	1	1B	.00355	.00205	3	54
		2A	.00185	.00107	2	2	2B	.00240	.00139	2	38
		3A	.00135	.00078	1	29	3B	.00180	.00104	1	59
.3125-28	UN	2A	.00170	.00098	2	11	2B	.00220	.00127	2	49
		3A	.00130	.00075	1	40	3B	.00165	.00095	2	7

TABLE 2.22. *Deviations in lead and half-angle equivalent to one-half of pitch diamter tolerances, Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External					Internal				
		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
			in	*in*	*deg*	*min*		*in*	*in*	*deg*	*min*
.3125-32	UNEF	2A	.00160	.00092	2	21	2B	.00210	.00121	3	5
		3A	.00120	.00069	1	46	3B	.00155	.00089	2	16
.375-16	UNC	1A	.00325	.00188	2	23	1B	.00425	.00245	3	7
		2A	.00220	.00127	1	37	2B	.00285	.00165	2	5
		3A	.00165	.00095	1	13	3B	.00215	.00124	1	35
.375-20	UN	2A	.00205	.00118	1	53	2B	.00270	.00156	2	28
		3A	.00155	.00089	1	25	3B	.00200	.00115	1	50
.375-24	UNF	1A	.00285	.00165	3	8	1B	.00370	.00214	4	4
		2A	.00190	.00110	2	5	2B	.00245	.00141	2	42
		3A	.00145	.00084	1	36	3B	.00185	.00107	2	2
.375-28	UN	2A	.00180	.00104	2	19	2B	.00230	.00133	2	57
		3A	.00135	.00078	1	44	3B	.00175	.00101	2	15
.375-32	UNEF	2A	.00170	.00098	2	30	2B	.00220	.00127	3	13
		3A	.00125	.00072	1	50	3B	.00165	.00095	2	25
.4375-14	UNC	1A	.00355	.00205	2	17	1B	.00460	.00266	2	57
		2A	.00235	.00136	1	30	2B	.00305	.00176	1	57
		3A	.00175	.00101	1	7	3B	.00230	.00133	1	29
.4375-16	UN	2A	.00230	.00133	1	41	2B	.00295	.00170	2	10
		3A	.00170	.00098	1	15	3B	.00225	.00130	1	39
.4375-20	UNF	1A	.00315	.00182	2	53	1B	.00405	.00234	3	42
		2A	.00210	.00121	1	55	2B	.00270	.00156	2	28
		3A	.00155	.00089	1	25	3B	.00205	.00118	1	53
.4375-28	UNEF	2A	.00180	.00104	2	19	2B	.00230	.00133	2	57
		3A	.00135	.00078	1	44	3B	.00175	.00101	2	15
.4375-32	UN	2A	.00170	.00098	2	30	2B	.00220	.00127	3	13
		3A	.00125	.00072	1	50	3B	.00165	.00095	2	25
.500-13	UNC	1A	.00370	.00214	2	12	1B	.00485	.00280	2	53
		2A	.00250	.00144	1	29	2B	.00325	.00188	1	56
		3A	.00185	.00107	1	6	3B	.00240	.00139	1	26
.500-16	UN	2A	.00235	.00136	1	43	2B	.00305	.00176	2	14
		3A	.00175	.00101	1	17	3B	.00230	.00133	1	41
.500-20	UNF	1A	.00320	.00185	2	56	1B	.00420	.00242	3	51
		2A	.00215	.00124	1	58	2B	.00280	.00162	2	34
		3A	.00160	.00092	1	28	3B	.00210	.00121	1	55
.500-28	UNEF	2A	.00185	.00107	2	22	2B	.00240	.00139	3	5
		3A	.00140	.00081	1	48	3B	.00180	.00104	2	19
.500-32	UN	2A	.00175	.00101	2	34	2B	.00225	.00130	3	18
		3A	.00130	.00075	1	54	3B	.00170	.00098	2	30
.5625-12	UNC	1A	.00390	.00225	2	9	1B	.00510	.00294	2	48
		2A	.00260	.00150	1	26	2B	.00340	.00196	1	52
		3A	.00195	.00113	1	4	3B	.00255	.00147	1	24
.5625-16	UN	2A	.00235	.00136	1	43	2B	.00305	.00176	2	14
		3A	.00175	.00101	1	17	3B	.00230	.00133	1	41
.5625-18	UNF	1A	.00340	.00196	2	48	1B	.00445	.00257	3	40
		2A	.00225	.00130	1	51	2B	.00295	.00170	2	26
		3A	.00170	.00098	1	24	3B	.00220	.00127	1	49
.5625-20	UN	2A	.00210	.00121	1	55	2B	.00275	.00159	2	31
		3A	.00160	.00092	1	28	3B	.00205	.00118	1	53
.5625-24	UNEF	2A	.00195	.00113	2	9	2B	.00255	.00147	2	48
		3A	.00145	.00084	1	36	3B	.00190	.00110	2	5
.5625-28	UN	2A	.00185	.00107	2	22	2B	.00240	.00139	3	5
		3A	.00140	.00081	1	48	3B	.00180	.00104	2	19
.5625-32	UN	2A	.00175	.00101	2	34	2B	.00225	.00130	3	18
		3A	.00130	.00075	1	54	3B	.00170	.00098	2	30
.625-11	UNC	1A	.00415	.00240	2	5	1B	.00535	.00309	2	42
		2A	.00275	.00159	1	23	2B	.00360	.00208	1	49
		3A	.00205	.00118	1	2	3B	.00270	.00156	1	22
.625-12	UN	2A	.00270	.00156	1	29	2B	.00355	.00205	1	57
		3A	.00205	.00118	1	8	3B	.00265	.00153	1	27

TABLE 2.22. *Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External					Internal				
		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
			in	*in*	*deg*	*min*		*in*	*in*	*deg*	*min*
.625-16	UN	2A	.00240	.00139	1	46	2B	.00310	.00179	2	16
		3A	.00180	.00104	1	19	3B	.00230	.00133	1	41
.625-18	UNF	1A	.00350	.00202	2	53	1B	.00455	.00263	3	45
		2A	.00235	.00136	1	56	2B	.00300	.00173	2	28
		3A	.00175	.00101	1	27	3B	.00225	.00130	1	51
.625-20	UN	2A	.00215	.00124	1	58	2B	.00280	.00162	2	34
		3A	.00160	.00092	1	28	3B	.00210	.00121	1	55
.625-24	UNEF	2A	.00200	.00115	2	12	2B	.00260	.00150	2	51
		3A	.00150	.00087	1	39	3B	.00195	.00113	2	9
.625-28	UN	2A	.00190	.00110	2	26	2B	.00245	.00141	3	8
		3A	.00140	.00081	1	48	3B	.00185	.00107	2	22
.625-32	UN	2A	.00180	.00104	2	38	2B	.00230	.00133	3	22
		3A	.00135	.00078	1	59	3B	.00175	.00101	2	34
.6875-12	UN	2A	.00270	.00156	1	29	2B	.00355	.00205	1	57
		3A	.00205	.00118	1	8	3B	.00265	.00153	1	27
.6875-16	UN	2A	.00240	.00139	1	46	2B	.00310	.00179	2	16
		3A	.00180	.00104	1	19	3B	.00230	.00133	1	41
.6875-20	UN	2A	.00215	.00124	1	58	2B	.00280	.00162	2	34
		3A	.00160	.00092	1	28	3B	.00210	.00121	1	55
.6875-24	UNEF	2A	.00200	.00115	2	12	2B	.00260	.00150	2	51
		3A	.00150	.00087	1	39	3B	.00195	.00113	2	9
.6875-28	UN	2A	.00190	.00110	2	26	2B	.00245	.00141	3	8
		3A	.00140	.00081	1	48	3B	.00185	.00107	2	22
.6875-32	UN	2A	.00180	.00104	2	38	2B	.00230	.00133	3	22
		3A	.00135	.00078	1	59	3B	.00175	.00101	2	34
.750-10	UNC	1A	.00440	.00254	2	1	1B	.00575	.00332	2	38
		2A	.00295	.00170	1	21	2B	.00385	.00222	1	46
		3A	.00220	.00127	1	0	3B	.00285	.00165	1	18
.750-12	UN	2A	.00275	.00159	1	31	2B	.00360	.00208	1	59
		3A	.00205	.00118	1	8	3B	.00270	.00156	1	29
.750-16	UNF	1A	.00375	.00217	2	45	1B	.00490	.00283	3	35
		2A	.00250	.00144	1	50	2B	.00325	.00188	2	23
		3A	.00190	.00110	1	24	3B	.00245	.00141	1	48
.750-20	UNEF	2A	.00220	.00127	2	1	2B	.00285	.00165	2	37
		3A	.00165	.00095	1	31	3B	.00215	.00124	1	58
.750-28	UN	2A	.00190	.00110	2	26	2B	.00250	.00144	3	12
		3A	.00145	.00084	1	52	3B	.00185	.00107	2	22
.750-32	UN	2A	.00180	.00104	2	38	2B	.00235	.00136	3	27
		3A	.00135	.00078	1	59	3B	.00180	.00104	2	38
.8125-12	UN	2A	.00275	.00159	1	31	2B	.00360	.00208	1	59
		3A	.00205	.00118	1	8	3B	.00270	.00156	1	29
.8125-16	UN	2A	.00245	.00141	1	48	2B	.00315	.00182	2	19
		3A	.00180	.00104	1	19	3B	.00235	.00136	1	43
.8125-20	UNEF	2A	.00220	.00127	2	1	2B	.00285	.00165	2	37
		3A	.00165	.00095	1	31	3B	.00215	.00124	1	58
.8125-28	UN	2A	.00190	.00110	2	26	2B	.00250	.00144	3	12
		3A	.00145	.00084	1	52	3B	.00185	.00107	2	22
.8125-32	UN	2A	.00180	.00104	2	38	2B	.00235	.00136	3	27
		3A	.00135	.00078	1	59	3B	.00180	.00104	2	38
.875-9	UNC	1A	.00475	.00274	1	58	1B	.00615	.00355	2	32
		2A	.00315	.00182	1	18	2B	.00410	.00237	1	41
		3A	.00235	.00136	0	58	3B	.00305	.00176	1	15
.875-12	UN	2A	.00275	.00159	1	31	2B	.00360	.00208	1	59
		3A	.00205	.00118	1	8	3B	.00270	.00156	1	29
.875-14	UNF	1A	.00405	.00234	2	36	1B	.00530	.00306	3	24
		2A	.00270	.00156	1	44	2B	.00350	.00202	2	15
		3A	.00205	.00118	1	19	3B	.00265	.00153	1	42
.875-16	UN	2A	.00245	.00141	1	48	2B	.00315	.00182	2	19
		3A	.00180	.00104	1	19	3B	.00235	.00136	1	43

TABLE 2.22. *Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External					Internal				
		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
			in	*in*	*deg*	*min*		*in*	*in*	*deg*	*min*
.875-20	UNEF	2A	.00220	.00127	2	1	2B	.00285	.00165	2	37
		3A	.00165	.00095	1	31	3B	.00215	.00124	1	58
.875-28	UN	2A	.00190	.00110	2	26	2B	.00250	.00144	3	12
		3A	.00145	.00084	1	52	3B	.00185	.00107	2	22
.875-32	UN	2A	.00180	.00104	2	38	2B	.00235	.00136	3	27
		3A	.00135	.00078	1	59	3B	.00180	.00104	2	38
.9375-12	UN	2A	.00285	.00165	1	34	2B	.00370	.00214	2	2
		3A	.00210	.00121	1	9	3B	.00275	.00159	1	31
.9375-16	UN	2A	.00250	.00144	1	50	2B	.00325	.00188	2	23
		3A	.00185	.00107	1	21	3B	.00245	.00141	1	48
.9375-20	UNEF	2A	.00225	.00130	2	4	2B	.00295	.00170	2	42
		3A	.00170	.00098	1	33	3B	.00220	.00127	2	1
.9375-28	UN	2A	.00200	.00115	2	34	2B	.00260	.00150	3	20
		3A	.00150	.00087	1	55	3B	.00195	.00113	2	30
.9375-32	UN	2A	.00190	.00110	2	47	2B	.00245	.00141	3	35
		3A	.00140	.00081	2	3	3B	.00185	.00107	2	43
1.000-8	UNC	1A	.00505	.00292	1	51	1B	.00660	.00381	2	25
		2A	.00340	.00196	1	15	2B	.00440	.00254	1	37
		3A	.00255	.00147	0	56	3B	.00330	.00191	1	13
1.000-12	UNF	1A	.00440	.00254	2	25	1B	.00570	.00329	3	8
		2A	.00295	.00170	1	37	2B	.00380	.00219	2	5
		3A	.00220	.00127	1	13	3B	.00285	.00165	1	34
1.000-16	UN	2A	.00250	.00144	1	50	2B	.00325	.00188	2	23
		3A	.00185	.00107	1	21	3B	.00245	.00141	1	48
1.000-20	UNEF	2A	.00225	.00130	2	4	2B	.00295	.00170	2	42
		3A	.00170	.00098	1	33	3B	.00220	.00127	2	1
1.000-28	UN	2A	.00200	.00115	2	34	2B	.00260	.00150	3	20
		3A	.00150	.00087	1	55	3B	.00195	.00113	2	30
1.000-32	UN	2A	.00190	.00110	2	47	2B	.00245	.00141	3	35
		3A	.00140	.00081	2	3	3B	.00185	.00107	2	43
1.0625-8	UN	2A	.00340	.00196	1	15	2B	.00445	.00257	1	38
		3A	.00255	.00147	0	56	3B	.00335	.00193	1	14
1.0625-12	UN	2A	.00285	.00165	1	34	2B	.00370	.00214	2	2
		3A	.00210	.00121	1	9	3B	.00275	.00159	1	31
1.0625-16	UN	2A	.00250	.00144	1	50	2B	.00325	.00188	2	23
		3A	.00185	.00107	1	21	3B	.00245	.00141	1	48
1.0625-18	UNEF	2A	.00235	.00136	1	56	2B	.00310	.00179	2	33
		3A	.00180	.00104	1	29	3B	.00230	.00133	1	54
1.0625-20	UN	2A	.00225	.00130	2	4	2B	.00295	.00170	2	42
		3A	.00170	.00098	1	33	3B	.00220	.00127	2	1
1.0625-28	UN	2A	.00200	.00115	2	34	2B	.00260	.00150	3	20
		3A	.00150	.00087	1	55	3B	.00195	.00113	2	30
1.125-7	UNC	1A	.00545	.00315	1	45	1B	.00705	.00407	2	16
		2A	.00360	.00208	1	9	2B	.00470	.00271	1	30
		3A	.00270	.00156	0	52	3B	.00355	.00205	1	8
1.125-8	UN	2A	.00345	.00199	1	16	2B	.00450	.00260	1	39
		3A	.00260	.00150	0	57	3B	.00335	.00193	1	14
1.125-12	UNF	1A	.00450	.00260	2	28	1B	.00585	.00338	3	13
		2A	.00300	.00173	1	39	2B	.00390	.00225	2	9
		3A	.00225	.00130	1	14	3B	.00295	.00170	1	37
1.125-16	UN	2A	.00250	.00144	1	50	2B	.00325	.00188	2	23
		3A	.00185	.00107	1	21	3B	.00245	.00141	1	48
1.125-18	UNEF	2A	.00235	.00136	1	56	2B	.00310	.00179	2	33
		3A	.00180	.00104	1	29	3B	.00230	.00133	1	54
1.125-20	UN	2A	.00225	.00130	2	4	2B	.00295	.00170	2	42
		3A	.00170	.00098	1	33	3B	.00220	.00127	2	1

TABLE 2.22. *Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External					Internal				
		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
			in	*in*	*deg*	*min*		*in*	*in*	*deg*	*min*
1.125-28	UN	2A	.00200	.00115	2	34	2B	.00260	.00150	3	20
		3A	.00150	.00087	1	55	3B	.00195	.00113	2	30
1.1875-8	UN	2A	.00350	.00202	1	17	2B	.00455	.00263	1	40
		3A	.00260	.00150	0	57	3B	.00340	.00196	1	15
1.1875-12	UN	2A	.00290	.00167	1	36	2B	.00375	.00217	2	4
		3A	.00215	.00124	1	11	3B	.00280	.00162	1	32
1.1875-16	UN	2A	.00255	.00147	1	52	2B	.00330	.00191	2	25
		3A	.00190	.00110	1	24	3B	.00250	.00144	1	50
1.1875-18	UNEF	2A	.00245	.00141	2	1	2B	.00315	.00182	2	36
		3A	.00180	.00104	1	29	3B	.00235	.00136	1	56
1.1875-20	UN	2A	.00235	.00136	2	9	2B	.00305	.00176	2	48
		3A	.00175	.00101	1	36	3B	.00225	.00130	2	4
1.1875-28	UN	2A	.00205	.00118	2	38	2B	.00265	.00153	3	24
		3A	.00155	.00089	1	59	3B	.00200	.00115	2	34
1.250-7	UNC	1A	.00555	.00320	1	47	1B	.00720	.00416	2	19
		2A	.00370	.00214	1	11	2B	.00480	.00277	1	32
		3A	.00275	.00159	0	53	3B	.00360	.00208	1	9
1.250-8	UN	2A	.00350	.00202	1	17	2B	.00460	.00266	1	41
		3A	.00265	.00153	0	58	3B	.00345	.00199	1	16
1.250-12	UNF	1A	.00460	.00266	2	32	1B	.00600	.00346	3	18
		2A	.00310	.00179	1	42	2B	.00400	.00231	2	12
		3A	.00230	.00133	1	16	3B	.00300	.00173	1	39
1.250-16	UN	2A	.00255	.00147	1	52	2B	.00330	.00191	2	25
		3A	.00190	.00110	1	24	3B	.00250	.00144	1	50
1.250-18	UNEF	2A	.00245	.00141	2	1	2B	.00315	.00182	2	36
		3A	.00180	.00104	1	29	3B	.00235	.00136	1	56
1.250-20	UN	2A	.00235	.00136	2	9	2B	.00305	.00176	2	48
		3A	.00175	.00101	1	36	3B	.00225	.00130	2	4
1.250-28	UN	2A	.00205	.00118	2	38	2B	.00265	.00153	3	24
		3A	.00155	.00089	1	59	3B	.00200	.00115	2	34
1.3125-8	UN	2A	.00355	.00205	1	18	2B	.00460	.00266	1	41
		3A	.00265	.00153	0	58	3B	.00345	.00199	1	16
1.3125-12	UN	2A	.00290	.00167	1	36	2B	.00375	.00217	2	4
		3A	.00215	.00124	1	11	3B	.00280	.00162	1	32
1.3125-16	UN	2A	.00255	.00147	1	52	2B	.00330	.00191	2	25
		3A	.00190	.00110	1	24	3B	.00250	.00144	1	50
1.3125-18	UNEF	2A	.00245	.00141	2	1	2B	.00315	.00182	2	36
		3A	.00180	.00104	1	29	3B	.00235	.00136	1	56
1.3125-20	UN	2A	.00235	.00136	2	9	2B	.00305	.00176	3	48
		3A	.00175	.00101	1	36	3B	.00225	.00130	2	4
1.3125-28	UN	2A	.00205	.00118	2	38	2B	.00265	.00153	3	24
		3A	.00155	.00089	1	59	3B	.00200	.00115	2	34
1.375-6	UNC	1A	.00600	.00346	1	39	1B	.00775	.00447	2	8
		2A	.00400	.00231	1	6	2B	.00520	.00300	1	26
		3A	.00300	.00173	0	50	3B	.00390	.00225	1	4
1.375-8	UN	2A	.00360	.00208	1	19	2B	.00465	.00268	1	42
		3A	.00270	.00156	0	59	3B	.00350	.00202	1	17
1.375-12	UNF	1A	.00470	.00271	2	35	1B	.00615	.00355	3	23
		2A	.00315	.00182	1	44	2B	.00410	.00237	2	15
		3A	.00235	.00136	1	18	3B	.00305	.00176	1	41
1.375-16	UN	2A	.00255	.00147	1	52	2B	.00330	.00191	2	25
		3A	.00190	.00110	1	24	3B	.00250	.00144	1	50
1.375-18	UNEF	2A	.00245	.00141	2	1	2B	.00315	.00182	2	36
		3A	.00180	.00104	1	29	3B	.00235	.00136	1	56

TABLE 2.22. *Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External					Internal				
		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
			in	*in*	*deg*	*min*		*in*	*in*	*deg*	*min*
1.375–20	UN	2A	.00235	.00136	2	9	2B	.00305	.00176	2	48
		3A	.00175	.00101	1	36	3B	.00225	.00130	2	4
1.375–28	UN	2A	.00205	.00118	2	38	2B	.00265	.00153	3	24
		3A	.00155	.00089	1	59	3B	.00200	.00115	2	34
1.4375–6	UN	2A	.00400	.00231	1	6	2B	.00520	.00300	1	26
		3A	.00300	.00173	0	50	3B	.00390	.00225	1	4
1.4375–8	UN	2A	.00360	.00208	1	19	2B	.00470	.00271	1	43
		3A	.00270	.00156	0	59	3B	.00355	.00205	1	18
1.4375–12	UN	2A	.00295	.00170	1	37	2B	.00380	.00219	2	5
		3A	.00220	.00127	1	13	3B	.00285	.00165	1	34
1.4375–16	UN	2A	.00260	.00150	1	54	2B	.00340	.00196	2	30
		3A	.00195	.00113	1	26	3B	.00255	.00147	1	52
1.4375–18	UNEF	2A	.00250	.00144	2	4	2B	.00325	.00188	2	41
		3A	.00185	.00107	1	32	3B	.00240	.00139	1	59
1.4375–20	UN	2A	.00240	.00139	2	12	2B	.00310	.00179	2	50
		3A	.00180	.00104	1	39	3B	.00230	.00133	2	6
1.4375–28	UN	2A	.00210	.00121	2	42	2B	.00275	.00159	3	31
		3A	.00155	.00089	1	59	3B	.00205	.00118	2	38
1.500–6	UNC	1A	.00605	.00349	1	40	1B	.00790	.00456	2	10
		2A	.00405	.00234	1	7	2B	.00525	.00303	1	27
		3A	.00305	.00176	0	50	3B	.00395	.00228	1	5
1.500–8	UN	2A	.00365	.00211	1	20	2B	.00475	.00274	1	44
		3A	.00275	.00159	1	0	3B	.00355	.00205	1	18
1.500–12	UNF	1A	.00480	.00277	2	38	1B	.00625	.00361	3	26
		2A	.00320	.00185	1	46	2B	.00415	.00240	2	17
		3A	.00240	.00139	1	19	3B	.00315	.00182	1	44
1.500–16	UN	2A	.00260	.00150	1	54	2B	.00340	.00196	2	30
		3A	.00195	.00113	1	26	3B	.00255	.00147	1	52
1.500–18	UNEF	2A	.00250	.00144	2	4	2B	.00325	.00188	2	41
		3A	.00185	.00107	1	32	3B	.00240	.00139	1	59
1.500–20	UN	2A	.00240	.00139	2	12	2B	.00310	.00179	2	50
		3A	.00180	.00104	1	39	3B	.00230	.00133	2	6
1.500–28	UN	2A	.00210	.00121	2	42	2B	.00275	.00159	3	31
		3A	.00155	.00089	1	59	3B	.00205	.00118	2	38
1.5625–6	UN	2A	.00410	.00237	1	8	2B	.00530	.00306	1	27
		3A	.00305	.00176	0	50	3B	.00400	.00231	1	6
1.5625–8	UN	2A	.00370	.00214	1	21	2B	.00480	.00277	1	46
		3A	.00275	.00159	1	0	3B	.00360	.00208	1	19
1.5625–12	UN	2A	.00295	.00170	1	37	2B	.00380	.00219	2	5
		3A	.00220	.00127	1	13	3B	.00285	.00165	1	34
1.5625–16	UN	2A	.00260	.00150	1	54	2B	.00340	.00196	2	30
		3A	.00195	.00113	1	26	3B	.00255	.00147	1	52
1.5625–18	UNEF	2A	.00250	.00144	2	4	2B	.00325	.00188	2	41
		3A	.00185	.00107	1	32	3B	.00240	.00139	1	59
1.5625–20	UN	2A	.00240	.00139	2	12	2B	.00310	.00179	2	50
		3A	.00180	.00104	1	39	3B	.00230	.00133	2	6
1.625–6	UN	2A	.00410	.00237	1	8	2B	.00535	.00309	1	28
		3A	.00310	.00179	0	51	3B	.00400	.00231	1	6
1.625–8	UN	2A	.00370	.00214	1	21	2B	.00485	.00280	1	47
		3A	.00280	.00162	1	2	3B	.00360	.00208	1	19
1.625–12	UN	2A	.00295	.00170	1	37	2B	.00380	.00219	2	5
		3A	.00220	.00127	1	13	3B	.00285	.00165	1	34
1.625–16	UN	2A	.00260	.00150	1	54	2B	.00340	.00196	2	30
		3A	.00195	.00113	1	26	3B	.00255	.00147	1	52
1.625–18	UNEF	2A	.00250	.00144	2	4	2B	.00325	.00188	2	41
		3A	.00185	.00107	1	32	3B	.00240	.00139	1	59

TABLE 2.22. *Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External					Internal				
		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
			in	*in*	*deg*	*min*		*in*	*in*	*deg*	*min*
1.625-20	UN	2A	.00240	.00139	2	12	2B	.00310	.00179	2	50
		3A	.00180	.00104	1	39	3B	.00230	.00133	2	6
1.6875-6	UN	2A	.00415	.00240	1	8	2B	.00540	.00312	1	29
		3A	.00310	.00179	0	51	3B	.00405	.00234	1	7
1.6875-8	UN	2A	.00375	.00217	1	22	2B	.00485	.00280	1	47
		3A	.00280	.00162	1	2	3B	.00365	.00211	1	20
1.6875-12	UN	2A	.00300	.00173	1	39	2B	.00390	.00225	2	9
		3A	.00225	.00130	1	14	3B	.00290	.00167	1	36
1.6875-16	UN	2A	.00265	.00153	1	57	2B	.00345	.00199	2	32
		3A	.00200	.00115	1	28	3B	.00260	.00150	1	54
1.6875-18	UNEF	2A	.00255	.00147	2	6	2B	.00330	.00191	2	43
		3A	.00190	.00110	1	34	3B	.00245	.00141	2	1
1.6875-20	UN	2A	.00240	.00139	2	12	2B	.00315	.00182	2	53
		3A	.00180	.00104	1	39	3B	.00235	.00136	2	9
1.750-5	UNC	1A	.00670	.00387	1	32	1B	.00870	.00502	2	0
		2A	.00445	.00257	1	1	2B	.00580	.00335	1	20
		3A	.00335	.00193	0	46	3B	.00435	.00251	1	0
1.750-6	UN	2A	.00415	.00240	1	8	2B	.00540	.00312	1	29
		3A	.00315	.00182	0	52	3B	.00405	.00234	1	7
1.750-8	UN	2A	.00375	.00217	1	22	2B	.00490	.00283	1	48
		3A	.00285	.00165	1	3	3B	.00370	.00214	1	21
1.750-12	UN	2A	.00300	.00173	1	39	2B	.00390	.00225	2	9
		3A	.00225	.00130	1	14	3B	.00290	.00167	1	36
1.750-16	UN	2A	.00265	.00153	1	57	2B	.00345	.00199	2	32
		3A	.00200	.00115	1	28	3B	.00260	.00150	1	54
1.750-20	UN	2A	.00240	.00139	2	12	2B	.00315	.00182	2	53
		3A	.00180	.00104	1	39	3B	.00235	.00136	2	9
1.8125-6	UN	2A	.00420	.00242	1	9	2B	.00545	.00315	1	30
		3A	.00315	.00182	0	52	3B	.00410	.00237	1	8
1.8125-8	UN	2A	.00380	.00219	1	24	2B	.00495	.00286	1	49
		3A	.00285	.00165	1	3	3B	.00370	.00214	1	21
1.8125-12	UN	2A	.00300	.00173	1	39	2B	.00390	.00225	2	9
		3A	.00225	.00130	1	14	3B	.00290	.00167	1	36
1.8125-16	UN	2A	.00265	.00153	1	57	2B	.00345	.00199	2	32
		3A	.00200	.00115	1	28	3B	.00260	.00150	1	54
1.8125-20	UN	2A	.00240	.00139	2	12	2B	.00315	.00182	2	53
		3A	.00180	.00104	1	39	3B	.00235	.00136	2	9
1.875-6	UN	2A	.00420	.00242	1	9	2B	.00550	.00318	1	31
		3A	.00315	.00182	0	52	3B	.00410	.00237	1	8
1.875-8	UN	2A	.00385	.00222	1	25	2B	.00500	.00289	1	50
		3A	.00285	.00165	1	3	3B	.00375	.00217	1	22
1.875-12	UN	2A	.00300	.00173	1	39	2B	.00390	.00225	2	9
		3A	.00225	.00130	1	14	3B	.00290	.00167	1	36
1.875-16	UN	2A	.00265	.00153	1	57	2B	.00345	.00199	2	32
		3A	.00200	.00115	1	28	3B	.00260	.00150	1	54
1.875-20	UN	2A	.00240	.00139	2	12	2B	.00315	.00182	2	53
		3A	.00180	.00104	1	39	3B	.00235	.00136	2	9
1.9375-6	UN	2A	.00425	.00245	1	10	2B	.00555	.00320	1	32
		3A	.00320	.00185	0	53	3B	.00415	.00240	1	8
1.9375-8	UN	2A	.00385	.00222	1	25	2B	.00500	.00289	1	50
		3A	.00290	.00167	1	4	3B	.00375	.00217	1	22
1.9375-12	UN	2A	.00305	.00176	1	41	2B	.00395	.00228	2	10
		3A	.00225	.00130	1	14	3B	.00295	.00170	1	37
1.9375-16	UN	2A	.00270	.00156	1	59	2B	.00350	.00202	2	34
		3A	.00200	.00115	1	28	3B	.00260	.00150	1	54
1.9375-20	UN	2A	.00245	.00141	2	15	2B	.00320	.00185	2	56
		3A	.00185	.00107	1	42	3B	.00240	.00139	2	12

TABLE 2.22. *Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External					Internal				
		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
			in	*in*	*deg*	*min*		*in*	*in*	*deg*	*min*
2.000-4.5	UNC	1A	.00715	.00413	1	28	1B	.00930	.00537	1	55
		2A	.00475	.00274	0	59	2B	.00620	.00358	1	17
		3A	.00355	.00205	0	44	3B	.00465	.00268	0	58
2.000-6	UN	2A	.00430	.00248	1	11	2B	.00555	.00320	1	32
		3A	.00320	.00185	0	53	3B	.00415	.00240	1	8
2.000-8	UN	2A	.00390	.00225	1	26	2B	.00505	.00292	1	51
		3A	.00290	.00167	1	4	3B	.00380	.00219	1	24
2.000-12	UN	2A	.00305	.00176	1	41	2B	.00395	.00228	2	10
		3A	.00225	.00130	1	14	3B	.00295	.00170	1	37
2.000-16	UN	2A	.00270	.00156	1	59	2B	.00350	.00202	2	34
		3A	.00200	.00115	1	28	3B	.00260	.00150	1	54
2.000-20	UN	2A	.00245	.00141	2	15	2B	.00320	.00185	2	56
		3A	.00185	.00107	1	42	3B	.00240	.00139	2	12
2.125-6	UN	2A	.00435	.00251	1	12	2B	.00565	.00326	1	33
		3A	.00325	.00188	0	54	3B	.00420	.00242	1	9
2.125-8	UN	2A	.00395	.00228	1	27	2B	.00510	.00294	1	52
		3A	.00295	.00170	1	5	3B	.00385	.00222	1	25
2.125-12	UN	2A	.00305	.00176	1	41	2B	.00395	.00228	2	10
		3A	.00225	.00130	1	14	3B	.00295	.00170	1	37
2.125-16	UN	2A	.00270	.00156	1	59	2B	.00350	.00202	2	34
		3A	.00200	.00115	1	28	3B	.00260	.00150	1	54
2.125-20	UN	2A	.00245	.00141	2	15	2B	.00320	.00185	2	56
		3A	.00185	.00107	1	42	3B	.00240	.00139	2	12
2.250-4.5	UNC	1A	.00730	.00421	1	30	1B	.00950	.00548	1	58
		2A	.00485	.00280	1	0	2B	.00630	.00364	1	18
		3A	.00365	.00211	0	45	3B	.00475	.00274	0	59
2.250-6	UN	2A	.00440	.00254	1	13	2B	.00570	.00329	1	34
		3A	.00330	.00191	0	54	3B	.00425	.00245	1	10
2.250-8	UN	2A	.00400	.00231	1	28	2B	.00520	.00300	1	54
		3A	.00300	.00173	1	6	3B	.00390	.00225	1	26
2.250-12	UN	2A	.00305	.00176	1	41	2B	.00395	.00228	2	10
		3A	.00225	.00130	1	14	3B	.00295	.00170	1	37
2.250-16	UN	2A	.00270	.00156	1	59	2B	.00350	.00202	2	34
		3A	.00200	.00115	1	28	3B	.00260	.00150	1	54
2.250-20	UN	2A	.00245	.00141	2	15	2B	.00320	.00185	2	56
		3A	.00185	.00107	1	42	3B	.00240	.00139	2	12
2.375-6	UN	2A	.00445	.00257	1	13	2B	.00575	.00332	1	35
		3A	.00330	.00191	0	54	3B	.00430	.00248	1	11
2.375-8	UN	2A	.00405	.00234	1	29	2B	.00525	.00303	1	55
		3A	.00300	.00173	1	6	3B	.00395	.00228	1	27
2.375-12	UN	2A	.00310	.00179	1	42	2B	.00405	.00234	2	14
		3A	.00230	.00133	1	16	3B	.00300	.00173	1	39
2.375-16	UN	2A	.00275	.00159	2	1	2B	.00360	.00208	2	38
		3A	.00205	.00118	1	30	3B	.00270	.00156	1	59
2.375-20	UN	2A	.00255	.00147	2	20	2B	.00330	.00191	3	1
		3A	.00190	.00110	1	44	3B	.00250	.00144	2	17
2.500-4	UNC	1A	.00775	.00447	1	25	1B	.01010	.00583	1	51
		2A	.00520	.00300	0	57	2B	.00675	.00390	1	14
		3A	.00390	.00225	0	43	3B	.00505	.00292	0	56
2.500-6	UN	2A	.00450	.00260	1	14	2B	.00580	.00335	1	36
		3A	.00335	.00193	0	55	3B	.00435	.00251	1	12
2.500-8	UN	2A	.00410	.00237	1	30	2B	.00530	.00306	1	57
		3A	.00305	.00176	1	7	3B	.00400	.00231	1	28
2.500-12	UN	2A	.00310	.00179	1	42	2B	.00405	.00234	2	14
		3A	.00230	.00133	1	16	3B	.00300	.00173	1	39
2.500-16	UN	2A	.00275	.00159	2	1	2B	.00360	.00208	2	38
		3A	.00205	.00118	1	30	3B	.00270	.00156	1	59

TABLE 2.22. *Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External					Internal				
		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
			in	*in*	*deg*	*min*		*in*	*in*	*deg*	*min*
2.500-20	UN	2A	.00255	.00147	2	20	2B	.00330	.00191	3	1
		3A	.00190	.00110	1	44	3B	.00250	.00144	2	17
2.625-6	UN	2A	.00450	.00260	1	14	2B	.00590	.00341	1	37
		3A	.00340	.00196	0	56	3B	.00440	.00254	1	13
2.625-8	UN	2A	.00410	.00237	1	30	2B	.00535	.00309	1	58
		3A	.00310	.00179	1	8	3B	.00400	.00231	1	28
2.625-12	UN	2A	.00310	.00179	1	42	2B	.00405	.00234	2	14
		3A	.00230	.00133	1	16	3B	.00300	.00173	1	39
2.625-16	UN	2A	.00275	.00159	2	1	2B	.00360	.00208	2	38
		3A	.00205	.00118	1	30	3B	.00270	.00156	1	59
2.625-20	UN	2A	.00255	.00147	2	20	2B	.00330	.00191	3	1
		3A	.00190	.00110	1	44	3B	.00250	.00144	2	17
2.750-4	UNC	1A	.00790	.00456	1	27	1B	.01030	.00595	1	53
		2A	.00525	.00303	0	58	2B	.00685	.00395	1	15
		3A	.00395	.00228	0	43	3B	.00515	.00297	0	57
2.750-6	UN	2A	.00455	.00263	1	15	2B	.00595	.00344	1	38
		3A	.00340	.00196	0	56	3B	.00445	.00257	1	13
2.750-8	UN	2A	.00415	.00240	1	31	2B	.00540	.00312	1	59
		3A	.00315	.00182	1	9	3B	.00405	.00234	1	29
2.750-12	UN	2A	.00310	.00179	1	42	2B	.00405	.00234	2	14
		3A	.00230	.00133	1	16	3B	.00300	.00173	1	39
2.750-16	UN	2A	.00275	.00159	2	1	2B	.00360	.00208	2	38
		3A	.00205	.00118	1	30	3B	.00270	.00156	1	59
2.750-20	UN	2A	.00255	.00147	2	20	2B	.00330	.00191	3	1
		3A	.00190	.00110	1	44	3B	.00250	.00144	2	17
2.875-6	UN	2A	.00460	.00266	1	16	2B	.00600	.00346	1	39
		3A	.00345	.00199	0	57	3B	.00450	.00260	1	14
2.875-8	UN	2A	.00420	.00242	1	32	2B	.00550	.00318	2	1
		3A	.00315	.00182	1	9	3B	.00410	.00237	1	30
2.875-12	UN	2A	.00315	.00182	1	44	2B	.00410	.00237	2	15
		3A	.00235	.00136	1	18	3B	.00310	.00179	1	42
2.875-16	UN	2A	.00280	.00162	2	3	2B	.00365	.00211	2	40
		3A	.00210	.00121	1	32	3B	.00275	.00159	2	1
2.875-20	UN	2A	.00260	.00150	2	23	2B	.00340	.00196	3	7
		3A	.00195	.00113	1	47	3B	.00255	.00147	2	20
3.000-4	UNC	1A	.00805	.00465	1	29	1B	.01045	.00603	1	55
		2A	.00535	.00309	0	59	2B	.00695	.00401	1	16
		3A	.00400	.00231	0	44	3B	.00520	.00300	0	57
3.000-6	UN	2A	.00465	.00268	1	17	2B	.00605	.00349	1	40
		3A	.00350	.00202	0	58	3B	.00455	.00263	1	15
3.000-8	UN	2A	.00425	.00245	1	33	2B	.00555	.00320	2	2
		3A	.00320	.00185	1	10	3B	.00415	.00240	1	31
3.000-12	UN	2A	.00315	.00182	1	44	2B	.00410	.00237	2	15
		3A	.00235	.00136	1	18	3B	.00310	.00179	1	42
3.000-16	UN	2A	.00280	.00162	2	3	2B	.00365	.00211	2	40
		3A	.00210	.00121	1	32	3B	.00275	.00159	2	1
3.000-20	UN	2A	.00260	.00150	2	23	2B	.00340	.00196	3	7
		3A	.00195	.00113	1	47	3B	.00255	.00147	2	20
3.125-6	UN	2A	.00470	.00271	1	18	2B	.00610	.00352	1	41
		3A	.00350	.00202	0	58	3B	.00460	.00266	1	16
3.125-8	UN	2A	.00430	.00248	1	35	2B	.00560	.00323	2	3
		3A	.00320	.00185	1	10	3B	.00420	.00242	1	32
3.125-12	UN	2A	.00315	.00182	1	44	2B	.00410	.00237	2	15
		3A	.00235	.00136	1	18	3B	.00310	.00179	1	42
3.125-16	UN	2A	.00280	.00162	2	3	2B	.00365	.00211	2	40
		3A	.00210	.00121	1	32	3B	.00275	.00159	2	1

TABLE 2.22. *Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External					Internal				
		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
			in	*in*	*deg*	*min*		*in*	*in*	*deg*	*min*
3.250-4	UNC	1A	.00815	.00471	1	30	1B	.01060	.00612	1	57
		2A	.00545	.00315	1	0	2B	.00705	.00407	1	18
		3A	.00410	.00237	0	45	3B	.00530	.00306	0	58
3.250-6	UN	2A	.00475	.00274	1	18	2B	.00615	.00355	1	41
		3A	.00355	.00205	0	59	3B	.00460	.00266	1	16
3.250-8	UN	2A	.00435	.00251	1	36	2B	.00565	.00326	2	4
		3A	.00325	.00188	1	11	3B	.00425	.00245	1	33
3.250-12	UN	2A	.00315	.00182	1	44	2B	.00410	.00237	2	15
		3A	.00235	.00136	1	18	3B	.00310	.00179	1	42
3.250-16	UN	2A	.00280	.00162	2	3	2B	.00365	.00211	2	40
		3A	.00210	.00121	1	32	3B	.00275	.00159	2	1
3.375-6	UN	2A	.00475	.00274	1	18	2B	.00620	.00358	1	42
		3A	.00360	.00208	0	59	3B	.00465	.00268	1	17
3.375-8	UN	2A	.00440	.00254	1	37	2B	.00570	.00329	2	5
		3A	.00330	.00191	1	13	3B	.00425	.00245	1	33
3.375-12	UN	2A	.00320	.00185	1	46	2B	.00420	.00242	2	19
		3A	.00242	.00139	1	19	3B	.00315	.00182	1	44
3.375-16	UN	2A	.00290	.00167	2	8	2B	.00375	.00217	2	45
		3A	.00215	.00124	1	35	3B	.00280	.00162	2	3
3.500-4	UNC	1A	.00830	.00479	1	31	1B	.01075	.00621	1	58
		2A	.00550	.00318	1	0	2B	.00715	.00413	1	19
		3A	.00415	.00240	0	46	3B	.00540	.00312	0	59
3.500-6	UN	2A	.00480	.00277	1	19	2B	.00625	.00361	1	43
		3A	.00360	.00208	0	59	3B	.00470	.00271	1	18
3.500-8	UN	2A	.00440	.00254	1	37	2B	.00575	.00332	2	6
		3A	.00330	.00191	1	13	3B	.00430	.00248	1	35
3.500-12	UN	2A	.00320	.00185	1	46	2B	.00420	.00242	2	19
		3A	.00240	.00139	1	19	3B	.00315	.00182	1	44
3.500-16	UN	2A	.00290	.00167	2	8	2B	.00375	.00217	2	45
		3A	.00215	.00124	1	35	3B	.00280	.00162	2	3
3.625-6	UN	2A	.00485	.00280	1	20	2B	.00630	.00364	1	44
		3A	.00365	.00211	1	0	3B	.00475	.00274	1	18
3.625-8	UN	2A	.00445	.00257	1	38	2B	.00580	.00335	2	8
		3A	.00335	.00193	1	14	3B	.00435	.00251	1	36
3.625-12	UN	2A	.00320	.00185	1	46	2B	.00420	.00242	2	19
		3A	.00240	.00139	1	19	3B	.00315	.00182	1	44
3.625-16	UN	2A	.00290	.00167	2	8	2B	.00375	.00217	2	45
		3A	.00215	.00124	1	35	3B	.00280	.00162	2	3
3.750-4	UNC	1A	.00840	.00485	1	32	1B	.01090	.00629	2	0
		2A	.00560	.00323	1	2	2B	.00725	.00419	1	20
		3A	.00420	.00242	0	46	3B	.00545	.00315	1	0
3.750-6	UN	2A	.00490	.00283	1	21	2B	.00635	.00367	1	45
		3A	.00365	.00211	1	0	3B	.00475	.00274	1	18
3.750-8	UN	2A	.00450	.00260	1	39	2B	.00585	.00338	2	9
		3A	.00335	.00193	1	14	3B	.00440	.00254	1	37
3.750-12	UN	2A	.00320	.00185	1	46	2B	.00420	.00242	2	19
		3A	.00240	.00139	1	19	3B	.00315	.00182	1	44
3.750-16	UN	2A	.00290	.00167	2	8	2B	.00375	.00217	2	45
		3A	.00215	.00124	1	35	3B	.00280	.00162	2	3
3.875-6	UN	2A	.00495	.00286	1	22	2B	.00640	.00369	1	46
		3A	.00370	.00214	1	1	3B	.00480	.00277	1	19
3.875-8	UN	2A	.00455	.00263	1	40	2B	.00590	.00341	2	10
		3A	.00340	.00196	1	15	3B	.00440	.00254	1	37
3.875-12	UN	2A	.00325	.00188	1	47	2B	.00425	.00245	2	20
		3A	.00245	.00141	1	21	3B	.00320	.00185	1	46
3.875-16	UN	2A	.00295	.00170	2	10	2B	.00380	.00219	2	47
		3A	.00220	.00127	1	37	3B	.00285	.00165	2	5

TABLE 2.22. *Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External					Internal				
		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
			in	*in*	*deg*	*min*		*in*	*in*	*deg*	*min*
4.000–4	UNC	1A	.00850	.00491	1	33	1B	.01105	.00638	2	2
		2A	.00565	.00326	1	2	2B	.00735	.00424	1	21
		3A	.00425	.00245	0	47	3B	.00555	.00320	1	1
4.000–6	UN	2A	.00495	.00286	1	22	2B	.00645	.00372	1	46
		3A	.00370	.00214	1	1	3B	.00485	.00280	1	20
4.000–8	UN	2A	.00455	.00263	1	40	2B	.00595	.00344	2	11
		3A	.00340	.00196	1	15	3B	.00445	.00257	1	38
4.000–12	UN	2A	.00325	.00188	1	47	2B	.00425	.00245	2	20
		3A	.00245	.00141	1	21	3B	.00320	.00185	1	46
4.000–16	UN	2A	.00295	.00170	2	10	2B	.00380	.00219	2	47
		3A	.00220	.00127	1	37	3B	.00285	.00165	2	5
4.125–6	UN	2A	.00500	.00289	1	22	2B	.00650	.00375	1	47
		3A	.00375	.00217	1	2	3B	.00485	.00280	1	20
4.125–12	UN	2A	.00325	.00188	1	47	2B	.00425	.00245	2	20
		3A	.00245	.00141	1	21	3B	.00320	.00185	1	46
4.125–16	UN	2A	.00295	.00170	2	10	2B	.00380	.00219	2	47
		3A	.00220	.00127	1	37	3B	.00285	.00165	2	5
4.250–4	UN	2A	.00575	.00332	1	3	2B	.00745	.00430	1	22
		3A	.00430	.00248	0	47	3B	.00560	.00323	1	2
4.250–6	UN	2A	.00505	.00292	1	23	2B	.00655	.00378	1	48
		3A	.00375	.00217	1	2	3B	.00490	.00283	1	21
4.250–12	UN	2A	.00325	.00188	1	47	2B	.00425	.00245	2	20
		3A	.00245	.00141	1	21	3B	.00320	.00185	1	46
4.250–16	UN	2A	.00295	.00170	2	10	2B	.00380	.00219	2	47
		3A	.00220	.00127	1	37	3B	.00285	.00165	2	5
4.375–6	UN	2A	.00505	.00292	1	23	2B	.00660	.00381	1	49
		3A	.00380	.00219	1	3	3B	.00495	.00286	1	22
4.375–12	UN	2A	.00325	.00188	1	47	2B	.00425	.00245	2	20
		3A	.00245	.00141	1	21	3B	.00320	.00185	1	46
4.375–16	UN	2A	.00295	.00170	2	10	2B	.00380	.00219	2	47
		3A	.00220	.00127	1	37	3B	.00285	.00165	2	5
4.500–4	UN	2A	.00580	.00335	1	4	2B	.00755	.00436	1	23
		3A	.00435	.00251	0	48	3B	.00565	.00326	1	2
4.500–6	UN	2A	.00510	.00294	1	24	2B	.00665	.00384	1	50
		3A	.00385	.00222	1	4	3B	.00495	.00286	1	22
4.500–12	UN	2A	.00325	.00188	1	47	2B	.00425	.00245	2	20
		3A	.00245	.00141	1	21	3B	.00320	.00185	1	46
4.500–16	UN	2A	.00295	.00170	2	10	2B	.00380	.00219	2	47
		3A	.00220	.00127	1	37	3B	.00285	.00165	2	5
4.625–6	UN	2A	.00515	.00297	1	25	2B	.00665	.00384	1	50
		3A	.00385	.00222	1	4	3B	.00500	.00289	1	22
4.625–12	UN	2A	.00335	.00193	1	51	2B	.00435	.00251	2	23
		3A	.00250	.00144	1	22	3B	.00330	.00191	1	49
4.625–16	UN	2A	.00305	.00176	2	14	2B	.00395	.00228	2	54
		3A	.00225	.00130	1	39	3B	.00295	.00170	2	10
4.750–4	UN	2A	.00585	.00338	1	4	2B	.00765	.00442	1	24
		3A	.00440	.00254	0	48	3B	.00570	.00329	1	3
4.750–6	UN	2A	.00515	.00297	1	25	2B	.00670	.00387	1	51
		3A	.00385	.00222	1	4	3B	.00505	.00292	1	23
4.750–12	UN	2A	.00335	.00193	1	51	2B	.00435	.00251	2	23
		3A	.00250	.00144	1	22	3B	.00330	.00191	1	49
4.750–16	UN	2A	.00305	.00176	2	14	2B	.00395	.00228	2	54
		3A	.00225	.00130	1	29	3B	.00295	.00170	2	10
4.875–6	UN	2A	.00520	.00300	1	26	2B	.00675	.00390	1	51
		3A	.00390	.00225	1	4	3B	.00505	.00292	1	23

TABLE 2.22. *Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified screw threads*—Continued

Nominal size and threads per inch	Series designation	External					Internal				
		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle		Class	Half of pitch diameter tolerance	Equivalent deviation in lead	Equivalent deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
			in	*in*	*deg*	*min*		*in*	*in*	*deg*	*min*
4.875-12	UN	2A	.00335	.00193	1	51	2B	.00435	.00251	1	23
		3A	.00250	.00144	1	22	3B	.00330	.00101	1	49
4.875-16	UN	2A	.00305	.00176	2	14	2B	.00395	.00228	2	54
		3A	.00225	.00130	1	39	3B	.00295	.00170	2	10
5.000-4	UN	2A	.00595	.00344	1	5	2B	.00770	.00445	1	25
		3A	.00445	.00257	0	49	3B	.00580	.00335	1	4
5.000-6	UN	2A	.00525	.00303	1	27	2B	.00680	.00393	1	52
		3A	.00390	.00225	1	4	3B	.00510	.00294	1	24
5.000-12	UN	2A	.00335	.00193	1	51	2B	.00435	.00251	2	23
		3A	.00250	.00144	1	22	3B	.00330	.00191	1	49
5.000-16	UN	2A	.00305	.00176	2	14	2B	.00395	.00228	2	54
		3A	.00225	.00130	1	39	3B	.00295	.00170	2	10
5.125-12	UN	2A	.00335	.00193	1	51	2B	.00435	.00251	2	23
		3A	.00250	.00144	1	22	3B	.00330	.00191	1	49
5.125-16	UN	2A	.00305	.00176	2	14	2B	.00395	.00228	2	54
		3A	.00225	.00130	1	39	3B	.00295	.00170	2	10
5.250-4	UN	2A	.00600	.00346	1	6	2B	.00780	.00450	1	26
		3A	.00450	.00260	0	50	3B	.00585	.00338	1	4
5.250-12	UN	2A	.00335	.00193	1	51	2B	.00435	.00251	2	23
		3A	.00250	.00144	1	22	3B	.00330	.00191	1	49
5.250-16	UN	2A	.00305	.00176	2	14	2B	.00395	.00228	2	54
		3A	.00225	.00130	1	39	3B	.00295	.00170	2	10
5.375-12	UN	2A	.00335	.00193	1	51	2B	.00435	.00251	2	23
		3A	.00250	.00144	1	22	3B	.00330	.00191	1	49
5.375-16	UN	2A	.00305	.00176	2	14	2B	.00395	.00228	2	54
		3A	.00225	.00130	1	39	3B	.00295	.00170	2	10
5.500-4	UN	2A	.00605	.00349	1	7	2B	.00790	.00456	1	27
		3A	.00455	.00263	0	50	3B	.00590	.00341	1	5
5.500-12	UN	2A	.00335	.00193	1	51	2B	.00435	.00251	2	23
		3A	.00250	.00144	1	22	3B	.00330	.00191	1	49
5.500-16	UN	2A	.00305	.00176	2	14	2B	.00395	.00228	2	54
		3A	.00225	.00130	1	39	3B	.00295	.00170	2	10
5.625-12	UN	2A	.00345	.00199	1	54	2B	.00450	.00260	2	28
		3A	.00260	.00150	1	26	3B	.00335	.00193	1	51
5.625-16	UN	2A	.00310	.00179	2	16	2B	.00405	.00234	2	58
		3A	.00235	.00136	1	43	3B	.00305	.00176	2	14
5.750-4	UN	2A	.00610	.00352	1	7	2B	.00795	.00459	1	27
		3A	.00460	.00266	0	51	3B	.00595	.00344	1	5
5.750-12	UN	2A	.00345	.00199	1	54	2B	.00450	.00260	2	28
		3A	.00260	.00150	1	26	3B	.00335	.00193	1	51
5.750-16	UN	2A	.00310	.00179	2	16	2B	.00405	.00234	2	58
		3A	.00235	.00136	1	43	3B	.00305	.00176	2	14
5.875-12	UN	2A	.00345	.00199	1	54	2B	.00450	.00260	2	28
		3A	.00260	.00150	1	26	3B	.00335	.00193	1	51
5.875-16	UN	2A	.00310	.00179	2	16	2B	.00405	.00234	2	58
		3A	.00235	.00136	1	43	3B	.00305	.00176	2	14
6.000-4	UN	2A	.00620	.00358	1	8	2B	.00805	.00465	1	29
		3A	.00465	.00268	0	51	3B	.00600	.00346	1	6
6.000-12	UN	2A	.00345	.00199	1	54	2B	.00450	.00260	2	28
		3A	.00260	.00150	1	26	3B	.00335	.00193	1	51
6.000-16	UN	2A	.00310	.00179	2	16	2B	.00405	.00234	2	58
		3A	.00235	.00136	1	43	3B	.00305	.00176	2	14

212-951 O - 76 - 6

INDEX

	Page
Allowances	2.17
American National screw threads compared with Unified	2.01
Angle deviations, diameter equivalent of	2.21
Classes, thread	2.17
Coarse-thread series	2.03
Coated threads	2.22
Constant pitch series	2.05
Data, thread	2.02
Design form of Unified thread	2.04
Designating screw threads	2.22
Diameter equivalent of	
Angle deviations	2.21
Lead deviations	2.21
Disposition of tolerances, allowances, and crest clearances	2.06
Engagement, length of	2.21
Extra-fine series	2.05
Fine thread series	2.04
Form of thread	2.01
High-temperature, high-strength applications	2.05
Increments in pitch diameter tolerance formula	2.18
Lead deviations, diameter equivalent of	2.21
Length of engagement	2.21
Limits of size	2.21
Modified threads	2.24
Selection, order of	2.03
Series, thread	2.03
Standard Unified series	2.08
Symbols for thread data	2.05
Thin-wall tubing threads	2.05
Tolerances	2.17

UNITED STATES DEPARTMENT OF COMMERCE

NATIONAL BUREAU OF STANDARDS

HANDBOOK H28

SCREW-THREAD STANDARDS

FOR FEDERAL SERVICES

SECTION 3

1969

UNIFIED THREADS OF SPECIAL DIAMETERS, PITCHES, AND LENGTHS OF ENGAGEMENT

CONTENTS

		Page
1.	Introduction	3.01
2.	Types of special threads	3.01
3.	Unified thread form	3.01
4.	Preferred diameters and pitches	3.01
5.	Thread classes	3.02
6.	Allowances	3.03
7.	Tolerances	3.03
8.	Length of engagement	3.04
9.	Limits of size	3.05
10.	Method of designating screw threads	3.05
11.	Directions for determining limits of size of special threads	3.05
12.	Gages	3.06
	Index	3.28

1. INTRODUCTION

The thread series, tolerances, and allowances specified in section 2 of H28 apply in general to bolts, nuts, and tapped holes of standard pitches and diameters. In addition, there are large quantities of threaded parts produced where the relations of diameter to pitch are necessarily different from those of the standard thread series, and the lengths of engagement either shorter or longer than for bolt and nut practice. Such threads are designated "threads of special diameters, pitches, and lengths of engagement". Selected combinations of Unified special screw threads are listed in table 3.1. Pitch diameter tolerances in this table are based on a length of thread engagement of 9 times the pitch. The pitch diameter limits are applicable to a length of engagement of from 5 to 15 times the pitch. (This should not be confused with the length of thread on mating parts, as it may exceed the length of engagement by a considerable amount.)

2. TYPES OF SPECIAL THREADS

There are various degrees of specialization in the design of special threads that may be classified as follows:

(1) A standard thread that is modified by the inclusion of some nonstandard feature as discussed in section 2,

(2) A thread of a standard diameter such as is found in one or more of the thread series in section 2 associated with a standard pitch listed in table 2.1 forming a diameter-pitch combination that is not in a standard thread series; for example, 1.000-10 UNS,

(3) A diameter of odd size such as 1.137 in. associated with a standard pitch,

(4) A thread of either standard or nonstandard diameter associated with a nonstandard pitch; for example, 1.000-15 UNS or .895-26 UNS,

(5) A thread of any of the first four degrees of specialization to which special tolerances are applied,

(6) A completely special thread that deviates from the standard Unified thread form.

In the interest of economy, the designer should adhere to standard threads or to thread features conforming as closely as possible to established standards. It should be remembered that special threads entail the design and manufacture of special threading tools and gages with consequent greater costs, increase in inventories, and difficulties in procuring spare parts when replacements are necessary.

In this section, standards for special threads are presented, including thread form, selected combinations of Unified special screw threads (table 3.1), allowances and tolerances, and detailed directions for specifying special threads on drawings. A discussion of factors affecting the design of special threads is presented in appendix A5.

3. UNIFIED FORM OF THREAD

The Unified form of thread profile as specified in section 2 shall be used.

4. PREFERRED DIAMETERS AND PITCHES

The use, whenever possible, of the standard series of screw threads listed in table 2.7 is recommended for all applications. Whenever sizes and pitches in table 2.7 are not suitable, the designer should, if possible, choose a thread from table 3.1 which lists selected combinations of Unified special screw threads. If a selection cannot be made from either table 2.7 or 3.1, consideration should be given to the following paragraphs in a choice of thread.

4.1. Preferred Diameters.—Whenever possible, the basic diameter should be selected from series of diameter increments as follows:

Range	Diameter increments	
	First choice	Second choice
in	*in*	*in*
0.25 to 0.6	0.05	----------
above 0.6 to 1.5	0.1	0.05
above 1.5 to 6.0	0.25	0.1
above 6 to 16	0.5	0.25
above 16 to 24	1.0	0.5

It is recommended that diameters less than 0.25 in conform to the standard sizes of screws under 0.25 in. as there is virtually no necessity for the selection of a diameter not included in those sizes. Furthermore, the coarse and fine thread series provide ample choice as to diameter-pitch combinations.

4.2. Preferred Pitches.—Whenever possible, the pitch should be selected from the series 40, 36, 32, 28, 24, 20, 16, 12, 10, 8, 6, and 4 threads per inch. Intermediate pitches should be used only when absolutely necessary. Pitches coarser than 4 threads per inch are not recommended.

There are practical limits to both the largest and smallest diameters suitable for any pitch. The curves on the chart for determining minimum length of thread engagement in Appendix A5 stop at such limits.

4.3. Basic Thread Data.—Basic thread data for standard pitches are given in table 2.1. These data are to be used in conjunction with the directions for specifying special threads on drawings as given in par. 5.4, p. 3.02.

5. THREAD CLASSES

Thread classes are distinguished from each other by the amounts of tolerance and allowance. The function of these classes is to assure the interchangeability of threaded parts. Six distinct classes of screw threads have been established for general use. These classes are: 1A, 2A, and 3A (for external threads only) and 1B, 2B, and 3B (for internal threads only).

Class 1AR (for external threads only, 16 threads per inch and coarser) is also included for special use. Class 1AR is produced by combining the American National class 1 allowances with class 1A tolerances.

The disposition of the tolerances, allowances, and crest clearances for the six general use classes is illustrated in figures 2.5 and 2.6.

The requirements for a screw thread fit for a specific application can be met by specifying the proper combination of classes for the components. For example, an external thread made to class 2A limits can be used with an internal thread made to classes 1B, 2B, or 3B limits for specific applications.

5.1. Classes 1A, 1AR, and 1B.—The combinations of classes 1A or 1AR and 1B are intended to cover the manufacture of threaded parts where quick and easy assembly is necessary, and where an allowance is required to permit ready assembly, even when the threads are slightly bruised or dirty.

Maximum diameters of class 1A (external) threads are less than basic by the amount of the same allowance as applied to class 2A. For the intended applications in American practice the allowance is not available for plating or coating. Where the thread is plated or coated, special provisions are necessary. The minimum diameters of class 1B (internal) threads, whether or not plated or coated, are basic, affording no allowance or clearance for assembly with maximum material external thread components having maximum diameters which are basic.

Allowances for all diameters and pitch diameter tolerances are specified in tables 3.2, 3.3, and 3.6. Their application is shown in figure 2.5.

5.2. Classes 2A and 2B.—Classes 2A for external threads and 2B for internal threads are designed for general use. A moderate allowance is provided for class 2A threads.

The maximum diameters of class 2A (external) 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 coating. 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 (the 2A maximum diameter plus allowance) apply to a part after plating. The minimum diameters of class 2B (internal) threads, whether or not plated or coated, are basic, affording no allowance or clearance in assembly at maximum material limits.

Allowances for all diameters and pitch diameter tolerances are specified in tables 3.2, 3.4, and 3.7. Their application is shown in figure 2.5.

5.3. Classes 3A and 3B.—Classes 3A for external threads and 3B for internal threads provides for applications where closeness of fit and accuracy of lead and angle of thread are important. They are obtainable consistently only by the use of high quality production equipment supported by a very efficient system of gaging and inspection. The maximum diameters of class 3A (external) threads and the minimum diameters of class 3B (internal) threads, whether or not plated or coated, are basic, affording no allowance or clearance for assembly of maximum material components

No allowance is provided, but since the tolerances on GO gages are within the limits of size of the product, the gages will assure a slight clearance between product made to the maximum-material limits. Pitch diameter tolerances are specified in tables 3.5 and 3.8. Their application is shown in figure 2.6.

5.4. Selection of Class of Thread.—Consideration should first be given to the use of a class 2A external thread with a class 2B internal thread since these classes are designed for general use. The use of class 2A provides that there will always be a small clearance between maximum-material parts except when the external thread is plated. Plated parts are intended to be gaged with basic-size GO gages. In either case, it is expected that parts will assemble readily without galling or seizing. Tolerances are sufficiently large so that ordinary production methods are generally applicable.

Past experience with similar designs may indicate that a more accurately made or closer fitting thread is required than that which is permitted by classes 2A and 2B tolerances. In such cases consideration should be given to the use of classes 3A and 3B. The necessary increase in cost should not be overlooked.

In some designs there may be advantages in providing for greater average looseness of fit than that obtained with classes 2A and 2B. Such greater average looseness is provided by classes 1A and 1B or the assembly of class 1A external threads with class 2B internal threads. The minimum looseness, however, is the same as for classes 2A and 2B except that a positive allowance is provided for plated parts. When a greater minimum looseness is requisite to provide for adverse conditions of assembly, class 1AR is available, which is not a Unified class and is based on the American National class 1 allowance combined with class 1A tolerance. These classes also provide larger tolerances to the manufacturer, which may be of advantage if the thread is difficult to produce.

It should be noted that any class of external thread may be associated with any class of internal thread, there being no requirement to combine classes of like number.

6. ALLOWANCES

The allowance is minus and is applied from the basic size to below basic size. Allowance is applied only to the classes 1A, 1AR, and 2A external threads. Values of the allowance for classes 1A and 2A are obtained by use of a C factor of 0.3 in the formula shown in paragraph 7.3. Numerical values of classes 1A and 2A allowances for the commonly used pitches are listed in table 3.2.

The formula in paragraph 7.3 is not applicable to class 1AR as this class is produced by combining the American National class 1 allowances with class 1A tolerances. These allowances are larger than those for classes 1A and 2A and provide for ready assembly under adverse conditions.

Numerical values of class 1AR allowances are:

Threads per inch (tpi), n	Class 1AR allowance
	in
16	0.0018
14	.0021
12	.0024
10	.0028
8	.0034
6	.0044
4	.0064

(Class 1AR allowances apply only to external threads, 16 tpi and coarser.)

7. TOLERANCES

The following general specifications apply to all classes specified for applications of the Unified form of thread.

7.1. Uniform Minimum Internal Thread.—The minimum major, pitch, and minor diameters of the internal thread are, respectively, the same for classes 1B, 2B, and 3B.

7.2. Direction and Scope of Tolerances.—(*a*) The tolerance on the internal thread is plus, and is applied from the basic size to above basic size.

(*b*) The tolerance on the external thread is minus and is applied from the maximum (or design) size to below the maximum size.

(*c*) The tolerances specified represent the extreme variations permitted on the product.

7.3. Pitch Diameter Tolerances.—The basic formula for pitch diameter tolerance is composed of the following increments:

P.D. Tolerance

$$= C(0.0015\sqrt[3]{D} + 0.0015\sqrt{L_e} + 0.015\sqrt[3]{p^2}),$$

where

C = a factor which differs for each class
D = basic major diameter
L_e = length of engagement
p = pitch.

This formula is based on the accuracy of present day threading practice, and is applicable to all reasonable combinations of diameter, pitch, and length of engagement. Numerical values of the increments in the formula for standard diameters, pitches, and lengths of engagement are given in table 2.19. The values of factor C for pitch diameter tolerances are as follows:

Class	Factor C
1A and 1AR	1.500
1B	1.950
2A	1.000
2B	1.300
3A	0.750
3B	.975

It will be noted that the factor C is 30 percent greater for internal than for external threads of a given class number on account of the relative difficulties of manufacture.

Numerical values of pitch diameter tolerances for classes 1A, 1AR, 1B, 2A, 2B, 3A, and 3B are given in tables 3.3 through 3.8. Two sets of tolerances are given: Those for 5 to 15 pitches length of engagement, based on lengths of 9 pitches, and those for 16 to 30 pitches length of engagement, which are 1.25 times the 9-pitch values. For lengths of engagement over 30 pitches, it is recommended that pitch diameter tolerances 1.5 times the 9-pitch values be used. If excessively small or large lengths of engagement are encountered, the thread tolerances may be calculated from the formulas, if considered advisable. Also, for threads per inch not included in the tables, tolerances should be calculated by applying the formulas.

7.4. Major Diameter Tolerances.—(*a*) *External threads.*—The tolerance on major diameter for special threads is not specified, as it must be determined in relation to the requirements of a given design in accordance with the procedure outlined in appendix A5. Preferred tolerances equal to $0.060\sqrt[3]{p^2}$ for classes 2A and 3A, and equal to $0.090\sqrt[3]{p^2}$ for classes 1A and 1AR are as follows:

Threads per inch	Major diameter tolerance	
	Classes 1A and 1AR, $0.090\sqrt[3]{p^2}$	Classes 2A and 3A, $0.060\sqrt[3]{p^2}$
	in	*in*
80	----------	0.0032
72	----------	.0035
64	----------	.0038
56	----------	.0041
48	----------	.0045
44	----------	.0048
40	0.0077	.0051
36	.0083	.0055
32	.0089	.0060
28	.0098	.0065
27	.0100	.0067
24	.0108	.0072
20	.0122	.0081
18	.0131	.0087
16	.0142	.0094
14	.0155	.0103
12	.0172	.0114
10	.0194	.0129
8	.0225	.0150
6	.0273	.0182
4	.0357	.0238

(b) *Internal threads.*—The tolerance on major diameter is for reference only. It is equal to $H/6$ plus the pitch diameter tolerance of the class of thread involved. The maximum major diameter of the internal thread may be determined by adding $0.793857p$ ($= 11H/12$, table 2.1) to the maximum pitch diameter of the internal thread. However, this diameter shall not result in a root flat width less than $p/24$. 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 which has no allowance.

7.5. Minor Diameter Tolerances.—(a) *External threads.*—The tolerance on minor diameter of external threads is for reference only. At the nominal minor diameter, that is, at the intersection of the rounded root with its center line (see fig. 2.3) it equals the pitch diameter tolerance plus $H/12$ and applies only where the rounded root is a requirement of the design. Otherwise the tolerance shall be $H/4$ plus the pitch diameter tolerance. The minimum minor diameter of the external thread may be determined by subtracting $0.649519p$ ($= 0.75H$, table 2.1) from the minimum pitch diameter of the external thread. However, this diameter shall not result in a root flat width less than $p/8$. 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 allowances, if any.

(b) *Internal threads.*—Formulas for the internal thread minor diameter tolerances are shown in table 2.20. Numerical values for the tolerances are shown in tables 3.9 and 3.10. To reduce the number of minor diameter tolerances to a practical minimum, tolerances are shown in these tables for selected pitches and diameters. In these tables, the tolerances are as follows:

Length of engagement	Percent of formula value	Tolerance ratio
Less than 0.33D	50%	0.5
From 0.33D to 0.67D	75%	0.75
Over 0.67D to 1.5D	100%	1.0
Over 1.5D	125%	1.25

When the tolerance value so computed is more than $0.394p$, which corresponds to a resulting minimum thread height of 53 percent, the value is adjusted to equal $0.394p$.

8. LENGTH OF ENGAGEMENT

The values in tables 3.9 and 3.10 for lengths of engagement from $0.67D$ to $1.5D$, are suitable for general applications.

Some thread applications have lengths of engagement which are greater than 1.5 diameters or less than $0.67D$. For applications having shorter or longer lengths of engagement it may be advantageous to decrease or increase the internal thread minor diameter tolerance as explained below.

The principal practical factors that govern these tolerances are tapping difficulties, particularly tap breakage in the small sizes, availability of standard drill sizes in the medium and large sizes, and depth of engagement. Depth of engagement correlates with the stripping strength of the thread assembly, and thus also 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 pitch diameter allowance and tolerance 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 increase in diameter. However, such decrease in tolerance often is not feasible without requiring special drill sizes; therefore, to be able to use as many as possible of the available standard drill sizes listed in USA B5.12, the minor diameter tolerance for classes 1B and 2B of a given pitch for 0.25 in. diameter and larger is constant, in accordance with the formula:

$$0.25p - 0.4p^2.$$

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 engagements 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 depth of engagement may be shallower and still develop stripping strength greater than the external thread breaking strength. In these cases the maximum tolerance should be increased to reduce the possibility of tapping difficulties.

Recommended internal thread minor diameter tolerances for various lengths of engagement are shown in tables 3.9 and 3.10. Recommended hole size limits before threading for different lengths of engagement are shown in appendix A3.

9. LIMITS OF SIZE

With respect to the pitch diameter limits of size, it is intended, except as hereinafter qualified, that no portion of the complete thread be permitted to project beyond the envelope defined by the maximum-material limits on the one hand, or beyond that defined by the minimum-material limits on the other, and thus be outside of the tolerance zone as illustrated in figures 2.5 and 2.6. The full tolerance cannot therefore, be used on pitch diameter unless deviations in other thread elements are zero.

Diameter equivalents of variations in lead, uniformity of helix, and flank angle are in the direction toward maximum material. Also included in pitch-diameter limits are other variations from size and profile, such as taper, out-of-round, and surface defects. Thus the maximum-material pitch diameter limits are a limitation of the virtual diameter (effective size) and are so specified herein for all thread classes. It is intended that diameter equivalents of deviations in any given element except pitch diameter should not exceed one-half of the pitch-diameter tolerance. Values are given in table 2.22 for deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances. Flank angle equivalents should be based on a depth of thread engagement of $0.625H$.

Variations in taper and roundness of the pitch diameter, together with variations of the pitch diameter as a whole, may be in the direction of minimum material and thus the minimum-material pitch diameter limit may be specified as a limitation of the pitch diameter as a single element. However, in view of the interrelation of the pitch diameter, variations in lead and flank angle, etc., together with practical considerations relating to established production processes, product application and inspection procedures, except for class 3A, for fasteners and some custom threaded parts, it is customary to base acceptance at the minimum-material condition (minimum pitch diameter of the external thread and maximum pitch diameter of the internal thread) on threaded plug and ring gaging, with gages to the thread form and length specified in section 6. See Dimensional acceptability of threads in that section.

10. METHOD OF DESIGNATING SPECIAL SCREW THREADS

For the method of designating threads of special diameters, pitches, and lengths of engagement, and UNS threads (threads with Unified tolerance formulations), see also section 2.

The symbol "UNS" is applicable to any thread,

(1) having the basic Unified thread form,
(2) with limits based on Unified formulations, and
(3) which is not listed in table 2.7.

Selected combinations of UNS threads are listed in table 3.1.

11. DIRECTIONS FOR DETERMINING LIMITS OF SIZE OF SPECIAL THREADS

The following directions are intended to simplify the task of the designer or specification writer in preparing the specification for a special thread:

The procedure to be followed in determining values for the essential thread elements (as shown in fig. 3.12) and the associated tolerances, is outlined in table 3.11. The application of this and other tables is illustrated by the following example:

Internal thread, 2.500-28UNS-2B
Length of engagement, 1 in.

Min major diameter = 2.5000 in.
Min pitch diameter = basic major diameter − $0.75H$ (table 2.1)
= 2.5000 − 0.0232 = 2.4768
Max pitch diameter = min pitch diameter + tolerance (table 3.7)
= 2.4768 + 0.0064 = 2.4832
Min minor diameter = basic major diameter − $1.25H$ (table 2.1)
= 2.500 − 0.0387 = 2.461
Max minor diameter = min minor diameter + tolerance (table 3.9)
= 2.4613 + 0.0063 = 2.468.

The dimensions of the above internal thread may be stated on the drawing as follows:

Major diameter: 2.5000 min
Pitch diameter: 2.4768 + 0.0064
− 0.0000
Minor diameter: 2.461 + 0.0063
− 0.0000.

External thread, 2.500-28UNS-2A (To mate with the above thread)

Max major diameter = basic major diameter − allowance (table 3.2)
= 2.5000 − 0.0014 = 2.4986
Min major diameter = max major diameter − tolerance (tabulated on p. 3.04)
= 2.4986 − 0.0065 = 2.4921
Max pitch diameter = max major diameter − 0.75H (table 2.1)
= 2.4986 − 0.0232 = 2.4754
Min pitch diameter = max pitch diameter − tolerance (table 3.4)
= 2.4754 − 0.0049 = 2.4705
Nom minor diameter = max major diameter − 17H/12 (1.4167H) (table 2.1)
= 2.4986 − 0.0438 = 2.4548.

The dimensions of the above external thread may be stated on the drawing as follows:

Major diameter: 2.4986 + 0.0000
− 0.0065
Pitch diameter: 2.4754 + 0.0000
− 0.0049
Minor diameter: 2.4548, nominal.

The design of a special thread usually requires that consideration be given to various factors in order that the thread assembly will function properly. These factors are discussed in appendix A5. It is to be noted particularly that deviations from the preferred tolerances for major diameter of the external thread and for minor diameter of the internal thread may be necessary in order to arrive at the optimum design.

12. GAGES

The specifications for gages, including marking, as presented in section 6 apply also to gages for special threads.

TABLE 3.1. *Selected combinations, Unified special screw threads, UNS*

Nominal size and threads per inch	External[a]								Internal[a]						
	Class	Allowance	Major diameter		Pitch diameter			(c) Minor diameter	Class	Minor diameter		Pitch diameter			Major diameter
			Max[b]	Min	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		in	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
.190-28	2A	0.0010	0.1890	0.1825	0.1658	0.1625	0.0033	0.1452	2B	0.151	0.160	0.1668	0.1711	0.0043	0.1900
.190-36	2A	.0009	.1891	.1836	.1711	.1681	.0030	.1550	2B	.160	.166	.1720	.1759	.0039	.1900
.190-40	2A	.0009	.1891	.1840	.1729	.1700	.0029	.1584	2B	.163	.169	.1738	.1775	.0037	.1900
.190-48	2A	.0008	.1892	.1847	.1757	.1731	.0026	.1636	2B	.167	.172	.1765	.1799	.0034	.1900
.190-56	2A	.0007	.1893	.1852	.1777	.1752	.0025	.1674	2B	.171	.175	.1784	.1816	.0032	.1900
.216-36	2A	.0009	.2151	.2096	.1971	.1941	.0030	.1810	2B	.186	.192	.1980	.2019	.0039	.2160
.216-40	2A	.0009	.2151	.2100	.1989	.1960	.0029	.1844	2B	.189	.195	.1998	.2035	.0037	.2160
.216-48	2A	.0008	.2152	.2107	.2017	.1991	.0026	.1896	2B	.193	.198	.2025	.2059	.0034	.2160
.216-56	2A	.0007	.2153	.2112	.2037	.2012	.0025	.1934	2B	.197	.201	.2044	.2076	.0032	.2160
.250-24	2A	.0011	.2489	.2417	.2218	.2181	.0037	.1978	2B	.205	.215	.2229	.2277	.0048	.2500
.250-27	2A	.0010	.2490	.2423	.2249	.2214	.0035	.2036	2B	.210	.219	.2259	.2304	.0045	.2500
.250-36	2A	.0009	.2491	.2436	.2311	.2280	.0031	.2150	2B	.220	.226	.2320	.2360	.0040	.2500
.250-40	2A	.0009	.2491	.2440	.2329	.2300	.0029	.2184	2B	.223	.229	.2338	.2376	.0038	.2500
.250-48	2A	.0008	.2492	.2447	.2357	.2330	.0027	.2236	2B	.227	.232	.2365	.2401	.0036	.2500
.250-56	2A	.0008	.2492	.2451	.2376	.2350	.0026	.2273	2B	.231	.235	.2384	.2417	.0033	.2500
.3125-27	2A	.0010	.3115	.3048	.2874	.2839	.0035	.2661	2B	.272	.281	.2884	.2929	.0045	.3125
.3125-36	2A	.0009	.3116	.3061	.2936	.2905	.0031	.2775	2B	.282	.289	.2945	.2985	.0040	.3125
.3125-40	2A	.0009	.3116	.3065	.2954	.2925	.0029	.2809	2B	.285	.291	.2963	.3001	.0038	.3125
.3125-48	2A	.0008	.3117	.3072	.2982	.2955	.0027	.2861	2B	.290	.295	.2990	.3026	.0036	.3125
.375-18	2A	.0013	.3737	.3650	.3376	.3333	.0043	.3055	2B	.315	.328	.3389	.3445	.0056	.3750
.375-27	2A	.0011	.3739	.3672	.3498	.3462	.0036	.3285	2B	.335	.344	.3509	.3556	.0047	.3750
.375-36	2A	.0010	.3740	.3685	.3560	.3528	.0032	.3399	2B	.345	.352	.3570	.3612	.0042	.3750
.375-40	2A	.0009	.3741	.3690	.3579	.3548	.0031	.3434	2B	.348	.354	.3588	.3628	.0040	.3750
.390-27	2A	.0011	.3889	.3822	.3648	.3612	.0036	.3435	2B	.350	.359	.3659	.3706	.0047	.3900
.4375-18	2A	.0013	.4362	.4275	.4001	.3958	.0043	.3680	2B	.377	.390	.4014	.4070	.0056	.4375
.4375-24	2A	.0011	.4364	.4292	.4093	.4055	.0038	.3853	2B	.392	.402	.4104	.4153	.0049	.4375
.4375-27	2A	.0011	.4364	.4297	.4123	.4087	.0036	.3910	2B	.397	.406	.4134	.4181	.0047	.4375
.4375-36	2A	.0011	.4365	.4310	.4185	.4153	.0032	.4024	2B	.407	.414	.4195	.4237	.0042	.4375
.4375-40	2A	.0009	.4366	.4315	.4204	.4173	.0031	.4059	2B	.410	.416	.4213	.4253	.0040	.4375
.500-12	2A	.0016	.4984	.4870	.4443	.4389	.0054	.3962	2B	.410	.428	.4459	.4529	.0070	.5000
	3A	.0000	.5000	.4886	.4459	.4419	.0040	.3978	3B	.4100	.4223	.4459	.4511	.0052	.5000
.500-14	2A	.0015	.4985	.4882	.4521	.4471	.0050	.4109	2B	.423	.438	.4536	.4601	.0065	.5000
.500-18	2A	.0013	.4987	.4900	.4626	.4582	.0044	.4305	2B	.440	.453	.4639	.4697	.0058	.5000
.500-24	2A	.0012	.4988	.4916	.4717	.4678	.0039	.4477	2B	.455	.465	.4729	.4780	.0051	.5000
.500-27	2A	.0011	.4989	.4922	.4748	.4711	.0037	.4535	2B	.460	.469	.4759	.4807	.0048	.5000
.500-36	2A	.0010	.4990	.4935	.4810	.4777	.0033	.4649	2B	.470	.476	.4820	.4863	.0043	.5000
.500-40	2A	.0010	.4990	.4939	.4828	.4796	.0032	.4683	2B	.473	.479	.4838	.4879	.0041	.5000
.5625-14	2A	.0015	.5610	.5507	.5146	.5096	.0050	.4734	2B	.485	.501	.5161	.5226	.0065	.5625
.5625-27	2A	.0011	.5614	.5547	.5373	.5336	.0037	.5160	2B	.522	.531	.5384	.5432	.0048	.5625
.5625-36	2A	.0010	.5615	.5560	.5435	.5402	.0033	.5274	2B	.532	.539	.5445	.5488	.0043	.5625
.5625-40	2A	.0010	.5615	.5564	.5453	.5421	.0032	.5308	2B	.535	.541	.5463	.5504	.0041	.5625
.625-14	2A	.0015	.6235	.6132	.5771	.5720	.0051	.5359	2B	.548	.564	.5786	.5852	.0066	.6250

See footnotes at end of table.

TABLE 3.1. *Selected combinations, Unified special screw threads, UNS*—Continued

Nominal size and threads per inch	External[a]								Internal[a]						
	Class	Allowance	Major diameter		Pitch diameter			(c) Minor diameter	Class	Minor diameter		Pitch diameter			Major diameter
			Max[b]	Min	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		in	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
.625-27	2A	.0011	.6239	.6172	.5998	.5960	.0038	.5785	2B	.585	.594	.6009	.6059	.0050	.6250
.625-36	2A	.0010	.6240	.6185	.6060	.6026	.0034	.5899	2B	.595	.602	.6070	.6114	.0044	.6250
.625-40	2A	.0010	.6240	.6189	.6078	.6045	.0033	.5933	2B	.598	.604	.6088	.6131	.0043	.6250
.750-14	2A	.0015	.7485	.7382	.7021	.6970	.0051	.6609	2B	.673	.688	.7036	.7103	.0067	.7500
.750-18	2A	.0014	.7486	.7399	.7125	.7079	.0046	.6804	2B	.690	.703	.7139	.7199	.0060	.7500
.750-24	2A	.0012	.7488	.7416	.7217	.7176	.0041	.6977	2B	.705	.715	.7229	.7282	.0053	.7500
.750-27	2A	.0012	.7488	.7421	.7247	.7208	.0039	.7034	2B	.710	.719	.7259	.7310	.0051	.7500
.750-36	2A	.0010	.7490	.7435	.7310	.7275	.0035	.7149	2B	.720	.726	.7320	.7365	.0045	.7500
.750-40	2A	.0010	.7490	.7439	.7328	.7294	.0034	.7183	2B	.723	.729	.7338	.7382	.0044	.7500
.875-10	2A	.0018	.8732	.8603	.8082	.8022	.0060	.7505	2B	.767	.788	.8100	.8178	.0078	.8750
.875-18	2A	.0014	.8736	.8649	.8375	.8329	.0046	.8054	2B	.815	.828	.8389	.8449	.0060	.8750
.875-24	2A	.0012	.8738	.8666	.8467	.8426	.0041	.8227	2B	.830	.840	.8479	.8532	.0053	.8750
.875-27	2A	.0012	.8738	.8671	.8497	.8458	.0039	.8284	2B	.835	.844	.8509	.8560	.0051	.8750
.875-36	2A	.0010	.8740	.8685	.8560	.8525	.0035	.8399	2B	.845	.852	.8570	.8615	.0045	.8750
.875-40	2A	.0010	.8740	.8689	.8578	.8544	.0034	.8433	2B	.848	.854	.8588	.8632	.0044	.8750
1.000-10	2A	.0018	.9982	.9853	.9332	.9270	.0062	.8755	2B	.892	.913	.9350	.9430	.0080	1.0000
1.000-14[d]	1A	.0017	.9983	.9828	.9519	.9435	.0084	.9107	1B	.923	.938	.9536	.9645	.0109	1.0000
	2A	.0017	.9983	.9880	.9519	.9463	.0056	.9107	2B	.923	.938	.9536	.9609	.0073	1.0000
	3A	.0000	1.0000	.9897	.9536	.9494	.0042	.9124	3B	.9230	.9315	.9536	.9590	.0054	1.0000
1.000-18	2A	.0014	.9986	.9899	.9625	.9578	.0047	.9304	2B	.940	.953	.9639	.9701	.0062	1.0000
1.000-24	2A	.0013	.9987	.9915	.9716	.9674	.0042	.9476	2B	.955	.965	.9729	.9784	.0055	1.0000
1.000-27	2A	.0012	.9988	.9921	.9747	.9707	.0040	.9534	2B	.960	.969	.9759	.9811	.0052	1.0000
1.000-36	2A	.0011	.9989	.9934	.9809	.9773	.0036	.9648	2B	.970	.976	.9820	.9867	.0047	1.0000
1.000-40	2A	.0010	.9990	.9939	.9828	.9793	.0035	.9683	2B	.973	.979	.9838	.9883	.0045	1.0000
1.125-10	2A	.0018	1.1232	1.1103	1.0582	1.0520	.0062	1.0005	2B	1.017	1.038	1.0600	1.0680	.0080	1.1250
1.125-14	2A	.0016	1.1234	1.1131	1.0770	1.0717	.0053	1.0358	2B	1.048	1.064	1.0786	1.0855	.0069	1.1250
1.125-24	2A	.0013	1.1237	1.1165	1.0966	1.0924	.0042	1.0726	2B	1.080	1.090	1.0979	1.1034	.0055	1.1250
1.250-10	2A	.0019	1.2481	1.2352	1.1831	1.1768	.0063	1.1254	2B	1.142	1.163	1.1850	1.1932	.0082	1.2500
1.250-14	2A	.0016	1.2484	1.2381	1.2020	1.1966	.0054	1.1608	2B	1.173	1.188	1.2036	1.2106	.0070	1.2500
1.250-24	2A	.0013	1.2487	1.2415	1.2216	1.2173	.0043	1.1976	2B	1.205	1.215	1.2229	1.2285	.0056	1.2500
1.375-10	2A	.0019	1.3731	1.3602	1.3081	1.3018	.0063	1.2504	2B	1.267	1.288	1.3100	1.3182	.0082	1.3750
1.375-14	2A	.0016	1.3734	1.3631	1.3270	1.3216	.0054	1.2858	2B	1.298	1.314	1.3286	1.3356	.0070	1.3750
1.375-24	2A	.0013	1.3737	1.3665	1.3466	1.3423	.0043	1.3226	2B	1.330	1.340	1.3479	1.3535	.0056	1.3750
1.500-10	2A	.0019	1.4981	1.4852	1.4331	1.4267	.0064	1.3754	2B	1.392	1.413	1.4350	1.4433	.0083	1.5000
1.500-14	2A	.0017	1.4983	1.4880	1.4519	1.4464	.0055	1.4107	2B	1.423	1.438	1.4536	1.4608	.0072	1.5000
1.500-24	2A	.0013	1.4987	1.4915	1.4716	1.4672	.0044	1.4476	2B	1.455	1.465	1.4729	1.4787	.0058	1.5000
1.625-10	2A	.0019	1.6231	1.6102	1.5581	1.5517	.0064	1.5004	2B	1.517	1.538	1.5600	1.5683	.0083	1.6250
1.625-14	2A	.0017	1.6233	1.6130	1.5769	1.5714	.0055	1.5357	2B	1.548	1.564	1.5786	1.5858	.0072	1.6250
1.625-24	2A	.0013	1.6237	1.6165	1.5966	1.5922	.0044	1.5726	2B	1.580	1.590	1.5979	1.6037	.0058	1.6250
1.750-10	2A	.0019	1.7481	1.7352	1.6831	1.6766	.0065	1.6254	2B	1.642	1.663	1.6850	1.6934	.0084	1.7500
1.750-14	2A	.0017	1.7483	1.7380	1.7019	1.6963	.0056	1.6607	2B	1.673	1.688	1.7036	1.7109	.0073	1.7500

See footnotes at end of table.

TABLE 3.1. *Selected combinations, Unified special screw threads, UNS*—Continued

Nominal size and threads per inch	External[a]								Internal[a]						
	Class	Allowance	Major diameter		Pitch diameter			(c) Minor diameter	Class	Minor diameter		Pitch diameter			Major diameter
			Max[b]	Min	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		in	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
1.750–18	2A	.0015	1.7485	1.7398	1.7124	1.7073	.0051	1.6803	2B	1.690	1.703	1.7139	1.7205	.0066	1.7500
1.875–10	2A	.0019	1.8731	1.8602	1.8081	1.8016	.0065	1.7504	2B	1.767	1.788	1.8100	1.8184	.0084	1.8750
1.875–14	2A	.0017	1.8733	1.8630	1.8269	1.8213	.0056	1.7857	2B	1.798	1.814	1.8286	1.8359	.0073	1.8750
1.875–18	2A	.0015	1.8735	1.8648	1.8374	1.8323	.0051	1.8053	2B	1.815	1.828	1.8389	1.8455	.0066	1.8750
2.000–10	2A	.0020	1.9980	1.9851	1.9330	1.9265	.0065	1.8753	2B	1.892	1.913	1.9350	1.9435	.0085	2.0000
2.000–14	2A	.0017	1.9983	1.9880	1.9519	1.9462	.0057	1.9107	2B	1.923	1.938	1.9536	1.9610	.0074	2.0000
2.000–18	2A	.0015	1.9985	1.9898	1.9624	1.9573	.0051	1.9303	2B	1.940	1.953	1.9639	1.9706	.0067	2.0000
2.0625–16	2A	.0016	2.0609	2.0515	2.0203	2.0149	.0054	1.9842	2B	1.995	2.009	2.0219	2.0289	.0070	2.0625
	3A	.0000	2.0625	2.0531	2.0219	2.0179	.0040	1.9858	3B	1.9950	2.0033	2.0219	2.0271	.0052	2.0625
2.1875–16	2A	.0016	2.1859	2.1765	2.1453	2.1399	.0054	2.1092	2B	2.120	2.134	2.1469	2.1539	.0070	2.1875
	3A	.0000	2.1875	2.1781	2.1469	2.1428	.0041	2.1108	3B	2.1200	2.1283	2.1469	2.1521	.0052	2.1875
2.250–10	2A	.0020	2.2480	2.2351	2.1830	2.1765	.0065	2.1253	2B	2.142	2.163	2.1850	2.1935	.0085	2.2500
2.250–14	2A	.0017	2.2483	2.2380	2.2019	2.1962	.0057	2.1607	2B	2.173	2.188	2.2036	2.2110	.0074	2.2500
2.250–18	2A	.0015	2.2485	2.2398	2.2124	2.2073	.0051	2.1803	2B	2.190	2.203	2.2139	2.2206	.0067	2.2500
2.3125–16	2A	.0017	2.3108	2.3014	2.2702	2.2647	.0055	2.2341	2B	2.245	2.259	2.2719	2.2791	.0072	2.3125
	3A	.0000	2.3125	2.3031	2.2719	2.2678	.0041	2.2358	3B	2.2450	2.2533	2.2719	2.2773	.0054	2.3125
2.4375–16	2A	.0017	2.4358	2.4264	2.3952	2.3897	.0055	2.3591	2B	2.370	2.384	2.3969	2.4041	.0072	2.4375
	3A	.0000	2.4375	2.4281	2.3969	2.3928	.0041	2.3608	3B	2.3700	2.3783	2.3969	2.4023	.0054	2.4375
2.500–10	2A	.0020	2.4980	2.4851	2.4330	2.4263	.0067	2.3753	2B	2.392	2.413	2.4350	2.4437	.0087	2.5000
2.500–14	2A	.0017	2.4983	2.4880	2.4519	2.4461	.0058	2.4107	2B	2.423	2.438	2.4536	2.4612	.0076	2.5000
2.500–18	2A	.0016	2.4984	2.4897	2.4623	2.4570	.0053	2.4302	2B	2.440	2.453	2.4639	2.4708	.0069	2.5000
2.750–10	2A	.0020	2.7480	2.7351	2.6830	2.6763	.0067	2.6253	2B	2.642	2.663	2.6850	2.6937	.0087	2.7500
2.750–14	2A	.0017	2.7483	2.7380	2.7019	2.6961	.0058	2.6607	2B	2.673	2.688	2.7036	2.7112	.0076	2.7500
2.750–18	2A	.0016	2.7484	2.7397	2.7123	2.7070	.0053	2.6802	2B	2.690	2.703	2.7139	2.7208	.0069	2.7500
3.000–10	2A	.0020	2.9980	2.9851	2.9330	2.9262	.0068	2.8753	2B	2.892	2.913	2.9350	2.9439	.0089	3.0000
3.000–14	2A	.0018	2.9982	2.9879	2.9518	2.9459	.0059	2.9106	2B	2.923	2.938	2.9536	2.9613	.0077	3.0000
3.000–18	2A	.0016	2.9984	2.9897	2.9623	2.9569	.0054	2.9302	2B	2.940	2.953	2.9639	2.9709	.0070	3.0000
3.250–10	2A	.0020	3.2480	3.2351	3.1830	3.1762	.0068	3.1253	2B	3.142	3.163	3.1850	3.1939	.0089	3.2500
3.250–14	2A	.0018	3.2482	3.2379	3.2018	3.1959	.0059	3.1606	2B	3.173	3.188	3.2036	3.2113	.0077	3.2500
3.250–18	2A	.0016	3.2484	3.2397	3.2123	3.2069	.0054	3.1802	2B	3.190	3.203	3.2139	3.2209	.0070	3.2500
3.500–10	2A	.0021	3.4979	3.4850	3.4329	3.4260	.0069	3.3752	2B	3.392	3.413	3.4350	3.4440	.0090	3.5000
3.500–14	2A	.0018	3.4982	3.4879	3.4518	3.4457	.0061	3.4106	2B	3.423	3.438	3.4536	3.4615	.0079	3.5000
3.500–18	2A	.0017	3.4983	3.4896	3.4622	3.4567	.0055	3.4301	2B	3.440	3.453	3.4639	3.4711	.0072	3.5000
3.750–10	2A	.0021	3.7479	3.7350	3.6829	3.6760	.0069	3.6252	2B	3.642	3.663	3.6850	3.6940	.0090	3.7500
3.750–14	2A	.0018	3.7482	3.7379	3.7018	3.6957	.0061	3.6606	2B	3.673	3.688	3.7036	3.7115	.0079	3.7500
3.750–18	2A	.0017	3.7483	3.7396	3.7122	3.7067	.0055	3.6801	2B	3.690	3.703	3.7139	3.7211	.0072	3.7500
4.000–10	2A	.0021	3.9979	3.9850	3.9329	3.9259	.0070	3.8752	2B	3.892	3.913	3.9350	3.9441	.0091	4.0000
4.000–14	2A	.0018	3.9982	3.9879	3.9518	3.9456	.0062	3.9106	2B	3.923	3.938	3.9536	3.9616	.0080	4.0000
4.250–10	2A	.0021	4.2479	4.2350	4.1829	4.1759	.0070	4.1252	2B	4.142	4.163	4.1850	4.1941	.0091	4.2500
4.250–14	2A	.0018	4.2482	4.2379	4.2018	4.1956	.0062	4.1606	2B	4.173	4.188	4.2036	4.2116	.0080	4.2500
4.500–10	2A	.0021	4.4979	4.4850	4.4329	4.4259	.0070	4.3752	2B	4.392	4.413	4.4350	4.4441	.0091	4.5000

See footnotes at end of table.

TABLE 3.1. *Selected combinations, Unified special screw threads, UNS*—Continued

Nominal size and threads per inch	External[a]								Internal[a]						
	Class	Allowance	Major diameter		Pitch diameter			(c) Minor diameter	Class	Minor diameter		Pitch diameter			Major diameter
			Max[b]	Min	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		in	*in*	*in*	*in*	*in*	*in*	*in*		*in*	*in*	*in*	*in*	*in*	*in*
4.500–14	2A	.0018	4.4982	4.4879	4.4518	4.4456	.0062	4.4106	2B	4.423	4.438	4.4536	4.4616	.0080	4.5000
4.750–10	2A	.0022	4.7478	4.7349	4.6828	4.6756	.0072	4.6251	2B	4.642	4.663	4.6850	4.6944	.0094	4.7500
4.750–14	2A	.0019	4.7481	4.7378	4.7017	4.6953	.0064	4.6605	2B	4.673	4.688	4.7036	4.7119	.0083	4.7500
5.000–10	2A	.0022	4.9978	4.9849	4.9328	4.9256	.0072	4.8751	2B	4.892	4.913	4.9350	4.9444	.0094	5.0000
5.000–14	2A	.0019	4.9981	4.9878	4.9517	4.9453	.0064	4.9105	2B	4.923	4.938	4.9536	4.9619	.0083	5.0000
5.250–10	2A	.0022	5.2478	5.2349	5.1828	5.1756	.0072	5.1251	2B	5.142	5.163	5.1850	5.1944	.0094	5.2500
5.250–14	2A	.0019	5.2481	5.2378	5.2017	5.1953	.0064	5.1605	2B	5.173	5.188	5.2036	5.2119	.0083	5.2500
5.500–10	2A	.0022	5.4978	5.4849	5.4328	5.4256	.0072	5.3751	2B	5.392	5.413	5.4350	5.4444	.0094	5.5000
5.500–14	2A	.0019	5.4981	5.4878	5.4517	5.4453	.0064	5.4105	2B	5.423	5.438	5.4536	5.4619	.0083	5.5000
5.750–10	2A	.0022	5.7478	5.7349	5.6828	5.6754	.0074	5.6251	2B	5.642	5.663	5.6850	5.6946	.0096	5.7500
5.750–14	2A	.0020	5.7480	5.7377	5.7016	5.6951	.0065	5.6604	2B	5.673	5.688	5.7036	5.7121	.0085	5.7500
6.000–10	2A	.0022	5.9978	5.9849	5.9328	5.9254	.0074	5.8751	2B	5.892	5.913	5.9350	5.9446	.0096	6.0000
6.000–14	2A	.0020	5.9980	5.9877	5.9516	5.9451	.0065	5.9104	2B	5.923	5.938	5.9536	5.9621	.0085	6.0000

[a] Regarding combinations of thread classes, see under Thread classes in section 2.
[b] For class 2A threads having an additive finish the maximum is increased to the basic size. See under Classes 2A and 2B threads, and Coated threads in section 2.
[c] See figures 2.3, 2.4, and 2.5.
[d] The 1.000–14 size was formerly NF. The tolerances and allowances for this size are based on one diameter length of engagement.

TABLE 3.2 *Allowances for external threads of special diameters and pitches, classes 1A and 2A*[a]

(UNS threads. See par. 10, p. 3.05.)

Allowance based on diameter of →	0.0625	0.09375	0.125	0.1875	0.25	0.375	0.5	0.625	0.75	1	1.25	1.5
For diameter range Above →	0.0470	0.0781	0.1094	0.1562	0.2188	0.3125	0.4375	0.5625	0.6875	0.875	1.125	1.375
To and including →	0.0781	0.1094	0.1562	0.2188	0.3125	0.4375	0.5625	0.6875	0.875	1.125	1.375	1.625
Threads per inch	Major, pitch, and minor diameter allowances											
	in	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*
80	0.0006	0.0006	0.0006	0.0007	0.0007	----	----	----	----	----	----	----
72	.0006	.0006	.0006	.0007	.0007	0.0007	----	----	----	----	----	----
64	.0006	.0007	.0007	.0007	.0007	.0008	0.0008	----	----	----	----	----
56	----	.0007	.0007	.0007	.0008	.0008	.0008	0.0009	.0009	----	----	----
48	----	.0007	.0008	.0008	.0008	.0009	.0009	.0009	.0009	----	----	----
44	----	.0008	.0008	.0008	.0008	.0009	.0009	.0009	.0010	0.0010	----	----
40	----	----	.0008	.0009	.0009	.0009	.0010	.0010	.0010	.0010	----	----
36	----	----	.0009	.0009	.0009	.0010	.0010	.0010	.0010	.0011	0.0011	0.0012
32	----	----	.0009	.0009	.0010	.0010	.0010	.0011	.0011	.0011	.0012	.0012
28	----	----	----	.0010	.0010	.0011	.0011	.0011	.0012	.0012	.0012	.0013
27	----	----	----	.0010	.0010	.0011	.0011	.0011	.0012	.0012	.0012	.0013
24	----	----	----	.0011	.0011	.0011	.0012	.0012	.0012	.0013	.0013	.0013
20	----	----	----	----	.0012	.0012	.0013	.0013	.0013	.0014	.0014	.0014
18	----	----	----	----	----	.0013	.0013	.0014	.0014	.0014	.0015	.0015
16	----	----	----	----	----	.0014	.0014	.0014	.0015	.0015	.0015	.0016
14	----	----	----	----	----	----	.0015	.0015	.0015	.0016	.0016	.0017
12	----	----	----	----	----	----	.0016	.0016	.0017	.0017	.0017	.0018
10	----	----	----	----	----	----	----	----	.0018	.0018	.0019	.0019
8	----	----	----	----	----	----	----	----	----	.0021	.0021	.0021
6	----	----	----	----	----	----	----	----	----	----	----	.0024
4	----	----	----	----	----	----	----	----	----	----	----	----

Allowance based on diameter of →	1.75	2	2.5	3	3.5	4	5	6	8	10	12
For diameter range Above →	1.625	1.875	2.25	2.75	3.25	3.75	4.5	5.5	7	9	11
To and including →	1.875	2.25	2.75	3.25	3.75	4.5	5.5	7	9	11	13
Threads per inch	Major, pitch, and minor diameter allowances										
	in	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*
80	----	----	----	----	----	----	----	----	----	----	----
72	----	----	----	----	----	----	----	----	----	----	----
64	----	----	----	----	----	----	----	----	----	----	----
56	----	----	----	----	----	----	----	----	----	----	----
48	----	----	----	----	Classes 1A and 2A allowances are determined by multiplying class 2A pitch diameter tolerances (computed to six decimal places) by 0.3 and are based on lengths of engagement of nine pitches.						
44	----	----	----	----							
40	----	----	----	----	----	----	----	----	----	----	----
36	----	----	----	----	----	----	----	----	----	----	----
32	0.0012	0.0013	0.0013	0.0013	----	----	----	----	----	----	----
28	.0013	.0013	.0014	.0014	0.0014	0.0015	----	----	----	----	----
27	.0013	.0013	.0014	.0014	.0014	.0015	0.0015	0.0016	----	----	----
24	.0014	.0014	.0014	.0015	.0015	.0015	.0016	.0016	----	----	----
20	.0015	.0015	.0015	.0016	.0016	.0016	.0017	.0017	----	----	----
18	.0015	.0015	.0016	.0016	.0017	.0017	.0017	.0018	0.0019	----	----
16	.0016	.0016	.0017	.0017	.0017	.0018	.0018	.0019	.0019	0.0020	----
14	.0017	.0017	.0017	.0018	.0018	.0018	.0019	.0020	.0020	.0021	0.0022
12	.0018	.0018	.0019	.0019	.0019	.0020	.0020	.0021	.0021	.0022	.0023
10	.0019	.0020	.0020	.0020	.0021	.0021	.0022	.0022	.0023	.0024	.0024
8	.0021	.0022	.0022	.0023	.0023	.0023	.0024	.0024	.0025	.0026	.0026
6	.0025	.0025	.0025	.0026	.0026	.0026	.0027	.0027	.0028	.0029	.0029
4	----	.0030	.0031	.0031	.0031	.0032	.0032	.0033	.0034	.0034	.0035

[a] Class 1AR allowances are tabulated on p. 3.03.

CLASSES 1A, 2A ALLOWANCES

TABLE 3.3. *Pitch diameter tolerances for external threads of special diameters, pitches, and lengths of engagement, classes 1A and 1AR*
(UNS threads. See par. 7.3, p. 3.03; par. 10, p. 3.05.)

Tolerance based on diameter of →			0.0625	0.09375	0.125	0.1875	0.25	0.375	0.5	0.625	0.75	1
For diameter range Above →			0.0470	0.0781	0.1094	0.1562	0.2188	0.3125	0.4375	0.5625	0.6875	0.875
To and including →			0.0781	0.1094	0.1562	0.2188	0.3125	0.4375	0.5625	0.6875	0.875	1.125
Threads per inch	Length of engagement		Pitch diameter tolerances									
	Number of pitches	Inches										
				in	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*
80	5 to 15	0.06 to 0.19	----	----	----	----	----	----	----	----	----	----
	16 to 30	0.191 to 0.38	----	----	----	----	----	----	----	----	----	----
72	5 to 15	0.07 to 0.21	----	----	----	----	----	----	----	----	----	----
	16 to 30	0.211 to 0.42	----	----	----	----	----	----	----	----	----	----
64	5 to 15	0.08 to 0.23	----	----	----	----	----	----	----	----	----	----
	16 to 30	0.231 to 0.46	----	----	----	----	----	----	----	----	----	----
56	5 to 15	0.09 to 0.27	----	----	----	----	----	----	----	----	----	----
	16 to 30	0.271 to 0.54	----	----	----	----	----	----	----	----	----	----
48	5 to 15	0.10 to 0.31	----	----	----	----	----	----	----	----	----	----
	16 to 30	0.311 to 0.62	----	----	----	----	----	----	----	----	----	----
44	5 to 15	0.11 to 0.34	----	0.0038	0.0039	0.0041	0.0042	0.0044	0.0046	0.0047	0.0049	0.0051
	16 to 30	0.341 to 0.68	----	.0048	.0049	.0051	.0053	.0056	.0058	.0059	.0061	.0063
40	5 to 15	0.12 to 0.38	----	----	.0041	.0043	.0044	.0046	.0048	.0049	.0050	.0052
	16 to 30	0.381 to 0.76	----	----	.0051	.0053	.0055	.0058	.0060	.0061	.0063	.0066
36	5 to 15	0.14 to 0.42	----	----	.0043	.0045	.0046	.0048	.0050	.0051	.0052	.0054
	16 to 30	0.421 to 0.84	----	----	.0054	.0056	.0058	.0060	.0062	.0064	.0065	.0068
32	5 to 15	0.16 to 0.47	----	----	.0045	.0047	.0048	.0050	.0052	.0053	.0055	.0057
	16 to 30	0.471 to 0.94	----	----	.0057	.0059	.0061	.0063	.0065	.0067	.0068	.0071
28	5 to 15	0.18 to 0.54	----	----	----	.0050	.0051	.0053	.0055	.0056	.0058	.0060
	16 to 30	0.541 to 1.08	----	----	----	.0063	.0064	.0067	.0069	.0070	.0072	.0075
27	5 to 15	0.19 to 0.56	----	----	----	.0051	.0052	.0054	.0056	.0057	.0058	.0060
	16 to 30	0.561 to 1.12	----	----	----	.0064	.0065	.0068	.0070	.0072	.0073	.0076
24	5 to 15	0.21 to 0.62	----	----	----	.0054	.0055	.0057	.0059	.0060	.0061	.0063
	16 to 30	0.621 to 1.24	----	----	----	.0067	.0069	.0071	.0073	.0075	.0077	.0079
20	5 to 15	0.25 to 0.75	----	----	----	----	.0060	.0062	.0063	.0065	.0066	.0068
	16 to 30	0.751 to 1.50	----	----	----	----	.0075	.0077	.0079	.0081	.0083	.0085
18	5 to 15	0.28 to 0.83	----	----	----	----	----	.0065	.0067	.0068	.0069	.0071
	16 to 30	0.831 to 1.66	----	----	----	----	----	.0081	.0083	.0085	.0086	.0089
16	5 to 15	0.31 to 0.94	----	----	----	----	----	.0069	.0070	.0072	.0073	.0075
	16 to 30	0.941 to 1.88	----	----	----	----	----	.0086	.0088	.0089	.0091	.0094
14	5 to 15	0.36 to 1.07	----	----	----	----	----	----	.0075	.0076	.0077	.0079
	16 to 30	1.071 to 2.14	----	----	----	----	----	----	.0093	.0095	.0097	.0099
12	5 to 15	0.42 to 1.25	----	----	----	----	----	----	.0080	.0082	.0083	.0085
	16 to 30	1.251 to 2.50	----	----	----	----	----	----	.0100	.0102	.0104	.0106
10	5 to 15	0.50 to 1.50	----	----	----	----	----	----	----	----	.0090	.0092
	16 to 30	1.501 to 3.00	----	----	----	----	----	----	----	----	.0113	.0115
8	5 to 15	0.62 to 1.88	----	----	----	----	----	----	----	----	----	.0103
	16 to 30	1.881 to 3.76	----	----	----	----	----	----	----	----	----	.0128
6	5 to 15	0.83 to 2.50	----	----	----	----	----	----	----	----	----	----
	16 to 30	2.501 to 5.00	----	----	----	----	----	----	----	----	----	----
4	5 to 15	1.25 to 3.75	----	----	----	----	----	----	----	----	----	----
	16 to 30	3.751 to 7.50	----	----	----	----	----	----	----	----	----	----

1A, 1AR P.D. TOLERANCES

TABLE 3.3. *Pitch diameter tolerances for external threads of special diameters, pitches, and lengths of engagement, classes 1A and 1AR*—Con.

1.25	1.5	1.75	2	2.5	3	3.5	4	5	6	8	10	12	
1.125	1.375	1.625	1.875	2.25	2.75	3.25	3.75	4.5	5.5	7	9	11	
1.375	1.625	1.875	2.25	2.75	3.25	3.75	4.5	5.5	7	9	11	13	
Pitch diameter tolerances													Threads per inch
in	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	
0.0056	0.0058	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	
.0070	.0072	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	36
.0058	.0060	0.0061	0.0063	0.0065	0.0067	----------	----------	----------	----------	----------	----------	----------	
.0073	.0075	.0077	.0078	.0081	.0083	----------	----------	----------	----------	----------	----------	----------	32
.0061	.0063	.0064	.0066	.0068	.0070	0.0071	0.0073	----------	----------	----------	----------	----------	
.0077	.0079	.0080	.0082	.0085	.0087	.0089	.0091	----------	----------	----------	----------	----------	28
.0061	.0064	.0065	.0066	.0069	.0070	.0072	.0074	0.0076	0.0079	----------	----------	----------	
.0078	.0080	.0081	.0083	.0086	.0088	.0090	.0092	.0096	.0099	----------	----------	----------	27
.0065	.0067	.0068	.0069	.0071	.0073	.0075	.0077	.0079	.0082	----------	----------	----------	
.0081	.0083	.0085	.0086	.0089	.0092	.0094	.0096	.0099	.0102	----------	----------	----------	24
.0070	.0071	.0073	.0074	.0076	.0078	.0080	.0081	.0084	.0087	----------	----------	----------	
.0087	.0089	.0091	.0092	.0095	.0098	.0100	.0102	.0105	.0108	----------	----------	----------	20
.0073	.0074	.0076	.0077	.0079	.0081	.0083	.0084	.0087	.0090	0.0094	----------	----------	
.0091	.0093	.0095	.0096	.0099	.0101	.0104	.0105	.0109	.0112	.0117	----------	----------	18
.0077	.0078	.0079	.0081	.0083	.0085	.0086	.0088	.0091	.0093	.0097	0.0101	----------	
.0096	.0098	.0099	.0101	.0104	.0106	.0108	.0110	.0113	.0116	.0122	.0126	----------	16
.0081	.0083	.0084	.0085	.0087	.0089	.0091	.0092	.0095	.0098	.0102	.0105	0.0108	
.0101	.0103	.0105	.0106	.0109	.0112	.0114	.0116	.0119	.0122	.0127	.0132	.0135	14
.0087	.0088	.0090	.0091	.0093	.0095	.0097	.0098	.0101	.0103	.0107	.0111	.0114	
.0108	.0110	.0112	.0113	.0116	.0119	.0121	.0123	.0126	.0129	.0134	.0139	.0142	12
.0094	.0096	.0097	.0098	.0100	.0102	.0104	.0106	.0108	.0111	.0115	.0118	.0121	
.0118	.0119	.0121	.0123	.0125	.0128	.0130	.0132	.0135	.0138	.0144	.0148	.0152	10
.0104	.0106	.0107	.0108	.0111	.0113	.0114	.0116	.0119	.0121	.0125	.0129	.0132	
.0130	.0132	.0134	.0136	.0138	.0141	.0143	.0145	.0148	.0151	.0156	.0161	.0165	8
----------	.0121	.0123	.0124	.0126	.0128	.0130	.0131	.0134	.0137	.0141	.0144	.0147	
----------	.0152	.0154	.0155	.0158	.0160	.0162	.0164	.0168	.0171	.0176	.0180	.0184	6
----------	----------	----------	.0151	.0154	.0155	.0157	.0159	.0162	.0164	.0168	.0172	.0175	
----------	----------	----------	.0189	.0192	.0194	.0196	.0198	.0202	.0205	.0210	.0214	.0218	4

LEGENDS

1. These values do not agree with and shall not be used in place of any tabulated values for the UNC, UNF, and 8UN thread series in table 2.21.
2. Classes 1A and 1AR tolerances in this table for 5 to 15 pitches are based on 9 pitches and are obtained by multiplying the class 2A (external thread) tolerances for 9 pitches taken to six decimal places (see table 2.19) by a factor of 1.5.
3. Classes 1A and 1AR tolerances in this table for 16 to 30 pitches are obtained by multiplying the class 2A (external thread) tolerances for 9 pitches taken to six decimal places (see table 2.19) by a factor of 1.875 (obtained by multiplying the 1.5 factor by 1.25). For lengths of engagement not tabulated, see par. 7.3, p. 3.03.
4. Pitches listed are those used most commonly and are recommended. Where intermediate pitches are specified, the formula in par. 7.3, p. 3.03, should be applied.
5. Tolerances are tabulated only for combinations of diameter, pitch, and length of engagement which are considered to be generally used. For other combinations encountered, see Design of Special Threads in appendix A5.

1A, 1AR P.D. TOLERANCES

212-951 O - 76 - 7

TABLE 3.4 *Pitch diameter tolerances for external threads of special diameters, pitches, and lengths of engagement, class 2A*

(UNS threads. See par. 7.3, p. 3.03; par. 10, p. 3.05.)

Threads per inch	Length of engagement: Number of pitches	Length of engagement: Inches	0.0625	0.09375	0.125	0.1875	0.25	0.375	0.5	0.625	0.75	1
Tolerance based on diameter of →			0.0625	0.09375	0.125	0.1875	0.25	0.375	0.5	0.625	0.75	1
For diameter range Above →			0.0470	0.0781	0.1094	0.1562	0.2188	0.3125	0.4375	0.5625	0.6875	0.875
To and including →			0.0781	0.1094	0.1562	0.2188	0.3125	0.4375	0.5625	0.6875	0.875	1.125
			Pitch diameter tolerances									
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*
80	5 to 15	0.06 to 0.19	0.0019	0.0020	0.0021	0.0022	0.0023	----	----	----	----	----
	16 to 30	0.191 to 0.38	.0024	.0025	.0026	.0027	.0028	----	----	----	----	----
72	5 to 15	0.07 to 0.21	.0020	.0021	.0021	.0023	.0023	0.0025	----	----	----	----
	16 to 30	0.211 to 0.42	.0025	.0026	.0027	.0028	.0029	.0031	----	----	----	----
64	5 to 15	0.08 to 0.23	.0021	.0022	.0022	.0024	.0024	.0026	0.0027	----	----	----
	16 to 30	0.231 to 0.46	.0026	.0027	.0028	.0029	.0031	.0032	.0034	----	----	----
56	5 to 15	0.09 to 0.27	----	.0023	.0024	.0025	.0026	.0027	.0028	0.0029	0.0030	----
	16 to 30	0.271 to 0.54	----	.0029	.0030	.0031	.0032	.0034	.0035	.0036	.0037	----
48	5 to 15	0.10 to 0.31	----	.0025	.0025	.0026	.0027	.0029	.0030	.0031	.0031	----
	16 to 30	0.311 to 0.62	----	.0031	.0032	.0033	.0034	.0036	.0037	.0038	.0039	----
44	5 to 15	0.11 to 0.34	----	.0026	.0026	.0027	.0028	.0030	.0031	.0032	.0032	0.0034
	16 to 30	0.341 to 0.68	----	.0032	.0033	.0034	.0035	.0037	.0038	.0040	.0041	.0042
40	5 to 15	0.12 to 0.38	----	----	.0027	.0029	.0029	.0031	.0032	.0033	.0034	.0035
	16 to 30	0.381 to 0.76	----	----	.0034	.0036	.0037	.0038	.0040	.0041	.0042	.0044
36	5 to 15	0.14 to 0.42	----	----	.0029	.0030	.0031	.0032	.0033	.0034	.0035	.0036
	16 to 30	0.421 to 0.84	----	----	.0036	.0037	.0038	.0040	.0041	.0043	.0044	.0045
32	5 to 15	0.16 to 0.47	----	----	.0030	.0031	.0032	.0034	.0035	.0036	.0036	.0038
	16 to 30	0.471 to 0.94	----	----	.0038	.0039	.0040	.0042	.0043	.0045	.0046	.0047
28	5 to 15	0.18 to 0.54	----	----	----	.0033	.0034	.0036	.0037	.0038	.0038	.0040
	16 to 30	0.541 to 1.08	----	----	----	.0042	.0043	.0044	.0046	.0047	.0048	.0050
27	5 to 15	0.19 to 0.56	----	----	----	.0034	.0035	.0036	.0037	.0038	.0039	.0040
	16 to 30	0.561 to 1.12	----	----	----	.0042	.0043	.0045	.0047	.0048	.0049	.0050
24	5 to 15	0.21 to 0.62	----	----	----	.0036	.0037	.0038	.0039	.0040	.0041	.0042
	16 to 30	0.621 to 1.24	----	----	----	.0045	.0046	.0048	.0049	.0050	.0051	.0053
20	5 to 15	0.25 to 0.75	----	----	----	----	.0040	.0041	.0042	.0043	.0044	.0045
	16 to 30	0.751 to 1.50	----	----	----	----	.0050	.0052	.0053	.0054	.0055	.0057
18	5 to 15	0.28 to 0.83	----	----	----	----	----	.0043	.0044	.0045	.0046	.0047
	16 to 30	0.831 to 1.66	----	----	----	----	----	.0054	.0055	.0057	.0058	.0059
16	5 to 15	0.31 to 0.94	----	----	----	----	----	.0046	.0047	.0048	.0049	.0050
	16 to 30	0.941 to 1.88	----	----	----	----	----	.0057	.0058	.0060	.0061	.0062
14	5 to 15	0.36 to 1.07	----	----	----	----	----	----	.0050	.0051	.0051	.0053
	16 to 30	1.071 to 2.14	----	----	----	----	----	----	.0062	.0063	.0064	.0066
12	5 to 15	0.42 to 1.25	----	----	----	----	----	----	.0054	.0054	.0055	.0057
	16 to 30	1.251 to 2.50	----	----	----	----	----	----	.0067	.0068	.0069	.0071
10	5 to 15	0.50 to 1.50	----	----	----	----	----	----	----	----	.0060	.0062
	16 to 30	1.501 to 3.00	----	----	----	----	----	----	----	----	.0075	.0077
8	5 to 15	0.62 to 1.88	----	----	----	----	----	----	----	----	----	.0068
	16 to 30	1.881 to 3.76	----	----	----	----	----	----	----	----	----	.0086
6	5 to 15	0.83 to 2.50	----	----	----	----	----	----	----	----	----	----
	16 to 30	2.501 to 5.00	----	----	----	----	----	----	----	----	----	----
4	5 to 15	1.25 to 3.75	----	----	----	----	----	----	----	----	----	----
	16 to 30	3.751 to 7.50	----	----	----	----	----	----	----	----	----	----

2A P.D. TOLERANCES

TABLE 3.4. *Pitch diameter tolerances for external threads of special diameters, pitches, and lengths of engagement, class 2A*—Con

1.25	1.5	1.75	2	2.5	3	3.5	4	5	6	8	10	12
1.125	1.375	1.625	1.875	2.25	2.75	3.25	3.75	4.5	5.5	7	9	11
1.375	1.625	1.875	2.25	2.75	3.25	3.75	4.5	5.5	7	9	11	13

LEGENDS

1. These values do not agree with and shall not be used in place of any tabulated values for the UNC, UNF, and 8UN thread series in table 2.21.
2. Formula:
   Class 2A tolerances $= 0.0015\sqrt[3]{D} + 0.0015\sqrt{L_e} + 0.015\sqrt[3]{p^2}$ where
   D = basic major diameter
   L_e = length of engagement
   p = pitch
3. Length of engagement increments included in the tabulated tolerances for lengths of engagement of from 5 to 15 pitches are based on lengths of 9 pitches; those for lengths of engagement greater than 15 to 30 pitches are obtained by multiplying the 9-pitch values taken to six decimal places (see table 2.19) by 1.25. For lengths of engagement not tabulated, the formula in legend 2 should be applied except as modified by par. 7.3, p. 3.03.
4. Pitches listed are those used most commonly and are recommended. When intermediate pitches are specified, the formula in legend 2 should be applied.
5. Tolerances are tabulated only for combinations of diameter, pitch and length of engagement which are considered to be generally used. For other combinations encountered, see Design of Special Threads in appendix A5.

Pitch diameter tolerances													Threads per inch
in	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	
----	----	----	----	----	----	----	----	----	----	----	----	----	40
----	----	----	----	----	----	----	----	----	----	----	----	----	
0.0037	0.0038	----	----	----	----	----	----	----	----	----	----	----	36
.0047	.0048	----	----	----	----	----	----	----	----	----	----	----	
.0039	.0040	0.0041	0.0042	0.0043	0.0044	----	----	----	----	----	----	----	32
.0049	.0050	.0051	.0052	.0054	.0056	----	----	----	----	----	----	----	
.0041	.0042	.0043	.0044	.0045	.0046	0.0048	0.0049	----	----	----	----	----	28
.0051	.0052	.0054	.0055	.0056	.0058	.0059	.0061	----	----	----	----	----	
.0041	.0042	.0043	.0044	.0046	.0047	.0048	.0049	0.0051	0.0053	----	----	----	27
.0052	.0053	.0054	.0055	.0057	.0059	.0060	.0061	.0064	.0066	----	----	----	
.0043	.0044	.0045	.0046	.0048	.0049	.0050	.0051	.0053	.0054	----	----	----	24
.0054	.0055	.0057	.0058	.0059	.0061	.0062	.0064	.0066	.0068	----	----	----	
.0047	.0048	.0048	.0049	.0051	.0052	.0053	.0054	.0056	.0058	----	----	----	20
.0058	.0059	.0061	.0062	.0063	.0065	.0066	.0068	.0070	.0072	----	----	----	
.0049	.0050	.0051	.0051	.0053	.0054	.0055	.0056	.0058	.0060	0.0062	----	----	18
.0061	.0062	.0063	.0064	.0066	.0068	.0069	.0070	.0073	.0075	.0078	----	----	
.0051	.0052	.0053	.0054	.0055	.0056	.0058	.0059	.0061	.0062	.0065	0.0067	----	16
.0064	.0065	.0066	.0067	.0069	.0071	.0072	.0073	.0076	.0078	.0081	.0084	----	
.0054	.0055	.0056	.0057	.0058	.0059	.0061	.0062	.0064	.0065	.0068	.0070	0.0072	14
.0068	.0069	.0070	.0071	.0073	.0074	.0076	.0077	.0079	.0081	.0085	.0088	.0090	
.0058	.0059	.0060	.0061	.0062	.0063	.0064	.0065	.0067	.0069	.0072	.0074	.0076	12
.0072	.0073	.0075	.0076	.0077	.0079	.0080	.0082	.0084	.0086	.0090	.0092	.0095	
.0063	.0064	.0065	.0065	.0067	.0068	.0069	.0070	.0072	.0074	.0077	.0079	.0081	10
.0078	.0080	.0081	.0082	.0084	.0085	.0087	.0088	.0090	.0092	.0096	.0099	.0101	
.0070	.0071	.0071	.0072	.0074	.0075	.0076	.0077	.0079	.0081	.0083	.0086	.0088	8
.0087	.0088	.0089	.0090	.0092	.0094	.0095	.0097	.0099	.0101	.0104	.0107	.0110	
----	.0081	.0082	.0083	.0084	.0085	.0087	.0088	.0089	.0091	.0094	.0096	.0098	6
----	.0101	.0102	.0103	.0105	.0107	.0108	.0110	.0112	.0114	.0117	.0120	.0123	
----	----	----	.0101	.0102	.0104	.0105	.0106	.0108	.0109	.0112	.0114	.0116	4
----	----	----	.0126	.0128	.0130	.0131	.0132	.0135	.0137	.0140	.0143	.0145	

2A P.D. TOLERANCES

TABLE 3.5 *Pitch diameter tolerances for external threads of special diameters, pitches, and lengths of engagement, class 3A*

*(UNS threads. See par. 7.3, p. 3.03; par. 10, p. 3.05.)

Tolerance based on diameter of →			0.0625	0.09375	0.125	0.1875	0.25	0.375	0.5	0.625	0.75	1
For diameter range Above →			0.0470	0.0781	0.1094	0.1562	0.2188	0.3125	0.4375	0.5625	0.6875	0.875
To and including →			0.0781	0.1094	0.1562	0.2188	0.3125	0.4375	0.5625	0.6875	0.875	1.125
Threads per inch	Length of engagement		Pitch diameter tolerances									
	Number of pitches	Inches										
			in	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*	*in*
80	5 to 15	0.06 to 0.19	0.0014	0.0015	0.0015	0.0016	0.0017	----	----	----	----	----
	16 to 30	0.191 to 0.38	.0018	.0019	.0019	.0020	.0021	----	----	----	----	----
72	5 to 15	0.07 to 0.21	.0015	.0016	.0016	.0017	.0018	0.0019	----	----	----	----
	16 to 30	0.211 to 0.42	.0019	.0019	.0020	.0021	.0022	.0023	----	----	----	----
64	5 to 15	0.08 to 0.23	.0016	.0016	.0017	.0018	.0018	.0019	0.0020	----	----	----
	16 to 30	0.231 to 0.46	.0020	.0020	.0021	.0022	.0023	.0024	.0025	----	----	----
56	5 to 15	0.09 to 0.27	----	.0017	.0018	.0019	.0019	.0020	.0021	0.0022	0.0022	----
	16 to 30	0.271 to 0.54	----	.0022	.0022	.0023	.0024	.0025	.0026	.0027	.0028	----
48	5 to 15	0.10 to 0.31	----	.0019	.0019	.0020	.0020	.0022	.0022	.0023	.0024	----
	16 to 30	0.311 to 0.62	----	.0023	.0024	.0025	.0026	.0027	.0028	.0029	.0030	----
44	5 to 15	0.11 to 0.34	----	.0019	.0020	.0021	.0021	.0022	.0023	.0024	.0024	0.0025
	16 to 30	0.341 to 0.68	----	.0024	.0025	.0026	.0026	.0028	.0029	.0030	.0030	.0032
40	5 to 15	0.12 to 0.38	----	----	.0021	.0021	.0022	.0023	.0024	.0025	.0025	.0026
	16 to 30	0.381 to 0.76	----	----	.0026	.0027	.0028	.0029	.0030	.0031	.0031	.0033
36	5 to 15	0.14 to 0.42	----	----	.0022	.0022	.0023	.0024	.0025	.0026	.0026	.0027
	16 to 30	0.421 to 0.84	----	----	.0027	.0028	.0029	.0030	.0031	.0032	.0033	.0034
32	5 to 15	0.16 to 0.47	----	----	.0023	.0024	.0024	.0025	.0026	.0027	.0027	.0028
	16 to 30	0.471 to 0.94	----	----	.0028	.0029	.0030	.0032	.0033	.0033	.0034	.0035
28	5 to 15	0.18 to 0.54	----	----	----	.0025	.0026	.0027	.0028	.0028	.0029	.0030
	16 to 30	0.541 to 1.08	----	----	----	.0031	.0032	.0033	.0034	.0035	.0036	.0037
27	5 to 15	0.19 to 0.56	----	----	----	.0025	.0026	.0027	.0028	.0029	.0029	.0030
	16 to 30	0.561 to 1.12	----	----	----	.0032	.0033	.0034	.0035	.0036	.0037	.0038
24	5 to 15	0.21 to 0.62	----	----	----	.0027	.0028	.0029	.0029	.0030	.0031	.0032
	16 to 30	0.621 to 1.24	----	----	----	.0034	.0034	.0036	.0037	.0038	.0038	.0040
20	5 to 15	0.25 to 0.75	----	----	----	----	.0030	.0031	.0032	.0032	.0033	.0034
	16 to 30	0.751 to 1.50	----	----	----	----	.0037	.0039	.0040	.0041	.0041	.0043
18	5 to 15	0.28 to 0.83	----	----	----	----	----	.0032	.0033	.0034	.0035	.0036
	16 to 30	0.831 to 1.66	----	----	----	----	----	.0041	.0042	.0042	.0043	.0044
16	5 to 15	0.31 to 0.94	----	----	----	----	----	.0034	.0035	.0036	.0036	.0037
	16 to 30	0.941 to 1.88	----	----	----	----	----	.0043	.0044	.0045	.0045	.0047
14	5 to 15	0.36 to 1.07	----	----	----	----	----	----	.0037	.0038	.0039	.0040
	16 to 30	1.071 to 2.14	----	----	----	----	----	----	.0047	.0048	.0048	.0050
12	5 to 15	0.42 to 1.25	----	----	----	----	----	----	.0040	.0041	.0041	.0042
	16 to 30	1.251 to 2.50	----	----	----	----	----	----	.0050	.0051	.0052	.0053
10	5 to 15	0.50 to 1.50	----	----	----	----	----	----	----	----	.0045	.0046
	16 to 30	1.501 to 3.00	----	----	----	----	----	----	----	----	.0056	.0058
8	5 to 15	0.62 to 1.88	----	----	----	----	----	----	----	----	----	.0051
	16 to 30	1.881 to 3.76	----	----	----	----	----	----	----	----	----	.0064
6	5 to 15	0.83 to 2.50	----	----	----	----	----	----	----	----	----	----
	16 to 30	2.501 to 5.00	----	----	----	----	----	----	----	----	----	----
4	5 to 15	1.25 to 3.75	----	----	----	----	----	----	----	----	----	----
	16 to 30	3.751 to 7.50	----	----	----	----	----	----	----	----	----	----

3A P.D. TOLERANCES