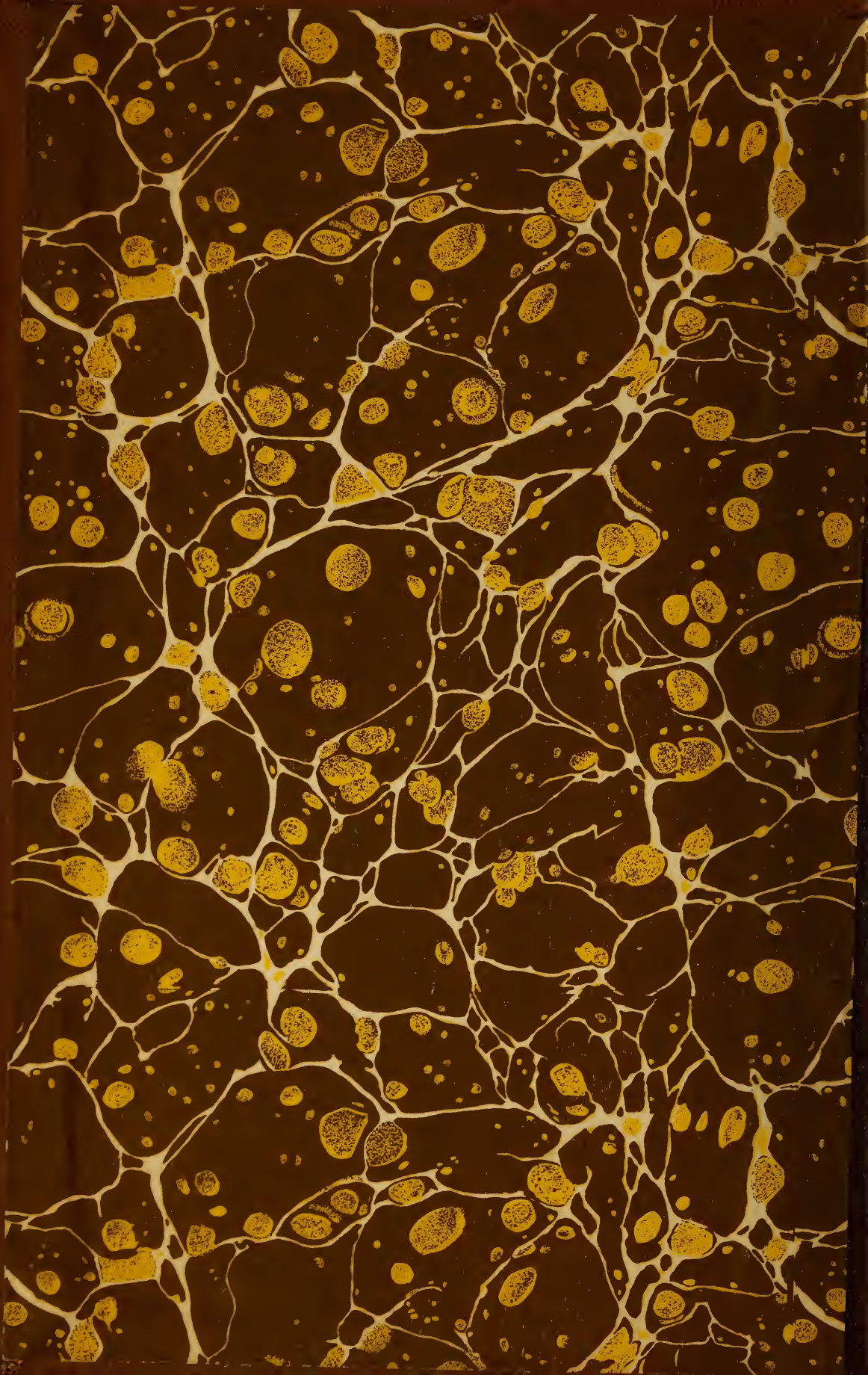
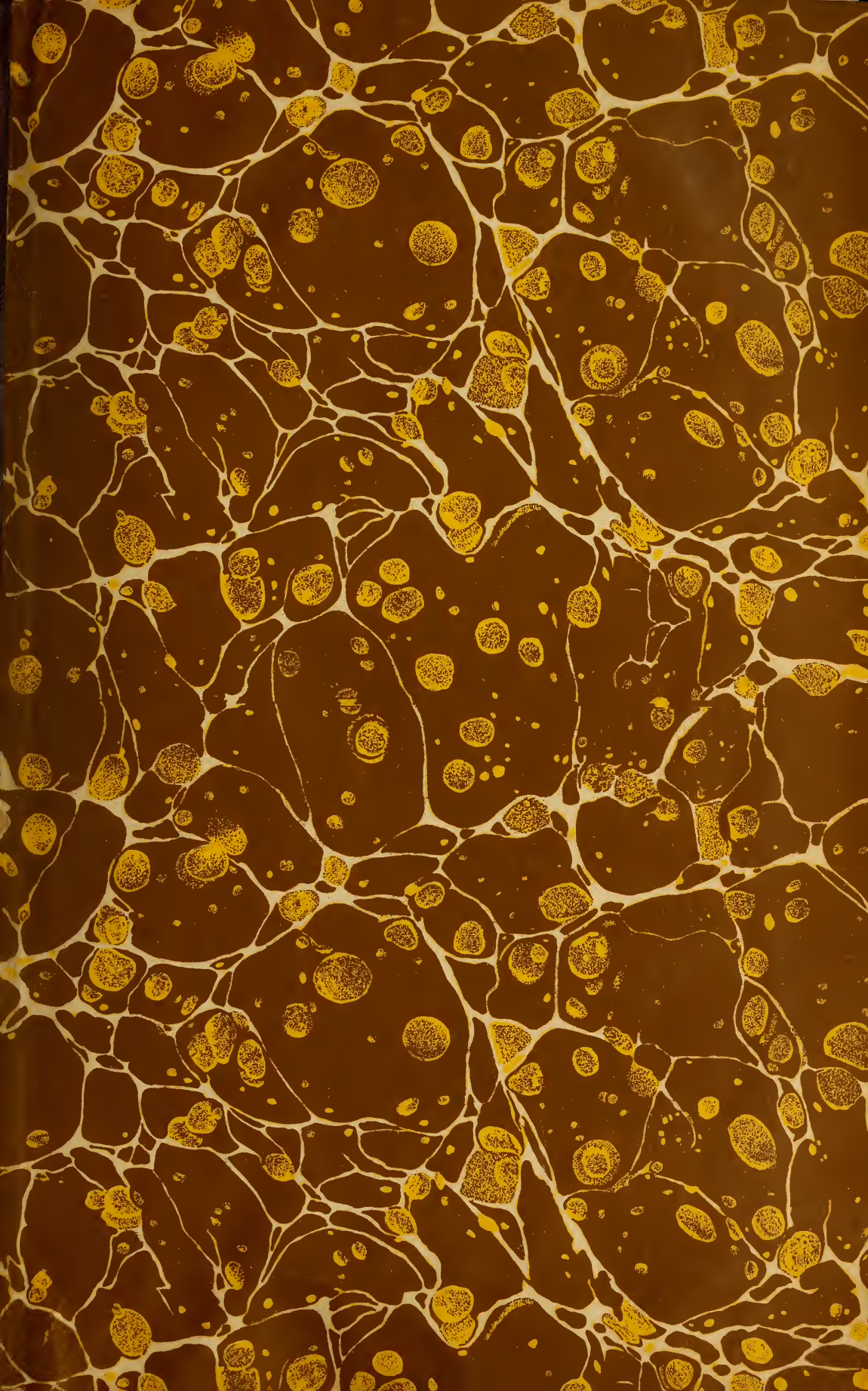


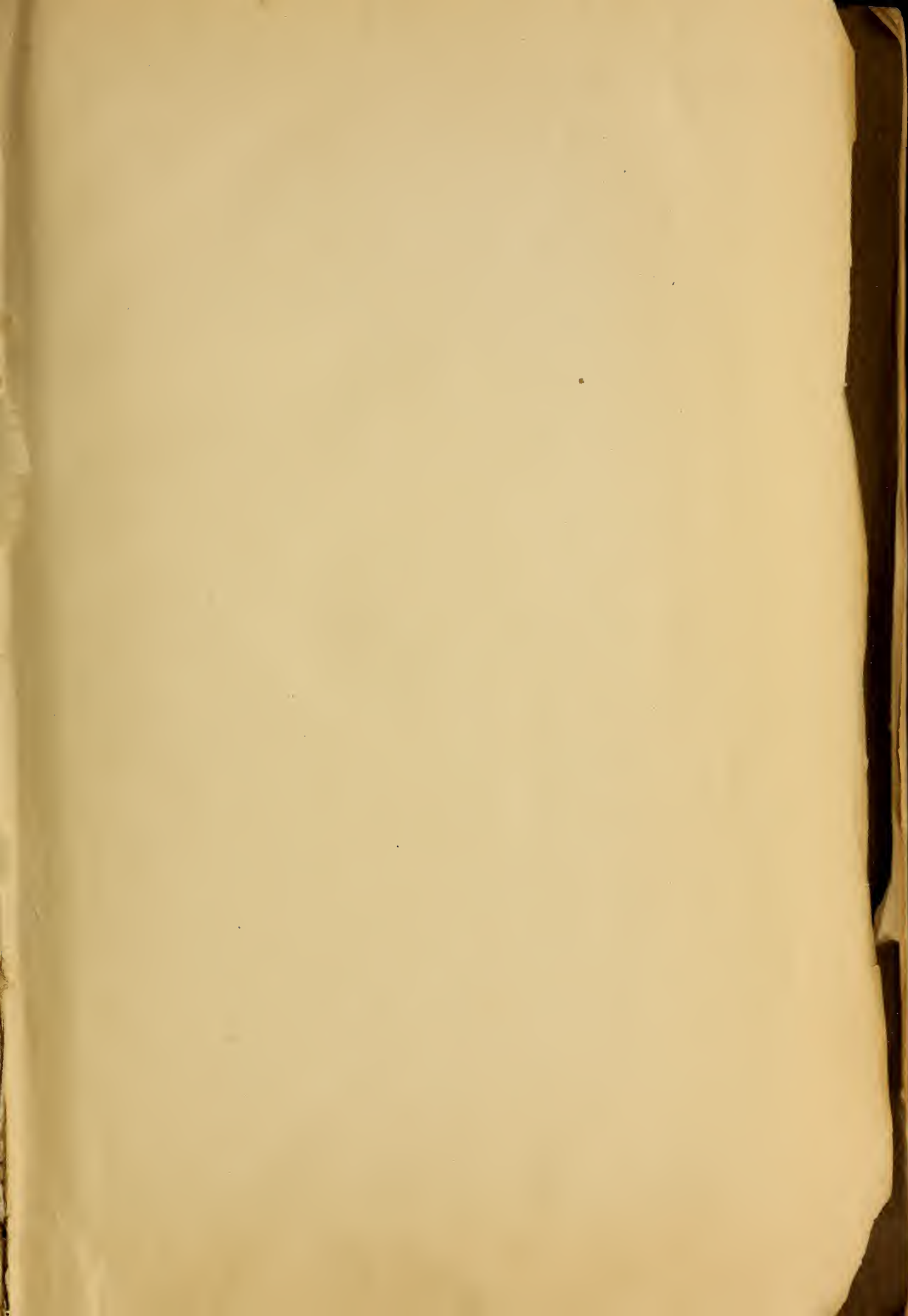
MISCELLANEOUS PUBLICATIONS
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UNITED STATES DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS

**AMERICAN NATIONAL
SCREW THREAD TABLES
FOR SHOP USE**

II. Special Threads

MISCELLANEOUS PUBLICATION OF THE BUREAU OF STANDARDS, No. 99

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Page	Table	Column	Line (below heading)	Incorrect value	Correct value
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14	29	9th	20	.0199	.0179

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MISCELLANEOUS PUBLICATION OF THE BUREAU OF STANDARDS, No. 99

AMERICAN NATIONAL SCREW THREAD TABLES FOR SHOP USE

II. Special Threads

[Recommended Commercial Standard]

SEPTEMBER 24, 1929



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AMERICAN NATIONAL SCREW-THREAD TABLES FOR SHOP USE

II. SPECIAL THREADS

ABSTRACT

This publication presents in compact form the tables of dimensions of special screw threads having the American National form of thread (60°), as published in the 1928 Report of the National Screw Thread Commission (Secs. IV and XD), Bureau of Standards Miscellaneous Publication, No. 89.¹ These tables cover the basic sizes, limiting dimensions, and tolerances for the American National 12-pitch thread series and other screw threads of special diameters, pitches, and lengths of engagement.

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I. AMERICAN NATIONAL 12-PITCH THREAD SERIES

Where special threads are required, it is sometimes essential to select a certain pitch as standard for a range of sizes. Also, in general practice, where the pitch of a special thread is optional, the uniform use of a selected pitch is advantageous. For such applications the 12 pitch is widely used, particularly for two distinct purposes as given below, but for different reasons.

Sizes of 12-pitch threads from one-half inch to and including $1\frac{3}{4}$ inches are used in railroad practice, which requires that worn stud holes be retapped with a tap of the next larger size, the increment being one-sixteenth inch throughout most of the range.

The 12-pitch threads are also widely used in machine construction, as for thin nuts on shafts and sleeves. From the standpoints of good design and simplification of practice, it is desirable to maintain shoulder diameters to one-eighth-inch steps. The 12 pitch is the coarsest, for a thread of basic depth, which will permit a threaded collar which screws onto a threaded shoulder to slip over a shaft, the difference in diameter between shoulder and shaft being one-eighth inch.

¹ The complete report may be procured from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., at 50 cents per copy.

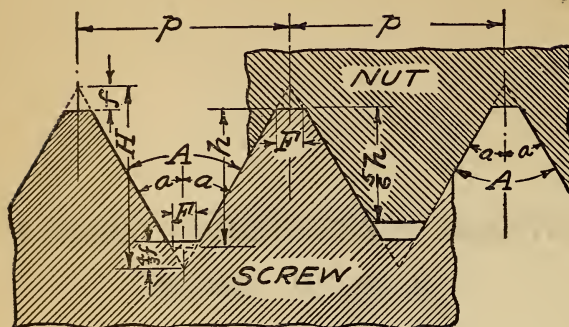


FIG. 3.—American National form of thread

NOTE.—No allowance is shown. This condition exists in class 2, free fit, and class 3, medium fit, where both the minimum nut and the maximum screw are basic.

NOTATION

n = number of threads per inch
 $H = 0.866025 p$, depth of 60° sharp V thread
 $h = 0.649519 p$, depth of American National form of thread
 $\frac{5}{8}h = 0.541266 p$, maximum depth of engagement

$F = 0.125000 p$, width of flat at crest and root of American National form
 $f = 0.108253 p$
 $= \frac{1}{8}H$
 $= \frac{1}{8}h$ } depth of truncation

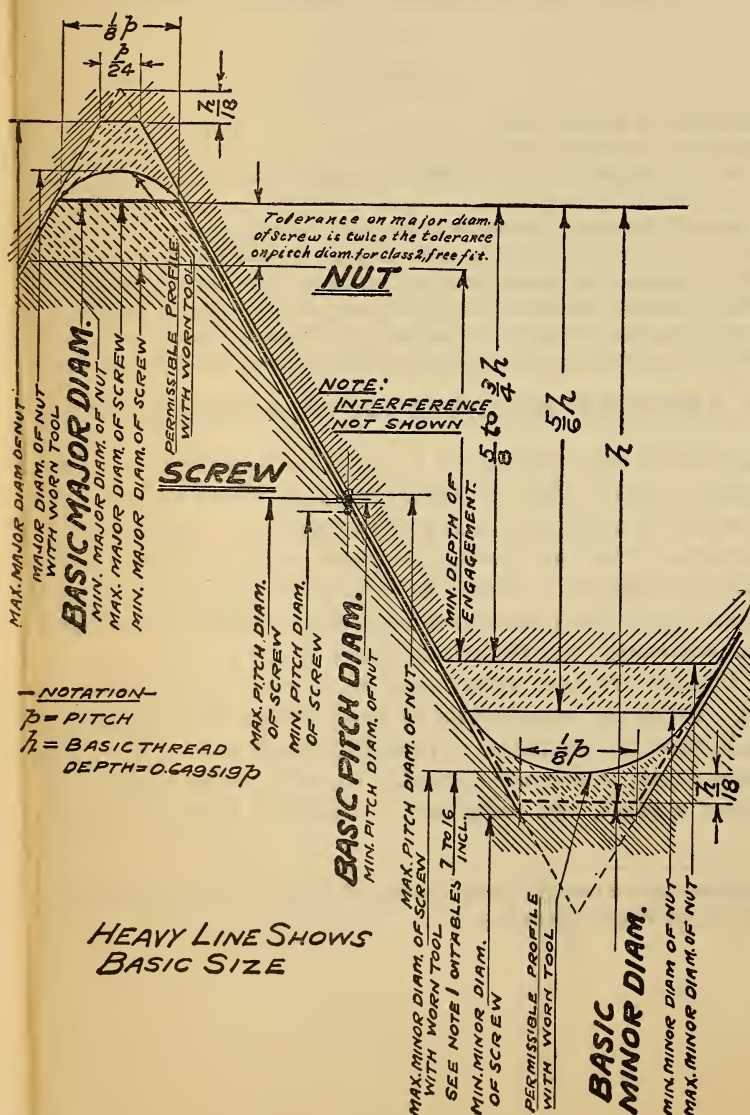


FIG. 10.—Illustration of tolerances and crest clearances for class 3, medium fit

TABLE 87.—American National 12-pitch thread series

Identification		Basic diameters			Metric equivalent of major diameter
Sizes	Threads per inch	Major diameter	Pitch diameter	Minor diameter	
		<i>D</i>	<i>E</i>	<i>K</i>	
1	2	3	4	5	6
		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>mm.</i>
$\frac{1}{2}$ -----	12	0. 5000	0. 4459	0. 3917	12. 700
$\frac{5}{16}$ ----- ¹	12	. 5625	. 5084	. 4542	14. 288
$\frac{3}{8}$ -----	12	. 6250	. 5709	. 5167	15. 875
$\frac{11}{16}$ -----	12	. 6875	. 6334	. 5792	17. 463
$\frac{3}{4}$ -----	12	. 7500	. 6959	. 6417	19. 050
$\frac{13}{16}$ -----	12	. 8125	. 7584	. 7042	20. 638
$\frac{7}{8}$ -----	12	. 8750	. 8209	. 7667	22. 225
$\frac{15}{16}$ -----	12	. 9375	. 8834	. 8292	23. 813
1-----	12	1. 0000	. 9459	. 8917	25. 400
$1\frac{1}{16}$ -----	12	1. 0625	1. 0084	. 9542	26. 988
$1\frac{1}{8}$ ----- ²	12	1. 1250	1. 0709	1. 0167	28. 575
$1\frac{3}{16}$ -----	12	1. 1875	1. 1334	1. 0792	30. 163
$1\frac{1}{4}$ ----- ²	12	1. 2500	1. 1959	1. 1417	31. 750
$1\frac{5}{16}$ -----	12	1. 3125	1. 2584	1. 2042	33. 338
$1\frac{3}{8}$ -----	12	1. 3750	1. 3209	1. 2667	34. 925
$1\frac{1}{2}$ ----- ²	12	1. 5000	1. 4459	1. 3917	38. 100
$1\frac{3}{4}$ -----	12	1. 7500	1. 6959	1. 6417	44. 450
2-----	12	2. 0000	1. 9459	1. 8917	50. 800
$2\frac{1}{4}$ -----	12	2. 2500	2. 1959	2. 1417	57. 150
$2\frac{1}{2}$ -----	12	2. 5000	2. 4459	2. 3917	63. 500
$2\frac{3}{4}$ -----	12	2. 7500	2. 6959	2. 6417	69. 850
3-----	12	3. 0000	2. 9459	2. 8917	76. 200

¹ Standard size of the American National coarse-thread series.

² Standard size of the American National fine-thread series.

TABLE 88.—Limiting dimensions and tolerances, classes 1, 2, 3, and 4 fits, American National 12-pitch thread series

Dimensions and tolerances ¹	Size, (inches)							
	½	¾ ²	⅞	1⅛	¾	1½	2	2½
1	2	3	4	5	6	7	8	9
BOLTS AND SCREWS								
Class 1, major diameter	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
	Max.	0. 4976	0. 5601	0. 6226	0. 6851	0. 7476	0. 8101	0. 8726
	Min.	. 4818	. 5443	. 6068	. 6693	. 7318	. 7943	. 8568
Classes 2, 3, and 4, major diameter	Tol.	. 0158	. 0158	. 0158	. 0158	. 0158	. 0158	. 0158
	Max.	. 5000	. 5625	. 6250	. 6875	. 7500	. 8125	. 8750
	Min.	. 4888	. 5513	. 6138	. 6763	. 7388	. 8013	. 8638
Class 1, minor diameter	Tol.	. 0112	. 0112	. 0112	. 0112	. 0112	. 0112	. 0112
	Max. ⁴	. 3954	. 4579	. 5204	. 5829	. 6454	. 7079	. 7704
	Classes 2, 3, and 4, minor diameter							
Class 1, loose fit, pitch diameter	Max. ⁴	. 3978	. 4603	. 5228	. 5853	. 6478	. 7103	. 7728
	Min.	. 4435	. 5060	. 5685	. 6310	. 6935	. 7560	. 8185
	Tol.	. 4356	. 4981	. 5606	. 6231	. 6856	. 7481	. 8106
Class 2, free fit, pitch diameter	Max.	. 0079	. 0079	. 0079	. 0079	. 0079	. 0079	. 0079
	Min.	. 4459	. 5084	. 5709	. 6334	. 6959	. 7584	. 8209
	Tol.	. 4403	. 5028	. 5653	. 6278	. 6903	. 7528	. 8153
Class 3, medium fit, pitch diameter	Max.	. 0056	. 0056	. 0056	. 0056	. 0056	. 0056	. 0056
	Min.	. 4459	. 5084	. 5709	. 6334	. 6959	. 7584	. 8209
	Tol.	. 4419	. 5044	. 5669	. 6294	. 6919	. 7544	. 8169
Class 4, close fit, pitch diameter	Max.	. 0040	. 0040	. 0040	. 0040	. 0040	. 0040	. 0040
	Min.	. 4464	. 5089	. 5714	. 6339	. 6964	. 7589	. 8214
	Tol.	. 4444	. 5069	. 5694	. 6319	. 6944	. 7569	. 8194
NUTS AND TAPPED HOLES								
Classes 1, 2, 3, and 4, major diameter	Min. ⁵	. 5000	. 5625	. 6250	. 6875	. 7500	. 8125	. 8750
Classes 1, 2, 3, and 4, minor diameter	Max.	. 4225	. 4850	. 5438	. 6063	. 6688	. 7313	. 7938
	Min.	. 4098	. 4723	. 5348	. 5973	. 6598	. 7223	. 7848
	Tol.	. 0127	. 0127	. 0090	. 0090	. 0090	. 0090	. 0090
Classes 1, 2, 3, and 4, pitch diameter	Min.	. 4459	. 5084	. 5709	. 6334	. 6959	. 7584	. 8209
Class 1, pitch diameter	Max.	. 4538	. 5163	. 5788	. 6413	. 7038	. 7663	. 8288
	Min.	. 0079	. 0079	. 0079	. 0079	. 0079	. 0079	. 0079
	Tol.	. 4515	. 5140	. 5765	. 6390	. 7015	. 7640	. 8265
Class 2, pitch diameter	Max.	. 0056	. 0056	. 0056	. 0056	. 0056	. 0056	. 0056
	Min.	. 4499	. 5124	. 5749	. 6374	. 6999	. 7624	. 8249
	Tol.	. 0040	. 0040	. 0040	. 0040	. 0040	. 0040	. 0040
Class 3, pitch diameter	Max.	. 4479	. 5104	. 5729	. 6354	. 6979	. 7604	. 8229
	Min.	. 0020	. 0020	. 0020	. 0020	. 0020	. 0020	. 0020
	Tol.	. 4479	. 5104	. 5729	. 6354	. 6979	. 7604	. 8229

Footnotes at end of table.

TABLE 88.—Limiting dimensions and tolerances, classes 1, 2, 3, and 4 fits, American National 12-pitch thread series—Continued

Dimensions and tolerances ¹	Size, (inches)						
	1	1 $\frac{1}{16}$	1 $\frac{1}{8}$ ²	1 $\frac{3}{16}$	1 $\frac{1}{4}$ ²	1 $\frac{5}{16}$	1 $\frac{3}{8}$
1	10	11	12	13	14	15	16
BOLTS AND SCREWS							
Class 1, major diameter-----	<i>Inch</i> {Max--	0. 9976	1. 0601	1. 1226	1. 1851	1. 2476	1. 3101
	{Min--	. 9818	1. 0443	1. 1068	1. 1693	1. 2318	1. 2943
	{Tol--	. 0158	. 0158	. 0158	. 0158	. 0158	. 0158
Classes 2, 3, and 4, major diameter-----	{Max--	1. 0000	1. 0625	1. 1250	1. 1875	1. 2500	1. 3125
	{Min--	. 9888	1. 0513	1. 1138	1. 1763	1. 2388	1. 3013
	{Tol--	. 0112	. 0112	. 0112	. 0112	. 0112	. 0112
Class 1, minor diameter-----	Max ⁴ --	. 8954	. 9579	1. 0204	1. 0829	1. 1454	1. 2079
Classes 2, 3, and 4, minor diameter--	Max ⁴ --	. 8978	. 9603	1. 0228	1. 0853	1. 1478	1. 2103
Class 1, loose fit, pitch diameter----	{Max--	. 9435	1. 0060	1. 0685	1. 1310	1. 1935	1. 2560
	{Min--	. 9356	. 9981	1. 0606	1. 1231	1. 1856	1. 2481
	{Tol--	. 0079	. 0079	. 0079	. 0079	. 0079	. 0079
Class 2, free fit, pitch diameter-----	{Max--	. 9459	1. 0084	1. 0709	1. 1334	1. 1959	1. 2584
	{Min--	. 9403	1. 0028	1. 0653	1. 1278	1. 1903	1. 2528
	{Tol--	. 0056	. 0056	. 0056	. 0056	. 0056	. 0056
Class 3, medium fit, pitch diameter-----	{Max--	. 9459	1. 0084	1. 0709	1. 1334	1. 1959	1. 2584
	{Min--	. 9419	1. 0044	1. 0669	1. 1294	1. 1919	1. 2544
	{Tol--	. 0040	. 0040	. 0040	. 0040	. 0040	. 0040
Class 4, close fit, pitch diameter-----	{Max--	. 9464	1. 0089	1. 0714	1. 1339	1. 1964	1. 2589
	{Min--	. 9444	1. 0069	1. 0694	1. 1319	1. 1944	1. 2569
	{Tol--	. 0020	. 0020	. 0020	. 0020	. 0020	. 0020
NUTS AND TAPPED HOLES							
Classes 1, 2, 3, and 4, major diameter--	Min. ⁵ --	1. 0000	1. 0625	1. 1250	1. 1875	1. 2500	1. 3125
Classes 1, 2, 3, and 4, minor diameter-----	{Max--	. 9188	. 9813	1. 0438	1. 1063	1. 1688	1. 2313
	{Min--	. 9098	. 9723	1. 0348	1. 0973	1. 1598	1. 2223
	{Tol--	. 0090	. 0090	. 0090	. 0090	. 0090	. 0090
Classes 1, 2, 3, and 4, pitch diameter--	Min--	. 9459	1. 0084	1. 0709	1. 1334	1. 1959	1. 2584
Class 1, pitch diameter-----	{Max--	. 9538	1. 0163	1. 0788	1. 1413	1. 2038	1. 2663
	{Tol--	. 0079	. 0079	. 0079	. 0079	. 0079	. 0079
Class 2, pitch diameter-----	{Max--	. 9515	1. 0140	1. 0765	1. 1390	1. 2015	1. 2640
	{Tol--	. 0056	. 0056	. 0056	. 0056	. 0056	. 0056
Class 3, pitch diameter-----	{Max--	. 9499	1. 0124	1. 0749	1. 1374	1. 1999	1. 2624
	{Tol--	. 0040	. 0040	. 0040	. 0040	. 0040	. 0040
Class 4, pitch diameter-----	{Max--	. 9479	1. 0104	1. 0729	1. 1354	1. 1979	1. 2604
	{Tol--	. 0020	. 0020	. 0020	. 0020	. 0020	. 0020

Footnotes at end of table.

TABLE 88.—Limiting dimensions and tolerances, classes 1, 2, 3, and 4 fits, American National 12-pitch thread series—Continued

Dimensions and tolerances ¹	Size, (inches)						
	1½ ²	1¾	2	2¼	2½	2¾	3
1	17	18	19	20	21	22	23
BOLTS AND SCREWS							
Class 1, major diameter-----	<i>Inches</i> Max-- 1. 4976	<i>Inches</i> 1. 7476	<i>Inches</i> 1. 9976	<i>Inches</i> 2. 2476	<i>Inches</i> 2. 4976	<i>Inches</i> 2. 7476	<i>Inches</i> 2. 9976
	Min-- 1. 4818	1. 7318	1. 9818	2. 2318	2. 4818	2. 7318	2. 9818
	Tol-- . 0158	. 0158	. 0158	. 0158	. 0158	. 0158	. 0158
Classes 2, 3, and 4, major diameter--	Max-- 1. 5000	1. 7500	2. 0000	2. 2500	2. 5000	2. 7500	3. 0000
	Min-- 1. 4888	1. 7388	1. 9888	2. 2388	2. 4888	2. 7388	2. 9888
	Tol-- . 0112	. 0112	. 0112	. 0112	. 0112	. 0112	. 0112
Class 1, minor diameter-----	Max. ⁴ 1. 3954	1. 6454	1. 8954	2. 1454	2. 3954	2. 6454	2. 8954
Classes 2, 3, and 4, minor diameter--	Max. ⁴ 1. 3978	1. 6478	1. 8978	2. 1478	2. 3978	2. 6478	2. 8978
Class 1, loose fit, pitch diameter-----	Max-- 1. 4435	1. 6935	1. 9435	2. 1935	2. 4435	2. 6935	2. 9435
	Min-- 1. 4356	1. 6829	1. 9329	2. 1823	2. 4323	2. 6823	2. 9323
	Tol-- . 0079	. 0106	. 0106	. 0112	. 0112	. 0112	. 0112
Class 2, free fit, pitch diameter-----	Max-- 1. 4459	1. 6959	1. 9459	2. 1959	2. 4459	2. 6959	2. 9459
	Min-- 1. 4403	1. 6882	1. 9382	2. 1876	2. 4376	2. 6876	2. 9376
	Tol-- . 0056	. 0077	. 0077	. 0083	. 0083	. 0083	. 0083
Class 3, medium fit, pitch diameter--	Max-- 1. 4459	1. 6959	1. 9459	2. 1959	2. 4459	2. 6959	2. 9459
	Min-- 1. 4419	1. 6896	1. 9396	2. 1890	2. 4390	2. 6890	2. 9390
	Tol-- . 0040	. 0063	. 0063	. 0069	. 0069	. 0069	. 0069
Class 4, close fit, pitch diameter-----	Max-- 1. 4464	1. 6964	1. 9464	2. 1964	2. 4464	2. 6964	2. 9464
	Min-- 1. 4444	1. 6933	1. 9433	2. 1930	2. 4430	2. 6930	2. 9430
	Tol-- . 0020	. 0031	. 0031	. 0034	. 0034	. 0034	. 0034
NUTS AND TAPPED HOLES							
Classes 1, 2, 3, and 4, major diameter--	Min. ⁵ 1. 5000	1. 7500	2. 0000	2. 2500	2. 5000	2. 7500	3. 0000
Classes 1, 2, 3, and 4, minor diameter--	Max-- 1. 4188	1. 6688	1. 9188	2. 1688	2. 4188	2. 6688	2. 9188
	Min-- 1. 4098	1. 6598	1. 9098	2. 1598	2. 4098	2. 6598	2. 9098
	Tol-- . 0090	. 0090	. 0090	. 0090	. 0090	. 0090	. 0090
Classes 1, 2, 3, and 4, pitch diameter--	Min-- 1. 4459	1. 6959	1. 9459	2. 1959	2. 4459	2. 6959	2. 9459
Class 1, pitch diameter-----	Max-- 1. 4538	1. 7065	1. 9565	2. 2071	2. 4571	2. 7071	2. 9571
	Tol-- . 0079	. 0106	. 0106	. 0112	. 0112	. 0112	. 0112
Class 2, pitch diameter-----	Max-- 1. 4515	1. 7036	1. 9536	2. 2042	2. 4542	2. 7042	2. 9542
	Tol-- . 0056	. 0077	. 0077	. 0083	. 0083	. 0083	. 0083
Class 3, pitch diameter-----	Max-- 1. 4499	1. 7022	1. 9522	2. 2028	2. 4528	2. 7028	2. 9528
	Tol-- . 0040	. 0063	. 0063	. 0069	. 0069	. 0069	. 0069
Class 4, pitch diameter-----	Max-- 1. 4479	1. 6990	1. 9490	2. 1993	2. 4493	2. 6993	2. 9493
	Tol-- . 0020	. 0031	. 0031	. 0034	. 0034	. 0034	. 0034

¹ Tolerances are based on a length of engagement of 1 inch.² Standard size screw and nut of the American national coarse-thread series.³ Standard size screw and nut of the American national fine-thread series.⁴ Dimensions given for the maximum minor diameter of the screw are figured to the intersection of the worn tool arc with a center line through crest and root. The minimum minor diameter of the screw shall be that corresponding to a flat at the minor diameter of the minimum screw equal to $\frac{1}{8} \times p$, and may be determined by subtracting 0.0541 inch from the minimum pitch diameter of the screw.⁵ Dimensions for the minimum major diameter of the nut correspond to the basic flat, $(\frac{1}{4} \times p)$, and the profile at the major diameter produced by a worn tool must not fall below the basic outline. The maximum major diameter of the nut shall be that corresponding to a flat at the major diameter of the maximum nut equal to $\frac{1}{4} \times p$, and may be determined by adding 0.0662 inch to the maximum pitch diameter of the nut.

II. SCREW THREADS OF SPECIAL DIAMETERS, PITCHES, AND LENGTHS OF ENGAGEMENT

For threaded parts such as hub and radiator caps in the automotive industry, threaded collars on machine tools, etc., where the diameters are larger, the pitches finer, and the lengths of engagement shorter than for bolt and nut practice Tables 27, 28, 29, 30, and 31 are arranged herein, and are intended to cover all practical combinations of diameter, pitch, length of engagement, and class of fit. The use of these tables instead of the application of formulas to determine limiting dimensions of a special thread facilitates placing dimensions on drawings. Also, in cases of special threads of the same diameter, pitch, and class of fit, but slightly different lengths of engagement, the threads may be gaged by a single set of gages, as identical pitch diameter tolerances will be applied.

RULES FOR USE OF TABLES.—For consistent application of these pitch-diameter tolerance tables to all cases, adherence to the following rules relative to the use of the tables is necessary:

1. All thread dimensions of threads of special diameters, pitches, and lengths of engagement, except pitch diameter tolerances, are derived from Table 27. Pitch diameter tolerances are taken from Tables 28, 29, 30, and 31, depending upon the class of fit required.

Tolerances on pitch diameter corresponding to major diameters between those for which values are given in the tables shall be those of the next larger diameter.

2. Tolerances on pitch diameter for pitches between those for which values are given in the tables shall be those of the next coarser pitch, except that for screws having 80, 72, 44, 13, 11, 9, 7, 5, or $4\frac{1}{2}$ threads per inch, lengths of engagement of one and one-half diameters or less, and diameters less than the standard diameters for the respective pitches as given in Section III² for standard sizes and pitches, the tolerances given in Section III shall be used.

3. Tolerances on pitch diameter for pitches coarser than 4 threads per inch shall be the same as those for 4 threads per inch.

4. Tolerances on pitch diameter when the length of engagement is $\frac{1}{2}$, or $1\frac{1}{2}$, inches for 12 threads per inch and finer, or 1, or 3, inches for pitches coarser than 12 threads per inch, shall correspond to the interval of which these are the upper limits.

5. Tolerances on pitch diameter for lengths of engagement greater than those for which values are given shall be the maximum values listed for the pitch concerned.

Example: $3\frac{1}{4}$ inch, 16-thread, class 1, with allowance on screw, one-half inch length of engagement:

From Table 28:

Pitch diameter tolerance.....=0.0095

Also from Table 27, for the screw:

Maximum major diameter=3.2500-0.0018=3.2482

Minimum major diameter =3.2482- .0126=3.2356

Maximum minor diameter=3.2500- .0785=3.1715

Maximum pitch diameter =3.2500- .0424=3.2076

Minimum pitch diameter =3.2076- .0095=3.1981

And for the nut:

Minimum major diameter.....=3.2500

Minimum minor diameter =3.2500- .0677=3.1823

Maximum minor diameter=3.1823+ .0068=3.1891

Minimum pitch diameter =3.2500- .0406=3.2094

Maximum pitch diameter =3.2094+ .0095=3.2189

² Of the 1928 report.

TABLE 27.—Thread dimensions of special screw threads, classes 1, 2, 3, and 4 *fits*

Threads per inch	SCREW SIZES					NUT SIZES				
	Major diameter					Minor diameter, ¹ maximum				
	Maximum		Tolerance			Pitch diameter, maximum		Minor diameter, minimum		
	Class 1	Classes 2, 3, 4	Class 1	Classes 2, 3, 4		Class 1	Classes 2, 3	Class 1	Pitch diameter, minimum	
				Class 1	Classes 2, 3, 4				Minimum	Tolerance
64	Inch 0.0007	Inch 0.0000	Inch 0.0052	Inch 0.0038	Inch 0.0101	Inch 0.0103	Inch 0.0101	Inch 0.0199	Inch 0.0169	Inch 0.0017
56	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
48	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
40	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
36	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
32	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
28	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
24	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
20	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
18	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
16	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
14	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
12	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
10	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

To obtain minimum dimensions for minor, pitch, and major diameters, subtract the values in the "minimum" columns from the basic major diameter.

Apply tolerances plus.
See Tables 28, 29, 30, and 31 for pitch diameter tolerances.

Threads per inch

¹ Dimensions given for the maximum minor diameter of the screw are figured to the intersection of the worm tool arc with a center line through crest and root. The minimum minor diameter of the screw shall be that corresponding to a flat at the minor diameter of the minimum screw equal to $\frac{1}{8} \times p$, and may be determined by subtracting the basic thread depth, h (or $0.6495p$), from the minimum pitch diameter of the screw.

² Dimensions for the minimum major diameter of the nut correspond to the basic flat ($\frac{1}{8} \times p$), and the profile at the major diameter produced by a worn tool must not fall below the basic outline. The maximum major diameter of the nut shall be that corresponding to a flat at the major diameter of the maximum nut equal to $\frac{1}{8} \times p$, and may be determined by adding $1\frac{1}{8} \times h$ (or $0.7939p$) to the maximum pitch diameter of the nut.

TABLE 28.—Pitch diameter tolerances for special screw threads, class 1, loose fit

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—						
	From—	To and including—	1/16 inch	1/8 inch	3/16 inch	1/4 inch	5/16 inch	3/8 inch	1/2 inch
	Inches	Inches	Inch	Inch	Inch	Inch	Inch	Inch	Inch
64-----		1/2	0. 0026	0. 0026	0. 0034	0. 0038	0. 0042	0. 0044	0. 0047
56-----	{ 1/2	1/2	. 0028	. 0028	. 0034	. 0038	. 0044	. 0046	. 0049
		1 1/2	. 0052	. 0054	. 0055	. 0056	. 0056	. 0056	. 0056
48-----	{ 1/2	1/2	. 0031	. 0031	. 0034	. 0038	. 0046	. 0048	. 0051
		1 1/2	. 0054	. 0056	. 0057	. 0057	. 0057	. 0057	. 0057
40-----	{ 1/2	1/2	. 0034	¹ . 0034	. 0034	. 0038	. 0046	. 0051	. 0054
		1 1/2	. 0057	. 0057	. 0057	. 0057	. 0057	. 0057	. 0057
36-----	{ 1/2	1/2		. 0036	. 0036	. 0038	. 0046	. 0051	. 0056
		1 1/2		. 0057	. 0057	. 0057	. 0057	. 0057	. 0057
32-----	{ 1/2	1/2		. 0038	. 0038	. 0038	. 0046	. 0051	. 0057
		1 1/2		. 0057	. 0057	. 0057	. 0057	. 0057	. 0057
28-----	{ 1/2	1/2			. 0043	² . 0043	. 0046	. 0051	. 0057
		1 1/2			. 0057	. 0057	. 0057	. 0057	. 0057
24-----	{ 1/2	1/2			. 0046	. 0046	² . 0046	. 0051	. 0057
		1 1/2			. 0057	. 0057	. 0057	. 0057	. 0057
20-----	{ 1/2	1/2			. 0051	¹ . 0051	. 0051	² . 0051	. 0057
	1 1/2	3			. 0057	. 0057	. 0057	. 0057	. 0057
					. 0098	. 0100	. 0102	. 0102	. 0102
18-----	{ 1/2	1/2				. 0057	. 0057	. 0057	. 0057
	1 1/2	3				. 0057	. 0057	. 0057	. 0057
						. 0102	. 0104	. 0106	. 0109
16-----	{ 1/2	1/2				. 0063	¹ . 0063	. 0063	. 0063
	1 1/2	3				. 0063	. 0063	. 0063	² . 0063
						. 0105	. 0107	. 0109	. 0112
14-----	{ 1/2	1/2					. 0070	. 0070	. 0070
	1 1/2	3					. 0070	. 0070	. 0070
							. 0111	. 0113	. 0116
12-----	{ 1/2	1/2					. 0075	. 0077	. 0079
	1 1/2	3					. 0079	. 0079	. 0079
							. 0115	. 0117	. 0120
10-----	{ 1	1						. 0087	¹ . 0092
	3	3						. 0117	. 0120
		6						. 0167	. 0171
8-----	{ 1	1						. 0095	. 0098
	3	3						. 0125	. 0128
		6						. 0175	. 0178
6-----	{ 1	1							. 0109
	3	3							. 0139
		6							. 0189

¹ Standard size of the American National coarse-thread series.² Standard size of the American National fine-thread series.

NOTE.—It is preferable to avoid the use of tolerances set in italics by choosing a closer fit, shorter length of engagement, coarser pitch, or smaller diameter.

TABLE 28.—Pitch diameter tolerances for special screw threads, class 1, loose fit—Continued

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—						
	From—	To and including—	1 inch	1½ inches	2 inches	3 inches	4 inches	6 inches	8 inches
	Inches	Inches	Inch	Inch	Inch	Inch	Inch	Inch	Inch
64-----		½	0. 0050	0. 0052					
56-----	{----- ½	½ 1½	. 0052 . 0056	. 0056 . 0056					
48-----	{----- ½	½ 1½	. 0054 . 0062	. 0058 . 0062	0. 0062 . 0062				
40-----	{----- ½	½ 1½	. 0057 . 0068	. 0061 . 0068	. 0065 . 0068				
36-----	{----- ½	½ 1½	. 0058 . 0070	. 0063 . 0072	. 0067 . 0072	0. 0072 . 0072			
32-----	{----- ½	½ 1½	. 0060 . 0070	. 0065 . 0076	. 0069 . 0076	. 0075 . 0076			
28-----	{----- ½	½ 1½	. 0063 . 0070	. 0067 . 0079	. 0071 . 0086	. 0077 . 0086	0. 0083 . 0086		
24-----	{----- ½	½ 1½	. 0066 . 0070	. 0070 . 0079	. 0074 . 0089	. 0080 . 0092	. 0086 . 0092		
20-----	{----- ½ 1½	½ 1½ 3	. 0070 . 0070 . 0102	. 0074 . 0079 . 0102	. 0078 . 0093 . 0102	. 0084 . 0099 . 0102	. 0090 . 0102 . 0102	0. 0099 . 0102 . 0102	
18-----	{----- ½ 1½	½ 1½ 3	. 0070 . 0070 . 0112	. 0077 . 0079 . 0114	. 0080 . 0095 . 0114	. 0087 . 0102 . 0114	. 0092 . 0107 . 0114	. 0101 . 0114 . 0114	0. 0109 . 0114 . 0114
16-----	{----- ½ 1½	½ 1½ 3	. 0070 . 0070 . 0115	. 0079 . 0079 . 0120	. 0083 . 0098 . 0123	. 0090 . 0105 . 0126	. 0095 . 0110 . 0126	. 0104 . 0119 . 0126	. 0112 . 0126 . 0126
14-----	{----- ½ 1½	½ 1½ 3	. 0070 . 0070 . 0119	. 0079 . 0079 . 0123	. 0087 . 0102 . 0127	. 0093 . 0108 . 0133	. 0099 . 0114 . 0139	. 0108 . 0123 . 0140	. 0115 . 0130 . 0140
12-----	{----- ½ 1½	½ 1½ 3	. 0079 . 0079 . 0123	. 0079 . 0079 . 0127	. 0091 . 0106 . 0131	. 0097 . 0112 . 0137	. 0103 . 0118 . 0143	. 0112 . 0127 . 0152	. 0119 . 0134 . 0158
10-----	{----- 1 3	1 3 6	. 0093 . 0123 . 0173	. 0098 . 0128 . 0178	. 0102 . 0132 . 0181	. 0108 . 0138 . 0184	. 0113 . 0143 . 0184	. 0122 . 0152 . 0184	. 0130 . 0160 . 0184
8-----	{----- 1 3	1 3 6	. 0111 . 0131 . 0181	. 0111 . 0135 . 0185	. 0111 . 0139 . 0189	. 0115 . 0145 . 0195	. 0121 . 0151 . 0201	. 0130 . 0160 . 0210	. 0137 . 0167 . 0217
6-----	{----- 1 3	1 3 6	. 0112 . 0142 . 0192	. 0116 . 0145 . 0196	. 0120 . 0150 . 0200	. 0126 . 0156 . 0206	. 0132 . 0162 . 0212	. 0141 . 0171 . 0221	. 0148 . 0178 . 0228
4-----	{----- 1 3	1 3 6	. 0130 . 0160 . 0210	. 0134 . 0164 . 0215	. 0138 . 0168 . 0218	. 0145 . 0204 . 0225	. 0150 . 0204 . 0230	. 0159 . 0204 . 0239	. 0167 . 0204 . 0247

¹ Standard size of the American National coarse-thread series.² Standard size of the American National fine-thread series.

NOTE.—It is preferable to avoid the use of tolerances set in italics by choosing a closer fit, shorter length of engagement, coarser pitch, or smaller diameter.

TABLE 28.—Pitch diameter tolerances for special screw threads, class 1, loose fit—Continued

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—						
	From—	To and including—	10 inches	12 inches	14 inches	16 inches	18 inches	20 inches	24 inches
	<i>Inches</i>	<i>Inches</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>
18-----	$\left\{ \begin{array}{l} \text{---} \\ \frac{1}{2} \\ 1\frac{1}{2} \end{array} \right.$	$\left\{ \begin{array}{l} \frac{1}{2} \\ 1\frac{1}{2} \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} 0.0114 \\ .0114 \\ .0114 \end{array} \right.$						
16-----	$\left\{ \begin{array}{l} \text{---} \\ \frac{1}{2} \\ 1\frac{1}{2} \end{array} \right.$	$\left\{ \begin{array}{l} \frac{1}{2} \\ 1\frac{1}{2} \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} .0118 \\ .0126 \\ .0126 \end{array} \right.$	$\left\{ \begin{array}{l} 0.0124 \\ .0126 \\ .0126 \end{array} \right.$					
14-----	$\left\{ \begin{array}{l} \text{---} \\ \frac{1}{2} \\ 1\frac{1}{2} \end{array} \right.$	$\left\{ \begin{array}{l} \frac{1}{2} \\ 1\frac{1}{2} \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} .0122 \\ .0137 \\ .0140 \end{array} \right.$	$\left\{ \begin{array}{l} .0128 \\ .0140 \\ .0140 \end{array} \right.$	$\left\{ \begin{array}{l} 0.0133 \\ .0140 \\ .0140 \end{array} \right.$	$\left\{ \begin{array}{l} 0.0138 \\ .0140 \\ .0140 \end{array} \right.$			
12-----	$\left\{ \begin{array}{l} \text{---} \\ \frac{1}{2} \\ 1\frac{1}{2} \end{array} \right.$	$\left\{ \begin{array}{l} \frac{1}{2} \\ 1\frac{1}{2} \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} .0126 \\ .0141 \\ .0158 \end{array} \right.$	$\left\{ \begin{array}{l} .0132 \\ .0147 \\ .0158 \end{array} \right.$	$\left\{ \begin{array}{l} .0138 \\ .0153 \\ .0158 \end{array} \right.$	$\left\{ \begin{array}{l} .0143 \\ .0158 \\ .0158 \end{array} \right.$	$\left\{ \begin{array}{l} 0.0148 \\ .0158 \\ .0158 \end{array} \right.$	$\left\{ \begin{array}{l} 0.0152 \\ .0158 \\ .0158 \end{array} \right.$	
10-----	$\left\{ \begin{array}{l} \text{---} \\ 1 \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} 1 \\ 3 \\ 6 \end{array} \right.$	$\left\{ \begin{array}{l} .0136 \\ .0166 \\ .0184 \end{array} \right.$	$\left\{ \begin{array}{l} .0142 \\ .0172 \\ .0184 \end{array} \right.$	$\left\{ \begin{array}{l} .0148 \\ .0178 \\ .0184 \end{array} \right.$	$\left\{ \begin{array}{l} .0153 \\ .0183 \\ .0184 \end{array} \right.$	$\left\{ \begin{array}{l} .0158 \\ .0184 \\ .0184 \end{array} \right.$	$\left\{ \begin{array}{l} .0163 \\ .0184 \\ .0184 \end{array} \right.$	$\left\{ \begin{array}{l} 0.0171 \\ .0184 \\ .0184 \end{array} \right.$
8-----	$\left\{ \begin{array}{l} \text{---} \\ 1 \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} 1 \\ 3 \\ 6 \end{array} \right.$	$\left\{ \begin{array}{l} .0144 \\ .0174 \\ .0222 \end{array} \right.$	$\left\{ \begin{array}{l} .0150 \\ .0180 \\ .0222 \end{array} \right.$	$\left\{ \begin{array}{l} .0156 \\ .0186 \\ .0222 \end{array} \right.$	$\left\{ \begin{array}{l} .0161 \\ .0191 \\ .0222 \end{array} \right.$	$\left\{ \begin{array}{l} .0166 \\ .0196 \\ .0222 \end{array} \right.$	$\left\{ \begin{array}{l} .0170 \\ .0200 \\ .0222 \end{array} \right.$	$\left\{ \begin{array}{l} .0179 \\ .0209 \\ .0222 \end{array} \right.$
6-----	$\left\{ \begin{array}{l} \text{---} \\ 1 \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} 1 \\ 3 \\ 6 \end{array} \right.$	$\left\{ \begin{array}{l} .0155 \\ .0185 \\ .0235 \end{array} \right.$	$\left\{ \begin{array}{l} .0161 \\ .0191 \\ .0241 \end{array} \right.$	$\left\{ \begin{array}{l} .0166 \\ .0196 \\ .0246 \end{array} \right.$	$\left\{ \begin{array}{l} .0172 \\ .0202 \\ .0252 \end{array} \right.$	$\left\{ \begin{array}{l} .0176 \\ .0206 \\ .0256 \end{array} \right.$	$\left\{ \begin{array}{l} .0181 \\ .0211 \\ .0261 \end{array} \right.$	$\left\{ \begin{array}{l} .0190 \\ .0220 \\ .0270 \end{array} \right.$
4-----	$\left\{ \begin{array}{l} \text{---} \\ 1 \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} 1 \\ 3 \\ 6 \end{array} \right.$	$\left\{ \begin{array}{l} .0173 \\ .0204 \\ .0253 \end{array} \right.$	$\left\{ \begin{array}{l} .0179 \\ .0209 \\ .0259 \end{array} \right.$	$\left\{ \begin{array}{l} .0185 \\ .0215 \\ .0265 \end{array} \right.$	$\left\{ \begin{array}{l} .0190 \\ .0220 \\ .0270 \end{array} \right.$	$\left\{ \begin{array}{l} .0195 \\ .0225 \\ .0275 \end{array} \right.$	$\left\{ \begin{array}{l} .0199 \\ .0229 \\ .0279 \end{array} \right.$	$\left\{ \begin{array}{l} .0208 \\ .0238 \\ .0288 \end{array} \right.$

NOTE.—It is preferable to avoid the use of tolerances set in italics by choosing a closer fit, shorter length of engagement, coarser pitch, or smaller diameter.

TABLE 29.—Pitch diameter tolerances for special screw threads, class 2, free fit

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—							
	From—	To and including—	1/16 inch	1/8 inch	3/16 inch	1/4 inch	5/16 inch	3/8 inch	7/16 inch	1/2 inch
	Inches	Inches	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
64-----		1/2	0. 0019	0. 0019	0. 0024	0. 0027	0. 0030	0. 0032	0. 0035	
56-----	{----- 1/2	1/2 1 1/2	. 0020 . 0038	. 0020 . 0040	. 0024 . 0040	. 0027 . 0040	. 0031 . 0040	. 0033 . 0040	. 0036 . 0040	
48-----	{----- 1/2	1/2 1 1/2	. 0022 . 0039	. 0022 . 0041	. 0024 . 0041	. 0027 . 0041	. 0032 . 0041	. 0034 . 0041	. 0037 . 0041	
40-----	{----- 1/2	1/2 1 1/2	. 0024 . 0041	¹ . 0024 . 0041	. 0024 . 0041	. 0027 . 0041	. 0033 . 0041	. 0035 . 0041	. 0038 . 0041	
36-----	{----- 1/2	1/2 1 1/2	----- -----	. 0025 . 0041	. 0025 . 0041	. 0027 . 0041	. 0033 . 0041	. 0036 . 0041	. 0039 . 0041	
32-----	{----- 1/2	1/2 1 1/2	----- -----	. 0027 . 0041	. 0027 . 0041	. 0027 . 0041	. 0033 . 0041	. 0036 . 0041	. 0040 . 0041	
28-----	{----- 1/2	1/2 1 1/2	----- -----	----- -----	. 0031 . 0041	² . 0031 . 0041	. 0033 . 0041	. 0036 . 0041	. 0041 . 0041	
24-----	{----- 1/2	1/2 1 1/2	----- -----	----- -----	. 0033 . 0041	. 0033 . 0041	² . 0033 . 0041	. 0036 . 0041	. 0041 . 0041	
20-----	{----- 1/2	1/2 1 1/2	----- -----	----- -----	. 0036 . 0041	¹ . 0036 . 0041	. 0036 . 0041	² . 0036 . 0041	. 0041 . 0041	
18-----	{----- 1 1/2	1/2 3	----- -----	----- -----	----- -----	. 0039 . 0041 . 0079	. 0041 . 0041 . 0081	. 0041 . 0041 . 0082	. 0041 . 0041 . 0082	
16-----	{----- 1 1/2	1/2 3	----- -----	----- -----	----- -----	. 0040 . 0045 . 0080	¹ . 0045 . 0045 . 0082	. 0045 . 0045 . 0084	. 0045 ² . 0045 . 0087	
14-----	{----- 1 1/2	1/2 3	----- -----	----- -----	----- -----	----- -----	. 0045 . 0049 . 0084	. 0048 . 0049 . 0086	. 0049 . 0049 . 0089	
12-----	{----- 1 1/2	1/2 3	----- -----	----- -----	----- -----	----- -----	. 0046 . 0056 . 0086	. 0048 . 0056 . 0088	. 0051 . 0056 . 0091	
10-----	{----- 3	1 3 6	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	. 0056 . 0088 . 0128	¹ . 0064 . 0091 . 0128	
8-----	{----- 3	1 3 6	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	. 0060 . 0090 . 0140	. 0064 . 0093 . 0143	
6-----	{----- 3	1 3 6	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	. 0068 . 0098 . 0148	

¹ Standard size of the American National coarse-thread series.² Standard size of the American National fine-thread series.

NOTE.—It is preferable to avoid the use of tolerances set in italics by choosing a closer fit, shorter length of engagement, coarser pitch, or smaller diameter.

TABLE 29.—Pitch diameter tolerances for speical screw threads, class 2, free fit—Continued

Threads per inch	Lengths of engage ment		Pitch diameter tolerances for diameters up to and including—						
	From—	To and includ ing—	1 inch	1½ inches	2 inches	3 inches	4 inches	6 inches	8 inches
	Inches	Inches	Inch	Inch	Inch	Inch	Inch	Inch	Inch
64-----		½	0. 0038						
56-----	{----- ½	½ 1½	. 0038 . 0040	0. 0040 . 0040					
48-----	{----- ½	½ 1½	. 0039 . 0044	. 0044 . 0044					
40-----	{----- ½	½ 1½	. 0041 . 0048	. 0045 . 0048	0. 0048 . 0048				
36-----	{----- ½	½ 1½	. 0042 . 0049	. 0046 . 0050	. 0050 . 0050				
32-----	{----- ½	½ 1½	. 0043 . 0049	. 0047 . 0054	. 0051 . 0054	0. 0054 . 0054			
28-----	{----- ½	½ 1½	. 0044 . 0049	. 0048 . 0056	. 0052 . 0062	. 0058 . 0062	0. 0062 . 0062		
24-----	{----- ½	½ 1½	. 0045 . 0049	. 0050 . 0056	. 0054 . 0066	. 0060 . 0066	. 0065 . 0066		
20-----	{----- ½	½ 1½	. 0047 . 0049	. 0052 . 0056	. 0056 . 0071	. 0062 . 0072	. 0067 . 0072	0. 0072 . 0072	
18-----	{----- ½ 1½	½ 1½ 3	. 0049 . 0049 . 0082	. 0053 . 0056 . 0082	. 0057 . 0072 . 0082	. 0063 . 0078 . 0082	. 0069 . 0082 . 0082	. 0078 . 0082 . 0082	0. 0082 . 0082 . 0082
16-----	{----- ½ 1½	½ 1½ 3	. 0049 . 0049 . 0090	. 0054 . 0056 . 0090	. 0058 . 0073 . 0090	. 0065 . 0080 . 0090	. 0070 . 0085 . 0090	. 0079 . 0090 . 0090	. 0087 . 0090 . 0090
14-----	{----- ½ 1½	½ 1½ 3	. 0049 . 0049 . 0092	. 0056 . 0056 . 0096	. 0060 . 0075 . 0098	. 0066 . 0081 . 0098	. 0072 . 0087 . 0098	. 0081 . 0096 . 0098	. 0088 . 0098 . 0098
12-----	{----- ½ 1½	½ 1½ 3	. 0054 . 0056 . 0094	. 0056 . 0056 . 0098	. 0062 . 0077 . 0100	. 0068 . 0083 . 0108	. 0074 . 0089 . 0112	. 0083 . 0098 . 0112	. 0090 . 0105 . 0112
10-----	{----- 1 3	1 3 6	. 0064 . 0094 . 0128	. 0066 . 0098 . 0128	. 0070 . 0100 . 0128	. 0076 . 0108 . 0128	. 0082 . 0112 . 0128	. 0091 . 0121 . 0128	. 0098 . 0128 . 0128
8-----	{----- 1 3	1 3 6	¹ . 0076 . 0095 . 0145	. 0076 . 0100 . 0150	. 0076 . 0104 . 0152	. 0080 ² . 0110 . 0152	. 0085 . 0115 . 0152	. 0094 . 0124 . 0152	. 0102 . 0132 . 0152
6-----	{----- 1 3	1 3 6	. 0071 . 0101 . 0151	. 0075 ¹ . 0101 . 0155	. 0079 . 0109 . 0159	. 0085 . 0115 . 0165	. 0091 . 0121 . 0171	. 0100 . 0130 . 0180	. 0107 . 0137 . 0187
4-----	{----- 1 3	1 3 6	. 0080 . 0110 . 0160	. 0084 . 0114 . 0164	. 0088 . 0118 . 0168	. 0095 ¹ . 0140 . 0175	. 0100 . 0140 . 0180	. 0109 . 0140 . 0189	. 0117 . 0147 . 0197

¹Standard size of the American National coarse-thread series.

²Standard size of the American National fine-thread series.

NOTE.—It is preferable to avoid the use of tolerances set in italics by choosing a closer fit, shorter length of engagement, coarser pitch, or smaller diameter.

TABLE 29.—Pitch diameter tolerances for special screw threads, class 2, free fit—Continued

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—						
	From—	To and including—	10 inches	12 inches	14 inches	16 inches	18 inches	20 inches	24 inches
	<i>Inches</i>	<i>Inches</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>
16	$\left\{ \begin{array}{l} \frac{1}{2} \\ 1\frac{1}{2} \end{array} \right.$	$\left\{ \begin{array}{l} \frac{1}{2} \\ 1\frac{1}{2} \\ 3 \end{array} \right.$	$\begin{array}{l} 0.0090 \\ .0090 \\ .0090 \end{array}$						
14	$\left\{ \begin{array}{l} \frac{1}{2} \\ 1\frac{1}{2} \end{array} \right.$	$\left\{ \begin{array}{l} \frac{1}{2} \\ 1\frac{1}{2} \\ 3 \end{array} \right.$	$\begin{array}{l} .0095 \\ .0098 \\ .0098 \end{array}$	$\begin{array}{l} 0.0098 \\ .0098 \\ .0098 \end{array}$					
12	$\left\{ \begin{array}{l} \frac{1}{2} \\ 1\frac{1}{2} \end{array} \right.$	$\left\{ \begin{array}{l} \frac{1}{2} \\ 1\frac{1}{2} \\ 3 \end{array} \right.$	$\begin{array}{l} .0097 \\ .0112 \\ .0112 \end{array}$	$\begin{array}{l} .0103 \\ .0112 \\ .0112 \end{array}$	$\begin{array}{l} 0.0109 \\ .0112 \\ .0112 \end{array}$	$\begin{array}{l} 0.0112 \\ .0112 \\ .0112 \end{array}$			
10	$\left\{ \begin{array}{l} 1 \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} 1 \\ 3 \\ 6 \end{array} \right.$	$\begin{array}{l} .0105 \\ .0128 \\ .0128 \end{array}$	$\begin{array}{l} .0111 \\ .0128 \\ .0128 \end{array}$	$\begin{array}{l} .0116 \\ .0128 \\ .0128 \end{array}$	$\begin{array}{l} .0122 \\ .0128 \\ .0128 \end{array}$	$\begin{array}{l} 0.0126 \\ .0128 \\ .0128 \end{array}$	$\begin{array}{l} 0.0128 \\ .0128 \\ .0128 \end{array}$	
8	$\left\{ \begin{array}{l} 1 \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} 1 \\ 3 \\ 6 \end{array} \right.$	$\begin{array}{l} .0109 \\ .0139 \\ .0152 \end{array}$	$\begin{array}{l} .0115 \\ .0145 \\ .0152 \end{array}$	$\begin{array}{l} .0120 \\ .0150 \\ .0152 \end{array}$	$\begin{array}{l} .0125 \\ .0152 \\ .0152 \end{array}$	$\begin{array}{l} .0130 \\ .0152 \\ .0152 \end{array}$	$\begin{array}{l} .0135 \\ .0152 \\ .0152 \end{array}$	$\begin{array}{l} 0.0143 \\ .0152 \\ .0152 \end{array}$
6	$\left\{ \begin{array}{l} 1 \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} 1 \\ 3 \\ 6 \end{array} \right.$	$\begin{array}{l} .0114 \\ .0144 \\ .0194 \end{array}$	$\begin{array}{l} .0120 \\ .0150 \\ .0200 \end{array}$	$\begin{array}{l} .0126 \\ .0156 \\ .0202 \end{array}$	$\begin{array}{l} .0131 \\ .0161 \\ .0202 \end{array}$	$\begin{array}{l} .0136 \\ .0166 \\ .0202 \end{array}$	$\begin{array}{l} .0140 \\ .0170 \\ .0202 \end{array}$	$\begin{array}{l} .0149 \\ .0179 \\ .0202 \end{array}$
4	$\left\{ \begin{array}{l} 1 \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} 1 \\ 3 \\ 6 \end{array} \right.$	$\begin{array}{l} .0123 \\ .0153 \\ .0203 \end{array}$	$\begin{array}{l} .0129 \\ .0159 \\ .0209 \end{array}$	$\begin{array}{l} .0135 \\ .0165 \\ .0215 \end{array}$	$\begin{array}{l} .0140 \\ .0170 \\ .0220 \end{array}$	$\begin{array}{l} .0145 \\ .0175 \\ .0225 \end{array}$	$\begin{array}{l} .0149 \\ .0199 \\ .0229 \end{array}$	$\begin{array}{l} .0158 \\ .0188 \\ .0238 \end{array}$

NOTE.—It is preferable to avoid the use of tolerances set in italics by choosing a closer fit, shorter length of engagement, coarser pitch, or smaller diameter.

TABLE 30.—Pitch diameter tolerances for special screw threads, class 3, medium fit

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—						
	From—	To and including—	1/16 inch	1/8 inch	3/16 inch	1/4 inch	5/16 inch	3/8 inch	1/2 inch
	Inches	Inches	Inch	Inch	Inch	Inch	Inch	Inch	Inch
64-----	{----- 1/2	1/2 1 1/2	0. 0014 . 0030	0. 0014 . 0030	0. 0017 . 0030	0. 0019 . 0030	0. 0023 . 0030	0. 0025 . 0030	0. 0028 . 0030
56-----	{----- 1/2	1/2 1 1/2	. 0015 . 0030	. 0015 . 0030	. 0017 . 0030	. 0019 . 0030	. 0024 . 0030	. 0026 . 0030	. 0029 . 0030
48-----	{----- 1/2	1/2 1 1/2	. 0016 . 0030	. 0016 . 0030	. 0017 . 0030	. 0019 . 0030	. 0024 . 0030	. 0026 . 0030	. 0029 . 0030
40-----	{----- 1/2	1/2 1 1/2	. 0017 . 0030	1. 0017 . 0030	. 0017 . 0030	. 0019 . 0030	. 0024 . 0030	. 0026 . 0030	. 0030 . 0030
36-----	{----- 1/2	1/2 1 1/2	----- -----	. 0018 . 0030	. 0018 . 0030	. 0019 . 0030	. 0024 . 0030	. 0026 . 0030	. 0030 . 0030
32-----	{----- 1/2	1/2 1 1/2	----- -----	. 0019 . 0030	. 0019 . 0030	. 0019 . 0030	. 0024 . 0030	. 0026 . 0030	. 0030 . 0030
28-----	{----- 1/2	1/2 1 1/2	----- -----	----- -----	. 0022 . 0030	2. 0022 . 0030	. 0024 . 0030	. 0026 . 0030	. 0030 . 0030
24-----	{----- 1/2	1/2 1 1/2	----- -----	----- -----	. 0024 . 0030	. 0024 . 0030	2. 0024 . 0030	. 0026 . 0030	. 0030 . 0030
20-----	{----- 1 1/2	1/2 3	----- -----	----- -----	. 0025 . 0065	1. 0026 . 0066	. 0026 . 0068	2. 0026 . 0070	. 0030 . 0071
18-----	{----- 1 1/2	1/2 3	----- -----	----- -----	----- -----	. 0027 . 0067	. 0030 . 0069	. 0030 . 0071	. 0030 . 0071
16-----	{----- 1 1/2	1/2 3	----- -----	----- -----	----- -----	. 0028 . 0068	1. 0032 . 0070	. 0032 . 0071	. 0032 . 0071
14-----	{----- 1 1/2	1/2 3	----- -----	----- -----	----- -----	----- -----	. 0032 . 0071	. 0036 . 0071	. 0036 . 0071
12-----	{----- 1 1/2	1/2 3	----- -----	----- -----	----- -----	----- -----	. 0032 . 0071	. 0036 . 0071	. 0040 . 0071
10-----	{----- 3	1 3	----- -----	----- -----	----- -----	----- -----	----- -----	. 0040 . 0071	1. 0045 . 0071
8-----	{----- 3	1 3	----- -----	----- -----	----- -----	----- -----	----- -----	. 0042 . 0122	. 0045 . 0125
6-----	{----- 3	1 3	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	. 0048 . 0128

¹ Standard size of the American National coarse-thread series.

² Standard size of the American National fine-thread series.

TABLE 30.—Pitch diameter tolerances for special screw threads, class 3, medium fit—Continued

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—						
	From—	To and including—	1 inch	1½ inches	2 inches	3 inches	4 inches	6 inches	8 inches
	Inches	Inches	Inch	Inch	Inch	Inch	Inch	Inch	Inch
64-----	$\frac{1}{2}$	$\frac{1}{2}$	0. 0031 . 0036	0. 0036 . 0038	0. 0038 . 0038				
56-----	$\frac{1}{2}$	$\frac{1}{2}$	. 0032 . 0036	. 0036 . 0040	. 0040 . 0040				
48-----	$\frac{1}{2}$	$\frac{1}{2}$	. 0032 . 0036	. 0037 . 0040	. 0041 . 0044	0. 0044 . 0044			
40-----	$\frac{1}{2}$	$\frac{1}{2}$	. 0033 . 0036	. 0037 . 0040	. 0041 . 0048	. 0048 . 0048			
36-----	$\frac{1}{2}$	$\frac{1}{2}$	. 0033 . 0036	. 0038 . 0040	. 0042 . 0050	. 0048 . 0050	0. 0050 . 0050		
32-----	$\frac{1}{2}$	$\frac{1}{2}$	. 0034 . 0036	. 0038 . 0040	. 0042 . 0054	. 0048 . 0054	. 0054 . 0054		
28-----	$\frac{1}{2}$	$\frac{1}{2}$	. 0034 . 0036	. 0039 . 0040	. 0043 . 0058	. 0049 . 0062	. 0054 . 0062	0. 0062 . 0062	
24-----	$\frac{1}{2}$	$\frac{1}{2}$	. 0035 . 0036	. 0040 . 0040	. 0044 . 0059	. 0050 . 0065	. 0055 . 0066	. 0064 . 0066	
20-----	$\frac{1}{2}$ $1\frac{1}{2}$	$\frac{1}{2}$ 3	. 0036 . 0036 . 0071	. 0040 . 0040 . 0071	. 0045 . 0060 . 0072	. 0051 . 0066 . 0072	. 0056 . 0071 . 0072	. 0065 . 0072 . 0072	0. 0072 . 0072 . 0072
18-----	$\frac{1}{2}$ $1\frac{1}{2}$	$\frac{1}{2}$ 3	. 0036 . 0036 . 0071	. 0040 . 0040 . 0071	. 0045 . 0060 . 0082	. 0051 . 0066 . 0082	. 0057 . 0072 . 0082	. 0066 . 0081 . 0082	. 0073 . 0082 . 0082
16-----	$\frac{1}{2}$ $1\frac{1}{2}$	$\frac{1}{2}$ 3	. 0036 . 0036 . 0071	. 0040 . 0040 . 0071	. 0046 . 0061 . 0084	. 0052 . 0067 . 0090	. 0058 . 0073 . 0090	. 0066 . 0081 . 0090	. 0074 . 0089 . 0090
14-----	$\frac{1}{2}$ $1\frac{1}{2}$	$\frac{1}{2}$ 3	. 0036 . 0036 . 0071	. 0040 . 0040 . 0071	. 0047 . 0062 . 0084	. 0053 . 0068 . 0092	. 0058 . 0073 . 0098	. 0067 . 0082 . 0098	. 0075 . 0090 . 0098
12-----	$\frac{1}{2}$ $1\frac{1}{2}$	$\frac{1}{2}$ 3	. 0040 . 0040 . 0071	. 0040 . 0040 . 0071	. 0048 . 0063 . 0084	. 0054 . 0069 . 0092	. 0059 . 0074 . 0099	. 0068 . 0083 . 0108	. 0076 . 0091 . 0112
10-----	$\frac{1}{2}$ 3	$\frac{1}{2}$ 3 6	. 0046 . 0071 . 0126	. 0050 . 0071 . 0128	. 0054 . 0084 . 0128	. 0060 . 0092 . 0128	. 0066 . 0099 . 0128	. 0075 . 0108 . 0128	. 0082 . 0112 . 0128
8-----	$\frac{1}{2}$ 3	$\frac{1}{2}$ 3 6	. 0054 . 0071 . 0128	. 0054 . 0071 . 0132	. 0056 . 0086 . 0136	. 0062 . 0092 . 0142	. 0068 . 0099 . 0148	. 0077 . 0108 . 0152	. 0084 . 0114 . 0152
6-----	$\frac{1}{2}$ 3	$\frac{1}{2}$ 3 6	. 0054 . 0071 . 0130	. 0055 . 0071 . 0135	. 0059 . 0089 . 0139	. 0065 . 0095 . 0145	. 0070 . 0100 . 0150	. 0079 . 0109 . 0159	. 0087 . 0117 . 0167
4-----	$\frac{1}{2}$ 3	$\frac{1}{2}$ 3 6	. 0055 . 0085 . 0135	. 0059 . 0089 . 0139	. 0063 . 0093 . 0143	. 0070 . 0097 . 0150	. 0075 . 0105 . 0155	. 0084 . 0114 . 0164	. 0092 . 0122 . 0172

¹ Standard size of the American National coarse-thread series.² Standard size of the American National fine-thread series.

NOTE.—It is preferable to avoid the use of tolerances set in italics by choosing a closer fit, shorter length of engagement, coarser pitch, or smaller diameter.

TABLE 30.—Pitch diameter tolerances for special screw threads, class 3, medium fit—Continued

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—						
	From—	To and including—	10 inches	12 inches	14 inches	16 inches	18 inches	20 inches	24 inches
	<i>Inches</i>	<i>Inches</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>
18	$\frac{1}{2}$ $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	0. 0080 <i>. 0082</i> <i>. 0082</i>						
16	$\frac{1}{2}$ $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	. 0081 <i>. 0090</i> <i>. 0090</i>	0. 0087 <i>. 0090</i> <i>. 0090</i>					
14	$\frac{1}{2}$ $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	. 0082 <i>. 0097</i> <i>. 0098</i>	. 0088 <i>. 0098</i> <i>. 0098</i>	0. 0093 <i>. 0098</i> <i>. 0098</i>	0. 0098 <i>. 0098</i> <i>. 0098</i>			
12	$\frac{1}{2}$ $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	. 0083 <i>. 0098</i> <i>. 0112</i>	. 0089 <i>. 0104</i> <i>. 0112</i>	. 0094 <i>. 0109</i> <i>. 0112</i>	. 0099 <i>. 0112</i> <i>. 0112</i>	0. 0104 <i>. 0112</i> <i>. 0112</i>	0. 0109 <i>. 0112</i> <i>. 0112</i>	
10	1 3	1 3 6	. 0089 <i>. 0119</i> <i>. 0128</i>	. 0095 <i>. 0125</i> <i>. 0128</i>	. 0101 <i>. 0128</i> <i>. 0128</i>	. 0106 <i>. 0128</i> <i>. 0128</i>	. 0111 <i>. 0128</i> <i>. 0128</i>	. 0115 <i>. 0128</i> <i>. 0128</i>	0. 0124 <i>. 0128</i> <i>. 0128</i>
8	1 3	1 3 6	. 0091 <i>. 0121</i> <i>. 0152</i>	. 0097 <i>. 0127</i> <i>. 0152</i>	. 0102 <i>. 0132</i> <i>. 0152</i>	. 0108 <i>. 0138</i> <i>. 0152</i>	. 0113 <i>. 0143</i> <i>. 0152</i>	. 0117 <i>. 0147</i> <i>. 0152</i>	. 0126 <i>. 0152</i> <i>. 0152</i>
6	1 3	1 3 6	. 0094 <i>. 0124</i> <i>. 0174</i>	. 0100 <i>. 0130</i> <i>. 0180</i>	. 0105 <i>. 0135</i> <i>. 0185</i>	. 0110 <i>. 0140</i> <i>. 0190</i>	. 0115 <i>. 0145</i> <i>. 0195</i>	. 0120 <i>. 0150</i> <i>. 0200</i>	. 0128 <i>. 0158</i> <i>. 0202</i>
4	1 3	1 3 6	. 0098 <i>. 0128</i> <i>. 0178</i>	. 0104 <i>. 0134</i> <i>. 0184</i>	. 0110 <i>. 0140</i> <i>. 0190</i>	. 0115 <i>. 0145</i> <i>. 0195</i>	. 0120 <i>. 0150</i> <i>. 0200</i>	. 0124 <i>. 0154</i> <i>. 0204</i>	. 0133 <i>. 0163</i> <i>. 0213</i>

NOTE.—It is preferable to avoid the use of tolerances set in italics by choosing a closer fit, shorter length of engagement, coarser pitch, or smaller diameter.

TABLE 31.—Pitch diameter tolerances for special screw threads, class 4, close fit

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—						
	From—	To and including—	1/16 inch	1/8 inch	3/16 inch	1/4 inch	5/16 inch	3/8 inch	1/2 inch
	Inches	Inches	Inch	Inch	Inch	Inch	Inch	Inch	Inch
64-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	0. 0007 . 0015 . 0028	0. 0007 . 0015 . 0029	0. 0009 . 0015 . 0030	0. 0010 . 0015 . 0031	0. 0012 . 0015 . 0032	0. 0013 . 0015 . 0033	0. 0014 . 0015 . 0034
56-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	. 0007 . 0015 . 0028	. 0007 . 0015 . 0029	. 0009 . 0015 . 0030	. 0010 . 0015 . 0031	. 0012 . 0015 . 0032	. 0013 . 0015 . 0033	. 0014 . 0015 . 0034
48-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	. 0008 . 0015 . 0029	. 0008 . 0015 . 0030	. 0009 . 0015 . 0030	. 0010 . 0015 . 0031	. 0012 . 0015 . 0032	. 0013 . 0015 . 0033	. 0015 . 0015 . 0035
40-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	. 0009 . 0015 . 0029	¹ . 0009 . 0015 . 0030	. 0009 . 0015 . 0031	. 0010 . 0015 . 0032	. 0012 . 0015 . 0033	. 0013 . 0015 . 0034	. 0015 . 0015 . 0035
36-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	----- ----- -----	. 0009 . 0015 . 0030	. 0009 . 0015 . 0031	. 0010 . 0015 . 0032	. 0012 . 0015 . 0033	. 0013 . 0015 . 0034	. 0015 . 0015 . 0035
32-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	----- ----- -----	. 0010 . 0015 . 0030	. 0010 . 0015 . 0031	. 0010 . 0015 . 0032	. 0012 . 0015 . 0033	. 0013 . 0015 . 0034	. 0015 . 0015 . 0036
28-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	----- ----- -----	----- ----- -----	. 0011 . 0015 . 0032	² . 0011 . 0015 . 0032	. 0012 . 0015 . 0033	. 0013 . 0015 . 0034	. 0015 . 0015 . 0036
24-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	----- ----- -----	----- ----- -----	. 0012 . 0015 . 0032	. 0012 . 0015 . 0033	² . 0012 . 0015 . 0034	. 0013 . 0015 . 0035	. 0015 . 0015 . 0036
20-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	----- ----- -----	----- ----- -----	. 0012 . 0015 . 0032	¹ . 0013 . 0015 . 0033	. 0013 . 0015 . 0034	² . 0013 . 0015 . 0035	. 0015 . 0015 . 0036
18-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	----- ----- -----	----- ----- -----	----- ----- -----	. 0013 . 0015 . 0033	. 0015 . 0015 . 0034	. 0015 . 0015 . 0035	. 0015 . 0015 . 0036
16-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	----- ----- -----	----- ----- -----	----- ----- -----	. 0014 . 0016 . 0034	¹ . 0016 . 0016 . 0035	. 0016 . 0016 . 0036	. 0016 ² . 0016 . 0036
14-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	. 0016 . 0018 . 0035	. 0018 . 0018 . 0036	. 0018 . 0018 . 0036
12-----	{ ----- 1/2 1 1/2	1/2 1 1/2 3	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	. 0016 . 0020 . 0036	. 0018 . 0020 . 0036	. 0020 . 0020 . 0036
10-----	{ ----- 1 3	1 3 6	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	. 0020 . 0036 . 0060	¹ . 0023 . 0036 . 0062
8-----	{ ----- 1 3	1 3 6	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	. 0021 . 0036 . 0061	. 0023 . 0036 . 0062
6-----	{ ----- 1 3	1 3 6	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	. 0024 . 0036 . 0064

¹ Standard size of the American National coarse-thread series.² Standard size of the American National fine-thread series.

TABLE 31.—Pitch diameter tolerances for special screw threads, class 4, close fit—Continued

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—						
	From—	To and including—	1 inch	1½ inches	2 inches	3 inches	4 inches	6 inches	8 inches
	Inches	Inches	Inch	Inch	Inch	Inch	Inch	Inch	Inch
64-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0016 .0018 .0036	.0018 .0020 .0036	.0020 .0027 .0038	.0023 .0030 .0038	.0026 .0033 .0038	.0030 .0038 .0038	.0034 .0038 .0038
56-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0016 .0018 .0036	.0018 .0020 .0036	.0020 .0027 .0040	.0023 .0031 .0040	.0026 .0033 .0040	.0030 .0038 .0040	.0034 .0040 .0040
48-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0016 .0018 .0036	.0018 .0020 .0036	.0020 .0028 .0040	.0023 .0031 .0043	.0026 .0034 .0044	.0031 .0038 .0044	.0034 .0042 .0044
40-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0016 .0018 .0036	.0018 .0020 .0036	.0021 .0028 .0041	.0024 .0031 .0044	.0027 .0034 .0047	.0031 .0038 .0048	.0035 .0042 .0048
36-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0017 .0018 .0036	.0019 .0020 .0036	.0021 .0028 .0041	.0024 .0031 .0044	.0027 .0034 .0047	.0031 .0039 .0050	.0035 .0042 .0050
32-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0017 .0018 .0036	.0019 .0020 .0036	.0021 .0029 .0041	.0024 .0032 .0044	.0027 .0034 .0047	.0031 .0039 .0051	.0035 .0043 .0054
28-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0017 .0018 .0036	.0019 .0020 .0036	.0021 .0029 .0041	.0024 .0032 .0044	.0027 .0035 .0047	.0032 .0039 .0052	.0036 .0043 .0056
24-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0018 .0018 .0036	.0020 .0020 .0036	.0022 .0029 .0042	.0025 .0032 .0045	.0028 .0035 .0048	.0032 .0040 .0052	.0036 .0043 .0056
20-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0018 .0018 .0036	.0020 .0020 .0036	.0022 .0030 .0042	.0025 .0033 .0045	.0028 .0036 .0048	.0033 .0040 .0053	.0036 .0044 .0056
18-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0018 .0018 .0036	.0020 .0020 .0036	.0023 .0030 .0042	.0026 .0033 .0046	.0028 .0036 .0048	.0033 .0040 .0053	.0037 .0044 .0057
16-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0018 .0018 .0036	.0020 .0020 .0036	.0023 .0030 .0042	.0026 .0033 .0046	.0029 .0036 .0049	.0033 .0041 .0053	.0037 .0044 .0057
14-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0018 . ² .0018 .0036	.0020 .0020 .0036	.0023 .0031 .0042	.0026 .0034 .0046	.0029 .0037 .0049	.0034 .0041 .0054	.0038 .0045 .0058
12-----	{ ----- $\frac{1}{2}$ ----- $1\frac{1}{2}$	$\frac{1}{2}$ $1\frac{1}{2}$ 3	.0020 .0020 .0036	.0020 . ² .0020 .0036	.0024 .0031 .0042	.0027 .0034 .0046	.0030 .0037 .0050	.0034 .0042 .0054	.0038 .0046 .0058
10-----	{ ----- 1 ----- 3	1 3 6	.0023 .0036 .0063	.0023 .0036 .0065	.0027 . ² .0042 .0067	.0030 .0046 .0070	.0033 .0050 .0073	.0037 .0054 .0077	.0041 .0058 .0081
8-----	{ ----- 1 ----- 3	1 3 6	. ¹ .0027 .0036 .0064	.0027 .0036 .0066	.0028 .0043 .0068	.0031 . ² .0046 .0071	.0034 .0050 .0074	.0038 .0054 .0078	.0042 .0058 .0082
6-----	{ ----- 1 ----- 3	1 3 6	.0027 .0036 .0065	.0027 . ¹ .0036 .0067	.0029 .0044 .0069	.0032 .0047 .0072	.0035 .0050 .0075	.0040 .0055 .0080	.0043 .0058 .0083
4-----	{ ----- 1 ----- 3	1 3 6	.0028 .0043 .0068	.0030 .0045 .0070	.0032 .0047 .0072	.0035 . ¹ .0048 .0075	.0038 .0053 .0078	.0042 .0057 .0082	.0046 .0061 .0086

¹ Standard size of the American National coarse-thread series.

² Standard size of the American National fine-thread series.

NOTE.—It is preferable to avoid the use of tolerances set in italics by choosing a shorter length of engagement, coarser pitch, or smaller diameter.

TABLE 31.—Pitch diameter tolerances for special screw threads, class 4, close fit—Continued

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—						
	From—	To and including—	10 inches	12 inches	14 inches	16 inches	18 inches	20 inches	24 inches
	Inches	Inches	Inch	Inch	Inch	Inch	Inch	Inch	Inch
64	$\frac{1}{2}$	$\frac{1}{2}$	0.0037						
	$\frac{1}{2}$	$1\frac{1}{2}$	.0038						
	$1\frac{1}{2}$	3	.0038						
56	$\frac{1}{2}$	$\frac{1}{2}$	.0037	0.0040					
	$\frac{1}{2}$	$1\frac{1}{2}$	.0040	.0040					
	$1\frac{1}{2}$	3	.0040	.0040					
48	$\frac{1}{2}$	$\frac{1}{2}$	.0038	.0041	0.0044				
	$\frac{1}{2}$	$1\frac{1}{2}$	.0044	.0044	.0044				
	$1\frac{1}{2}$	3	.0044	.0044	.0044				
40	$\frac{1}{2}$	$\frac{1}{2}$	.0038	.0041	.0044	0.0046			
	$\frac{1}{2}$	$1\frac{1}{2}$	.0046	.0048	.0048	.0048			
	$1\frac{1}{2}$	3	.0048	.0048	.0048	.0048			
36	$\frac{1}{2}$	$\frac{1}{2}$	.0038	.0041	.0044	.0047	0.0049		
	$\frac{1}{2}$	$1\frac{1}{2}$	.0046	.0049	.0050	.0050	.0050		
	$1\frac{1}{2}$	3	.0050	.0050	.0050	.0050	.0050		
32	$\frac{1}{2}$	$\frac{1}{2}$	.0038	.0041	.0044	.0047	.0049	0.0052	
	$\frac{1}{2}$	$1\frac{1}{2}$	.0046	.0049	.0052	.0054	.0054	.0054	
	$1\frac{1}{2}$	3	.0054	.0054	.0054	.0054	.0054	.0054	
28	$\frac{1}{2}$	$\frac{1}{2}$	.0039	.0042	.0045	.0047	.0050	.0052	0.0056
	$\frac{1}{2}$	$1\frac{1}{2}$	.0046	.0049	.0052	.0055	.0057	.0059	.0062
	$1\frac{1}{2}$	3	.0059	.0062	.0062	.0062	.0062	.0062	.0062
24	$\frac{1}{2}$	$\frac{1}{2}$	.0039	.0042	.0045	.0048	.0050	.0052	.0057
	$\frac{1}{2}$	$1\frac{1}{2}$	.0047	.0050	.0052	.0055	.0057	.0060	.0064
	$1\frac{1}{2}$	3	.0059	.0062	.0065	.0066	.0066	.0066	.0066
20	$\frac{1}{2}$	$\frac{1}{2}$	.0040	.0043	.0046	.0048	.0050	.0053	.0057
	$\frac{1}{2}$	$1\frac{1}{2}$	.0047	.0050	.0053	.0056	.0058	.0060	.0065
	$1\frac{1}{2}$	3	.0060	.0063	.0066	.0068	.0070	.0072	.0072
18	$\frac{1}{2}$	$\frac{1}{2}$	.0040	.0043	.0046	.0048	.0051	.0053	.0057
	$\frac{1}{2}$	$1\frac{1}{2}$	.0047	.0050	.0053	.0056	.0058	.0061	.0065
	$1\frac{1}{2}$	3	.0060	.0063	.0066	.0068	.0071	.0073	.0077
16	$\frac{1}{2}$	$\frac{1}{2}$	.0040	.0043	.0046	.0049	.0051	.0053	.0058
	$\frac{1}{2}$	$1\frac{1}{2}$	.0048	.0051	.0054	.0056	.0059	.0061	.0065
	$1\frac{1}{2}$	3	.0060	.0063	.0066	.0069	.0071	.0073	.0078
14	$\frac{1}{2}$	$\frac{1}{2}$	.0041	.0044	.0047	.0049	.0052	.0054	.0058
	$\frac{1}{2}$	$1\frac{1}{2}$	.0048	.0051	.0054	.0057	.0059	.0061	.0066
	$1\frac{1}{2}$	3	.0061	.0064	.0067	.0069	.0072	.0074	.0078
12	$\frac{1}{2}$	$\frac{1}{2}$	.0041	.0044	.0047	.0050	.0052	.0054	.0059
	$\frac{1}{2}$	$1\frac{1}{2}$	.0049	.0052	.0055	.0057	.0060	.0062	.0066
	$1\frac{1}{2}$	3	.0061	.0064	.0067	.0070	.0072	.0074	.0079
10	$\frac{1}{2}$	1	.0044	.0048	.0050	.0053	.0055	.0058	.0062
	1	3	.0061	.0064	.0067	.0070	.0072	.0074	.0079
	3	6	.0084	.0088	.0090	.0093	.0095	.0098	.0102
8	$\frac{1}{2}$	1	.0045	.0048	.0051	.0054	.0056	.0059	.0063
	1	3	.0061	.0064	.0067	.0070	.0072	.0074	.0079
	3	6	.0085	.0088	.0091	.0094	.0096	.0099	.0103
6	$\frac{1}{2}$	1	.0047	.0050	.0053	.0055	.0058	.0060	.0064
	1	3	.0062	.0065	.0068	.0070	.0073	.0075	.0079
	3	6	.0087	.0090	.0093	.0095	.0098	.0100	.0104
4	$\frac{1}{2}$	1	.0049	.0052	.0055	.0058	.0060	.0062	.0066
	1	3	.0064	.0067	.0070	.0073	.0075	.0077	.0082
	3	6	.0089	.0092	.0095	.0098	.0100	.0102	.0106

NOTE.—It is preferable to avoid the use of tolerances set in italics by choosing a shorter length of engagement, coarser pitch, or smaller diameter.



