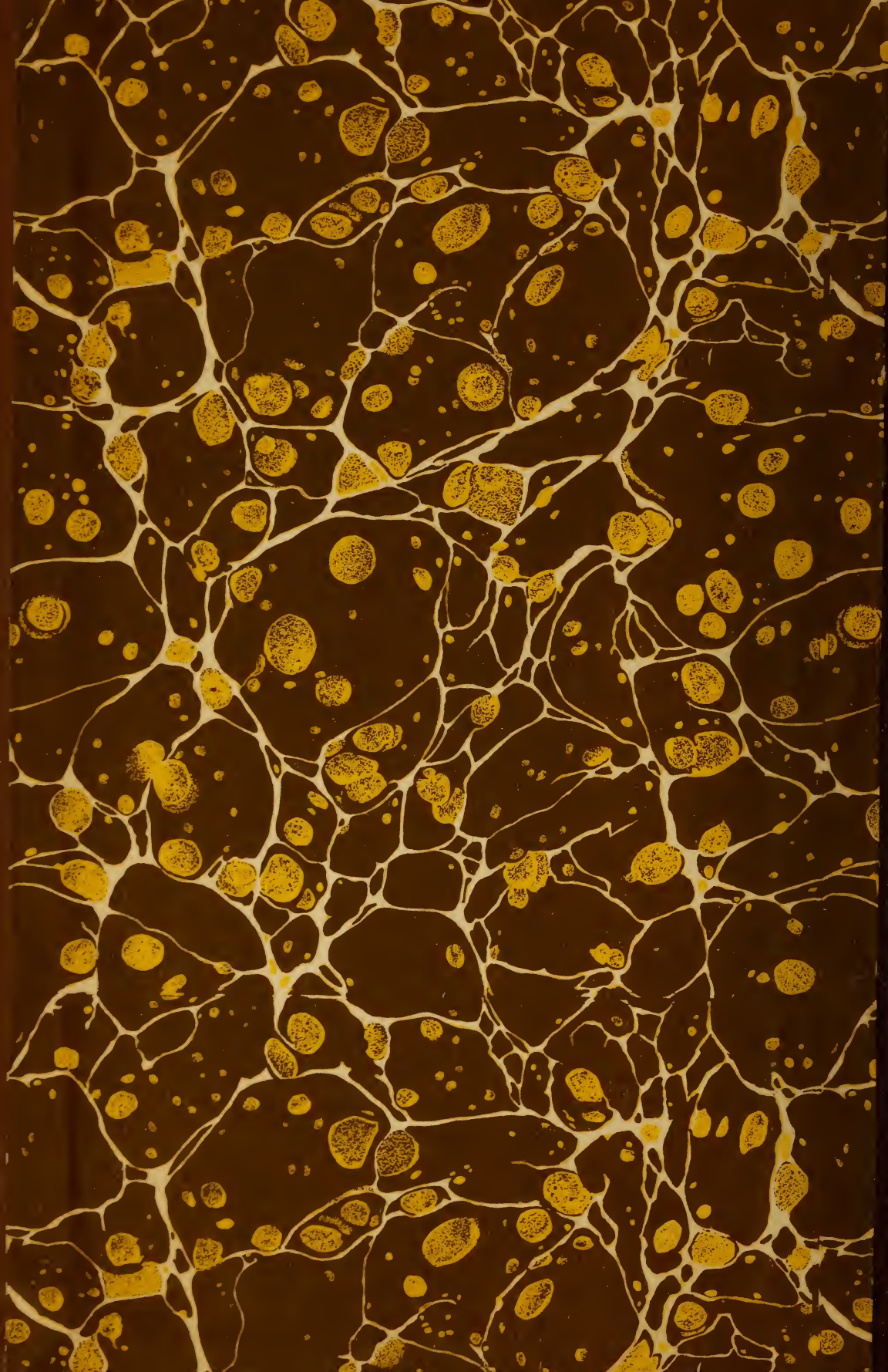


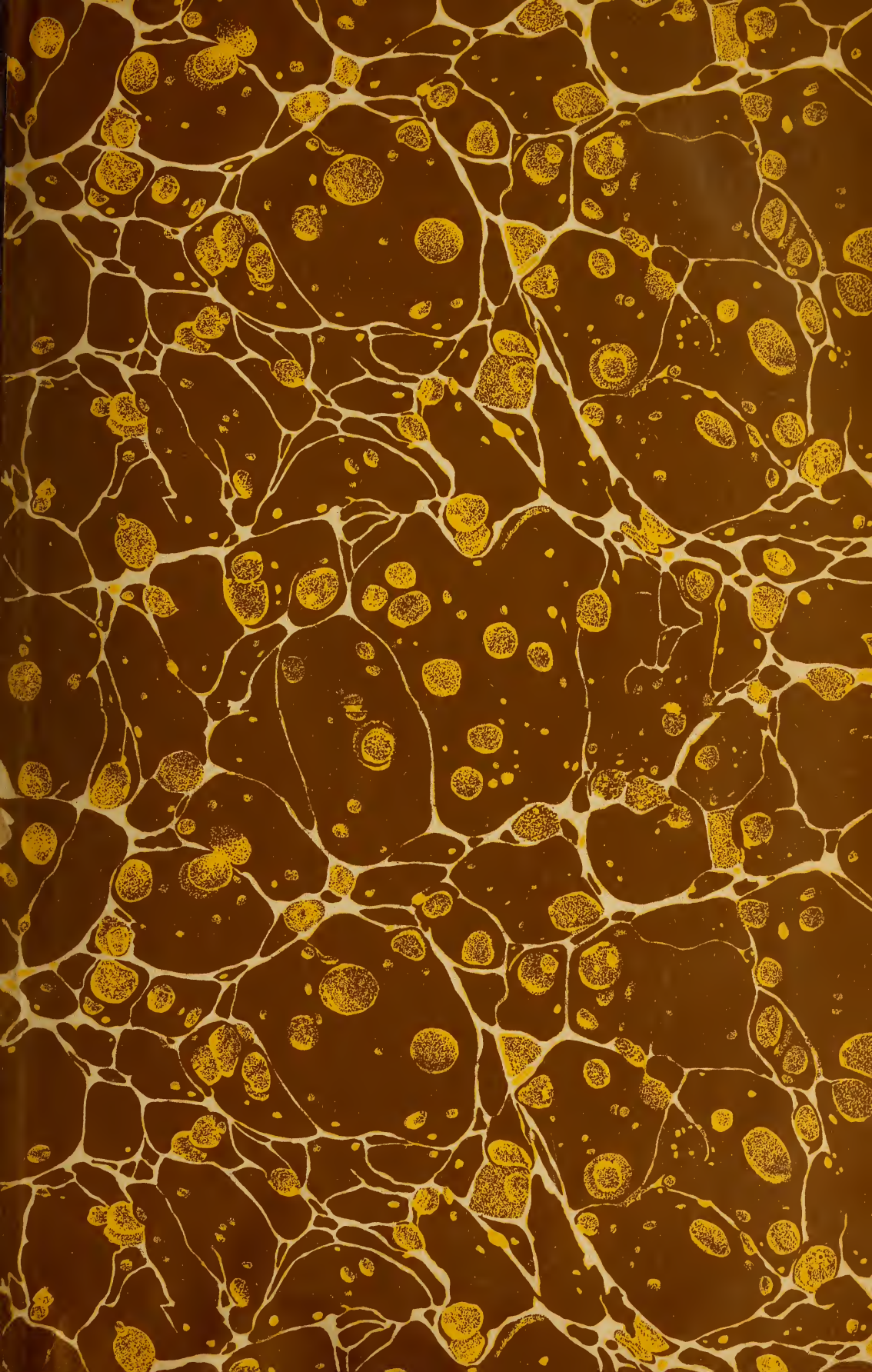
MISCELLANEOUS PUBLICATIONS  
OF THE  
BUREAU OF STANDARDS

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NOS. 91-102











UNITED STATES DEPARTMENT OF COMMERCE  
BUREAU OF STANDARDS

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

**I. Standard Threads**  
**(Coarse and Fine Thread Series)**

MISCELLANEOUS PUBLICATION OF THE BUREAU OF STANDARDS, No. 98



UNITED STATES DEPARTMENT OF COMMERCE

R. P. LAMONT, Secretary

BUREAU OF STANDARDS

GEORGE K. BURGESS, Director

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MISCELLANEOUS PUBLICATION OF THE BUREAU OF STANDARDS, No. 98

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# AMERICAN NATIONAL SCREW THREAD TABLES FOR SHOP USE

## I. Standard Threads

(Coarse and Fine Thread Series)

[Recommended Commercial Standard]

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SEPTEMBER 23, 1929



UNITED STATES  
GOVERNMENT PRINTING OFFICE  
WASHINGTON : 1929





# AMERICAN NATIONAL SCREW THREAD TABLES FOR SHOP USE

## I. STANDARD THREADS (COARSE AND FINE THREAD SERIES)

### ABSTRACT

This publication makes available for convenient use six of the most essential tables of dimensions of fastening screws as published in the 1928 Report of the National Screw Thread Commission (Sec. III and Appendix 4), Bureau of Standards Miscellaneous Publication No. 89.<sup>1</sup> These tables cover the basic sizes, limiting dimensions, tolerances, and tap-drill sizes for the American National coarse and fine thread series.

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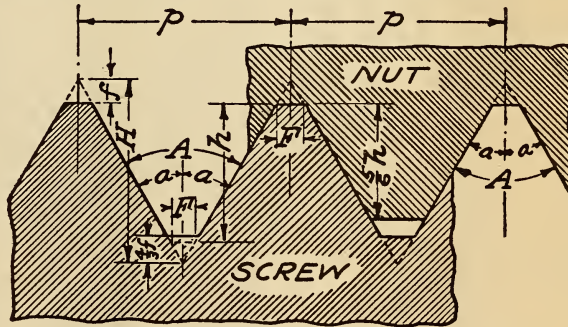


FIGURE 3.—American National form of thread

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  $\nabla$  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
- $f = 0.108253 p$
- $\left. \begin{array}{l} = \frac{1}{4} H \\ = \frac{1}{6} h \end{array} \right\} \text{depth of truncation}$

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

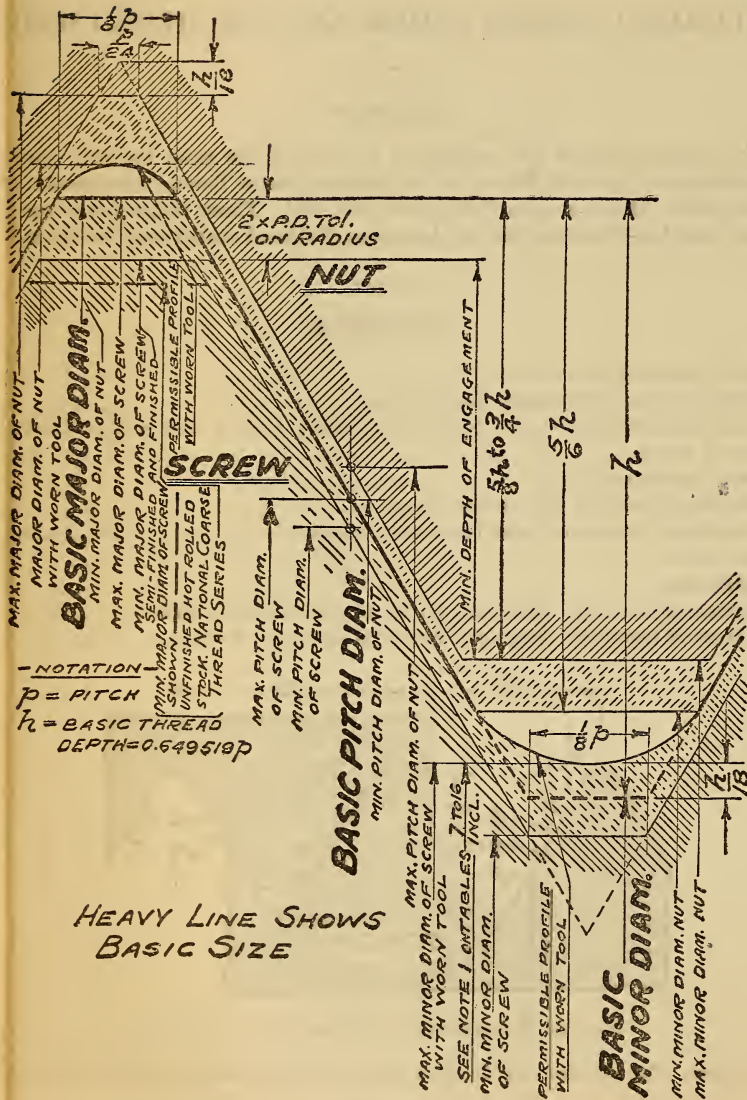


FIGURE 7.—Illustration of tolerances and crest clearances for class 2, free fit

I. AMERICAN NATIONAL COARSE-THREAD SERIES

The American National coarse-thread series is recommended for general use in engineering work, in machine construction where conditions are favorable to the use of bolts, screws, and other threaded components where quick and easy assembly of the parts is desired, and for all work where conditions do not require the use of fine-pitch threads.

TABLE 1.—American National coarse-thread series

Identification		Basic diameters			Thread data							
Sizes	Threads per inch <i>n</i>	Major diameter <i>D</i>	Pitch diameter <i>E</i>	Minor diameter <i>K</i>	Metric equivalent of major diameter	Pitch <i>p</i>	Depth of thread <i>h</i>	Basic width of flat <i>p/8</i>	Minimum width of flat at major diameter of nut <i>p/24</i>	Helix angle at basic pitch diameter <i>s</i>	Basic area of section at root of thread $\frac{\pi K^2}{4}$	
1	2	3	4	5	6	7	8	9	10	11	12	
		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>mm</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>°</i> <i>'</i>	<i>Sq. in.</i>
1-----	64	0.073	0.0629	0.0527	1.854	0.01562	0.01015	0.00195	0.00065	4 31	0.0022	
2-----	56	.086	.0744	.0628	2.184	.01786	.01160	.00223	.00074	4 22	.0031	
3-----	48	.099	.0855	.0719	2.515	.02083	.01353	.00260	.00087	4 26	.0041	
4-----	40	.112	.0958	.0795	2.845	.02500	.01624	.00312	.00104	4 45	.0050	
5-----	40	.125	.1088	.0925	3.175	.02500	.01624	.00312	.00104	4 11	.0067	
6-----	32	.138	.1177	.0974	3.505	.03125	.02030	.00391	.00130	4 50	.0075	
8-----	32	.164	.1437	.1234	4.166	.03125	.02030	.00391	.00130	3 58	.0120	
10-----	24	.190	.1629	.1359	4.826	.04167	.02706	.00521	.00174	4 39	.0145	
12-----	24	.216	.1889	.1619	5.486	.04167	.02706	.00521	.00174	4 1	.0206	
1/4-----	20	.2500	.2175	.1850	6.350	.05000	.03248	.00625	.00208	4 11	.0269	
5/16-----	18	.3125	.2764	.2403	7.938	.05556	.03608	.00694	.00231	3 40	.0454	
3/8-----	16	.3750	.3344	.2938	9.525	.06250	.04059	.00781	.00260	3 24	.0678	
7/16-----	14	.4375	.3911	.3447	11.113	.07143	.04639	.00893	.00298	3 20	.0933	
1/2-----	13	.5000	.4500	.4001	12.700	.07692	.04996	.00962	.00321	3 7	.1257	
9/16-----	12	.5625	.5084	.4542	14.288	.08333	.05413	.01042	.00347	2 59	.1620	
5/8-----	11	.6250	.5660	.5069	15.875	.09091	.05905	.01136	.00379	2 56	.2018	
3/4-----	10	.7500	.6850	.6201	19.050	.10000	.06495	.01250	.00417	2 40	.3020	
7/8-----	9	.8750	.8028	.7307	22.225	.11111	.07217	.01389	.00463	2 31	.4193	
1-----	8	1.0000	.9188	.8376	25.400	.12500	.08119	.01562	.00521	2 29	.5510	
1 1/8-----	7	1.1250	1.0322	.9394	28.575	.14286	.09279	.01786	.00595	2 31	.6931	
1 1/4-----	7	1.2500	1.1572	1.0644	31.750	.14286	.09279	.01786	.00595	2 15	.8898	
1 1/2-----	6	1.5000	1.3917	1.2835	38.100	.16667	.10825	.02083	.00694	2 11	1.2938	
1 3/4-----	5	1.7500	1.6201	1.4902	44.450	.20000	.12990	.02500	.00833	2 15	1.7441	
2-----	4 1/2	2.0000	1.8557	1.7113	50.800	.22222	.14434	.02778	.00926	2 11	2.3001	
2 1/4-----	4 1/2	2.2500	2.1057	1.9613	57.150	.22222	.14434	.02778	.00926	1 55	3.0212	
2 1/2-----	4	2.5000	2.3376	2.1752	63.500	.25000	.16238	.03125	.01042	1 57	3.7161	
2 3/4-----	4	2.7500	2.5876	2.4252	69.850	.25000	.16238	.03125	.01042	1 46	4.6194	
3 <sup>1</sup> -----	4	3.0000	2.8376	2.6752	76.200	.25000	.16238	.03125	.01042	1 36	5.6209	
3-----	3 1/2	3.0000	2.8144	2.6288	76.200	.28571	.18558	.03571	.01190	1 51	5.4276	

<sup>1</sup> Optional. Standard for marine work.



TABLE 15.—Limiting dimensions and tolerances, classes 1, 2, 3, and 4 fits, American National coarse-thread series

1	Machine screw number							
	1	2	3	4	5	6	8	
	Threads per inch							
	64	56	48	40	40	32	32	
1	2	3	4	5	6	7	8	
<b>BOLTS AND SCREWS</b>								
Class 1, major diameter	Max	<i>Inch</i> 0.0723	<i>Inch</i> 0.0852	<i>Inch</i> 0.0981	<i>Inch</i> 0.1110	<i>Inch</i> 0.1240	<i>Inch</i> 0.1369	<i>Inch</i> 0.1629
	Min	.0671	.0796	.0919	.1042	.1172	.1293	.1553
	Tol	.0052	.0056	.0062	.0068	.0068	.0076	.0076
Classes 2, 3, and 4, major diameter	Max	.0730	.0860	.0990	.1120	.1250	.1380	.1640
	Min	.0692	.0820	.0946	.1072	.1202	.1326	.1586
	Tol	.0038	.0040	.0044	.0048	.0048	.0054	.0054
Class 2, major diameter (threaded parts of unfinished, hot-rolled material)	Max	.0730	.0860	.0990	.1120	.1250	.1380	.1640
	Min	.0678	.0804	.0928	.1052	.1182	.1304	.1564
	Tol	.0052	.0056	.0062	.0068	.0068	.0076	.0076
Class 1, minor diameter	Max. <sup>1</sup>	.0531	.0633	.0725	.0803	.0933	.0986	.1246
Classes 2, 3, and 4, minor diameter	Max. <sup>1</sup>	.0538	.0641	.0734	.0813	.0943	.0997	.1257
Class 1, loose fit, pitch diameter	Max	.0622	.0736	.0846	.0948	.1078	.1166	.1426
	Min	.0596	.0708	.0815	.0914	.1044	.1128	.1388
	Tol	.0026	.0028	.0031	.0034	.0034	.0038	.0038
Class 2, free fit, pitch diameter	Max	.0629	.0744	.0855	.0958	.1088	.1177	.1437
	Min	.0610	.0724	.0833	.0934	.1064	.1150	.1410
	Tol	.0019	.0020	.0022	.0024	.0024	.0027	.0027
Class 3, medium fit, pitch diameter	Max	.0629	.0744	.0855	.0958	.1088	.1177	.1437
	Min	.0615	.0729	.0839	.0941	.1071	.1158	.1418
	Tol	.0014	.0015	.0016	.0017	.0017	.0019	.0019
Class 4, close fit, pitch diameter	Max	.0630	.0746	.0857	.0960	.1090	.1179	.1439
	Min	.0623	.0739	.0849	.0951	.1081	.1169	.1429
	Tol	.0007	.0007	.0008	.0009	.0009	.0010	.0010
<b>NUTS AND TAPPED HOLES</b>								
Classes 1, 2, 3, and 4, major diameter	Min. <sup>2</sup>	.0730	.0860	.0990	.1120	.1250	.1380	.1640
Classes 1, 2, 3, and 4, minor diameter	Max	.0604	.0715	.0820	.0913	.1043	.1118	.1378
	Min	.0561	.0667	.0764	.0849	.0979	.1042	.1302
	Tol	.0043	.0048	.0056	.0064	.0064	.0076	.0076
Classes 1, 2, 3, and 4, pitch diameter	Min	.0629	.0744	.0855	.0958	.1088	.1177	.1437
Class 1, loose fit, pitch diameter	Max	.0655	.0772	.0886	.0992	.1122	.1215	.1475
	Tol	.0026	.0028	.0031	.0034	.0034	.0038	.0038
Class 2, free fit, pitch diameter	Max	.0648	.0764	.0877	.0982	.1112	.1204	.1464
	Tol	.0019	.0020	.0022	.0024	.0024	.0027	.0027
Class 3, medium fit, pitch diameter	Max	.0643	.0759	.0871	.0975	.1105	.1196	.1456
	Tol	.0014	.0015	.0016	.0017	.0017	.0019	.0019
Class 4, close fit, pitch diameter	Max	.0636	.0751	.0863	.0967	.1097	.1187	.1447
	Tol	.0007	.0007	.0008	.0009	.0009	.0010	.0010

<sup>1</sup> See footnote 1 on page 12.<sup>2</sup> See footnote 2 on page 12.

TABLE 15.—Limiting dimensions and tolerances, classes 1, 2, 3, and 4 fits, American National coarse-thread series—Continued

	Machine screw number or nominal size							
	10	12	¼	⅝	¾	⅞	1	
	Threads per inch							
	24	24	20	18	16	14	13	
1	9	10	11	12	13	14	15	
<b>BOLTS AND SCREWS</b>								
Class 1, major diameter	Max	<i>Inch</i> 0.1887	<i>Inch</i> 0.2147	<i>Inch</i> 0.2485	<i>Inch</i> 0.3109	<i>Inch</i> 0.3732	<i>Inch</i> 0.4354	<i>Inch</i> 0.4978
	Min	.1795	.2055	.2383	.2995	.3606	.4214	.4830
	Tol	.0092	.0092	.0102	.0114	.0126	.0140	.0148
Classes 2, 3, and 4, major diameter	Max	.1900	.2160	.2500	.3125	.3750	.4375	.5000
	Min	.1834	.2094	.2428	.3043	.3660	.4277	.4896
	Tol	.0066	.0066	.0072	.0082	.0090	.0098	.0104
Class 2, major diameter (threaded parts of unfinished, hot-rolled material)	Max	.1900	.2160	.2500	.3125	.3750	.4375	.5000
	Min	.1808	.2068	.2398	.3011	.3624	.4235	.4852
	Tol	.0092	.0092	.0102	.0114	.0126	.0140	.0148
Class 1, minor diameter	Max. <sup>1</sup>	.1376	.1636	.1872	.2427	.2965	.3478	.4034
Classes 2, 3, and 4, minor diameter	Max. <sup>1</sup>	.1389	.1649	.1887	.2443	.2983	.3499	.4056
Class 1, loose fit, pitch diameter	Max	.1616	.1876	.2160	.2748	.3326	.3890	.4478
	Min	.1570	.1830	.2109	.2691	.3263	.3820	.4404
	Tol	.0046	.0046	.0051	.0057	.0063	.0070	.0074
Class 2, free fit, pitch diameter	Max	.1629	.1889	.2175	.2764	.3344	.3911	.4500
	Min	.1596	.1856	.2139	.2723	.3299	.3862	.4448
	Tol	.0033	.0033	.0036	.0041	.0045	.0049	.0052
Class 3, medium fit, pitch diameter	Max	.1629	.1889	.2175	.2764	.3344	.3911	.4500
	Min	.1605	.1865	.2149	.2734	.3312	.3875	.4463
	Tol	.0024	.0024	.0026	.0030	.0032	.0036	.0037
Class 4, close fit, pitch diameter	Max	.1632	.1892	.2178	.2767	.3348	.3915	.4504
	Min	.1620	.1880	.2165	.2752	.3332	.3897	.4485
	Tol	.0012	.0012	.0013	.0015	.0016	.0018	.0019
<b>NUTS AND TAPPED HOLES</b>								
Classes 1, 2, 3, and 4, major diameter	Min. <sup>2</sup>	.1900	.2160	.2500	.3125	.3750	.4375	.5000
Classes 1, 2, 3, and 4, minor diameter	Max	.1541	.1801	.2060	.2630	.3184	.3721	.4290
	Min	.1449	.1709	.1959	.2524	.3073	.3602	.4167
	Tol	.0092	.0092	.0101	.0106	.0111	.0119	.0123
Classes 1, 2, 3, and 4, pitch diameter	Min	.1629	.1889	.2175	.2764	.3344	.3911	.4500
Class 1, loose fit, pitch diameter	Max	.1675	.1935	.2226	.2821	.3407	.3981	.4574
	Tol	.0046	.0046	.0051	.0057	.0063	.0070	.0074
Class 2, free fit, pitch diameter	Max	.1662	.1922	.2211	.2805	.3389	.3960	.4552
	Tol	.0033	.0033	.0036	.0041	.0045	.0049	.0052
Class 3, medium fit, pitch diameter	Max	.1653	.1913	.2201	.2794	.3376	.3947	.4537
	Tol	.0024	.0024	.0026	.0030	.0032	.0036	.0037
Class 4, close fit, pitch diameter	Max	.1641	.1901	.2188	.2779	.3360	.3929	.4519
	Tol	.0012	.0012	.0013	.0015	.0016	.0018	.0019

<sup>1</sup> See footnote 1 on page 12.

<sup>2</sup> See footnote 2 on page 12.

TABLE 15.—Limiting dimensions and tolerances, classes 1, 2, 3, and 4 fits, American National coarse-thread series—Continued

	Sizes								
	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	
	Threads per inch								
	12	11	10	9	8	7	7	6	
1	16	17	18	19	20	21	22	23	
<b>BOLTS AND SCREWS</b>									
Class 1, major diameter	Max.	<i>Inch</i> 0. 5601	<i>Inch</i> 0. 6224	<i>Inch</i> 0. 7472	<i>Inch</i> 0. 8719	<i>Inch</i> 0. 9966	<i>Inches</i> 1. 1211	<i>Inches</i> 1. 2461	<i>Inches</i> 1. 4956
	Min.	. 5443	. 6054	. 7288	. 8519	. 9744	1. 0963	1. 2213	1. 4666
	Tol.	. 0158	. 0170	. 0184	. 0200	. 0222	. 0248	. 0248	. 0290
Classes 2, 3, and 4, major diameter	Max.	. 5625	. 6250	. 7500	. 8750	1. 0000	1. 1250	1. 2500	1. 5000
	Min.	. 5513	. 6132	. 7372	. 8610	. 9848	1. 1080	1. 2330	1. 4798
	Tol.	. 0112	. 0118	. 0128	. 0140	. 0152	. 0170	. 0170	. 0202
Class 2, major diameter (threaded parts of unfinished, hot-rolled material)	Max.	. 5625	. 6250	. 7500	. 8750	1. 0000	1. 2500	1. 2500	1. 5000
	Min.	. 5467	. 6080	. 7316	. 8550	. 9778	1. 1002	1. 2252	1. 4710
	Tol.	. 0158	. 0170	. 0184	. 0200	. 0222	. 0248	. 0248	. 0290
Class 1, minor diameter	Max. <sup>1</sup>	. 4579	. 5109	. 6245	. 7356	. 8432	. 9458	1. 0708	1. 2911
	Classes 2, 3, and 4, minor diameter	Max. <sup>1</sup>	. 4603	. 5135	. 6273	. 7387	. 8466	. 9497	1. 0747
Class 1, loose fit, pitch diameter	Max.	. 5060	. 5634	. 6822	. 7997	. 9154	1. 0283	1. 1533	1. 3873
	Min.	. 4981	. 5549	. 6730	. 7897	. 9043	1. 0159	1. 1409	1. 3723
	Tol.	. 0079	. 0085	. 0092	. 0100	. 0111	. 0124	. 0124	. 0145
Class 2, free fit, pitch diameter	Max.	. 5084	. 5660	. 6850	. 8028	. 9188	1. 0322	1. 1572	1. 3917
	Min.	. 5028	. 5601	. 6786	. 7958	. 9112	1. 0237	1. 1487	1. 3816
	Tol.	. 0056	. 0059	. 0064	. 0070	. 0076	. 0085	. 0085	. 0101
Class 3, medium fit, pitch diameter	Max.	. 5084	. 5660	. 6850	. 8028	. 9188	1. 0322	1. 1572	1. 3917
	Min.	. 5044	. 5618	. 6805	. 7979	. 9134	1. 0263	1. 1513	1. 3846
	Tol.	. 0040	. 0042	. 0045	. 0049	. 0054	. 0059	. 0059	. 0071
Class 4, close fit, pitch diameter	Max.	. 5089	. 5665	. 6856	. 8034	. 9195	1. 0330	1. 1580	1. 3926
	Min.	. 5069	. 5644	. 6833	. 8010	. 9168	1. 0300	1. 1550	1. 3890
	Tol.	. 0020	. 0021	. 0023	. 0024	. 0027	. 0030	. 0030	. 0036
<b>NUTS AND TAPPED HOLES</b>									
Classes 1, 2, 3, and 4, major diameter	Min. <sup>2</sup>	. 5625	. 6250	. 7500	. 8750	1. 0000	1. 1250	1. 2500	1. 5000
Classes 1, 2, 3, and 4, minor diameter	Max.	. 4850	. 5397	. 6553	. 7689	. 8795	. 9858	1. 1108	1. 3376
	Min.	. 4723	. 5266	. 6417	. 7547	. 8647	. 9704	1. 0954	1. 3196
	Tol.	. 0127	. 0131	. 0136	. 0142	. 0148	. 0154	. 0154	. 0180
Classes 1, 2, 3, and 4, pitch diameter	Min.	. 5084	. 5660	. 6850	. 8028	. 9188	1. 0322	1. 1572	1. 3917
Class 1, loose fit, pitch diameter	Max.	. 5163	. 5745	. 6942	. 8128	. 9299	1. 0446	1. 1696	1. 4062
	Tol.	. 0079	. 0085	. 0092	. 0100	. 0111	. 0124	. 0124	. 0145
Class 2, free fit, pitch diameter	Max.	. 5140	. 5719	. 6914	. 8098	. 9264	1. 0407	1. 1657	1. 4018
	Tol.	. 0056	. 0059	. 0064	. 0070	. 0076	. 0085	. 0085	. 0101
Class 3, medium fit, pitch diameter	Max.	. 5124	. 5702	. 6895	. 8077	. 9242	1. 0381	1. 1631	1. 3988
	Tol.	. 0040	. 0042	. 0045	. 0049	. 0054	. 0059	. 0059	. 0071
Class 4, close fit, pitch diameter	Max.	. 5104	. 5681	. 6873	. 8052	. 9215	1. 0352	1. 1602	1. 3953
	Tol.	. 0020	. 0021	. 0023	. 0024	. 0027	. 0030	. 0030	. 0036

<sup>1</sup> See footnote 1 on page 12.<sup>2</sup> See footnote 2 on page 12.



TABLE 15.—Limiting dimensions and tolerances, classes 1, 2, 3, and 4 fits, American National coarse-thread series—Continued

1	Sizes						
	1¼	2	2¼	2½	2¾	3	3
	Threads per inch						
	5	4½	4½	4	4	4	3½
	24	25	26	27	28	29	30
<b>BOLTS AND SCREWS</b>							
Class 1, major diameter	<i>Inches</i> Max. 1.7448 Min. 1.7110 Tol. .0338	<i>Inches</i> 1.9943 1.9575 .0368	<i>Inches</i> 2.2443 2.2075 .0368	<i>Inches</i> 2.4936 2.4528 .0408	<i>Inches</i> 2.7436 2.7028 .0408	<i>Inches</i> 2.9936 2.9528 .0408	<i>Inches</i> 2.9927 2.9469 .0458
Classes 2, 3, and 4, major diameter	Max. 1.7500 Min. 1.7268 Tol. .0232	2.0000 1.9746 .0254	2.2500 2.2246 .0254	2.5000 2.4720 .0280	2.7500 2.7220 .0280	3.0000 2.9720 .0280	3.0000 2.9686 .0314
Class 2, major diameter (threaded parts of unfinished, hot-rolled material)	Max. 1.7500 Min. 1.7162 Tol. .0338	2.0000 1.9632 .0368	2.2500 2.2132 .0368	2.5000 2.4592 .0408	2.7500 2.7092 .0408	3.0000 2.9592 .0408	3.0000 2.9542 .0458
Class 1, minor diameter	Max. <sup>1</sup> 1.4994	1.7217	1.9717	2.1869	2.4369	2.6869	2.6421
Classes 2, 3, and 4, minor diameter	Max. <sup>1</sup> 1.5046	1.7274	1.9774	2.1933	2.4433	2.6933	2.6494
Class 1, loose fit, pitch diameter	Max. 1.6149 Min. 1.5980 Tol. .0169	1.8500 1.8316 .0184	2.1000 2.0816 .0184	2.3312 2.3108 .0204	2.5812 2.5608 .0204	2.8312 2.8108 .0204	2.8071 2.7842 .0229
Class 2, free fit, pitch diameter	Max. 1.6201 Min. 1.6085 Tol. .0116	1.8557 1.8430 .0127	2.1057 2.0930 .0127	2.3376 2.3236 .0140	2.5876 2.5736 .0140	2.8376 2.8236 .0140	2.8144 2.7987 .0157
Class 3, medium fit, pitch diameter	Max. 1.6201 Min. 1.6119 Tol. .0082	1.8557 1.8468 .0089	2.1057 2.0968 .0089	2.3376 2.3279 .0097	2.5876 2.5779 .0097	2.8376 2.8279 .0097	2.8144 2.8037 .0107
Class 4, close fit, pitch diameter	Max. 1.6211 Min. 1.6170 Tol. .0041	1.8568 1.8524 .0044	2.1068 2.1024 .0044	2.3389 2.3341 .0048	2.5889 2.5841 .0048	2.8389 2.8341 .0048	2.8160 2.8107 .0053
<b>NUTS AND TAPPED HOLES</b>							
Classes 1, 2, 3, and 4, major diameter	Min. <sup>2</sup> 1.7500	2.0000	2.2500	2.5000	2.7500	3.0000	3.0000
Classes 1, 2, 3, and 4, minor diameter	Max. 1.5551 Min. 1.5335 Tol. .0216	1.7835 1.7594 .0241	2.0335 2.0094 .0241	2.2564 2.2294 .0270	2.5064 2.4794 .0270	2.7564 2.7294 .0270	2.7216 2.6907 .0309
Classes 1, 2, 3, and 4, pitch diameter	Min. 1.6201	1.8557	2.1057	2.3376	2.5876	2.8376	2.8144
Class 1, loose fit, pitch diameter	Max. 1.6370 Tol. .0169	1.8741 .0184	2.1241 .0184	2.3580 .0204	2.6080 .0204	2.8580 .0204	2.8373 .0229
Class 2, free fit, pitch diameter	Max. 1.6317 Tol. .0116	1.8684 .0127	2.1184 .0127	2.3516 .0140	2.6016 .0140	2.8516 .0140	2.8301 .0157
Class 3, medium fit, pitch diameter	Max. 1.6283 Tol. .0082	1.8646 .0089	2.1146 .0089	2.3473 .0097	2.5973 .0097	2.8473 .0097	2.8251 .0107
Class 4, close fit, pitch diameter	Max. 1.6242 Tol. .0041	1.8601 .0044	2.1101 .0044	2.3424 .0048	2.5924 .0048	2.8424 .0048	2.8197 .0053

<sup>1</sup> See footnote 1 on page 12.

<sup>2</sup> See footnote 2 on page 12.

## II. AMERICAN NATIONAL FINE-THREAD SERIES

The American National fine-thread series is recommended for general use in automotive and aircraft work, for use where the design requires both strength and reduction in weight, and where special conditions require a fine thread.

TABLE 2.—American National fine-thread series

Identification		Basic diameters			Thread data						
Sizes	Threads per inch $n$	Major diameter $D$	Pitch diameter $E$	Minor diameter $K$	Metric equivalent of major diameter	Pitch $p$	Depth of thread $h$	Basic width of flat $p/8$	Minimum width of flat at major diameter of nut $p/24$	Helix angle at basic pitch diameter $s$	Basic area of section at root of thread $\frac{\pi K^2}{4}$
1	2	3	4	5	6	7	8	9	10	11	12
		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>mm</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>Inch</i>	<i>°</i>	<i>Sq. in.</i>
0	80	0.060	0.0519	0.0438	1.524	0.01250	0.00812	0.00156	0.00052	4 23	0.0015
1	72	.073	.0640	.0550	1.854	.01389	.00902	.00174	.00058	3 57	.0024
2	64	.086	.0759	.0657	2.184	.01562	.01015	.00195	.00065	3 45	.0034
3	56	.099	.0874	.0758	2.515	.01786	.01160	.00223	.00074	3 43	.0045
4	48	.112	.0985	.0849	2.845	.02083	.01353	.00260	.00087	3 51	.0057
5	44	.125	.1102	.0955	3.175	.02273	.01476	.00284	.00095	3 45	.0072
6	40	.138	.1218	.1055	3.505	.02500	.01624	.00312	.00104	3 44	.0087
8	36	.164	.1460	.1279	4.166	.02778	.01804	.00347	.00116	3 28	.0128
10	32	.190	.1697	.1494	4.826	.03125	.02030	.00391	.00130	3 21	.0175
12	28	.216	.1928	.1696	5.486	.03571	.02320	.00446	.00149	3 22	.0226
1/4	28	.2500	.2268	.2036	6.350	.03571	.02320	.00446	.00149	2 52	.0326
5/16	24	.3125	.2854	.2584	7.938	.04167	.02706	.00521	.00174	2 40	.0524
3/8	24	.3750	.3479	.3209	9.525	.04167	.02706	.00521	.00174	2 11	.0809
7/16	20	.4375	.4050	.3725	11.113	.05000	.03248	.00625	.00208	2 15	.1090
1/2	20	.5000	.4675	.4350	12.700	.05000	.03248	.00625	.00208	1 57	.1486
9/16	18	.5625	.5264	.4903	14.288	.05556	.03608	.00694	.00231	1 55	.1888
5/8	18	.6250	.5889	.5528	15.875	.05556	.03608	.00694	.00231	1 43	.2400
3/4	16	.7500	.7094	.6688	19.050	.06250	.04059	.00781	.00260	1 36	.3513
7/8	14	.8750	.8286	.7822	22.225	.07143	.04639	.00893	.00298	1 34	.4805
1	14	1.0000	.9536	.9072	25.400	.07143	.04639	.00893	.00298	1 22	.6464
1 1/8	12	1.1250	1.0709	1.0167	28.575	.08333	.05413	.01042	.00347	1 25	.8118
1 1/4	12	1.2500	1.1959	1.1417	31.750	.08333	.05413	.01042	.00347	1 16	1.0238
1 1/2	12	1.5000	1.4459	1.3917	38.100	.08333	.05413	.01042	.00347	1 3	1.5212
1 3/4	10	1.7500	1.6850	1.6201	44.450	.10000	.06495	.01250	.00417	1 5	2.0615
2	10	2.0000	1.9350	1.8701	50.800	.10000	.06495	.01250	.00417	0 57	2.7468
2 1/4	8	2.2500	2.1688	2.0876	57.150	.12500	.08119	.01562	.00521	1 3	3.4228
2 1/2	8	2.5000	2.4188	2.3376	63.500	.12500	.08119	.01562	.00521	0 57	4.2917
2 3/4	8	2.7500	2.6688	2.5876	69.850	.12500	.08119	.01562	.00521	0 51	5.2588
3	8	3.0000	2.9188	2.8376	76.200	.12500	.08119	.01562	.00521	0 47	6.3240

TABLE 16.—Limiting dimensions and tolerances, classes 1, 2, 3, and 4 fits, American National fine-thread series

	Machine screw number							
	0	1	3	3	4	5	6	
	Threads per inch							
	80	72	64	56	48	44	40	
1	2	3	4	5	6	7	8	
<b>BOLTS AND SCREWS</b>								
Class 1, major diameter.....	Max.....	<i>Inch</i> 0. 0593	<i>Inch</i> 0. 0723	<i>Inch</i> 0. 0853	<i>Inch</i> 0. 0982	<i>Inch</i> 0. 1111	<i>Inch</i> 0. 1241	<i>Inch</i> 0. 1370
	Min.....	. 0545	. 0673	. 0801	. 0926	. 1049	. 1177	. 1302
	Tol.....	. 0048	. 0050	. 0052	. 0056	. 0062	. 0064	. 0068
Classes 2, 3, and 4, major diameter.....	Max.....	. 0600	. 0730	. 0860	. 0990	. 1120	. 1250	. 1380
	Min.....	. 0566	. 0694	. 0822	. 0950	. 1076	. 1204	. 1332
	Tol.....	. 0034	. 0036	. 0038	. 0040	. 0044	. 0046	. 0048
Class 1, minor diameter.....	Max. <sup>1</sup>	. 0440	. 0553	. 0661	. 0763	. 0855	. 0962	. 1063
Classes 2, 3, and 4, minor diameter.....	Max. <sup>1</sup>	. 0447	. 0560	. 0668	. 0771	. 0864	. 0971	. 1073
Class 1, pitch diameter.....	Max.....	. 0512	. 0633	. 0752	. 0866	. 0976	. 1093	. 1208
	Min.....	. 0488	. 0608	. 0726	. 0838	. 0945	. 1061	. 1174
	Tol.....	. 0024	. 0025	. 0026	. 0028	. 0031	. 0032	. 0034
Class 2, pitch diameter.....	Max.....	. 0519	. 0640	. 0759	. 0874	. 0985	. 1102	. 1218
	Min.....	. 0502	. 0622	. 0740	. 0854	. 0963	. 1079	. 1194
	Tol.....	. 0017	. 0018	. 0019	. 0020	. 0022	. 0023	. 0024
Class 3, pitch diameter.....	Max.....	. 0519	. 0640	. 0759	. 0874	. 0985	. 1102	. 1218
	Min.....	. 0506	. 0627	. 0745	. 0859	. 0969	. 1086	. 1201
	Tol.....	. 0013	. 0013	. 0014	. 0015	. 0016	. 0016	. 0017
Class 4, pitch diameter.....	Max.....	. 0520	. 0641	. 0760	. 0876	. 0987	. 1104	. 1220
	Min.....	. 0514	. 0634	. 0753	. 0869	. 0979	. 1096	. 1211
	Tol.....	. 0006	. 0007	. 0007	. 0007	. 0008	. 0008	. 0009
<b>NUTS AND TAPPED HOLES</b>								
Classes 1, 2, 3, and 4, major diameter.....	Min. <sup>2</sup>	. 0600	. 0730	. 0860	. 0990	. 1120	. 1250	. 1380
Classes 1, 2, 3, and 4, minor diameter.....	Max.....	. 0492	. 0610	. 0724	. 0834	. 0937	. 1049	. 1158
	Min.....	. 0465	. 0580	. 0691	. 0797	. 0894	. 1004	. 1109
	Tol.....	. 0027	. 0030	. 0033	. 0037	. 0043	. 0045	. 0049
Classes 1, 2, 3, and 4, pitch diameter.....	Min.....	. 0519	. 0640	. 0759	. 0874	. 0985	. 1102	. 1218
Class 1, pitch diameter.....	Max.....	. 0543	. 0665	. 0785	. 0902	. 1016	. 1134	. 1252
	Tol.....	. 0024	. 0025	. 0026	. 0028	. 0031	. 0032	. 0034
Class 2, pitch diameter.....	Max.....	. 0536	. 0658	. 0778	. 0894	. 1007	. 1125	. 1242
	Tol.....	. 0017	. 0018	. 0019	. 0020	. 0022	. 0023	. 0024
Class 3, pitch diameter.....	Max.....	. 0532	. 0653	. 0773	. 0889	. 1001	. 1118	. 1235
	Tol.....	. 0013	. 0013	. 0014	. 0015	. 0016	. 0016	. 0017
Class 4, pitch diameter.....	Max.....	. 0525	. 0647	. 0766	. 0881	. 0993	. 1110	. 1227
	Tol.....	. 0006	. 0007	. 0007	. 0007	. 0008	. 0008	. 0009

<sup>1</sup> See footnote 1 on page 12.

<sup>2</sup> See footnote 2 on page 12.



TABLE 16.—Limiting dimensions and tolerances, classes 1, 2, 3, and 4 fits, American National fine-thread series—Continued

	Machine screw number or nominal size							
	8	10	12	¼	⅝	¾	⅞	
	Threads per inch							
	36	32	28	28	24	24	20	
1	9	10	11	12	13	14	15	
<b>BOLTS AND SCREWS</b>								
Class 1, major diameter	Max.	<i>Inch</i> 0.1629	<i>Inch</i> 0.1889	<i>Inch</i> 0.2148	<i>Inch</i> 0.2488	<i>Inch</i> 0.3112	<i>Inch</i> 0.3737	<i>Inch</i> 0.4360
	Min.	.1557	.1813	.2062	.2402	.3020	.3645	.4258
	Tol.	.0072	.0076	.0086	.0086	.0092	.0092	.0102
Classes 2, 3, and 4, major diameter	Max.	.1640	.1900	.2160	.2500	.3125	.3750	.4375
	Min.	.1590	.1846	.2098	.2438	.3059	.3684	.4303
	Tol.	.0050	.0054	.0062	.0062	.0066	.0066	.0072
Class 1, minor diameter	Max. <sup>1</sup>	.1288	.1506	.1710	.2050	.2601	.3226	.3747
Classes 2, 3, and 4, minor diameter	Max. <sup>1</sup>	.1299	.1517	.1722	.2062	.2614	.3239	.3762
Class 1, pitch diameter	Max.	.1449	.1686	.1916	.2256	.2841	.3466	.4035
	Min.	.1413	.1648	.1873	.2213	.2795	.3420	.3984
	Tol.	.0036	.0038	.0043	.0043	.0046	.0046	.0051
Class 2, pitch diameter	Max.	.1460	.1697	.1928	.2268	.2854	.3479	.4050
	Min.	.1435	.1670	.1897	.2237	.2821	.3446	.4014
	Tol.	.0025	.0027	.0031	.0031	.0033	.0033	.0036
Class 3, pitch diameter	Max.	.1460	.1697	.1928	.2268	.2854	.3479	.4050
	Min.	.1442	.1678	.1906	.2246	.2830	.3455	.4024
	Tol.	.0018	.0019	.0022	.0022	.0024	.0024	.0026
Class 4, pitch diameter	Max.	.1462	.1699	.1930	.2270	.2857	.3482	.4053
	Min.	.1453	.1689	.1919	.2259	.2845	.3470	.4040
	Tol.	.0009	.0010	.0011	.0011	.0012	.0012	.0013
<b>NUTS AND TAPPED HOLES</b>								
Classes 1, 2, 3, and 4, major diameter	Min. <sup>2</sup>	.1640	.1900	.2160	.2500	.3125	.3750	.4375
Classes 1, 2, 3, and 4, minor diameter	Max.	.1391	.1618	.1833	.2173	.2739	.3364	.3906
	Min.	.1339	.1562	.1773	.2113	.2674	.3299	.3834
	Tol.	.0052	.0056	.0060	.0060	.0065	.0065	.0072
Classes 1, 2, 3, and 4, pitch diameter	Min.	.1460	.1697	.1928	.2268	.2854	.3479	.4050
Class 1, pitch diameter	Max.	.1496	.1735	.1971	.2311	.2900	.3525	.4101
	Tol.	.0036	.0038	.0043	.0043	.0046	.0046	.0051
Class 2, pitch diameter	Max.	.1485	.1724	.1959	.2299	.2887	.3512	.4086
	Tol.	.0025	.0027	.0031	.0031	.0033	.0033	.0036
Class 3, pitch diameter	Max.	.1478	.1716	.1950	.2290	.2878	.3503	.4076
	Tol.	.0018	.0019	.0022	.0022	.0024	.0024	.0026
Class 4, pitch diameter	Max.	.1469	.1707	.1939	.2279	.2866	.3491	.4063
	Tol.	.0009	.0010	.0011	.0011	.0012	.0012	.0013

<sup>1</sup> See footnote 1 on page 12.<sup>2</sup> See footnote 2 on page 12.

TABLE 16.—Limiting dimensions and tolerances, classes 1, 2, 3, and 4 fits, American National fine-thread series—Continued

	Sizes								
	½	⅜	⅝	¾	⅞	1	1¼	1½	
	Threads per inch								
	20	18	18	16	14	14	12	12	
1	16	17	18	19	20	21	22	23	
<b>BOLTS AND SCREWS</b>									
Class 1, major diameter	Max	Inch 0.4985	Inch 0.5609	Inch 0.6234	Inch 0.7482	Inch 0.8729	Inch 0.9979	Inches 1.1226	Inches 1.2476
	Min	.4883	.5495	.6120	.7356	.8589	.9839	1.1068	1.2318
	Tol	.0102	.0114	.0114	.0126	.0140	.0140	.0158	.0158
Classes 2, 3, and 4, major diameter	Max	.5000	.5625	.6250	.7500	.8750	1.0000	1.1250	1.2500
	Min	.4928	.5543	.6168	.7410	.8652	.9902	1.1138	1.2388
	Tol	.0072	.0082	.0082	.0090	.0098	.0098	.0112	.0112
Class 1, minor diameter	Max. <sup>1</sup>	.4372	.4927	.5552	.6715	.7853	.9103	1.0204	1.1454
	Classes 2, 3, and 4, minor diameter	Max. <sup>1</sup>	.4387	.4943	.5568	.6733	.7874	.9124	1.0228
Class 1, pitch diameter	Max	.4660	.5248	.5873	.7076	.8265	.9515	1.0685	1.1935
	Min	.4609	.5191	.5816	.7013	.8195	.9445	1.0606	1.1856
	Tol	.0051	.0057	.0057	.0063	.0070	.0070	.0079	.0079
Class 2, pitch diameter	Max	.4675	.5264	.5889	.7094	.8286	.9536	1.0709	1.1959
	Min	.4639	.5223	.5848	.7049	.8237	.9487	1.0653	1.1903
	Tol	.0036	.0041	.0041	.0045	.0049	.0049	.0056	.0056
Class 3, pitch diameter	Max	.4675	.5264	.5889	.7094	.8286	.9536	1.0709	1.1959
	Min	.4649	.5234	.5859	.7062	.8250	.9500	1.0669	1.1919
	Tol	.0026	.0030	.0030	.0032	.0036	.0036	.0040	.0040
Class 4, pitch diameter	Max	.4678	.5267	.5892	.7098	.8290	.9540	1.0714	1.1964
	Min	.4665	.5252	.5877	.7082	.8272	.9522	1.0694	1.1944
	Tol	.0013	.0015	.0015	.0016	.0018	.0018	.0020	.0020
<b>NUTS AND TAPPED HOLES</b>									
Classes 1, 2, 3, and 4, major diameter	Min. <sup>2</sup>	.5000	.5625	.6250	.7500	.8750	1.0000	1.1250	1.2500
Classes 1, 2, 3, and 4, minor diameter	Max	.4531	.5100	.5725	.6903	.8062	.9312	1.0438	1.1688
	Min	.4459	.5024	.5649	.6823	.7977	.9227	1.0348	1.1598
	Tol	.0072	.0076	.0076	.0080	.0085	.0085	.0090	.0090
Classes 1, 2, 3, and 4, pitch diameter	Min	.4675	.5264	.5889	.7094	.8286	.9536	1.0709	1.1959
Class 1, pitch diameter	Max	.4726	.5321	.5946	.7157	.8356	.9606	1.0788	1.2038
	Tol	.0051	.0057	.0057	.0063	.0070	.0070	.0079	.0079
Class 2, pitch diameter	Max	.4711	.5305	.5930	.7139	.8335	.9585	1.0765	1.2015
	Tol	.0036	.0041	.0041	.0045	.0049	.0049	.0056	.0056
Class 3, pitch diameter	Max	.4701	.5294	.5919	.7126	.8322	.9572	1.0749	1.1999
	Tol	.0026	.0030	.0030	.0032	.0036	.0036	.0040	.0040
Class 4, pitch diameter	Max	.4688	.5279	.5904	.7110	.8304	.9554	1.0729	1.1979
	Tol	.0013	.0015	.0015	.0016	.0018	.0018	.0020	.0020

<sup>1</sup> See footnote 1 on page 12.

<sup>2</sup> See footnote 2 on page 12.

TABLE 16.—Limiting dimensions and tolerances, classes 1, 2, 3, and 4 fits, American National fine-thread series—Con.

	Sizes							
	1½	1¾	2	2¼	2½	2¾	3	
	Threads per inch							
	12	10	10	8	8	8	8	
1	24	25	25	27	25	29	30	
<b>BOLTS AND SCREWS</b>								
Class 1, major diameter	Max	1.4976	1.7472	1.9972	2.2466	2.4966	2.7466	2.9966
	Min	1.4818	1.7288	1.9788	2.2244	2.4744	2.7244	2.9744
	Tol	.0158	.0184	.0184	.0222	.0222	.0222	.0222
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	1.7372	1.9872	2.2348	2.4848	2.7348	2.9848
	Tol	.0112	.0128	.0128	.0152	.0152	.0152	.0152
Class 1, minor diameter	Max. <sup>1</sup>	1.3954	1.6245	1.8745	2.0932	2.3432	2.5932	2.8432
Classes 2, 3, and 4, minor diameter	Max. <sup>1</sup>	1.3978	1.6273	1.8773	2.0966	2.3466	2.5966	2.8466
Class 1, pitch diameter	Max	1.4435	1.6822	1.9322	2.1654	2.4154	2.6654	2.9154
	Min	1.4356	1.6690	1.9190	2.1509	2.4009	2.6509	2.9009
	Tol	.0079	.0132	.0132	.0145	.0145	.0145	.0145
Class 2, pitch diameter	Max	1.4459	1.6850	1.9350	2.1688	2.4188	2.6688	2.9188
	Min	1.4403	1.6750	1.9250	2.1578	2.4078	2.6578	2.9078
	Tol	.0056	.0100	.0100	.0110	.0110	.0110	.0110
Class 3, pitch diameter	Max	1.4459	1.6850	1.9350	2.1688	2.4188	2.6688	2.9188
	Min	1.4419	1.6766	1.9266	2.1596	2.4096	2.6596	2.9096
	Tol	.0040	.0084	.0084	.0092	.0092	.0092	.0092
Class 4, pitch diameter	Max	1.4464	1.6856	1.9356	2.1695	2.4195	2.6695	2.9195
	Min	1.4444	1.6814	1.9314	2.1649	2.4149	2.6649	2.9149
	Tol	.0020	.0042	.0042	.0046	.0046	.0046	.0046
<b>NUTS AND TAPPED HOLES</b>								
Classes 1, 2, 3, and 4, major diameter	Min. <sup>2</sup>	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	1.6525	1.9025	2.1282	2.3782	2.6282	2.8782
	Min	1.4098	1.6417	1.8917	2.1147	2.3647	2.6147	2.8647
	Tol	.0090	.0108	.0108	.0135	.0135	.0135	.0135
Classes 1, 2, 3, and 4, pitch diameter	Min	1.4459	1.6850	1.9350	2.1688	2.4188	2.6688	2.9188
Class 1, pitch diameter	Max	1.4538	1.6982	1.9482	2.1833	2.4333	2.6833	2.9333
	Tol	.0079	.0132	.0132	.0145	.0145	.0145	.0145
Class 2, pitch diameter	Max	1.4515	1.6950	1.9450	2.1798	2.4298	2.6798	2.9298
	Tol	.0056	.0100	.0100	.0110	.0110	.0110	.0110
Class 3, pitch diameter	Max	1.4499	1.6934	1.9434	2.1780	2.4280	2.6780	2.9280
	Tol	.0040	.0084	.0084	.0092	.0092	.0092	.0092
Class 4, pitch diameter	Max	1.4479	1.6892	1.9392	2.1734	2.4234	2.6734	2.9234
	Tol	.0020	.0042	.0042	.0046	.0046	.0046	.0046

<sup>1</sup> 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 1/8 × p, and may be determined by subtracting the basic thread depth, h (or 0.6495 p), from the minimum pitch diameter of the screw.

<sup>2</sup> Dimensions for the minimum major diameter of the nut correspond to the basic flat (1/8 × 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 1/4 × p, and may be determined by adding 1 3/8 × h (or 0.7939 p) to the maximum pitch diameter of the nut.



III. APPENDIX  
TAP DRILL SIZES

TABLE 107.—*Sizes of tap drills, American National coarse-thread series*

Size of thread	Threads per inch	Minor diameter of nut			Stock drills within limits on minor diameter of nut					
		Basic	Maximum	Minimum	Numbered and fractional-inch sizes			Metric sizes		
					Nominal size	Diameter	Per cent of depth of basic thread	Nominal size	Diameter	Per cent of depth of basic thread
1	2	3	4	5	6	7	8	9	10	11
1	64	<i>Inch</i> 0. 0527	<i>Inch</i> 0. 0604	<i>Inch</i> 0. 0561	No. 53	<i>Inch</i> 0. 0595	67	<i>mm</i> 1. 5	<i>Inch</i> 0. 0591	68
2	56	. 0628	. 0715	. 0667	{ No. 51 No. 50	. 0670 . 0700	82 69	1. 7 1. 75 1. 8	. 0669 . 0689 . 0709	82 74 65
3	48	. 0719	. 0820	. 0764	{ $\frac{5}{64}$ inch No. 47 No. 46 No. 45	. 0781 . 0785 . 0810 . 0820	77 76 67 63	2. 0	. 0787	75
4	40	. 0795	. 0913	. 0849	{ No. 44 No. 43	. 0860 . 0890	80 71	2. 2 2. 25 2. 3	. 0866 . 0886 . 0906	78 72 66
5	40	. 0925	. 1043	. 0979	{ No. 40 No. 39 No. 38 No. 37	. 0980 . 0995 . 1015 . 1040	83 79 72 65	2. 5 2. 6	. 0984 . 1024	82 70
6	32	. 0974	. 1118	. 1042	{ No. 36 $\frac{7}{64}$ inch No. 35 No. 34	. 1065 . 1094 . 1100 . 1110	78 70 69 67	2. 7 2. 75 2. 8	. 1063 . 1083 . 1102	78 73 68
8	32	. 1234	. 1378	. 1302	{ No. 29	. 1360	69	3. 4 3. 5	. 1339 . 1378	74 65
10	24	. 1359	. 1541	. 1449	{ No. 26 No. 25 No. 24 No. 23	. 1470 . 1495 . 1520 . 1540	79 75 70 67	3. 7 3. 75 3. 8 3. 9	. 1457 . 1476 . 1496 . 1535	82 78 75 67
12	24	. 1619	. 1801	. 1709	{ $\frac{11}{64}$ inch No. 17 No. 16 No. 15	. 1719 . 1730 . 1770 . 1800	81 79 72 67	4. 4 4. 5	. 1732 . 1772	79 72
$\frac{1}{4}$	20	. 1850	. 2060	. 1959	{ No. 9 No. 8 No. 7 $\frac{13}{64}$ inch No. 6 No. 5	. 1960 . 1990 . 2010 . 2031 . 2040 . 2055	83 79 75 72 71 69	5. 0 5. 1 5. 2	. 1968 . 2008 . 2047	82 76 70
$\frac{5}{16}$	18	. 2403	. 2630	. 2524	{ F G	. 2570 . 2610	77 71	6. 5 6. 6	. 2559 . 2598	78 73
$\frac{3}{8}$	16	. 2938	. 3184	. 3073	{ $\frac{5}{16}$ inch O	. 3125 . 3160	77 73	7. 9 8. 0	. 3110 . 3150	79 74
$\frac{7}{16}$	14	. 3447	. 3721	. 3602	{ U	. 3680	75	9. 2 9. 25 9. 3 9. 4	. 3622 . 3642 . 3661 . 3701	81 79 77 73

TABLE 107.—*Sizes of tap drills, American National coarse-thread series—Continued*

Size of thread	Threads per inch	Minor diameter of nut			Stock drills within limits on minor diameter of nut					
		Basic	Maximum	Minimum	Numbered and fractional-inch sizes			Metric sizes		
					Nominal size	Diameter	Per cent of depth of basic thread	Nominal size	Diameter	Per cent of depth of basic thread
1	2	3	4	5	6	7	8	9	10	11
		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>		<i>Inches</i>		<i>mm</i>	<i>Inches</i>	
1/2-----	13	0. 4001	0. 4290	0. 4167	27/64 inch-----	0. 4219	78			
9/16-----	12	. 4542	. 4850	. 4723	31/64 inch-----	. 4844	72	12. 0	0. 4724	83
5/8-----	11	. 5069	. 5397	. 5266	17/32 inch-----	. 5312	79	13. 5	. 5315	79
3/4-----	10	. 6201	. 6553	. 6417				16. 5	. 6496	77
7/8-----	9	. 7307	. 7689	. 7547	49/64 inch-----	. 7656	76	19. 5	. 7677	74
1-----	8	. 8376	. 8795	. 8647	7/8 inch-----	. 8750	77	22. 0	. 8661	82
1 1/8-----	7	. 9394	. 9858	. 9704	63/64 inch-----	. 9844	76	25. 0	. 9842	76
1 1/4-----	7	1. 0644	1. 1108	1. 0954	17/64 inches-----	1. 1094	76	28. 0	1. 1024	80
1 1/2-----	6	1. 2835	1. 3376	1. 3196	121/64 inches-----	1. 3281	79			
1 3/4-----	5	1. 4902	1. 5551	1. 5335	{ 135/64 inches-----	1. 5469	78	39. 0	1. 5354	83
								39. 5	1. 5551	75
2-----	4 1/2	1. 7113	1. 7835	1. 7594	{ 149/64 inches-----	1. 7656	81	45. 0	1. 7716	79
					{ 125/32 inches-----	1. 7812	76			
2 1/4-----	4 1/2	1. 9613	2. 0335	2. 0094	{ 21/64 inches-----	2. 0156	81	51. 5	2. 0276	77
					{ 27/32 inches-----	2. 0312	76			
2 1/2-----	4	2. 1752	2. 2564	2. 2294	{ 215/64 inches-----	2. 2344	82	57. 0	2. 2441	79
					{ 27/4 inches-----	2. 2500	77			
2 3/4-----	4	2. 4252	2. 5064	2. 4794	{ 231/64 inches-----	2. 4844	82	63. 0	2. 4803	83
					{ 27/2 inches-----	2. 5000	77	63. 5	2. 5000	77
3-----	4	2. 6752	2. 7564	2. 7294	{ 247/64 inches-----	2. 7344	82	69. 5	2. 7362	81
					{ 23/4 inches-----	2. 7500	77	70. 0	2. 7559	75
3-----	3 1/2	2. 6288	2. 7216	2. 6907	{ 245/64 inches-----	2. 7031	80	68. 5	2. 6968	82
					{ 223/32 inches-----	2. 7188	76	69. 0	2. 7165	76

TABLE 108.—*Sizes of tap drills, American National fine-thread series*

Size of thread	Threads per inch	Minor diameter of nut			Stock drills within limits on minor diameter of nut					
		Basic	Maximum	Minimum	Numbered and fractional-inch sizes			Metric sizes		
					Nominal size	Diameter	Per cent of depth of basic thread	Nominal size	Diameter	Per cent of depth of basic thread
1	2	3	4	5	6	7	8	9	10	11
0	80	<i>Inches</i> 0. 0438	<i>Inches</i> 0. 0492	<i>Inches</i> 0. 0465	{ No. 56 3/64 inch	<i>Inches</i> 0. 0465 . 0469	83 81	<i>mm</i> 1. 2 1. 25	<i>Inches</i> 0. 0472 . 0492	79 67
1	72	. 0550	. 0610	. 0580	No. 53	. 0595	75	1. 5	. 0591	77
2	64	. 0657	. 0724	. 0691	No. 50	. 0700	79	1. 8	. 0709	74
3	56	. 0758	. 0834	. 0797	{ No. 46 No. 45	. 0810 . 0820	78 73	2. 1	. 0827	70
4	48	. 0849	. 0937	. 0894	{ 5/32 inch No. 42	. 0938 . 0935	67 68	2. 3	. 0906	79
5	44	. 0955	. 1049	. 1004	{ No. 38 No. 37	. 1015 . 1040	80 71	2. 6	. 1024	77
6	40	. 1055	. 1158	. 1109	{ No. 34 No. 33	. 1110 . 1130	83 77	2. 9	. 1142	73
8	36	. 1279	. 1391	. 1339	{ No. 29 -----	. 1360 -----	78 -----	3. 4 3. 5	. 1339 . 1378	83 73
10	32	. 1494	. 1618	. 1562	{ 5/32 inch No. 22 No. 21 No. 20	. 1562 . 1570 . 1590 . 1610	83 81 76 71	4. 0 4. 1	. 1575 . 1614	80 70
12	28	. 1696	. 1833	. 1773	{ No. 15 No. 14	. 1800 . 1820	78 73	4. 6	. 1811	75
1/4	28	. 2036	. 2173	. 2113	{ No. 3 -----	. 2130 -----	80 -----	5. 4 5. 5	. 2126 . 2165	81 72
5/16	24	. 2584	. 2739	. 2647	{ I -----	. 2720 -----	75 -----	6. 8 6. 9	. 2677 . 2717	83 75
3/8	24	. 3209	. 3364	. 3299	{ Q -----	. 3320 -----	79 -----	8. 4 8. 5	. 3307 . 3346	82 75
7/16	20	. 3725	. 3906	. 3834	{ W 25/64 inch	. 3860 . 3906	79 72	9. 75 9. 8 9. 9	. 3839 . 3858 . 3898	83 80 73
1/2	20	. 4350	. 4531	. 4459	29/64 inch	. 4531	72	11. 5	. 4528	73
5/16	18	. 4903	. 5100	. 5024	-----	. 5062	78	-----	-----	-----
9/16	18	. 5528	. 5725	. 5649	-----	-----	-----	14. 5	. 5709	75
3/4	16	. 6638	. 6903	. 6823	1 1/16 inch	. 6875	77	17. 5	. 6890	75
7/8	14	. 7822	. 8062	. 7977	(1)	(1)	(1)	(1)	(1)	(1)
1	14	. 9072	. 9312	. 9227	-----	-----	-----	23. 5	. 9252	81
1 1/8	12	1. 0167	1. 0433	1. 0348	-----	-----	-----	26. 5	1. 0433	75
1 1/4	12	1. 1417	1. 1688	1. 1598	-----	-----	-----	29. 5	1. 1614	82
1 1/2	12	1. 3917	1. 4188	1. 4098	-----	-----	-----	36. 0	1. 4173	76
1 3/4	10	1. 6201	1. 6525	1. 6417	(1)	(1)	(1)	(1)	(1)	(1)
2	10	1. 8701	1. 9025	1. 8917	(1)	(1)	(1)	(1)	(1)	(1)
2 1/4	8	2. 0876	2. 1282	2. 1147	2 5/8 inches	2. 1250	77	54. 0	2. 1260	76
2 1/2	8	2. 3376	2. 3782	2. 3647	2 3/4 inches	2. 3750	77	-----	-----	-----
2 3/4	8	2. 5876	2. 6282	2. 6147	2 5/8 inches	2. 6250	77	66. 5	2. 6181	81
3	8	2. 8376	2. 8782	2. 8647	2 5/8 inches	2. 8750	77	73. 0	2. 8740	78

<sup>1</sup> No standard size.













