U. S. DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS

AMERICAN NATIONAL STANDARD SCREW THREADS

(COARSE AND FINE THREAD SERIES)

COMMERCIAL STANDARD CS24-30

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Through
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U. S. DEPARTMENT OF COMMERCE
R. P. LAMONT, Secretary
BUREAU OF STANDARDS
GEORGE K. BURGESS, Director

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(COARSE AND FINE THREAD SERIES)

COMMERCIAL STANDARD CS24-30

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NOTE

This commercial standard 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,[1] and *is identical therewith.* Figure and table numbers are identical with those in the Report of the N. S. T. C. for convenience in making references.

[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.

ACCEPTORS

ASSOCIATIONS

Bolt, Nut, and Rivet Manufacturers Association, Port Chester, N. Y.
Southern Hardware Jobbers Association, New Orleans, La.
Southern Supply & Machinery Dealers Association, Richmond, Va.

FIRMS

Acme Machine Tool Co., The, Cincinnati, Ohio.
Adams Co., The, Dubuque, Iowa.
Allied Products Corporation, Victor-peninsular division, Detroit, Mich.
Almond Manufacturing Co., T. R., Ashburnham, Mass.
Alvord-Polk Tool Co., Millersburg, Pa.
American Manganese Bronze Co., Philadelphia, Pa.
American Ring Co., Waterbury, Conn.
American Screw Co., Providence, R. I.
Armstrong Manufacturing Co., The, Bridgeport, Conn.
Arrow Head Steel Products Co., Minneapolis, Minn., (in principle).
Atlas Bolt & Screw Co., The, Cleveland, Ohio.
Autocar Co., Ardmore, Pa.
Autoscrew Co., New York, N. Y.
Babson Dow Manufacturing Co., Roxbury, Mass.
Bard Manufacturing Co., Royersford, Pa.
Barnes Drill Co., Rockford, Ill.
Bath & Co. (Inc.), John, Worcester, Mass.
Bousch & Lomb Optical Co., Rochester, N. Y.
Baush Machine Tool Co., Springfield, Mass., (in principle).
Bell Co. (Inc.), The David, Buffalo, N. Y.
Bethlehem Steel Co., Lebanon, Pa.
Biglow & Co. (Inc.), L. C., New York, N. Y.
Bommer Spring Hinge Co., Brooklyn, N. Y.
Bristol Co., The, Waterbury, Conn.
Brown & Sharpe Manufacturing Co., Providence, R. I.
Buffalo Bolt Co., North Tonawanda, N. Y.
Chase Companies (Inc.), Waterbury Manufacturing Co., division, Waterbury, Conn.
Chicago Screw Co., Chicago, Ill.
Clark Bros. Bolt Co., Milldale, Conn.
Clendenin Bros. (Inc.), Baltimore, Md.
Cleveland Cap Screw Co., The, Cleveland, Ohio.
Cleveland Twist Drill Co., Cleveland, Ohio.
Cleveland Wrought Products Co., The, Cleveland, Ohio.
Columbus Bolt Works Co., The, Columbus, Ohio.
Commercial Tool Co., The, Cleveland, Ohio.
Comtor Co., The, Waltham, Mass.
Conant & Donelson Co., Conway, Mass.
Continental Wood Screw Co., New Bedford, Mass.
Corbin Screw Corporation, The, New Britian, Conn.
Cox & Sons Co., The, Bridgeton, N. J., (in principle).
Curtis Screw Co, (Inc.), Buffalo, N. Y.
Dallett Co., The, Philadelphia, Pa.
Davenport Machine Tool Co. (Inc.), Rochester, N. Y.
Davis & Hemphill, Elkridge, Md.
Detroit Screw Works, Detroit, Mich.
Eastern Machine Screw Corporation, New Haven, Conn.
Eastwood Wire Corporation, Belleville, N. J.
Economy Engineering Co., The, Willoughby, Ohio.
Ekstrom Carlson & Co., Rockford, Ill.
Electric Boat Co., Groton, Conn.
Erie Forge & Steel Co., Erie, Pa.
Essley Machinery Co., The E. L., Chicago, Ill.
Eureka Tool & Machine Co., Newark, N. J.
Federal Huber Co., Plano, Kendall County, Ill.
Flannery Bolt Co., Bridgeville, Pa.
Foster Machine Co., Elkhart, Ind.
Gaskell & Son, (Inc.), William, Brooklyn, N. Y.
General Manufacturing Co., The, Waterbury, Conn.
General Motors Corporation, Detroit, Mich.
Geometric Tool Co., The, New Haven, Conn.
Gibbs & Cox (Inc.), New York, N. Y.
Gisholt Machine Co., Madison, Wis.
Globe Products Co., The, Cleveland, Ohio.
Grabler Manufacturing Co., The, Cleveland, Ohio.
Greenfield Tap & Die Corporation, Greenfield, Mass.
Gurley, W. & L. E., Troy, N. Y.
Hardinge Bros., Chicago, Ill.
Hardware Products Co., Boston, Mass.
Harper Co., H. M., Chicago, Ill.
Hartford Machine Screw Co., Hartford, Conn.
Haynes Stellite Co., Kokomo, Ind.
Indicating Calipers Corporation, New York, N. Y.
Jenckes Knitting Machine Co., Pawtucket, R. I.
John-sons Gage Works, Hartford, Conn.
Johnson Rule Manufacturing Co., E. P., Chicago, Ill.
Kalman Steel Co., Chicago, Ill.
Kinner Airplane & Motor Corporation, Glendale, Calif.
Lamson & Sessions Co., The, Cleveland, Ohio.
Landis Machine Co., Waynesboro, Pa.
Lang Tool Co., The C. W., Dayton, Ohio.
Lanman Co., The E. B., East Chicago, Ind.
Lehmann Machine Co., St. Louis, Mo.
Livingston Manufacturing Co., Rockland, Me.
MacLean-Fogg Lock Nut Co., Chicago, Ill.
Macy & Co. (Inc.), R. H., New York, N. Y.
Manufacturers' & Inventors' Electric Co., New York, N. Y.
Maryland Bolt & Nut Co., The, Mount Washington, Baltimore, Md.
Meisel Press Manufacturing Co., Boston, Mass.
Merrill Bros., Maspeth L. I., N. Y.
Michigan Screw Co., Lansing, Mich.
Milled Screw Products Co., Chicago, Ill.
Mitchell Engineering Co., The, Springfield, Ohio.

Morse Twist Drill & Machine Co., New Bedford, Mass.
Moto Meter Gauge & Equipment Corporation, La Crosse, Wis.
Napoleon Products Co., The, Napoleon, Ohio.
Narragansett Machine Co., Pawtucket, R. I.
Nash Motors Co., The, Racine, Wis.
National Lock Co., Rockford, Ill.
National Machine Products Co., Detroit, Mich.
National Marine Lamp Co., The, Forestville, Conn.
National Screw & Manufacturing Co., The, Cleveland, Ohio.
National Twist Drill & Tool Co., Detroit, Mich.
Nestor Manufacturing Co. (Inc.), New York, N. Y.
Northwest Automatic Products Corporation, Minneapolis, Minn.
Ohio Brass Co., The, Mansfield, Ohio.
Packard Motor Car Co., Detroit, Mich.
Palnut Co. (Inc.), The, Irvington, N. J.
Pawtucket Manufacturing Co., Pawtucket, R. I.
Penn Screw & Machine Works, Philadelphia, Pa.
Philadelphia Hardware & Malleable Iron Works (Inc.), Philadelphia, Pa.
Phillips, F. C., Stoughton, Mass.
Pittsburgh Screw & Bolt Corporation, N. S. Pittsburgh, Pa.
Reed & Prince Manufacturing Co., Worcester, Mass.
Reed Small Tool Works, Worcester, Mass.
Rickert-Shafer Co., Erie, Pa.
Rochester Machine Screw Co., Rochester, N. Y.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Sabin Machine Co., The, Cleveland, Ohio.
St. Louis Screw & Bolt Co., St. Louis, Mo.
Scovill Manufacturing Co., Waterbury, Conn.
Screw Machine Specialty Co., Pittsburgh, Pa.
Sessions, & Son, J. H., Bristol, Conn.
Seymour Brass Turning Co., Seymour, Conn.
Sherman-Klove Co., The, Chicago, Ill.
Smalley General Co., Bay City, Mich.
Smith Tool & Manufacturing Co., R. G., Newark, N. J.
South Bend Lathe Works, South Bend, Ind.
Standard Automatic Products Corporation, Corry, Pa.
Standard Nut & Bolt Co., Valley Falls, R. I.
Standard Screw Co., Chicago, Ill.
Standard Shop Equipment Co., Philadelphia, Pa.
Strong, Carlisle & Hammond Co., The, Cleveland, Ohio.
Superior Machine & Engineering Co., Detroit, Mich.
Taft-Peirce Manufacturing Co., Woonsocket, R. I.
Taylor Instrument Cos., Rochester, N. Y.
Triplex Machine Tool Co., New York, N. Y.
Triplex Screw Co., Cleveland, Ohio.
Trundle Engineering Co., The, Cleveland, Ohio.
Upson-Walton Co., The, Cleveland, Ohio.
V. & O. Press Co., The, Hudson, N. Y.
Van Denburgh, L. W., Newark, N. J.
Van Keuren Co., The, Watertown, Mass.
Waltham Machine Works, Waltham, Mass.
Ware Bros. (Chicago Roller Skate Co.), Chicago, Ill.
Waterbury Button Co., Waterbury, Conn.
Western Automatic Machine Screw Co., Elyria, Ohio.
Western Screw-Products Co., St. Louis, Mo.
Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.
Williams & Co., J. H., Buffalo, N. Y.
Williams Tool Corporation, Erie, Pa.
Winter Bros. Co., Wrentham, Mass.
Worcester Taper Pin Co., Worcester, Mass.

GOVERNMENT

Federal Specifications Board, Washington, D. C. (in principle).
Navy Department, Washington, D. C.

AMERICAN NATIONAL STANDARD SCREW THREADS

(COARSE AND FINE THREAD SERIES)

COMMERCIAL STANDARD CS24–30

At the request of the National Screw Thread Commission, a pamphlet entitled "American National Screw Thread Tables For Shop Use, I. Standard Threads (Coarse and Fine Thread Series)," and incorporating the essential tables of dimensions of fastening screws as published in the 1928 Report of the National Screw Thread Commission, Bureau of Standards Miscellaneous Publication No. 89, was circulated as a recommended commercial standard to producers, distributors, and users for written acceptance. The industry has since accepted and approved for promulgation by the Department of Commerce the limiting dimensions, tolerances, and tap drill sizes shown herein.

This standard is effective (see p. 16) for new production by acceptors of record July 1, 1930.

Promulgation recommended.

I. J. FAIRCHILD,
Chief, Division of Trade Standards.

Promulgated.

GEORGE K. BURGESS,
Director, Bureau of Standards.

APPROVED.

R. P. LAMONT,
Secretary of Commerce.

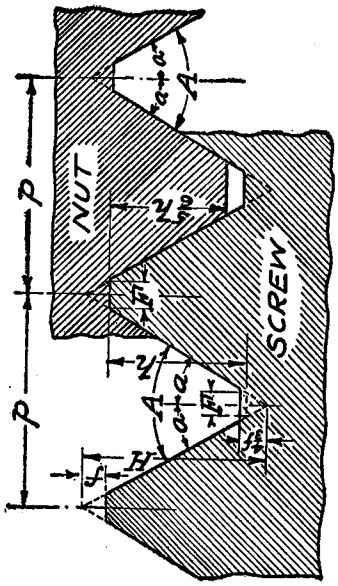

FIGURE 3.—*American National form of thread*

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 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 } depth of truncation
=⅙ H
=⅙ h

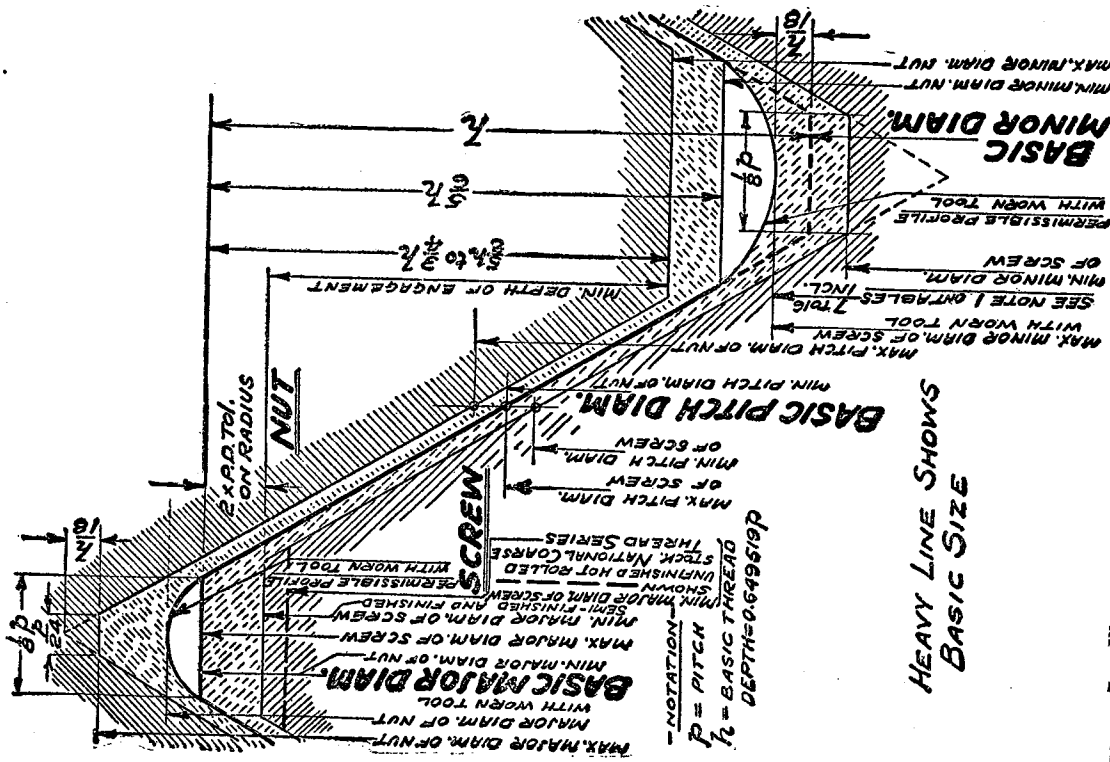

FIGURE 7.—*Illustration of tolerances and crest clearances for class 2, free fit*

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 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 $\frac{\pi K^2}{4}$
		Inches	*Inches*	*Inches*	*mm*	*Inch*	*Inch*	*Inch*	*Inch*	°	′	*Sq. in.*
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
¼	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
⅜	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
½	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
⅝	11	.6250	.5660	.5069	15.875	.09091	.05905	.01136	.00379	2	56	.2018
¾	10	.7500	.6850	.6201	19.050	.10000	.06495	.01250	.00417	2	40	.3020
⅞	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
1⅛	7	1.1250	1.0322	.9394	28.575	.14286	.09279	.01786	.00595	2	31	.6931
1¼	7	1.2500	1.1572	1.0644	31.750	.14286	.09279	.01786	.00595	2	15	.8898
1½	6	1.5000	1.3917	1.2835	38.100	.16667	.10825	.02083	.00694	2	11	1.2938
1¾	5	1.7500	1.6201	1.4902	44.450	.20000	.12990	.02500	.00833	2	15	1.7441
2	4½	2.0000	1.8557	1.7113	50.800	.22222	.14434	.02778	.00926	2	11	2.3001
2¼	4½	2.2500	2.1057	1.9613	57.150	.22222	.14434	.02778	.00926	1	55	3.0212
2½	4	2.5000	2.3376	2.1752	63.500	.25000	.16238	.03125	.01042	1	57	3.7161
2¾	4	2.7500	2.5876	2.4252	69.850	.25000	.16238	.03125	.01042	1	46	4.6194
3 [1]	4	3.0000	2.8376	2.6752	76.200	.25000	.16238	.03125	.01042	1	36	5.6209
3	3½	3.0000	2.8144	2.6288	76.200	.28571	.18558	.03571	.01190	1	51	5.4276

[1] Optional. Standard for marine work.

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

		Machine screw number						
		1	2	3	4	5	6	8
		Threads per inch						
		64	56	48	40	40	32	32
BOLTS AND SCREWS		*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*
Class 1, major diameter	Max.	0.0723	0.0852	0.0981	0.1110	0.1240	0.1369	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.[1]	.0531	.0633	.0725	.0803	.0933	.0986	.1246
Classes 2, 3, and 4, minor diameter	Max.[1]	.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
NUTS AND TAPPED HOLES								
Classes 1, 2, 3, and 4, major diameter	Min.[2]	.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

[1] See footnote 1 on page 12.

[2] 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	5/16	⅜	7/16	½
		Threads per inch						
		24	24	20	18	16	14	13
BOLTS AND SCREWS		*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*
Class 1, major diameter	Max	0.1887	0.2147	0.2485	0.3109	0.3732	0.4354	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.[1]	.1376	.1636	.1872	.2427	.2965	.3478	.4034
Classes 2, 3, and 4, minor diameter	Max.[1]	.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
NUTS AND TAPPED HOLES								
Classes 1, 2, 3, and 4, major diameter	Min.[2]	.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

[1] See footnote 1 on page 12.

[2] 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							
	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2
	Threads per inch							
	12	11	10	9	8	7	7	6
BOLTS AND SCREWS	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inches*	*Inches*	*Inches*
Class 1, major diameter — Max.	0.5601	0.6224	0.7472	0.8719	0.9966	1.1211	1.2461	1.4956
Class 1, major diameter — Min.	.5443	.6054	.7288	.8519	.9744	1.0963	1.2213	1.4666
Class 1, major diameter — 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
Classes 2, 3, and 4, major diameter — Min.	.5513	.6132	.7372	.8610	.9848	1.1080	1.2330	1.4798
Classes 2, 3, and 4, major diameter — 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
Class 2, major diameter (threaded parts of unfinished, hot-rolled material) — Min.	.5467	.6080	.7316	.8550	.9778	1.1002	1.2252	1.4710
Class 2, major diameter (threaded parts of unfinished, hot-rolled material) — Tol.	.0158	.0170	.0184	.0200	.0222	.0248	.0248	.0290
Class 1, minor diameter — Max.[1]	.4579	.5109	.6245	.7356	.8432	.9458	1.0708	1.2911
Classes 2, 3, and 4, minor diameter — Max.[1]	.4603	.5135	.6273	.7387	.8466	.9497	1.0747	1.2955
Class 1, loose fit, pitch diameter — Max.	.5060	.5634	.6822	.7997	.9154	1.0283	1.1533	1.3873
Class 1, loose fit, pitch diameter — Min.	.4981	.5549	.6730	.7897	.9043	1.0159	1.1409	1.3728
Class 1, loose fit, pitch diameter — 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
Class 2, free fit, pitch diameter — Min.	.5028	.5601	.6786	.7958	.9112	1.0237	1.1487	1.3816
Class 2, free fit, pitch diameter — 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
Class 3, medium fit, pitch diameter — Min.	.5044	.5618	.6805	.7979	.9134	1.0263	1.1513	1.3846
Class 3, medium fit, pitch diameter — 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
Class 4, close fit, pitch diameter — Min.	.5069	.5644	.6833	.8010	.9168	1.0300	1.1550	1.3890
Class 4, close fit, pitch diameter — Tol.	.0020	.0021	.0023	.0024	.0027	.0030	.0030	.0036
NUTS AND TAPPED HOLES								
Classes 1, 2, 3, and 4, major diameter — Min.[2]	.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
Classes 1, 2, 3, and 4, minor diameter — Min.	.4723	.5266	.6417	.7547	.8647	.9704	1.0954	1.3196
Classes 1, 2, 3, and 4, minor diameter — 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
Class 1, loose fit, pitch diameter — 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
Class 2, free fit, pitch diameter — 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
Class 3, medium fit, pitch diameter — 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
Class 4, close fit, pitch diameter — Tol.	.0020	.0021	.0023	.0024	.0027	.0030	.0030	.0036

[1] See footnote 1 on page 12.

[2] 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						
		1¾	2	2¼	2½	2¾	3	3
		Threads per inch						
		5	4½	4½	4	4	4	3½
BOLTS AND SCREWS		*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*
Class 1, major diameter	Max	1. 7448	1. 9943	2. 2443	2. 4936	2. 7436	2. 9936	2. 9927
	Min	1. 7110	1. 9575	2. 2075	2. 4528	2. 7028	2. 9528	2. 9469
	Tol	. 0338	. 0368	. 0368	. 0408	. 0408	. 0408	. 0458
Classes 2, 3, and 4, major diameter	Max	1. 7500	2. 0000	2. 2500	2. 5000	2. 7500	3. 0000	3. 0000
	Min	1. 7268	1. 9746	2. 2246	2. 4720	2. 7220	2. 9720	2. 9686
	Tol	. 0232	. 0254	. 0254	. 0280	. 0280	. 0280	. 0314
Class 2, major diameter (threaded parts of unfinished, hot-rolled material)	Max	1. 7500	2. 0000	2. 2500	2. 5000	2. 7500	3. 0000	3. 0000
	Min	1. 7162	1. 9632	2. 2132	2. 4592	2. 7092	2. 9592	2. 9542
	Tol	. 0338	. 0368	. 0368	. 0408	. 0408	. 0408	. 0458
Class 1, minor diameter	Max.[1]	1. 4994	1. 7217	1. 9717	2. 1869	2. 4369	2. 6869	2. 6421
Classes 2, 3, and 4, minor diameter	Max.[1]	1. 5046	1. 7274	1. 9774	2. 1933	2. 4433	2. 6933	2. 6494
Class 1, loose fit, pitch diameter	Max	1. 6149	1. 8500	2. 1000	2. 3312	2. 5812	2. 8312	2. 8071
	Min	1. 5980	1. 8316	2. 0816	2. 3108	2. 5608	2. 8108	2. 7842
	Tol	. 0169	. 0184	. 0184	. 0204	. 0204	. 0204	. 0229
Class 2, free fit, pitch diameter	Max	1. 6201	1. 8557	2. 1057	2. 3376	2. 5876	2. 8376	2. 8144
	Min	1. 6085	1. 8430	2. 0930	2. 3236	2. 5736	2. 8236	2. 7987
	Tol	. 0116	. 0127	. 0127	. 0140	. 0140	. 0140	. 0157
Class 3, medium fit, pitch diameter	Max	1. 6201	1. 8557	2. 1057	2. 3376	2. 5876	2. 8376	2. 8144
	Min	1. 6119	1. 8468	2. 0968	2. 3279	2. 5779	2. 8279	2. 8037
	Tol	. 0082	. 0089	. 0089	. 0097	. 0097	. 0097	. 0107
Class 4, close fit, pitch diameter	Max	1. 6211	1. 8568	2. 1068	2. 3389	2. 5889	2. 8389	2. 8160
	Min	1. 6170	1. 8524	2. 1024	2. 3341	2. 5841	2. 8341	2. 8107
	Tol	. 0041	. 0044	. 0044	. 0048	. 0048	. 0048	. 0053
NUTS AND TAPPED HOLES								
Classes 1, 2, 3, and 4, major diameter	Min.[2]	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	1. 7835	2. 0335	2. 2564	2. 5064	2. 7564	2. 7216
	Min	1. 5335	1. 7594	2. 0094	2. 2294	2. 4794	2. 7294	2. 6907
	Tol	. 0216	. 0241	. 0241	. 0270	. 0270	. 0270	. 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	1. 8741	2. 1241	2. 3580	2. 6080	2. 8580	2. 8373
	Tol	. 0169	. 0184	. 0184	. 0204	. 0204	. 0204	. 0229
Class 2, free fit, pitch diameter	Max	1. 6317	1. 8684	2. 1184	2. 3516	2. 6016	2. 8516	2. 8301
	Tol	. 0116	. 0127	. 0127	. 0140	. 0140	. 0140	. 0157
Class 3, medium fit, pitch diameter	Max	1. 6283	1. 8646	2. 1146	2. 3473	2. 5973	2. 8473	2. 8251
	Tol	. 0082	. 0089	. 0089	. 0097	. 0097	. 0097	. 0107
Class 4, close fit, pitch diameter	Max	1. 6242	1. 8601	2. 1101	2. 3424	2. 5924	2. 8424	2. 8197
	Tol	. 0041	. 0044	. 0044	. 0048	. 0048	. 0048	. 0053

[1] See footnote 1 on page 12.

[2] 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 $\frac{\pi K^2}{4}$
		Inches	*Inches*	*Inches*	*mm*	*Inch*	*Inch*	*Inch*	*Inch*	°	′	*Sq. in.*
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
BOLTS AND SCREWS		*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*
Class 1, major diameter	Max	0.0593	0.0723	0.0853	0.0982	0.1111	0.1241	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.[1]	.0440	.0553	.0661	.0763	.0855	.0962	.1063
Classes 2, 3, and 4, minor diameter	Max.[1]	.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
NUTS AND TAPPED HOLES								
Classes 1, 2, 3, and 4, major diameter	Min.[2]	.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

[1] See footnote 1 on page 12.

[2] 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	5/16	3/8	7/16
		Threads per inch						
		36	32	28	28	24	24	20
BOLTS AND SCREWS		*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*
Class 1, major diameter	Max	0.1629	0.1889	0.2148	0.2488	0.3112	0.3737	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.[1]	.1288	.1506	.1710	.2050	.2601	.3226	.3747
Classes 2, 3, and 4, minor diameter	Max.[1]	.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
NUTS AND TAPPED HOLES								
Classes 1, 2, 3, and 4, major diameter	Min.[2]	.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

[1] See footnote 1 on page 12.

[2] 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	9/16	⅝	¾	⅞	1	1⅛	1¼
		Threads per inch							
		20	18	18	16	14	14	12	12
BOLTS AND SCREWS		*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inches*	*Inches*
Class 1, major diameter	Max	0.4985	0.5609	0.6234	0.7482	0.8729	0.9979	1.1226	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.[1]	.4372	.4927	.5552	.6715	.7853	.9103	1.0204	1.1454
Classes 2, 3, and 4, minor diameter	Max.[1]	.4387	.4943	.5568	.6733	.7874	.9124	1.0228	1.1478
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
NUTS AND TAPPED HOLES									
Classes 1, 2, 3, and 4, major diameter	Min.[2]	.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

[1] See footnote 1 on page 12.

[2] See footnote 2 on page 12.

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

		Sizes						
		1½	1¾	2	2¼	2½	2¾	3
		Threads per inch						
		12	10	10	8	8	8	8
BOLTS AND SCREWS		*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*
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.[1]	1. 3954	1. 6245	1. 8745	2. 0932	2. 3432	2. 5932	2. 8432
Classes 2, 3, and 4, minor diameter	Max.[1]	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
NUTS AND TAPPED HOLES								
Classes 1, 2, 3, and 4, major diameter	Min.[2]	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

[1] 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 the basic thread depth, h (or 0.6495 p), 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 $\frac{1}{24} \times p$, and may be determined by adding $1\frac{2}{9} \times h$ (or 0.7939 p) to the maximum pitch diameter of the nut.

III.

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					
					Numbered and fractional-inch sizes			Metric sizes		
		Basic	Maximum	Minimum	Nominal size	Diameter	Per cent of depth of basic thread	Nominal size	Diameter	Per cent of depth of basic thread
		Inch	*Inch*	*Inch*		*Inch*		*mm*	*Inch*	
1	64	0.0527	0.0604	0.0561	No. 53	0.0595	67	1.5	0.0591	68
2	56	.0628	.0715	.0667	No. 51	.0670	82	1.7	.0669	82
					No. 50	.0700	69	1.75	.0689	74
								1.8	.0709	65
3	48	.0719	.0820	.0764	5/64 inch	.0781	77	2.0	.0787	75
					No. 47	.0785	76			
					No. 46	.0810	67			
					No. 45	.0820	63			
4	40	.0795	.0913	.0849	No. 44	.0860	80	2.2	.0866	78
					No. 43	.0890	71	2.25	.0886	72
								2.3	.0906	66
5	40	.0925	.1043	.0979	No. 40	.0980	83	2.5	.0984	82
					No. 39	.0995	79	2.6	.1024	70
					No. 38	.1015	72			
					No. 37	.1040	65			
6	32	.0974	.1118	.1042	No. 36	.1065	78	2.7	.1063	78
					7/64 inch	.1094	70	2.75	.1083	73
					No. 35	.1100	69	2.8	.1102	68
					No. 34	.1110	67			
8	32	.1234	.1378	.1302	No. 29	.1360	69	3.4	.1339	74
								3.5	.1378	65
10	24	.1359	.1541	.1449	No. 26	.1470	79	3.7	.1457	82
					No. 25	.1495	75	3.75	.1476	78
					No. 24	.1520	70	3.8	.1496	75
					No. 23	.1540	67	3.9	.1535	67
12	24	.1619	.1801	.1709	11/64 inch	.1719	81	4.4	.1732	79
					No. 17	.1730	79	4.5	.1772	72
					No. 16	.1770	72			
					No. 15	.1800	67			
1/4	20	.1850	.2060	.1959	No. 9	.1960	83	5.0	.1968	82
					No. 8	.1990	79	5.1	.2008	76
					No. 7	.2010	75	5.2	.2047	70
					13/64 inch	.2031	72			
					No. 6	.2040	71			
					No. 5	.2055	69			
5/16	18	.2403	.2630	.2524	F	.2570	77	6.5	.2559	78
					G	.2610	71	6.6	.2598	73
3/8	16	.2938	.3184	.3073	5/16 inch	.3125	77	7.9	.3110	79
					O	.3160	73	8.0	.3150	74
7/16	14	.3447	.3721	.3602	U	.3680	75	9.2	.3622	81
								9.25	.3642	79
								9.3	.3661	77
								9.4	.3701	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					
					Numbered and fractional-inch sizes			Metric sizes		
		Basic	Maximum	Minimum	Nominal size	Diameter	Per cent of depth of basic thread	Nominal size	Diameter	Per cent of depth of basic thread
		Inches	*Inches*	*Inches*		*Inches*		*mm*	*Inches*	
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	1 7/64 inches	1.1094	76	28.0	1.1024	80
1 1/2	6	1.2835	1.3376	1.3196	1 21/64 inches	1.3281	79			
1 3/4	5	1.4902	1.5551	1.5335	1 35/64 inches	1.5469	78	39.0	1.5354	83
								39.5	1.5551	75
2	4 1/2	1.7113	1.7835	1.7594	1 49/64 inches	1.7656	81	45.0	1.7716	79
					1 25/32 inches	1.7812	76			
2 1/4	4 1/2	1.9613	2.0335	2.0094	2 1/64 inches	2.0156	81	51.5	2.0276	77
					2 1/32 inches	2.0312	76			
2 1/2	4	2.1752	2.2564	2.2294	2 15/64 inches	2.2344	82	57.0	2.2441	79
					2 1/4 inches	2.2500	77			
2 3/4	4	2.4252	2.5064	2.4794	2 31/64 inches	2.4844	82	63.0	2.4803	83
					2 1/2 inches	2.5000	77	63.5	2.5000	77
3	4	2.6752	2.7564	2.7294	2 47/64 inches	2.7344	82	69.5	2.7362	81
					2 3/4 inches	2.7500	77	70.0	2.7559	75
3	3 1/2	2.6288	2.7216	2.6907	2 45/64 inches	2.7031	80	68.5	2.6968	82
					2 23/32 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					
					Numbered and fractional-inch sizes			Metric sizes		
		Basic	Maximum	Minimum	Nominal size	Diameter	Per cent of depth of basic thread	Nominal size	Diameter	Per cent of depth of basic thread
		Inches	*Inches*	*Inches*		*Inches*		*mm*	*Inches*	
0	80	0.0438	0.0492	0.0465	No. 56	0.0465	83	1.2	0.0472	79
					3/64 inch	.0469	81	1.25	.0492	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	.0810	78	2.1	.0827	70
					No. 45	.0820	73			
4	48	.0849	.0937	.0894	3/32 inch	.0938	67	2.3	.0906	79
					No. 42	.0935	68			
5	44	.0955	.1049	.1004	No. 38	.1015	80	2.6	.1024	77
					No. 37	.1040	71			
6	40	.1055	.1158	.1109	No. 34	.1110	83	2.9	.1142	73
					No. 33	.1130	77			
8	36	.1279	.1391	.1339	No. 29	.1360	78	3.4	.1339	83
								3.5	.1378	73
10	32	.1494	.1618	.1562	5/32 inch	.1562	83	4.0	.1575	80
					No. 22	.1570	81	4.1	.1614	70
					No. 21	.1590	76			
					No. 20	.1610	71			
12	28	.1696	.1833	.1773	No. 15	.1800	78	4.6	.1811	75
					No. 14	.1820	73			
1/4	28	.2036	.2173	.2113	No. 3	.2130	80	5.4	.2126	81
								5.5	.2165	72
5/16	24	.2584	.2739	.2647	I	.2720	75	6.8	.2677	83
								6.9	.2717	75
3/8	24	.3209	.3364	.3299	Q	.3320	79	8.4	.3307	82
								8.5	.3346	75
7/16	20	.3725	.3906	.3834	W	.3860	79	9.75	.3839	83
					25/64 inch	.3906	72	9.8	.3858	80
								9.9	.3898	73
1/2	20	.4350	.4531	.4459	29/64 inch	.4531	72	11.5	.4528	73
9/16	18	.4903	.5100	.5024		.5062	78			
5/8	18	.5528	.5725	.5649				14.5	.5709	75
3/4	16	.6688	.6903	.6823	11/16 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	1.0438	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 1/8 inches	2.1250	77	54.0	2.1260	76
2 1/2	8	2.3376	2.3782	2.3647	2 3/8 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 7/8 inches	2.8750	77	73.0	2.8740	78

[1] No standard size.

HISTORY OF PROJECT

In the United States the standardization of screw threads was begun with the appointment of a special committee by the Franklin Institute on April 21, 1861, for the investigation of a proper system of screw threads, bolt heads, and nuts. From this beginning there was developed a system variously known as the Franklin Institute thread, the Sellers thread or the United States thread. Later a system having finer pitches was recommended by the Society of Automotive Engineers, and a machine screw thread series providing smaller sizes of screws than the United States series, was recommended by the American Society of Mechanical Engineers.

On July 18, 1918, the Congress authorized the appointment of the National Screw Thread Commission, consisting of nine members, to "ascertain and establish standards for screw threads" which when "accepted and approved shall be adopted and used in the several manufacturing plants under the control of the War and Navy Departments, and, so far as practicable, in all specifications for screw threads in proposals for manufactured articles, parts, or materials to be used under the direction of these departments." The National Screw Thread Commission issued printed reports in 1921, 1924, and 1928 based upon a long series of hearings and investigations both in the United States and abroad.

While the recommendations of the N. S. T. C. are mandatory upon the War and Navy Departments and as far as practicable apply also to purchases by all Government departments, it seemed desirable to determine the extent to which these standards were being applied within the industries concerned. Accordingly, on May 8, 1929, the National Screw Thread Commission requested the cooperation of the National Bureau of Standards to determine the extent of adoption and use of the N. S. T. C. recommendations in industry.

The hearings of the N. S. T. C. having performed all the essential functions of the general conferences normally required as a part of the procedure leading to the establishment of commercial standards, and the recommendations of the N. S. T. C. having attained national recognition and a large following, it seemed logical to proceed directly with the circulation of the essential screw thread tables and tolerances to industry for written acceptance. This was done and resulted in the impressive roster of organizations as listed on page v of this pamphlet which have indicated in writing their intention of making the American National Standard Screw Threads, as set forth herein, their standard of practice.

STANDING COMMITTEE

The National Screw Thread Commission, being a thoroughly representative body, seemed the logical one to act as the standing committee to consider or propose any changes in the standard in order that it may be kept continually in accord with the desires of the industry and the advance in the art. Comment or suggestions are welcome at all times and should be addressed to H. W. Bearce, secretary, National Screw Thread Commission, Washington, D. C.

EFFECTIVE DATE

A number of producers and users have followed the reports of the National Screw Thread Commission for several years, and for such organizations the effective date will indicate no change in practice. The chief purpose of the effective date is to identify the acceptors of record with the commercial standard. The selection of a date for making it effective was determined after circulation of the industry, when the necessary support was secured. Adequate support having been recorded and announced, the standard was made effective as of July 1, 1930, for new production.

COMMERCIAL STANDARDS SERVICE

Industry has long sensed the need for a wider application and use of specifications developed and approved by nationally recognized organizations. To assist these bodies and the producers and consumers in securing this result and as a natural outgrowth of the movement toward elimination of waste through simplified practice, the National Bureau of Standards has set up a procedure under which specifications, properly indorsed, may be printed as official publications

of the Department of Commerce and promulgated as "commercial standards." This service parallels that of simplified practice in many respects and is available only upon request.

Broadly speaking, the aim is to continue the same character of cooperative service in this field that is being rendered in simplification. The division of trade standards is not designed to act as a standardizing body, nor will it engage in the preparation of specifications. Its service is mainly promotional in character, since its chief mission is to get behind a standard or a specification which any branch of industry may want to promulgate on a nation-wide basis; to determine its eligibility for promulgation; to publish and broadcast it in the event the prerequisites of procedure have been met, including a satisfactory majority acceptance; to facilitate the application of the certification plan for the assurance and convenience of the purchaser; to provide means for periodic audits of adherence; and to cooperate with the Bureau of Foreign and Domestic Commerce in determining the desire of industry relative to translation and promulgation of such specifications as a basis for foreign commerce. In general, it may be said that a simplification covers types, sizes, and varieties of a commodity which are retained by industry on the basis of demand, whereas a commercial standard establishes definite requirements as to grade, quality, or dimensional tolerances in addition to any limitation of variety desired and accepted by the industry.

ORGANIZATION AND DUTIES OF STANDING COMMITTEE

In order to carry on the aims and desires of the industry in the standardization of their product, a standing committee is appointed at the general conference. This committee consists of members from each division of the industry, namely, producers, distributors, and consumers, and thus reflects the well-balanced viewpoint of all concerned. The members of the committee receive all suggestions regarding the commercial standard and consider its revision in the event that such action is desirable and mutually beneficial.

If the commercial standard does not warrant revision, it is reaffirmed in its existing form, but if any important changes are found desirable their adoption is recommended by the committee, whereupon the industry is again solicited for written acceptance of the standard in its revised form.

The committee is, in effect, a centralizing agency for criticisms and comments regarding the commercial standard and is charged with the responsibility of recommending revisions to keep the standard abreast with current industrial practice. The proper functioning of the committee requires that, when necessary, its members be willing to attend meetings held at some central place, although in many cases it will be possible to conduct the work by correspondence.

When any deceptions in reference to the commercial standard are reported to the standing committee, it applies moral suasion or such other corrective measures as seem desirable. The Department of Commerce has no "police power" to compel adherence; therefore it is incumbent upon the standing committee to do all in its power to encourage all divisions of the industry to follow the provisions of the commercial standard and contribute in every way possible to its general adoption and usefulness.

YOUR COOPERATION

As a producer, distributor, or consumer of some of the commodities for which commercial standards have already been established, you are in a position to avail yourself of the benefits arising from the use of quality standards and incidentally to add impetus to this method of eliminating waste. The first step is a declaration in favor of the standard by recording your intention to adhere, as closely as circumstances will allow, to the standards for those products which you may buy or sell. The receipt of your signed acceptance will permit the listing of your company in new editions of the commercial standards that you accept.

You will, of course, want to examine any commercial standards before signing a formal acceptance. The Bureau of Standards will, therefore, furnish a copy of any standard under consideration for acceptance. To facilitate this procedure, a list appears on page 22 that may

be checked and mailed to the Division of Trade Standards, Bureau of Standards, Washington, D. C. The publications may also be secured singly or in quantities at a nominal price from the Government Printing Office. Prices will be furnished upon request.

The acceptance of a commercial standard is an entirely voluntary action and applies to the production, sale, and use of stock items. It is not meant to interfere with the manufacture or sale of special sizes and types sometimes required.

Trade associations and individual companies often distribute large numbers of the printed standard for the information and guidance of their members or customers. In such cases it is possible to extend the scope and degree of adherence by urging each recipient to send in an acceptance, bearing in mind that the practical value of any standardization is measured by the observance it receives.

An acceptance form for the commercial standard herein covered is included on page 19.

ACCEPTANCE OF COMMERCIAL STANDARD

Please Sign and Return this Sheet to Division of Trade Standards, Bureau of Standards, Washington, D. C.

(Cut on this line)

Date----------

DIVISION OF TRADE STANDARDS,
BUREAU OF STANDARDS,
Washington, D. C.

GENTLEMEN: We, the undersigned, do hereby accept the original draft of the commercial standard, as our standard practice in the

Production [1]
Distribution [1] of standard screw threads, beginning ----------, and will
Use [1]
(Date)

use our best effort in securing its general adoption.

To permit intelligent review of the effectiveness of the commercial standard every year by an accredited committee of all interests, working in cooperation with the Department of Commerce, we plan to supply all data, upon request, which may be necessary for the development of constructive revisions. It is understood that any suggested modifications will be submitted as soon as formulated, and shall not be promulgated until accepted in form similar to this recommendation.

Signature----------

(Kindly typewrite or print the following lines)

Title----------

Company----------

Street address----------

City and State----------

We are members of the following associations or other organizations interested in the production, sale or use of standard screw threads:

---

[1] Please designate which group you represent by drawing lines through the other two. In the case of related interests, trade papers, colleges, etc., desiring to record their general approval, the words "in principle" should be added after the signature.

TO THE ACCEPTOR

In signing the acceptance blank, please bear the following points clearly in mind:

1. *Adherence.*—The Department of Commerce has no regulatory powers to enforce adherence to the commercial standards. Instead, this waste-elimination program is based on voluntary cooperation and self-government in industry. To make this specific standardization operate as a satisfactory example of self-government, it is highly desirable that it be kept distinct from any plan or method of governmental regulation or control. It will be successful according to the degree to which manufacturers, distributors, and purchasers adhere to its terms and conditions.

2. *The industry's responsibility.*—The department cooperates only on the request of the industry and assumes no responsibility for industrial acceptance or adherence. This program was developed by the industry on its own initiative. Its success depends wholly on the active cooperation of those concerned.

3. *The acceptor's responsibility.*—You are entering into an entirely voluntary arrangement, whereby the members of the industry—the distributors and consumers of the product, and others concerned—hope to secure the benefits inherent in commercial standardization. Those responsible for this standard realize that instances may occur in which it will be necessary to supply or purchase items not included therein. The purpose is, however, to secure wider support for nationally recognized standards covering grade, quality, and other characteristics of products. *Consumers* can make the program a success if, in their purchasing, they will make a definite and conscientious effort to *specify in terms of this commercial standard.*

4. *The department's responsibility.*—The function performed by the Department of Commerce is fourfold: First, to act as a referee to insure adequate consideration of the needs of all interests; second, to supply such assistance and advice in the development of this program as past experience with similar programs may suggest; third, to solicit and record the extent of adoption and adherence to the standard; and fourth, to add all possible prestige to this standardization movement by publication and promulgation if and when it is adopted and accepted by all elements directly concerned.

REQUEST FOR COMMERCIAL STANDARDS

Date.....

DIVISION OF TRADE STANDARDS,
BUREAU OF STANDARDS,
Washington, D. C.

GENTLEMEN: The undersigned wishes to examine the commercial standards checked on the reverse side of this page, with a view toward accepting them as our standard of practice in the production, distribution, or consumption of the standardized lines.

(Cut on this line)

Signed.....

(Kindly typewrite or print the following lines)

Title.....

Company.....

Street address.....

City and State.....

COMMERCIAL STANDARDS

C. S. No.	Item
0–30.	The Commercial Standards Service and Its Value to Business.
1–28.	Clinical thermometers.
2–29.	Surgical gauze (preparation postponed).
3–28.	Stoddard solvent.
4–29.	Staple porcelain (all-clay) plumbing fixtures.
5–29.	Steel pipe nipples.
6–29.	Wrought-iron pipe nipples.
7–29.	Standard weight malleable iron or steel screwed unions.
8–30.	Plain and thread plug and ring gage blanks.
9–29.	Builders' template hardware.
10–29.	Brass pipe nipples.
11–29.	Regain of mercerized cotton yarns.
12–29.	Domestic and industrial fuel oils.
13–30.	Dress patterns.
14–	Boys' blouses, button-on waists, shirts, and junior shirts (in preparation).
15–29.	Men's pajamas.
16–29.	Wall paper.
17–30.	Diamond core drill fittings.
18–29.	Hickory golf shafts.
19–30.	Foundry patterns of wood.
20–30.	Staple vitreous china plumbing fixtures.
21–30.	Interchangeable ground glass joints.
22–30.	Builders' hardware (nontemplate) (in preparation).
23–30.	Feldspar (in preparation).
24–30.	Standard screw threads.
25–30.	Special screw threads (in preparation).