

SLOTTED AND RECESSED HEAD SCREWS—SAE J478a

SAE Standard

Report of Screw Threads Committee approved October 1947, revised June 1960 and last revised by Fasteners Committee June 1962. Conforms to American Standards Association, ASA B18.6.2—1956, Hexagon and Slotted Head Cap Screws—Square Head Set Screws—Slotted Headless Set Screws; proposed revision to ASA B18.6.4—1959, Slotted and Recessed Head Tapping Screws and Metallic Drive Screws; proposed revision to ASA B18.6.1, Slotted and Recessed Head Wood Screws; and proposed ASA B18.6.3 Slotted and Recessed Head Machine Screws and Machine Screw Nuts.

Scope—Included herein are complete general and dimensional data for the types of slotted and recessed head machine, tapping, and wood screws, and slotted capscrews recognized as SAE Standard. Also included are performance data for tapping screws and appendixes which provide instructions for protrusion gaging flat heads, penetration gaging of recessed heads, across corners gaging of hexagon heads, recommended hole

sizes for tapping screws, and a cross reference of tapping screw type designations.

The inclusion of dimensional data in this standard is not intended to imply that all of the products described are stock production sizes. Consumer interests are requested to consult with manufacturers concerning lists of stock production sizes.

CONTENTS—TAPPING, MACHINE, AND WOOD SCREWS; AND CAPSCREWS

General Specifications for Tapping,
Machine, and Wood Screws

Tapping Screw Tables

Hole Sizes for Drive Test

Inspection 1

Torsional Strengths for

Referee Testing 2

Flat Head 3, 3A, 3B

Undercut Flat Head 4, 4A, 4B

Flat Trim Head 5, 5A, 5B

Oval Head 7, 7A, 7B

Undercut Oval Head 8, 8A, 8B

Oval Trim Head 9, 9A, 9B

Pan Head 10, 10A, 10B

Fillister Head 11, 11A, 11B

Truss Head 12, 12A, 12B

Round Head 13, 13A, 13B

Hexagon Head 15

Hexagon Washer Head 16

Type A Screw Threads

and Points 19

Types B, BF, FG, BP, and

BT Screw Threads and

Points 20

Types C, D, F, G, and T

Screw Threads and Points 21

Recommended Hole Sizes

(See Appendix E) 30, 31, 32, 33,

34, 35, 36, 37,

38, 39, 40, 41

and 42

Machine Screw Tables

Flat Head 3, 3A, 3B

Undercut Flat Head 4, 4A, 4B

Flat Trim Head 5, 5A, 5B

100 Deg Flat Head 6, 6A, 6B

Oval Head 7, 7A, 7B

Undercut Oval Head 8, 8A, 8B

Oval Trim Head 9, 9A, 9B

Pan Head 10, 10A, 10B

Fillister Head 11, 11A, 11B

Truss Head 12, 12A, 12B

Round Head 13, 13A, 13B

Binding Head 14, 14A, 14B

Hexagon Head 15

Hexagon Washer Head 16

Drilled Fillister Head 17

Threads and Header Points 18

Wood Screw Tables

Flat Head 3, 3C, 3D

Oval Head 7, 7C, 7D

Round Head 13, 13C, 13D

Threads and Points 22

General Specifications for Capscrews

Capscrew Tables

Flat Head 23

Fillister Head 24

Round Head 25

Appendix A

Protrusion Gaging

Appendix B

Penetration Gaging of Cross

Recess Screws and Tables 26, 27, 28 and

29

Appendix C

Across Corners Gaging of Hexagon Heads

Appendix D

Cross Reference of Tapping Screw Point

Designations

Appendix E

Recommended Hole Sizes

for Tapping Screws and

Tables 30, 31, 32, 33,

34, 35, 36, 37,

38, 39, 40, 41

and 42

MACHINE, TAPPING, AND WOOD SCREWS—GENERAL
SPECIFICATIONS

Heads

Head Height—The head height indicated in the dimensional tables represents a metal to metal measurement. In other words, on heads having rounded top surfaces, the truncation of the rounded surface due to recess or slot is not considered part of the head height.

On countersunk type heads, the head height is a reference dimension measured parallel to the axis of the screw from the largest diameter of the bearing surface of the head to the point of intersection of the bearing surface of the head and basic major diameter of the screw. This point of intersection is not necessarily the same as the actual junction of head and shank.

Depth of Recess—The recess depth shown in the tables is measured parallel to the axis of the screw from the intersection of the maximum diameter of the recess with the rounded head surface to the bottom of the recess.

Penetration Gaging—Penetration gaging values are shown in the tables, and the method is explained in Appendix B.

Depth of Slots—The depth of slots is measured parallel to axis of screw from the highest part of the head to the intersection of the bottom of the slot with the head surface.

Bearing Surface—The bearing surface of perpendicular bearing surface type machine and tapping screw heads shall be at right angles to the axis of the body within 2 deg.

Eccentricity—Eccentricity is defined as one-half of the full indicator reading.

Eccentricity of Head—Machine and tapping screw heads shall not be eccentric with the axis of the screw by more than 3% of the maximum head diameter.

Eccentricity of Slots—Slots in machine and tapping screw heads shall not be eccentric with the axis of the screw by more than 6% of the basic screw diameter or 0.010 in., whichever is greater. Slots in wood screw heads shall not be eccentric with the axis of the screw by more than 6% of the basic screw diameter or 0.015 in., whichever is greater.

Eccentricity of Recesses—Recesses in machine, tapping, and wood screw heads shall not be eccentric with the axis of the screw by more than 6% of the basic screw diameter or 0.015 in., whichever is greater.

Underhead Fillets—The radius of the fillet under perpendicular bearing surface head and undercut countersunk head machine and tapping screws shall be not greater than 15% of the basic screw diameter. The radius of fillet under countersunk type heads shall be not greater than 40% of the basic screw diameter.

The maximum radius of the fillet under the head of perpendicular bearing surface head wood screws shall be 0.016 in. for sizes No. 0 through No. 4; 0.031 in. for sizes No. 5 through No. 12; and 0.046 for sizes larger than No. 12. The maximum radius of fillet under countersunk head wood screws shall be 0.031 for sizes No. 0 through No. 4; 0.062 in. for sizes No. 5 through No. 12; and 0.093 in. for sizes larger than No. 12.

Length

Measurement—The length of screws shall be measured from the largest diameter of the bearing surface of the head to the extreme point parallel with the screw axis.

Tolerances on Length—Tolerances on length for the various screw types shall be tabulated as follows:

Screw Type	Nominal Screw Length, in.	Tolerance on Length, in.
Machine Screws	Up to 1, incl	—0.031
	Over 1 to 2, incl	—0.062
	Over 2	—0.094
Tapping Screws Types A and BP	Up to 1, incl	±0.031
	Over 1	±0.047
Tapping Screws Types B, BF, BG, BT, C, D, F, G, and T	Up to 3/4, incl	—0.031
	Over 3/4 to 1-1/2, incl	—0.062
	Over 1-1/2	—0.094
Wood Screws	Up to 1, incl	—0.031
	Over 1 to 2, incl	—0.062
	Over 2-3/4 to 5, incl	—0.094
	Over 5	—0.094

Threads and Points

Machine Screws—Threads shall be UNC or UNF. Class 2A as indicated in Table 18. For threads with additive finish, the maximum diameters of Class 2A may be exceeded by the amount of the allowance; that is, the 2A maximum diameters apply to an unplated part or to a part before plating, whereas the basic diameters (the 2A maximum diameters plus the allowance) apply to a part after plating. Unless otherwise specified, machine screws shall have plain sheared ends. When specified, header points are obtainable as shown in Table 18. Other points of longer lengths will require machining.

Thread Forming Tapping Screws—For application in the more ductile materials where large internal stresses are permissible or desirable to increase resistance to loosening, tapping screws shall be of the following types:

Type A—Spaced thread screw with gimlet point primarily for use in materials such as light sheet metal, resin impregnated plywood, and asbestos compositions. See Table 19.

Type B—Spaced thread screw with punches generally somewhat finer than Type A with a blunt point for use in materials such as light and heavy sheet metal, nonferrous castings, plastics, resin impregnated plywood, and asbestos compositions. See Table 20.

Type BP—spaced thread screw, the same as Type B but having a cone point, used for piercing fabrics or in assemblies where holes are misaligned. See Table 20.

Type C—Screws having machine screw diameter pitch combinations with threads approximating Unified form and with blunt tapered points. Used where the use of a machine screw thread is preferable to the use of spaced thread types of thread forming screws. Also useful when chips from thread cutting screws are objectionable. It should be recognized that in specific applications, this type of screw may require extreme driving torques due to long thread engagement or use in hard materials. See Table 21.

Thread Cutting Tapping Screws—For application in materials where disruptive internal stresses are not desirable, or where excessive driving torques are encountered with thread forming screws. Tapping screws shall be of the following types:

Types D, F, G, and T—Screws with threads approximating machine screw threads, with blunt point, and with tapered entering threads having one or more cutting edges and chip cavities. The tapered threads of the Type F may be complete or incomplete at the producer's option; all other types have incomplete tapered threads. These screws can be used in materials such as aluminum, zinc and lead die castings, steel sheets and shapes, cast iron, brass, and plastics. See Table 21.

Types BF, BG, and BT—Spaced thread screws as in Type B with blunt points, with one or more cutting edges and chip cavities, for use in plastics, die castings, metal clad and resin impregnated plywoods, asbestos, and other similar compositions. See Table 20.

Wood Screws—Wood screws shall be furnished with gimlet points and thread style shall conform with that shown in the illustration above Table 22.

Length of Thread

Machine Screws—Screws up to and including 2 in. nominal length shall have full form threads extending to within 2 threads of the bearing surface of the head or closer if practicable. Screws over 2 in. nominal length shall have a minimum full thread length of 1.75 in.

Trim Head Machine Screws—Screws up to and including 3 diameters nominal length shall have full form threads extending to within 1 thread of the head or closer if practicable. Screws over 3 diameters, up to and including 1½ in. nominal length, shall have full form threads extending to within 2 threads of the head or closer if practicable. Screws over 1½ in. long shall have a minimum full thread length of 1.25 in.

Tapping Screws, Types A, B, BF, BG, BP, and BT—Screws up to and including 8 diameters nominal length shall be threaded as close for the head as is practicable in manufacturing process. For nominal lengths greater than 8 diameters, unless otherwise specified, thread length shall be optional with the producer, but shall not be less than 6 diameters.

Trim Head Tapping Screws, Type A—For sizes up to and including No. 12 body diameter, the thread on screws up to and including 1 in. nominal length shall extend as close to the head as is practicable in the manufacturing process; on nominal lengths greater than 1 in., threads shall extend to within 0.500 in. of the head with a tolerance of plus 2 pitches. For sizes larger than No. 12 body diameter, the threads on screws having nominal lengths up to and including 8 diameters, shall extend as close to the head as is practicable in the manufacturing process; and on nominal lengths greater than 8 diameters, threads shall extend to within 0.750 in. of the head with a tolerance of plus 2 pitches.

Tapping Screws, Types C, D, F, G, and T—Screws up to and including 3 diameters nominal length shall be threaded to within 1 full thread of the head or closer if practicable. For nominal lengths over 3 diameters, up to and including 8 diameters, threads shall extend to within 2 full threads of the head or closer if practicable. For nominal lengths greater than 8 diameters, unless otherwise specified, thread length shall be optional with producer but shall be not less than 6 diameters.

Trim Head Tapping Screws, Types B, BF, BG, BP, BT, C, D, F, G, and T—Screws up to and including 3 diameters nominal length shall be threaded to within 1 full thread of the head or closer if practicable. For nominal lengths greater than 3 diameters, up to and including 1½ in., the thread shall extend to within 2 full threads of the head or closer if practicable. For nominal lengths greater than 1½ in., minimum full thread length shall be 1.25 in.

Wood Screws—The length of thread shall be equal to approximately two-thirds of the length of the screw.

Diameter of Unthreaded Body

Machine Screws—The diameter of the unthreaded body shall be not less than the minimum pitch diameter of the thread nor greater than the basic major diameter of the thread.

Trim Head Machine Screws—The diameter of the unthreaded body shall be not less than the minimum pitch diameter of the thread nor

TABLE 1—STANDARD HOLE SIZES FOR DRIVE TEST INSPECTION OF TAPPING SCREWS

Screw Size	Test Plate Thickness				Type A				Types B and BP				Type C				Types D, F, G, and T			
	Types A, B, BP, and C				Types D, F, G, and T				Type A				Types B and BP				Type C			
	Gage	Max	Min	Max	Min	Drill Size	Hole Dia	Drill Size	Hole Dia	Drill Size	Hole Dia	Drill Size	Hole Dia	Drill Size	Hole Dia	Drill Size	Hole Dia	Drill Size	Hole Dia	Drill Size
2	18	0.0500	0.0450	0.0380	0.0760	48	0.0760	48	0.0760	48	0.0810	48	0.0760	48	0.0760	48	0.0760	48	0.0760	48
3	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
4	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
5	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
6	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
7	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
8	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
10	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
12	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
14	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
1/4	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
5/16	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
3/8	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
7/16	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48
1/2	18	0.0500	0.0450	0.0380	0.0760	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48	0.0810	48

*Inches and/or otherwise specified.

† Drive test done not applicable to Types BF, BG, and BP.

greater than the basic major diameter of the thread. Nominal lengths over 1½ in. shall have a 0.062 in. minimum length shoulder under the head as specified in Tables 3 and 9.

Tapping Screws, Types A, B, BF, BG, BP, and BT—The diameter of the unthreaded body shall be not less than the minimum minor diameter nor greater than the maximum major diameter of the thread.

Trim Head Tapping Screws, Types A, B, BF, BG, BP, and BT—For screws which are not threaded to the head, the diameter of the unthreaded body shall be not less than the minimum minor diameter nor greater than the maximum major diameter of the thread except for a 0.062 in. minimum length full body diameter shoulder under the head as specified in Tables 3 and 9. At manufacturer's option, the full body diameter may extend entire length from the head to the thread.

Tapping Screws, Types C, D, E, G, and T—The diameter of the unthreaded body shall be not less than the Class 2A thread minimum pitch diameter nor greater than maximum major diameter of the thread.

Trim Head Tapping Screws, Types C, D, E, G, and T—The diameter of the unthreaded body shall be not less than the minimum pitch diameter of Class 2A nor greater than the maximum major diameter of the thread. Nominal lengths over 1½ in. shall have a 0.062 in. minimum length shoulder under the head as specified in Tables 3 and 9.

Wood Screws—Unthreaded body detail shown in Table 22.

Materials

Machine and Wood Screws—Steel, brass, or stainless steel, as specified by the purchaser. Unless otherwise specified, no physical requirements apply.

Tapping Screws—Steel used in the manufacture of tapping screws shall be of high quality and suitable to meet the performance requirements of the specifications. Tapping screws may also be made of corrosion resistant steel, brass, monel, and aluminum alloys; however, the performance requirements do not apply to screws of these materials.

Tapping Screw Performance and Testing

Hardness—Tapping screws made of carbon steel shall be case

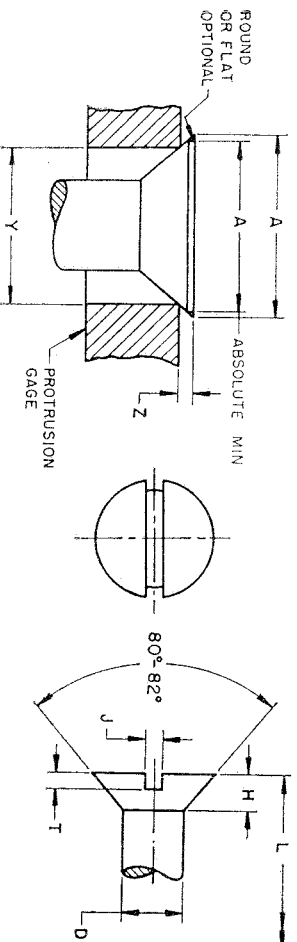


TABLE 3—DIMENSIONS OF FLAT HEAD MACHINE, TAPPING, AND WOOD SCREWS, IN. A

Nominal Size	Applicable to Screw Types ^a	D Basic Dia of Screw	A Dia of Head		H ^b Height of Head	J Width of Slot		T Depth of Slot		Y ^c Gage Dia		Z ^d Protrusion of Head Above Gage		L ^e Screws These Lengths and Shorter are Undercut ^f	
			Max. Sharp	Min. Sharp		Abs. Min	Ref	Min	Max	Min	Max	Min	Max	Machine	Tapping
0	MABW	0.060	0.119	0.105	0.099	0.035	0.016	0.010	0.015	0.078	0.026	0.016	0.026	1/8	1/8 ^g
1	MABW	0.073	0.146	0.130	0.123	0.043	0.026	0.019	0.023	0.101	0.039	0.017	0.039	1/8	5/32 ^g
2	MABW	0.086	0.172	0.156	0.147	0.051	0.031	0.023	0.023	0.124	0.049	0.017	0.049	1/8	3/16
3	MABW	0.099	0.199	0.181	0.171	0.059	0.037	0.027	0.027	0.148	0.059	0.018	0.059	1/8	7/32
4	MABW	0.112	0.225	0.207	0.195	0.067	0.043	0.033	0.033	0.172	0.069	0.019	0.069	3/16	1/4
5	MABW	0.125	0.252	0.232	0.220	0.075	0.043	0.034	0.034	0.196	0.079	0.020	0.079	3/16	1/4
6	MABW	0.138	0.279	0.257	0.244	0.083	0.048	0.024	0.038	0.220	0.089	0.021	0.089	3/16	5/16
7	ABW	0.151	0.305	0.283	0.268	0.091	0.048	0.027	0.041	0.243	0.099	0.022	0.099	3/8	3/8
8	ABW	0.164	0.332	0.308	0.292	0.100	0.054	0.029	0.045	0.267	0.109	0.023	0.109	3/8	7/16
9	W	0.177	0.358	0.334	0.316	0.108	0.060	0.032	0.049	0.291	0.119	0.025	0.119	1/2	1/2
10	MW	0.190	0.385	0.359	0.340	0.116	0.066	0.034	0.053	0.313	0.129	0.027	0.129	1/2	1/2
12	MW	0.216	0.438	0.410	0.389	0.132	0.075	0.040	0.060	0.362	0.149	0.029	0.149	5/8	5/8
14	AW	0.242	0.491	0.461	0.437	0.148	0.084	0.044	0.068	0.410	0.169	0.031	0.169	5/8	5/8
16	AW	0.268	0.544	0.512	0.485	0.164	0.094	0.049	0.075	0.457	0.189	0.033	0.189	5/8	5/8
18	AW	0.294	0.597	0.563	0.534	0.180	0.106	0.054	0.083	0.505	0.209	0.035	0.209	5/8	5/8
20	AW	0.320	0.650	0.614	0.582	0.196	0.118	0.059	0.090	0.553	0.229	0.037	0.229	5/8	5/8
24	AW	0.372	0.756	0.716	0.679	0.228	0.138	0.069	0.105	0.648	0.269	0.041	0.269	5/8	5/8
1/4	MBCD	0.250	0.507	0.477	0.452	0.153	0.081	0.044	0.070	0.424	0.189	0.034	0.189	1/2	1/2
5/16	MBCD	0.3125	0.635	0.600	0.568	0.191	0.072	0.058	0.088	0.539	0.249	0.039	0.249	5/8	5/8
3/8	MBCD	0.375	0.762	0.722	0.685	0.230	0.081	0.070	0.106	0.653	0.269	0.041	0.269	5/8	5/8
7/16	MB	0.4375	0.812	0.772	0.723	0.223	0.081	0.066	0.103	0.690	0.289	0.043	0.289	5/8	5/8
1/2	MB	0.500	0.875	0.831	0.775	0.260	0.091	0.065	0.103	0.739	0.309	0.045	0.309	5/8	5/8
9/16	M	0.5625	1.000	0.950	0.889	0.260	0.102	0.077	0.120	0.851	0.329	0.047	0.329	5/8	5/8
3/4	M	0.6250	1.125	1.069	1.002	0.298	0.116	0.088	0.137	0.962	0.349	0.049	0.349	5/8	5/8
5/16	M	0.7500	1.375	1.306	1.230	0.372	0.131	0.111	0.171	1.186	0.369	0.051	0.369	5/8	5/8

^a Additional specifications and details pertain to bodies and threads are given in the General Specifications.

^b These values are calculated to maximum formula.

^c Provision gaging and undercut heads not applicable to wood screws.

^d See Table 4, Dimensions of Undercut Flat Head Machine and Tapping Screws.

hardened to meet the performance requirements in the test specifications. Drive test requirements apply to Types A, B, BP, C, D, E, G, and T tapping screws only. Reference test requirements shall apply to all types of carbon steel case hardened tapping screws.

Test Plates—Test plates shall be low carbon cold rolled steel, having 80-107 Rockwell B (RB) or equivalent hardness. Test holes shall be drilled and redrilled or reamed to ± 0.001 in. of nominal. See Table 1 for test hole sizes and material gages or thickness.

Drive Test—Thread forming tapping screws shall, without deforming their own threads, form a mating thread in the test plate until the tapered threads of the point are completely through the test plate. Thread cutting tapping screws shall, without deforming their own threads cut or form a mating thread until the tapered threads of the point are completely through the test plate. If the screws fail while driving, then additional screws from the same lot shall be subjected to the Reference Test.

Reference Test—Screws shall be clamped by suitable means, making certain that the clamped portion of threads are not damaged, that at least two full threads project above clamping device, and that at least two full threads exclusive of point or end slot are held within the clamping device. By means of a suitably calibrated torque measuring device, torque shall be applied to the screw until failure occurs. The torque required to caused failure shall equal or exceed the minimum values given in Table 2.

TABLE 2—TORSIONAL STRENGTHS FOR REFERENCE TESTING OF TAPPING SCREWS

Screw Size	Type A	Min Torsional Strength, in.-lbs		Types B, BF, BG, BP, and BT	Type C		Types D, E, G, and T	
		Coarse Thread	Fine Thread		Coarse Thread	Fine Thread	Coarse Thread	Fine Thread
2	4	4	5	4	5	6	5	6
3	9	9	9	9	9	10	9	10
4	12	13	13	13	13	15	13	15
5	18	18	18	18	18	20	18	20
6	24	24	23	24	23	27	23	27
7	30	30	23	30	23	27	23	27
8	39	39	42	39	42	47	42	47
10	48	56	56	48	56	74	56	74
12	83	88	93	83	93	108	93	108
14	125	142	140	125	142	179	140	179
16	152	152	140	152	152	179	140	179
5/16	196	290	306	196	290	370	290	370
3/8	250	590	560	250	590	710	560	710
20	492	—	—	492	—	—	—	—
24	—	—	—	—	—	—	—	—

^e 3/16 for Type A tapping screws.

^f Application code:

M — Machine Screws.

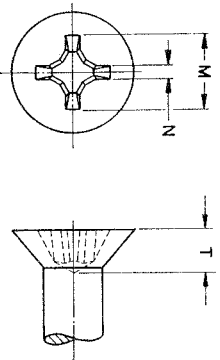
T — Tapping Screws, all types.

A — Tapping Screws, Type A.

Documents

Documents

Documents

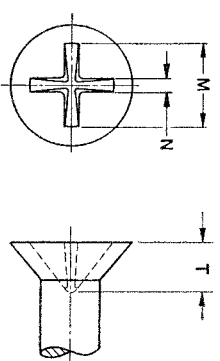


This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded.

TABLE 3A—TYPE I CROSS RECESS DIMENSIONS OF FLAT HEAD MACHINE AND TAPPING SCREWS, IN.

Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Gauging Depth	
	Min	Max	Min	Max	Min	Max		Min	Max
0	0.056	0.069	0.027	0.033	0.014	0.014	0	0.020	0.036
1	0.064	0.077	0.035	0.051	0.015	0.015	0	0.026	0.044
2	0.089	0.102	0.047	0.063	0.017	0.017	1	0.046	0.054
3	0.094	0.107	0.052	0.068	0.018	0.018	1	0.045	0.061
4	0.115	0.128	0.073	0.089	0.018	0.018	1	0.066	0.082
5	0.141	0.154	0.083	0.106	0.029	0.029	2	0.052	0.075
6	0.161	0.174	0.083	0.106	0.030	0.030	2	0.072	0.095
7	0.169	0.182	0.091	0.114	0.030	0.030	2	0.080	0.103
8	0.176	0.189	0.096	0.121	0.030	0.030	2	0.087	0.110
10	0.191	0.204	0.113	0.136	0.032	0.032	2	0.102	0.125
12	0.255	0.268	0.133	0.156	0.035	0.035	3	0.116	0.139
14	0.270	0.283	0.148	0.171	0.036	0.036	3	0.131	0.154
16	0.290	0.303	0.168	0.191	0.039	0.039	3	0.151	0.174
18	0.352	0.365	0.194	0.216	0.061	0.061	4	0.174	0.196
20	0.365	0.378	0.208	0.230	0.062	0.062	4	0.188	0.210
24	0.380	0.393	0.223	0.245	0.065	0.065	4	0.203	0.225
1/4	0.270	0.283	0.148	0.171	0.036	0.036	3	0.131	0.154
5/16	0.352	0.365	0.194	0.216	0.061	0.061	4	0.174	0.196
3/8	0.380	0.393	0.223	0.245	0.065	0.065	4	0.203	0.225
7/16	0.396	0.409	0.239	0.261	0.068	0.068	4	0.219	0.241
1/2	0.411	0.424	0.254	0.276	0.069	0.069	4	0.234	0.256
9/16	0.431	0.454	0.278	0.300	0.073	0.073	4	0.258	0.280
5/8	0.473	0.496	0.316	0.342	0.070	0.070	5	0.283	0.309
3/4	0.537	0.560	0.380	0.406	0.077	0.077	5	0.347	0.373

^a See Appendix B.



This type of recess consists of two intersecting slots with parallel sides converging to a slightly truncated apex at bottom of recess.

TABLE 3B—TYPE II CROSS RECESS DIMENSIONS OF FLAT HEAD MACHINE AND TAPPING SCREWS, IN.

Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Gauging Depth	
	Min	Max	Min	Max	Min	Max		Min	Max
0	0.073	0.083	0.031	0.042	0.021	0.021		$\frac{a-b}{2}$	$\frac{a-b}{2}$
1	0.091	0.102	0.042	0.054	0.024	0.024		0.029	0.040
2	0.109	0.120	0.054	0.066	0.027	0.027		0.041	0.053
3	0.127	0.139	0.066	0.079	0.030	0.030		0.052	0.064
4	0.145	0.157	0.075	0.087	0.032	0.032		0.064	0.077
5	0.162	0.176	0.087	0.101	0.035	0.035		0.075	0.089
6	0.180	0.195	0.098	0.113	0.038	0.038		0.087	0.101
7	0.198	0.213	0.110	0.125	0.040	0.040		0.099	0.113
8	0.216	0.232	0.117	0.132	0.043	0.043	Point on all drivers	0.102	0.117
10	0.251	0.269	0.140	0.156	0.048	0.048	same	0.122	0.137
12	0.287	0.307	0.163	0.181	0.054	0.054		0.145	0.162
14	0.323	0.344	0.178	0.197	0.059	0.059		0.168	0.186
16	0.358	0.381	0.201	0.221	0.064	0.064		0.191	0.210
18	0.394	0.418	0.225	0.245	0.070	0.070		0.215	0.234
20	0.430	0.455	0.248	0.269	0.075	0.075		0.238	0.258
24	0.501	0.529	0.294	0.318	0.086	0.086		0.284	0.307
1/4	0.334	0.355	0.186	0.204	0.061	0.061		0.176	0.193
5/16	0.420	0.444	0.242	0.262	0.074	0.074		0.232	0.251
3/8	0.495	0.523	0.291	0.314	0.086	0.086		0.281	0.303
7/16	0.540	0.568	0.330	0.343	0.092	0.092		0.310	0.332
1/2	0.578	0.608	0.345	0.370	0.098	0.098		0.335	0.359
9/16	0.623	0.656	0.374	0.400	0.104	0.104		0.364	0.389
5/8	0.623	0.656	0.374	0.400	0.104	0.104		0.364	0.389
3/4	0.623	0.656	0.374	0.400	0.104	0.104		0.364	0.389

^a See Appendix B.

^b Not practical to gauge.

TABLE 3C—TYPE I CROSS RECESS DIMENSIONS OF FLAT HEAD WOOD SCREWS, IN.

Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Gauging Depth ^a	
	Min	Max	Min	Max	Min	Max		Min	Max
0	0.056	0.069	0.027	0.033	0.014	0.014	0	0.020	0.036
1	0.064	0.077	0.035	0.051	0.015	0.015	0	0.028	0.044
2	0.089	0.102	0.047	0.063	0.017	0.017	1	0.040	0.056
3	0.094	0.107	0.052	0.068	0.018	0.018	1	0.045	0.061
4	0.115	0.128	0.073	0.089	0.018	0.018	1	0.066	0.082
5	0.141	0.154	0.083	0.106	0.029	0.029	2	0.052	0.075
6	0.161	0.174	0.083	0.106	0.030	0.030	2	0.072	0.095
7	0.176	0.189	0.098	0.121	0.030	0.030	2	0.087	0.110
8	0.191	0.204	0.113	0.136	0.032	0.032	2	0.102	0.125
10	0.201	0.214	0.123	0.146	0.033	0.033	3	0.112	0.135
12	0.245	0.258	0.123	0.146	0.034	0.034	3	0.106	0.129
14	0.270	0.283	0.148	0.171	0.036	0.036	3	0.131	0.154
16	0.290	0.303	0.168	0.191	0.039	0.039	3	0.151	0.174
18	0.314	0.327	0.193	0.216	0.045	0.045	4	0.176	0.199
20	0.365	0.378	0.208	0.230	0.062	0.062	4	0.188	0.210
24	0.380	0.393	0.223	0.245	0.065	0.065	4	0.203	0.225
24	0.411	0.424	0.254	0.276	0.069	0.069	4	0.234	0.256

^a See Appendix B.

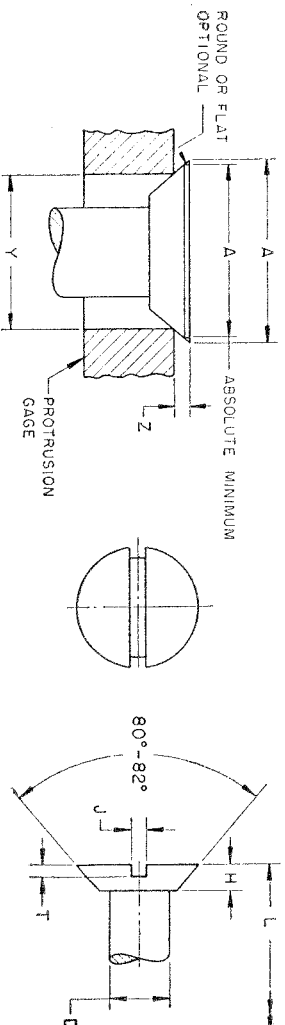
TABLE 3D—TYPE II CROSS RECESS DIMENSIONS OF FLAT HEAD WOOD SCREWS, IN.

Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Gauging Depth ^a	
	Min	Max	Min	Max	Min	Max		Min	Max
0	0.073	0.083	0.031	0.042	0.021	0.021		$\frac{a-b}{2}$	$\frac{a-b}{2}$
1	0.091	0.102	0.042	0.054	0.024	0.024		0.029	0.040
2	0.109	0.120	0.054	0.066	0.027	0.027		0.041	0.053
3	0.127	0.139	0.066	0.079	0.030	0.030		0.052	0.064
4	0.145	0.157	0.075	0.087	0.032	0.032		0.064	0.077
5	0.162	0.176	0.087	0.101	0.035	0.035	Point on all drivers	0.075	0.089
6	0.180	0.195	0.098	0.113	0.038	0.038		0.087	0.101
7	0.198	0.213	0.110	0.125	0.040	0.040		0.099	0.113
8	0.216	0.232	0.117	0.132	0.043	0.043		0.110	0.125
10	0.251	0.269	0.140	0.156	0.048	0.048		0.132	0.147
12	0.287	0.307	0.163	0.181	0.054	0.054		0.145	0.162
14	0.323	0.344	0.178	0.197	0.059	0.059		0.168	0.186
16	0.358	0.381	0.201	0.221	0.064	0.064		0.191	0.210
18	0.394	0.418	0.225	0.245	0.070	0.070		0.215	0.234
20	0.430	0.455	0.248	0.269	0.075	0.075		0.238	0.258
24	0.501	0.529	0.294	0.318	0.086	0.086		0.284	0.307

^a See Appendix B.

^b Not practical to gauge.

(Tables continued on next page)

TABLE 4—DIMENSIONS OF UNDERCUT FLAT HEAD MACHINE AND TAPPING SCREWS, IN.^a

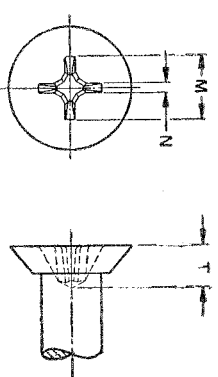
Nominal Size	Appli- cable to Screw Types ^b	D Basic Dia of Screw	Screws These Lengths and Shorter are Undercut	A Dia of Head			H Height of Head		J Width of Slot		T Depth of Slot		Y Gauge Dia	Z Protrusion of Head Above Gauge	
				Max Sharp	Min Sharp	Abs Min	Max	Min	Min	Max	Min	Max		Max	Min
0	MAB	0.050	1/8	0.119	0.105	0.099	0.025	0.018	0.016	0.023	0.007	0.011	—	—	—
1	MAB	0.073	1/8	0.146	0.130	0.123	0.031	0.023	0.026	0.026	0.009	0.014	0.124	0.029	0.017
2	MT	0.086	3/16	0.172	0.156	0.147	0.036	0.028	0.023	0.031	0.011	0.016	0.148	0.031	0.018
3	MT	0.099	1/8	0.199	0.181	0.171	0.042	0.033	0.027	0.035	0.012	0.019	—	—	—
4	MT	0.112	3/16	0.225	0.207	0.195	0.047	0.038	0.031	0.039	0.014	0.022	0.172	0.032	0.019
5	MT	0.125	3/16	0.232	0.232	0.220	0.053	0.043	0.035	0.043	0.016	0.024	0.196	0.034	0.020
6	MT	0.138	3/16	0.259	0.257	0.244	0.059	0.048	0.039	0.048	0.017	0.027	0.220	0.036	0.021
7	AB	0.151	—	0.305	0.283	0.268	0.064	0.053	0.039	0.048	0.019	0.030	0.243	0.037	0.022
8	MT	0.164	1/4	0.332	0.308	0.292	0.070	0.058	0.045	0.054	0.021	0.032	0.267	0.039	0.023
10	MT	0.190	5/16	0.385	0.359	0.340	0.081	0.068	0.050	0.060	0.024	0.037	0.313	0.042	0.025
12	MT	0.216	3/8	0.438	0.410	0.389	0.092	0.078	0.056	0.067	0.028	0.043	0.362	0.045	0.027
14	A	0.242	—	0.491	0.461	0.437	0.104	0.088	0.064	0.075	0.031	0.048	0.410	0.049	0.029
16	A	0.268	—	0.544	0.512	0.485	0.115	0.098	0.064	0.075	0.035	0.053	0.457	0.052	0.031
18	A	0.294	13/16	0.597	0.563	0.534	0.126	0.108	0.072	0.084	0.038	0.058	0.505	0.055	0.033
20	A	0.320	—	0.650	0.614	0.582	0.137	0.118	0.072	0.084	0.042	0.064	0.553	0.058	0.035
24	A	0.372	—	0.756	0.716	0.679	0.160	0.139	0.081	0.094	0.049	0.074	0.648	0.065	0.039
1/4	MBCD	0.250	7/16	0.507	0.477	0.452	0.107	0.092	0.064	0.075	0.032	0.050	0.424	0.050	0.029
5/16	MBCD	0.3125	1/2	0.635	0.600	0.568	0.134	0.116	0.072	0.084	0.041	0.062	0.539	0.057	0.034
3/8	MBCD	0.375	9/16	0.762	0.722	0.685	0.161	0.140	0.081	0.094	0.049	0.075	0.653	0.065	0.039
7/16	MB	0.4375	5/8	0.812	0.767	0.723	0.156	0.133	0.081	0.094	0.045	0.072	0.690	0.073	0.044
1/2	MB	0.500	3/4	0.875	0.831	0.775	0.156	0.130	0.091	0.106	0.046	0.072	0.739	0.081	0.049
9/16	M	0.5625	13/16	1.000	0.950	0.889	0.182	0.153	0.102	0.118	0.054	0.084	0.851	0.089	0.053
5/8	M	0.6250	15/16	1.125	1.069	1.002	0.208	0.176	0.116	0.133	0.052	0.096	0.962	0.097	0.058
3/4	M	0.7500	1-1/8	1.375	1.306	1.230	0.260	0.223	0.131	0.149	0.078	0.120	1.186	0.112	0.067

^a Additional specifications and details pertinent to bodies and threads are given in the General Specifications.^b 3/16 for Type A tapping screws.^c Application code.

M—Machine Screws.

TABLE 4A—TYPE I CROSS RECESS DIMENSIONS OF UNDERCUT FLAT HEAD MACHINE AND TAPPING SCREWS, IN.

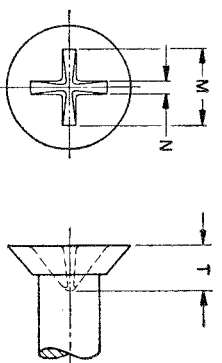
Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess	Driver Size	Penetration Gauging Depth	
	Min	Max	Min	Max	Min		Min	Max
0	0.056	0.069	0.027	0.043	0.014	0	0.020	0.034
1	0.064	0.077	0.035	0.051	0.015	0	0.028	0.044
2	0.082	0.095	0.040	0.056	0.017	1	0.033	0.049
3	0.089	0.102	0.047	0.063	0.018	1	0.040	0.056
4	0.103	0.116	0.062	0.078	0.018	1	0.055	0.071
5	0.115	0.128	0.073	0.089	0.018	2	0.064	0.082
6	0.133	0.146	0.085	0.078	0.025	2	0.044	0.067
7	0.141	0.154	0.063	0.086	0.027	2	0.052	0.075
8	0.161	0.174	0.083	0.106	0.029	2	0.072	0.095
10	0.176	0.189	0.098	0.121	0.050	2	0.087	0.110
12	0.220	0.233	0.098	0.121	0.030	3	0.081	0.104
14	0.227	0.250	0.113	0.136	0.032	3	0.096	0.119
16	0.255	0.268	0.133	0.156	0.035	3	0.116	0.139
18	0.304	0.317	0.146	0.168	0.053	4	0.126	0.148
20	0.304	0.335	0.167	0.186	0.055	4	0.144	0.166
24	0.352	0.365	0.194	0.216	0.061	4	0.174	0.196
1/4	0.237	0.250	0.113	0.136	0.032	3	0.096	0.119
5/16	0.304	0.317	0.146	0.168	0.053	4	0.126	0.148
3/8	0.332	0.365	0.194	0.216	0.061	4	0.174	0.196
7/16	0.380	0.393	0.223	0.245	0.065	4	0.203	0.225
1/2	0.396	0.409	0.242	0.261	0.068	4	0.219	0.241

^a See Appendix B.

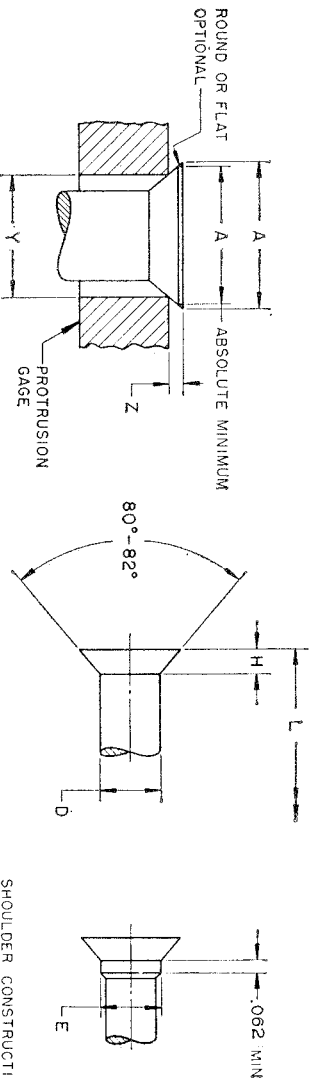
This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded.

TABLE 4B—TYPE II CROSS RECESS DIMENSIONS OF UNDERCUT FLAT HEAD MACHINE AND TAPPING SCREWS, IN.

Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Gaging Depth ^a	
	Min	Max	Min	Max	Min	Max		Min	Max
0	0.062	0.072	0.023	0.035	0.020	0.022	Point	— ^b	— ^b
1	0.097	0.087	0.033	0.045	0.022	0.020		— ^b	— ^b
2	0.095	0.105	0.044	0.036	0.023	0.020		0.030	0.030
3	0.106	0.116	0.052	0.064	0.026	0.038	Point	0.027	0.038
4	0.123	0.135	0.063	0.076	0.039	0.038		0.050	0.050
5	0.141	0.153	0.073	0.086	0.032	0.050		0.062	0.071
6	0.155	0.167	0.082	0.095	0.034	0.050	Point	0.071	0.071
7	0.171	0.185	0.092	0.107	0.036	0.069		0.083	0.083
8	0.190	0.204	0.105	0.119	0.039	0.082		0.095	0.095
10	0.228	0.244	0.125	0.140	0.048	0.102	same on all drivers	0.121	0.121
12	0.251	0.269	0.140	0.156	0.048	0.122		0.137	0.137
14	0.285	0.305	0.162	0.180	0.053	0.144		0.161	0.161
16	0.314	0.336	0.173	0.192	0.058	0.163	same on all drivers	0.181	0.181
18	0.341	0.365	0.190	0.210	0.062	0.180		0.200	0.200
20	0.360	0.404	0.216	0.235	0.068	0.206		0.225	0.225
24	0.439	0.467	0.254	0.277	0.077	0.244	same on all drivers	0.266	0.266
1/4	0.294	0.314	0.160	0.178	0.054	0.150		0.167	0.167
5/16	0.359	0.393	0.208	0.229	0.056	0.198	same on all drivers	0.218	0.218
3/8	0.439	0.467	0.254	0.277	0.077	0.244		0.266	0.266
7/16	0.483	0.513	0.283	0.307	0.083	0.273	same on all drivers	0.296	0.296
1/2	0.533	0.563	0.315	0.340	0.090	0.305		0.329	0.329

^a See Appendix B.^b Not practical to gage.

This type of recess consists of two intersecting slots with parallel sides converging to a slightly truncated apex at bottom of recess.



SHOULDER CONSTRUCTION
FOR LONG SCREWS WITH
REDUCED BODY
(SEE GENERAL SPECIFICATIONS)

TABLE 5—DIMENSIONS OF FLAT TRIM HEAD MACHINE AND TAPPING SCREWS, IN.^{a,b}

Nominal Size	Head	Code Letters	D Basic Dia of Screw	E Dia of Body or Shoulder				A Dia of Head	H ^c Height of Head	Y Gage Dia	Z Protrusion Dia Above Gage					
				Type A Tapping		Machine and Other Types of Tapping					Max Sharp	Min Sharp	Abs Min	Ref	Max	Min
				Max	Min	Max	Min									
4	3	MT	0.112	0.116	0.105	0.112	0.106	0.199	0.181	0.171	0.052	0.148	0.031	0.018		
5	4	MT	0.125	0.129	0.118	0.125	0.119	0.225	0.207	0.195	0.060	0.172	0.032	0.019		
6	4	MT	0.138	0.142	0.131	0.138	0.131	0.225	0.207	0.195	0.052	0.172	0.032	0.019		
6	5	MT	0.138	0.142	0.131	0.138	0.131	0.252	0.232	0.220	0.068	0.196	0.034	0.020		
8	5	MT	0.164	0.168	0.157	0.164	0.157	0.252	0.232	0.220	0.052	0.196	0.034	0.020		
8	6	MT	0.164	0.168	0.157	0.164	0.157	0.279	0.257	0.244	0.069	0.220	0.036	0.021		
10	8	MT	0.190	0.194	0.183	0.190	0.181	0.332	0.308	0.292	0.085	0.267	0.039	0.023		
12	8	MT	0.216	0.220	0.209	0.216	0.207	0.332	0.308	0.292	0.069	0.267	0.039	0.023		
12	10	MT	0.216	0.220	0.209	0.216	0.207	0.385	0.359	0.340	0.101	0.313	0.042	0.025		
14	10	A	0.242	0.246	0.235	—	—	0.385	0.359	0.340	0.080	0.313	0.042	0.025		
14	12	A	0.242	0.246	0.235	—	—	0.438	0.410	0.389	0.112	0.362	0.045	0.027		
1/4	10	MBCD	0.250	—	—	0.250	0.240	0.385	0.359	0.340	0.080	0.313	0.042	0.025		
1/4	12	MBCD	0.250	—	—	0.250	0.240	0.438	0.410	0.389	0.112	0.362	0.045	0.025		
5/16	12	MBCD	0.3125	—	—	0.312	0.302	0.438	0.410	0.389	0.075	0.362	0.045	0.027		
5/16	1/4	MBCD	0.3125	—	—	0.312	0.302	0.507	0.477	0.452	0.116	0.424	0.049	0.029		
3/8	5/16	MBCD	0.375	—	—	0.375	0.364	0.635	0.600	0.568	0.155	0.539	0.057	0.034		

^a Additional specifications and details pertinent to bodies and threads are given in the General Specifications.^b Flat trim head machine and tapping screws are furnished in cross recess head only, see Tables 5A and 5B for recess dimensions.^c These values are calculated to maximum formula.^d Application codes:

M — Machine Screws, all types.

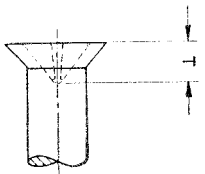
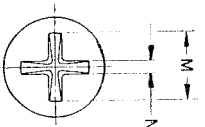
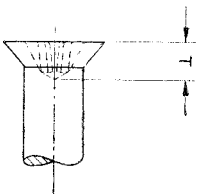
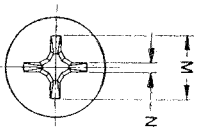
T — Tapping Screws, all types.

A — Tapping Screws, Type A, BF, BG, BP, and BT.

B — Tapping Screws, Type B, BF, BG, BP, and BT.

C — Tapping Screws, Type C.

D — Tapping Screws, Type D, F, G, and T.



This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded.

This type of recess consists of two intersecting slots with parallel sides converging to a slightly truncated apex at bottom of recess.

TABLE 5A—TYPE I CROSS RECESS DIMENSIONS OF FLAT TRIM HEAD MACHINE AND TAPPING SCREWS, IN.

Nominal Size	Body	Head	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Gaging Depth ^a	
			Min	Max	Min	Max	Min	Max		Min	Max
4		3	0.094	0.107	0.052	0.068	0.018		1	0.045	0.061
5		4	0.115	0.128	0.073	0.089	0.018		1	0.066	0.082
6		4	0.115	0.128	0.073	0.089	0.018		1	0.066	0.082
6		5	0.141	0.154	0.063	0.086	0.027		2	0.052	0.075
8		5	0.151	0.164	0.073	0.096	0.029		2	0.062	0.085
8		6	0.169	0.182	0.091	0.114	0.030		2	0.080	0.103
10		8	0.176	0.189	0.098	0.121	0.031		2	0.087	0.110
12		8	0.185	0.198	0.108	0.131	0.032		2	0.097	0.120
12		10	0.191	0.204	0.113	0.136	0.032		2	0.102	0.125
14		10	0.191	0.204	0.113	0.136	0.032		2	0.102	0.125
14		12	0.255	0.268	0.133	0.156	0.035		3	0.116	0.139
1/4		10	0.191	0.204	0.113	0.136	0.032		2	0.102	0.125
1/4		12	0.255	0.268	0.133	0.156	0.035		3	0.116	0.139
5/16		12	0.255	0.268	0.133	0.156	0.035		3	0.116	0.139
5/16		1/4	0.255	0.268	0.133	0.156	0.035		3	0.131	0.154
3/8		5/16	0.352	0.365	0.194	0.216	0.061		4	0.174	0.196

^a See Appendix B.

TABLE 5B—TYPE II CROSS RECESS DIMENSIONS OF FLAT TRIM HEAD MACHINE AND TAPPING SCREWS, IN.

Nominal Size	Body	Head	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Gaging Depth ^a	
			Min	Max	Min	Max	Min	Max		Min	Max
4		3	0.127	0.139	0.066	0.079	0.030			0.041	0.053
5		4	0.145	0.157	0.075	0.088	0.032			0.052	0.064
6		4	0.145	0.157	0.075	0.088	0.032			0.052	0.064
6		5	0.162	0.176	0.087	0.101	0.035			0.064	0.077
8		5	0.162	0.176	0.087	0.101	0.035			0.064	0.077
8		6	0.180	0.195	0.096	0.113	0.038		Point	0.075	0.089
10		8	0.216	0.232	0.117	0.132	0.043			0.099	0.113
12		8	0.216	0.232	0.117	0.132	0.043		same	0.099	0.113
12		10	0.251	0.269	0.140	0.156	0.048		on all	0.122	0.137
14		10	0.251	0.269	0.140	0.156	0.048		drivers	0.122	0.137
14		12	0.287	0.307	0.163	0.181	0.054			0.145	0.162
1/4		12	0.251	0.269	0.140	0.156	0.048			0.122	0.137
1/4		10	0.287	0.307	0.163	0.181	0.054			0.145	0.162
5/16		12	0.287	0.307	0.163	0.181	0.054			0.145	0.162
5/16		1/4	0.334	0.355	0.186	0.204	0.061			0.176	0.193
3/8		5/16	0.420	0.444	0.242	0.262	0.074			0.232	0.251

^a See Appendix B.

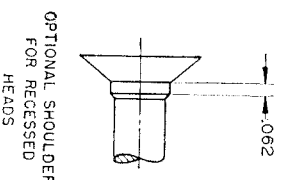
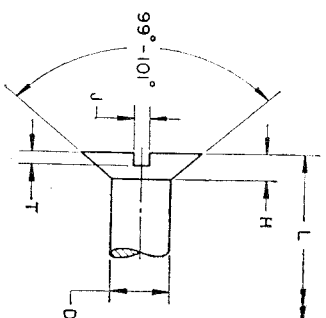
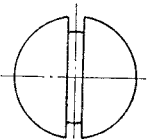
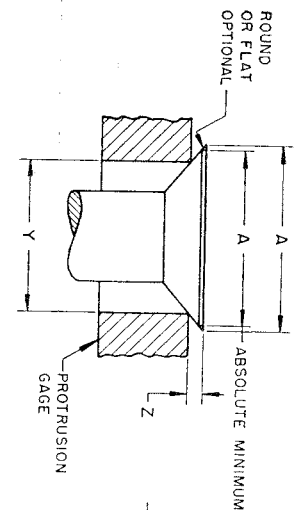


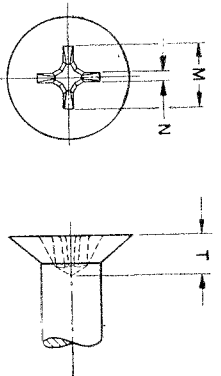
TABLE 6—DIMENSIONS OF 100 DEG FLAT HEAD MACHINE SCREWS, IN.^a

Nominal Size	D Basic Dia of Screw	A Dia of Head			H ^b Height of Head	J Width of Slot		T Depth of Slot		Y Gage Dia	Z Protrusion of Head Above Gage	
		Max Sharp	Min Sharp	Abs Min		Min	Max	Min	Max		Max	Min
4	0.112	0.225	0.207	0.191	0.049	0.031	0.039	0.017	0.024	0.167	0.025	0.016
6	0.138	0.278	0.257	0.238	0.060	0.039	0.048	0.022	0.030	0.214	0.028	0.017
8	0.164	0.332	0.308	0.285	0.072	0.045	0.054	0.027	0.036	0.261	0.031	0.019
10	0.190	0.385	0.359	0.333	0.083	0.050	0.060	0.031	0.042	0.307	0.034	0.021
1/4	0.250	0.507	0.477	0.442	0.110	0.064	0.075	0.042	0.055	0.415	0.040	0.025
5/16	0.3125	0.635	0.600	0.556	0.138	0.072	0.084	0.053	0.069	0.526	0.047	0.030
3/8	0.375	0.762	0.722	0.670	0.165	0.081	0.094	0.055	0.083	0.638	0.053	0.034

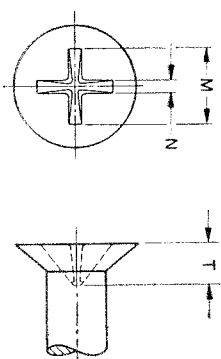
^a Additional specifications and details pertinent to bodies and threads are given in the General Specifications.

^b These values calculated to maximum formula.

(Tables continued on next page)



This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded.



This type of recess consists of two intersecting slots with parallel sides converging to a slightly rounded apex at bottom of recess.

TABLE 6A—TYPE I CROSS RECESS DIMENSIONS OF 100 DEG FLAT MACHINE SCREWS, IN.

Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size		Penetration Gaging Depth ^a	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
4	0.103	0.116	0.062	0.078	0.018	0.018	1	0.055	0.071	0.071
6	0.141	0.154	0.063	0.086	0.027	0.027	2	0.052	0.075	0.075
8	0.156	0.169	0.078	0.101	0.028	0.028	2	0.067	0.090	0.090
10	0.171	0.184	0.093	0.116	0.030	0.030	2	0.082	0.105	0.105
1/4	0.234	0.247	0.112	0.135	0.033	0.033	3	0.095	0.118	0.118
5/16	0.304	0.317	0.146	0.168	0.053	0.053	4	0.126	0.148	0.148
3/8	0.329	0.342	0.171	0.193	0.056	0.056	4	0.151	0.173	0.173

^a See Appendix B.

TABLE 6B—TYPE II CROSS RECESS DIMENSIONS OF 100 DEG FLAT HEAD MACHINE SCREWS, IN.

Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Gaging Depth ^a	
	Min	Max	Min	Max	Min	Max		Min	Max
4	0.126	0.136	0.050	0.089	0.029	0.029	0.036	0.036	0.051
6	0.152	0.162	0.065	0.106	0.033	0.033	0.051	0.051	0.068
8	0.179	0.191	0.081	0.124	0.037	0.037	0.067	0.067	0.086
10	0.213	0.225	0.097	0.147	0.042	0.042	0.109	0.109	0.109
1/4	0.282	0.294	0.136	0.192	0.053	0.053	0.132	0.132	0.154
5/16	0.349	0.361	0.179	0.235	0.063	0.063	0.175	0.175	0.197
3/8	0.426	0.440	0.230	0.287	0.075	0.075	0.226	0.226	0.249

^a See Appendix B.

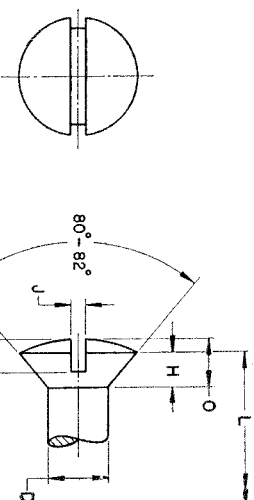
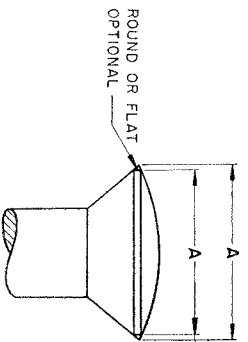


TABLE 7—DIMENSIONS OF OVAL HEAD MACHINE, TAPPING, AND WOOD SCREWS, IN.^a

Nominal Size	Applicable to Screw Types ^b	D Basic Dia of Screw	A Dia of Head			H ^b Side Height of Head	O Total Height of Head		J Width of Slot		T Depth of Slot		Screws These Lengths and Shorter are Undercut	Tapping
			Max Sharp	Min Sharp	Abs Min		Max	Min	Min	Max	Min	Max		
0	MABW	0.060	0.119	0.105	0.099	0.035	0.056	0.041	0.016	0.023	0.025	0.030	1/8	1/8 ^d
1	MABW	0.073	0.146	0.130	0.123	0.043	0.068	0.052	0.019	0.026	0.031	0.038	1/8	5/32 ^d
2	MABW	0.086	0.172	0.156	0.147	0.051	0.080	0.065	0.023	0.031	0.037	0.045	1/8	3/16
3	MTW	0.099	0.199	0.181	0.171	0.059	0.092	0.073	0.027	0.035	0.043	0.052	1/8	7/32
4	MTW	0.112	0.225	0.207	0.195	0.067	0.104	0.084	0.031	0.039	0.049	0.059	3/16	1/4
5	MTW	0.125	0.252	0.232	0.220	0.075	0.116	0.095	0.035	0.043	0.055	0.067	3/16	1/4
6	MTW	0.138	0.267	0.244	0.230	0.083	0.128	0.105	0.039	0.048	0.060	0.074	3/16	5/16
7	ABW	0.151	0.305	0.283	0.268	0.091	0.140	0.116	0.039	0.048	0.066	0.081	—	—
8	MTW	0.164	0.332	0.308	0.292	0.100	0.152	0.126	0.045	0.054	0.072	0.088	1/4	7/16
9	W	0.177	0.358	0.334	0.316	0.108	0.164	0.137	0.045	0.054	0.078	0.095	5/16	1/2
10	MTW	0.190	0.385	0.357	0.340	0.115	0.174	0.148	0.050	0.060	0.084	0.103	5/16	1/2
12	MTW	0.216	0.438	0.410	0.389	0.132	0.200	0.169	0.056	0.067	0.096	0.117	—	9/16
14	AW	0.242	0.491	0.461	0.437	0.148	0.224	0.190	0.064	0.075	0.108	0.132	—	5/8
16	AW	0.268	0.544	0.512	0.485	0.164	0.248	0.212	0.064	0.075	0.120	0.146	—	3/4
18	AW	0.294	0.597	0.563	0.534	0.180	0.272	0.233	0.072	0.084	0.132	0.160	—	13/16
20	AW	0.320	0.650	0.614	0.582	0.196	0.292	0.254	0.072	0.084	0.144	0.175	—	13/16
24	AW	0.372	0.756	0.716	0.679	0.228	0.344	0.297	0.081	0.094	0.168	0.204	—	—
1/4	MBCD	0.350	0.477	0.450	0.432	0.153	0.232	0.197	0.064	0.075	0.112	0.136	7/16	5/8
5/16	MBCD	0.375	0.505	0.477	0.458	0.161	0.260	0.224	0.072	0.084	0.124	0.147	1/2	5/8
3/8	MBCD	0.425	0.555	0.522	0.495	0.230	0.347	0.300	0.081	0.094	0.170	0.206	9/16	5/8
7/16	MB	0.497	0.612	0.576	0.543	0.223	0.345	0.295	0.081	0.094	0.174	0.210	3/4	3/4
1/2	MB	0.500	0.612	0.576	0.543	0.223	0.345	0.295	0.081	0.094	0.174	0.210	3/4	3/4
9/16	MA	0.5625	0.685	0.641	0.608	0.260	0.354	0.299	0.091	0.106	0.176	0.216	13/16	—
5/8	MA	0.6250	0.750	0.700	0.660	0.298	0.407	0.350	0.102	0.118	0.207	0.250	—	—
3/4	M	0.7500	0.900	0.830	0.780	0.372	0.578	0.497	0.131	0.149	0.293	0.353	1-1/8	—

^a Additional specifications and details pertinent to bodies and threads are given in the General Specifications.

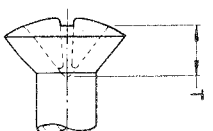
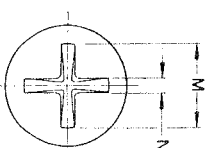
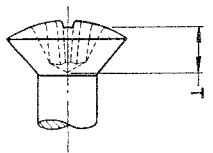
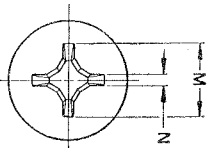
^b These values calculated to maximum formula.

^c Undercut heads not applicable to wood screws. See Table 8, Dimensions of Undercut Oval Head Machine and Tapping Screws.

^d 3/16 for Type A tapping screws.

^e Application code:

M—Machine Screws,
T—Tapping Screws, all types;
A—Tapping Screws, Type A;
B—Tapping Screws, Types B, BF, BG, BF, and BT;
C—Tapping Screws, Type C;
D—Tapping Screws, Types D, F, G, and T;
W—Wood Screws.



This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded.

This type of recess consists of two intersecting slots with parallel sides converging to a slightly truncated apex at bottom of recess.

TABLE 7A—TYPE I CROSS RECESS DIMENSIONS OF OVAL HEAD MACHINE AND TAPPING SCREWS, IN.

Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Gauging Depth ^a	
	Min	Max	Min	Max	Min	Max		Min	Max
0	0.061	0.074	0.027	0.045	0.014	0.015	0	0.020	0.038
1	0.064	0.077	0.030	0.048	0.015	0.015	0	0.023	0.041
2	0.099	0.112	0.052	0.069	0.018	0.018	1	0.045	0.062
3	0.111	0.124	0.064	0.081	0.019	0.019	1	0.057	0.074
4	0.123	0.136	0.077	0.094	0.019	0.019	1	0.070	0.087
5	0.145	0.158	0.061	0.085	0.028	0.028	2	0.050	0.074
6	0.165	0.178	0.080	0.105	0.030	0.030	2	0.057	0.084
7	0.170	0.183	0.086	0.111	0.030	0.030	2	0.075	0.100
8	0.179	0.192	0.095	0.119	0.031	0.031	2	0.084	0.108
10	0.196	0.209	0.113	0.137	0.033	0.033	3	0.102	0.126
12	0.257	0.270	0.128	0.152	0.038	0.038	3	0.111	0.133
14	0.275	0.288	0.140	0.165	0.039	0.039	3	0.123	0.144
16	0.319	0.332	0.189	0.214	0.046	0.046	3	0.172	0.197
18	0.368	0.381	0.202	0.226	0.064	0.064	4	0.181	0.206
20	0.387	0.400	0.221	0.245	0.066	0.066	4	0.201	0.225
24	0.423	0.436	0.258	0.282	0.072	0.072	4	0.238	0.262
1/4	0.277	0.290	0.148	0.173	0.040	0.040	3	0.131	0.156
5/16	0.377	0.390	0.214	0.238	0.065	0.065	4	0.194	0.218
3/8	0.397	0.410	0.245	0.269	0.068	0.068	4	0.213	0.237
7/16	0.409	0.422	0.245	0.269	0.070	0.070	4	0.225	0.249
1/2	0.424	0.437	0.259	0.283	0.071	0.071	4	0.239	0.263
9/16	0.450	0.473	0.292	0.316	0.075	0.075	4	0.271	0.296
5/8	0.568	0.591	0.324	0.356	0.081	0.081	5	0.291	0.315
3/4	0.630	0.653	0.390	0.421	0.088	0.088	5	0.357	0.388

^a See Appendix B.

Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Gauging Depth ^a	
	Min	Max	Min	Max	Min	Max		Min	Max
0	0.073	0.083	0.031	0.042	0.021	0.021	0	0.021	0.031
1	0.091	0.102	0.042	0.054	0.024	0.024	1	0.029	0.040
2	0.109	0.120	0.054	0.066	0.027	0.027	2	0.041	0.053
3	0.127	0.139	0.066	0.079	0.030	0.030	3	0.052	0.064
4	0.145	0.157	0.075	0.088	0.032	0.032	4	0.064	0.077
5	0.162	0.176	0.087	0.101	0.035	0.035	5	0.077	0.089
6	0.180	0.195	0.098	0.113	0.038	0.038	6	0.087	0.101
7	0.198	0.213	0.110	0.125	0.040	0.040	7	0.099	0.113
8	0.216	0.232	0.117	0.132	0.043	0.043	8	0.113	0.127
10	0.251	0.269	0.140	0.156	0.054	0.054	10	0.122	0.137
12	0.287	0.307	0.163	0.181	0.054	0.054	12	0.145	0.162
14	0.323	0.344	0.178	0.197	0.059	0.059	14	0.168	0.186
16	0.358	0.381	0.201	0.221	0.064	0.064	16	0.191	0.210
18	0.394	0.418	0.225	0.245	0.070	0.070	18	0.215	0.234
20	0.430	0.455	0.248	0.269	0.075	0.075	20	0.238	0.258
24	0.501	0.529	0.294	0.318	0.086	0.086	24	0.284	0.307
1/4	0.334	0.355	0.186	0.204	0.061	0.061	1/4	0.176	0.193
5/16	0.420	0.444	0.242	0.262	0.074	0.074	5/16	0.232	0.251
3/8	0.495	0.523	0.291	0.314	0.086	0.086	3/8	0.281	0.303
7/16	0.540	0.568	0.320	0.343	0.092	0.092	7/16	0.310	0.332
1/2	0.578	0.608	0.345	0.370	0.098	0.098	1/2	0.335	0.359
9/16	0.623	0.656	0.374	0.400	0.104	0.104	9/16	0.364	0.389
5/8	0.656	0.686	0.374	0.400	0.104	0.104	5/8	0.364	0.389
3/4	0.623	0.656	0.374	0.400	0.104	0.104	3/4	0.364	0.389

^a See Appendix B.

^b Not practical to gage.

TABLE 7C—TYPE I CROSS RECESS DIMENSIONS OF OVAL HEAD WOOD SCREWS, IN.

Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Gauging Depth ^a	
	Min	Max	Min	Max	Min	Max		Min	Max
0	0.061	0.074	0.027	0.045	0.014	0.014	0	0.020	0.038
1	0.064	0.077	0.030	0.048	0.015	0.015	0	0.023	0.041
2	0.099	0.112	0.052	0.069	0.018	0.018	1	0.045	0.062
3	0.111	0.124	0.064	0.081	0.019	0.019	1	0.057	0.074
4	0.123	0.136	0.077	0.094	0.019	0.019	1	0.070	0.087
5	0.145	0.158	0.061	0.085	0.028	0.028	2	0.050	0.074
6	0.165	0.178	0.080	0.105	0.030	0.030	2	0.057	0.084
7	0.176	0.189	0.092	0.115	0.031	0.031	2	0.081	0.104
8	0.192	0.205	0.106	0.131	0.033	0.033	2	0.095	0.120
9	0.203	0.216	0.119	0.144	0.034	0.034	2	0.108	0.133
10	0.248	0.261	0.118	0.142	0.037	0.037	3	0.101	0.125
12	0.270	0.283	0.140	0.165	0.040	0.040	3	0.123	0.148
14	0.292	0.305	0.163	0.188	0.042	0.042	3	0.146	0.171
16	0.319	0.332	0.189	0.214	0.046	0.046	4	0.172	0.197
18	0.368	0.381	0.202	0.226	0.064	0.064	4	0.182	0.206
20	0.387	0.400	0.221	0.245	0.066	0.066	4	0.201	0.225
24	0.423	0.436	0.258	0.282	0.072	0.072	4	0.238	0.262

^a See Appendix B.

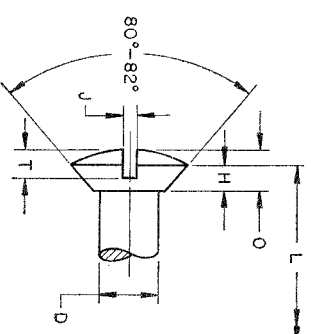
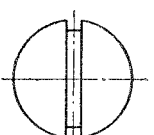
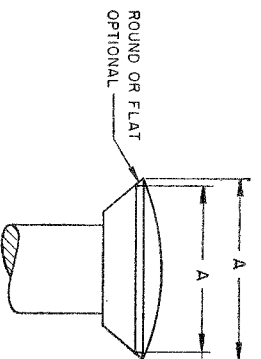
TABLE 7D—TYPE II CROSS RECESS DIMENSIONS OF OVAL HEAD WOOD SCREWS, IN.

Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Gauging Depth ^a	
	Min	Max	Min	Max	Min	Max		Min	Max
0	0.073	0.083	0.031	0.042	0.021	0.021	0	0.021	0.031
1	0.091	0.102	0.042	0.054	0.024	0.024	1	0.029	0.040
2	0.109	0.120	0.054	0.066	0.027	0.027	2	0.041	0.053
3	0.127	0.139	0.066	0.079	0.030	0.030	3	0.052	0.064
4	0.145	0.157	0.075	0.088	0.032	0.032	4	0.064	0.077
5	0.162	0.176	0.087	0.101	0.035	0.035	5	0.077	0.089
6	0.180	0.195	0.098	0.113	0.038	0.038	6	0.087	0.101
7	0.198	0.213	0.110	0.125	0.040	0.040	7	0.099	0.113
8	0.216	0.232	0.117	0.132	0.043	0.043	8	0.113	0.127
9	0.234	0.251	0.128	0.145	0.046	0.046	9	0.122	0.137
10	0.251	0.269	0.140	0.156	0.048	0.048	10	0.145	0.162
12	0.287	0.307	0.163	0.181	0.054	0.054	12	0.168	0.186
14	0.323	0.344	0.178	0.197	0.059	0.059	14	0.191	0.210
16	0.358	0.381	0.201	0.221	0.064	0.064	16	0.215	0.234
18	0.394	0.418	0.225	0.245	0.070	0.070	18	0.238	0.258
20	0.430	0.455	0.248	0.269	0.075	0.075	20	0.284	0.307
24	0.501	0.529	0.294	0.318	0.086	0.086	24	0.310	0.332

^a See Appendix B.

^b Not practical to gage.

(Tables continued on next page)

TABLE 8—DIMENSIONS OF UNDERCUT OVAL HEAD MACHINE AND TAPPING SCREWS, IN.^a

Nominal Size	Applicable Screw Types ^d	D Basic Dia of Screw	¹ Screws These Lengths and Under are Undercut		A Die of Head			^h Side Height of Head	O Total Height of Head		J Width of Slot		T Depth of Slot	
			Machine	Tapping	Max Sharp	Min Sharp	Abs Min	Ref	Max	Min	Min	Max	Min	Max
0	MAB	0.060	1/8	1/8 ^e	0.119	0.105	0.099	0.025	0.046	0.033	0.016	0.023	0.022	0.028
1	MAB	0.073	1/8	5/32 ^e	0.119	0.130	0.123	0.031	0.056	0.042	0.019	0.026	0.022	0.034
2	MAB	0.086	1/8	3/16	0.172	0.156	0.147	0.036	0.065	0.050	0.023	0.031	0.033	0.040
3	MT	0.099	1/8	7/32	0.199	0.181	0.171	0.042	0.075	0.059	0.027	0.035	0.038	0.047
4	MT	0.112	3/16	1/4	0.225	0.207	0.195	0.047	0.084	0.067	0.031	0.039	0.043	0.053
5	MT	0.125	3/16	1/4	0.252	0.232	0.224	0.053	0.094	0.076	0.035	0.043	0.048	0.058
6	MT	0.138	3/16	5/16	0.279	0.257	0.244	0.059	0.104	0.084	0.039	0.048	0.053	0.065
7	AB	0.151	—	3/8	0.305	0.283	0.268	0.064	0.113	0.093	0.039	0.048	0.059	0.071
8	MT	0.164	1/4	7/16	0.332	0.308	0.292	0.070	0.123	0.101	0.045	0.054	0.064	0.078
10	MT	0.190	5/16	1/2	0.385	0.359	0.340	0.081	0.142	0.118	0.050	0.060	0.074	0.090
12	MT	0.216	3/8	5/8	0.438	0.410	0.389	0.092	0.161	0.135	0.056	0.067	0.085	0.103
14	A	0.242	—	5/8	0.491	0.461	0.437	0.104	0.180	0.152	0.064	0.075	0.095	0.113
16	A	0.268	—	—	0.544	0.512	0.485	0.115	0.199	0.169	0.064	0.075	0.107	0.128
18	A	0.294	—	1 1/16	0.597	0.563	0.534	0.126	0.218	0.186	0.072	0.084	0.116	0.140
20	A	0.320	—	1 1/8	0.650	0.614	0.582	0.137	0.238	0.203	0.072	0.084	0.127	0.153
24	A	0.372	—	—	0.756	0.716	0.679	0.160	0.276	0.237	0.081	0.094	0.148	0.178
1/4	MBCD	0.250	7/16	5/8	0.507	0.477	0.452	0.107	0.186	0.158	0.064	0.075	0.098	0.119
5/16	MBCD	0.3125	1/2	5/8	0.635	0.600	0.568	0.134	0.232	0.198	0.072	0.084	0.124	0.149
3/8	MBCD	0.375	5/8	3/4	0.752	0.722	0.685	0.151	0.278	0.239	0.081	0.094	0.149	0.179
7/16	MBCD	0.4375	3/4	3/4	0.812	0.767	0.723	0.156	0.299	0.259	0.081	0.094	0.154	0.184
1/2	MB	0.500	3/4	3/4	0.875	0.831	0.775	0.156	0.288	0.244	0.081	0.106	0.169	0.204
9/16	M	0.5625	13/16	—	1.000	0.950	0.889	0.182	0.332	0.283	0.102	0.118	0.194	0.233
5/8	M	0.6250	1 1/16	—	1.125	1.069	1.002	0.208	0.377	0.323	0.106	0.133	0.220	0.263
3/4	M	0.7500	1 1/8	—	1.375	1.306	1.230	0.260	0.467	0.402	0.131	0.149	0.270	0.322

^a Additional specifications and details pertinent to bodies and threads are given in the General Specifications.^b These values calculated to maximum formula.^c 3/16 for Type A tapping screws.^d Application codes:

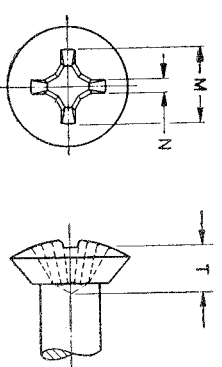
M — Machine Screws.
T — Tapping Screws, all types.
A — Tapping Screws, Type A.
B — Tapping Screws, Type B, BF, BG, BF, and BT.
C — Tapping Screws, Type C.
D — Tapping Screws, Types D, F, G, and T.

TABLE 8A—TYPE I CROSS RECESS DIMENSIONS OF UNDERCUT OVAL HEAD MACHINE AND TAPPING SCREWS, IN.

Nominal Size	M Dia of Recess		T Depth of Recess		N Width of Recess		Driver Size	Penetration Depth ^g	
	Min	Max	Min	Max	Min	Max		Min	Max
0	0.061	0.074	0.027	0.045	0.014	0.020	0	0.020	0.038
1	0.064	0.077	0.030	0.048	0.015	0.023	0	0.023	0.041
2	0.069	0.112	0.052	0.069	0.018	0.045	1	0.045	0.062
3	0.111	0.124	0.064	0.081	0.019	0.057	1	0.057	0.074
4	0.123	0.136	0.077	0.094	0.019	0.070	1	0.070	0.087
5	0.145	0.158	0.061	0.085	0.028	0.050	2	0.050	0.074
6	0.165	0.178	0.080	0.105	0.030	0.069	2	0.069	0.094
7	0.170	0.183	0.086	0.111	0.030	0.075	2	0.075	0.100
8	0.179	0.192	0.095	0.119	0.031	0.084	2	0.084	0.108
10	0.196	0.206	0.113	0.137	0.033	0.102	2	0.102	0.126
12	0.257	0.270	0.128	0.152	0.038	0.111	3	0.111	0.135
14	0.225	0.268	0.140	0.165	0.039	0.123	3	0.123	0.148
16	0.294	0.307	0.166	0.190	0.040	0.149	3	0.149	0.173
18	0.352	0.365	0.185	0.209	0.061	0.165	4	0.165	0.189
20	0.377	0.390	0.214	0.238	0.064	0.194	4	0.194	0.218
24	0.367	0.400	0.221	0.245	0.066	0.201	4	0.201	0.225
1/4	0.277	0.290	0.148	0.173	0.040	0.131	3	0.131	0.156
5/16	0.381	0.202	0.064	0.226	0.064	0.182	4	0.206	0.206
3/8	0.387	0.400	0.221	0.245	0.066	0.201	4	0.201	0.225
7/16	0.397	0.410	0.233	0.257	0.068	0.213	4	0.213	0.237
1/2	0.409	0.422	0.245	0.269	0.070	0.225	4	0.225	0.249

^g See Appendix B.

This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded.



(Tables continued on next page)