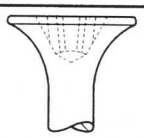
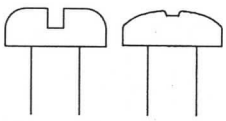
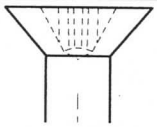
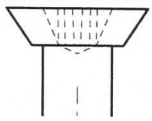
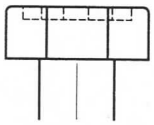
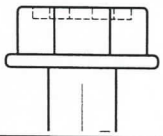
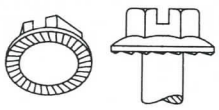
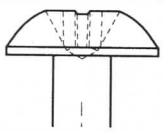
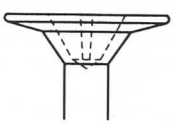
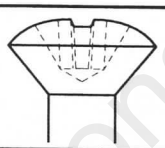
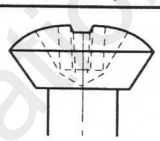
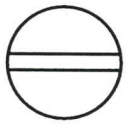
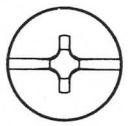
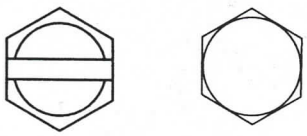
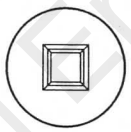
Self-Tapping Screws — *Head Styles*

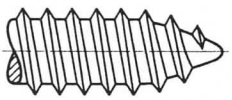
Schematic	Head Style	Description	Applications/ Advantages
	Bugle	A countersunk head with a flat top surface and a concave underhead bearing surface.	Designed specifically for use in drywall. Distributes bearing stress over a wider area than flat heads.
	Pan	Slotted pan heads have a flat or gently rounded top surface, cylindrical sides and a flat bearing surface. Phillips, Torx® and square pan heads have a rounded top surface, cylindrical sides and a flat bearing surface.	For general applications. Can be substituted in most applications for round, truss or binding heads.
	Flat 82°	A countersunk head with a flat top surface and a cone-shaped bearing surface with a head angle of approximately 82°.	Used in applications where protrusion of the fastener above the mating surface is unacceptable. Use a protrusion gage when measuring head height.
	Flat Undercut	Similar to an 82° flat head except that the head is undercut to 70% of its normal side height.	Standard for short lengths because it allows greater length of threads. Also avoids transition fillet and assembly interference.
	Indented Hex	Has an indented top surface, six flat sides, and a flat bearing surface.	Preferred in high volume assembly where pneumatic equipment is used to drive the screw. Can transmit significantly higher tightening torque levels than other head styles.
	Indented Hex Washer	Has an indented top surface, six flat sides with a flat washer which projects beyond the sides and provides a flat bearing surface. The washer and hex head are formed together as one piece.	Increased bearing area reduces likelihood of crushing mating surfaces.
	Serrated Hex Washer	Same as an Indented Hex Washer head but with serrations formed into the bearing surface on the underside of the washer.	Serration geometry is oriented to resist loosening. Also slows the screw at the point of engagement with the mating piece of sheet metal so as to minimize stripping.
	Truss	Has a low rounded top with a flat bearing surface greater in area than a round-head screw of the same nominal size.	Weaker than pan or round heads but preferred in applications where minimal clearance exists above the head. Truss profile provides a trim, finished appearance.
	Wafer	A countersunk head with a flat top surface and a cone-shaped bearing surface. The wafer's 70° conical underhead area does not extend to the outer edge of the head, providing a bearing surface of 16° around the circumference of the underhead.	Preferred head style for Type-CSD self-drilling screws. Provides the necessary bearing surface and flush fit in wood and softer materials. The head/shank fillet contoured to strengthen the underhead area.
	Oval	A countersunk head with a rounded top surface and a cone-shaped bearing surface of approximately 82°.	Preferred over a flat head in conical applications, or when a more decorative finished look is desired. The countersunk surface nests into mating countersunk application sites.
	Oval Undercut	Similar to an 82° oval head except that the head is undercut to 70% of its normal side height.	Standard for short lengths because it allows greater length of threads.
	Round (U-drive)	Has a semi-elliptical top surface and a flat bearing surface.	Standard head style for drive screws. Provides efficient non-torque fastening for high-speed assembly.

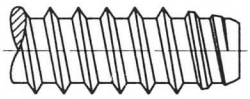
Drive Types for Self-Tapping Screws

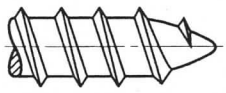
Schematic	Drive Type	Uses
	Phillips	Most recommended drive type. Provides good control in driving. Always use a driver bit of the proper size which is in good condition.
	Slotted	Accepts standard blade screwdriver. Requires less downward pressure to drive parts than those with recessed openings. Use proper fitting blade to minimize slippage.
	Combination: Phillips/Slotted	Accepts phillips and standard blade screwdrivers. Often used when fastener is expected to be driven and backed-out several times.
	Hex / Slotted-Hex	Accepts hex wrench. Slotted drive is added to make it easier to remove the fastener.
	Torx®	Positive-engaging, fast-locating method which transmits drive torque with less required downward pressure. Good fastening appearance.
	Square	Increases productivity with excellent torque transmission and resists cam-out. Distinctive appearance which discourages tinkering.
	Pozidriv®-Alternative (Type 1A)	Design offers even greater control in driving than Phillips drive. Used in automotive and appliance manufacturing.

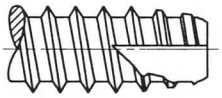
Torx® is a registered trademark of the Camcar Corporation, division of Textron Industries.
Pozidriv® is a registered trademark of the Phillips Screw Company. Kanebridge Type-1A drive fasteners are not manufactured by or connected with the producers of Pozidriv® screws.

Self-Tapping Screws *Hole Size Data* Types A, AB, B, 25

AB 

B 

A 

25 

Suggested Test Plate Thicknesses & Hole Sizes for Types AB - B - 25

Nominal Screw Size & No. of Threads per Inch	Thickness			Hole Size	
	Gage	Max	Min	Drill Size	Hole Diam.
2-32	18	.0500	.0460	48	.0760
3-28	18	.0500	.0460	46	.0810
4-24	18	.0500	.0460	44	.0860
5-20	18	.0500	.0460	36	.1065
6-20	14	.0770	.0730	32	.1160
7-19	14	.0770	.0730	30	.1285
8-18	14	.1270	.1230	29	.1360
10-16	1/8	.1270	.1230	21	.1590
12-14	1/8	.1270	.1230	3/16	.1875
1/4-14	3/16	.1905	.1845	5.5 mm	.2165
5/16-12	3/16	.1905	.1845	I	.2720
3/8-12	3/16	.1905	.1845	21/64	.3281

Suggested Hole Sizes for Type A

Nominal Screw Size	Hole Size	
	Drill Size	Hole Diam.
6-18	#32	0.1160
7-16	#30	0.1285
8-15	#29	0.1360
10-12	#21	0.1590
12-11	3/16	0.1875
14-10	5.5mm	0.2165
20-9	L	0.2900
24-9	11/32	0.3438

Notes Regarding Hole Preparation:

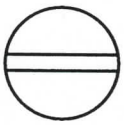
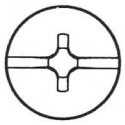
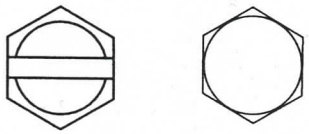
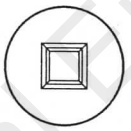
- Preformed holes can be drilled, cored, punched, pierced or extruded. If edge burrs can cause assembly difficulty, they should be removed. Wall ovality and/or taper can affect load carrying ability.

- "Minimum torsional strength" is the torque that free standing screws must accept without evidence of damage or failure.

Drive Types

Self-Tapping Screws

Drive Types for Self-Tapping Screws

Schematic	Drive Type	Uses
	Phillips	Most recommended drive type. Provides good control in driving. Always use a driver bit of the proper size which is in good condition.
	Slotted	Accepts standard blade screwdriver. Requires less downward pressure to drive parts than those with recessed openings. Use proper fitting blade to minimize slippage.
	Combination: Phillips/Slotted	Accepts phillips and standard blade screwdrivers. Often used when fastener is expected to be driven and backed-out several times.
	Hex / Slotted-Hex	Accepts hex wrench. Slotted drive is added to make it easier to remove the fastener.
	Torx®	Positive-engaging, fast-locating method which transmits drive torque with less required downward pressure. Good fastening appearance.
	Square	Increases productivity with excellent torque transmission and resists cam-out. Distinctive appearance which discourages tinkering.
	Pozidriv®-Alternative (Type 1A)	Design offers even greater control in driving than Phillips drive. Used in automotive and appliance manufacturing.

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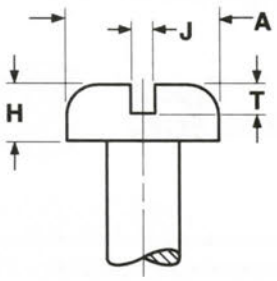
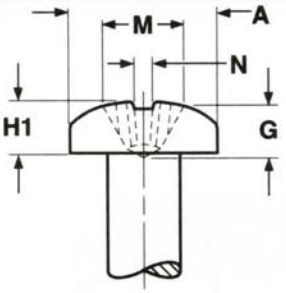
Self-Tapping Screws *Head Dimensions* Pan 100° Flat

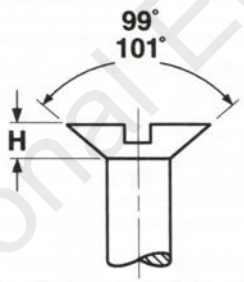


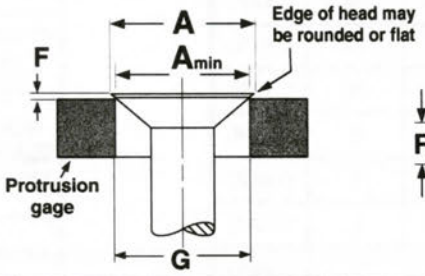


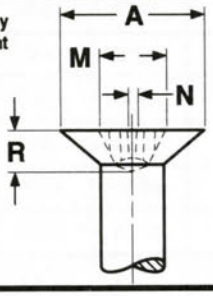
Pan Heads for Self-Tapping and Drilling Screws

ASME B18.6.4-1998

Nominal Size	A		H		H1		J		T		M		G	N	Phillips Driver Size
	Head Diameter		Height of Head				Width of Slot		Depth of Slot		Dimensions of Recess				
			Slotted		Recessed						Diameter		Depth	Width	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
2	.167	.155	.053	.045	.062	.053	.031	.023	.031	.022	.104	.091	.059	.017	1
3	.193	.180	.060	.051	.071	.062	.035	.027	.036	.026	.112	.099	.068	.019	1
4	.219	.205	.068	.058	.080	.070	.039	.031	.040	.030	.122	.109	.078	.019	1
5	.245	.231	.075	.065	.089	.079	.043	.035	.045	.034	.158	.145	.083	.028	2
6	.270	.256	.082	.072	.097	.087	.048	.039	.050	.037	.166	.153	.091	.028	2
7	.296	.281	.089	.079	.106	.096	.048	.039	.054	.041	.176	.163	.100	.029	2
8	.322	.306	.096	.085	.115	.105	.054	.045	.058	.045	.182	.169	.108	.030	2
10	.373	.357	.110	.099	.133	.122	.060	.050	.068	.053	.199	.186	.124	.031	2
12	.425	.407	.125	.112	.151	.139	.067	.056	.077	.061	.259	.246	.141	.034	3
14	.476	.457	.139	.126	.169	.156	.075	.064	.085	.068	.281	.268	.148	.036	3
1/4	.492	.473	.144	.130	.175	.162	.075	.064	.087	.070	.281	.268	.161	.036	3
5/16	.615	.594	.178	.162	.218	.203	.084	.072	.106	.085	.350	.337	.193	.059	4
3/8	.740	.716	.212	.195	.261	.244	.094	.081	.124	.100	.389	.376	.233	.065	4





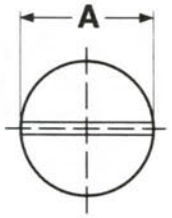


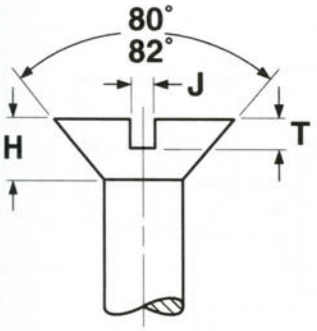
Flat Head 100° for Self-Tapping Screws

ASME B18.6.4-1998

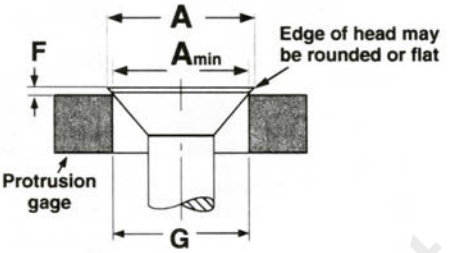
Nominal Size	A		H		J		T		M	R	N	F		G	Phillips Driver Size
	Head Dimensions				Slot Dimensions				Recess Dimensions			Protrusion Above Gaging Diameter		Gaging Diameter	
	Diameter		Height		Width		Depth		Diam.	Depth	Width				
	Max	Min	Max	Min	Max	Min	Max	Min	Ref	Ref	Ref	Max	Min		
4	.212	.188	.049	.039	.039	.031	.024	.017	.110	.070	.018	.025	.016	.167	1
6	.262	.235	.060	.049	.048	.039	.030	.022	.148	.074	.027	.028	.017	.214	2
8	.312	.282	.072	.060	.054	.045	.036	.027	.162	.090	.028	.031	.019	.261	2
10	.362	.329	.083	.070	.060	.050	.042	.031	.178	.104	.030	.034	.021	.307	2
1/4	.477	.437	.110	.094	.075	.064	.055	.042	.240	.124	.033	.040	.025	.415	3

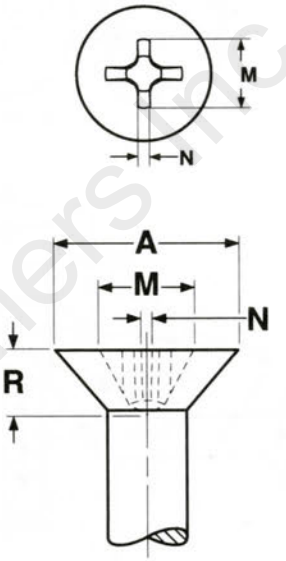
82° Flat *Head Dimensions* Self-Tapping Screws





Slotted





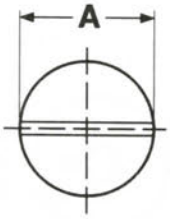
Phillips

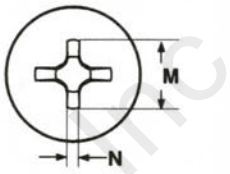
Flat Heads for Self-Tapping Screws

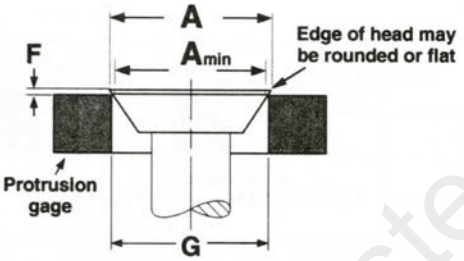
ASME B18.6.4-1998

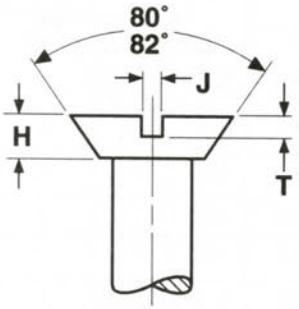
Nominal Size	These Lengths or Shorter are Undercut		A		H		J		T		M	R	N	F		G	Phillips Driver Size
	Head Dimensions						Slot Dimensions				Phillips Dimensions			Protrusion Above Gaging Diameter		Gaging Diameter	
	Diameter				Height		Width		Depth		Diam.	Depth	Width				
	Types A & AB	Other Types	Max	Min	Max	Min	Max	Min	Max	Min	Ref	Ref	Ref	Max	Min		
0	3/16	1/8	.112	.096	.035	.026	.023	.016	.015	.010	.062	.035	.014	.026	.016	.078	0
1	3/16	5/32	.137	.120	.043	.033	.026	.019	.019	.012	.070	.043	.015	.028	.016	.101	0
2	3/16	3/16	.162	.144	.051	.040	.031	.023	.023	.015	.096	.055	.017	.029	.017	.124	1
3	7/32	7/32	.187	.167	.061	.047	.035	.027	.027	.017	.100	.060	.018	.031	.018	.148	1
4	1/4	1/4	.212	.191	.067	.055	.039	.031	.030	.020	.122	.081	.018	.032	.019	.172	1
5	1/4	1/4	.237	.215	.075	.062	.043	.035	.034	.022	.148	.074	.027	.034	.020	.196	2
6	5/16	5/16	.262	.238	.083	.069	.048	.039	.038	.024	.168	.094	.029	.036	.021	.220	2
7	3/8	3/8	.287	.262	.091	.076	.048	.039	.041	.027	.176	.102	.030	.037	.022	.243	2
8	7/16	7/16	.312	.285	.100	.084	.054	.045	.045	.029	.182	.110	.030	.039	.023	.267	2
10	1/2	1/2	.362	.333	.116	.098	.060	.050	.053	.034	.198	.124	.032	.042	.025	.313	2
12	9/16	9/16	.412	.380	.132	.112	.067	.056	.060	.039	.262	.144	.035	.045	.027	.362	3
14	5/8	-	.462	.427	.148	.126	.075	.064	.068	.044	.276	.160	.036	.049	.029	.410	3
1/4	5/8	5/8	.477	.442	.153	.131	.075	.064	.070	.046	.276	.160	.036	.050	.029	.424	3
5/16	13/16	5/8	.597	.556	.191	.165	.084	.072	.088	.058	.358	.205	.061	.057	.034	.539	4
3/8	-	5/8	.717	.670	.230	.200	.094	.081	.106	.070	.386	.234	.065	.065	.039	.653	4
1/2	-	3/4	.815	.765	.223	.186	.106	.091	.103	.065	.418	.265	.069	.081	.049	.739	4

Self-Tapping Screws *Head Dimensions* Flat Undercut









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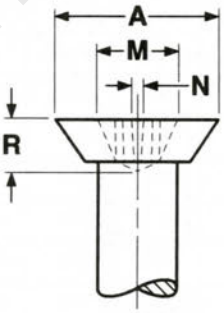


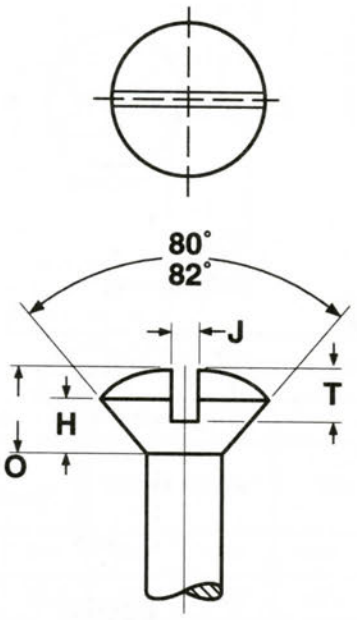
Phillips

Undercut Flat Heads for Self-Tapping Screws

ASME B18.6.4-1998

Nominal Size	These Lengths or Shorter are Undercut		A		H		J		T		M	R	N	F		G	Phillips Driver Size
	Head Dimensions						Slot Dimensions				Recess Dimensions			Protrusion Above Gaging Diameter		Gaging Diameter	
	Diameter				Height		Width		Depth		Diam.	Depth	Width				
	Types A & AB	Other Types	Max	Min	Max	Min	Max	Min	Max	Min	Ref	Ref	Ref	Max	Min		
0	3/16	1/8	.112	.096	.025	.018	.023	.016	.011	.007	.062	.035	.014	-	-	-	0
1	3/16	5/32	.137	.120	.031	.023	.026	.019	.014	.009	.070	.043	.015	-	-	-	0
2	3/16	3/16	.162	.144	.036	.028	.031	.023	.016	.011	.088	.048	.017	.029	.017	.124	1
3	7/32	7/32	.187	.167	.042	.033	.035	.027	.019	.012	.096	.055	.018	.031	.018	.148	1
4	1/4	1/4	.212	.191	.047	.038	.039	.031	.022	.014	.110	.070	.018	.032	.019	.172	1
5	1/4	1/4	.237	.215	.053	.043	.043	.035	.024	.016	.122	.081	.018	.034	.020	.196	1
6	5/16	5/16	.262	.238	.059	.048	.048	.039	.027	.017	.140	.066	.025	.036	.021	.220	2
7	3/8	3/8	.287	.262	.064	.053	.048	.039	.030	.019	.148	.074	.027	.037	.022	.243	2
8	7/16	7/16	.312	.285	.070	.058	.054	.045	.032	.021	.168	.094	.029	.039	.023	.267	2
10	1/2	1/2	.362	.333	.081	.068	.060	.050	.037	.024	.182	.110	.030	.042	.025	.313	2
12	9/16	9/16	.412	.380	.092	.078	.067	.056	.043	.028	.226	.110	.030	.045	.027	.362	3
1/4	5/8	5/8	.477	.442	.107	.092	.075	.064	.050	.032	.244	.124	.032	.050	.029	.424	3
5/16	13/16	5/8	.597	.556	.134	.116	.084	.072	.062	.041	.310	.157	.053	.057	.034	.539	4
3/8	-	5/8	.717	.670	.161	.140	.094	.081	.075	.049	.358	.205	.061	.065	.039	.653	4

Oval *Head Dimensions* Self-Tapping Screws



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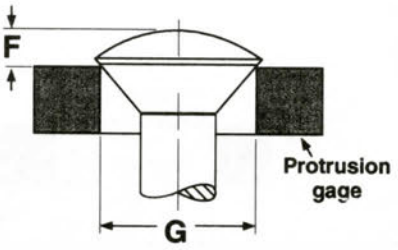
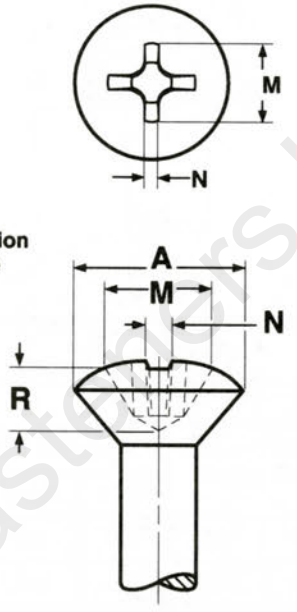




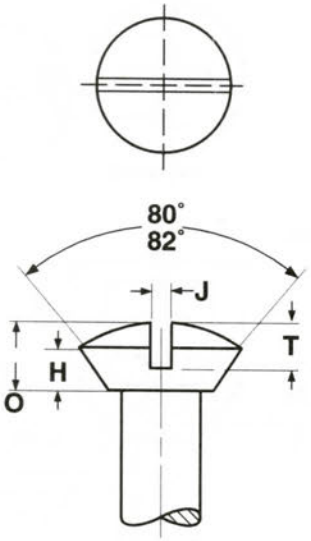
Phillips

Oval Heads for Self-Tapping Screws

ANSI B18.6.4-1998

Nominal Size	A		H	O	J		T		M	R	N	F		G	Phillips Driver Size
	Head Diameter		Height of Head		Width of Slot		Depth of Slot		Dimensions of Recess			Protrusion Above Gaging Diameter		Gaging Diam.	
			Side	Total					Diam	Depth	Width				
	Max	Min	Max	Max	Max	Min	Max	Min	Ref	Ref	Ref	Max	Min		
0	.112	.096	.035	.056	.023	.016	.030	.025	.068	.036	.014	.047	.031	.078	0
1	.137	.120	.043	.068	.026	.019	.038	.031	.070	.039	.015	.053	.035	.101	0
2	.162	.144	.051	.080	.031	.023	.045	.037	.106	.060	.018	.058	.039	.124	1
3	.187	.167	.059	.092	.035	.027	.052	.043	.118	.072	.019	.064	.044	.148	1
4	.212	.191	.067	.104	.039	.031	.059	.049	.130	.086	.019	.069	.048	.172	1
5	.237	.215	.075	.116	.043	.035	.067	.055	.152	.073	.028	.075	.053	.196	2
6	.262	.238	.083	.128	.048	.039	.074	.060	.172	.092	.030	.080	.057	.220	2
7	.287	.262	.091	.140	.048	.039	.081	.066	.176	.098	.030	.085	.062	.243	2
8	.312	.285	.100	.152	.054	.045	.088	.072	.186	.107	.031	.091	.066	.267	2
10	.362	.333	.116	.176	.060	.050	.103	.084	.202	.125	.033	.102	.075	.313	2
12	.412	.380	.132	.200	.067	.056	.117	.096	.264	.140	.038	.113	.084	.362	3
14	.462	.427	.148	.224	.075	.064	.132	.108	.282	.152	.039	.125	.093	.410	3
1/4	.477	.442	.153	.232	.075	.064	.136	.112	.284	.160	.040	.129	.095	.424	3
5/16	.597	.556	.191	.290	.084	.072	.171	.141	.384	.226	.065	.155	.117	.539	4
3/8	.717	.670	.230	.347	.094	.081	.206	.170	.404	.245	.068	.182	.139	.653	4
7/16	.760	.715	.223	.345	.094	.081	.210	.174	.416	.257	.070	.195	.150	.690	4
1/2	.815	.765	.223	.354	.106	.091	.216	.176	.430	.271	.071	.212	.163	.739	4

Self-Tapping Screws *Head Dimensions* Oval Undercut



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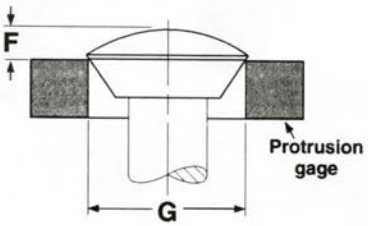
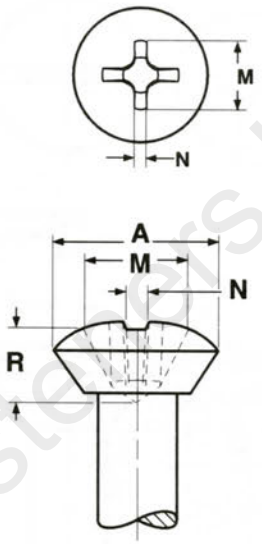




Phillips

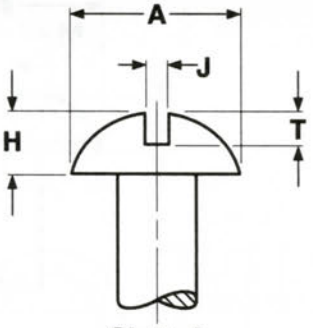
Undercut Oval Heads For Self-Tapping Screws

ANSI B18.6.4-1998

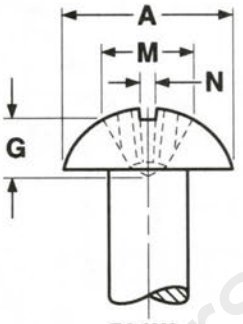
Nominal Size	These Lengths or Shorter are Undercut		A		H	O		J		T		M	R	N	F		G	
	Head Dimensions							Slot Dimensions				Recess Dimensions			Protrusion Above Gaging Diameter		Gaging Diam.	Phillips Driver Size
			Diameter		Side Height	Total Height		Width		Depth		Diam	Depth	Width				
	Type AB	Other Types	Max	Min	Ref	Max	Min	Max	Min	Max	Min	Ref	Ref	Ref	Max	Min		
0	3/16	1/8	0.112	0.096	0.025	0.046	0.033	0.023	0.016	0.028	0.022	0.068	0.036	0.014	0.047	0.031	0.078	0
1	3/16	5/32	0.137	0.120	0.031	0.056	0.042	0.026	0.019	0.034	0.027	0.070	0.039	0.015	0.053	0.035	0.101	0
2	3/16	3/16	0.162	0.144	0.036	0.065	0.050	0.031	0.023	0.040	0.033	0.106	0.060	0.018	0.058	0.039	0.124	1
3	7/32	7/32	0.187	0.167	0.042	0.075	0.059	0.035	0.027	0.047	0.038	0.118	0.072	0.019	0.064	0.044	0.148	1
4	1/4	1/4	0.212	0.191	0.047	0.084	0.067	0.039	0.031	0.053	0.043	0.130	0.086	0.019	0.069	0.048	0.172	1
5	1/4	1/4	0.237	0.215	0.053	0.094	0.076	0.043	0.035	0.059	0.048	0.152	0.073	0.028	0.075	0.053	0.196	2
6	5/16	5/16	0.262	0.238	0.059	0.104	0.084	0.048	0.039	0.065	0.053	0.172	0.092	0.030	0.080	0.057	0.220	2
7	3/8	3/8	0.287	0.262	0.064	0.113	0.093	0.048	0.039	0.071	0.059	0.176	0.098	0.030	0.085	0.062	0.243	2
8	7/16	7/16	0.312	0.285	0.070	0.123	0.101	0.054	0.045	0.078	0.064	0.186	0.107	0.031	0.091	0.066	0.267	2
10	1/2	1/2	0.362	0.333	0.081	0.142	0.118	0.060	0.050	0.090	0.074	0.202	0.125	0.033	0.102	0.075	0.313	2
12	9/16	9/16	0.412	0.380	0.092	0.161	0.135	0.067	0.056	0.103	0.085	0.264	0.140	0.038	0.113	0.084	0.362	3
1/4	5/8	5/8	0.477	0.442	0.107	0.186	0.158	0.075	0.064	0.119	0.098	0.284	0.160	0.040	0.129	0.095	0.424	3
5/16	13/16	5/8	0.597	0.556	0.134	0.232	0.198	0.084	0.072	0.149	0.124	0.374	0.214	0.065	0.155	0.117	0.539	4
3/8	-	5/8	0.717	0.670	0.161	0.278	0.239	0.094	0.081	0.179	0.149	0.394	0.233	0.068	0.182	0.139	0.653	4
7/16	-	3/4	0.760	0.715	0.156	0.279	0.239	0.094	0.081	0.184	0.154	0.404	0.245	0.070	0.195	0.150	0.690	4
1/2	-	3/4	0.815	0.765	0.156	0.288	0.244	0.106	0.091	0.204	0.169	0.416	0.257	0.071	0.212	0.163	0.739	4

Round & Round Washer

Head Dimensions Self-Tapping Screws



Slotted

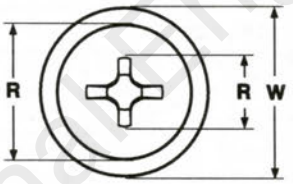


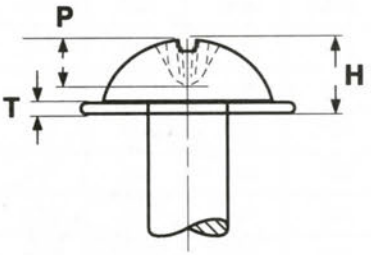
Phillips

Round Heads for Self Tapping Screws

ASME B18.6.4-1998

Nominal Size	A		H		J		T		M	G	N	Recess Penetration Gaging Depth		Phillips Driver Size
	Head Diameter		Height of Head		Slot Width		Slot Depth		Dimensions of Recess					
									Diameter	Depth	Width			
	Max	Min	Max	Min	Max	Min	Max	Min	Ref	Ref	Ref	Max	Min	
2	.162	.146	.069	.059	.031	.023	.048	.037	.094	.044	.017	.046	.027	1
4	.211	.193	.086	.075	.039	.031	.058	.044	.112	.062	.019	.065	.046	1
6	.260	.240	.103	.091	.048	.039	.068	.051	.156	.070	.027	.073	.045	2
8	.309	.287	.120	.107	.054	.045	.077	.058	.172	.088	.030	.090	.064	2
10	.359	.334	.137	.123	.060	.050	.087	.065	.188	.106	.031	.108	.082	2
12	.408	.382	.153	.139	.067	.056	.096	.073	.242	.112	.032	.108	.082	3
14	.457	.429	.170	.155	.075	.064	.106	.080	.258	.129	.034	.125	.099	3
1/4	.472	.443	.175	.160	.075	.064	.109	.082	.262	.134	.034	.130	.104	3



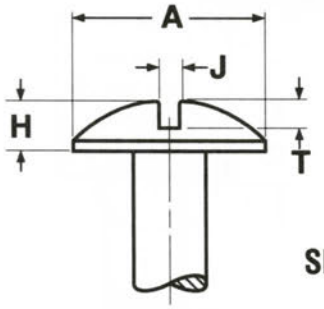


Round Washer Heads for Self Tapping Screws

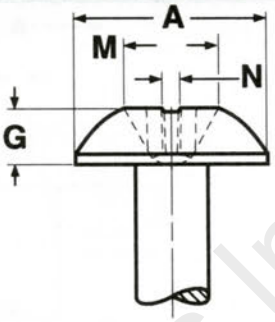
ASME B18.6.3-2002

Nominal Size	W		T	R	H		D	P	Recess Penetration Gaging Depth		Phillips Driver Size
	Washer Outside Diameter		Washer Thickness	Crown Diameter	Overall Head Height		Recess Diameter	Recess Depth			
	Max	Min	Ref	Ref	Max	Min	Ref	Ref	Max	Min	
6	.321	.301	.040	.218	.096	.084	.147	.058	.061	.033	2
8	.380	.358	.040	.259	.113	.101	.161	.073	.076	.048	2
10	.439	.416	.050	.300	.130	.118	.177	.091	.093	.066	2
1/4	.576	.548	.050	.396	.170	.157	.244	.110	.107	.080	3

Self-Tapping Screws *Head Dimensions* Truss & Wafer



Slotted

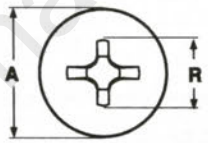


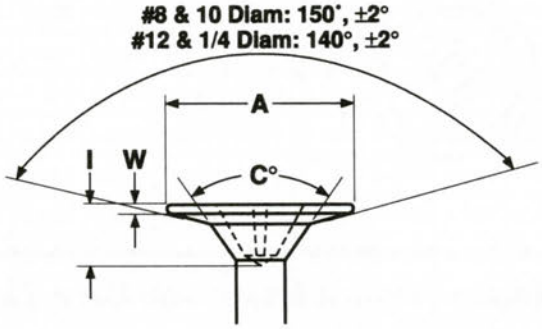
Phillips

Truss Heads for Self-Tapping Screws

ASME B18.6.4-1998

Nominal Size	A		H		J		T		M		G	N	Phillips Driver Size
	Head Diameter		Height of Head		Slot Width		Slot Depth		Dimensions of Recess				
									Diameter		Depth	Width	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
2	.194	.180	.053	.044	.031	.023	.031	.022	.104	.091	.050	.018	1
4	.257	.241	.069	.059	.039	.031	.040	.030	.112	.099	.069	.018	1
5	.289	.272	.078	.066	.043	.035	.045	.034	.128	.115	.076	.019	1
6	.321	.303	.086	.074	.048	.039	.050	.037	.158	.145	.084	.027	2
7	.352	.333	.094	.081	.048	.039	.054	.041	.165	.152	.078	.028	2
8	.384	.364	.102	.088	.054	.045	.058	.045	.173	.160	.099	.029	2
10	.448	.425	.118	.103	.060	.050	.068	.053	.188	.175	.115	.030	2
12	.511	.487	.134	.118	.067	.056	.077	.061	.248	.235	.128	.032	3
14	.557	.530	.146	.129	.075	.064	.085	.068	.263	.250	.130	.033	3
1/4	.573	.546	.150	.133	.075	.064	.087	.070	.263	.250	.143	.033	3
5/16	.698	.666	.183	.162	.084	.072	.106	.085	.352	.339	.193	.059	4
3/8	.823	.787	.215	.191	.094	.081	.124	.100	.383	.370	.226	.063	4



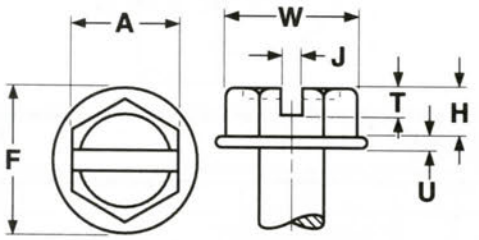


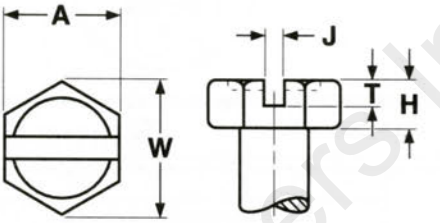
Wafer Heads for Self-Drilling Screws

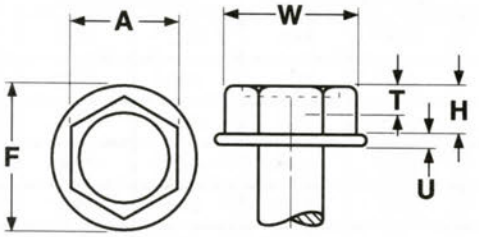
Nominal Size	A		R		I	W		Bottom Countersink Angle	Phillips Driver Size
	Head Diameter		Recess Diameter		Recess Depth	Wafer Thickness			
	Max.	Min.	Max	Min	Ref.	Max	Min	± 2°	
8	.380	.359	.189	.176	.255	.035	.025	50°	2
10	.516	.441	.204	.190	.322	.040	.031	80°	2
12	.552	.511	.268	.254	.377	.040	.031	70°	3
1/4	.620	.580	.282	.267	.160	.042	.033	70°	3

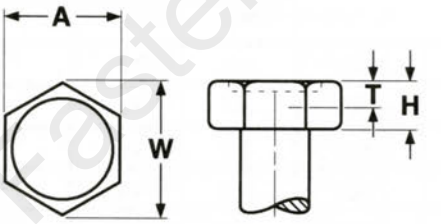
NOTE: There is no single standard for Wafer head dimensions. These values are offered as a guide; deviations from these specifications may occur.

Hex and Hex Washer Heads *Head Dimensions* Self-Tapping Screws









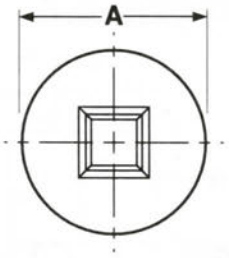
Hex & Hex Washer Heads for Self-Tapping & Self-Drilling Screws

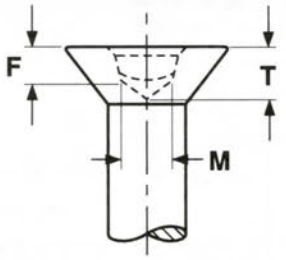
ASME B18.6.4-1998*

Nominal Size	A		W	H		F		U		J		T	
	Width Across Flats		Width Across Corners	Height of Head		Diameter of Washer		Thickness of Washer		Width of Slot		Depth of Slot	
	Max	Min	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
4	.188	.181	.202	.060	.049	.243	.225	.019	.011	.039	.031	.036	.025
6	.250	.244	.272	.093	.080	.328	.302	.025	.015	.048	.039	.046	.033
7	.250	.244	.272	.093	.080	.328	.302	.029	.017	.048	.039	.054	.040
8	.250	.244	.272	.110	.096	.348	.322	.031	.019	.054	.045	.066	.052
10	.312	.305	.340	.120	.105	.414	.384	.031	.019	.060	.050	.072	.057
12	.312	.305	.340	.155	.139	.432	.398	.039	.022	.067	.056	.093	.077
14	.375	.367	.409	.190	.172	.520	.480	.050	.030	.075	.064	.101	.083
1/4	.375	.367	.409	.190	.172	.520	.480	.050	.030	.075	.064	.101	.083
5/16	.500	.489	.545	.230	.208	.676	.624	.055	.035	.084	.072	.122	.100
3/8	.562	.551	.614	.295	.270	.780	.720	.063	.037	.094	.081	.156	.131
1/2*	.750	.735	.820	.400	.367	1.040	.960	.085	.050	.106	.091	.190	.165

*Slot dimensions for 1/2-inch diameter hex washer head tapping screws are independent of ASME B18.6.4.

Self-Tapping Screws *Head Dimensions* Square Flat & Pan



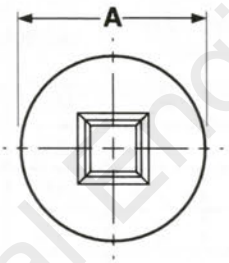


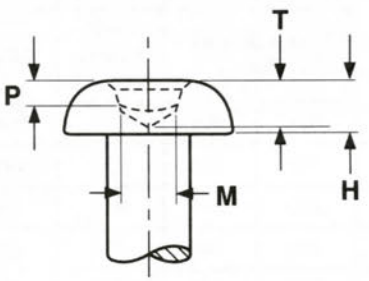
Square Socket Flat Heads

ASME B18.6.3-2002

Nominal Size or Basic Screw Diameter		A		M	T	F		P		Driver Size
		Head Diameter		Recess Across the Flats	Recess Depth	Protrusion Above Gaging Diameter		Recess Penetration Gaging Depth		
		Max	Min	Ref	Ref	Max	Min	Max	Min	
4	.1120	.212	.191	.071	.073	.032	.019	.038	.028	0
6	.1380	.262	.238	.091	.113	.036	.021	.055	.040	1S
8	.1640	.312	.285	.1126	.140	.039	.023	.063	.048	2S
10	.1900	.362	.333	.1126	.140	.042	.025	.075	.060	2R
12	.2160	.412	.380	.133	.165	.045	.027	.095	.080	3R
14	.2420	.462	.427	.133	.165	.050	.029	.095	.080	3R
1/4	.2500	.477	.442	.133	.165	.050	.029	.095	.080	3R
5/16	.3125	.597	.556	.191	.201	.057	.034	.100	.085	4R

This type of recess has a square center opening, slightly tapered side walls and a conical bottom.





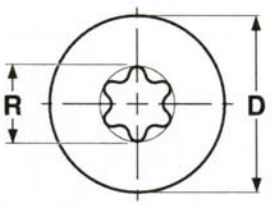
Square Drive Pan Heads for Self-Tapping Screws

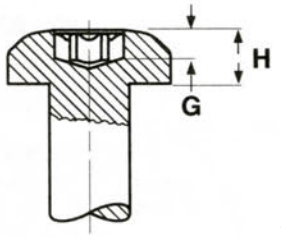
ASME B18.6.3- 2002

Nominal Size or Basic Screw Diameter		A		H		M	T	Driver Size	P	
		Head Diameter		Head Height		Recess Across Flats	Recess Depth		Penetrating Gauging Depth	
		Max	Min	Max	Min	Ref	Ref		Max	Min
4	.1120	.219	.205	.086	.076	.070	.066	0	.038	.028
6	.1380	.270	.256	.103	.093	.091	.106	1R	.065	.050
8	.1640	.322	.306	.120	.110	.112	.127	2R	.075	.060
10	.1900	.373	.357	.137	.126	.112	.127	2R	.075	.060
12	.2160	.425	.407	.153	.141	.133	.158	3R	.095	.080
14	.2420	.476	.457	.169	.156	.133	.158	3R	.095	.080
1/4	.2500	.492	.473	.175	.160	.133	.165	3R	.095	.085

This type of recess has a square center opening, slightly tapered side walls and a conical bottom.

Torx® & Combo Pan *Head Dimensions* Self-Tapping Screws

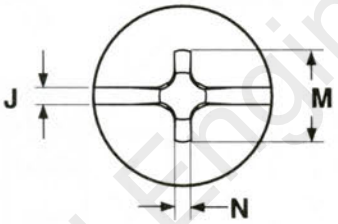


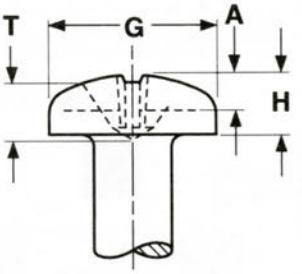


Torx® Drive Pan Heads

Camcar

Screw Size	D		H		R	G		Driver Size
	Head Dimensions				Recess Dimensions			
	Head Diameter		Head Height		Ref	Gauge Penetration Min	(Fallaway) Max Penetration	
	Max	Min	Max	Min				
2	.167	.155	.062	.053	.094	.030	.019	T8
4	.219	.205	.080	.070	.111	.035	.022	T10
6	.270	.256	.097	.087	.132	.045	.026	T15
8	.322	.306	.115	.105	.155	.055	.031	T20
10	.373	.357	.133	.122	.178	.070	.036	T25
12	.425	.407	.151	.139	.200	.070	.040	T27
1/4	.492	.473	.175	.162	.221	.085	.044	T30
5/16	.615	.594	.218	.203	.266	.105	.047	T40



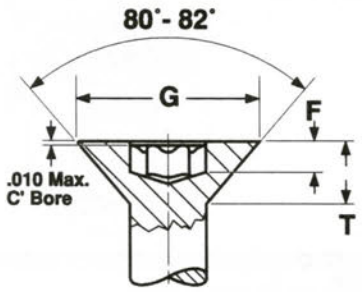


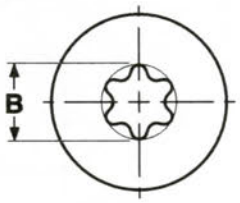
Phillips and Slotted Combination Drive Pan Heads

Nominal Screw Size	G		H		J		A		M	T	N	Recess Penetration Gaging Depth		Phillips Driver Size
	Head Dimensions				Slot Dimensions				Recess Dimensions					
	Head Diameter		Head Height		Width		Depth		Diameter	Depth	Width			
	Max	Min	Max	Min	Max	Min	Max	Min	Ref	Ref	Ref	Max	Min	
4	.219	.205	.080	.070	.039	.031	.040	.027	.115	.069	.019	.071	.053	1
6	.270	.256	.097	.087	.048	.039	.050	.033	.159	.078	.028	.080	.055	2
7	.296	.281	.106	.096	.048	.039	.054	.041	.170	.088	.029	.089	.064	2
8	.322	.306	.115	.105	.054	.045	.058	.041	.175	.095	.030	.097	.071	2
10	.373	.357	.133	.122	.060	.050	.068	.048	.192	.112	.031	.113	.089	2
12	.425	.407	.151	.139	.067	.056	.077	.055	.252	.128	.034	.124	.098	3
1/4	.492	.473	.175	.162	.075	.064	.087	.063	.274	.148	.036	.144	.118	3

®Torx is a registered trademark of the Camcar Corporation, division of Textron Industries.

Self-Tapping Screws *Head Dimensions* Torx® Flat & Torx® Flat Undercut

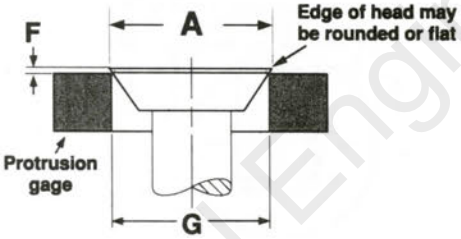


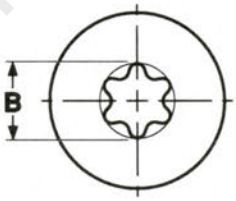


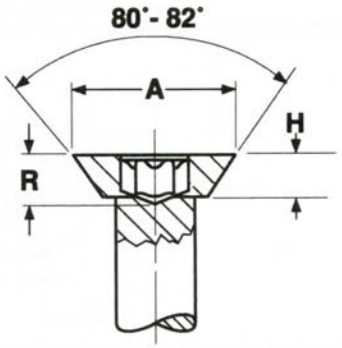
Torx® Drive Flat Heads for Self-Tapping Screws

Camcar, 4/99

Nominal Size	G		T	B	F	Fallaway	Torx® Driver Size
	Head Diameter		Head Height	Recess Diameter	Gauge Penetration		
	Max	Min	Ref	Ref	Min	Max	
2	.172	.147	.051	.069	.017	.014	T6
4	.225	.195	.067	.094	.028	.019	T8
5	.252	.220	.075	.111	.035	.022	T10
6	.279	.244	.083	.111	.035	.022	T10
8	.332	.292	.100	.132	.040	.026	T15
10	.385	.340	.116	.155	.050	.031	T20
1/4	.507	.452	.153	.200	.075	.040	T27





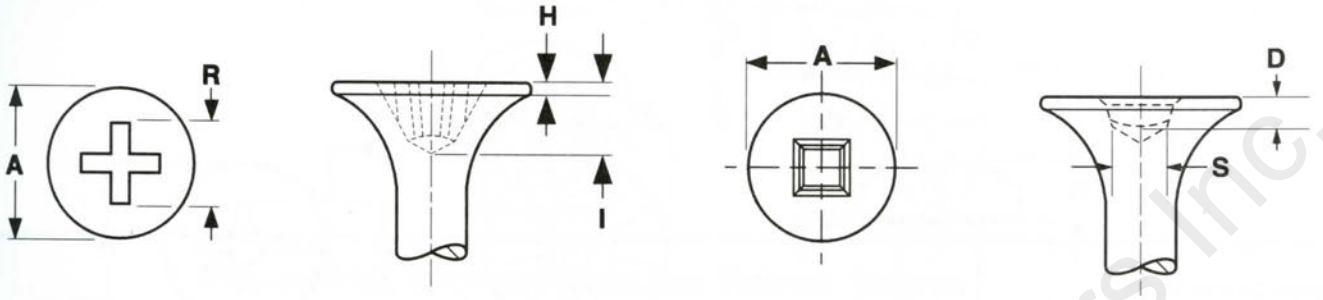


Torx® Drive Flat Undercut Heads for Self-Tapping Screws

Camcar

Nominal Size	A		H		B	F		Recess Penetration Gaging Depth	Torx® Driver Size
	Head Diameter		Head Height		Recess Diameter	Protrusion Above Gaging Diameter			
	Max	Min	Max	Min	Ref	Max	Min	Max	
4	.225	.195	.047	.038	.094	.032	.019	.020	T8
6	.279	.244	.059	.048	.111	.036	.021	.024	T10
8	.332	.292	.070	.058	.132	.039	.023	.035	T15
10	.385	.340	.081	.068	.155	.042	.025	.045	T20
12	.438	.389	.092	.078	.178	.045	.027	.050	T25
1/4	.507	.452	.107	.092	.200	.050	.029	.055	T27

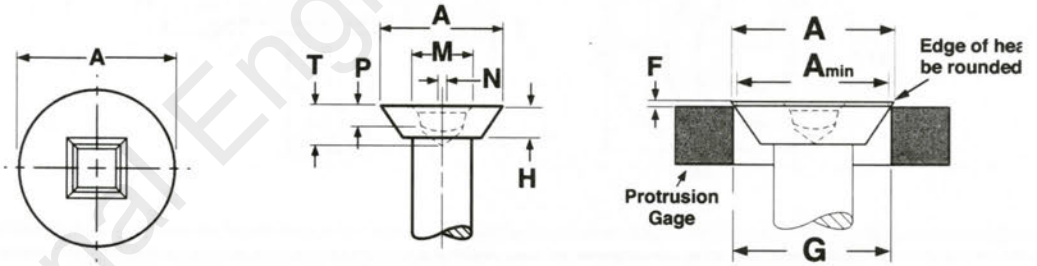
Head Dimensions Self-Tapping Screws



Bugle Heads for Drywall, Particle Board & Deck Screws

Nominal Size	A		H		R		I	Phillips Driver Size (Reduced Diameter Bit for #6 thru #10)	S		D		Square Recess Driver Size
	Head Diameter		Head Thickness		Phillips Recess Drive				Square Recess Drive				
					Diameter		Depth		Recess Square		Depth		
	Max	Min	Max	Min	Max	Min	Ref		Max	Min	Max	Min	
6	.347	.315	.031	.020	.201	.176	.106	2	106	.090	.071	.055	1
7	.355	.315	.031	.020	.201	.176	.118	2	-	-	-	-	-
8	.363	.315	.039	.020	.201	.176	.124	2	.113	.110	.075	.064	2
9	.363	.334	.039	.020	.201	.176	.124	2	-	-	-	-	-
10	.363	.334	.039	.020	.204	.190	.124	2	.113	.110	.075	.064	2
12	.415	.390	.055	.042	.265	.250	.144	3	-	-	-	-	-
1/4	.472	.450	.058	.047	.277	.260	.160	3	-	-	-	-	-

In the abscence of a single industry standard for Bugle Heads, these dimensions are offered as a guide; slight deviations are acceptable.



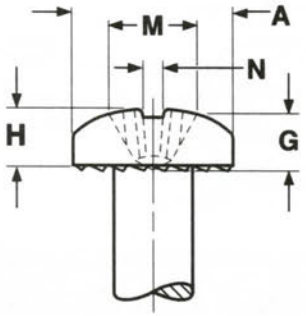
Flat Undercut Square Recess Heads for Tapping Screws

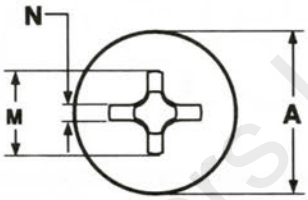
ASME B18.6.3 2002

Nominal Size	A		H		M	T	Recess Size	P		F		G
	Head Diameter		Head Height		Recess Across Flats	Recess Depth		Recess Penetrating Gaging Depth		Protrusion Above Gaging Diameter		Gaging Diameter
	Max	Min	Max	Min	Ref	Ref		Max	Min	Max	Min	
6	.262	.238	.059	.048	.091	.070	1SS	.027	.017	.036	.021	.220
8	.312	.285	.070	.058	.112	.091	2SS	.037	.027	.039	.023	.267
10	.362	.333	.081	.068	.112	.091	2SS	.037	.027	.042	.025	.313
12	.412	.380	.092	.078	.133	.138	3SS	.073	.063	.045	.027	.362
1/4	.477	.442	.107	.092	.133	.143	3S	.080	.065	.050	.029	.424

Self-Tapping Screws *Head Dimensions*

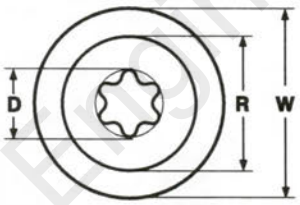
Serrated Pan Phillips
Round Washer 6-lobe

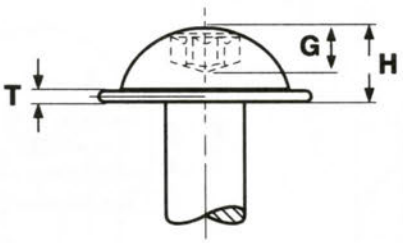




Serrated Pan Phillips for Tapping Screws

Nominal Size	A		H		M	G	N	Recess Penetrating Gaging Depth		Recess Size
	Head Diameter		Head Height		Recess Diameter	Recess Depth	Recess Width			
	Max	Min	Max	Min	Ref	Ref		Min	Max	
8	.322	.306	.115	.105	.176	.095	.030	.097	.071	2
10	.373	.357	.133	.122	.192	.112	.031	.113	.089	2



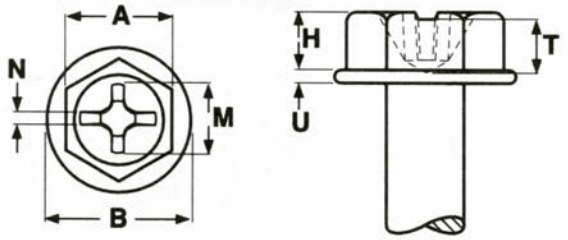


Six-Lobe Recess Round Washer Head for Tapping Screws

Nominal Screw Size	W		T		R	H		D	G	(Fallaway) Max Penetration	Driver Size
	Washer Outside Diameter		Washer Thickness		Head Outside Diameter	Overall Head Height		Recess Diameter	Gauge Penetration		
	Max	Min	Max	Min	Ref	Max	Min	Ref	Min		
8	.385	.365	.041	.030	.288	.128	.116	.155	.055	.036	T20

Hex Washer Phillips & Truss Square Recess

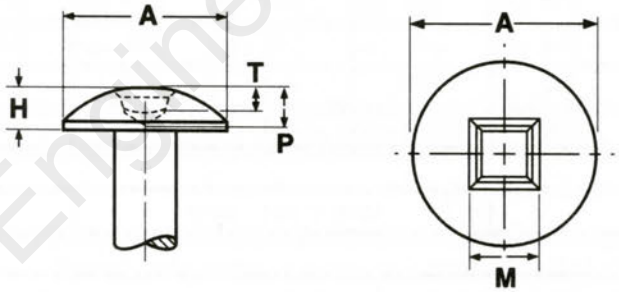
Head Dimensions Self-Tapping Screws



Phillips Hex Washer Heads for Tapping Screws

ASME B18.6.3 2002

Nominal Size	A		H		B		U		M	T	N		Recess Penetration Gaging Depth		Phillips Driver Size
	Width Across Flats		Head Height		Washer Diameter		Washer Thickness		Recess Diameter	Recess Depth	Recess Width	Protrusion Beyond Gaging Ring			
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Min		Max	Min	
4	.188	.181	.060	.049	.243	.225	.019	.011	.097	.065	.017	.029	.067	.049	1
6	.250	.244	.093	.080	.328	.302	.025	.015	.148	.088	.026	.048	.089	.064	2
8	.250	.244	.110	.096	.348	.322	.031	.019	.168	.114	.029	.058	.115	.090	2
10	.312	.305	.120	.105	.414	.384	.031	.019	.178	.126	.029	.063	.127	.102	2
12	.312	.305	.155	.139	.432	.398	.039	.022	.247	.157	.033	.083	.152	.127	3
1/4	.375	.367	.190	.172	.520	.480	.050	.030	.277	.191	.034	.103	.186	.161	3

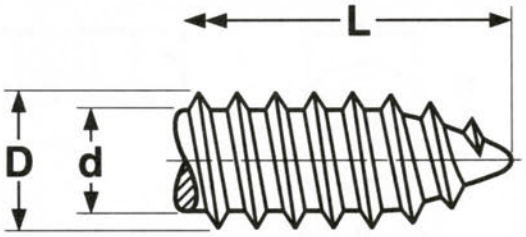


Truss Square Recess Heads for Tapping Screws

ASME B18.6.3 2002

Nominal Size	A		H		B	T	Recess Size	P	
	Head Diameter		Head Height		Recess Across Flats	Recess Depth		Recess Penetrating Gaging Depth	
	Max	Min	Max	Min	Ref	Ref		Max	Min
4	.257	.241	.069	.059	.070	.066	0	.038	.028
6	.321	.303	.086	.074	.091	.096	1S	.055	.040
8	.384	.364	.102	.088	.112	.115	2S	.063	.048
10	.448	.425	.128	.113	.112	.115	2R	.075	.060
1/4	.573	.546	.150	.133	.133	.143	3S	.080	.065

Self-Tapping Screws *Thread Forming* Type-AB



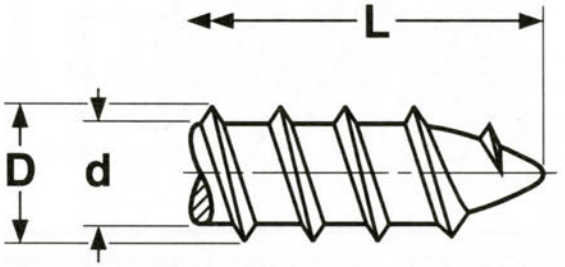
Threads For Self-Tapping Screws Type AB

ASME B18.6.4-1998

Nominal Size or Basic Screw Diameter		Threads Per Inch	D		d		L		Minimum Torsional Strength, lb.- in. (STEEL SCREWS ONLY)
			Major Diameter		Minor Diameter		Minimum Practical Screw Length		
			Max	Min	Max	Min	90° Heads	Csk Heads	
2	.0860	32	.088	.082	.064	.060	3/16	7/32	4
3	.0990	28	.101	.095	.075	.071	3/16	1/4	9
4	.1120	24	.114	.108	.086	.082	7/32	9/32	13
5	.1250	20	.130	.123	.094	.090	1/4	5/16	18
6	.1380	20	.139	.132	.104	.099	9/32	11/32	24
7	.1510	19	.154	.147	.115	.109	5/16	3/8	30
8	.1640	18	.166	.159	.122	.116	5/16	3/8	39
10	.1900	16	.189	.182	.141	.135	3/8	7/16	56
12	.2160	14	.215	.208	.164	.157	7/16	21/32	88
1/4	.2500	14	.246	.237	.192	.185	1/2	19/32	142
5/16	.3125	12	.315	.306	.244	.236	5/8	3/4	290
3/8	.3750	12	.380	.371	.309	.299	3/4	29/32	590
Tolerance on Length				Up to 1" Incl.: ±0.03			Over 1": ±0.05		

Description	A thread forming tapping screw with spaced threads and a gimlet point
Applications/ Advantages	For self starting in thin metal or resin-filled plywood. Recommended over a Type-A, particularly in brittle materials.
Material	**Steel:** AISI 1016 - 1024 or equivalent steel. **Stainless:** 18-8 stainless steel.
Heat Treatment (Steel only)	Screws shall be quenched in liquid and then tempered by reheating to 650°F minimum.
Surface Hardness	**Steel:** Rockwell C45 minimum
Case Depth (Steel only)	No. 4 thru 6 diameter: .002 - .007 No. 8 thru 12 diameter: .004 - .009 1/4" and larger: .005 - .011
Core Hardness (after tempering)	**Steel:** Rockwell C28 - 38
Plating	See Appendix-A for plating information.

Type-A *Thread Forming* Self-Tapping Screws



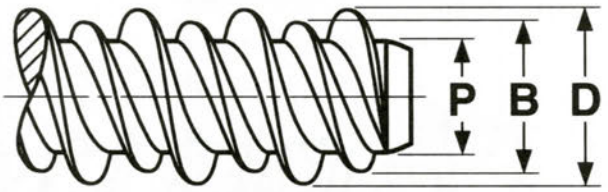
Threads For Self-Tapping Screws Type A

ANSI B18.6.4

Nominal Size or Basic Screw Diameter		Threads Per Inch	D		d		L		Minimum Torsional Strength, lb.-in. (STEEL SCREWS ONLY)
			Major Diameter		Minor Diameter		These Lengths or Shorter Have AB Threads		
			Max	Min	Max	Min	90° Heads	Csk Heads	
6	0.1380	18	.141	.136	.102	.096	1/4	5/16	24
7	0.1510	16	.158	.152	.114	.108	5/16	3/8	30
8	0.1640	15	.168	.162	.123	.116	3/8	7/16	39
10	0.1900	12	.194	.188	.133	.126	3/8	1/2	48
12	0.2160	11	.221	.215	.162	.155	7/16	9/16	83
14	0.2420	10	.254	.248	.185	.178	1/2	5/8	125
20	0.3200	9	.333	.327	.234	.226	11/16	13/16	250
24	0.3720	9	.390	.383	.291	.282	3/4	1	492
Tolerance on Length				Up to 1" Incl.: ±0.03			Over 1": ±0.05		

Description	A thread forming tapping screw with wider spaced threads than a Type-AB and a gimlet point.
Applications/ Advantages	For self starting in thin (.015-.050 thick) metal or resin-filled plywood. 18-8 Stainless steel tapping screws may be used in applications which require general atmospheric corrosion resistance. Fastening stainless steel parts to aluminum or steel can cause a type of corrosion known as a galvanic couple in some environments.
Material	**Steel:** AISI 1016 - 1024 or equivalent steel. **Stainless:** Austenitic 18-8 stainless steel
Heat Treatment (Steel only)	Screws shall be quenched in liquid and then tempered by reheating to 650°F minimum.
Surface Hardness	**Steel:** Rockwell C45 minimum
Case Depth (Steel only)	No. 6 diameter: .002 - .007 No. 8 thru 12 diameter: .004 - .009 1/4" and larger: .005 - .011
Core Hardness (after tempering)	**Steel:** Rockwell C28 - 38
Plating	See Appendix-A for information on plating of steel screws.

Self-Tapping Screws *Thread Forming* High-Low Style

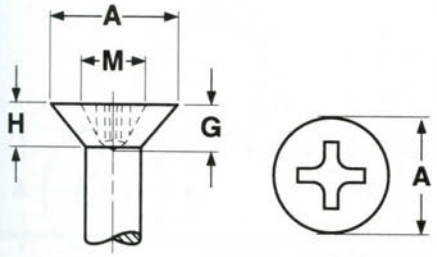


THREAD AND HOLE DIMENSIONS FOR HIGH-LOW THREAD FORMING SCREWS						Elco*, ASME B18.6.4
Screw Size	D	B	P	Pilot Hole Diameter Flexural Modulus of Plastic		Minimum Torsional Strength, lb. in. (STEEL SCREWS ONLY)
	High Thread Diameter	Low Thread Diameter	Point Diameter	Up to 200,000 P.S.I.	200,000-400,000 P.S.I.	
2-32	.084 - .090	.069	.050 - .058	.0670	.0700	-
3-28	.095 - .105	.078	.057 - .065	.0730	.0781	-
4-24	.105 - .115	.086	.061 - .070	.0810	.0860	4
5-20	.119 - .125	.100	.073 - .082	.0935	.0995	9
6-19	.135 - .145	.108	.080 - .090	.1015	.1100	13
7-19	.148 - .158	.130	.089 - .100	.1200	.1250	18
8-18	.160 - .170	.130	.095 - .105	.1200	.1285	18
10-16	.185 - .195	.145	.099 - .110	.1360	.1440	30
12-16	.210 - .220	.167	.125 - .137	.1570	.1660	39
1/4-15	.250 - .260	.200	.161 - .175	.1890	.2010	56
5/16-14	.307 - .317	.250	.200 - .212	.2380	.2500	142
Tolerance on Length			Up to 1 in., Incl.: +0, -3/64		Over 1 in.: +0, -1/16	

Description	A thread forming screw with a double-lead, consisting of a high and low thread. The lower thread varies in height from 1/3 to 1/2 that of the higher thread, which is sharper and flatter than a standard thread.
Applications/ Advantages	For use in plastic, nylon, wood or other low-density materials. Thread design reduces driving torques, enhances resistance to thread stripping, improves pullout strength and lessens risk of cracking the work piece.
Material	**Steel:** 1019-1022 or equivalent steel. **Stainless:** 410 martensitic or 18-8 austenitic stainless steel
Heat Treatment	**Steel:** Screws shall be quenched in liquid and then tempered by reheating to 650° F minimum. **410 Stainless:** Screws shall be annealed by heating to 1850-1950° F, held at least 1/2 hour and rapid air- or oil-quenched then reheating to 525° F minimum for at least 1 hour and air cooled to provide the required tensile, yield and hardness properties.
Case Hardness	**Steel:** Rockwell C45 minimum
Case Depth (steel)	No. 2 thru 6 diameter: .002 - .007 No. 8 thru 12 diameter: .004 - .009 1/4" diameter and larger: .005 - .011
Core Hardness	**Steel (after tempering):** Rockwell C28 - 36 **410 Stainless (after tempering):** Rockwell C38 - 42 **18-8 Stainless:** Rockwell B100 (approximate)
Plating	See Appendix-A

*Elco is the original writer of high-low screw dimensions.

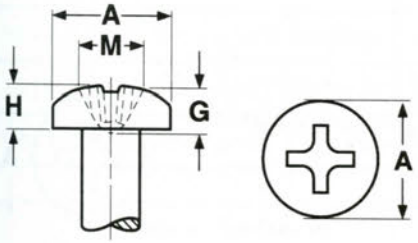
High-Low Style *Head Dimensions* Self-Tapping Screws



Head & Drive Dimensions for Phillips Flat High-Low

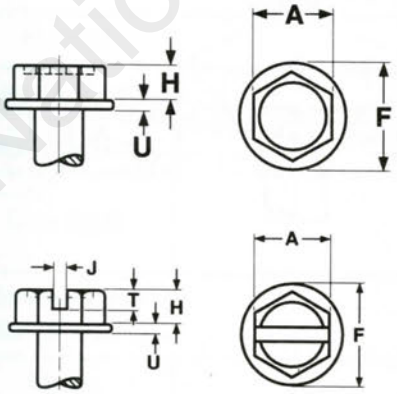
Nominal Size	A		H	M		G		Driver Size
	Head Diameter		Head Height	Recess Diameter		Recess Penetration Gaging Depth		
	Max	Min	Ref	Max	Min	Max	Min	
2	.162	.144	.051	.102	.089	.056	.040	1
4	.212	.191	.067	.128	.115	.082	.066	1
6	.262	.238	.083	.174	.161	.095	.072	2
8	.312	.285	.100	.189	.176	.110	.087	2
10	.362	.333	.116	.204	.191	.125	.102	2
12	.412	.380	.132	.268	.255	.139	.116	3
1/4	.477	.442	.153	.283	.270	.154	.131	3

Undercut Flat head High-Low screws conform to ASME B 18.6.4 specifications (see page 8).



Head & Drive Dimensions for Phillips Pan High-Low

Nominal Size	A		H		M		G		Driver Size
	Head Diameter		Head Height		Recess Diameter		Recess Penetration Gaging Depth		
	Max	Min	Max	Min	Max	Min	Max	Min	
2	.167	.155	.062	.053	.104	.091	.052	.034	1
4	.193	.180	.071	.062	.112	.099	.061	.043	1
5	.219	.205	.080	.070	.122	.109	.071	.053	1
6	.254	.240	.097	.087	.158	.145	.072	.046	2
7 & 8	.270	.256	.097	.087	.166	.153	.080	.055	2
10	.322	.306	.115	.105	.182	.169	.097	.071	2
12	.373	.357	.133	.122	.199	.186	.113	.089	2
1/4	.492	.473	.175	.162	.281	.268	.144	.118	3



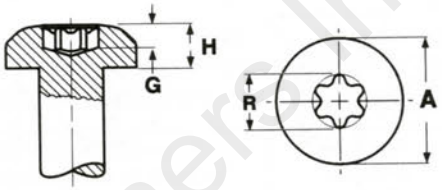
Head & Drive Dimensions for Hex Washer High-Low

Nominal Size	A		T		J		H		F		U	
	Width Across Flats		Slot Depth		Slot Width		Height of Head		Diameter of Washer		Thickness of Washer	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
4	.125	.120	-	-	-	-	.055	.044	.177	.163	.016	.010
6	.187	.181	.049	.030	.043	.035	.070	.058	.260	.240	.025	.015
8	.250	.244	.053	.033	.048	.039	.093	.080	.328	.302	.025	.015
10	.250	.244	.074	.052	.054	.045	.110	.096	.348	.322	.031	.019
12	.312	.305	.103	.077	.067	.056	.155	.139	.432	.398	.039	.022
1/4	.375	.367	.111	.083	.075	.064	.190	.172	.520	.480	.050	.030
5/16	.375	.367	.111	.083	.075	.064	.190	.172	.520	.480	.050	.030

Self-Tapping Screws *Head Dimensions* High-Low Style

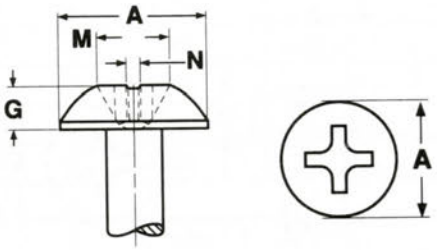
Head & Drive Dimensions for Six-Lobe Pan High-Low Screws

Nominal Size	A		H		R	G	Fallaway Gauge Penetration	Driver Size
	Head Diameter		Head Height		Recess Diameter	Recess Gauge Penetration		
	Max	Min	Max	Min	Ref	Min	Max	
2	.167	.155	.062	.053	.094	.030	.019	T8
4	.193	.180	.071	.062	.094	.033	.019	T8
6	.254	.240	.097	.087	.111	.035	.022	T10
8	.270	.256	.097	.087	.132	.045	.026	T15
10	.322	.306	.115	.105	.155	.055	.031	T20
1/4	.492	.473	.175	.162	.221	.085	.044	T30



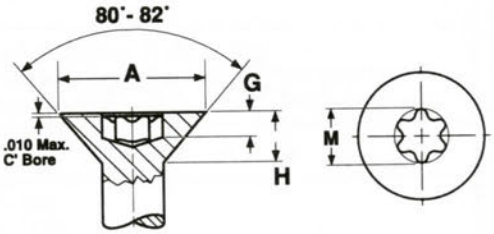
Head & Drive Dimensions for Truss Phillips High-Low

Nominal Size	A		H		M	N	G		Driver Size
	Head Diameter		Head Height		Recess Diameter	Recess Width	Recess Penetration Gaging Depth		
	Max	Min	Max	Min	Ref	Ref	Max	Min	
4	.226	.211	.061	.051	.104	.018	.059	.042	1
6	.289	.272	.078	.066	.122	.019	.078	.060	1
8	.321	.303	.086	.074	.152	.027	.073	.048	2
10	.384	.364	.102	.088	.166	.029	.088	.063	2

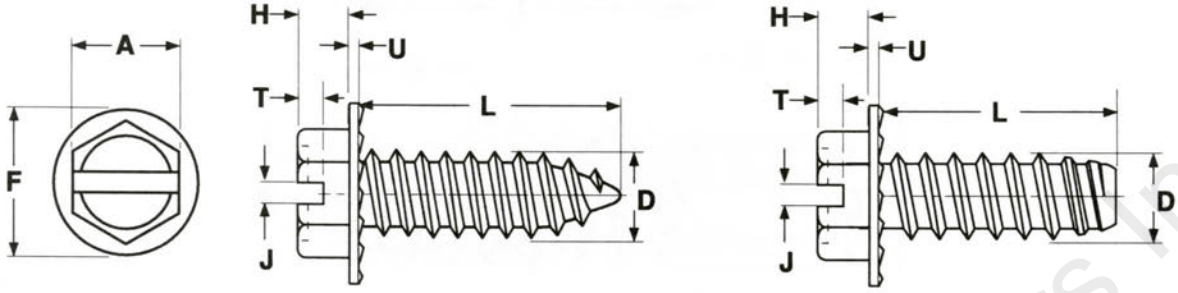


Head & Drive Dimensions for Torx Flat High-Low

Nominal Size	A		H	M	G		Fallaway	Driver Size
	Head Diameter		Head Height	Recess Diameter	Recess Penetration Gaging Depth			
	Max	Min	Ref	Ref	Max	Min	Max	
2	.162	.144	.051	.069	.056	.040	.014	T6
4	.212	.191	.067	.094	.082	.066	.019	T8
6	.262	.238	.083	.111	.095	.072	.022	T10
8	.312	.285	.100	.132	.110	.087	.026	T15
10	.362	.333	.116	.155	.125	.102	.031	T20
1/4	.477	.442	.153	.200	.154	.131	.040	T27



Serrated Hex Washer Type-AB & B *Thread Forming* Self-Tapping Screws



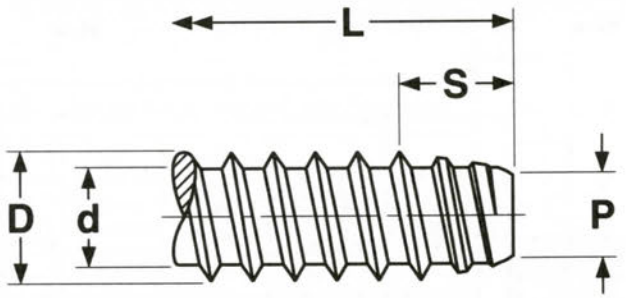
Serrated Hex Washer Self Tapping Screws - Type-AB / B

Nominal Size & Number of Threads per Inch	A		H		F		U		J		T		D		Drive Test Results				
	Width Across Flats		Head Height		Washer Diameter		Washer Thickness		Slot Width		Slot Depth		Major Diameter		Test Plate		Drive Torque	Strip Torque	Strip to Drive Ratio
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Hole Diam.	Thickness			
4-24	.188	.181	.060	.049	.243	.225	.019	.011	.039	.031	.036	.025	.114	.108	-	-	-	-	-
6-20	.250	.244	.093	.080	.328	.302	.025	.015	.048	.039	.046	.033	.139	.132	.081	.025	5	20	4.0:1
8-18	.250	.244	.110	.096	.348	.322	.031	.019	.054	.045	.066	.052	.166	.159	.090	.025	6.6	31	4.7:1
10-16	.312	.305	.120	.105	.414	.384	.031	.019	.060	.050	.072	.057	.189	.182	.110	.025	10	56	5.6:1
12-14	.312	.305	.155	.139	.432	.398	.039	.022	.067	.056	.093	.077	.215	.208	.187	.125	47	139	3.0:1
1/4-14	.375	.367	.190	.172	.520	.480	.050	.030	.075	.064	.101	.083	.246	.237	.2615	.125	37	148	4.0:1

Tolerance on Length	Up to 1" Incl.: ±0.03	Over 1": ±0.05

Description	A slotted hex washer head thread forming tapping screw with serrations on the underside of the washer face and spaced threads. The Type-AB screw has a gimlet point while the Type-B has a blunt point.
Applications/ Advantages	The serrations on the underside of the washer face allow this part to perform two main functions: (1) act as a locking fastener, and (2) break drive torque during installation which lessens the chance of reaming out the mating hole in the bearing surface. The torque-breaking feature slows the rotation of the screw when it meets the mating surface. The serrations allow for more pitch body diameter under the head giving the mating sheet metal more travel so as not to snap over the last bit of major diameter thread crest. Appliance manufacturers use these screws to reduce the thickness of the sheet metal they require, which reduces the cost of production.
Material	AISI 1016 - 1024 or equivalent steel.
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650° F minimum.
Surface Hardness	Rockwell C45 minimum
Case Depth	No. 6 diameter: .002 - .007 No. 8 thru 12 diameter: .004 - .009 1/4" diameter: .005 - .011
Core Hardness (after tempering)	Rockwell C28 - 38
Plating	See Appendix-A for plating information.

Self-Tapping Screws *Thread Forming* Type-B



Threads for Self-Tapping Screws Type-B

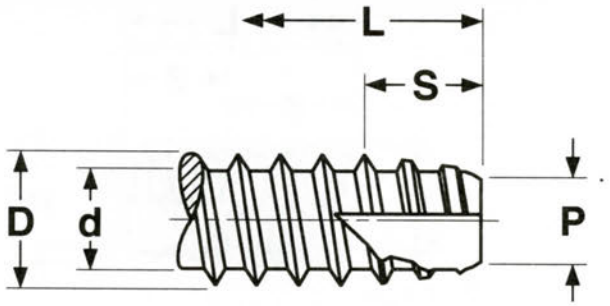
ANSI B18.6.4

Nominal Size or Basic Screw Diameter		Threads Per Inch	D		d		P		S		L		Minimum Torsional Strength, lb.- in. (STEEL SCREWS ONLY)
			Major Diameter		Minor Diameter		Point Diameter		Point Taper Length		Minimum Practical Screw Length		
			Max	Min	Max	Min	Max	Min	Max	Min	90° Heads	Csk Heads	
2	.0860	32	.088	.082	.064	.060	.058	.054	.062	.047	5/32	3/16	4
3	.0990	28	.101	.095	.075	.071	.068	.064	.071	.054	3/16	7/32	9
4	.1120	24	.114	.108	.086	.082	.079	.074	.083	.063	3/16	1/4	13
5	.1250	20	.130	.123	.094	.090	.087	.082	.100	.075	7/32	9/32	18
6	.1380	20	.139	.132	.104	.099	.095	.089	.100	.075	1/4	9/32	24
7	.1510	19	.154	.147	.115	.109	.105	.099	.105	.079	1/4	5/16	30
8	.1640	18	.166	.159	.122	.116	.112	.106	.111	.083	9/32	11/32	39
10	.1900	16	.189	.182	.141	.135	.130	.123	.125	.094	5/16	3/8	56
12	.2160	14	.215	.208	.164	.157	.152	.145	.143	.107	11/32	7/16	88
1/4	.2500	14	.246	.237	.192	.185	.179	.171	.143	.107	3/8	1/2	142
5/16	.3125	12	.315	.306	.244	.236	.230	.222	.167	.125	15/32	19/32	290
3/8	.3750	12	.380	.371	.309	.299	.293	.285	.167	.125	17/32	11/16	590

Tolerance on Length	Up to 3/4 in., Incl.: -0.03	Over 3/4 to 1-1/2 in., Incl.: -0.05	Over 1-1/2 in.: -0.06

Description	A thread forming tapping screw with spaced threads and a blunt point with incomplete entering threads.
Applications/ Advantages	For molded or through holes in thin metal, non-ferrous castings, plastics or resin-filled plywood.
Material	**Steel**: AISI 1016 - 1024 or equivalent steel. **Stainless**: 18-8 Stainless steel
Heat Treatment (steel only)	Screws shall be quenched in liquid and then tempered by reheating to 650°F minimum.
Surface Hardness	**Steel:** Rockwell C45 minimum
Case Depth (steel only)	No. 4 thru 6 diameter: .002 - .007 No. 8 thru 12 diameter: .004 - .009 1/4" and larger: .005 - .011
Core Hardness (after tempering)	**Steel:** Rockwell C28 - 38
Plating	See Appendix-A for plating information.

Type-25 *Thread Cutting* Self-Tapping Screws



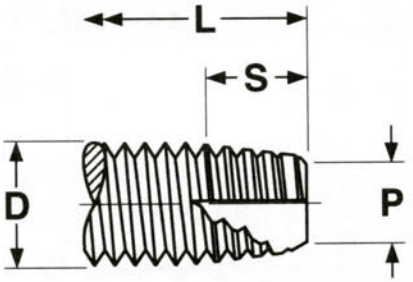
Threads For Thread Cutting Screws Type 25

ASME B18.6.4-1998

Nominal Size or Basic Screw Diameter		Threads Per Inch	D		d		P	S		L		Minimum Torsional Strength, lb.- in. (STEEL SCREWS ONLY)
			Major Diameter		Minor Diameter		Point Diameter	Point Taper Length		Minimum Practical Screw Length		
			Max	Min	Max	Min	Ref	Max	Min	90° Heads	Csk Heads	
2	.0860	32	.088	.082	.064	.060	.058	.062	.047	5/32	3/16	4
4	.1120	24	.114	.108	.086	.082	.079	.083	.063	3/16	1/4	13
5	.1250	20	.130	.123	.094	.090	.087	.100	.075	7/32	9/32	18
6	.1380	20	.139	.132	.104	.099	.095	.100	.075	1/4	9/32	24
7	.1510	19	.154	.147	.115	.109	.105	.105	.079	1/4	5/16	30
8	.1640	18	.166	.159	.122	.116	.112	.111	.083	9/32	11/32	39
10	.1900	16	.189	.182	.141	.135	.130	.125	.094	5/16	3/8	56
12	.2160	14	.215	.208	.164	.157	.152	.143	.107	11/32	7/16	88
1/4	.2500	14	.246	.237	.192	.185	.179	.143	.107	3/8	1/2	142
5/16	.3125	12	.315	.306	.244	.236	.230	.167	.125	15/32	19/32	290
3/8	.3750	12	.380	.371	.309	.299	.293	.167	.125	17/32	11/16	590
Tolerance on Length			Up to 3/4 in., Incl.: -0.03					Over 3/4 to 1-1/2 in., Incl.: -0.05				

Description	A thread cutting screw with spaced threads, a blunt point, tapered entering threads, a single wide cutting edge, and a chip cavity.	
	Steel	Stainless
Applications/ Advantages	For molded or through holes in plastics and other soft materials. Provides excellent chip clearing capability.	Stainless screws offer greater corrosion resistance than steel screws but have a more limited range of applications due to being a softer metal. When using any thread-cutting screw, the material in which the threads are cut should have a a lower hardness by 10-20 Rockwell hardness points.
Material	AISI 1016 - 1024 or equivalent steel.	18-8 stainless steel.
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650° F minimum.	18-8 thread-cutting screws are not heat-treated.
Surface Hardness	Rockwell C45 minimum	-
Case Depth	No. 4 thru 6 diameter: .002 - .007 No. 8 thru 10 diameter: .004 - .009 1/4" diameter and larger: .005 - .011	-
Core Hardness (after tempering)	Rockwell C28 - 38	Rockwell B90 - C20
Plating	See Appendix-A for plating information.	

Self-Tapping Screws *Thread Cutting* Type-23



Threads and Points for Type 23 Thread Cutting Screws

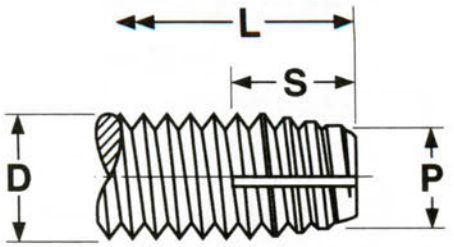
ASME B18.6.4-1998

Nominal Size or Basic Screw Diameter		Threads Per Inch	D		P	S				L				Minimum Torsional Strength, lb.-in.
			Major Diameter		Point Diameter	Point Taper Length				Determinant Length for Point Taper		Minimum Practical Nominal Screw Lengths		
						Short Screws		Long Screws						
			Max	Min	Ref	Max	Min	Max	Min	90° Heads	Csk Heads	90° Heads	Csk Heads	
2	.0860	56	.0860	.0813	.068	.062	.045	.080	.062	5/32	3/16	5/32	3/16	5
4	.1120	40	.1120	.1061	.087	.088	.062	.112	.088	7/32	1/4	3/16	1/4	13
5	.1250	40	.1250	.1191	.100	.088	.062	.112	.088	7/32	9/32	3/16	1/4	18
6	.1380	32	.1380	.1312	.107	.109	.078	.141	.109	1/4	5/16	1/4	5/16	23
8	.1640	32	.1640	.1571	.132	.109	.078	.141	.109	1/4	11/32	1/4	5/16	42
10	.1900	24	.1900	.1818	.148	.146	.104	.188	.146	11/32	7/16	5/16	13/32	56
10	.1900	32	.1900	.1831	.158	.109	.078	.141	.109	1/4	11/32	1/4	5/16	74
12	.2160	24	.2160	.2078	.174	.146	.104	.188	.146	11/32	7/16	5/16	13/32	93
1/4	.2500	20	.2500	.2408	.200	.175	.125	.225	.175	13/32	17/32	3/8	1/2	140
5/16	.3125	18	.3125	.3026	.257	.194	.139	.250	.194	15/32	19/32	7/16	9/16	306
3/8	.3750	16	.3750	.3643	.312	.219	.156	.281	.219	1/2	11/16	15/32	5/8	560

Tolerance on Length	Up to 3/4 in., Incl.: -0.03	Over 3/4 to 1-1/2 in., Incl.: -0.05	Over 1-1/2 in.: -0.06

Description	A thread cutting screw with machine screw thread pitch, a blunt point, tapered entering threads, a single wide cutting edge, and a chip cavity.
Applications/ Advantages	Steel type-23's are well-suited for cast iron and zinc, aluminum die castings, and plastics. The type-23 design provides excellent chip clearing with minimum tightening torques. 18-8 stainless screws offer additional resistance to corrosion. When using any thread-cutting screw, the material in which the threads are cut should have a lower hardness by at least 10 to 20 Rockwell hardness points.
Material	**Steel:** AISI 1016 - 1024 or equivalent steel; **Stainless**:18-8 stainless steel.
Heat Treatment	**Steel**: Screws shall be quenched in liquid and then tempered by reheating to 650°F minimum.
Surface Hardness	**Steel:** Rockwell C45 minimum
Case Depth (steel)	No. 4 thru 6 diameter: .002 - .007 No. 8 thru 12 diameter: .004 - .009 1/4" diameter and larger: .005 - .011
Core Hardness	**Steel (after tempering):** Rockwell C28 - 38 **Stainless:** Rockwell B90 - C20
Plating	See Appendix-A for plating of steel thread-cutting screws.

Type-1 *Thread Cutting* Self-Tapping Screws



Threads and Points for Type 1 Thread Cutting Screws

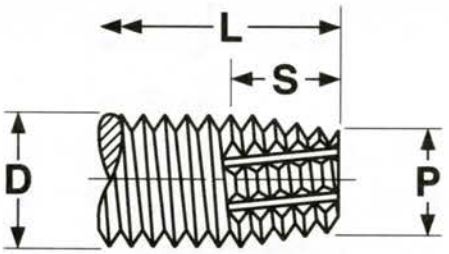
ASME B18.6.4-1998

Nominal Size or Basic Screw Diameter		Threads Per Inch	D		P	S				L				Minimum Torsional Strength, lb.-in.
			Major Diameter		Point Diameter	Point Taper Length				Determinant Length for Point Taper		Minimum Practical Nominal Screw Lengths		
						Short Screws		Long Screws						
			Max	Min	Ref	Max	Min	Max	Min	90° Heads	Csk Heads	90° Heads	Csk Heads	
2	.0860	56	.0860	.0813	.068	.062	.045	.080	.062	5/32	3/16	5/32	3/16	5
4	.1120	40	.1120	.1061	.087	.088	.062	.112	.088	7/32	1/4	3/16	1/4	13
6	.1380	32	.1380	.1312	.107	.109	.078	.141	.109	1/4	5/16	1/4	5/16	23
8	.1640	32	.1640	.1571	.132	.109	.078	.141	.109	1/4	11/32	1/4	5/16	42
10	.1900	24	.1900	.1818	.148	.146	.104	.188	.146	11/32	7/16	5/16	13/32	56
10	.1900	32	.1900	.1831	.158	.109	.078	.141	.109	1/4	11/32	1/4	5/16	74
12	.2160	24	.2160	.2078	.174	.146	.104	.188	.146	11/32	7/16	5/16	13/32	93
1/4	.2500	20	.2500	.2408	.200	.175	.125	.225	.175	13/32	17/32	3/8	1/2	140
5/16	.3125	18	.3125	.3026	.257	.194	.139	.250	.194	15/32	19/32	7/16	9/16	306
3/8	.3750	16	.3750	.3643	.312	.219	.156	.281	.219	1/2	11/16	15/32	5/8	560
1/2	.5000	13	.5000	.4876	.423	.269	.192	.346	.269	5/8	25/32	19/32	3/4	1075

Tolerance on Length	Up to 3/4 in., Incl.: -0.03	Over 3/4 to 1-1/2 in., Incl.: -0.05	Over 1-1/2 in.: -0.06

Description	A thread cutting screw with machine screw thread pitch, blunt point, tapered entering threads and a single cutting edge.	
	Steel	Stainless
Applications/ Advantages	May be used in steel sheets, structural shapes, special alloy steels, cast iron, brass or plastics.	Stainless screws offer greater corrosion resistance than steel screws but have a more limited range of applications due to being a softer metal. When using any thread-cutting screw, the material in which the threads are cut should have a lower hardness by 10-20 Rockwell hardness points.
Material	AISI 1016 - 1024 or equivalent steel.	18-8 stainless steel.
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650° F minimum.	18-8 thread-cutting screws are not heat-treated.
Surface Hardness	Rockwell C45 minimum	-
Case Depth	No. 4 thru 6 diameter: .002 - .007 No. 8 thru 12 diameter: .004 - .009 1/4" diameter and larger: .005 - .011	-
Core Hardness (after tempering)	Rockwell C28 - 38	Rockwell B90 - C20
Plating	See Appendix-A for plating information.	

Self-Tapping Screws — *Thread Cutting* — Type-F



Threads and Points for Type-F Thread Cutting Screws

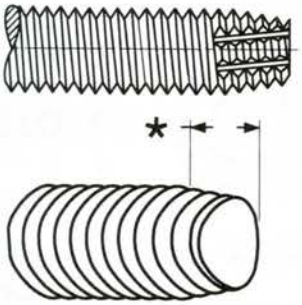
ASME B18.6.4-1998

Nominal Size or Basic Screw Diameter		Threads Per Inch	D		P	S				L				Minimum Torsional Strength, lb.-in. (STEEL SCREWS ONLY)
			Major Diameter		Point Diameter	Point Taper Length				Determinant Length for Point Taper		Minimum Practical Screw Lengths		
						Short Screws		Long Screws						
			Max	Min	Ref	Max	Min	Max	Min	90° Heads	Csk Heads	90° Heads	Csk Heads	
2	.0860	56	.0860	.0813	.068	.062	.045	.080	.062	5/32	3/16	5/32	3/16	5
4	.1120	40	.1120	.1061	.087	.088	.062	.112	.088	7/32	1/4	3/16	1/4	13
5	.1250	40	.1250	.1191	.100	.088	.062	.112	.088	7/32	9/32	3/16	1/4	18
6	.1380	32	.1380	.1312	.107	.109	.078	.141	.109	1/4	5/16	1/4	5/16	23
8	.1640	32	.1640	.1571	.132	.109	.078	.141	.109	1/4	11/32	1/4	5/16	42
10	.1900	24	.1900	.1818	.148	.146	.104	.188	.146	11/32	7/16	5/16	13/32	56
10	.1900	32	.1900	.1831	.158	.109	.078	.141	.109	1/4	11/32	1/4	5/16	74
12	.2160	24	.2160	.2078	.174	.146	.104	.188	.146	11/32	7/16	5/16	13/32	93
1/4	.2500	20	.2500	.2408	.200	.175	.125	.225	.175	13/32	17/32	3/8	1/2	140
5/16	.3125	18	.3125	.3026	.257	.194	.139	.250	.194	15/32	19/32	7/16	9/16	306
3/8	.3750	16	.3750	.3643	.312	.219	.156	.281	.219	1/2	11/16	15/32	5/8	560
1/2	.5000	13	.5000	.4876	.423	.269	.192	.346	.269	5/8	25/32	19/32	3/4	1075

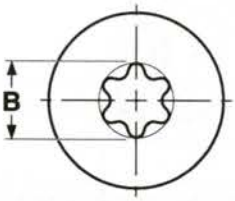
Tolerance on Length	Up to 3/4 in., incl.: -0.03	Over 3/4 to 1-1/2 in., incl.: -0.05	Over 1-1/2 in.: -0.06

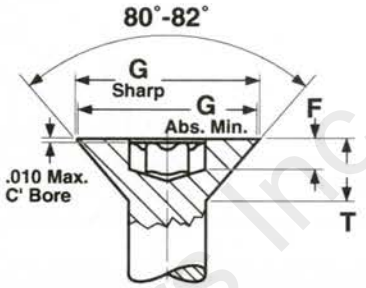
Description	A thread cutting screw with machine screw thread pitch, blunt point, tapered entering threads and multiple cutting edges.
Applications/ Advantages	Steel thread-cutters are used in heavy gauge sheet metal, aluminum, zinc and lead die castings, cast iron, brass and plastic. Stainless screws offer additional resistance to corrosion, 18-8 moreso than 410. When using any thread-cutting screw, the material in which the threads are cut should have a lower hardness by at least 10 to 20 Rockwell hardness points.
Material	**Steel:** AISI 1016 - 1024 or equivalent steel. **Stainless:** 410 martensitic stainless steel or 18-8 stainless steel.
Heat Treatment	**410 Stainless:** Screws shall be annealed by heating to 1850-1950°F, held at least for 1/2 hour and rapid air- or oil-quenched then reheating to 525°F minimum for at least 1 hour and air cooled to provide the required tensile, yield and hardness properties.
Surface Hardness	**Steel:** Rockwell C45 minimum
Case Depth (steel)	No. 4 thru 6 diameter: .002 - .007 No. 8 thru 12 diameter: .004 - .009 1/4" diameter & larger: .005 - .011
Core Hardness	**Steel (after tempering):** Rockwell C28 - 38 **410 Stainless:** Rockwell C38 - 42; **18-8 Stainless:** Rockwell B90 - C20
Plating	See Appendix-A for information on plating of steel thread cutting screws.

Type-F *Floorboard Screws* Self-Tapping Screws



*2-3 Pitch Lead Length





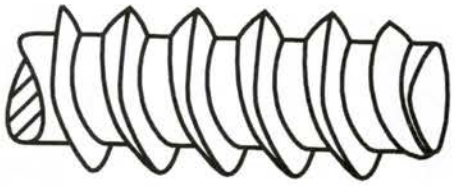
TORX® DRIVE FLAT HEADS (FLOORBOARD)

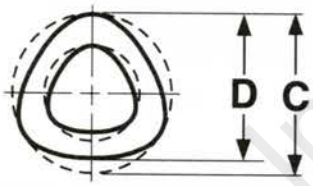
Camcar

Nominal Size or Basic Screw Diameter		G		T	B	F		Drive Size
		Head Diameter		Head Height	Recess Diameter	Gauge Penetration		
		Max Sharp	Abs. Min	Ref	Ref	Max	Min	
6 (U-Cut)	.138	.279	.244	.059	.111	.028	.024	T10
8	.164	.332	.292	.100	.132	.054	.045	T15
10	.190	.385	.340	.116	.155	.064	.053	T20
12	.216	.438	.389	.132	.178	.073	.061	T25
1/4	.2500	.520	.452	.160	.221	.104	.085	T30
5/16	.3125	.648	.568	.199	.266	.109	.090	T40
3/8	.375	.762	.685	.230	.266	.109	.090	T40
1/2**	.500	.875	.775	.223	.352	.144	.120	T50

**1/2 inch diameter floorboard screws are supplied as trilobular thread rolling screws.

Description	A countersunk, torx® drive thread cutting screw with machine screw thread pitch, blunt point, tapered entering threads, and multiple cutting edges. Larger diameter sizes may also be supplied as a thread rolling screw rather than thread cutting. Floorboard screws are, by definition, available in much longer sizes than standard type-F screws.
Applications/ Advantages	Floorboard screws are specifically designed for installing wood floors into truck trailers.
Material	AISI 1016 - 1024 or equivalent steel
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650°F minimum.
Surface Hardness	Rockwell C45 minimum
Case Depth	No. 8 thru 12 diameter: .004 - .009 1/4" diameter & larger: .005 - .011
Core Hardness (after tempering)	Rockwell C28 - 38
Thread Dimensions	**#8 thru 3/8" diameters:** Same as those for Type-F thread cutting screws. **1/2" diameter:** Same as those for a thread rolling screw.
Plating	See Appendix-A for information on the plating of floorboard screws.





PLASTITE 48-2 THREAD ROLLING SCREWS

Reminc

Nominal Screw Size and Threads Per Inch	C		D		Minimum Out-Of-Round	Recommended Pilot Hole Sizes	
	Diameter of Circumscribing Circle		Measurements Across Center				
	Max	Min	Max	Min		Soft Ductile Materials	Brittle Materials
2 - 28	.092	.086	.089	.083	.002	.076	.080
3 - 24	.110	.104	.106	.100	.002	.088	.094
4 - 20	.127	.121	.123	.117	.002	.100	.106
5 - 20	.136	.132	.133	.129	.002	-	-
6 - 19	.147	.141	.143	.137	.003	.122	.128
7 - 18	.166	.160	.160	.154	.004	.134	.142
8 - 16	.185	.179	.179	.173	.004	.149	.158
10 - 14	.212	.206	.208	.202	.004	.175	.185
12 - 11	.232	.226	.226	.220	.005	.195	.205
1/4 - 10	.276	.270	.268	.262	.006	.224	.240
Tolerance on Length	Thru 3/4": ±.030"				Over 3/4": ±.050"		

Description	Trilobular thread-rolling screw with extra wide spacing between 48° profile threads; twin lead threads with a 1-2 thread point taper.	
Applications/ Advantages	Thermoplastics, engineering resins and certain thermosets. Sharper thread profile increases holding strength while reducing material displacement. Drive and strip torques are higher, reducing the need for inserts or reinforcing clips.	
Material	*Steel*	*Stainless*
	AISI 1022 steel	**18-8:** 18-8 stainless steel **410:** 410 austenitic stainless steel
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650° F minimum.	**410**: Screws shall be annealed by heating to 1850° -1950° F, held at least 1/2 hr & rapid air- or oil-quenched; then reheated to 525° F min. for at least 1 hr & air cooled to provide the required mechanical properties.
Case Hardness	Rockwell C45 minimum	-
Case Depth	No. 2 thru 6 diameters: .002 - .007 No. 8 thru 10 diameters: .004 - .009 1/4" diameter: .005 - .011	-
Core Hardness (after tempering)	Rockwell C28-38	**18-8**: Rockwell B90 - C20 **410**: Rockwell C34 - 42
Plating	Various finishes with wax coating (see Appendix-A)	Stainless thread rolling screws are supplied passivated & waxed.

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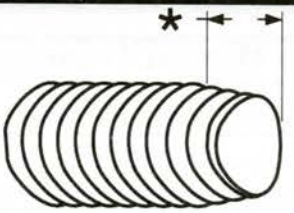
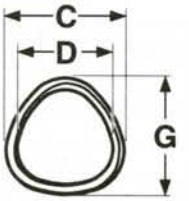
Taptite® II *Thread Rolling* Self-Tapping Screws





*2-3 Pitch Lead Length

TAPTITE® II THREAD ROLLING SCREWS

Reminc

Nominal Screw Width	C		D		G
	Screw Body Dimensions				Point
	Diameter of Circumscribing Circle		Measurement Across Center		Diameter of Circumscribing Circle
	Max	Min	Max	Min	Max
2-56	.0875	.0835	.0840	.0800	.070
3-48	.1010	.0970	.0970	.0930	.081
4-40	.1145	.1105	.1095	.1055	.090
5-40	.1275	.1235	.1225	.1185	.103
6-32	.1410	.1350	.1350	.1290	.111
8-32	.1670	.1610	.1610	.1550	.137
10-24	.1940	.1880	.1860	.1800	.153
10-32	.1930	.1870	.1870	.1810	.163
12-24	.2200	.2140	.2120	.2060	.179
1/4-20	.2550	.2490	.2450	.2390	.206
5/16-18	.3180	.3120	.307	.301	.264
3/8-16	.3810	.3750	.3685	.3625	.320
1/2-13	.5075	.5015	.4920	.4860	.432

Tolerance on Length	Nominal Screw Size	Nominal Screw Length			
		To 1/2" Incl.	Over 1/2" to 1" Incl.	Over 1" to 2" Incl.	Over 2"
	#2 - #12	+0, -.020	+0, -.030	+0, -.060	+0, -.090
	1/4" - 1/2"	+0, -.030	+0, -.030	+0, -.060	+0, -.090

Description	Trilobular thread rolling screw. As each lobe of the screw moves through the pilot hole in the nut material, it forms and work-hardens the nut thread metal, producing an uninterrupted grain flow.	
Applications/ Advantages	For drilled, punched or corred holes in all ductile metals and punch extruded metals. Eliminates chips, requires low drive torque and provides excellent resistance to vibrational loosening.	
Material	*Steel*	*Stainless*
	Steel thread rolling screws shall be made from cold-heading steel conforming to the following chemical composition: *Carbon*: 0.13-0.27%; *Manganese*: 0.64-1.71%	**18-8:** 18-8 stainless steel **410:** 410 austenitic stainless steel
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650°F minimum.	**410**: Screws shall be annealed by heating to 1850° - 1950°F, held at least for 1/2 hr & rapid air- or oil-quenched; then reheated to 525°F min. for at least 1 hr & air cooled to provide the required mechanical properties.
Case Hardness	Rockwell C45 minimum	-
Case Depth	2-56 through 6-32 diameters: .002 - .007 8-32 through 12-24 diameters: .004 - .009 1/4-20 diameter & larger: .005 - .011	-
Core Hardness (after tempering)	Rockwell C28-38	**18-8**: Rockwell B90 - C20 **410**: Rockwell C34 - 42
Plating	See Appendix-A for information on the plating of Taptite® II screws.	Stainless thread rolling screws are supplied passivated and waxed.

Taptite® II is a registered trademark of REMINC (Research Engineering & Manufacturing Inc.)

Self-Tapping Screws — *Hole Size Data* — Steel Taptite® II

Taptite® II Recommended Pilot Hole Sizes for Various Material Thicknesses

Reminc

Application Duty Class	Light 0.3 Diameter of Material			Medium-Light 0.5 Diameter of Material			Medium-Heavy 0.75 Diameter of Material			Full Strength 1.0 Diameter of Material			Extended 1.25 Diameter of Material		
% of Thread	90%			85%			80%			75%			70%		
Nominal Size	Material Thickness	Pilot Hole	Drill Size	Material Thickness	Pilot Hole	Drill Size	Material Thickness	Pilot Hole	Drill Size	Material Thickness	Pilot Hole	Drill Size	Material Thickness	Pilot Hole	Drill Size
2-56	.017-.034	.0756	.0748	.034-.052	.0761	.076	.052-.073	.0767	.0763	.073-.095	.0773	.0781	.095-.169	.0779	.0781
3-48	.020-.040	.0868	.0866	.040-.059	.0875	.0866	.059-.084	.0882	.089	.084-.110	.0888	.089	.110-.141	.0895	.089
4-40	.022-.045	.0974	.098	.045-.067	.0982	.098	.067-.095	.099	.0995	.095-.126	.0998	.0995	.126-.157	.1006	.0995
5-40	.025-.051	.1104	.1102	.051-.075	.1112	.111	.075-.106	.112	.113	.106-.141	.1128	.113	.141-.175	.1136	.113
6-32	.028-.066	.1197	.120	.066-.083	.1207	.120	.083-.117	.1218	.122	.117-.152	.1228	.122	.152-.193	.1238	.125
8-32	.033-.066	.1457	.1457	.066-.098	.1467	.147	.098-.141	.1478	.1476	.141-.180	.1488	.1496	.180-.230	.1498	.1496
10-24	.038-.079	.1656	.166	.079-.114	.167	.1673	.114-.162	.1683	.1695	.162-.209	.1697	.1695	.209-.266	.171	.1719
10-32	.038-.079	.1717	.1719	.079-.114	.1727	.173	.114-.162	.1738	.173	.162-.209	.1748	.1732	.209-.266	.1758	.177
12-24	.043-.086	.1916	.191	.086-.130	.193	.1929	.130-.184	.1943	.196	.184-.238	.1957	.196	.238-.302	.197	.1969
1/4-20	.050-.100	.2208	.221	.100-.150	.2224	.2244	.150-.213	.224	.2244	.213-.275	.2256	.2264	.275-.350	.2273	.228
5/16-18	.062-.126	.2800	.2795	.126-.188	.2818	.2812	.188-.266	.2836	.2835	.266-.345	.2854	.2854	.345-.438	.2872	.2874
3/8-16	.075-.150	.3384	.3386	.150-.225	.3405	.3386	.225-.319	.3425	.3425	.319-.413	.3445	.3455	.413-.525	.3466	.3465
1/2-13	.100-.200	.455	.4531	.200-.300	.4575	.4531	.300-.425	.460	.4531	.425-.550	.4625	.4688	.550-.700	.465	.4688

NOTES:
APPLICATION DUTY CLASS is a general term used here to group material thicknesses in terms of screw diameters. For example, the average material thickness listed under "Medium-Heavy" equals 75% of the screw diameter.

Taptite® II Suggested Hole Sizes At Various Percentages of Thread Engagement

Reminc

Nominal Screw Size	Percent Thread													
	100	95	90(1)	85(1)	80	75	70	65	60	55	50	45	40	35
	Pilot Hole Sizes													
2-56	.0744	.0750	.0756	.0761	.0767	.0773	.0779	.0785	.0790	.0796	.0802	.0808	.0814	.0819
3-48	.0855	.0861	.0868	.0875	.0882	.0888	.0895	.0902	.0909	.0916	.0922	.0929	.0936	.0943
4-40	.0958	.0966	.0974	.0982	.0990	.0998	.1006	.1014	.1023	.1031	.1039	.1047	.1055	.1063
5-40	.1088	.1096	.1104	.1112	.1120	.1128	.1136	.1144	.1153	.1161	.1169	.1177	.1185	.1193
6-32	.1177	.1187	.1197	.1207	.1218	.1228	.1238	.1248	.1258	.1268	.1278	.1289	.1299	.1309
8-32	.1437	.1447	.1457	.1467	.1478	.1488	.1498	.1508	.1518	.1528	.1538	.1549	.1559	.1569
10-24	.1629	.1643	.1656	.1670	.1683	.1697	.1710	.1724	.1738	.1751	.1765	.1778	.1792	.1805
10-32	.1697	.1707	.1717	.1727	.1738	.1748	.1758	.1768	.1778	.1788	.1798	.1809	.1819	.1829
12-24	.1889	.1903	.1916	.1930	.1943	.1957	.1970	.1984	.1998	.2011	.2025	.2038	.2052	.2065
1/4-20	.2175	.2191	.2208	.2224	.2240	.2256	.2273	.2289	.2305	.2321	.2338	.2354	.2370	.2386
5/16-18	.2764	.2782	.2800	.2818	.2836	.2854	.2872	.2890	.2908	.2926	.2944	.2963	.2981	.2999
3/8-16	.3344	.3364	.3384	.3405	.3425	.3445	.3466	.3486	.3506	.3527	.3547	.3567	.3588	.3608
1/2-13	.4500	.4525	.4550	.4575	.4600	.4625	.4650	.4675	.4700	.4725	.4750	.4775	.4800	.4825

(1) Pilot holes listed under 90% & 85% (thread percent) also recommended for single punch extruded holes. See suggested extruded hole chart.

NOTES:
-The above values are based on a linear relation between hole size and percentage thread engagement, the hole data becomes less accurate for engagements less than 70%. The chart indicates that a 10-32 screw in a .1738" hole size provides 80% thread engagement.
-These holes are based on the U.S. basic thread depth of .6495 times the pitch and are calculated using nominal screw diameters .
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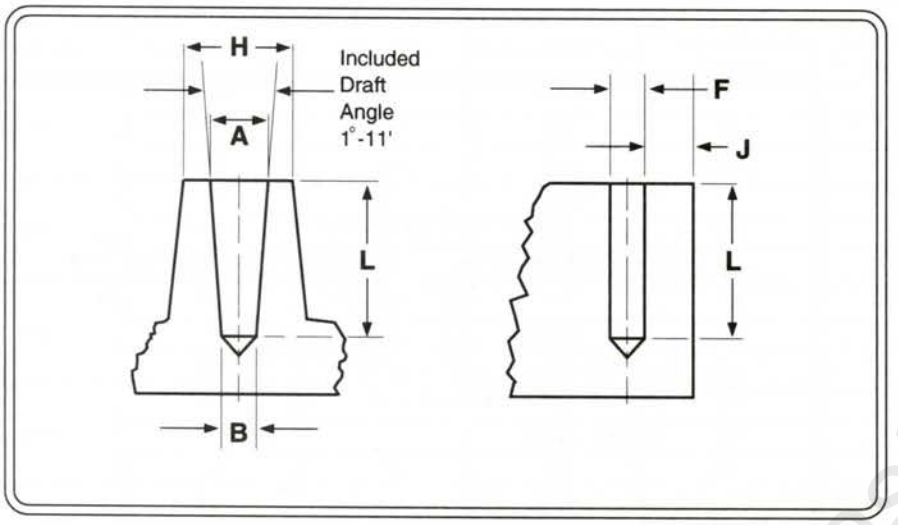

TAPTITE® II SUGGESTED HOLE SIZES FOR ALUMINUM OR ZINC DIE CASTING

Reminc

Screw Size	A		B		F	L	H	J
	Top		Bottom		Hole Diameter as Drilled	Length of Thread Engagement	Boss Diameter	Distance to Edge for No Measurable Distortion
	Hole Diameter as Cast Std. Taper							
	Max	Min	Max	Min			Min	Min
2-56	.081	.078	.077	.074	.077	.172	.197	.046
3-48	.093	.090	.088	.085	.088	.198	.208	.054
4-40	.105	.102	.099	.096	.099	.224	.220	.065
5-40	.118	.115	.112	.109	.112	.250	.232	.065
6-32	.128	.125	.122	.119	.122	.276	.242	.081
8-32	.155	.152	.148	.145	.148	.328	.272	.081
10-24	.177	.174	.168	.165	.168	.380	.315	.108
10-32	.182	.179	.174	.171	.174	.380	.315	.081
12-24	.203	.200	.194	.191	.194	.432	.359	.108
1/4-20	.235	.232	.224	.221	.224	.500	.415	.130
5/16-18	.297	.294	.284	.281	.284	.625	.519	.144
3/8-16	.359	.356	.343	.340	.343	.750	.623	.162
1/2-13	.481	.478	.460	.457	.460	1.000	.830	.200

NOTES:

-The minimum length of thread engagement should be equal to twice the diameter of the screw (to approach utilizing available screw strength). The hole diameter, to ensure optimum performance, should provide for 65% to 75% thread engagement.

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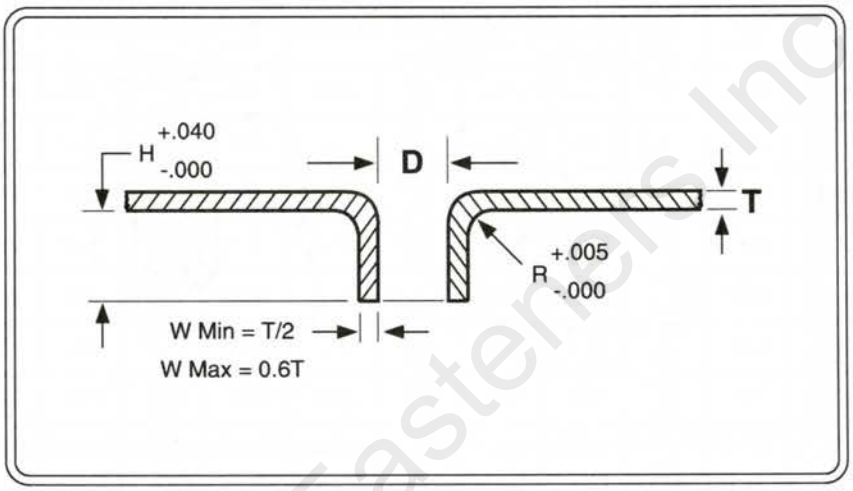
Self-Tapping Screws *Hole Size Data* Steel Taptite® II



TAPTITE® II SUGGESTED EXTRUDED HOLES IN LIGHT-GAUGE STEEL

Reminc

Inch Thickness T	.02	.03	.04	.06	.09	.13	.16	.19	.22	.25	.31	.38	
Screw Size	Hole Sizes - D												
6-32	.118 .120	.118 .121	.119 .122	.120 .123	.122 .125	-	-	-	-	-	-	-	D HOLE DIAMETER
8-32	.144 .146	.144 .147	.145 .148	.146 .149	.147 .150	.148 .152	-	-	-	-	-	-	
10-24	.163 .165	.163 .166	.164 .167	.165 .168	.166 .170	.168 .173	-	-	-	-	-	-	
10-32	.170 .172	.170 .173	.171 .174	.172 .175	.173 .176	.174 .177	-	-	-	-	-	-	
12-24	.189 .191	.189 .192	.190 .193	.191 .194	.192 .196	.193 .197	.195 .200	.198 .203	-	-	-	-	
1/4-20	-	-	.218 .220	.218 .221	.219 .223	.221 .225	.224 .228	.227 .231	.228 .233	.230 .235	-	-	
5/16-18	-	-	-	.277 .279	.278 .280	.279 .281	.280 .283	.281 .285	.283 .288	.285 .290	-	-	
3/8-16	-	-	-	-	-	.335 .337	.336 .338	.337 .340	.337 .340	.342 .346	.344 .349	-	
1/2-13	-	-	-	-	-	-	-	.450 .453	.452 .455	.454 .457	.455 .460	.459 .464	

NOTES:

Taptite® II screws will develop almost twice the failure torque in extruded holes, providing maximum joint integrity.

The above chart indicates that an extruded hole diameter of .166" to .170" is suggested in .090" thick material when using a 10-24 Taptite® II screw.

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Steel Taptite® II *Hole Size Data* Self-Tapping Screws

TAPTITE® II TYPICAL TORQUE PERFORMANCE IN COLD ROLLED STEEL

Reminc

Screw Size	Plate Thickness	Hole Size	Nearest Drill Size	Thread Forming Torque	Prevailing First Removal Torque	Recommended Assembly Torque	Failure Torque
2-56	.0469	.075	1.9mm	1-2	.5-1	4	6-7*
	.0625	.076	#48	1-2	.5-1	4	8-10*
	.0938	.079	#47	1-2	.5-1	5	11-14•
3-48	.0625	.087	2.2mm	3-4	1-2	6	14-15*
	.0938	.089	#43	3-5	1-2	7	15-16*
	.1250	.090	#43	4-6	1-2	7	15-18•
4-40	.0312	.098	#40	2-3	1-2	6	8-11*
	.0625	.102	2.6mm	3-4	1-2	9	15-18*
	.0938	.102	2.6mm	3-4	1-2	11	22-27•
5-40	.0625	.111	#34	4-5	2-3	12	22-29*
	.0938	.113	#33	4-7	3-4	18	34-41*
	.1250	.116	#32	6-8	4-5	20	38-46•
6-32	.0625	.120	#31	4-7	3-4	14	25-30*
	.0938	.120	#31	6-9	3-5	20	35-45*•
	.1250	.125	1/8	6-9	4-6	22	39-45•
8-32	.0938	.147	#26	10-13	5-7	30	65-75*
	.1250	.150	3.8mm	11-14	4-7	45	75-85*•
	.1875	.150	3.8mm	16-20	8-11	45	75-95•
10-24	.0938	.172	11/64	14-18	5-8	35	65-80*
	.1250	.172	11/64	14-18	5-8	45	80-90*
	.1875	.172	11/64	17-22	9-13	55	100-115•
10-32	.0938	.173	#17	11-14	9-13	35	80-95*
	.1250	.177	#16	12-16	9-13	50	100-120*
	.1875	.177	#16	19-25	12-16	70	115-140*
12-24	.1250	.196	#9	19-24	9-12	65	95-115*
	.1875	.199	#8	21-26	9-13	75	135-155*
	.2500	.203	13/64	21-26	10-14	85	150-170•
1/4-20	.1250	.224	5.7mm	30-36	18-25	85	170-195*
	.1875	.224	5.7mm	45-55	25-35	125	205-235•
	.2500	.228	#1	55-65	25-35	125	205-235•
5/16-18	.1875	.281	K	75-85	40-50	160	380-410*
	.2500	.285	7.25mm	75-85	40-50	225	425-465*•
	.3125	.285	7.25mm	80-90	55-65	250	450-500•
3/8-16	.2500	.348	S	90-100	45-55	350	825-875*
	.3125	.348	S	110-125	50-60	400	950-1000*
	.3750	.354	9mm	95-110	30-45	450	950-1000*
1/2-13	.250	.465	29/64	150-180	60-80	500	975-1075*
	.3750	.469	15/32	185-215	60-90	850	1600-1800*
	.5000	.469	15/32	235-275	75-105	1000	1900-2200•

*Indicates probability that nut threads will strip. •Indicates probability that screw will break.

NOTES: •Torque values are listed in pound-inches. Plate dimensions are listed in inches.

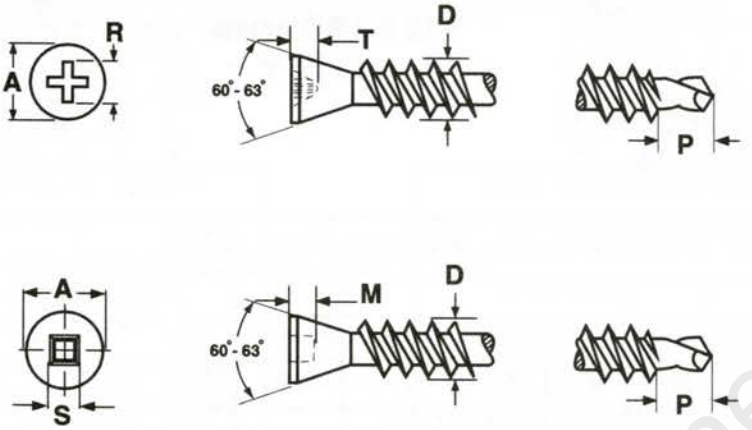
•Torque values were developed using hex washer head screws, zinc plated plus wax, driven at low speed under laboratory controlled conditions. The values shown only represent these controlled conditions and should not be used in lieu of proper application testing. The data is presented to provide the user with an estimate of what could be achieved in an actual application having a thicker or thinner nut member, harder or softer material, different hole or fastener all contribute to variations in torque performance.

•Recommended tightening torque is intended to induce approximately 30,000 to 50,000 psi clamping force.

•Prevailing first removal torque, the torque necessary to remove the screw after the head has been unseated, is an indication of Taptite® II screws' inherent resistance to loosening under vibration, even without the screw head being seated.

Mechanical Properties of Hardened 410 Stainless Steel Taptite® II Thread Rolling Screws	
Nominal Diameter and Thread Pitch	Torsional Strength (Inch-Lbs.)
	Min.
4-40	11.5
5-40	17.8
6-32	21.3
8-32	42.2
10-24	57.3
10-32	73.7
12-24	95.6
1/4-20	142
1/4-28	184

Trim Head *Self-Drilling* Self- Tapping Screws



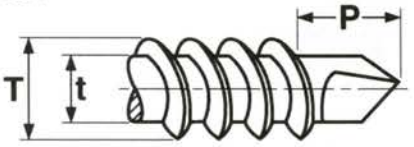
Trim Head Self Drilling Screws

Nominal Size & Number of Threads per Inch	D		R		T		S		M		A		P	Phillips Driver Size	Square Recess Driver Size	Torque Test (KG/CM)
	Major Thread Diameter		Phillips Drive				Square Drive				Head Diameter		Drill Point Length			
			Recess Diameter		Recess Penetration Gaging Depth		Recess Square		Recess Depth							
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Min			Min
6-20	.142	.133	.136	.121	.082	.066	.091	.089	.063	.047	.236	.216	.140	1	1	28
8-18	.169	.161	.136	.121	.082	.066	.091	.089	.063	.047	.275	.255	.156	1	1	45
8-18	.169	.161	.182	.168	.104	.079	.113	.110	.075	.064	.275	.255	.156	2	2	45
10-16	.189	.182	.182	.168	.110	.086	-	-	-	-	.331	.291	.255	2	-	70
Tolerance on Length									± 0.06							

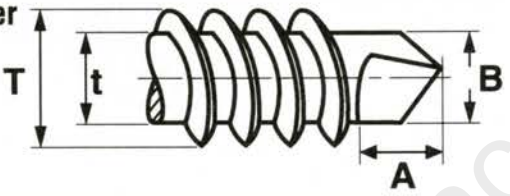
Description	A steel fastener with a spaced thread, a point that drills its own hole, and a countersunk flat head of a width 1/3 less than a standard self drilling screw.
Applications/ Advantages	Ideal for attaching base board or trim through one or two layers of drywall to 12 - 20 gauge metal studs:
Material	AISI 1016 - 1022 or equivalent steel.
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 625°F minimum.
Surface Hardness	Vickers HV 550 - 800
Case Depth	.004 minimum
Core Hardness (after tempering)	Vickers HV 270 - 450
Plating	Trim head self-drilling screws are commonly available in zinc plated coatings. See Appendix-A for details.

Self-Tapping Screws — *Self-Drilling* — Type-BSD / Type-CSD

Type-BSD



5/16 & 3/8 Diameter #3 Point



Self-Drilling Screws, Type BSD

*SAE J78-1998

Nominal Size or Basic Screw Diameter		Threads Per Inch	T Major Diameter		t Minor Diameter		P Protrusion Allowance		Minimum Practical Nominal Screw Lengths, Formed Points				Minimum Torsional Strength, lb.- in. (STEEL SCREWS ONLY)
			Max	Min	Max	Min	#2 Pt.	#3 Pt.	90° Head, #2 Pt	Csk Head, #2 Pt	90° Head, #3 Pt	Csk Head, #3 Pt	
4	.1120	24	.114	.110	.086	.082	.163	-	5/16	3/8	-	-	14
6	.1380	20	.139	.135	.104	.099	.190	.220	5/16	3/8	3/8	7/16	24
7*	.1510	19	.153	.146	.113	.109	.137	.157	5/16	3/8	3/8	7/16	-
8	.1640	18	.166	.161	.122	.116	.211	.251	3/8	7/16	7/16	1/2	42
10	.1900	16	.189	.183	.141	.135	.235	.300	7/16	1/2	1/2	9/16	61
12	.2160	14	.215	.209	.164	.157	.283	.353	1/2	5/8	1/2	5/8	92
1/4	.2500	14	.246	.240	.192	.185	.318	.393	1/2	5/8	1/2	5/8	150

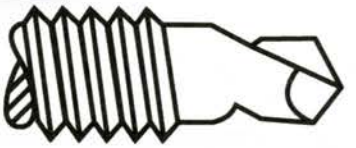
*SAE J78 does not include specifications for #7 diameter drill screws.

Coarse Thread Self Drilling Screws - 5/16 & 3/8 Diameters, #3 Point

Nominal Size or Basic Screw Diameter		Threads Per Inch	T Major Diameter		t Minor Diameter		A Drill Point Length		B Drill Point Diameter	
			Max	Min	Max	Min	Max	Min	Max	Min
5/16	.3125	12	.315	.307	.272	.263	.421	.361	.270	.265
3/8	.3750	12	.380	.370	.308	.298	.354	.314	.338	.330

	Steel	*Stainless*
Description	*Type BSD:* A tapping screw with spaced threads and a drill point which drills its own hole. *Type CSD:* A wafer head thread forming screw with machine screw thread pitch and a drill point which drills its own hole. Both types allow the screw to form mating threads and produce a complete fastening system in a single operation.	
Applications/ Advantages	*Type BSD:* May be used to attach plywood, soft woods or composition board to metal, or attach metal to metal. *Type CSD:* The finer thread pitch reduces friction and driving torques. Type-CSD screws are normally used with thicker materials. The wafer head design allows the screw to set flush in wood and softer materials and provides a clean, finished appearance. All self-drilling screws offer economical benefits: reduces labor and tooling costs; reduces or eliminates drill bits and taps.	*Type BSD:* The 1º-8 stainless drill screw offers superior corrosion resistance while the 410 stainless screw will drill through harder material than the 18-8. The hardness of the material to be drilled should be a minimum of 10-20 Rockwell hardness points. Minimum torques are the same for stainless and steel self-drill screws. Drill time is 2.5 seconds for a 1mm thick plate.
Material	AISI 1016 - 1024 or equivalent steel	410 or 18-8 stainless steel
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 625°F minimum.	410 stainless screws shall be hardened and tempered by heating to 1800°-1900°F sufficient for austenitization, held for at least 1/2 hour and rapid air or oil-quenched then reheating to 500°-600°F for at least 1 hour and air cooled to provide the specified hardness.
Case Hardness	Rockwell C52 -58	**410 SS:** Rockwell C55 minimum
Case Depth	No. 4 and 6 diameter: .002 - .007 No. 8 thru 12 diameter: .004 - .009 1/4" diameter and larger: .005 - .011	
Core Hardness	Rockwell C32 - 40 (after tempering)	**410 SS**: Rockwell C38 - 42 (after tempering) **18-8 SS**: Rockwell B90 - C25 (approx.)
Plating	See Appendix-A for plating information.	Stainless drill screws are usually supplied plain.

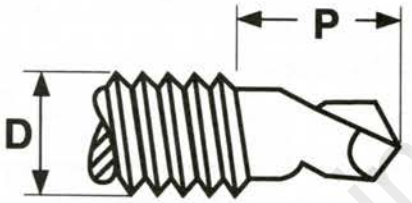
Type-BSD Type-CSD *Self-Drilling* Self-Tapping Screws



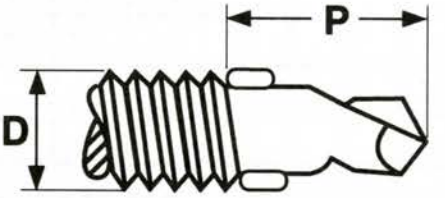
Type BSD Self-Drilling Screw Selection Chart			
Nominal Screw Size	Point Number	Recommended Panel Thickness, in.	
		Min.	Max.
4	2	.035	.080
6	2	.035	.090
8	2	.035	.100
10	2	.035	.110
10	3	.110	.175
12	3	.110	.210
1/4	3	.110	.220
This table is only a guide and does not constitute a warranty of any type.			

Type CSD Self Drilling Screw Selection Chart	
Screw Size	Maximum Drilling Capacity*
10-24 x 3/4"	1/4" Plywood to .175 Metal
10-24 x 1"	3/8" Plywood to .175 Metal
10-24 x 1-1/4"	1/2" Plywood to .175 Metal
10-24 x 1-1/2"	1/2" Plywood to .175 Metal
10-24 x 1-7/16"	5/8 & 3/4" Wood to .175 Metal
*Drilling capacity may vary with type of material & hardness.	

Type-CSD



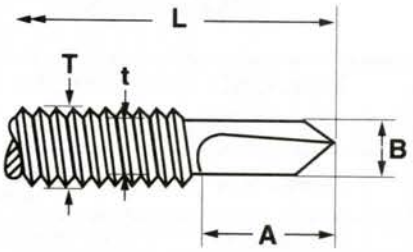
Reamer with Wings (Type(CSD)



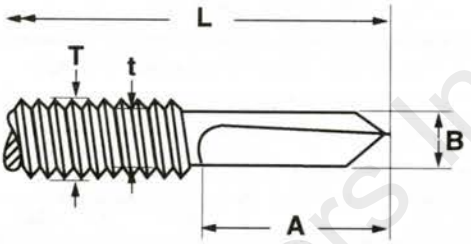
Countersunk Steel Self-Drilling Screws, Type CSD									SAE J78
Nominal Size or Basic Screw Diameter		Threads Per Inch	D Major Diameter		P Protrusion Allowance		Minimum Practical Nominal Screw Lengths, Countersunk Heads, Formed Points		Minimum Torsional Strength, lb.- in. (STEEL SCREWS ONLY)
			Max	Min	#2 Pt	#3 Pt	#2 Pt	#3 Pt	
8	.1640	32	.1640	.1586	.162	.202	7/16	1/2	48
10	.1900	24	.1900	.1834	.193	.258	1/2	9/16	65
12	.2160	24	.2160	.2094	.223	.293	5/8	5/8	100
1/4	.2500	20	.2500	.2428	.275	.350	5/8	5/8	156

Description	*Reamer with Wings:* A Type CSD self-drilling screw with reaming wings located at opposite sides of the shank, below the threads and above the drill point. The 10-24 x 1 7/16 is the only size that is manufactured with wings.
Applications/ Advantages	May be used for drilling through wood over 1/2" thick and the metal surface behind it. The wings drill out a clearance hole in wood or other soft materials, then snap off when in contact with the metal surface to be drilled.
Mechanical & Performance Requirements	Same as other Type CSD self-drilling screws (see previous page).

Self-Tapping Screws — *Self-Drilling* — #4 &#5 Point with Unified Thread



#4 Point



#5 Point

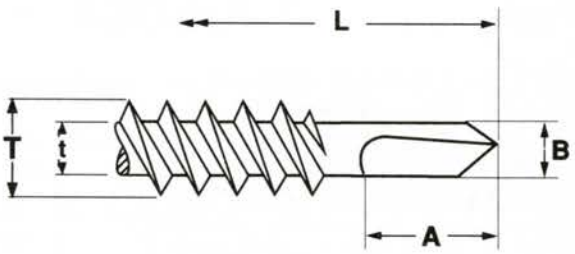
#4 & #5 Point Self Drilling Screws, Unified Thread Pitch

Diameter & Thread Pitch	L	Point Size	T		t		A		B		Drilling Capacity		Performance Info		
	Length (+0, -.050)		Major Thread Diameter		Minor Thread Diameter		Drill Point Length		Drill Point Diameter				Steel Gauge	Shear Strength (lapped steel) (lbs.)	Pullout Strength (lbs.)
			Max	Min	Max	Min	Max	Min	Max	Min	Max	Min			
12-24	7/8	#4	.216	.207	.172	.168	.523	.495	.202	.190	.312	.145	12	2000	1500
12-24	1.25 & 1.5	#5	.216	.207	.172	.168	.640	.603	.202	.190	.500	.250	1/8	2700	2200
													1/4	2760	4000

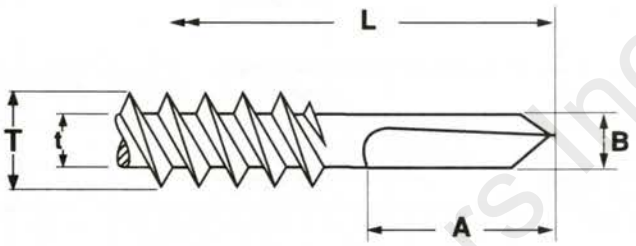
NOTE: There is no single standard for #4 & #5 self-drilling screws. These values are offered as a guide; deviations from these specifications may occur.

Description	A tapping screw with an integrally formed hex washer head, spaced or unified threads, and a drill point significantly longer than that of a # 2 or #3 point drill screw.
Applications/ Advantages	Designed to drill through a greater thickness of steel than a standard self drilling screw. Although it can assist in attaching metal deck to structural steel, the #4 & #5 point self drilling screws are not structural bolts and should not be used as such.
Material	AISI 1022 or equivalent steel
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 625° F minimum.
Case Hardness	Rockwell C50 - 56
Case Depth	No. 12 diameter: .004 - .009 1/4 and larger: .005 - .011
Core Hardness (after tempering)	Rockwell C32 - 40
Shear Strength	The average ultimate values for shear strength are listed in the above table. Safety factors should be used when designing final applications.
Pull-out Strength	The average ultimate values for pull-out strength are listed in the above table. Safety factors should be used when designing final applications.
Plating	See Appendix-A for plating information.

#4 &#5 Point with Spaced Thread *Self-Drilling* Self-Tapping Screws



#4 Point



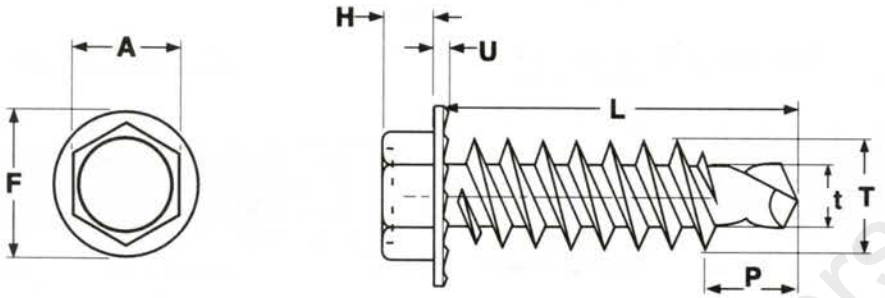
#5 Point

#4 & #5 Point Self Drilling Screws, Tapping Screw Thread

Diameter & Thread Pitch	L	Point Size	T		t		A		B		Drilling Capacity	
	Length (+0, -.050)		Major Thread Diameter		Minor Thread Diameter		Drill Point Length		Drill Point Diameter			
			Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
12-14	7/8	#4	.215	.209	.164	.157	..480	.455	.202	.188	.312	.145
12-14	7/8 thru 3"	#5	.215	.209	.164	.157	.630	.605	.202	.188	.500	.250
1/4-14	7/8 thru 3.5"	#4	.246	.240	.192	.185	.650	.625	.225	.215	.312	.145
1/4-14	1 thru 3"	#5	.246	.240	.192	.185	.755	.730	.225	.215	.500	.250
5/16-12	1 thru 1.5"	#4	.315	.307	.272	.263	.570	.515	.285	.275	.312	.110

Description	A tapping screw with an integrally formed hex washer head, spaced or unified threads, and a drill point significantly longer than that of a # 2 or #3 point drill screw.
Applications/ Advantages	Designed to drill through a greater thickness of steel than a standard self drilling screw. Although it can assist in attaching metal deck to structural steel, the #4 & #5 point self drilling screws are not structural bolts and should not be used as such.
Material	AISI 1022 or equivalent steel
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 625° F minimum.
Case Hardness	Rockwell C50 - 56
Case Depth	No. 12 diameter: .004 - .009 1/4 and larger: .005 - .011
Core Hardness (after tempering)	Rockwell C32 - 40
Shear Strength	The average ultimate values for shear strength are listed in the above table. Safety factors should be used when designing final applications.
Pull-out Strength	The average ultimate values for pull-out strength are listed in the above table. Safety factors should be used when designing final applications.
Plating	See Appendix-A for plating information.

Self-Tapping Screws — *Self Drilling* — Serrated Hex Washer



Serrated Hex Washer Self-Drilling Screws, Spaced Thread

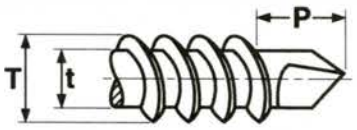
Nominal Screw Size & Threads per Inch	A Width Across Head		H Head Height		F Washer Diameter		U Washer Thickness		T Major Diameter		t Minor Diameter		Drill Point Size	P Protrusion Allowance	Drilling Thickness		Recommended Screw Gun Speed
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min			Max	Min	Max RPM
8-18	.250	.244	.110	.096	.348	.322	.036	.024	.166	.161	.122	.116	2	.211	.100	.035	2500
10-16	.312	.305	.120	.105	.414	.384	036	.024	.189	.183	.141	.135	2	.235	.110	.035	2500
1/4-14	.438	.428	.190	.172	.590	.560	.063	.037	.246	.240	.192	.185	3	.393	.220	.110	2000
5/16-12	.438	.428	.230	.208	.610	.580	.063	.037	.315	.307	.272	.263	4	.510	.312	.110	2000

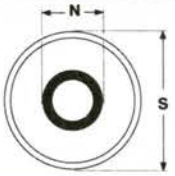
Serrated Hex Washer Self-Drilling Screws, Machine Screw Thread

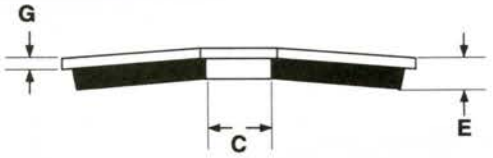
1/4-20	.438	.428	.190	.172	.590	.551	.063	.029	.250	.242	-	-	2	.275	.035	.175	2000

Description	An integrally formed hex washer head screw with serrations on the bearing surface side of the washer face and a drill point. Serrations extend from outer edge of washer face to the screw shank. Thread design can be either spaced (like a type-BSD drill screw) or unified (type-CSD).
Applications/ Advantages	Used to attach plywood, soft wood or metal to metal. Serrated washer design adds greater holding power to components subject to vibrations caused by repeated movements. The 1/4-inch diameter screws, for instance, are commonly used to attach reinforcing strut or L-angle to garage doors.
Material	AISI 1016 - 1024 or equivalent steel
Heat Treatment	Fasteners are heat treated in a carbonitriding or gas-carburizing system at a minimum temperature of 625°F, or in a cyaniding system (with consent of the buyer) at a minimum temperature of 450°F.
Case Hardness	Rockwell C 50 - 56
Case Depth	#4 & #6 Diameters: .002 - .007 #8 thru #12 Diameters: .004 - .009 1/4" Diameter & larger: .005 - .011
Core Hardness	Rockwell C32 - 40
Minimum Torsional Strength for ZINC-plated screws	#8 diameter: 41 lb.-in. #10 diameter: 55 lb.-in. 1/4" diameter: 132 lb.-in. 5/16" diameter: (no industry standard)
Plating	Serrated hex washer self-drilling screws are usually supplied with a clear zinc finish.

With Neo-EPDM Washers — *Self-Drilling* Self-Tapping Screws







Self-Drilling Screws, Type BSD

SAE J78-1998

Nominal Size or Basic Screw Diameter		Threads Per Inch	T Major Diameter		t Minor Diameter		P Protrusion Allowance		Minimum Practical Nominal Screw Lengths, Formed Points				Minimum Torsional Strength, lb.- in. (STEEL SCREWS ONLY)
			Max	Min	Max	Min	#2 Pt.	#3 Pt.	90° Head, #2 Pt	Csk Head, #2 Pt	90° Head, #3 Pt	Csk Head, #3 Pt	
8	.1640	18	.166	.161	.122	.116	.211	.251	3/8	7/16	7/16	1/2	42
10	.1900	16	.189	.183	.141	.135	.235	.300	7/16	1/2	1/2	9/16	61
12	.2160	14	.215	.209	.164	.157	.283	.353	1/2	5/8	1/2	5/8	92
1/4	.2500	14	.246	.240	.192	.185	.318	.393	1/2	5/8	1/2	5/8	150

Coarse Thread Self Drilling Screws - 5/16 & 3/8 Diameters, #3 Point

Nominal Size or Basic Screw Diameter		Threads Per Inch	T Major Diameter		t Minor Diameter		A Drill Point Length		B Drill Point Diameter	
			Max	Min	Max	Min	Max	Min	Max	Min
5/16	.3125	12	.315	.307	.272	.263	.421	.361	.270	.265
3/8	.3750	12	.380	.370	.308	.298	.354	.314	.338	.330

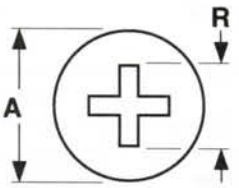
Neo-EPDM Washers used with Self Piercing & Self Drilling Screws

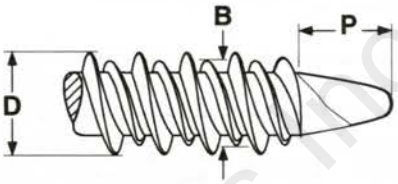
For Use with Screw of this Nominal Diameter	S Outside Diameter of Steel Section		N Inside Diameter of Steel Section		G Thickness of Steel Section		E Total Thickness (EPDM & Steel)	
	Max	Min	Max	Min	Max	Min	Max	Min
8	.507	.491	.212	.196	.039	.023	.125	.093
10	.507	.491	.212	.196	.039	.023	.125	.093
12	.558	.542	.243	.227	.039	.023	.125	.093
14 or 1/4	.617	.601	.275	.259	.039	.023	.125	.093
5/16	.750	.720	.345	.315	.040	.032	.116	.086
3/8	.750	.720	.449	.419	.040	.032	.110	.080

NOTE: There is no single standard for Neo-EPDM washers. These values are offered as a guide; deviations from these specifications may occur.

Description	A hex washer head tapping screw with spaced threads and a drill point which drills its own hole. Beneath the head is a thin conically-shaped circular steel washer, bonded to a similarly shaped rubber-like piece which as a slightly smaller outside and inside diameter. When these washers are assembled (rubber side down) to self-piercing or self-drilling screws, those fasteners become "sealing screws".
Applications/ Advantages	When properly assembled, this washer: (a) offers protection against leakage; (b) provides load bearing qualities superior to that of a regular flat washer; (c) reduces the chance of the fastening becoming loose due to vibration; (d) minimizes damage to the mating surface caused by contact with a steel washer. Sealing screws may be used to attach roofing or metal walls to steel frames. Consult a self-drilling screw selection chart for the correct size.
Material	**Screw:** AISI 1016-1024 or equivalent steel; **Steel Section of washer:** 20 gauge steel; **Elastic Section of washer**: Style 40 EPDM sheet
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 625° F minimum.
Case Hardness	**Screw:** Rockwell C52 -58 **Washer:** EPDM material: Shore A 65 - 75 (Durometer scale)
Case Depth of Screw	No. 4 and 6 diameter: .002 - .007 No. 8 thru 12 diameter: .004 - .009 1/4" diameter and larger: .005 - .011
Core Hardness of Screw	Rockwell C32 - 40 (after tempering)
Plating	See Appendix-A for plating information.

Self-Tapping Screws *Self-Drilling* Wafer Phillips High-Low w/Spade Pt.





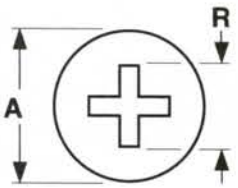
Wafer Phillips Spade Point High-Low Self Drilling Screws with Nibs under Head

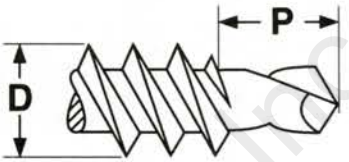
Screw Size	Threads per Inch	A		R		I		D		B		P		Phillips Drive Size
		Head Diameter		Recess Diameter		Recess Depth		Major Thread Diameter		Minor Thread Diameter		Point Length		
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
8	15	.417	.377	.209	.196	.148	.123	.201	.182	.169	.149	.228	.208	2
Tolerance on Length														

NOTE: There is no single standard for spade point high-low screws. These values are offered as a guide; deviations from these specifications may occur.

Description	A countersunk, flat head screw with a double lead, consisting of a high and low thread; and spade-shaped point designed to drill its own hole. The head has eight protrusions, or nibs, equidistantly spaced from each other, that run from the outer edge of the head down the cone-shaped bearing surface.
Applications/ Advantages	Specifically designed for attaching cement board to plywood.
Material	AISI 1018 - 1022 steel
Case Depth	.004 minimum
Surface Hardness	Vickers HV 450 - 800
Core Hardness	Vickers HV 290 - 450
Recommended Torque	45 kg/cm minimum
Finish	Screws have a green ceramic coating intended to withstand a salt-spray test of 500 hours.

Wafer Phillips w/ Drill Point *Self-Drilling* Self- Tapping Screws





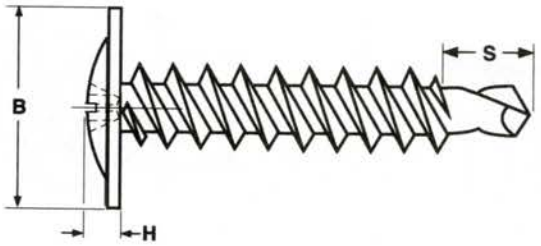
Wafer Phillips Self Drilling Screws with Nibs under the Head

Screw Size	Threads per Inch	A		R		I		D		P	Phillips Drive Size
		Head Diameter		Recess Diameter		Recess Depth		Major Thread Diameter		Point Length	
		Max	Min	Max	Min	Max	Min	Max	Min	Min	
8	15	.417	.377	.209	.196	.148	.123	.169	.157	.156	2
Tolerance on Length											

NOTE: There is no single standard for Wafer Phillips self-drilling screws. These values are offered as a guide; deviations from these specifications may occur.

Description	A countersunk fastener with a flat head, spaced threads and self drilling point. The head has eight protrusions, or nibs, equidistantly spaced from each other, that run from the outer edge of the head down the cone-shaped bearing surface.
Applications/ Advantages	Specifically designed for attaching cement board to metal studs of a thickness from 14-20 gauge.
Material	AISI 1018 - 1022 steel
Case Depth	.004 minimum
Surface Hardness	Vickers HV 450 - 800
Core Hardness	Vickers HV 290 - 450
Recommended Torque	45 kg/cm minimum
Finish	Screws have a green ceramic coating intended to withstand a salt-spray test of 500 hours.

Self-Tapping Screws — *Self-Drilling* — Modified Truss Head



Modified Truss Head Phillips Self Drilling Screws

Nominal Size & Number of Threads per inch	B		H		D1		D2		Point Size	S		Phillips Driver Size
	Overall Head Diameter		Total Head Height		Minor Diameter		Major Diameter			Protrusion Allowance		
	Max	Min	Max	Min	Max	Min	Max	Min		Max	Min	
6-20	.401	.385	.099	.070	.104	.098	.139	.131	#2	.158	.117	2
8-18	.446	.426	.098	.082	.122	.116	.165	.161	#2	.197	.149	2
10-16	.441	.425	.098	.079	.141	.135	.189	.183	#2	.228	.118	2
10-16	.441	.425	.098	.079	.141	.135	.189	.183	#3	.307	.256	2

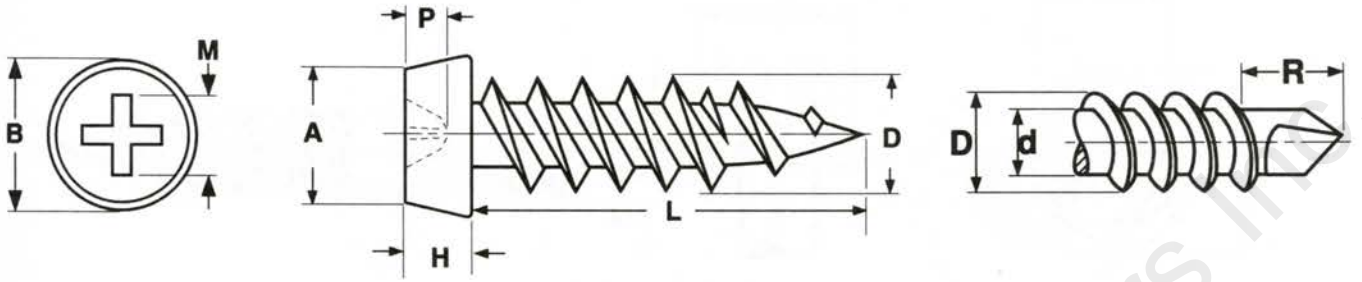
Tolerance on Length	Nominal Screw Size	Nominal Screw Length		
		Thru 1 in.	Over 1" to 2" incl.	Over 2 in.
	#5 thru #10	+0, -.03"	+0, -.047	+0, -.06

NOTE: There is no single standard for Modified Truss self-drilling screws. These values are offered as a guide; deviations from these specifications may occur.

Description	A steel fastener with an extra wide head, twinfast thread and self drilling point. The head is an integrally formed round washer with a low rounded top that is approximately 75% the diameter of the washer.
Applications/ Advantages	Common usage is to attach wire or metal lathe to metal studs of a thickness between 12 - 20 gauge. The head design offers low clearance and an extra large bearing surface. The recommended drive speed for installation is 2500 rpm.
Material	AISI 1016 - 1022 or equivalent steel.
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 625°F minimum.
Surface Hardness	Rockwell C 50 - 56
Case Depth	#8 & #10 diameters: .004 - .009
Core Hardness (after tempering)	Rockwell C 32 - 40
Plating	Screws are commonly available in zinc or black phosphate coatings. See Appendix-A for details.

Sharp & Drill Points

Framing Screws Self- Tapping Screws



Pan Phillips Framing Screw — Sharp Point

Nominal Size	A		B		H		D		M		P	
	Top Head Diameter		Bottom Head Diameter		Head Height		Major Diameter		Recess Diameter		Recess Depth	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
7	.263	.224	.314	.295	.114	.098	.153	.142	.197	.171	.106	.086

Tolerance on Length	+.015, -.020

Pan Phillips Framing Screw — Drill Point

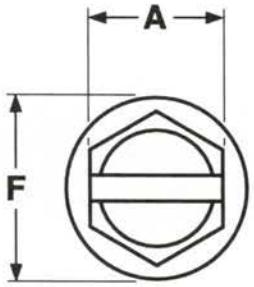
Nominal Size	A		B		H		D		d		M		P		R
	Top Head Diameter		Bottom Head Diameter		Head Height		Major Diameter		Minor Diameter		Recess Diameter		Recess Depth		Protrusion Allowance
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	#2 Point
6	.263	.224	.314	.295	.114	.098	.139	.135	.104	.099	.197	.171	.106	.086	.190

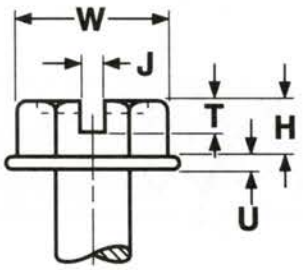
Minimum Torsional Strength	24 Lb.-Inch (Steel Screws Only)

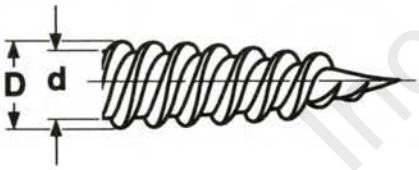
NOTE: There is no single standard for framing screw dimensions. These values are offered as a guide; deviations from these specifications may occur.

Description	A case hardened screw with either (a) a sharp point and twinfast thread, or (b) a drill point and single lead thread. The head has a trapezodal profile with a flat top and a flat underside.
Applications/ Advantages	For framing applications: the sharp point screwis used in thin gauge (less than .050 thick) metal studs & tracks; the drill point variety can be used in metals up to .090 thick.
Material	AISI 1018 steel
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650° F minimum.
Case Hardness	HV 550 - 800
Core Hardness	HV 270 - 450
Case Depth	.004 minimum
Torsional Strength	34 kg/cm minimum
Plating	Parts are usually supplied with a black phosphate finish.

Self-Tapping Screws — *Self-Piercing* — Slotted Hex Washer







Head dimensions of self-piercing screws differ from those of standard tapping screws.

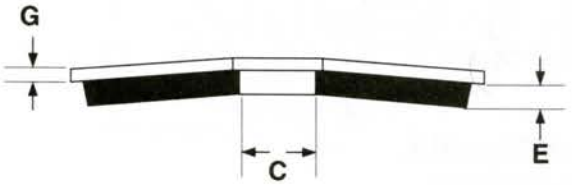
Hex Washer Head Slotted Self-Piercing Screws

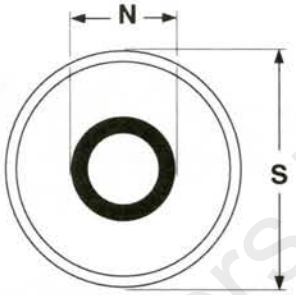
Size	A		H		F		U		J		T		D		d	
	Width Across Flats		Head Height		Washer Diameter		Washer Thickness		Slot Width		Slot Depth		Major Diameter		Minor Diameter	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
6-18	.250	.244	.093	.080	.328	.302	.025	.015	.048	.039	.053	.033	.141	.136	.102	.096
7-16	.250	.244	.093	.080	.328	.302	.029	.017	.048	.039	.062	.040	.158	.152	.114	.108
8-15	.250	.244	.110	.096	.348	.322	.031	.019	.054	.045	.074	.052	.168	.162	.123	.116
10-12	.250	.244	.110	.096	.414	.384	.031	.019	.054	.045	.074	.052	.194	.188	.133	.126
12-11	.312	.305	.150	.133	.432	.398	.039	.022	.067	.056	.093	.077	.221	.215	.162	.155
14-10	.375	.366	.190	.171	.520	.479	.050	.029	.075	.064	.111	.082	.254	.247	.200	.178
Tolerance on Length									±0.05							

NOTE: There is no single standard for self-piercing screw dimensions. These values are offered as a guide; deviations from these specifications may occur.

Description	A slotted hex washer head thread forming tapping screw with a single lead thread rolled to the tip of an extra sharp point, and a second thread spaced 180° apart.
Applications/ Advantages	May be used in thin metal (less than .050 thick). Eliminates need for pre-drilled or pre-punched holes. Undercut area beneath the head allows greater length of thread engagement. Twin lead threads help to reduce driving torque.
Material	AISI 1018 - 1022 or equivalent steel
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650° F minimum.
Surface Hardness	Rockwell C45 minimum
Case Depth	No. 6 diameter: .002 - .007 No. 7 thru 12 diameter: .004 - .009 1/4" diameter: .005 - .011
Core Hardness (after tempering)	Rockwell C28 - 38
Plating	See Appendix-A for plating information.

With Neo-EPDM Sealing Washers *Self-Piercing* Self-Tapping Screws





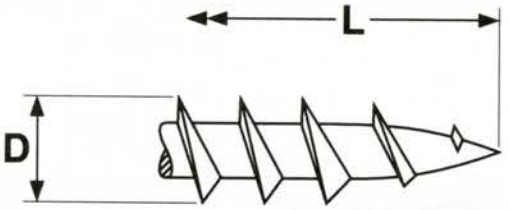
Neo-EPDM Washers used with Self Piercing & Self Drilling Screws

For Use with Screw of this Nominal Diameter	S		N		G	C		E	
	Outside Diameter of Steel Section		Inside Diameter of Steel Section		Thickness of Steel Section	Inside Diameter of EPDM Section		Thickness of EPDM Section	
	Max	Min	Max	Min	Ref	Max	Min	Max	Min
8	.507	.491	.212	.196	.031	.149	.126	.087	.070
10	.507	.491	.212	.196	.031	.149	.126	.087	.070
12	.558	.542	.243	.227	.031	.197	.172	.087	.070
14	.617	.601	.275	.259	.031	.232	.208	.087	.070

NOTE: There is no single standard for Neo-EPDM washers. These values are offered as a guide; deviations from these specifications may occur.

Description	A thin conically-shaped circular steel stamping with a centrally located hole, bonded to a similarly shaped rubber-like piece which as a slightly smaller outside and inside diameter. When these washers are assembled (rubber side down) to self-piercing or self-drilling screws, those fasteners become "sealing screws".
Applications / Advantages	When properly assembled, this washer: (a) offers protection against leakage; (b) provides load bearing qualities superior to that of a regular flat washer; (c) reduces the chance of the fastening becoming loose due to vibration; (d) minimizes damage to the mating surface caused by contact with a steel washer. Self-piercing sealing screws are used in thin metals (less than .050" thick). Self-drilling sealing screws may be used in thicker metals, depending on the diameter of the screw and length of the drill point (consult a self-drilling screw selection chart).
Material	Steel Section of washer: 20 gauge steel Elastic Section of washer: Style 40 EPDM sheet
Hardness	EPDM material: Shore A 65 - 75 (Durometer scale)
Plating	Steel Section of washer: Galvanized

Self-Tapping Screws — Coarse Thread Drywall & Particle Board Screws — Bugle Head



Coarse Thread Drywall & Particle Board Screw

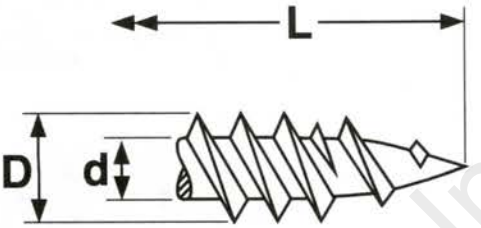
Threads for Coarse Thread Drywall and Particle Board Screws			
Screw Size	Threads per inch	D	
		Major Diameter	
		Max.	Min.
6	8 to 10	.158	.142
7	8 to 10	.172	.153
8	8 to 10	.187	.160
9	8 to 10	.194	.177
10	8 to 9	.211	.190
12	8 to 9	.238	.218
1/4	8 to 9	.270	.252
Tolerance on Length		Up to 1 in. incl.: -0, +0.060	Over 1 in.: -0, +0.100
In the abscence of a single industry standard for Drywall and Particle Board screws, these dimensions are offered as a guide; slight deviations are acceptable.			

NOTE: There is no single standard for drywall and particle board screw dimensions. These values are offered as a guide; deviations from these specifications may occur.

Description	*Coarse thread Drywall--Sharp point:* A bugle head screw with spaced threads, extra sharp point and black phosphate finish.	*Particle Board Screw:* Same as a coarse thread drywall screw but available in shorter lengths than standard drywall screws.
Applications/ Advantages	*Coarse thread Drywall--Sharp point:* For attaching drywall to wood studs or to 25 gage metal studs.	*Particle Board Screw:* Designed specifically for use in dense woods, especially man-made types such as chipboard and particle board.
Material	AISI 1018 or equivalent steel	
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650°F minimum.	
Case Hardness	Rockwell C 44 minimum	
Plating	See Appendix-A for information about the coatings of drywall and particle board screws.	

Bugle Head *Fine Thread Drywall Screws* Self-Tapping Screws

Fine Thread Drill Point Drywall Screw



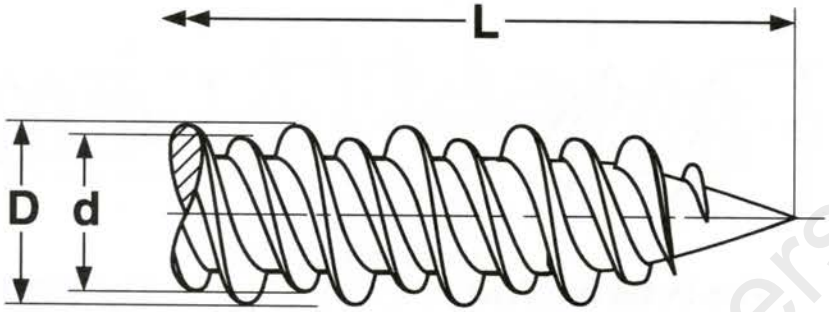
Fine Thread Sharp Point Drywall Screw

THREADS FOR FINE THREAD DRYWALL SCREWS					
Screw Size	Threads per inch	D		d	
		Major Diameter		Minor Diameter	
		Max.	Min.	Max.	Min.
6	18	.144	.135	.102	.096
7	16	.156	.147	.113	.106
8	15	.170	.161	.123	.116
10	14	.201	.193	.158	.152
Tolerance on Length		Up to 1 in. incl.: -0, +0.060		Over 1 in.: -0, +0.100	

NOTE: There is no single standard for drywall screw dimensions. These values are offered as a guide; deviations from these specifications may occur.

Description	*Fine thread Drywall--Sharp point:* A bugle head screw with twinfast thread, extra sharp point and black phosphate finish. *Fine thread Drywall--Drill point:* A bugle head screw with twin lead spaced thread, self drilling point and black phosphate finish.
Applications/ Advantages	*Fine thread Drywall--Sharp point:* For attaching drywall to metal studs from 25 gage through 20 gage thick. Longer sizes are ideal for multiple layers or insulation. *Fine thread Drywall--Drill point:* Will drive easily through drywall, drill a hole in a steel stud up to 14 gage thick, and form its own mating thread. Can also be used for attaching plywood or insulation board to 14 gage metal.
Material	AISI 1018 or equivalent steel
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650°F minimum.
Case Hardness	Rockwell C44 minimum
Plating	See Appendix-A for information about the coating of drywall screws.

Self-Tapping Screws — *High-Low Drywall Screws* — Bugle Head



High-Low Pattern
Drywall Screw Thread

Threads for High-Low Drywall Screws

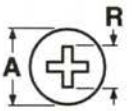
Screw Size	Threads per inch	D		d	
		High Thread Diameter		Low Thread Diameter	
		Max.	Min.	Max.	Min.
6	18	.154	.141	.124	.118
7	16	.166	.153	.130	.122
8	15	.181	.165	.138	.131
Tolerance on Length		Up to 1 in. incl.: -0, +0.060		Over 1 in.: -0, +0.100	

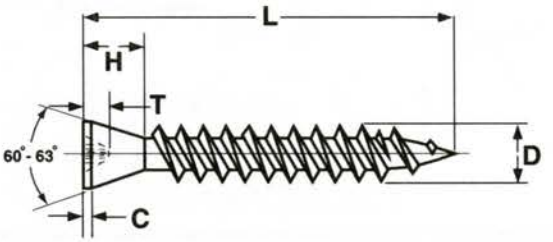
NOTE: There is no single standard for drywall screw dimensions. These values are offered as a guide; deviations from these specifications may occur.

Description	A bugle head screw with a double-lead, consisting of a high and low thread with an extra sharp point and black phosphate finish. The lower thread varies in height from 1/3 to 1/2 that of the higher thread, which is sharper and flatter than a standard thread.
Applications/ Advantages	Requires less torque to drive than a standard twinfast drywall screw. The high-low thread is more resistant to vibration and reduces the chance of heads popping.
Material	AISI 1018 or equivalent steel
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650° F minimum.
Surface Hardness	Vickers HV 550-800 (Rockwell C 52.3 - 64)
Core Hardness	Vickers HV 270-450 (Rockwell C 25.6 - 45.3)
Plating	See Appendix-A for information about the coating of drywall screws.

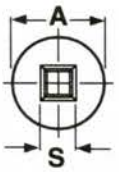
Phillips & Square Drive *Trim Head Drywall Screws* Self-Tapping Screws

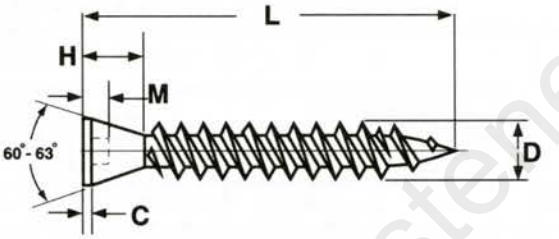
Phillips Drive Trim Head





Square Drive Trim Head





Trim Head Drywall Screws

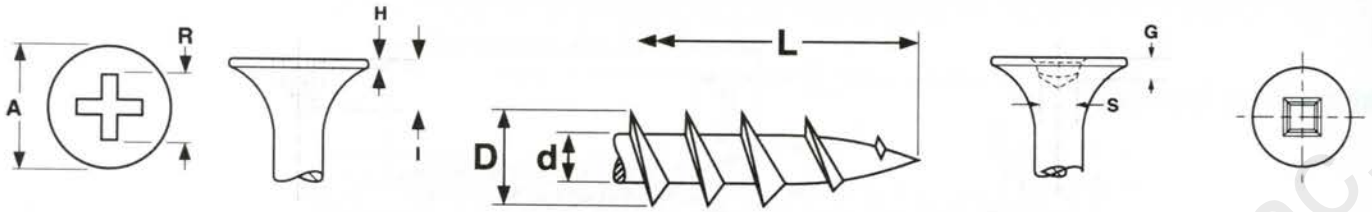
Nominal Size & Threads per Inch	A		R		T		S		M		C		D		H		Drive Size
	Head Diameter		Phillips Recess Diameter		Phillips Recess Depth		Recess Square		Square Recess Depth		Head Thickness		Thread Diameter		Head Height		
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
6 - 18	.236	.216	.154	.141	.075	.051	.106	.091	.071	.055	.031	.023	.142	.133	.150	.133	#1
8 - 15	.276	.256	.185	.169	.104	.080	.113	.110	.075	.065	.031	.023	.169	.161	.150	.133	#2

Tolerance on Length	± 0.06

NOTE: There is no single standard for trim head drywall screw dimensions. These values are offered as a guide; deviations from these specifications may occur.

Description	A screw with twinfast thread, extra sharp point and countersunk flat head of a width 1/3 less than a standard bugle drywall screws.
Applications/ Advantages	For attaching wood trim to wood framing of up to 20 gage thick. The square drive variety is preferred when greater torque is required during installation.
Material	AISI 1018 or equivalent steel
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650°F minimum.
Case Depth	.004 in. minimum
Surface Hardness	Vickers HV 550 - 800 (Rockwell C 52.3 - 64)
Core Hardness	HV 270 - 450 (Rockwell C 25.6 - 45.3)
Plating	Black phosphate finish

Self-Tapping Screws — *Deck Screws* — Phillips Recess / Square Recess



Square Recess Coarse Thread Deck Screws

Screw Size	Threads per inch	D		S		G		Drive Size
		Major Diameter		Recess Square		Penetration Gaging Depth		
		Max.	Min.	Max	Min	Max	Min	
6	10	.154	.142	.091	.089	.065	.056	1
8	8	.180	.163	.113	.110	.075	.064	2
10	8	.210	.180	.113	.110	.075	.064	2

Tolerance on Length	Up to 1 in. incl.: -0, +0.060	Over 1 in.: -0, +0.100

In the abscence of a single industry standard for Deck Screws, these dimensions are offered as a guide; slight deviations are acceptable.

Phillips Recess Coarse Thread Deck Screws

Screw Size	Threads per inch	D		R		I	Phillips Recess Depth
		Major Diameter		Phillips Recess Diameter		Phillips Recess Depth	
		Max.	Min.	Max.	Min.	Ref	
6	8 to 10	.158	.142	.201	.176	.106	2
7	8 to 10	.169	.153	.201	.176	.118	2
8	8 to 10	.187	.170	.201	.176	.124	2
9	8	.195	.180	.201	.176	.124	2
10	8	.211	.192	.204	.190	.124	2
12	8	.239	.212	.265	.250	.144	3
1/4	8	.270	.240	.277	.260	.160	3

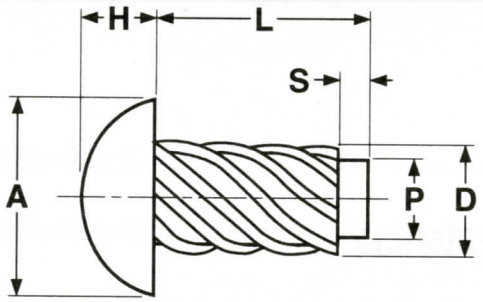
Tolerance on Length	Up to 1 in. incl.: -0, +0.060	Over 1 in.: -0, +0.100

In the abscence of a single industry standard for Deck Screws, these dimensions are offered as a guide; slight deviations are acceptable.

NOTE: There is no single standard for deck screw dimensions. These values are offered as a guide; deviations from these specifications may occur.

	Steel	*Stainless*
Description	A bugle head screw with spaced threads, extra sharp point and dacrotized finish.	A bugle head screw with spaced threads and extra sharp point, manufactured of corrosion-resistant stainless steel.
Applications/ Advantages	Designed specifically for joining pieces of pressure treated lumber. Provides corrosion resistance superior to phosphate-coated drywall screws without discoloring the wood. The square drive recess is preferred by some for its excellent torque transmission and resistance to cam-out problems.	Designed specifically for joining pieces of pressure treated lumber. Remains resistant to corrosion for approximately twice as long as do dacrotized steel deck screws.
Material	AISI 1018 or equivalent steel	18-8 passivated stainless steel
Hardness	HV 550 - 800	Rockwell B 85 - 95
Plating	Steel deck screws have a dacrotized finish.	Stainless deck screws require no additional coating.

Type U *Drive Screws* Self-Tapping Screws



Drive Screws - Round Head Type U

ANSI B18.6.4

Nominal Screw Size	Number of Thread Starts	D Outside Diameter Max	D Outside Diameter Min	A Head Diameter Max	A Head Diameter Min	H Head Height Max	H Head Height Min	P Pilot Diameter Max	P Pilot Diameter Min	Recommended Hole Size Drill Size No.	Recommended Hole Size Hole Diameter
00	6	.060	.057	.099	.090	.034	.026	.049	.046	55	.052
0	6	.075	.072	.127	.118	.049	.041	.063	.060	51	.067
2	8	.100	.097	.162	.146	.069	.059	.083	.080	44	.086
4	7	.116	.112	.211	.193	.086	.075	.096	.092	37	.104
6	7	.140	.136	.260	.240	.103	.091	.116	.112	31	.120
7	8	.154	.150	.285	.264	.111	.099	.126	.122	29	.136
8	8	.167	.162	.309	.287	.120	.107	.136	.132	27	.144
10	8	.182	.177	.359	.334	.137	.123	.150	.146	20	.161
12	8	.212	.206	.408	.382	.153	.139	.177	.173	11	.191
14	9	.242	.236	.457	.429	.170	.155	.202	.198	2	.221

L	Nominal Screw Length	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1" and over
Tolerance on Length		±0.02	±0.02	±0.02	±0.02	±0.02	±0.03	±0.03	±0.03	±0.03
S	Pilot Length	.047	.047	.047	.047	.062	.062	.078	.078	.125

Description	Round head metallic drive screw having multiple start threads of large helix angle, with a pivot.	
Applications/ Advantages	For making permanent fastenings in metals and plastics, when forced into the work under pressure.	
Material	*Steel*	*Stainless*
	AISI 1016 - 1024 or equivalent steel	18-8 Stainless Steel
Heat Treatment	Screws shall be quenched in liquid and then tempered by reheating to 650°F minimum.	-
Case Hardness	Rockwell C 45 minimum	-
Core Hardness	Rockwell C 28-38	Rockwell B 100 (approximate)
Case Depth	No. 2 through 6 diameter: .002 - .007 No. 7 through 12 diameter: .004 - .009 No. 14 diameter: .006 - .011	-
For Use In	Drive screws shall produce mating threads without shearing of threads or fracture of the screw when driven into properly sized holes in test plates having a Rockwell hardness of B70 to B85.	Not recommended for use in materials of a hardness greater than Rockwell B 65.
Plating	See Appendix-A for plating information.	Parts are typically supplied without secondary finishes.