

Head Style Reference Chart	60
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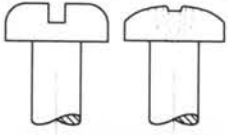
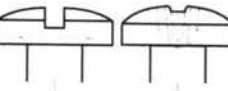



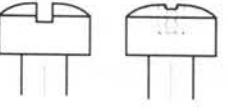
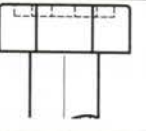
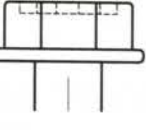
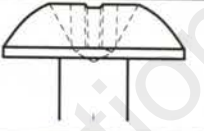

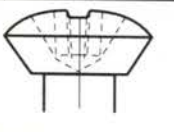
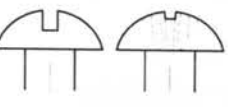
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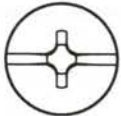
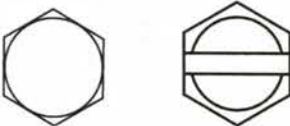



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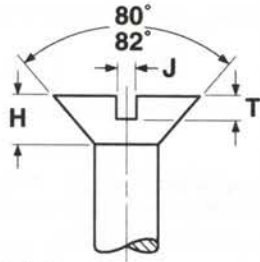
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Schematic	Head Style	Description	Applications/ Advantages
	Pan	Slotted pan heads have a flat or gently rounded top surface, cylindrical sides and a flat bearing surface. Phillips and Torx® pan heads have a rounded top, cylindrical sides and a flat bearing surface.	Has a general purpose bearing area. Can be substituted in most applications for round, truss or binding heads.
	Binding	Has a rounded top surface and slightly tapered sides. The bearing surface is flat with the slotted variety having an annular undercut adjacent to the shank.	Preferred design for making a firm electrical connection.
	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.
	Flat 100°	A countersunk head with a flat top surface and a cone-shaped bearing surface with a head angle of approximately 100°.	Preferred over an 82° flat head when fastening in soft materials--the 100° countersunk head distributes pressure over a larger surface area.
	Fillister	Has a rounded top surface, cylindrical sides, and a flat bearing surface. The greater side height is what distinguishes a fillister head from a pan head.	Preferred style for use in counterbored holes.
	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 and 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.	Offers greater protection to the mating surface than a standard indented hex head. Increased bearing area reduces likelihood of crushing mating surfaces.
	Truss	Has a low rounded top surface 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 assembly appearance.
	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. 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	Has a semi-elliptical top surface and a flat bearing surface.	Sometimes preferred over pan head for its smooth surface and appearance.

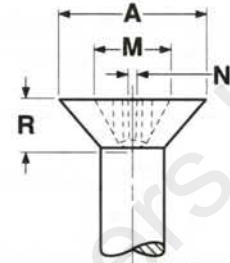
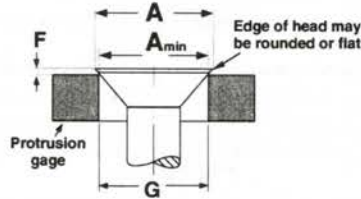
DRIVE TYPES FOR MACHINE SCREWS		
Schematic	Drive Type	Uses
	Phillips	Most recommended drive type. Provides good control in driving. Always use a driver bit in good condition.
	Slotted	Accepts standard blade screwdrivers. Requires less downward pressure to drive slotted parts than it does those with cross-recessed 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 of transmitting torque and optimizing worker efficiency.
	Pozidriv®-Alternative (Type 1A)	Design offers even greater control in driving than Phillips drive. Used in automotive and appliance manufacturing.
	Square Socket	Increases productivity with excellent torque transmission and resists cam-out. Distinctive appearance which discourages tinkering.

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

Pozidriv® is a registered trademark of the Phillips Screw Company. Kanebridge's fasteners with a 1A-drive are not manufactured by or connected with the producers of Pozidriv® fasteners.



Slotted

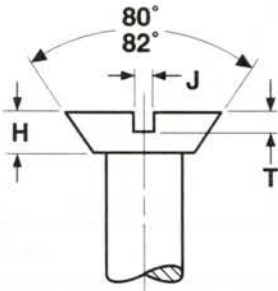


Phillips

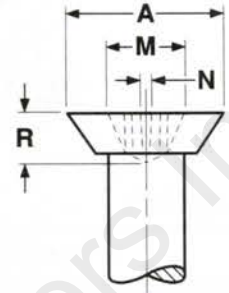
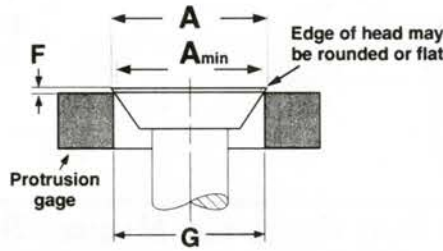
FLAT HEADS FOR MACHINE SCREWS

ASME B18.6.3-2002

Nominal Size	A		H		J		T		M	R	N	F		G	Phillips Driver Size	
	Head Dimensions															Gaging Diameter
	Diameter		Height		Width		Depth		Diam.	Depth	Width	Protrusion Above Gaging Diameter				
	Max	Min	Max	Min	Max	Min	Max	Min	Ref	Ref	Ref	Max	Min			
0	.112	.096	.035	.026	.023	.016	.015	.010	.062	.035	.014	.026	.016	.078	0	
1	.137	.120	.043	.033	.026	.019	.019	.012	.070	.043	.015	.028	.016	.101	0	
2	.162	.144	.051	.040	.031	.023	.023	.015	.096	.055	.017	.029	.017	.124	1	
3	.187	.167	.059	.047	.035	.027	.027	.017	.100	.060	.018	.031	.018	.148	1	
4	.212	.191	.067	.055	.039	.031	.030	.020	.122	.081	.018	.032	.019	.172	1	
5	.237	.215	.075	.062	.043	.035	.034	.022	.148	.074	.027	.034	.020	.196	2	
6	.262	.238	.083	.069	.048	.039	.038	.024	.168	.094	.029	.036	.021	.220	2	
8	.312	.285	.100	.084	.054	.045	.045	.029	.182	.110	.030	.039	.023	.267	2	
10	.362	.333	.116	.098	.060	.050	.053	.034	.198	.124	.032	.042	.025	.313	2	
12	.412	.380	.132	.112	.067	.056	.060	.039	.262	.144	.035	.045	.027	.362	3	
1/4	.477	.442	.153	.131	.075	.064	.070	.046	.276	.160	.036	.050	.029	.424	3	
5/16	.597	.556	.191	.165	.084	.072	.088	.058	.358	.205	.061	.057	.034	.539	4	
3/8	.717	.670	.230	.200	.094	.081	.106	.070	.386	.234	.065	.065	.039	.653	4	
1/2	.815	.765	.223	.186	.106	.091	.103	.065	.418	.265	.069	.081	.049	.739	4	



Slotted

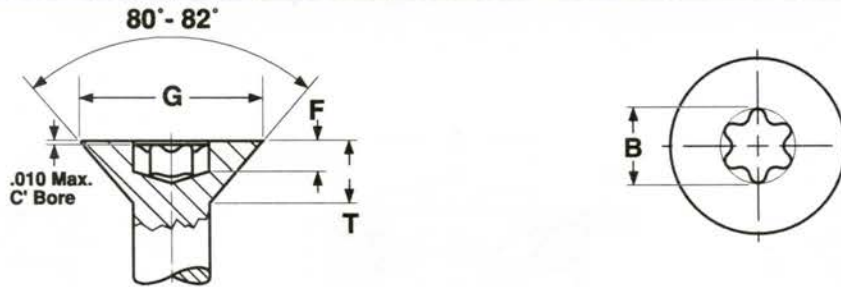


Phillips

UNDERCUT FLAT HEADS FOR MACHINE SCREWS

ASME B18.6.3-2002

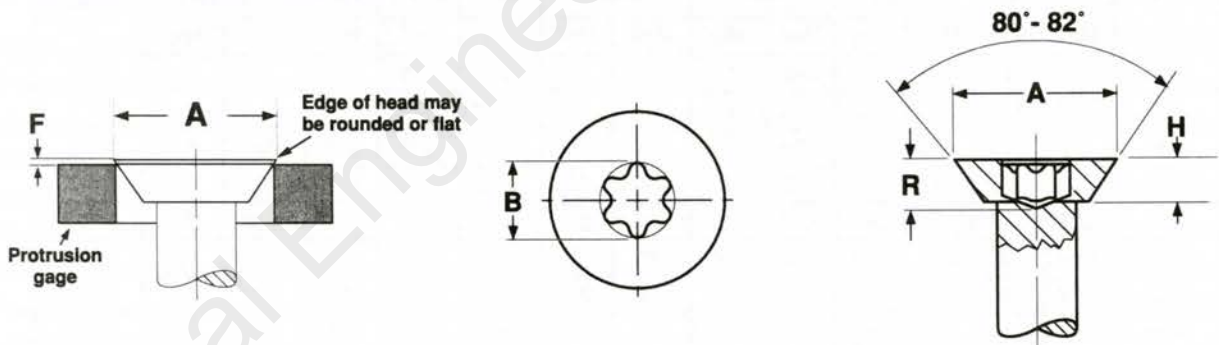
Nominal Size	L <small>These Lengths or Shorter are Undercut</small>	Head Dimensions				Slot Dimensions				Recess Dimensions			Protrusion Above Gaging Diameter		Gaging Diameter	Phillips Driver Size
		Diameter		Height		Width		Depth		Diam.	Depth	Width	Max	Min		
		Max	Min	Max	Min	Max	Min	Max	Min	Ref	Ref	Ref				
0	1/8	.112	.096	.025	.018	.023	.016	.011	.007	.062	.035	.014	-	-	-	0
1	1/8	.137	.120	.031	.023	.026	.019	.014	.009	.070	.043	.015	-	-	-	0
2	1/8	.162	.144	.036	.028	.031	.023	.016	.011	.088	.048	.017	.029	.017	.124	1
4	3/16	.212	.191	.047	.038	.039	.031	.022	.014	.110	.070	.018	.032	.019	.172	1
5	3/16	.237	.215	.053	.043	.043	.035	.024	.016	.122	.081	.018	.034	.020	.196	1
6	3/16	.262	.238	.059	.048	.048	.039	.027	.017	.140	.066	.025	.036	.021	.220	2
8	1/4	.312	.285	.070	.058	.054	.045	.032	.021	.168	.094	.029	.039	.023	.267	2
10	5/16	.362	.333	.081	.068	.060	.050	.037	.024	.182	.110	.030	.042	.025	.313	2
12	3/8	.412	.380	.092	.078	.067	.056	.043	.028	.226	.110	.030	.045	.027	.362	3
1/4	7/16	.477	.442	.107	.092	.075	.064	.050	.032	.244	.124	.032	.050	.029	.424	3
5/16	1/2	.597	.556	.134	.116	.084	.072	.062	.041	.310	.157	.053	.057	.034	.539	4
3/8	9/16	.717	.670	.161	.140	.094	.081	.075	.049	.358	.205	.061	.065	.039	.653	4
1/2	3/4	.815	.765	.156	.130	.106	.091	.072	.046	.402	.252	.068	.081	.049	.739	4



TORX® DRIVE FLAT HEADS FOR MACHINE SCREWS

Camcar

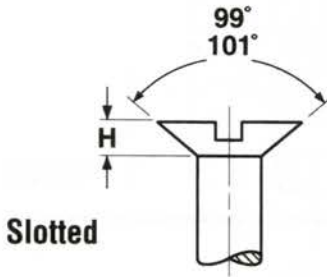
Nominal Size	G		T	B	F	Fallaway	Torx® Driver Size
	Head Diameter		Head Height	Recess Diameter	Gauge Penetration		
	Max	Min	Ref	Ref	Min	Max	
2	.172	.147	.051	.069	.017	.014	T6
4	.225	.195	.067	.094	.028	.018	T8
5	.252	.220	.075	.111	.035	.022	T10
6	.279	.244	.083	.111	.035	.022	T10
8	.332	.292	.100	.132	.040	.026	T15
10	.385	.340	.116	.155	.050	.031	T20
12	.438	.389	.132	.178	.055	.036	T25
1/4	.507	.452	.153	.200	.075	.040	T27
5/16	.635	.568	.191	.266	.087	.047	T40



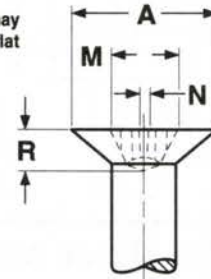
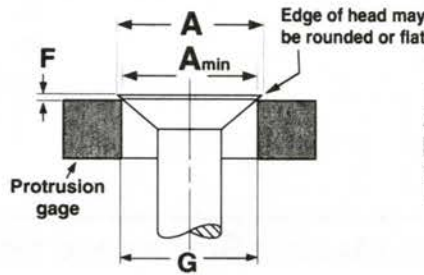
TORX® DRIVE FLAT UNDERCUT HEADS FOR MACHINE SCREWS

Camcar

Nominal Size	A		H		B	F		R	Torx Driver Size
	Head Diameter		Head Height		Recess Diameter	Protrusion Above Gauging Diameter		Recess Penetration Gauging Depth	
	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



Slotted

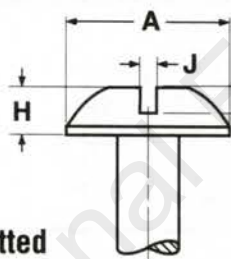


Phillips

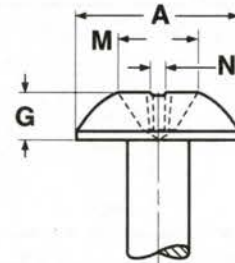
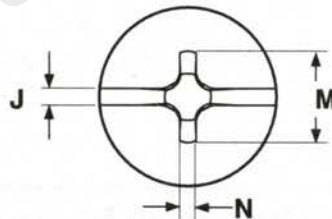
FLAT HEAD 100° FOR MACHINE SCREWS

ASME B18.6.3-2002

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	Max	Min	Ref	Ref	Ref				
0	.112	.095	.026	.019	.023	.016	.013	.008	.054	.027	.013	.020	.012	.074	0
2	.162	.142	.037	.029	.031	.023	.019	.012	.088	.048	.012	.022	.014	.121	1
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
12	.438	.375	.095	.080	-	-	.050	.039	-	-	-	.037	.023	-	3
1/4	.477	.437	.110	.094	.075	.064	.055	.042	.240	.124	.033	.040	.025	.415	3
5/16	.597	.550	.138	.118	.084	.072	.069	.053	.310	.157	.053	.047	.030	.526	4



Slotted



Phillips

COMBINATION DRIVE TRUSS HEADS FOR MACHINE SCREWS

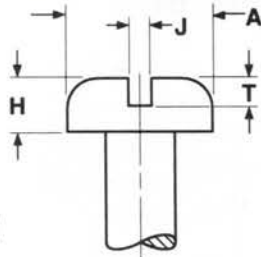
ASME B 18.6.3-2002

Nominal Size	A		H		J		T		M	G	N	Recess Penetration Gaging Depth		Phillips Driver Size
	Head Diameter		Height of Head		Width of Slot		Depth of Slot		Dimensions of Recess			Max	Min	
	Max	Min	Max	Min	Max	Min	Max	Min	Diameter	Depth	Width			
	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref			
4	.257	.241	.069	.059	.039	.031	.040	.027	.105	.060	.018	.062	.044	1
6	.321	.303	.086	.074	.048	.039	.050	.033	.151	.071	.027	.073	.048	2
8	.384	.364	.102	.088	.054	.045	.058	.040	.166	.086	.029	.088	.063	2
10	.448	.425	.128	.113	.060	.050	.068	.048	.181	.102	.030	.104	.079	2
12	.511	.487	.134	.118	.067	.056	.077	.055	.241	.115	.032	.111	.086	3
1/4	.573	.546	.150	.133	.075	.064	.087	.063	.256	.130	.033	.126	.101	3

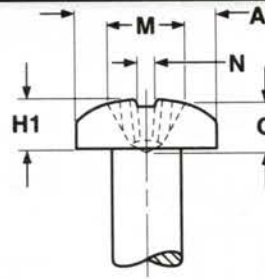
Machine Screws

Head Dimensions

Pan
Combo Pan



Slotted

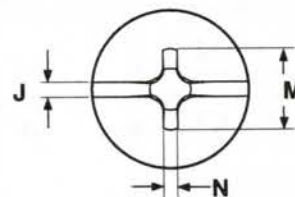
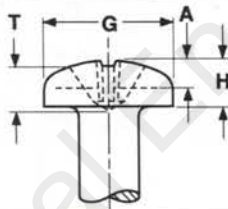


Phillips

PAN HEADS FOR MACHINE SCREWS AND SEMS

ASME B18.6.3-2002

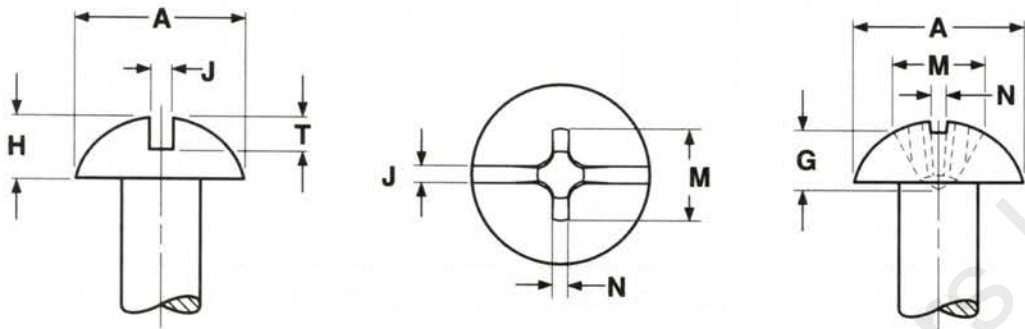
Nominal Size	A		H		H1		J		T		M		G	N	Phillips Driver Size
	Head Diameter		Height of Head				Width of Slot		Depth of Slot		Dimensions of Recess				
			Slotted		Recessed						Diameter		Depth	Width	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
0	.116	.104	.039	.031	.044	.036	.023	.016	.022	.014	.067	.054	.039	.013	0
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
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
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



COMBINATION DRIVE PAN HEADS FOR MACHINE SCREWS

ASME B18.6.3 2002

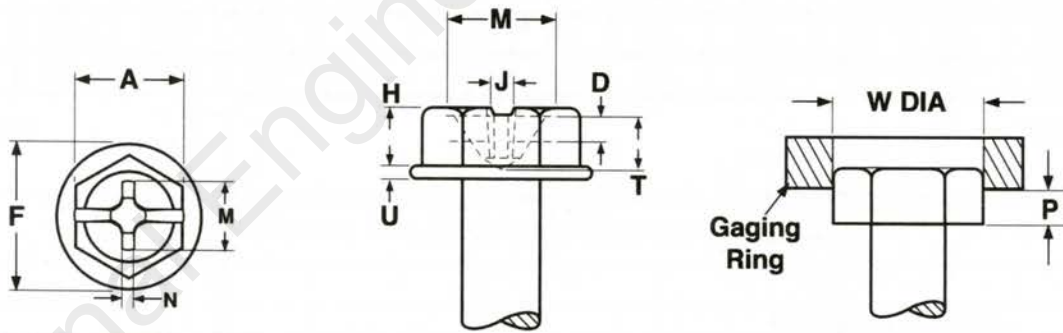
Nominal Screw Size	G		H		J		A		M		T		N		Recess Penetration		Driver Size
	Head Dimensions				Slot Dimensions				Recess Dimensions				Recess Penetration				
	Head Diameter		Head Height		Width		Depth		Diameter		Depth				Recess Width		
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Min	Max	Min		
4	.219	.205	.080	.070	.039	.031	.040	.030	.122	.109	.078	.060	.019	.071	.053	1	
6	.270	.256	.097	.087	.048	.039	.050	.037	.166	.153	.091	.066	.028	.080	.055	2	
8	.322	.306	.115	.105	.054	.045	.058	.045	.182	.169	.108	.082	.030	.097	.071	2	
10	.373	.357	.133	.122	.060	.050	.068	.053	.199	.186	.124	.100	.031	.113	.089	2	
12	.425	.407	.125	.112	.067	.056	.077	.061	.259	.246	.141	.115	.034	.124	.098	3	
1/4	.492	.473	.175	.162	.075	.064	.087	.070	.281	.268	.161	.135	.036	.144	.118	3	
5/16	.615	.594	.218	.203	.084	.072	.106	.085	.350	.337	.193	.169	.059	.173	.149	4	



COMBINATION ROUND HEADS FOR MACHINE SCREWS

ASME B18.6.3 2002

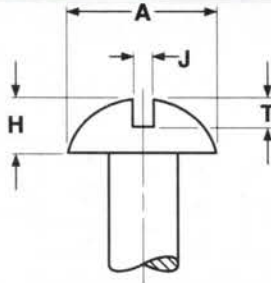
Nominal Size	A		H		J		T		M	G	N	Recess Penetration Gaging Depth		Phillips Driver Size
	Head Diameter		Head Height		Slot Width		Slot Depth		Recess Diameter	Recess Depth	Recess Width	Max	Min	
	Max	Min	Max	Min	Max	Min	Max	Min	Ref	Ref	Ref			
6	.260	.240	.103	.091	.048	.039	.068	.051	.155	.070	.027	.073	.045	2
8	.309	.287	.120	.107	.054	.045	.077	.058	.171	.088	.030	.090	.064	2
10	.359	.334	.137	.123	.060	.050	.087	.065	.188	.106	.031	.108	.082	2
1/4	.472	.443	.175	.160	.075	.064	.109	.082	.261	.134	.034	.130	.104	3
5/16	.590	.557	.216	.198	.084	.072	.132	.099	.301	.174	.040	.170	.144	3
3/8	.708	.670	.256	.237	.094	.081	.155	.117	.380	.215	.064	.208	.182	4



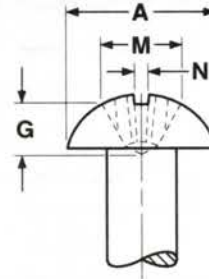
COMBINATION HEX WASHER HEADS FOR MACHINE SCREWS

ASME B18.6.3
2002

Nom Size	A		H		F		U		J		D		P	M	T	N	Recess Penetrating Gaging Depth		Driver Size
	Width Across Flats		Head Height		Washer Diameter		Washer Thickness		Slot Width		Slot Depth		Protrusion Beyond Gaging Ring	Recess Diameter	Recess Depth	Recess Width	Max	Min	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Min	Ref	Ref	Ref			
6	.250	.244	.093	.080	.328	.302	.025	.015	.048	.039	.053	.030	.048	.148	.088	.026	.089	.064	2
8	.250	.244	.110	.096	.348	.322	.031	.019	.054	.045	.074	.048	.058	.168	.114	.029	.115	.090	2
10	.312	.305	.120	.105	.414	.384	.031	.019	.060	.050	.080	.052	.063	.178	.126	.029	.127	.102	2
12	.312	.305	.155	.139	.432	.398	.039	.022	.067	.056	.103	.072	.083	.247	.157	.033	.152	.127	3
1/4	.375	.367	.190	.172	.520	.480	.050	.030	.075	.064	.111	.078	.103	.277	.191	.034	.186	.161	3



Slotted

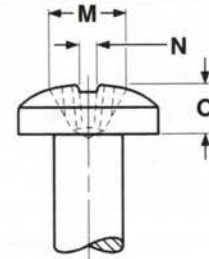
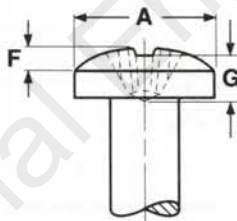


Phillips

ROUND HEADS FOR MACHINE SCREWS

ASME B18.6.3
2002

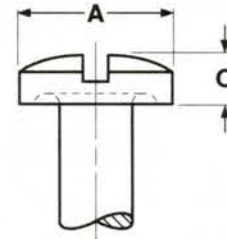
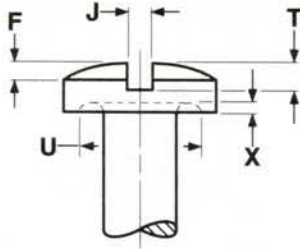
Nominal Size	A		H		J		T		M		G	N	Phillips Driver Size
	Head Diameter		Height of Head		Width of Slot		Depth of Slot		Dimensions of Recess				
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
2	.162	.146	.069	.059	.031	.023	.048	.037	.100	.087	.053	.017	1
3	.187	.169	.078	.067	.035	.027	.053	.040	.109	.096	.062	.018	1
4	.211	.193	.086	.075	.039	.031	.058	.044	.118	.105	.072	.019	1
5	.236	.217	.095	.083	.043	.035	.063	.047	.154	.141	.074	.027	2
6	.260	.240	.103	.091	.048	.039	.068	.051	.162	.149	.084	.027	2
8	.309	.287	.120	.107	.054	.045	.077	.058	.178	.165	.101	.030	2
10	.359	.334	.137	.123	.060	.050	.087	.065	.195	.182	.119	.031	2
12	.408	.382	.153	.139	.067	.056	.096	.073	.249	.236	.125	.032	3
1/4	.472	.443	.175	.160	.075	.064	.109	.082	.268	.255	.147	.034	3
5/16	.590	.557	.216	.198	.084	.072	.132	.099	.308	.295	.187	.040	3
3/8	.708	.670	.256	.237	.094	.081	.155	.117	.387	.374	.228	.064	4
1/2	.813	.766	.355	.332	.106	.091	.211	.159	.416	.403	.256	.068	4



PHILLIPS BINDING HEADS FOR MACHINE SCREWS

ASME B18.6.3-2002

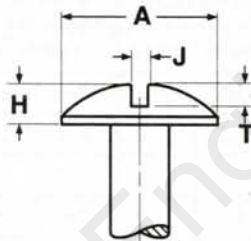
Nominal Size	A		O		F		M		G		N	Phillips Driver Size
	Head Diameter		Total Head Height		Head Oval Height		Recess Diameter		Recess Depth		Recess Width	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Min	
2	.181	.171	.050	.043	.018	.013	.100	.087	.058	.041	.017	1
4	.235	.223	.068	.061	.025	.018	.118	.105	.077	.059	.017	1
6	.290	.275	.087	.078	.032	.024	.160	.147	.088	.064	.026	2
8	.344	.326	.105	.095	.039	.029	.186	.173	.114	.090	.028	2
10	.399	.378	.123	.112	.045	.034	.205	.192	.134	.109	.029	2
1/4	.525	.498	.165	.152	.061	.046	.281	.268	.164	.140	.046	3



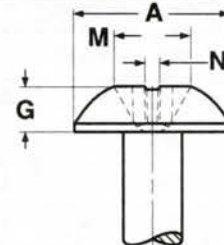
SLOTTED BINDING HEADS UNDERCUT FOR MACHINE SCREWS

ASME B18.6.3
2002

Nominal Size	A		F		O		J		T		U		X	
	Head Diameter		Height of Head				Width of Slot		Depth of Slot		Dimensions of Undercut			
			Height of Oval		Total Height						Diameter		Depth	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
2	.181	.171	.018	.013	.050	.043	.031	.023	.030	.020	.141	.124	.010	.005
3	.208	.197	.022	.016	.059	.052	.035	.027	.036	.025	.162	.143	.011	.006
4	.235	.223	.025	.018	.068	.061	.039	.031	.042	.030	.184	.161	.012	.007
5	.263	.249	.029	.021	.078	.069	.043	.035	.048	.035	.205	.180	.014	.009
6	.290	.275	.032	.024	.087	.078	.048	.039	.053	.040	.226	.199	.015	.010
8	.344	.326	.039	.029	.105	.095	.054	.045	.065	.050	.269	.236	.017	.012
10	.399	.378	.045	.034	.123	.112	.060	.050	.077	.060	.312	.274	.020	.015
12	.454	.430	.052	.039	.141	.130	.067	.056	.089	.070	.354	.311	.023	.018
1/4	.525	.498	.061	.046	.165	.152	.075	.064	.105	.084	.410	.360	.026	.021



Slotted

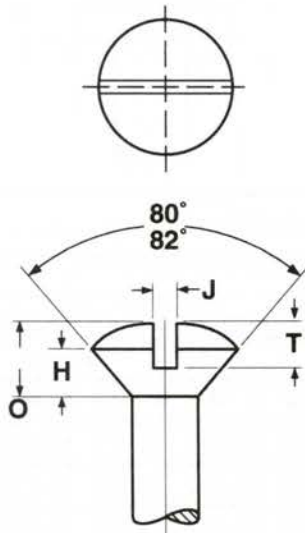


Phillips

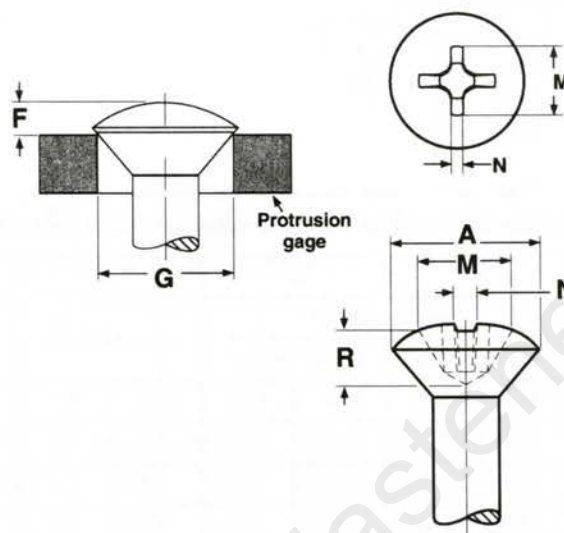
TRUSS HEADS FOR MACHINE SCREWS

ASME B18.6.3-
2002

Nominal Size	A		H		J		T		M		G		Phillips Driver Size	
	Head Diameter		Height of Head		Width of Slot		Depth of Slot		Dimensions of Recess					
									Diameter		Depth			Width
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min		Min
2	.194	.180	.053	.044	.031	.023	.031	.022	.104	.091	.059	.041	.018	1
3	.226	.211	.061	.051	.035	.027	.036	.026	.110	.097	.066	.049	.018	1
4	.257	.241	.069	.059	.039	.031	.040	.030	.112	.099	.069	.051	.018	1
5	.289	.272	.078	.066	.043	.035	.045	.034	.128	.115	.085	.067	.019	1
6	.321	.303	.086	.074	.048	.039	.050	.037	.158	.145	.084	.059	.027	2
8	.384	.364	.102	.088	.054	.045	.058	.045	.173	.160	.099	.074	.029	2
10	.448	.425	.118	.103	.060	.050	.068	.053	.188	.175	.115	.090	.030	2
12	.511	.487	.134	.118	.067	.056	.077	.061	.248	.235	.128	.103	.032	3
1/4	.573	.546	.150	.133	.075	.064	.087	.070	.263	.250	.143	.118	.033	3
5/16	.698	.666	.183	.162	.084	.072	.106	.085	.352	.339	.193	.168	.059	4
3/8	.823	.787	.215	.191	.094	.081	.124	.100	.383	.370	.226	.202	.063	4
1/2	1.073	1.028	.280	.250	.106	.091	.161	.131	.444	.431	.288	.263	.072	4



Slotted

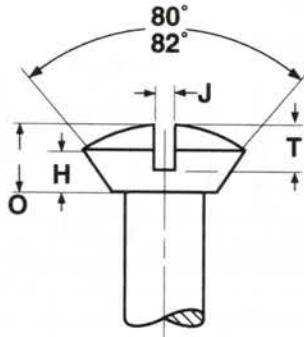


Phillips

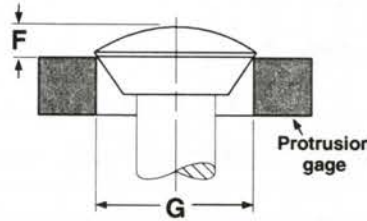
OVAL HEADS FOR MACHINE SCREWS

ASME B18.6.3-2002

Nominal Size	A		H	O	J		T		M	R	N	F		G	Phillips Driver Size
	Head Diameter		Height of Head		Slot Dimensions				Recess Dimensions			Protrusion Above Gaging Diameter		Gaging Diameter	
	Max	Min	Side	Total	Width		Depth		Diam.	Depth	Width	Max	Min		
			Ref	Ref	Ref	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
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
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



Slotted

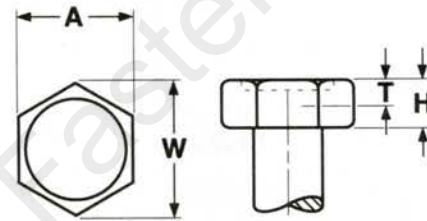
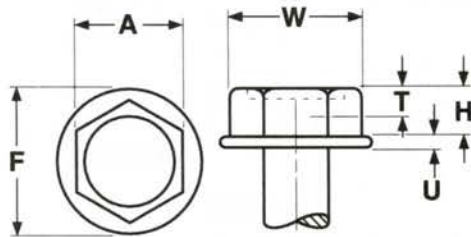
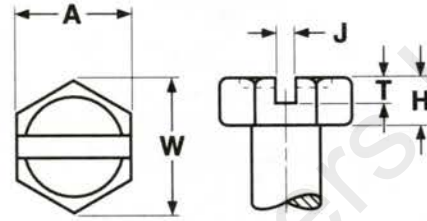
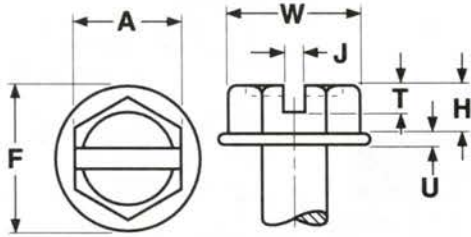


Phillips

UNDERCUT OVAL HEADS FOR MACHINE SCREWS

ASME B18.6.3-2002

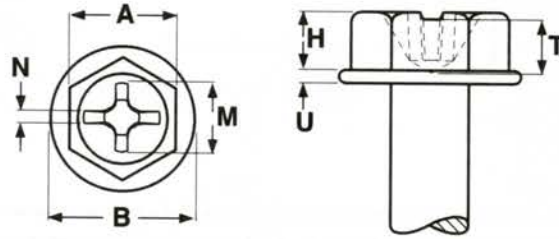
Nominal Size	These Lengths or Shorter are Undercut	A		H		O		J		T		M		R		N		F		Gaging Diam.	Phillips Driver Size							
		Head Dimensions																Slot Dimensions				Recess Dimensions			Protrusion Above Gaging Diameter			
		Diameter		Side Height		Total Height		Width		Depth		Diam.	Depth	Width	Max	Min	Max	Min										
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min									
0	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	1/8	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	1/8	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	1/8	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	3/16	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	3/16	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	3/16	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											
8	1/4	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	5/16	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	3/8	0.412	0.380	0.092	0.161	0.135	0.067	0.056	0.103	0.085	0.220	0.140	0.038	0.113	0.084	0.362	3											
1/4	7/16	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	1/2	0.597	0.556	0.134	0.232	0.198	0.084	0.072	0.149	0.124	0.374	0.214	0.064	0.155	0.117	0.539	4											
3/8	9/16	0.717	0.670	0.161	0.278	0.239	0.094	0.081	0.179	0.149	0.394	0.233	0.066	0.182	0.139	0.653	4											
7/16	5/8	0.760	0.715	0.156	0.279	0.239	0.094	0.081	0.184	0.154	0.404	0.245	0.068	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	0.070	0.212	0.163	0.739	4											



HEX HEADS AND HEX WASHER HEADS FOR MACHINE SCREWS

ASME B18.6.3-2002

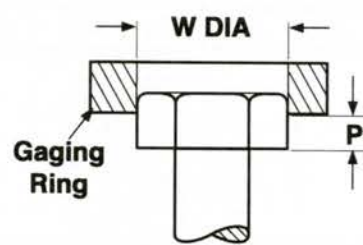
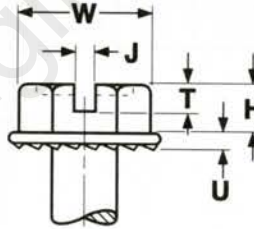
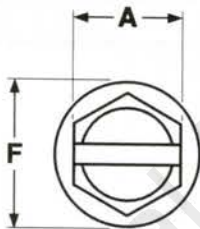
Nominal Size	A		W	H		F		U		J		T	
	Width Across Flats		Width Across Corners	Height of Head		Diameter of Washer		Thickness of Washer		Width of Slot		Depth of Slot	
	Max	Min	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
2	.125	.120	.134	.050	.040	.166	.154	.016	.010	-	-	-	-
4	.188	.181	.202	.060	.049	.243	.225	.019	.011	.039	.031	.042	.025
5	.188	.181	.202	.070	.058	.260	.240	.025	.015	.043	.035	.049	.030
6	.250	.244	.272	.093	.080	.328	.302	.025	.015	.048	.039	.053	.033
8	.250	.244	.272	.110	.096	.348	.322	.031	.019	.054	.045	.074	.052
10	.312	.305	.340	.120	.105	.414	.384	.031	.019	.060	.050	.080	.057
12	.312	.305	.340	.155	.139	.432	.398	.039	.022	.067	.056	.103	.077
1/4	.375	.367	.409	.190	.172	.520	.480	.050	.030	.075	.064	.111	.083
5/16	.500	.489	.545	.230	.208	.676	.624	.055	.035	.084	.072	.134	.100
3/8	.562	.551	.614	.295	.270	.780	.720	.063	.037	.094	.081	.168	.131
1/2	.750	.735	.820	.400	.367	1.040	.960	.085	.050	-	-	-	-



PHILLIPS HEX WASHER HEADS FOR MACHINE SCREWS

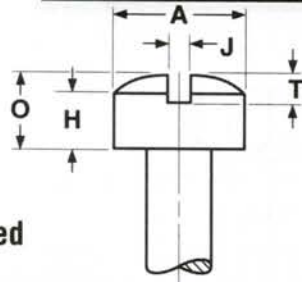
ASME B18.6.3
2002

Nominal Size	A		H		B		U		M	T	N	Protrusion Beyond Gaging Ring	Recess Penetration Gaging Depth		Phillips Driver Size
	Width Across Flats		Head Height		Washer Diameter		Washer Thickness		Recess Diameter	Recess Depth	Recess Width		Max	Min	
	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

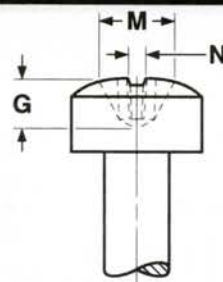


SLOTTED HEX WASHER HEADS WITH SERRATIONS FOR MACHINE SCREWS

Nominal Size	A		W	H		F		U		J		T		P
	Width Across Flats		Width Across Corners	Head Height		Washer Diameter		Washer Thickness		Slot Width		Slot Depth		Protrusion Beyond Gaging Ring
	Max	Min	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Min
4	.188	.181	.202	.060	.049	.243	.225	.019	.011	.039	.031	.042	.025	.029
6	.250	.244	.272	.093	.080	.328	.302	.025	.015	.048	.039	.053	.033	.048
8	.250	.244	.272	.110	.096	.348	.322	.031	.019	.054	.045	.074	.052	.058
10	.312	.305	.340	.120	.105	.414	.384	.031	.019	.060	.050	.080	.057	.063
1/4	.375	.367	.409	.190	.172	.520	.480	.050	.030	.075	.064	.111	.083	.103



Slotted

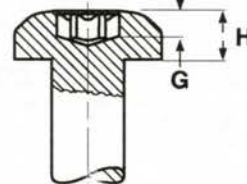
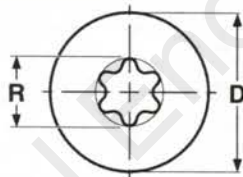


Phillips

FILLISTER HEADS FOR MACHINE SCREWS

ASME B18.6.3-2002

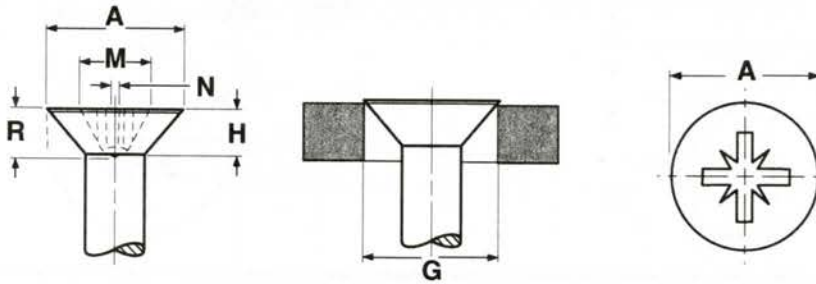
Nominal Size	A		H		O		J		T		M		G	N	Phillips Driver Size
	Head Diameter		Height of Head				Width of Slot		Depth of Slot		Dimensions of Recess			Phillips Driver Size	
			Side Height		Total Height						Diameter		Depth		
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
0	.096	.083	.043	.038	.055	.047	.023	.016	.025	.015	.067	.054	.039	.013	0
2	.140	.124	.062	.053	.083	.066	.031	.023	.037	.025	.104	.091	.059	.017	1
3	.161	.145	.070	.061	.095	.077	.035	.027	.043	.030	.112	.099	.068	.019	1
4	.183	.166	.079	.069	.107	.088	.039	.031	.048	.035	.122	.109	.078	.019	1
5	.205	.187	.088	.078	.120	.100	.043	.035	.054	.040	.143	.130	.067	.027	2
6	.226	.208	.096	.086	.132	.111	.048	.039	.060	.045	.166	.153	.091	.028	2
8	.270	.250	.113	.102	.156	.133	.054	.045	.071	.054	.182	.169	.108	.030	2
10	.313	.292	.130	.118	.180	.156	.060	.050	.083	.064	.199	.186	.124	.031	2
12	.357	.334	.148	.134	.205	.178	.067	.056	.094	.074	.259	.246	.141	.034	3
1/4	.414	.389	.170	.155	.237	.207	.075	.064	.109	.087	.281	.268	.161	.036	3
5/16	.518	.490	.211	.194	.295	.262	.084	.072	.137	.110	.322	.309	.203	.042	3
3/8	.622	.590	.253	.233	.355	.315	.094	.081	.164	.133	.389	.376	.233	.065	4



TORX® DRIVE PAN HEADS

Camcar

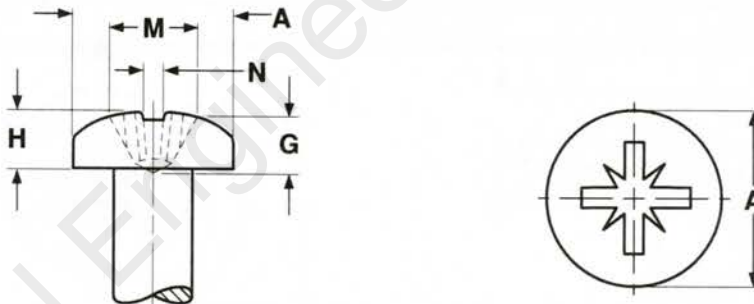
Screw Size	D		H		R	G	Driver Size	
	Head Dimensions				Recess Dimensions			
	Head Diameter		Head Height		Ref	Gauge Penetration Min		(Fallaway) Max Penetration
	Max	Min	Max	Min				
2	.167	.155	.062	.053	.094	.030	.019	T8
4	.219	.205	.080	.070	.111	.035	.022	T10
6	.270	.256	.097	.087	.132	.045	.026	T15
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



POZIDRIV® (TYPE 1A) FLAT HEADS FOR MACHINE SCREWS

ASME B18.6.3-2002

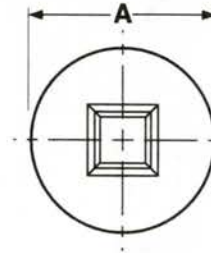
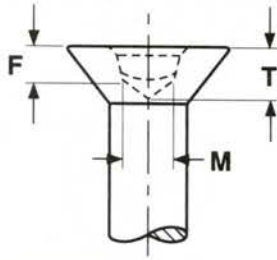
Nominal Size	A		H		M	R	N	Recess Penetration Gaging Depth		F		G	Driver Size
	Head Dimensions		Recess Dimensions			Protrusion Above Gaging Diameter							
	Diameter		Height		Diam.	Depth	Width	Max	Min	Max	Min		
	Max	Min	Max	Min	Ref	Ref	Ref	Max	Min	Max	Min		
2	.162	.144	.051	.040	.096	.055	.029	.053	.037	.029	.017	.124	1
4	.212	.191	.067	.055	.122	.081	.030	.079	.063	.032	.019	.172	1
6	.262	.238	.083	.069	.168	.098	.041	.091	.073	.036	.021	.220	2
8	.312	.285	.100	.084	.182	.112	.041	.107	.089	.039	.023	.267	2
10	.362	.333	.116	.098	.198	.127	.041	.122	.104	.042	.025	.313	2
12	.412	.380	.132	.112	.262	.149	.056	.136	.118	.045	.027	.362	3
1/4	.477	.442	.153	.131	.276	.164	.057	.151	.133	.050	.029	.424	3
5/16	.597	.556	.191	.165	.358	.211	.086	.193	.175	.057	.034	.539	4
3/8	.717	.670	.230	.200	.386	.239	.086	.222	.204	.065	.039	.653	4



POZIDRIV® (TYPE 1A) PAN HEADS FOR MACHINE SCREWS

ASME B18.6.3-2002

Nominal Size	A		H		M		G		N	Recess Penetration Gaging Depth		Driver Size
	Head Diameter		Height of Head		Dimensions of Recess							
					Diameter		Depth		Width			
	Max	Min	Max	Min	Max	Min	Max	Min	Min	Max	Min	
2	.167	.155	.062	.053	.104	.091	.064	.048	.028	.053	.037	1
4	.219	.205	.080	.070	.122	.109	.083	.067	.029	.072	.056	1
6	.270	.256	.097	.087	.162	.149	.092	.074	.040	.076	.058	2
8	.322	.306	.115	.105	.177	.164	.108	.090	.041	.092	.074	2
10	.373	.357	.133	.122	.193	.180	.124	.106	.041	.108	.090	2
12	.425	.407	.151	.139	.254	.241	.139	.121	.056	.117	.099	3
1/4	.492	.473	.175	.162	.273	.260	.159	.141	.057	.137	.119	3

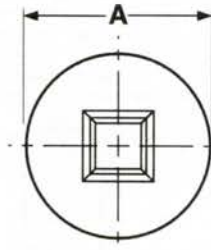
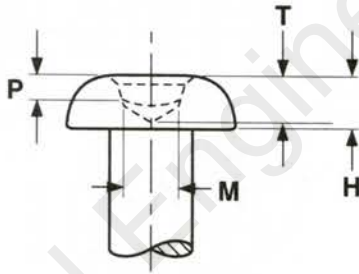


SQUARE SOCKET FLAT HEADS

ASME B
18.6.3 2002

Nominal Size or Basic Screw Diameter		A		H		M	T	F		Driver Size
		Head Diameter		Head Height		Recess Square	Recess Depth	Recess Penetration Gaging Depth		
		Max	Min	Ref	Ref	Ref	Max	Min		
4	.1120	.212	.191	.067	.0696	.066	.038	.028	0	
6	.1380	.262	.238	.083	.090	.096	.055	.040	1	
8	.1640	.312	.285	.100	.111	.115	.063	.048	2	
10	.1900	.362	.333	.116	.111	.127	.075	.060	2	
12	.2160	.412	.380	.132	.1315	.158	.095	.080	3	
1/4	.2500	.477	.442	.153	.1315	.158	.095	.080	3	
5/16	.3125	.597	.556	.191	.1895	.194	.100	.085	4	

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

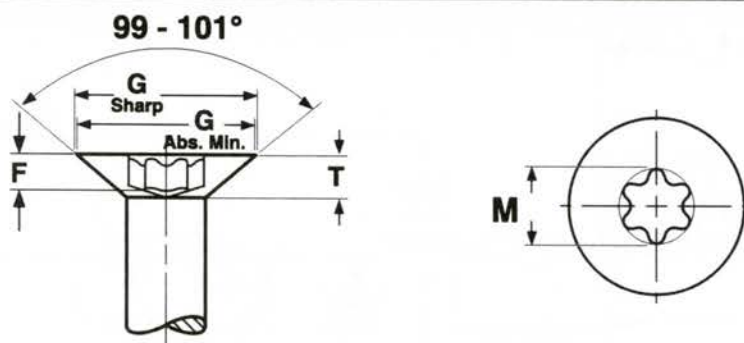


SQUARE SOCKET PAN HEADS

ASME B18.6.3
2002

Nominal Size or Basic Screw Diameter		A		H		M	T	P		Driver Size
		Head Diameter		Head Height		Recess Square	Recess Depth	Penetration Gaging Depth		
		Max	Min	Max	Min	Ref	Ref	Max	Min	
4	.1120	.219	.205	.086	.076	.070	.066	.038	.028	0
6	.1380	.270	.256	.103	.093	.091	.106	.065	.050	1
8	.1640	.322	.306	.120	.110	.112	.127	.075	.060	2
10	.1900	.373	.357	.137	.126	.112	.127	.075	.060	2
12	.2160	.425	.407	.153	.141	.133	.158	.095	.080	3
1/4	.2500	.492	.473	.175	.162	.133	.158	.095	.080	3
5/16	.3125	.615	.594	.218	.203	.191	.194	.100	.085	4

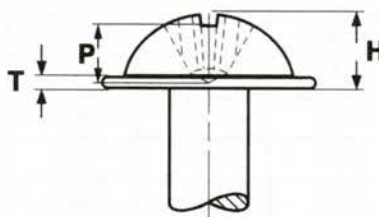
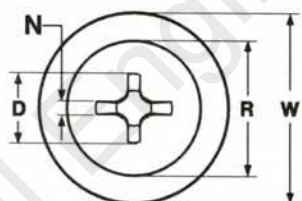
This type of recess has a square center opening, slightly tapered side walls and a conical bottom.



TORX® 100° FLAT HEAD FOR MACHINE SCREWS

Camcar
Textron

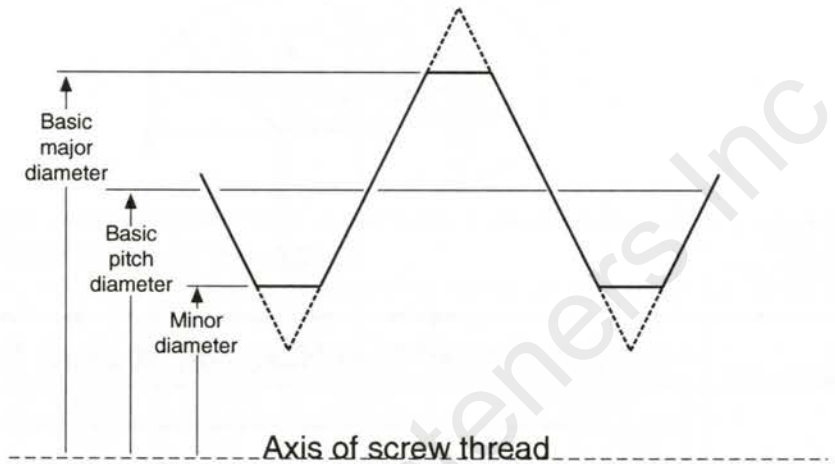
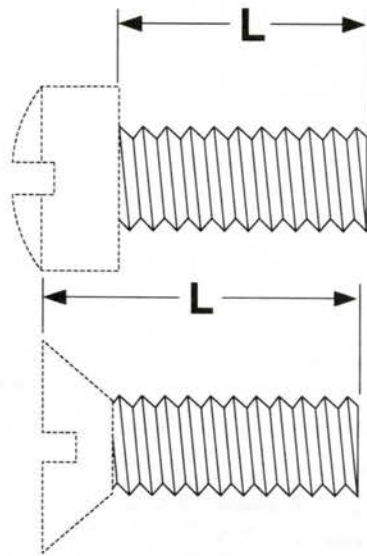
Nominal Size	T	G		M	F	Fallaway Maximum Penetration of No-Go Gauge	Driver Size
	Head Height	Head Diameter		Recess Diam.	Gauge Penetration		
	Ref	Max Sharp	Abs. Min	Ref	Ref	Max	
4	.049	.212	.188	.094	.028	.019	T8
6	.060	.279	.238	.111	.035	.022	T10
8	.072	.332	.285	.132	.046	.026	T15
10	.083	.385	.333	.155	.056	.031	T20
1/4	.110	.507	.442	.221	.085	.044	T30
5/16	.138	.635	.556	.266	.092	.047	T40
3/8	.165	.762	.670	.312	.110	.055	T45



PHILLIPS ROUND WASHER HEADS FOR MACHINE SCREWS

ASME B18.6.3 2002

Nominal Size	R	H		W		T	D	P	N	Recess Penetrating Gaging Depth		Driver Size
	Crown Diam.	Head Height		Washer Diameter		Washer Thick- ness	Recess Diam.	Recess Depth	Recess Width	Max	Min	
	Ref	Max	Min	Max	Min	Ref	Ref	Ref	Ref	Max	Min	
4	.177	.079	.067	.261	.243	.030	.116	.062	.019	.065	.044	1
6	.218	.096	.084	.321	.301	.040	.147	.058	.026	.061	.033	2
8	.259	.113	.101	.380	.358	.040	.161	.073	.028	.076	.048	2
10	.300	.130	.118	.439	.416	.050	.177	.091	.029	.093	.066	2
12	.341	.148	.134	.498	.473	.050	.228	.097	.030	.094	.066	3
1/4	.396	.170	.157	.576	.548	.050	.244	.110	.032	.107	.080	3
5/16	.494	.211	.197	.719	.687	.060	.292	.160	.038	.156	.129	3



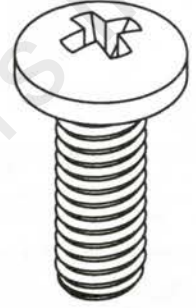
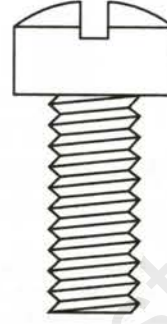
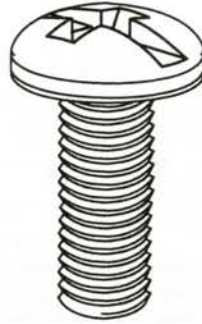
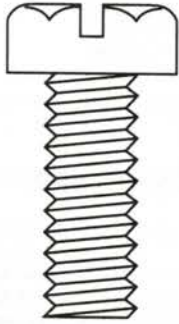
EXTERNAL THREADS FOR MACHINE SCREWS AND SEMS

ASME B 1.1

Nominal Size & Threads per Inch	Series Designation	Allowance	Major Diameter		Pitch Diameter			Stress Area, in ²	Tensile Strength, ^a lb., min.
			Max	Min	Max	Min	Tolerance		
0-80 0.060	UNF	.0005	.0595	.0563	.0514	.0496	.0018	-	-
1-64 0.073	UNC	.0006	.0724	.0686	.0623	.0603	.0020	-	-
2-56 0.086	UNC	.0006	.0854	.0813	.0738	.0717	.0021	-	-
3-48 0.099	UNC	.0007	.0983	.0938	.0848	.0825	.0023	-	-
4-40 0.112	UNC	.0008	.1112	.1061	.0950	.0925	.0025	0.00604	360
5-40 0.125	UNC	.0008	.1242	.1191	.1080	.1054	.0026	0.00796	470
6-32 0.138	UNC	.0008	.1372	.1312	.1169	.1141	.0028	0.00909	550
8-32 0.164	UNC	.0009	.1631	.1571	.1428	.1399	.0029	0.0140	850
10-24 0.190	UNC	.0010	.1890	.1818	.1619	.1586	.0033	0.0175	1050
10-32 0.190	UNF	.0009	.1891	.1831	.1688	.1658	.0030	0.0200	1200
12-24 0.216	UNC	.0010	.2150	.2078	.1879	.1845	.0034	0.0242	1450
1/4-20 0.250	UNC	.0011	.2489	.2408	.2164	.2127	.0037	0.0318	1900
1/4-28 0.250	UNF	.0010	.2490	.2425	.2258	.2225	.0033	0.0364	2200
5/16-18 0.312	UNC	.0012	.3113	.3026	.2752	.2712	.0040	0.0524	3150
3/8-16 0.375	UNC	.0013	.3737	.3643	.3331	.3287	.0044	0.0775	4650
1/2-13 0.500	UNC	.0015	.4985	.4876	.4485	.4435	.0050	0.1419	8500

Tolerance on Length L	Nominal Screw Size	Nominal Screw Length			
		Up to 1/2 in., incl.	Over 1/2 to 1 in., incl.	Over 1 to 2 in., incl.	Over 2 in.
	0 thru 12	-0.02	-0.03	-0.06	-0.09
1/4 thru 3/4	-0.03	-0.03	-0.06	-0.09	

^aTensile strength values are based on 60,000 psi. and apply to carbon steel screws and SEMS only. Hex and Hex Washer head machine screws of sufficient length may be wedge tensile tested. Other head styles may be axial tensile tested.

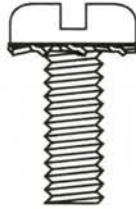


Description	A straight shank fastener with external threads designed to go through a hole or nut that is pre-tapped to form a mating thread for the screw.		
Applications/ Advantages	Machine screws form a fastening superior in strength to spaced thread screws.		
	Steel	Stainless	Aluminum
	<p><i>Steel Zinc</i> is the most common and most popular variety of steel machine screws</p> <p><i>Steel Zinc yellow</i> screws are popular in electronics applications.</p> <p><i>Steel Zinc Black and Black Oxide</i> screws are used to blend in with black-colored components.</p>	<p><i>Stainless steel</i> machine screws are used in applications which require general atmospheric corrosion resistance, in food processing machinery and refrigeration equipment. Stainless is also superior to steel in withstanding some elevation in application operating temperature while maintaining its strength.</p>	<p>In some applications, aluminum machine screws can be a less expensive alternative to stainless screws because of their resistance to corrosion and high rate of conductivity. Aluminum machine screws should be fastened with aluminum nuts to minimize the chance of galvanic corrosion.</p>
Material	AISI 1006 - 1022 or equivalent steel.	SAE 18-8 stainless steel	2024-T4 alloy
Hardness	Rockwell B70 - B100.	Rockwell B85 - B95 (approximate)*	-
Tensile Strength	60,000 psi. minimum.	80,000 psi. minimum (100,000 psi after cold working)*	62,000 psi. minimum
	Machine screws which have a nominal diameter smaller than #4 are not subject to tensile testing. No. 4 and No. 5 machine screws which are shorter than 1/2" are not subject to tensile testing. Machine screws of diameters No. 6 to 1/2" inclusive, which are shorter than either 1/2" or 3D (where D is the nominal screw size in inches) are not subject to tensile testing. Such machine screws of a size to be tested shall meet the tensile load requirements given on page 80.		
Plating	See Appendix-A for information on the plating of steel machine screws	Stainless machine screws are usually supplied plain or with a black oxide finish.	Aluminum machine screws are usually supplied without any additional finish.
*Hardness and tensile strength standards are offered as guides only for stainless machine screws. There is currently no national standard for these performance requirements for stainless machine screws.			

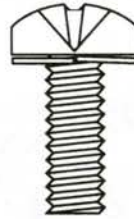
MACHINE SCREWS WITH FREE-SPINNING LOCKWASHERS



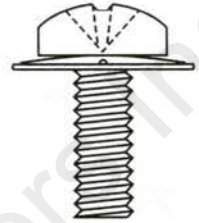
Internal Tooth



External Tooth



Split-Lock

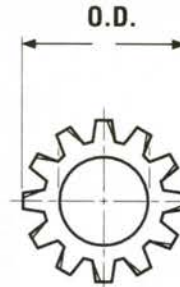
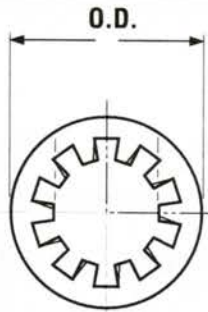


Square-Cone®

Description	A machine screw and free-spinning lock-washer manufactured as one assembly. Steel SEMS are available with the following types of washers: internal tooth, external tooth, split-lock and square-cone®. Stainless SEMS are offered with external tooth lock washers.
Applications/ Advantages	The washer/screw assembly makes this a locking screw with the washer providing the locking action. Machine pre-assembly provides cost savings to the end user. <i>Internal Tooth SEMS:</i> Recommended when it is desirable to hide the teeth for appearance or to prevent snagging. <i>External Tooth SEMS:</i> Preferred over the internal tooth style as the teeth provide greater torsional resistance being on the larger radius. <i>Split-Lock SEMS:</i> Preferred over tooth lockwasher SEMS for use with hardened bearing surfaces. <i>Square-Cone® SEMS:</i> Provides a higher retained clamp load & improved compensation for thermal cycling and vibration. Can accept a high tension load and maintain spring action. The washer design makes for better control during installation, and improved tool bit life. Ideal for clamping fragile materials and for spanning large clearance holes.
Material	Steel Screws-- AISI 1022 or equivalent steel. Steel Washers-- <i>Split-lock:</i> SAE 1055-1065 carbon steel; <i>Tooth-lock:</i> SAE 1050-1065; <i>Square-Cone®:</i> SAE 1050. Stainless Screws-- SAE 18-8 stainless steel or 410 martensitic stainless steel Stainless Washers-- <i>Split-lock:</i> SAE J405 302-305; <i>Tooth-lock:</i> SAE 410 stainless steel; <i>Square-Cone®:</i> 18-8 stainless steel
Hardness	Steel Screws-- Rockwell B70 - B100. Steel Washers-- <i>Split-lock:</i> Rockwell C38 - 46; <i>Tooth-lock:</i> Rockwell C40 - 50; <i>Square-Cone®:</i> Rockwell C42 - 46. Stainless Washers-- <i>Split-lock:</i> Rockwell C35 - 43; <i>Tooth-lock:</i> Rockwell C40 - 50; <i>Square-Cone®:</i> Rockwell B88 minimum.
Tensile Strength	Steel: 60,000 psi. minimum. No. 2 diameter SEMS screws are not subject to tensile testing. No. 4 SEMS screws shorter than 1/2" are not subject to tensile testing. SEMS screws of diameters No. 6 to 10 inclusive, which are shorter than 1/2" or 3D (where D is the nominal screw size in inches) are not subject to tensile testing. Such SEMS screws of a size to be tested shall meet the tensile load requirements given on page 78. 18-8 Stainless: No. 4: 99,000 psi. minimum; No. 6 & No. 8: 96,000 psi. minimum. Note: No. 4, No. 6 and No. 8 SEMS screws which are shorter than 1/2" are not subject to tensile testing. 410 Stainless: No. 4, No. 6 and No. 8 SEMS screws which are shorter than 1/2" are not subject to tensile testing.
Plating	See Appendix-A for information on the plating of steel SEMS.

HOW SEMS SPECIFICATIONS VARY FROM MACHINE SCREWS

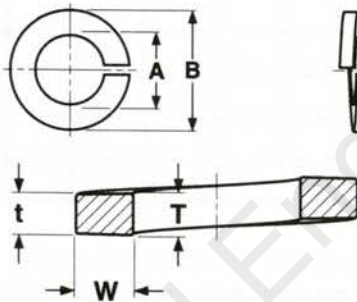
- The maximum diameter of the unthreaded shank shall be less than the maximum major diameter of the thread by an amount sufficient to prevent disassembly of the washer from the screw.
- The unthreaded length on fully threaded screws is measured to the contacting face of the washer instead of to the bearing face of the screw.
- The minimum underhead fillet radius is equivalent to 5% of the basic screw diameter.



TOOTH-LOCK WASHERS FOR PAN HEAD SEMS

ASME B18.13-1996

Nominal Size or Basic Screw Diameter		Internal Tooth				External Tooth			
		Washer Thickness		Washer Outside Diameter		Washer Thickness		Washer Outside Diameter	
		Max	Min	Max	Min	Max	Min	Max	Min
2	.0860	.016	.010	.185	.175	.016	.010	.180	.170
4	.1120	.018	.012	.268	.258	.018	.012	.230	.220
6	.1380	.022	.016	.288	.278	.022	.016	.285	.270
8	.1640	.023	.018	.338	.327	.023	.018	.320	.305
10	.1900	.024	.018	.383	.372	.024	.018	.381	.365
12	.2160	.027	.020	.408	.396	.027	.020	.410	.395
1/4	.2500	®.028	.023	.478	.466	.028	.023	.510	.494

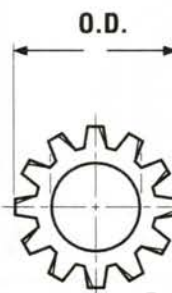
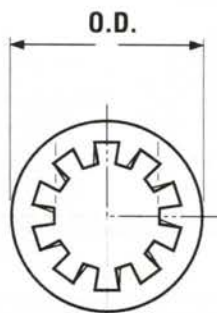


WASHERS FOR SPLIT-LOCK & SQUARE-CONE® PAN HEAD SEMS

ASME B18.13,-1996 Shakeproof*

Nominal Size or Basic Screw Diameter		Split-Lock				Square Cone®				
		Washer Inside Diameter A		Washer Section Min		Washer Outside Diameter B		Washer Thickness	Washer Outside Diameter	
		Max	Min	Width W	Thickness $\frac{T+t}{2}$	Max	Min	Ref	Max	Min
2	.0860	.080	.075	.035	.020	.156	.145	.015	.210	.200
4	.1120	.106	.101	.055	.034	.222	.211	.015	.250	.244
6	.1380	.129	.124	.062	.034	.261	.248	.025	.320	.307
8	.1640	.155	.149	.078	.040	.319	.305	.030	.383	.370
10	.1900	.179	.173	.093	.047	.373	.359	.032	.446	.433
1/4	.2500	.238	.230	.125	.062	.496	.480	.039	.508	.495

*Dimensions of Square-Cone washers are to Shakeproof specifications. Square-Cone is a registered trademark of Shakeproof division of Illinois Tool Works.



TOOTH LOCK WASHERS FOR HEX HEAD SEMS

ASME B18.13-1996

Nominal Size or Basic Screw Diameter		Internal Tooth				External Tooth			
		Washer Thickness		Washer Outside Diameter		Washer Thickness		Washer Outside Diameter	
		Max	Min	Max	Min	Max	Min	Max	Min
4	.1120	.018	.012	.268	.258	.018	.012	.230	.220
6	.1380	.022	.016	.288	.278	.022	.016	.285	.278
8	.1640	.023	.018	.338	.327	.023	.018	.320	.305
10	.1900	.024	.018	.383	.372	.024	.018	.381	.365
1/4	.2500	.028	.023	.478	.466	.028	.023	.475	.460
5/16	.3125	.034	.028	.610	.597	.034	.028	.580	.567
3/8	.3750	.040	.032	.692	.678	.040	.032	.660	.640

TOOTH LOCK WASHERS FOR HEX WASHER HEAD SEMS

ASME B18.13-1996

Nominal Size or Basic Screw Diameter		Internal Tooth				External Tooth			
		Washer Thickness		Washer Outside Diameter		Washer Thickness		Washer Outside Diameter	
		Max	Min	Max	Min	Max	Min	Max	Min
4	.1120	-	-	-	-	.018	.012	.230	.220
6	.1380	.022	.016	.288	.278	.022	.016	.317	.306
8	.1640	.023	.018	.338	.327	.023	.018	.317	.306
10	.1900	.024	.018	.383	.372	.024	.018	.406	.395
12	.2160	.027	.020	.408	.396	.027	.020	.406	.395
1/4	.2500	.028	.023	.478	.466	.028	.023	.580	.567
5/16	.3125	.034	.028	.610	.597	.034	.028	.654	.640
3/8	.3750	.040	.032	.692	.678	.040	.032	.760	.740