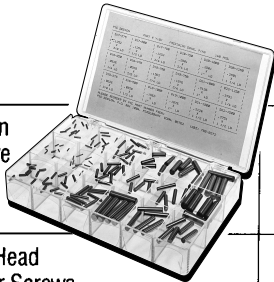


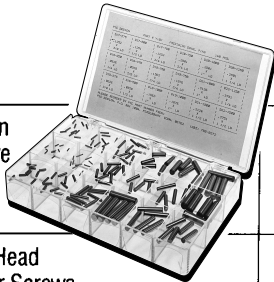



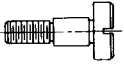

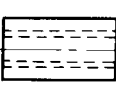
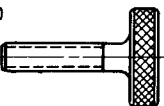
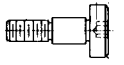
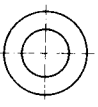
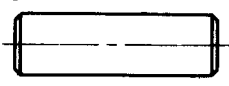
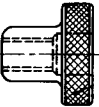


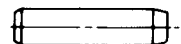
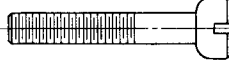

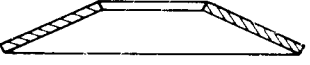







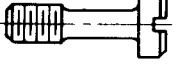

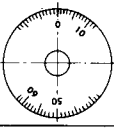
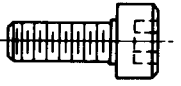


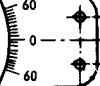

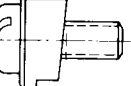
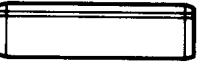
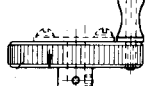


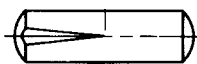
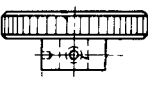
PIC Design offers an extensive line of precision Hardware which contains various items for fastening and/or locating of precision industrial components. The hardware is manufactured from Stainless Steel to the PIC High Quality Standards, in either inch or metric styles of thread, diameter and length.

Drill and Tap Data in Inch for both the UNF and UNC pieces, selects the correct drill to be used for the appropriate tap. For the Metric ISO thread, the correct drill is recommended for the thread size and pitch.

The following pages have been included as a technical guide to aid the designer or engineer in selecting the appropriate screw type and size. The

The Screw Head Detail Data for both Inch and Metric Heads enables the Designer to select the appropriate type of head required and to allow for the clearance of the heads.



Precision Hardware Kits 	Nylon Screws, 	Spacers 	Cotter Pins 
Slotted Head Shoulder Screws 	Hexagon Nuts 	Standoffs 	Knurled Thumb Screws 
Socket Head Shoulder Screws 	Precision Washers 	Dowel Pins 	Knurled Thumb Nuts 
No-Mar Set Screws 	Washers-Plain, Lock and Tooth 	Hardened Dowel Pins 	Swivel Studs, Nuts and Washers 
Silver Grip Set Screws 	Belleville Spring Washers 	Reamers 	Springs 
Cup Point Set Screws 	Curved Washers 	Woodruff Keys 	Screw Thread Inserts 
Brass Tip Set Screws 	Captive Screws 	Taper Pins 	Dials 
Socket Head Screws 	Retaining Rings 	Spring Pins 	Verniers 
Stainless Machine Screws 	Motor Mount Cleats 	Spirol Pins 	Cranks 
Self-Locking Machine Screws 	Handles 	Groove Pins 	Knobs 

# TAP/CLEARANCE DRILL CHART

## Recommended Drill & Tap Data

### UNIFIED COARSE THREADS

Screw Size	Outside Dia.	Root Dia.	Tap Drill Data		Clearance Drill	
			Drill No.	Size	Drill No.	Size
# 1-64	.073	.054	#54	.055	#46	.081
# 2-56	.086	.064	#51	.067	#41	.096
# 3-48	.099	.073	#48	.076	#36	.106
# 4-40	.112	.081	#44	.086	#31	.120
# 5-40	.125	.094	#39	.0995	#29	.136
# 6-32	.138	.100	#36	.106	#26	.147
# 8-32	.164	.126	#30	.1285	#17	.173
#10-24	.190	.139	#25	.1495	# 6	.204

### UNIFIED FINE THREADS

#000-120	.034	.023	#71	.026	#62	.039
#00-96	.047	.033	#62	.038	#55	.052
# 0-80	.060	.045	#56	.046	#51	.067
# 1-72	.073	.056	#54	.055	#46	.081
# 2-64	.086	.067	#50	.070	#41	.096
# 3-56	.099	.077	#47	.0785	#36	.106
# 4-48	.112	.086	#42	.0935	#31	.120
# 5-44	.125	.097	#37	.104	#29	.136
# 6-40	.138	.107	#34	.111	#26	.147
# 8-36	.164	.130	#29	.136	#17	.173
#10-32	.190	.152	#21	.159	# 6	.204

### LETTER SIZE THREADS

Letter	Dia.	Letter	Dia.	Letter	Dia.	Letter	Dia.	Letter	Dia.
"A"	.234	"F"	.257	"K"	.281	"P"	.323	"U"	.368
"B"	.238	"G"	.261	"L"	.290	"Q"	.332	"V"	.377
"C"	.242	"H"	.266	"M"	.295	"R"	.339	"W"	.386
"D"	.246	"I"	.272	"N"	.302	"S"	.348	"X"	.397
"E"	.250	"J"	.277	"O"	.316	"T"	.358	"Y"	.404

### TWIST DRILL & STEEL WIRE GAGE

No.	Dia.	No.	Dia.	No.	Dia.	No.	Dia.	No.	Dia.
#1	.2280	#17	.1730	#33	.1130	#49	.0730	#65	.0350
#2	.2210	#18	.1695	#34	.1110	#50	.0700	#66	.0330
#3	.2130	#19	.1660	#35	.1100	#51	.0670	#67	.0320
#4	.2090	#20	.1610	#36	.1065	#52	.0635	#68	.0310
#5	.2055	#21	.1590	#37	.1040	#53	.0595	#69	.0295
#6	.2040	#22	.1570	#38	.1015	#54	.0550	#70	.0280
#7	.2010	#23	.1540	#39	.0995	#55	.0520	#71	.0260
#8	.1990	#24	.1520	#40	.0980	#56	.0465	#72	.0250
#9	.1960	#25	.1495	#41	.0960	#57	.0430	#73	.0240
#10	.1935	#26	.1470	#42	.0935	#58	.0420	#74	.0225
#11	.1910	#27	.1440	#43	.0890	#59	.0410	#75	.0210
#12	.1890	#28	.1405	#44	.0860	#60	.0400	#76	.0200
#13	.1850	#29	.1360	#45	.0820	#61	.0390	#77	.0180
#14	.1820	#30	.1285	#46	.0810	#62	.0380	#78	.0160
#15	.1800	#31	.1200	#47	.0785	#63	.0370	#79	.0145
#16	.1770	#32	.1160	#48	.0760	#64	.0360	#80	.0135

# METRIC TAP/CLEARANCE DRILL CHART

## METRIC TAP DRILL FORMULA (Approximate Values)

- 70% of thread = (Nominal O.D.) minus (0.86) (Pitch)
- 75% of thread = (Nominal O.D.) minus (0.92) (Pitch)
- 80% of thread = (Nominal O.D.) minus (0.98) (Pitch)
- 81% of thread = (Nominal O.D.) minus (1.00) (Pitch)
- 85% of thread = (Nominal O.D.) minus (1.04) (Pitch)

ISO Metric Thread Designation (Screw $\varnothing$ X Pitch) (Nominal Size) Pitch	Tap Drill Size 81% Thd.	Clearance Drill Size	ISO Metric Thread Designation (Screw $\varnothing$ X Pitch) (Nominal Size) Pitch		Tap Drill Size 81% Thd.	Clearance Drill Size
			Size	Pitch		
M 1.4 x 0.3	1.1	1.55	M 3 x 0.5		2.5	3.2
M 1.4 x 0.2	1.2	1.55	M 3 x 0.35		2.65	3.2
M 1.6 x 0.35	1.25	1.75	M 3.5 x 0.5		2.9	3.7
M 1.6 x 0.2	1.4	1.75	M 3.5 x 0.35		3.10	3.7
M 1.8 x 0.35	1.45	2	M 4 x 0.7		3.3	4.2
M 1.8 x 0.2	1.6	2	M 4 x 0.5		3.5	4.2
M 2 x 0.4	1.6	2.3	M 4.5 x 0.75		3.7	4.7
M 2 x 0.25	1.75	2.3	M 4.5 x 0.5		4	4.7
M 2.2 x 0.45	1.75	2.4	M 5 x 0.8		4.2	5.2
M 2.2 x 0.25	1.95	2.4	M 5 x 0.5		4.5	5.2
M 2.5 x 0.45	2.05	2.7	M 5.5 x 0.5		5	5.7
M 2.5 x 0.35	2.15	2.7	M 6 x 1.0		5	6.2
			M 6 x 0.75		5.25	6.2

## AVAILABLE STANDARD METRIC DRILL SIZES

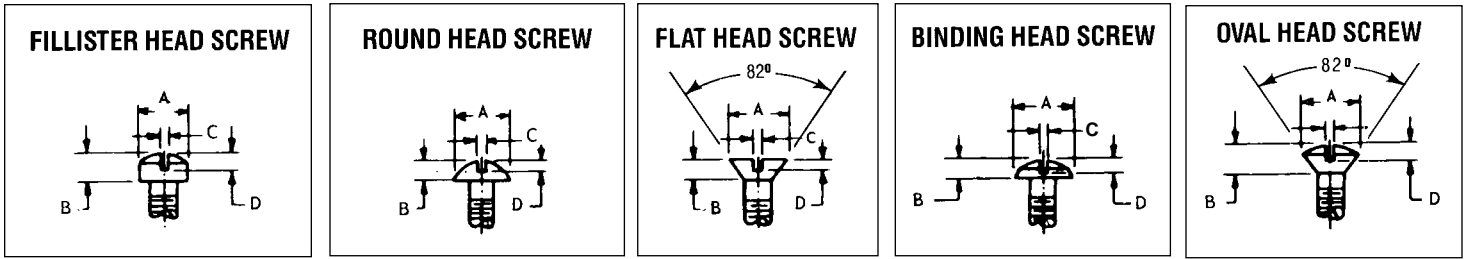
Diameter From	Diameter To	Increment (Steps)
0.25	3.00	0.05
3.10	13.00	0.10
13.20		Increments not readily available
13.50		Increments not readily available
13.80		Increments not readily available
14.00	25.00	0.25
25.50	50.00	0.50
51.00	75.00	1.00

## SCREW THREAD COMPARISONS

Pitch (mm)	Approximate Threads per Inch	Pitch (mm)	Approximate Threads per Inch
0.2	127	0.5	50.8
0.25	101.6	0.6	42.3
0.3	84.6	0.7	36.3
0.35	72.5	0.75	33.9
0.4	63.5	0.8	31.7
0.45	56.4	1	25.4

# SCREW HEAD DETAIL DATA

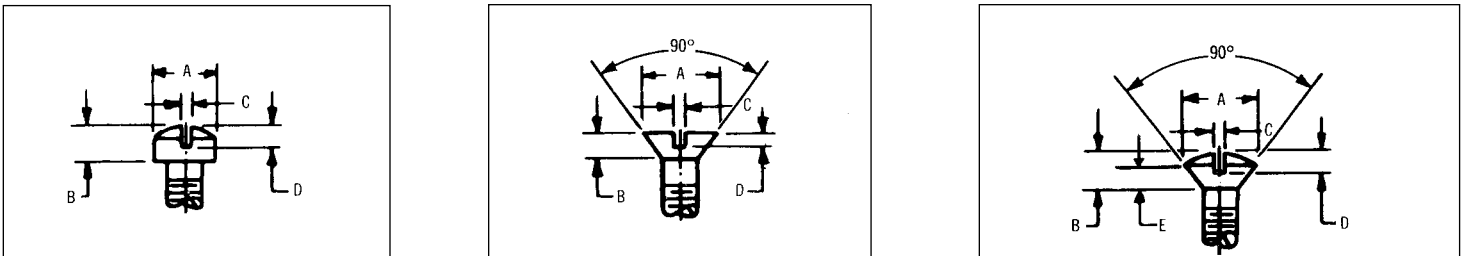
Recommended Design Data



Size	Fillister Head Screw				Round Head Screw				Flat Head Screw				Binding Head Screw				Oval Head Screw			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
000	.059	.035	.012	.017	.062	.031	.012	.018	.064	.016	.011	.009	.073	.021	.012	.013	—	—	—	—
00	.082	.047	.017	.022	.089	.045	.017	.026	.092	.028	.017	.014	.098	.028	.017	.018	.093	.042	.017	.023
0	.096	.055	.023	.025	.113	.053	.023	.039	.119	.035	.023	.015	.126	.032	.023	.018	.119	.056	.023	.030
1	.118	.066	.026	.031	.138	.061	.026	.044	.146	.043	.026	.019	.153	.044	.026	.024	.146	.068	.026	.038
2	.140	.083	.031	.037	.162	.069	.031	.048	.172	.051	.031	.023	.181	.050	.031	.030	.172	.080	.031	.045
3	.161	.095	.035	.043	.187	.078	.035	.053	.199	.059	.035	.027	.208	.059	.035	.036	.199	.092	.035	.052
4	.183	.107	.039	.048	.211	.086	.039	.058	.225	.067	.039	.030	.235	.068	.039	.042	.225	.104	.039	.059
5	.205	.120	.043	.054	.236	.095	.043	.063	.252	.075	.043	.034	.263	.078	.043	.048	.252	.116	.043	.067
6	.226	.132	.048	.060	.260	.103	.048	.068	.279	.083	.048	.038	.290	.087	.048	.053	.279	.128	.048	.074
8	.270	.156	.054	.071	.309	.120	.054	.077	.332	.100	.054	.045	.344	.105	.054	.065	.332	.152	.054	.088
10	.313	.180	.060	.083	.359	.137	.060	.087	.385	.116	.060	.053	.399	.123	.060	.077	.385	.176	.060	.103

# METRIC SCREW HEAD DETAIL DATA

Recommended Design Data



Type MSW 1  
FILLISTER HEAD SCREW  
(Cheese Head)

Size	A	B	C	D (Min.)
M 1.2 x 0.25	2.3	0.8	0.3	0.3
M 1.6 x 0.35	3.0	1.0	0.4	0.45
M 2 x 0.4	3.8	1.3	0.5	0.6
M 3 x 0.5	5.5	2.0	0.8	0.9
M 4 x 0.7	7.0	2.6	1.0	1.2
M 5 x 0.8	8.5	3.3	1.2	1.5

Type MSW 2  
FLAT HEAD SCREW

Size	A	B (Max.)	C	D (Min.)
M 1.2 x 0.25	2.3	0.72	0.3	0.25
M 1.6 x 0.35	3.0	0.96	0.4	0.32
M 2 x 0.4	3.8	1.2	0.5	0.4
M 3 x 0.5	5.6	1.65	0.8	0.6
M 4 x 0.7	7.5	2.2	1.0	0.8
M 5 x 0.8	9.2	2.5	1.2	1.0

Type MSW 3  
OVAL HEAD SCREW

Size	A	B (Max.)	C	D (Min.)	E
M 1.2 x 0.25	2.3	1.02	0.3	0.5	0.72
M 1.6 x 0.35	3.0	1.36	0.4	0.65	0.96
M 2 x 0.4	3.8	1.70	0.5	0.8	1.2
M 3 x 0.5	5.6	2.40	0.8	1.2	1.65
M 4 x 0.7	7.5	3.20	1.0	1.6	2.2
M 5 x 0.8	9.2	3.75	1.2	2.0	2.5