

Materials Chart No. 2

Material	Code Letter	Material Specifications
Brass	B	Alloy 360, 353 ASTM B16
Aluminum	A	¹ QQ-A-225/3 (2011-T3) QQ-A-225/6 (2024-T4) QQ-A-225/8 (6061-T6) QQ-A-200/9 (6063-T5)
Stainless Steel	SS	ASTM A582
Steel	S	ASTM A108-81, C12L14
Nylon	N	² LP-410
Teflon	T	² Mil-P-14078 Mil-P-19468
Phenolic	PH	³ Mil-P-79 Type PBE XXX (Paper Base)
Phenolic	PH-F	³ Mil-P-79 Type FBE Grade CP-940 or 4 below Fabric Base
Delrin	D	LP-392
Fibre	F	Mil-F-1148A (Grade CH)
Poly Vinyl Chloride	PVC	ASTM D-1784

1. Depending upon application
2. Smallest Thread size recommended is 4-40
3. Mil-P-15035C

Thread Code Chart No. 3

Thread code is the 4 digit number assigned to the part number to designate the thread size of a part. All threads are Class 2 (A and B) (commercial)*.

AMATOM		AMATOM		AMATOM	
Thread Size	Thread Code	Thread Size	Thread Code	Thread Size	Thread Code
0-80	0080	5-44	0544	1/4-32	2532
1-64	0164	6-32	0632	5/16-18	3118
1-72	0172	6-40	0640	5/16-24	3124
2-56	0256	8-32	0832	3/8-16	3716
2-64	0264	8-36	0836	3/8-24	3724
3-48	0348	10-24	1024	3/8-32	3732
3-56	0356	10-32	1032	7/16-14	4314
4-40	0440	12-24	1224	7/16-20	4320
4-48	0448	1/4-20	2520	1/2-13	5013
5-40	0540	1/4-28	2528	1/2-20	5020

*Note: For special threads, contact Amatom Sales Office for Number.

Self Locking Hardware (No lockwashers required)

Amatom threaded hardware is available with HELI-COIL® inserts. (HELI-COIL® inserts not available in Teflon and Delrin parts.)

To specify parts requiring a HELI-COIL® locking insert - add the letters "HL" to the thread code, i.e. 80 XX - B - 0440HL

Unless otherwise specified HELI-COIL® inserts will be 1 1/2 x diam. of the thread.

(Prices available on application only.)

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Length of Thread

Brass and Aluminum Parts

0-80 thread is tapped thru up to 3/8 in. length
2-56 thread is tapped thru up to 5/8 in. length
4-40 and larger threads are tapped thru up to 1 in. length

Stainless Steel, Nylon, Phenolic

0-80 thread is tapped thru up to 1/4 in. length
2-56 thread is tapped thru up to 3/8 in. length
4-40 thread is tapped thru up to 1/2 in. length
6-32 and larger threads are tapped thru up to 1 in. length

Standoffs with longer lengths than shown above will be tapped both ends to thread depths as indicated in Chart 3A.

NOTE: Standoffs and spacers from 1 1/16 thru 2" long may be manufactured from tubing or solid material at our discretion. If your requirement calls for solid material please specify TBE (tap both ends) when ordering.

Depth of Thread

Chart No. 3A

Recommended Blind Hole Thread Length in Standoffs

(Drilled and Tapped both ends)

Per Handbook H-28 (Part 1)

Screwthread Standards (Federal)

Thread Size	Screw Engagement	Thread Size	Screw Engagement
0-80	3/16	12-24	1/2
2-56	3/16	1/4-20	9/16
3-48	1/4	1/4-28	1/2
4-40	1/4	5/16-18	9/16
6-32	3/8	3/8-16	9/16
8-32	7/16	3/8-32	3/8
10-24	1/2	7/16-20	9/16
10-32	1/2		

Exceptions are noted on catalog pages where applicable.

Percentage of Thread

Chart 3B

Screw Thread Size	% of Thread Allowable	
	Roll, or Cold Form Tap	Cut Tap
2	55	56
4	55	57
6	55	66
8	55	58
10	55	59
12	55	63
1/4	55	67

Note: Parts will be made by both methods and are interchangeable, unless customer specifically requests otherwise.

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Clearance Hole Code Chart No. 4

Clearance Code is the size of hole in a spacer, needed to clear the major diameter and not have a sloppy fit.

Thread Size	Clearance Hole Range	Clearance Hole Code	Thread Size	Clearance Hole Range	Clearance Hole Code
0-80	.062-.072	.063	10-24	.192-.202	.194
1-64	.075-.085	.076	10-32	.192-.202	.194
1-72	.075-.085	.076	12-24	.218-.228	.219
2-56	.088-.098	.091	1/4-20	.252-.262	.257
2-64	.088-.098	.091	1/4-28	.252-.262	.257
3-48	.101-.111	.104	5/16-18	.3145-.3245	.316
3-56	.101-.111	.104	5/16-24	.3145-.3245	.316
4-40	.114-.124	.115	3/8-16	.377-.387	.381
4-48	.114-.124	.115	3/8-24	.377-.387	.381
5-40	.127-.137	.129	3/8-32	.377-.387	.381
5-44	.127-.137	.129	7/16-14	.4395-.4495	7/16
6-32	.140-.150	.140	7/16-20	.4395-.4495	7/16
6-40	.140-.150	.140	1/2-13	.502-.512	1/2
8-32	.166-.176	.171	1/2-20	.502-.512	1/2
8-36	.166-.176	.171			

Note:

1. Size of Clearance Hole computed as follows:
Minimum I.D.=Thread Major Diameter + .002
Maximum I.D.=Thread Major Diameter +.012
2. For special clearance sizes not listed, designate the inside diameter required by .xxx of the decimal equivalent of size required.

Shank Length Code Chart No. 1

Code	Length of Shank	Panel Thickness	Code	Length of Shank	Panel Thickness
A	.075	1/32	D	.165	1/8
B	.105	1/16	E	.230	3/16
C	.135	3/32	F	.290	1/4

Properties

Property	Vulcanized Fibre	Nylon 101	Teflon	Phenolic		Delrin Acetal
				XXXP	LE	
Tensile Strength psi	6,000-12,000	11,200-16,500	2,700-3,100	13,500	10,000-14,000	10,000
Compressive Strength psi	20,000-30,000	4,000-11,000	700-1,200	36,000	37,000	18,000
Heat Resistance (continuous °F)	221	250	550	250-275	225-250	250
Dielectric Constant (60 cycles)	4-7	10	2.1			3.7
Dielectric Strength 1/8 thickness (v/mil)	150	300-400	400	325	225	500
Arc Resistance (Sec)	80	140	200	10	10	129
Water Absorption 24 hrs (%)	15-25	1.5	.00	.5	1.8	.12
Rockwell Hardness	R Scale 80	107-119	R-58	M110	M113	R120
Flammability (in/min) .125 in.		Self-Ext.	Non-Flam.			1.1
Specific Gravity	1.0-1.5	1.13-1.14	2.13	1.35	1.33	1.42

Information listed above was obtained from charts submitted by various manufacturers. We believe this information to be accurate, but since test methods vary, their validity cannot be verified. This chart is compiled for information purposes only.

Tolerances - Functionability

Tolerances in manufacture of standoffs and spacers

Diameter: ±.006 except where otherwise noted	Length: 1. Up to 4" long all are kept to ±.005 2. 4" to 6" long ±.008 3. Over 6": long ±.010 4. Nylon Parts ±.015
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Amatom reserves the right to make adjustments in dimensions and specifications at any time without notice. Customer's inspection should be determined primarily on functionability.

Anti-Rotation Swage Standoffs

3-4 times more holding power than conventional standoffs. The Amatom high torque (anti-rotation) swage standoff is designed primarily for installation in epoxy glass, phenolic boards and aluminum panels or chassis. This broaching type standoff literally cuts its way down into the mounting material, biting in for torque resistance. The knurled shank feature eliminates electrical connection breaks due to loosening and spinning of the standoff under high torque conditions.

Performance Data

Average Torque Load (inch-pounds)

Method of Installation	4-40 Thread	6-32 Thread	8-32 Thread	10-24 Thread	10-32 Thread
Straight Hole	35	40	50	50	70

Your torque loads may vary due to differences in installation parameters.
Tests performed on Epoxy Glass G10 boards.

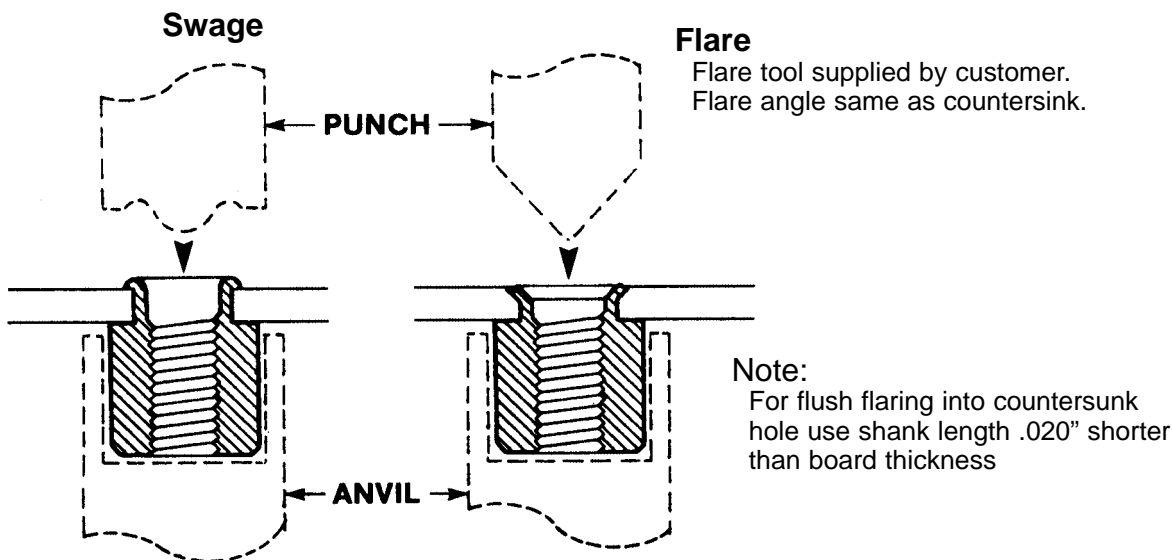
Methods of Installation

1. Select proper hole size (straight hole):

Anti-Rotation Swage					
Thread Size	4-40	6-32	8-32	10-24	10-32
Shank Dia. "C" Dim.	.179	.226	.263	.285	.285
Hole Dia. +.005-.000	.166	.213	.250	.272	.272

Plain Swage
Hole Diameter same as shank +.003 O.D. Tol. -.000

2. Swage or flare as required:



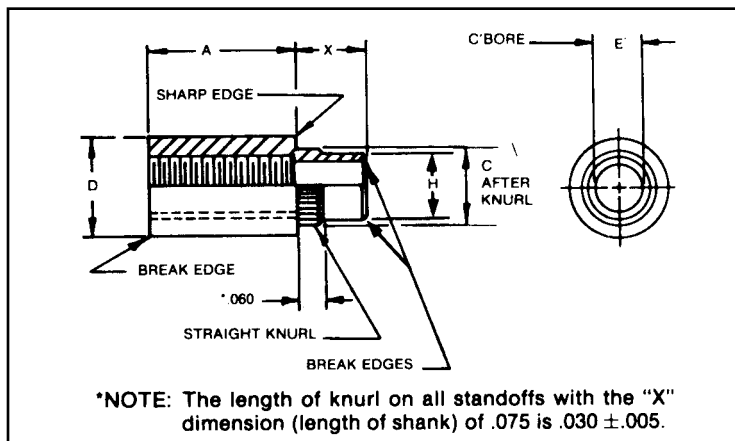
Tool part numbers for swaging are listed along with anti-rotation and swage standoff part descriptions.

Finishes Available

ALUM (A)		Notes	BRASS (B)		Notes
0	No Finish	A	0	No Finish	
1A	Anodize-Mil-A-8625 Type 1 (Chromic) Hot Water Seal (Dk. Grey)		3	Cadmium Plate-QQ-P-416 Class 1 -Clear Chromate Special Order	
1B	Anodize-Mil-A-8625 Type 2 (Sulphuric) Hot Water Seal (Clear)		3B	Cadmium Plate-QQ-P-416 Class 3, Type 2-Color Chromate Special Order	
1C	Anodize-Mil-A-8625 Type 2 (Sulphuric) Dichromate Seal (Yellow/Green)		4	Nickel plate QQN-290 A Grade G	
2	Anodize-Mil-A-8625 Black Type 2		6A	Brass Ebonal "C" (Black) Mil-F-495	
8	Caustic Etch		14	Electro Tin Plate-Mil-T- 10727-Type I	
9	Caustic Etch and Lacquer		14A	Electro Tin Solder 60/40 per M230 Mil-F-14072	B
10	Alodine 1200		15	Bright Dip (Brass Finish)	
16	Iridite-Clear-Mil-C-5541		28	Zinc Plate .0002 thick-ASTM-B-633 Type I	A
17	Iridite-Gold-Mil-C-5541		37	Zinc Plate .0002 thick-ASTM-B-633 Type II (Color Chromate)	
STEEL (S)			Note: Brass parts stocked with Zinc Plate finish-28. Refer to chart above for other finishes required. Finish #3 and 3B available on special order.		
0	No Finish		STAINLESS STEEL (SS)		
3	Cadmium Plate-QQ-P-416 Class 3 -Clear Chromate Special Order		6B	Stainless Steel "Black Oxide" Mil-C-13924	
3B	Cadmium plate-QQ-P-416 Class 3, Type 2-Color Chromate Special Order		7	Passivate-QQ-P-35	A
4	Nickel Plate QQ-N-290, A Grade F		PHENOLIC (PH)(PHF)		
14	Electro Tin Plate-Mil-T- 10727-Type I		0	No Finish	A
14A	Electro Tin Solder 60/40 Per M230 Mil-F-14072	B	30	Moisture and Fungus Resistant Finish Mil-V-173	
28	Zinc Plate .0002 thick-ASTM-B-633 Type I		NYLON (N)		
37	Zinc Plate .0002 thick-ASTM-B-633 Type II (Color Chromate)		Plain-No finish		
Notes:	(A.) Standard Finish for stocked parts. (B.) Not suitable for 2-56 or smaller threads specify oversized tap when ordering thread sizes.				

ANTI-ROTATION ROUND STANDOFFS 7/32", 9/32", 11/32" & 3/8"

Length ±.005	Part No.			
	7/32	9/32	11/32	3/8
1/8	18091	18121	18151	18181
3/16	18092	18122	18152	18182
1/4	18093	18123	18153	18183
5/16	18094	18124	18154	18184
3/8	18095	18125	18155	18185
7/16	18096	18126	18156	18186
1/2	18097	18127	18157	18187
9/16	18098	18128	18158	18188
5/8	18099	18129	18159	18189
11/16	18100	18130	18160	18190
3/4	18101	18131	18161	18191
7/8	18103	18133	18163	18193
1	18105	18135	18165	18195



Dimensions and Tolerances					
Outside Diameter		7/32	9/32	11/32	3/8
Thread Size		4-40	6-32	8-32	10-24
Ref.					
E	±.002	.129	.176	.213	.235
C	+.004 -.002	.179	.226	.263	.285
D	±.006	.219	.281	.344	.375
H	+.000 -.004	.166	.213	.250	.272

Swage Tooling					
Body Length		1/8-3/16	1/4-7/16	1/2-11/16	3/4-1"
Size	Punch	ANVIL	ANVIL	ANVIL	ANVIL
7/32	062-4	201-1H	201-2H	201-3H	201-4H
9/32	062-6	110-1H	110-2H	110-3H	110-4H
11/32	062-8	203-1	203-2	203-3	203-4
3/8	062-10	189-1	189-2	189-3	189-4

MATERIAL	CODE
Aluminum	A
Brass	B
Steel	S
Stainless Steel	SS

PART NUMBER ORDERING SYSTEM			
XXXXXX	- X -	XXXX	- XX
PART NO.	MAT'L	SHANK	FINISH
		THREAD	

Refer to page 8 for Finish Codes.
For parts not listed contact sales office.

SHANK/BOARD THICKNESS CODE		
X Shank ±.005	T Board Thick.	Code
.075	1/32	A
.105	1/16	B
.135	3/32	C
.165	1/8	D

THREAD CODE		
SIZE	THREAD	CODE
7/32	4-40	0440
9/32	6-32	0632
11/32	8-32	0832
3/8	10-24	1024
3/8	10-32	1032

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