

# SHOULDER WASHERS

## Machine Screw Insulators

- Use with TO-3, TO-3P, TO-66, TO-218, TO-220 and TO-247 Devices
- 125°C maximum recommended service temperature
- Chemically inert
- Recommended torque of 5 to 6 inch-pounds

### Material Specifications:

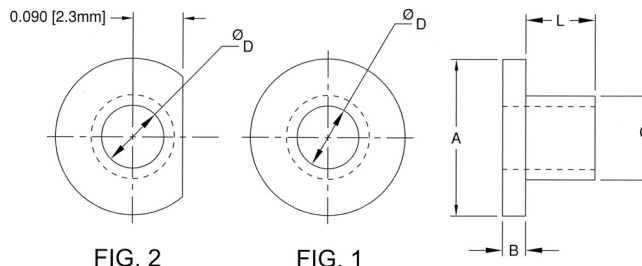
40% Glass filled Polyphenylene Sulfide (PPS)  
UL Rated 94V-0

**Oxygen Rating Index:** Over 45%

### Standard Drawing Tolerances:

(unless otherwise indicated)

Fractions:  $\pm 1/64$  (0.4) .XX =  $\pm 0.01$  (0.25)  
.X =  $\pm 0.10$  (2.5) .XXX =  $\pm 0.005$  (0.13)



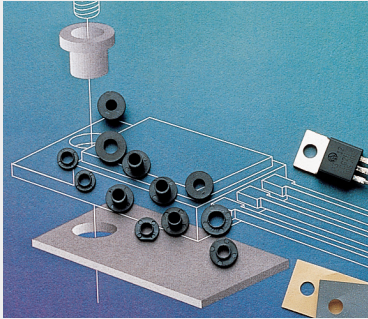
Part No.	L	A	B	C	D	Screw Size	FIG.
SW-031-120	.031 (0.8)					2	1
SW-063-120	.063 (1.6)						
SW-093-120	.093 (2.4)						
SW-125-120	.125 (3.2)	.235 (6.0)	.047 (1.2)	.120 (3.0)	.090 (2.3)		
SW-187-120	.187 (4.8)						
SW-250-120	.250 (6.4)						
SW-375-120	.375 (9.5)						
SW-032-135	.032 (0.8)	.215 (5.5)	.040 (1.0)	.135 (3.4)	.116 (3.0)	4	1
SW-040-140	.040 (1.0)	.245 (6.2)	.040 (1.0)	.140 (3.6)	.119 (3.0)		2
SW-125-140	.125 (3.2)	.280 (7.1)	.042 (1.1)	.140 (3.6)	.112 (2.8)	4	1
SW-030-145	.031 (0.8)	.235 (6.0)	.047 (1.2)	.145 (3.7)	.115 (2.9)		
SW-031-145	.031 (0.8)	.280 (7.1)	.047 (1.2)	.145 (3.7)	.118 (3.0)		
SW-063-145	.063 (1.6)						
SW-093-145	.093 (2.4)						
SW-125-145	.125 (3.2)	.235 (6.0)	.047 (1.2)	.145 (3.7)	.115 (2.9)		
SW-187-145	.187 (4.8)						
SW-250-145	.250 (6.4)						
SW-375-145	.375 (9.5)						
SW-125-150	.125 (3.2)	.280 (7.1)	.042 (1.1)	.150 (3.8)	.112 (2.8)	6	1
SW-185-150	.185 (4.7)	.280 (7.1)	.042 (1.1)	.150 (3.8)	.112 (2.8)		
SW-031-170	.031 (0.8)					6	1
SW-063-170	.063 (1.6)						
SW-093-170	.093 (2.4)						
SW-125-170	.125 (3.2)						
SW-187-170	.187 (4.8)	.290 (7.4)	.047 (1.2)	.170 (4.3)	.140 (3.6)		
SW-250-170	.250 (6.4)						
SW-375-170	.375 (9.5)						
SW-500-170	.500 (12.7)						
SW-031-177	.031 (0.8)	.312 (7.9)	.047 (1.2)	.177 (4.5)	.144 (3.7)	6	1
SW-031-190	.031 (0.8)	.312 (7.9)	.047 (1.2)	.190 (4.8)	.146 (3.7)		

Part No.	L	A	B	C	D	Screw Size	FIG.
SW-031-205	.031 (0.8)					8	1
SW-063-205	.063 (1.6)						
SW-093-205	.093 (2.4)						
SW-125-205	.125 (3.2)						
SW-187-205	.187 (4.8)	.344 (8.7)	.063 (1.6)	.205 (5.2)	.173 (4.4)		
SW-250-205	.250 (6.4)						
SW-375-205	.375 (9.5)						
SW-500-205	.500 (12.7)						
SW-031-260	.031 (0.8)					10	1
SW-063-260	.063 (1.6)						
SW-093-260	.093 (2.4)						
SW-125-260	.125 (3.2)						
SW-187-260	.187 (4.8)	.399 (10.1)	.063 (1.6)	.260 (6.6)	.200 (5.1)		
SW-250-260	.250 (6.4)						
SW-375-260	.375 (9.5)						
SW-500-260	.500 (12.7)						
SW-031-312	.031 (0.8)					10	1
SW-063-312	.063 (1.6)						
SW-093-312	.093 (2.4)						
SW-125-312	.125 (3.2)						
SW-187-312	.187 (4.8)	.513 (13.0)	.063 (1.6)	.312 (7.9)	.260 (6.6)		
SW-250-312	.250 (6.4)						
SW-375-312	.375 (9.5)						
SW-500-312	.500 (12.7)						
SW-031-360	.031 (0.8)					10	1
SW-063-360	.063 (1.6)						
SW-093-360	.093 (2.4)						
SW-125-360	.125 (3.2)						
SW-187-360	.187 (4.8)	.620 (15.7)	.063 (1.6)	.360 (9.1)	.320 (8.1)		
SW-250-360	.250 (6.4)						
SW-375-360	.375 (9.5)						
SW-500-360	.500 (12.7)						

# SHOULDER WASHERS

## High Temperature Machine Screw Insulators

- Use with TO-3, TO-3P, TO-66, TO-218, TO-220 and TO-247 Devices
- 260°C maximum recommended service temperature
- Chemically inert (no known solvents under 200°C)



### Material Specifications:

White or Natural Nylon, per ASTM D4066  
PA111, UL Rated 94V-2

**Oxygen Rating Index:** Over 28%

### Standard Drawing Tolerances:

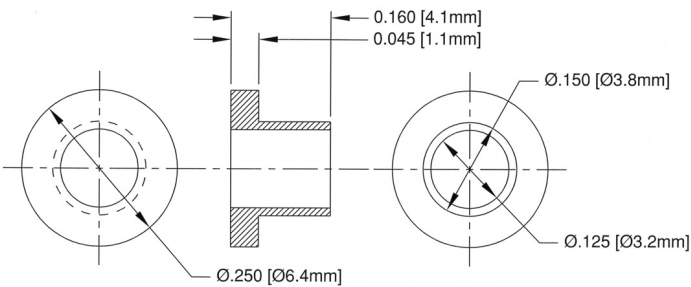
(unless otherwise indicated)

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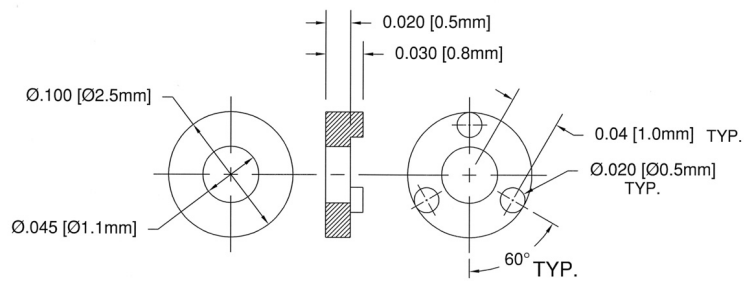
**405-160**

Color: White or Natural, Price Code: A



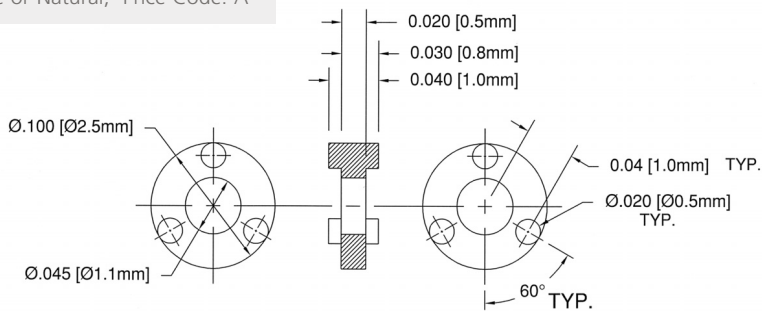
**413-030**

Color: White or Natural, Price Code: A



**419-040**

Color: White or Natural, Price Code: A



# PCB ASSEMBLY AIDS

## Printed Circuit Board Hole Plugs

- Prevents solder from reaching top of PCBs
- Simple press-in use without tools, easy to remove by hand
- Withstands wave, dip or hand soldering temperatures; will not contaminate solder
- Low in cost, re-usable, available from stock
- 9 Standard sizes fit holes from .016" - .500" (.41-12.7) diameter

Designed to prevent solder from flowing through unused holes in PCBs, Bivar's PLUG-O-HOLE™ PCB hole plugs offer an economical solution to keep unwanted solder from reaching the top surfaces of PCBs. Low in cost, these convenient hole plugs are tapered for a snug fit, yet are simple to remove. Made of temperature resistant material, they will withstand flow, dip or hand soldering and are re-usable.

9 Standard sizes, ranging from .016" to .500" diameter, will fit most PCB holes. Protrusion above and below board surfaces will not interfere with solder process baths or conveyors.

### Standard Drawing Tolerances:

(unless otherwise indicated)

Fractions:  $\pm 1/64$  (0.4)    .XX =  $\pm 0.01$  (0.25)  
 .X =  $\pm 0.10$  (2.5)    .XXX =  $\pm 0.005$  (0.13)



Part No.	FIG.	D1	H.D.	D2	T	E	L $\pm .015$	Color	Price Code
POH-1	1	0.012 (.03)	0.025 (0.6)	0.047 (1.2)	0.31 (7.9)	0.13 (3.2)	0.500 (12.7)	Black	Z
POH-2	1	0.015 (0.4)	0.050 (1.3)	0.082 (2.1)	0.31 (7.9)	0.17 (4.4)	0.545 (13.8)	Black	Z
POH-3S	2	0.040 (1.0)	0.100 (2.5)	0.160 (4.1)	0.31 (7.9)	0.22 (5.6)	0.585 (14.9)	Black	I
POH-4S	2	0.090 (2.3)	0.150 (3.8)	0.209 (5.3)	0.31 (7.9)	0.22 (5.6)	0.585 (14.9)	Black	K
POH-5S	2	0.140 (3.6)	0.200 (5.1)	0.261 (6.6)	0.31 (7.9)	0.22 (5.6)	0.585 (14.9)	Black	C
POH-6S	2	0.200 (5.1)	0.250 (6.4)	0.309 (7.8)	0.31 (7.9)	0.17 (4.4)	0.540 (13.7)	Black	BB
POH-7S	3	0.261 (6.6)	0.312 (7.9)	0.355 (9.0)	0.25 (6.4)	0.17 (4.4)	0.475 (12.1)	Black	CC
POH-8S	3	0.320 (8.1)	0.375 (9.5)	0.420 (10.7)	0.25 (6.4)	0.17 (4.4)	0.475 (12.1)	Black	EE
POH-9S	3	0.443 (11.3)	0.500 (12.7)	0.539 (13.7)	0.25 (6.4)	0.17 (4.4)	0.475 (12.1)	Black	KK

