PennEngineering®

BULLETIN PF™

PEM® CAPTIVE PANEL SCREWS

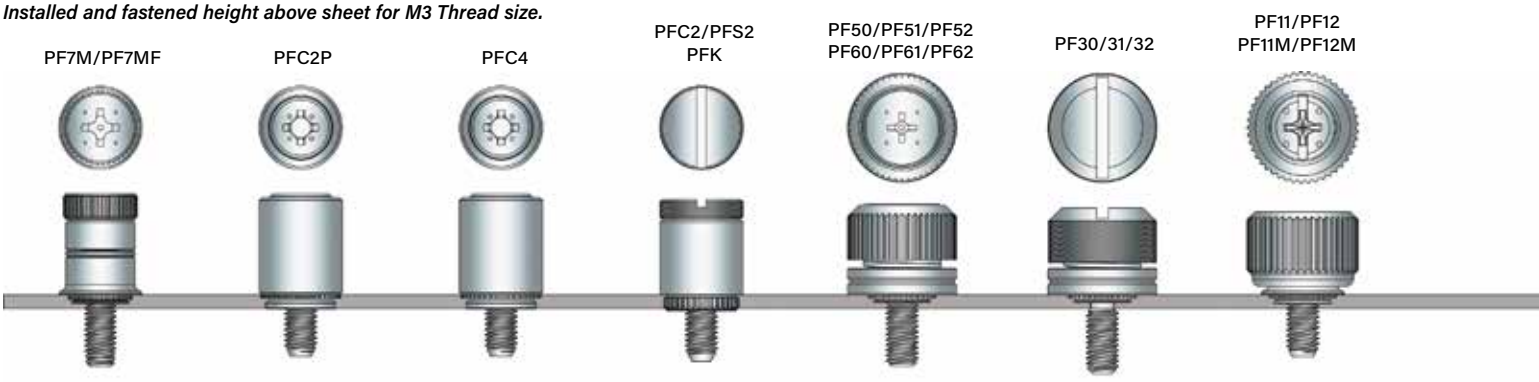
PEM®

PEM® CAPTIVE PANEL SCREWS

PEM® brand captive panel screws are designed to help keep parts to a minimum and eliminate risks associated with loose hardware that could fall out and damage internal components. These panel fastener assemblies are ideal to attach metal panels or other thin material components in applications where subsequent access will be necessary.

HEIGHT COMPARISON GUIDE AND STANDARD DRIVER RECESS

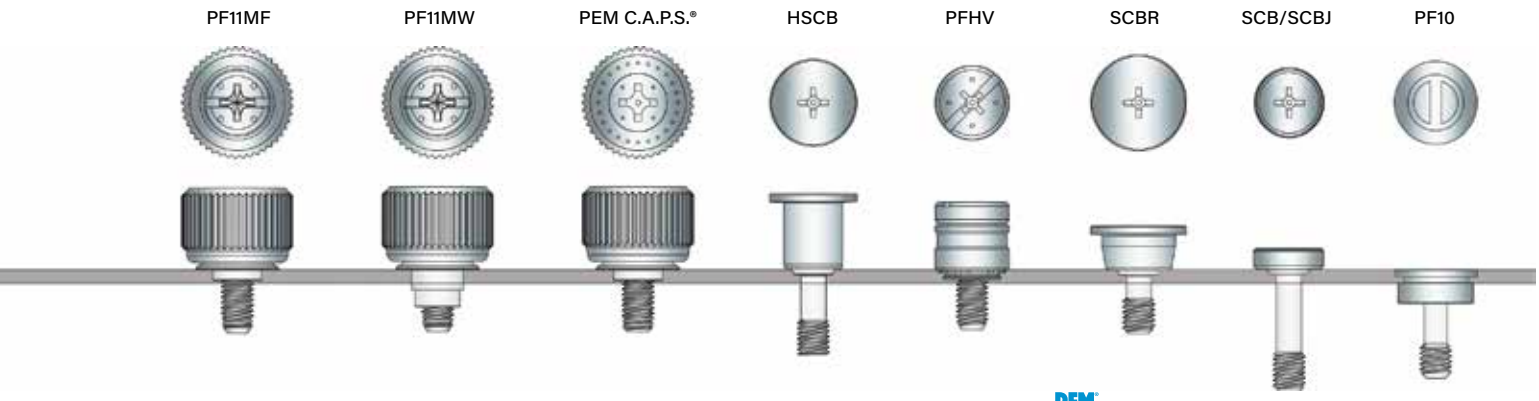
Installed and fastened height above sheet for M3 Thread size.



CAPTIVE PANEL SCREW SELECTOR GUIDE

PEM® Panel Fastener Type	Page No.	Application Requires:														
					Actuation		Installs into									
		UL Approved	High corrosion resistance	Spring loaded	Tool	Hand	Thinner sheets	Printed circuit boards	Stainless steel sheet	Painted panels and/or any hardness	Multiple screw lengths	Flush mounted top side	Available in black	Available in custom colors	Includes anti cross-threading feature	Mating hole misa-lignment
PF11	5			▪	▪	▪					▪		▪			
PF11M	5			▪	▪	▪					▪		▪		▪	
PF12	5			▪	▪						▪		▪			
PF12M	5			▪	▪						▪		▪		▪	
PF11MF	6			▪	▪	▪	▪		▪	▪	▪		▪		▪	
PF12MF	6			▪	▪		▪		▪	▪	▪		▪		▪	
PF11MW	7			▪	▪	▪	▪	▪	▪	▪	▪		▪		▪	▪
PF12MW	7			▪	▪		▪	▪	▪	▪	▪		▪		▪	▪
PEM C.A.P.S.	8			▪	▪	▪					▪		▪(1)	▪	▪	
PFHV	9				▪						▪		▪			
PF7M	10			▪	▪	▪					▪				▪	
PF7MF	11			▪	▪	▪	▪		▪	▪	▪				▪	
PF30 PF31 PF32	12			▪	▪	▪							▪			
PF50 PF51 PF52	13			▪	▪	▪					▪		▪			
PF60 PF61 PF62	13			▪	▪						▪		▪			
PFC4	14	▪		▪	▪				▪		▪					
PFC2P	15	▪		▪	▪						▪		▪			
PFC2	16		▪	▪	▪	▪					▪		▪			
PFS2	16			▪	▪	▪					▪		▪			
SCBR	18			▪	▪											
SCB/SCBJ	19				▪						▪					
HSCB	20-21			▪	▪											
PF10	22-23	▪	▪		▪							▪				
SMTPFLSM	24			▪	▪	▪		▪			▪				▪	
SMTPF	25				▪	▪		▪			▪		▪(1)	▪		
PFK	26		▪	▪	▪	▪		▪			▪		▪			

(1) Standard color is black.



PEM® PF11™/PF12™ CAPTIVE PANEL SCREWS

PEM® PF11/PF12 panel fasteners provide design flexibility by offering three styles of installation types, each having the same profile or look above the sheet or panel into which it is installed. The various mounting types include self-clinching, flare-mounted, and floating styles. Each offers a distinct advantage depending on your application. The standard selection of knobs include knurled or smooth metal caps and plastic PEM C.A.P.S.® (colored access panel screws).

Self-clinching Flare-mounted Floating

Key features include:

1) Universal Phillips/slot drive (except for plastic cap).
2) Shoulder on retainer to provide positive stop during installation.
3) Anti cross-threading feature (designated with an "M" in the part number). Eases assembly, aligns components, improves assembly line productivity, prevents jamming, and slides through clogged internal threads.

1

*Universal Phillips/ slot drive**

2

Shoulder on retainer

3 **ANTI CROSS-THREAD TECHNOLOGY - HOW IT WORKS**

PennEngineering is a licensee for MAThread® technology, a registered trademark of MAThread Inc.

-1-
MISALIGNED AXIS

-2-
THREADS CAM

-3-
THREADS DRIVE NORMALLY

** Plastic cap version has Phillips drive only.*

Standard Mounting Styles:

Self-clinching

- Installs flush on back side of panel.
- Available in three screw lengths.

Flare-mounted

- Appropriate for close centerline-to-edge applications.
- Doesn't require high installation force.
- Installs into any panel hardness.
- Installs flush on back side of panel.
- Can be installed into most any thin material.
- Appropriate for painted panels.

Flare-mounted, Floating

- Compensates for mating hole misalignment.
- Installs into any panel hardness.

Standard Cap Selection:

Metal Cap knurled
All metal cap available with knurls.

Metal Cap Un-knurled
All metal cap available without knurls.

Black Metal Cap
DuraBlack™ finish is scratch resistant. Finish is on both metal cap and screw. (finish code "BL")

Plastic Cap
Available with custom color plastic cap.
(See page 8 for colors)

Available Drive Configurations:

PF11

Phillips/slot
(Standard - except for plastic cap)

PF11P

Phillips
(Optional)

PF11LS

Torx®/Slot Combination
(Optional)

PF11S

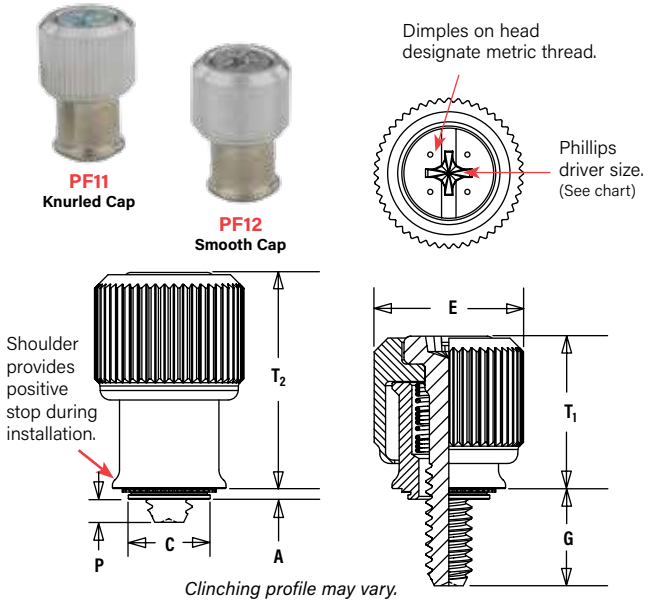
Slotted
(Optional)

PF11L

Torx®
(Optional)

PennEngineering is a licensee for Acument Global Technologies (Torx®).

PEM® PF11™/PF12™/PF11M™/PF12M™ CAPTIVE PANEL SCREWS



Clinching profile may vary.

Float .010"/0.25mm minimum, in all directions from center, .020"/0.5mm total.

Installation Data page 28. Performance Data page 36.

Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g

Material:
Knob: Aluminum
Retainer: Hardened Carbon Steel
Screw (PF11/PF12): 400 Series Stainless Steel
Screw (PF11M/PF12M): Hardened Carbon Steel (1)
Spring: 300 Series Stainless Steel

Finish: Optional Finish (BL):
Knob: Natural Finish
Retainer: Bright nickel over copper flash per ASTM B689
Screw (PF11/PF12): Passivated and/or tested per ASTM A380
Screw: (PF11M/PF12M): Zinc plated, 5µm, colorless (3)
Spring: Natural Finish
Knob: Black anodize (2)
Screw: Black nitride, AMS2753, Section 3 (2)

For use in sheet hardness:
HRB 80 or less (Hardness Rockwell "B" Scale) / HB 150 or less (Hardness Brinell)

PART NUMBER DESIGNATION

PF11 M - 632 - 1 BL

- PF11: Type
- M: Optional Anti-cross thread feature
- 632: Thread Code
- 1: Screw Length Code
- BL: Optional DuraBlack finish

All dimensions are in inches.

	Thread Size	Type: Knurled Cap	Type: Smooth Cap	Thread Code	Screw Length Code	A Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C Max.	E ±.010	G ±.025	P ±.025	T_1 Nom.	T_2 Nom.	Driver Size	Min. Dist. Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	PF11 PF11M	PF12 PF12M	440	0	.036	.036	.219	.218	.417	.170	.000	.310	.450	#1	.28
					1						.230	.060				
					2						.290	.120				
	.138-32 (#6-32)	PF11 PF11M	PF12 PF12M	632	0	.036	.036	.250	.249	.450	.230	.000	.450	.640	#2	.29
					1						.290	.060				
					2						.350	.120				
	.164-32 (#8-32)	PF11 PF11M	PF12 PF12M	832	0	.036	.036	.312	.311	.514	.230	.000	.450	.640	#2	.33
					1						.290	.060				
					2						.350	.120				
	.190-32 (#10-32)	PF11 PF11M	PF12 PF12M	032	0	.036	.036	.312	.311	.514	.230	.000	.450	.640	#2	.33
					1						.290	.060				
					2						.350	.120				
	.250-20 (1/4-20)	PF11 PF11M	PF12 PF12M	0420	0	.036	.036	.375	.374	.575	.290	.000	.530	.790	#3	.46
					1						.350	.060				
					2						.410	.120				

All dimensions are in millimeters.

	Thread Size x Pitch	Type: Knurled Cap	Type: Smooth Cap	Thread Code	Screw Length Code	A Max.	Min. Sheet Thickness	Hole Size In Sheet +0.08	C Max.	E ±0.25	G ±0.64	P ±0.64	T_1 Nom.	T_2 Nom.	Driver Size	Min. Dist. Hole ℄ To Edge
METRIC	M3 x 0.5	PF11 PF11M	PF12 PF12M	M3	0	0.92	0.92	5.56	5.54	10.59	4.32	0	7.87	11.43	#1	7.11
					1						5.84	1.52				
					2						7.37	3.05				
	M3.5 x 0.6	PF11 PF11M	PF12 PF12M	M3.5	0	0.92	0.92	6.35	6.33	11.43	5.84	0	11.43	16.26	#2	7.37
					1						7.37	1.52				
					2						8.89	3.05				
	M4 x 0.7	PF11 PF11M	PF12 PF12M	M4	0	0.92	0.92	7.92	7.9	13.06	5.84	0	11.43	16.26	#2	8.38
					1						7.37	1.52				
					2						8.89	3.05				
	M5 x 0.8	PF11 PF11M	PF12 PF12M	M5	0	0.92	0.92	7.92	7.9	13.06	5.84	0	11.43	16.26	#2	8.38
					1						7.37	1.52				
					2						8.89	3.05				
	M6 x 1	PF11 PF11M	PF12 PF12M	M6	0	0.92	0.92	9.53	9.5	14.61	7.37	0	13.46	20.07	#3	11.68
					1						8.89	1.52				
					2						10.41	3.05				

(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

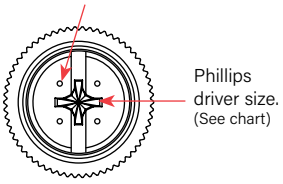
(2) "BL" suffix will be added to part number to designate DuraBlack™ finish.

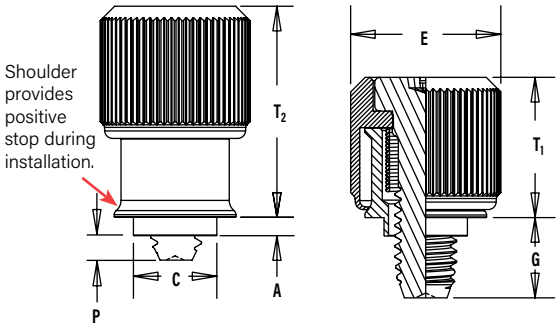
(3) See PEM Technical Support section of our website (www.pemnet.com) for related plating standards and specifications.

PEM® PF11MF™ FLARE-MOUNTED CAPTIVE PANEL SCREWS

PF11MF
Knurled Cap

PF12MF
Smooth Cap





Float .010"/0.25mm minimum, in all directions from center, .020"/0.5mm total.

Installation Data page 28. Performance Data page 36.

Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g (1)

Material:
Knob: Aluminum
Retainer: Aluminum
Screw: Hardened Carbon Steel
Spring: 300 Series Stainless Steel

Finish:
Knob: Natural Finish
Retainer: Natural Finish
Screw: Zinc plated, 5µm, colorless (3)
Spring: Natural Finish

Optional Finish (BL):
Knob: Black anodize (2)
Screw: Black nitride AMS2753, Section 3 (2)

PART NUMBER DESIGNATION

PF11 / PF12	M / M	F	-	632	-	1	BL
Type	Anti-cross Thread Feature	Flare-mounted Style		Thread Code		Screw Length Code	Optional DuraBlack finish

All dimensions are in inches.

	Thread Size	Type: Knurled Cap	Type: Smooth Cap	Thread Code	Screw Length Code	A Max.	Min. Sheet Thickness	Hole Size In Sheet +.005 -.000	C Max.	E ±.010	G ±.025	P ±.025	T_1 Nom.	T_2 Nom.	Driver Size
UNIFIED	.112-40 (#4-40)	PF11MF	PF12MF	440	0	.041	.031	.187	.186	.417	.170	.000	.310	.450	#1
					1						.230	.055			
					2						.290	.115			
	.138-32 (#6-32)	PF11MF	PF12MF	632	0	.072	.060	.213	.212	.450	.230	.000	.450	.640	#2
					1						.290	.024			
					2						.350	.084			
	.164-32 (#8-32)	PF11MF	PF12MF	832	0	.072	.060	.266	.265	.514	.230	.000	.450	.640	#2
					1						.290	.024			
					2						.350	.084			
	.190-32 (#10-32)	PF11MF	PF12MF	032	0	.072	.060	.266	.265	.514	.230	.000	.450	.640	#2
					1						.290	.024			
					2						.350	.084			
	.250-20 (1/4-20)	PF11MF	PF12MF	0420	0	.072	.060	.323	.322	.575	.290	.000	.530	.790	#3
					1						.350	.024			
					2						.410	.084			

All dimensions are in millimeters.

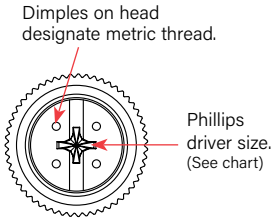
	Thread Size x Pitch	Type: Knurled Cap	Type: Smooth Cap	Thread Code	Screw Length Code	A Max.	Min. Sheet Thickness	Hole Size In Sheet +0.1	C Max.	E ±0.25	G ±0.64	P ±0.64	T_1 Nom.	T_2 Nom.	Driver Size
METRIC	M3 x 0.5	PF11MF	PF12MF	M3	0	1.05	0.79	4.75	4.73	10.59	4.32	0	7.87	11.43	#1
					1						5.84	1.4			
					2						7.37	2.92			
	M4 x 0.7	PF11MF	PF12MF	M4	0	1.83	1.52	6.76	6.74	13.06	5.84	0	11.43	16.26	#2
					1						7.37	0.61			
					2						8.89	2.13			
	M5 x 0.8	PF11MF	PF12MF	M5	0	1.83	1.52	6.76	6.74	13.06	5.84	0	11.43	16.26	#2
					1						7.37	0.61			
					2						8.89	2.13			
	M6 x 1	PF11MF	PF12MF	M6	0	1.83	1.52	8.2	8.18	14.61	7.37	0	13.46	20.07	#3
					1						8.89	0.61			
					2						10.41	2.13			

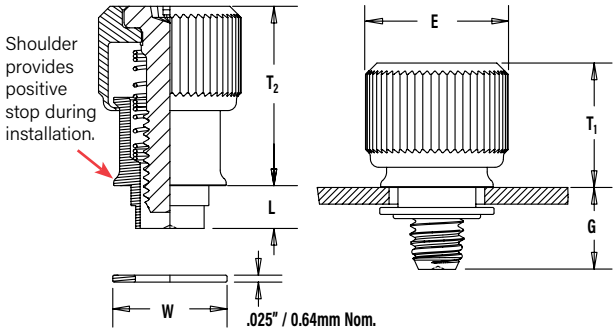
(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

(2) "BL" suffix will be added to part number to designate DuraBlack™ finish.

(3) See PEM Technical Support section of our website (www.pemnet.com) for related plating standards and specifications.

PEM® PF11MW™ FLARE-MOUNTED, FLOATING CAPTIVE PANEL SCREW





Installation Data page 29. Performance Data page 36.

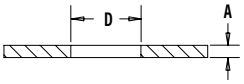
Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g (1)

Material:
Knob: Aluminum
Retainer: Aluminum
Screw: Hardened Carbon Steel
Spring: 300 Series Stainless Steel
Washer: 300 Series Stainless Steel

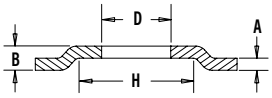
Finish:
Knob: Natural Finish
Retainer: Natural Finish
Screw: Zinc plated, 5µm, colorless (3)
Spring: Natural Finish
Washer: Natural Finish

Optional Finish (BL):
Knob: Black anodize (2)
Screw: Black nitride, AMS2753, Section 3 (2)

PANEL CONFIGURATION 1
For applications where a space between mating panels is acceptable.



PANEL CONFIGURATION 2
For applications where a space between mating panels is not acceptable.



PART NUMBER DESIGNATION

PF11 / PF12	M / M	W - 632 - 1	1 / 1	BL
Type	Anti-cross Thread Feature	Floating style	Thread Code	Shank Code (4)	Screw Length Code (4)	Optional DuraBlack finish

PF11MW panel fasteners are shipped with mating washers.

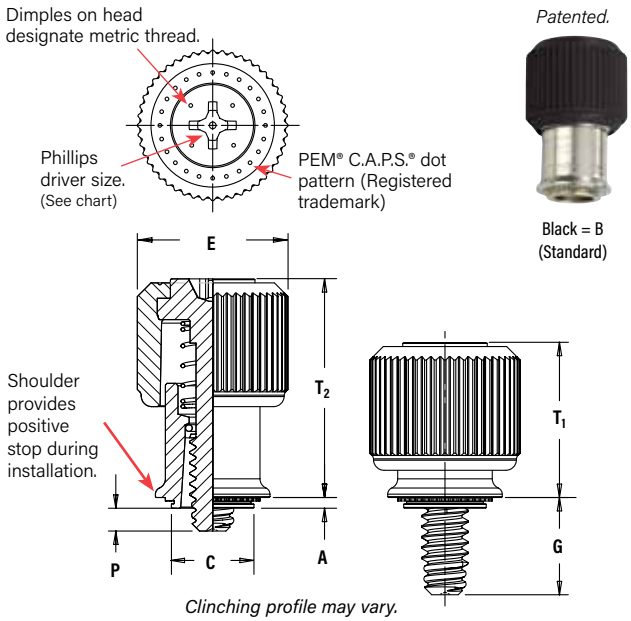
All dimensions are in inches.

	Thread Size	Type: Knurled Cap	Type: Smooth Cap	Thread Code	Shank Code (4)	Screw Length Code (4)	A Max. Sheet Thickness	B Min.	D Hole Size In Sheet +.003 -.001	E ±.010	G Nom.	H Min.	L Nom.	T_1 Nom.	T_2 Nom.	Driver Size	Min. Total Float	W Nom.
UNIFIED	.112-40 (#4-40)	PF11MW	PF12MW	440	1	1	.063	.111	.250	.417	.230	.375	.137	.310	.450	#1	.073	.312
						2					.290							
	.138-32 (#6-32)	PF11MW	PF12MW	632	1	1	.063	.115	.283	.450	.290	.413	.149	.450	.640	#2	.076	.344
						2					.350							
	.164-32 (#8-32)	PF11MW	PF12MW	832	1	1	.063	.121	.346	.514	.290	.469	.157	.450	.640	#2	.076	.407
						2					.350							
	.190-32 (#10-32)	PF11MW	PF12MW	032	1	1	.063	.121	.346	.514	.290	.469	.157	.450	.640	#2	.076	.407
						2					.350							
	.250-20 (1/4-20)	PF11MW	PF12MW	0420	1	1	.063	.128	.413	.575	.350	.531	.157	.530	.790	#3	.081	.468
						2					.410							

All dimensions are in millimeters.

	Thread Size x Pitch	Type: Knurled Cap	Type: Smooth Cap	Thread Code	Shank Code (4)	Screw Length Code (4)	A Max. Sheet Thickness	B Min.	D Hole Size In Sheet +0.08 -0.03	E ±0.25	G Nom.	H Min.	L Nom.	T_1 Nom.	T_2 Nom.	Driver Size	Min. Total Float	W Nom.
METRIC	M3 x 0.5	PF11MW	PF12MW	M3	1	1	1.6	2.82	6.35	10.59	5.84	9.52	3.48	7.87	11.43	#1	1.85	7.92
						2					7.37							
	M3.5 x 0.6	PF11MW	PF12MW	M3.5	1	1	1.6	2.92	7.19	11.43	7.37	10.49	3.78	11.43	16.26	#2	1.93	8.74
						2					8.89							
	M4 x 0.7	PF11MW	PF12MW	M4	1	1	1.6	3.07	8.79	13.06	7.37	11.91	3.99	11.43	16.26	#2	1.93	10.34
						2					8.89							
	M5 x 0.8	PF11MW	PF12MW	M5	1	1	1.6	3.07	8.79	13.06	7.37	11.91	3.99	11.43	16.26	#2	1.93	10.34
						2					8.89							
	M6 x 1	PF11MW	PF12MW	M6	1	1	1.6	3.25	10.49	14.61	8.89	13.48	3.99	13.46	20.07	#3	2.06	11.89
						2					10.41							

(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.
(2) "BL" suffix will be added to part number to designate DuraBlack™ finish.
(3) See PEM Technical Support section of our website (www.pemnet.com) for related plating standards and specifications.
(4) Other shank and screw lengths available.



Clinching profile may vary.

Float .010"/0.25mm minimum, in all directions from center, .020"/0.5mm total.

Installation Data page 28. Performance Data page 37.

Color Capabilities (1)

Choose a knob color code and add it to the end of the base part number.

Red = R | Orange = N | Yellow = Y | Green = G | Blue = U | Violet = V | Metallic = M

Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g (2)

Material:
Knob: PC/ABS (UL 94V-0, halogen-free) (3)
Retainer: Hardened Carbon Steel
Screw: Hardened Carbon Steel
Spring: 300 Series Stainless Steel

Finish:
Retainer: CN - Bright nickel over copper flash per ASTM B689
Screw: Zinc plated, 5µm, colorless (4)
Spring: Natural Finish

For use in sheet hardness:
HRB 80 or less (Hardness Rockwell "B" Scale)
HB 150 or less (Hardness Brinell)

PART NUMBER DESIGNATION

PF11	P	M	-	632	-	0	B
Type	Phillips Drive	Anti-cross Thread Feature		Thread Code		Screw Length Code	Color Code (Standard Black)

Also available with flare-mounted retainer as PF11PMF or with floating style retainer as PF11PMW.

All dimensions are in inches.

	Thread Size	Type: Knurled Cap	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + .003 - .000	C Max.	E ± .010	G ± .025	P ± .025	T_1 Nom.	T_2 Nom.	Driver Size	Min. Dist. Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	PF11PM	440	0	.036	.036	.219	.218	.417	.170	.000	.310	.450	#2	.28
				1						.230	.060				
				2						.290	.120				
	.138-32 (#6-32)	PF11PM	632	0	.036	.036	.250	.249	.450	.230	.000	.450	.640	#2	.29
				1						.290	.060				
				2						.350	.120				
	.164-32 (#8-32)	PF11PM	832	0	.036	.036	.312	.311	.514	.230	.000	.450	.640	#2	.33
				1						.290	.060				
				2						.350	.120				
	.190-32 (#10-32)	PF11PM	032	0	.036	.036	.312	.311	.514	.230	.000	.450	.640	#2	.33
				1						.290	.060				
				2						.350	.120				

All dimensions are in millimeters.

	Thread Size x Pitch	Type: Knurled Cap	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + 0.08	C Max.	E ± 0.25	G ± 0.64	P ± 0.64	T_1 Nom.	T_2 Nom.	Driver Size	Min. Dist. Hole ℄ To Edge
METRIC	M3 x 0.5	PF11PM	M3	0	0.92	0.92	5.56	5.54	10.59	4.32	0	7.87	11.43	#2	7.11
				1						5.84	1.52				
				2						7.37	3.05				
	M4 x 0.7	PF11PM	M4	0	0.92	0.92	7.92	7.9	13.06	5.84	0	11.43	16.26	#2	8.38
				1						7.37	1.52				
				2						8.89	3.05				
	M5 x 0.8	PF11PM	M5	0	0.92	0.92	7.92	7.9	13.06	5.84	0	11.43	16.26	#2	8.38
				1						7.37	1.52				
				2						8.89	3.05				

(1) *The colors shown (except for black) are non-stocked standards and available on special order. Since actual color knob may vary slightly from those represented, we recommend that you request samples for color verification. If you require a custom color or you need a "color matched" knob, please contact us.*

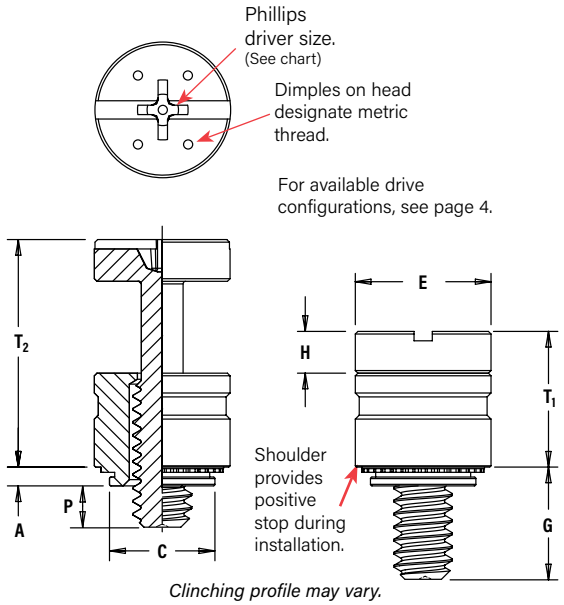
(2) *As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.*

(3) *Temperature limit is 210˚ F / 99˚ C.*

(4) *See PEM Technical Support section of our website (www.pemnet.com) for related plating standards and specifications.*

PEM® PFHV™ CAPTIVE PANEL SCREWS

- Low cost captive screw design to replace loose hardware.
- Small, compact and low profile design for limited access areas.
- Two screw lengths.
- Universal slot/Phillips recess standard.
- Available with MAThread® anti cross-thread technology. (See page 4 for more information).
- Available with Torx® recess.



Clinching profile may vary.

Installation Data page 29. Performance Data page 37.

Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g (1)

Material:
Retainer: Carbon Steel
Screw: Hardened Carbon Steel

Finish:
Retainer: CN - Bright nickel over copper flash per ASTM B689
Screw: CN - Bright nickel over copper flash per ASTM B689 (1)

For use in sheet hardness:
HRB 60 or less (Hardness Rockwell "B" Scale)
HB 107 or less (Hardness Brinell)

PART NUMBER DESIGNATION

PFHV - 632 - 0 CN

PFHV	632	0	CN
Type	Thread Size Code	Screw Length Code	Finish Code

All dimensions are in inches.

	Thread Size	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C Max.	E ±.010	G ±.025	H ±.005	P ±.025	T_1 Nom.	T_2 Nom.	Driver Size	Min. Dist. Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	PFHV	440	0	.036	.036	.203	.202	.260	.216	.080	.000	.260	.436	#1	.21
				1						.316		.095				
	.138-32 (#6-32)	PFHV	632	0	.036	.036	.219	.218	.276	.234	.092	.000	.290	.484	#2	.23
				1						.359		.120				
	.164-32 (#8-32)	PFHV	832	0	.036	.036	.252	.251	.309	.259	.111	.000	.335	.555	#2	.26
				1						.371		.106				

All dimensions are in millimeters.

	Thread Size x Pitch	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + 0.08	C Max.	E ± 0.25	G ± 0.64	H ± 0.13	P ±0.64	T_1 Nom.	T_2 Nom.	Driver Size	Min. Dist. Hole ℄ To Edge
METRIC	M3 x 0.5	PFHV	M3	0	0.92	0.92	5.5	5.49	6.95	5.55	2.03	0	6.69	11.25	#1	5.8
				1						7.56		1.9				
	M3.5 x 0.6	PFHV	M3.5	0	0.92	0.92	6	5.98	7.45	6.01	2.34	0	7.45	12.47	#2	6.3
				1						8.42		2.3				
	M4 x 0.7	PFHV	M4	0	0.92	0.92	6.4	6.38	7.85	6.59	2.79	0	8.5	14.1	#2	6.7
				1						9.39		2.7				

(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

PEM® PF7M™/PF7MF™ CAPTIVE PANEL SCREWS

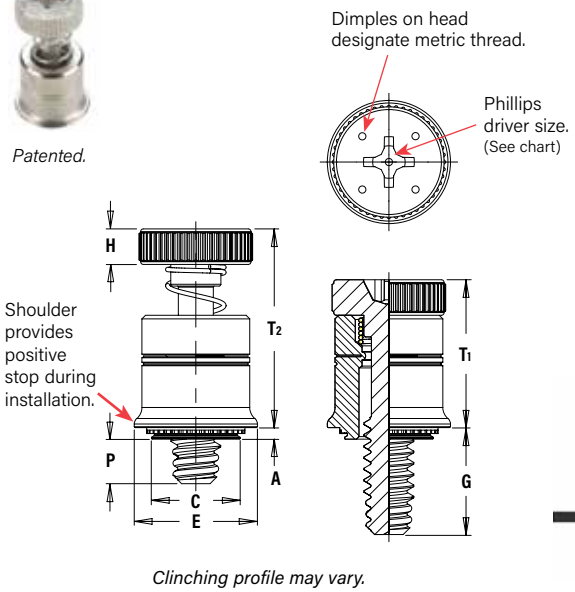
- Smallest footprint, spring-loaded panel fastener for limited access areas.
- MAThread® anti cross-thread technology. (See page 4 for more information).
- Installs flush on back side of panel.
- PF7M Self-clinching mounting design provides high pushout resistance.
- PF7M does not require special hole preparation.
- PF7MF is appropriate for close centerline-to-edge applications.
- PF7MF does not require high installation force.
- PF7MF installs into any panel hardness.
- Available with Torx® recess.

PF7M

PF7MF

PF7M™ SELF-CLINCHING CAPTIVE PANEL SCREWS

Patented.



Clinching profile may vary.

Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g [1]

Material:
Retainer: Carbon Steel
Screw: Hardened Carbon Steel
Spring: 300 Series Stainless Steel

Finish:
Retainer: CN - Bright nickel over copper flash per ASTM B689
Screw: CN - Bright nickel over copper flash per ASTM B689
Spring: Natural Finish

For use in sheet hardness:
HRB 60 or less (Hardness Rockwell "B" Scale)
HB 107 or less (Hardness Brinell)

PART NUMBER DESIGNATION

PF7	M	-	632	-	0	CN
Type	Anti Cross-thread Feature		Thread Size Code		Length Code	Finish

Installation Data page 30. Performance Data page 37.

All dimensions are in inches.

	Thread Size	Type / Fastener Material / Steel	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C Max.	E ±.010	H ±.010	G ±.025	P ±.025	T1 Nom.	T2 Nom.	Driver Size	Min. Dist. Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	PF7M	440	0	.036	.036	.219	.218	.310	.100	.210	.000	.380	.550	#2	.28
				1							.270	.065				
	.138-32 (#6-32)	PF7M	632	0	.036	.036	.250	.249	.342	.100	.240	.000	.410	.610	#2	.29
				1							.300	.065				
	.164-32 (#8-32)	PF7M	832	0	.036	.036	.312	.311	.405	.120	.240	.000	.430	.630	#2	.33
				1							.300	.065				

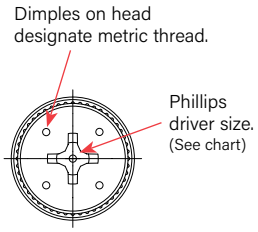
All dimensions are in millimeters.

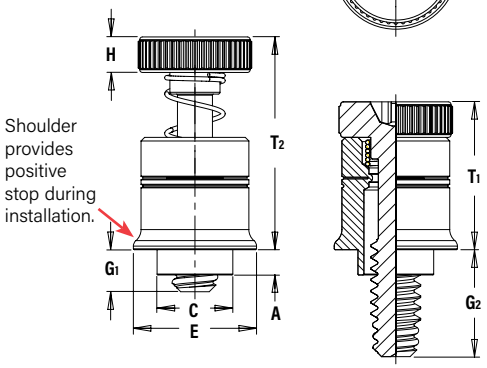
	Thread Size x Pitch	Type / Fastener Material / Steel	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +0.08	C Max.	E ±0.25	H ±0.25	G ±0.64	P ±0.64	T1 Nom.	T2 Nom.	Driver Size	Min. Dist. Hole ℄ To Edge
METRIC	M3 x 0.5	PF7M	M3	0	0.92	0.92	5.56	5.54	7.87	2.5	5.33	0	9.65	13.97	#2	7.11
				1							6.86	1.65				
	M4 x 0.7	PF7M	M4	0	0.92	0.92	7.92	7.9	10.29	3	6.1	0	10.92	16	#2	8.38
				1							7.62	1.65				

(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

PF7MF™ FLARE-MOUNTED CAPTIVE PANEL SCREWS

Patented.





Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g (1)

Material:
Retainer: Aluminum
Screw: Hardened Carbon Steel
Spring: 300 Series Stainless Steel
Spring: Natural Finish

Finish:
Retainer: Natural finish
Screw: CN - Bright nickel over copper flash per ASTM B689

PART NUMBER DESIGNATION

PF7	M	F	-	632	-	0
Type	Anti Cross-thread Feature	Flaring		Thread Size Code		Length Code

Installation Data page 30. Performance Data page 37.

All dimensions are in inches.

	Thread Size	Type / Fastener Material / Steel	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.005 -.000	C Max.	E ±.010	H ±.010	G1 ±.025	G2 ±.025	T1 Nom.	T2 Nom.	Driver Size
UNIFIED	.112-40 (#4-40)	PF7MF	440	0	.041	.031	.187	.186	.310	.100	.040	.210	.380	.550	#2
				1							.100	.270			
	.138-32 (#6-32)	PF7MF	632	0	.072	.060	.213	.212	.342	.100	.040	.240	.410	.610	#2
				1							.100	.300			
	.164-32 (#8-32)	PF7MF	832	0	.072	.060	.266	.265	.405	.120	.040	.240	.430	.630	#2
				1							.100	.300			

All dimensions are in millimeters.

	Thread Size x Pitch	Type / Fastener Material / Steel	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +0.13	C Max.	E ±0.25	H ±0.25	G1 ±0.64	G2 ±0.64	T1 Nom.	T2 Nom.	Driver Size
METRIC	M3 x 0.5	PF7MF	M3	0	1.05	0.79	4.75	4.73	7.87	2.5	1.02	5.33	9.65	13.97	#2
				1							2.54	6.86			
	M4 x 0.7	PF7MF	M4	0	1.83	1.52	6.76	6.74	10.29	3	1.02	6.1	10.92	16	#2
				1							2.54	7.62			

(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

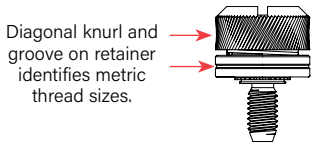
PEM® PF30™/PF50™/PF60™ CAPTIVE PANEL SCREWS

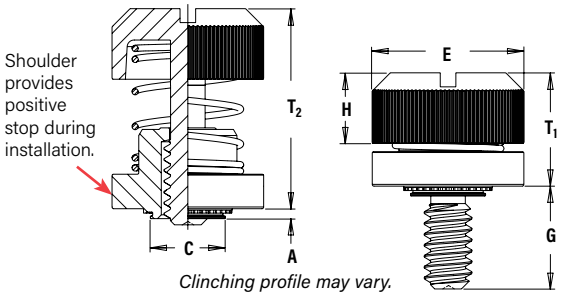
- Low-profile design satisfies many functional and cosmetic requirements.
- Convenient large head for tool or finger operation.
- PF50/PF60 are available with Torx® recess.
- PF50/PF60 are available with MAThread® anti cross-thread technology. (See page 4 for more information).

PF30 Knurled Cap | **PF50** Knurled Cap | **PF60** Smooth Cap

PF30™ LOW-PROFILE CAPTIVE PANEL SCREWS

Available with DuraBlack™ finish (Finish Code "BN")





Clinching profile may vary.

Installation Data page 31. Performance Data page 38.

Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g (1)

Material:
Retainer: Carbon Steel
Screw: Hardened Carbon Steel (#4-40 and M3 sizes only)
Carbon Steel (all other sizes)
Spring: 300 Series Stainless Steel

Finish:
Retainer: CN - Bright nickel over copper flash per ASTM B689
Screw: CN - Bright nickel over copper flash per ASTM B689
Spring: Natural Finish

Optional Finish:
Retainer: BN - Black nitride, AMS2753, Section 3
Screw: BN - Black nitride, AMS2753, Section 3

For use in sheet hardness:
HRB 60 or less (Hardness Rockwell "B" Scale)
HB 107 or less (Hardness Brinell)

PART NUMBER DESIGNATION

PF30	-	832	-	30	CN
Type and Shank Code		Thread Size Code		Screw Length Code	Finish Code

All dimensions are in inches.

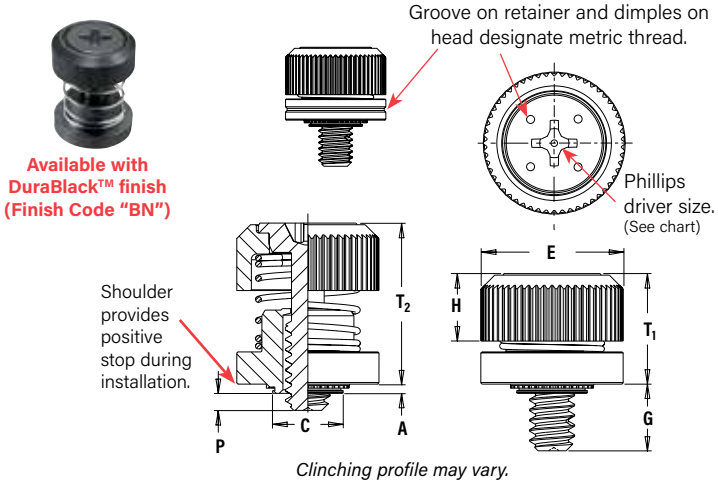
	Thread Size	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + .003 - .000	C Max.	E ±.010	G ± .015	H ± .005	T_1 Max.	T_2 Nom.	Min. Dist. Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	PF30	440	30	.030	.030	.203	.202	.406	.300	.202	.325	.595	.26
		PF31			.038	.040								
		PF32			.058	.060								
	.138-32 (#6-32)	PF30	632	30	.030	.030	.219	.218	.438	.300	.202	.325	.595	.28
		PF31			.038	.040								
		PF32			.058	.060								
	.164-32 (#8-32)	PF30	832	30	.030	.030	.250	.249	.468	.300	.207	.330	.600	.29
		PF31			.038	.040								
		PF32			.058	.060								
	.190-32 (#10-32)	PF30	032	30	.030	.030	.312	.311	.530	.300	.220	.335	.605	.33
		PF31			.038	.040								
		PF32			.058	.060								
	.250-20 (1/4-20)	PF32	0420	35	.058	.060	.375	.374	.625	.350	.242	.385	.675	.38

All dimensions are in millimeters.

	Thread Size x Pitch	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + 0.08	C Max.	E ±0.25	G ± 0.4	H ± 0.13	T_1 Max.	T_2 Nom.	Min. Dist. Hole ℄ To Edge
METRIC	M3 x 0.5	PF31	M3	30	0.97	1	5.5	5.48	10.31	7.62	5.13	8.26	15.11	6.6
		PF32			1.48	1.5								
	M4 x 0.7	PF31	M4	30	0.97	1	6.4	6.38	11.89	7.62	5.26	8.38	15.24	7.37
		PF32			1.48	1.5								
	M5 x 0.8	PF31	M5	30	0.97	1	8	7.98	13.46	7.62	5.59	8.51	15.37	8.38
		PF32			1.48	1.5								
	M6 x 1	PF32	M6	35	1.48	1.5	9.5	9.48	15.88	8.89	6.12	9.78	17.15	9.65

(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

PF50™ AND PF60™ LOW-PROFILE CAPTIVE PANEL SCREWS



Clinching profile may vary.

Installation Data page 31. Performance Data page 39.

Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g (1)

Material:
Knob: Carbon Steel — Retainer: Carbon Steel
Screw: Carbon Steel — Spring: 300 Series Stainless Steel

Finish:
Knob: CN - Bright nickel over copper flash per ASTM B689
Retainer: CN - Bright nickel over copper flash per ASTM B689
Screw: CN - Bright nickel over copper flash per ASTM B689
Spring: Natural Finish

Optional Finish:
Knob: BN - Black Nitride, AMS2753, Section 3
Retainer: BN - Black Nitride, AMS2753, Section 3
Screw: BN - Black Nitride, AMS2753, Section 3

For use in sheet hardness:
HRB 60 or less (Hardness Rockwell "B" Scale)
HB 107 or less (Hardness Brinell)

PART NUMBER DESIGNATION

PF50 - 440 - 1 CN
PF60 - 440 - 1 CN

Type and Shank Code | Thread Size Code | Screw Length Code | Finish Code

All dimensions are in inches.

	Thread Size	Type: Knurled Cap	Type: Smooth Cap	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C Max.	E +.015 -.005	G ±.025	H ±.008	P ±.025	T_1 Max.	T_2 Nom.	Driver Size	Min. Dist Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	PF50	PF60	440	0	.030	.030	.203	.202	.406	.230	.207	.000	.340	.520	#1	.26
					1						.290		.060				
		PF51	PF61	440	0	.038	.040	.203	.202	.406	.230	.207	.000	.340	.520	#1	.26
					1						.290		.052				
		PF52	PF62	440	0	.058	.060	.203	.202	.406	.230	.207	.000	.340	.520	#1	.26
					1						.290		.032				
	.138-32 (#6-32)	PF50	PF60	632	0	.030	.030	.219	.218	.438	.230	.207	.000	.340	.520	#2	.28
					1						.290		.060				
		PF51	PF61	632	0	.038	.040	.219	.218	.438	.230	.207	.000	.340	.520	#2	.28
					1						.290		.052				
		PF52	PF62	632	0	.058	.060	.219	.218	.438	.230	.207	.000	.340	.520	#2	.28
					1						.290		.032				
	.164-32 (#8-32)	PF50	PF60	832	0	.030	.030	.250	.249	.468	.230	.217	.000	.340	.520	#2	.29
					1						.290		.060				
		PF51	PF61	832	0	.038	.040	.250	.249	.468	.230	.217	.000	.340	.520	#2	.29
					1						.290		.052				
		PF52	PF62	832	0	.058	.060	.250	.249	.468	.230	.217	.000	.340	.520	#2	.29
					1						.290		.032				
	.190-32 (#10-32)	PF50	PF60	032	0	.030	.030	.312	.311	.530	.230	.225	.000	.340	.530	#2	.33
					1						.290		.060				
		PF51	PF61	032	0	.038	.040	.312	.311	.530	.230	.225	.000	.340	.530	#2	.33
					1						.290		.052				
		PF52	PF62	032	0	.058	.060	.312	.311	.530	.230	.225	.000	.340	.530	#2	.33
					1						.290		.032				
	.250-20 (1/4-20)	PF52	PF62	0420	0	.058	.060	.375	.374	.625	.280	.246	.000	.395	.600	#2	.38
					1						.340		.060				

All dimensions are in millimeters.

	Thread Size x Pitch	Type: Knurled Cap	Type: Smooth Cap	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + 0.08	C Max.	E +0.4 -0.13	G ±0.64	H ±0.2	P ±0.64	T_1 Max.	T_2 Nom.	Driver Size	Min. Dist Hole ℄ To Edge
METRIC	M3 x 0.5	PF50	PF60	M3	0	0.77	0.8	5.5	5.48	10.3	5.84	5.26	0	8.64	13.21	#1	6.6
					1						7.37		1.52				
		PF51	PF61	M3	0	0.97	1	5.5	5.48	10.3	5.84	5.26	0	8.64	13.21	#1	6.6
					1						7.37		1.32				
		PF52	PF62	M3	0	1.48	1.5	5.5	5.48	10.3	5.84	5.26	0	8.64	13.21	#1	6.6
					1						7.37		0.81				
	M3.5 x 0.6	PF50	PF60	M3.5	0	0.77	0.8	5.56	5.54	11.1	5.84	5.26	0	8.64	13.21	#2	7.1
					1						7.37		1.52				
		PF51	PF61	M3.5	0	0.97	1	5.56	5.54	11.1	5.84	5.26	0	8.64	13.21	#2	7.1
					1						7.37		1.32				
		PF52	PF62	M3.5	0	1.48	1.5	5.56	5.54	11.1	5.84	5.26	0	8.64	13.21	#2	7.1
					1						7.37		0.81				
	M4 x 0.7	PF50	PF60	M4	0	0.77	0.8	6.4	6.38	11.9	5.84	5.51	0	8.64	13.46	#2	7.4
					1						7.37		1.52				
		PF51	PF61	M4	0	0.97	1	6.4	6.38	11.9	5.84	5.51	0	8.64	13.46	#2	7.4
					1						7.37		1.32				
		PF52	PF62	M4	0	1.48	1.5	6.4	6.38	11.9	5.84	5.51	0	8.64	13.46	#2	7.4
					1						7.37		0.81				
	M5 x 0.8	PF50	PF60	M5	0	0.77	0.8	8	7.98	13.5	5.84	5.72	0	8.64	13.46	#2	8.4
					1						7.37		1.52				
		PF51	PF61	M5	0	0.97	1	8	7.98	13.5	5.84	5.72	0	8.64	13.46	#2	8.4
					1						7.37		1.32				
		PF52	PF62	M5	0	1.48	1.5	8	7.98	13.5	5.84	5.72	0	8.64	13.46	#2	8.4
					1						7.37		0.81				
	M6 x 1	PF52	PF62	M6	0	1.48	1.5	9.5	9.48	15.9	7.11	6.25	0	10.04	15.24	#2	9.7
					1						8.64		1.52				

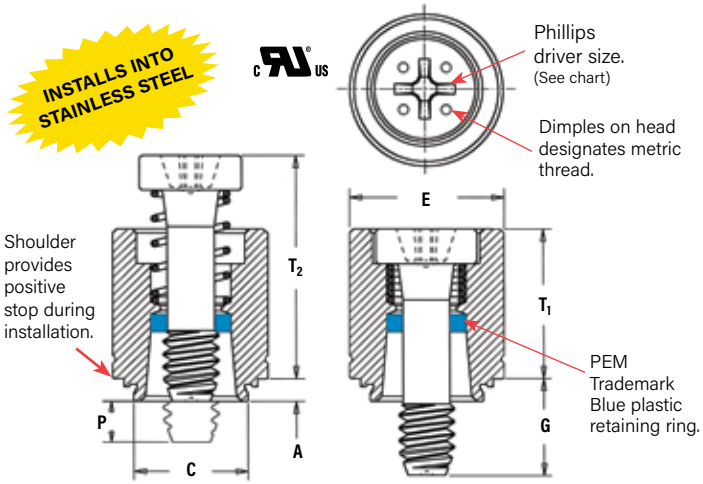
(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

PEM® PFC4™/PFC2P™ CAPTIVE PANEL SCREWS

- PFC4/PFC2P have fully concealed-head for tool only access.
- PFC4/PFC2P comply with UL 60950 standards.
- PFC4 installs into stainless steel sheets HRB 88 or less.
- PFC4/PFC2P are available with MAThread® anti cross-thread technology. (See page 4 for more information).
- PFC4/PFC2P available with Torx® recess.

PFC4 PFC2P

PFC4™ RECESSED-HEAD CAPTIVE PANEL SCREWS



Clinching profile may vary.

Installation Data page 32. Performance Data page 39.

Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g

Material:
Retainer: 400 Series Stainless Steel
Screw: 400 Series Stainless Steel
Spring: 300 Series Stainless Steel
Retaining Ring: Nylon, temperature limit 200˚ F / 93˚ C

Finish:
Retainer: Passivated and/or tested per ASTM A380
Screw: Passivated and/or tested per ASTM A380
Spring: Natural Finish

For use in sheet hardness:
HRB 88 or less (Hardness Rockwell "B" Scale)
HB 183 or less (Hardness Brinell)

PART NUMBER DESIGNATION

PFC4 - 832 - 50

- PFC4: Type and Material
- 832: Thread Size Code
- 50: Screw Length Code

All dimensions are in inches.

	Thread Size	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C Max.	E ±.010	G ±.016	P ±.025	T_1 Max.	T_2 Nom.	Driver Size	Min. Dist. Hole Ⓒ To Edge
UNIFIED	.112-40 (#4-40)	PFC4	440	40	.060	.060	.265	.264	.344	.250	.000	.370	.540	#1	.25
				62						.375	.125				
	.138-32 (#6-32)	PFC4	632	40	.060	.060	.281	.280	.375	.250	.000	.380	.540	#2	.28
				62						.375	.125				
				84						.500	.250				
	.164-32 (#8-32)	PFC4	832	50	.060	.060	.312	.311	.406	.312	.000	.480	.705	#2	.31
				72						.437	.125				
				94						.562	.250				
	.190-32 (#10-32)	PFC4	032	50	.060	.060	.344	.343	.437	.312	.000	.490	.705	#2	.34
				72						.437	.125				
				94						.562	.250				

All dimensions are in millimeters.

	Thread Size x Pitch	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + 0.08	C Max.	E ± 0.25	G ± 0.4	P ±0.64	T_1 Max.	T_2 Nom.	Driver Size	Min. Dist Hole Ⓒ To Edge
METRIC	M3 x 0.5	PFC4	M3	40	1.53	1.53	6.73	6.71	8.74	6.4	0	9.4	13.72	#1	6.35
				62						9.5	3.2				
	M4 x 0.7	PFC4	M4	50	1.53	1.53	7.92	7.9	10.31	7.9	0	12.19	17.91	#2	7.87
				72						11.1	3.2				
				94						14.3	6.4				
	M5 x 0.8	PFC4	M5	50	1.53	1.53	8.74	8.72	11.1	7.9	0	12.45	17.91	#2	8.63
				72						11.1	3.2				
				94						14.3	6.4				

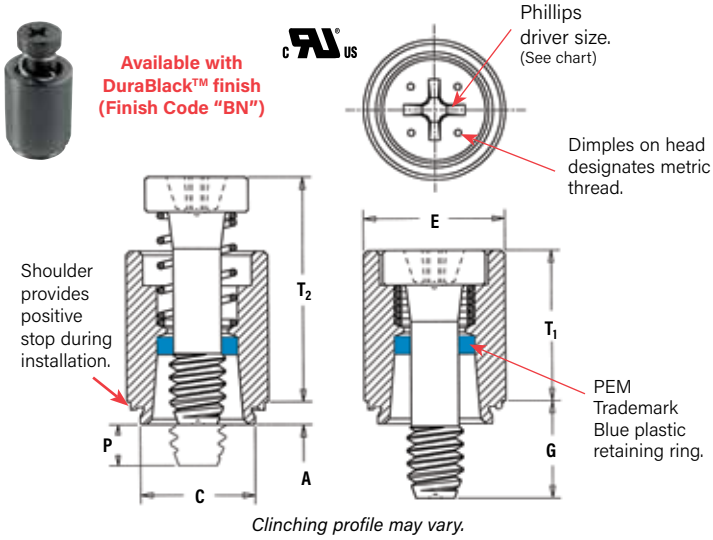
A NOTE ABOUT FASTENERS FOR STAINLESS STEEL PANELS

In order for self-clinching fasteners to work properly, the fastener must be harder than the sheet into which it is being installed. In the case of stainless steel panels, fasteners made from 300 Series Stainless Steel do not meet this hardness criteria. It is for this reason that 400 series fasteners are offered (PFC4). However, while these 400 Series fasteners install and perform well in 300 Series stainless sheets they should not be used if the end product:

- Will be exposed to any appreciable corrosive presence.
- Requires non-magnetic fasteners.
- Will be exposed to any temperatures above 300˚F (149˚C)

If any of the these are issues, please contact techsupport@pemnet.com for other options.

PFC2P™ RECESSED-HEAD CAPTIVE PANEL SCREWS



Clinching profile may vary.

Installation Data page 32. Performance Data page 39.

Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g

Material:
Retainer: 300 Series Stainless Steel
Screw: 400 Series Stainless Steel
Spring: 300 Series Stainless Steel
Retaining Ring: Nylon, temperature limit 200˚ F / 93˚ C

Finish:
Retainer: Passivated and/or tested per ASTM A380
Screw: Passivated and/or tested per ASTM A380
Spring: Natural Finish

Optional Finish:
Retainer: BN - Black nitride, AMS2753, Section 3
Screw: BN - Black nitride, AMS2753, Section 3

For use in sheet hardness:
HRB 70 or less (Hardness Rockwell "B" Scale)
HB 125 or less (Hardness Brinell)

PART NUMBER DESIGNATION

PFC2P - 832 - 50

- PFC2P: Type and Material
- 832: Thread Size Code
- 50: Screw Length Code

All dimensions are in inches.

	Thread Size	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + .003 - .000	C Max.	E ± .010	G ± .016	P ±.025	T_1 Max.	T_2 Nom.	Driver Size	Min. Dist. Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	PFC2P	440	40	.060	.060	.265	.264	.312	.250	.000	.370	.540	#1	.25
				62						.375	.125				
	.138-32 (#6-32)	PFC2P	632	40	.060	.060	.281	.280	.344	.250	.000	.380	.540	#2	.28
				62						.375	.125				
				84						.500	.250				
	.164-32 (#8-32)	PFC2P	832	50	.060	.060	.312	.311	.375	.312	.000	.480	.705	#2	.31
				72						.437	.125				
				94						.562	.250				
	.190-32 (#10-32)	PFC2P	032	50	.060	.060	.344	.343	.406	.312	.000	.490	.705	#2	.34
				72						.437	.125				
				94						.562	.250				
	.250-20 (1/4-20)	PFC2P	0420	60	.060	.060	.413	.412	.468	.375	.000	.620	.905	#3	.38
				82						.500	.125				
				04						.625	.250				

All dimensions are in millimeters.

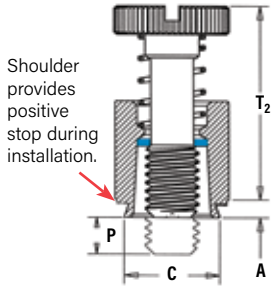
	Thread Size x Pitch	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + 0.08	C Max.	E ± 0.25	G ± 0.4	P ±0.64	T_1 Max.	T_2 Nom.	Driver Size	Min. Dist Hole ℄ To Edge
METRIC	M3 x 0.5	PFC2P	M3	40	1.53	1.53	6.73	6.71	7.92	6.4	0	9.4	13.72	#1	6.35
				62						9.5	3.2				
	M4 x 0.7	PFC2P	M4	50	1.53	1.53	7.92	7.9	9.53	7.9	0	12.19	17.91	#2	7.87
				72						11.1	3.2				
				94						14.3	6.4				
	M5 x 0.8	PFC2P	M5	50	1.53	1.53	8.74	8.72	10.31	7.9	0	12.45	17.91	#2	8.63
				72						11.1	3.2				
				94						14.3	6.4				
	M6 x 1	PFC2P	M6	60	1.53	1.53	10.49	10.47	11.89	9.5	0	15.75	22.99	#3	9.65
				82						12.7	3.2				
				04						15.9	6.4				

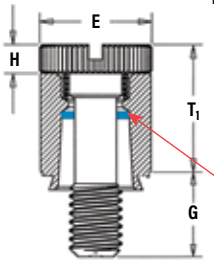
PEM® PFC2™/PFS2™ CAPTIVE PANEL SCREWS

PFC2/PFS2

PFS2 is available with DuraBlack™ finish (Finish Code "BN")

PFC2	PFS2
Threads: External, ASME B1.1, 2A / ASME B1.13M, 6g	**Threads:** External, ASME B1.1, 2A / ASME B1.13M, 6g (1)
Material: Retainer: 300 Series Stainless Steel (2) Screw: 300 Series Stainless Steel Spring: 300 Series Stainless Steel Retaining Ring: Nylon, temperature limit 200˚ F / 93˚ C	**Material:** Retainer: Hardened Carbon Steel (2) Screw: Carbon Steel Spring: 300 Series Stainless Steel Retaining Ring: Nylon, temperature limit 200˚ F / 93˚ C
Finish: Retainer: Passivated and/or tested per ASTM A380 Screw: Passivated and/or tested per ASTM A380 Spring: Natural Finish	**Finish:** Retainer: CN - Bright nickel over copper flash per ASTM B689 Screw: CN - Bright nickel over copper flash per ASTM B689 Spring: Natural Finish
Optional Finish: Retainer: BN - Black nitride, AMS2753, Section 3 Screw: BN - Black nitride, AMS2753, Section 3	**Optional Finish:** Retainer: BN - Black nitride, AMS2753, Section 3 Screw: BN - Black nitride, AMS2753, Section 3
For use in sheet hardness: HRB 70 or less (Hardness Rockwell "B" Scale) HB 125 or less (Hardness Brinell)	**For use in sheet hardness:** HRB 80 or less (Hardness Rockwell "B" Scale) HB 150 or less (Hardness Brinell)





Diagonal knurl identifies metric thread sizes.

PEM Trademark Blue plastic retaining ring

Clinching profile may vary.

PART NUMBER DESIGNATION

PFC2 - 832 - 50

PFS2 - 832 - 50 CN

Type and Material	Thread Size Code	Screw Length Code	Finish Code

Installation Data page 33. Performance Data page 39.

All dimensions are in inches.

	Thread Size	Type: Stainless Steel	Type: Steel	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C Max.	E ±.010	G ±.016	H ±.005	P ±.025	T_1 Max.	T_2 Nom.	Min. Dist. Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	PFC2	PFS2	440	40	.060	.060	.265	.264	.312	.250	.072	.000	.360	.540	.25
					62						.375		.125			
	.138-32 (#6-32)	PFC2	PFS2	632	40	.060	.060	.281	.280	.344	.250	.072	.000	.360	.540	.28
					62						.375		.125			
					84						.500		.250			
	.164-32 (#8-32)	PFC2	PFS2	832	50	.060	.060	.312	.311	.375	.312	.082	.000	.450	.690	.31
					72						.437		.125			
					94						.562		.250			
	.190-32 (#10-32)	PFC2	PFS2	032	50	.060	.060	.344	.343	.406	.312	.082	.000	.450	.690	.34
					72						.437		.125			
					94						.562		.250			
	.250-20 (1/4-20)	PFC2	PFS2	0420	60	.060	.060	.413	.412	.468	.375	.097	.000	.580	.880	.38
					82						.500		.125			
					04						.625		.250			

All dimensions are in millimeters.

	Thread Size x Pitch	Type: Stainless Steel	Type: Steel	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + 0.08	C Max.	E ±.25	G ± 0.4	H ± 0.13	P ±0.64	T_1 Max.	T_2 Nom.	Min. Dist. Hole ℄ To Edge
METRIC	M3 x 0.5	PFC2	PFS2	M3	40	1.53	1.53	6.73	6.71	7.92	6.4	1.83	0	9.14	13.72	6.35
					62						9.5		3.2			
	M4 x 0.7	PFC2	PFS2	M4	50	1.53	1.53	7.92	7.9	9.53	7.9	2.08	0	11.43	17.53	7.87
					72						11.1		3.2			
					94						14.3		6.4			
	M5 x 0.8	PFC2	PFS2	M5	50	1.53	1.53	8.74	8.72	10.31	7.9	2.08	0	11.47	17.53	8.63
					72						11.1		3.2			
					94						14.3		6.4			
	M6 x 1	PFC2	PFS2	M6	60	1.53	1.53	10.49	10.47	11.89	9.5	2.46	0	14.73	22.35	9.65
					82						12.7		3.2			
					04						15.9		6.4			

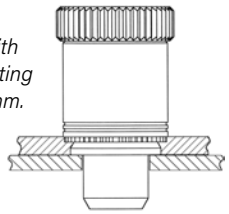
(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

(2) The blue plastic retaining rings are a PEM trademark. The temperature limit is 200° F / 93° C.

PEM® PTL2™/PSL2™ SPRING-LOADED PLUNGER ASSEMBLIES

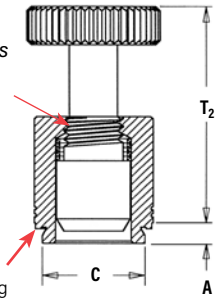
- Used as positioning pins for sliding components such as drawer slides and equipment consoles.
- Fast installation and removal of components.
- Reverse side of sheet is flush when plunger is retracted.
- PTL2 has quick lockout feature to hold plunger in fully retracted position.
- For use in sheets of HRB 80 or less.
- Available as PSL2 without lockout feature on special order.

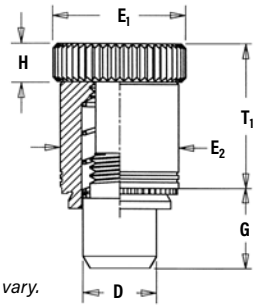
PTL2/PSL2 installed and with mating panel. Minimum mating hole diameter .251" / 6.38 mm.



Lockout feature holds plunger in retracted position. Simply retract and twist to engage lockout feature.

Shoulder provides positive stop during installation.





Clinching profile may vary.

Material:
Plunger: Hardened Carbon Steel
Retainer: Hardened Carbon Steel
Spring: 300 Series Stainless Steel

Finish:
Plunger: CN - Bright nickel over copper flash per ASTM B689
Retainer: CN - Bright nickel over copper flash per ASTM B689
Spring: Natural Finish

For use in sheet hardness:
HRB 80 or less (Hardness Rockwell "B" Scale)
HB 150 or less (Hardness Brinell)

PART NUMBER DESIGNATION

PTL2	-	04	-	4	CN
Type		Plunger Diameter Code		Plunger Length Code	Finish Code

Installation Data page 33. Performance Data page 39.

All dimensions are in inches.

	Type	Plunger Diameter Code	Plunger Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C Max.	D + .000 - .005	E_1 ± .010	E_2 ± .010	G ± .010	H ± .010	T_1 ± .010	T_2 Nom.	Min. Dist. Hole ℄ To Edge
UNIFIED	PTL2	04	4	.058	.060	.328	.327	.250	.50	.406	.310	.17	.595	.895	.34
	PSL2 (1)	04	4	.058	.060	.328	.327	.250	.50	.406	.310	.17	.510	.780	.34

All dimensions are in millimeters.

	Type	Plunger Diameter Code	Plunger Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + 0.08	C Max.	D - 0.13	E_1 ± 0.25	E_2 ± 0.25	G ± 0.25	H ± 0.25	T_1 ± 0.25	T_2 Nom.	Min. Dist. Hole ℄ To Edge
METRIC	PTL2	04	4	1.47	1.53	8.33	8.31	6.35	12.7	10.3	7.87	4.32	15.11	22.73	8.64
	PSL2 (1)	04	4	1.47	1.53	8.33	8.31	6.35	12.7	10.3	7.87	4.32	12.95	19.81	8.64

(1) Without lockout feature. Available on special order.

PEM® SCBR™/SCB™/SCBJ™ CAPTIVE PANEL SCREWS

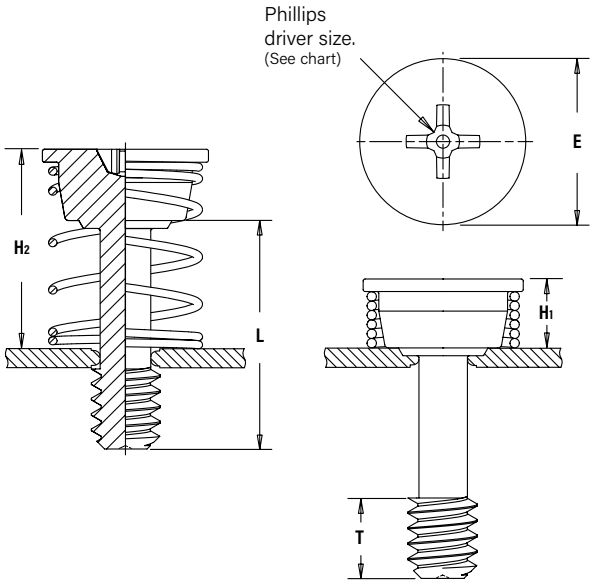
- Permanently captivates into sheets as thin as .040" / 1.02 mm and greater.
- Lowest cost captive screw design to replace loose hardware.
- Available with self-retracting (SCBR), axial float (SCB), or jacking feature (SCBJ).
- Appropriate for close centerline-to-edge applications.

SCBR

SCB

SCBJ

SCBR™ SPINNING CLINCH BOLT WITH SELF-RETRACTING FEATURE



SCBR retracted

SCBR engaged

Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g (1)

Material:
Screw - Hardened Carbon Steel
Spring - 300 series stainless steel

Finish:
Screw - ZI - Zinc plated, 5µm, colorless (standard) (2)
Spring: Natural Finish

For use in sheet hardness:
HRB 80 or less (Hardness Rockwell "B" Scale)
HB 150 or less (Hardness Brinell)

PART NUMBER DESIGNATION

SCBR - 632 - 8 ZI

- SCBR: Type
- 632: Thread Size Code
- 8: Length Code
- ZI: Finish

Installation Data page 34. Performance Data page 40.

All dimensions are in inches.

	Thread Size	Type	Thread Code	Length Code "L" ±.015 (Length Code in 16ths of an inch) .500	Min. Sheet Thickness	Hole Size in Sheet +.003 -.000	E +.005 -.010	H_1 ±.005	H_2 Ref.	T Nom.	Driver Size	Min. Dist Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	SCBR	440	8	.040	.112	.348	.165	.495	.130	#1	.175
	.138-32 (#6-32)	SCBR	632	8	.040	.138	.381	.170	.500	.130	#2	.190
	.164-32 (#8-32)	SCBR	832	8	.040	.164	.410	.175	.505	.130	#2	.205

All dimensions are in millimeters.

	Thread Size x Pitch	Type	Thread Code	Length Code "L" ±0.4 (Length Code in millimeters)	Min. Sheet Thickness	Hole Size in Sheet +0.08	E +0.13 −0.25	H_1 ±0.13	H_2 Ref.	T Nom.	Driver Size	Min. Dist Hole ℄ To Edge
METRIC	M3 x 0.5	SCBR	M3	12	1.02	3	9.1	4.2	11.8	3.3	#1	4.5
	M4 x 0.7	SCBR	M4	12	1.02	4	10.7	4.5	12.1	3.3	#2	5.4

(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

(2) See PEM Technical Support section of our website (www.pemnet.com) for related plating standards and specifications.

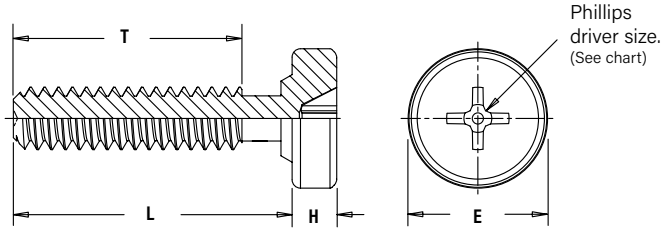
NOTE: SCBR screws are shipped with mating springs.
For designs requiring a specific spring rate, contact our PEM Technical Support group at techsupport@pemnet.com.

SCB™/SCBJ™ SPINNING CLINCH BOLTS

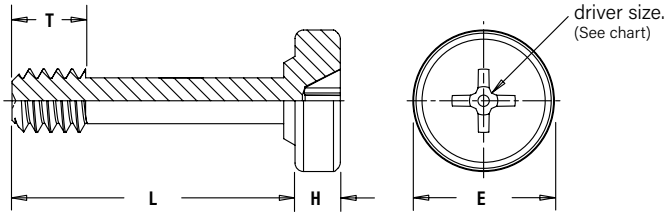
SCB with axial float.

SCBJ with jacking feature.

SCBJ



SCB



Installation Data page 34. Performance Data page 40.

Threads:	External, ASME B1.1, 2A / ASME B1.13M, 6g (1)
Material:	Hardened Carbon Steel
Finish:	ZI - Zinc plated, 5µm, colorless (standard) (2)
For use in sheet hardness:	HRB 80 or less (Hardness Rockwell "B" Scale) HB 150 or less (Hardness Brinell)

PART NUMBER DESIGNATION

SCB	J	-	632	-	6	ZI
Type	Jacking (If applicable)		Thread Size Code		Length Code	Finish

All dimensions are in inches.

	Thread Size	Type		Thread Code	Length Code "L" ±.015 (Length Code in 16ths of an inch)			Min. Sheet Thickness	Hole Size in Sheet +.003 -.000	E ±.010	H Nom.	T Nom.			Nom. Axial Float	Driver Size	Min. Dist. Hole ℄ To Edge
		Jacking	Non-jacking		.250	.375	.500					-4	-6	-8			
UNIFIED	.112-40 (#4-40)	SCBJ	—	440	4	6	8	.040	.112	.250	.080	.160	.285	.410	—	#1	.13
		—	SCB		—	—	8					—	—	.130	.330		
	.138-32 (#6-32)	SCBJ	—	632	4	6	8	.040	.138	.291	.080	.160	.285	.410	—	#2	.15
		—	SCB		—	—	8					—	—	.130	.330		

All dimensions are in millimeters.

	Thread Size x Pitch	Type		Thread Code	Length Code "L" ±0.4 (Length Code in millimeters)				Min. Sheet Thickness	Hole Size in Sheet +0.08	E ±0.25	H Nom.	T Nom.				Nom. Axial Float	Driver Size	Min. Dist. Hole ℄ To Edge
		Jacking	Non-jacking										-6	-10	-12	-14			
METRIC	M3 x 0.5	SCBJ	—	M3	6	10	12	14	1.02	3	6.6	2.03	3.7	7.7	9.7	11.7	—	#1	3.3
		—	SCB		—	—	12	14					—	—	3.3	5.3	7.67		
	M4 x 0.7	SCBJ	—	M4	6	10	12	14	1.02	4	8.28	2.03	3.7	7.7	9.7	11.7	—	#2	5
		—	SCB		—	—	12	14					—	—	3.3	5.3	7.67		

(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

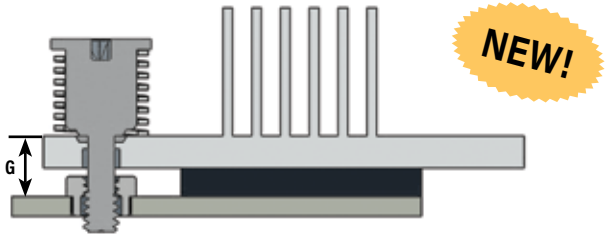
(2) See PEM Technical Support section of our website (www.pemnet.com) for related plating standards and specifications.

PEM® HSCB™ HEAT SINK MOUNTING SYSTEM

The new HSCB™ engineered mounting system provides secure attachment of a heat sink to the circuit board while providing firm contact to the chip component allowing optimum heat dissipation. The three-piece fastening system, sold individually, includes the screw, spring and receptacle nut. The clamp load created is determined by the spring rate and the amount of deflection that is designed into the joint of the hardware. The system also allows for slight expansion and contraction of the joint components without stress to the delicate circuitry. The unique "click" feature lets the user know when the fastener is completely installed.

Patented

- Screw can not be overtightened. Audible "click" when fully engaged.
- Screw and spring mount together permanently into the heat sink.
- Spring determines clamp force.
- Receptacle nut mounts permanently to the PC board.
- Provides even, constant contact of heat sink to chip component.
- Allows removal of heat sink if desired.

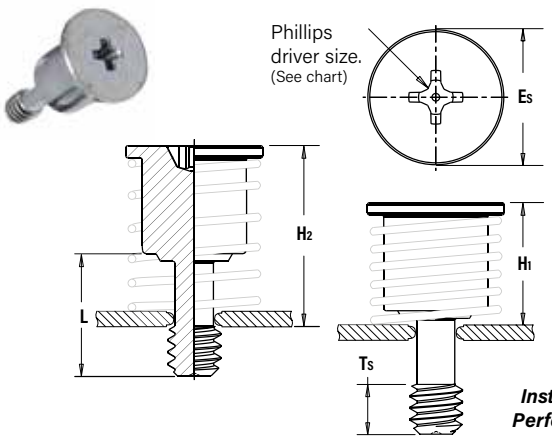


To select proper length code of nut/standoff:

1) Determine "G", the distance from the top surface of the heat sink to the top of the P.C. Board.
2) Find the combination of Screw (HSCB) and Nut (HSR) whose sum of Screw Factor (SF) plus Nut Factor (NF) are closest to G.
3) Find D = G – SF – NF. The D value must be a negative number between zero and 1mm or 1/32" (1 dash length of HSR nut).
4) The actual working load is equal to the Spring (HSL) Working Load + (D x spring rate k). Lower D value results in lower force.

If this or any standard product does not meet your application needs, contact our PEM Technical Support group at techsupport@pemnet.com to develop a special product that matches your specific application.

HSCB™ SELF-CAPTIVATING SCREW



Installation Data page 35.
Performance Data page 40.

Threads:	External, ASME B1.1, 2A / ASME B1.13M, 6g (1)
Material:	Hardened carbon steel
Finish:	Screw - ZI - Zinc plated, 5µm, colorless (2)
For use in sheet hardness:	HRB 80 / HB150 or less (3)

PART NUMBER DESIGNATION

HSCB - 440 - 4 ZI

- HSCB: Type
- 440: Thread Size Code
- 4: Length Code
- ZI: Finish

All dimensions are in inches.

	Thread Size	Type	Thread Code	Length Code "L" ±.015	Min. Sheet Thickness	Hole Size in Sheet +.003 -.000	Es ±.010	H1 Ref.	H2 Ref.	Ts Min.	Screw Factor (SF)	Driver Size	Min. Dist Hole ℄ To Edge
				.320									
UNIFIED	.112-40 (#4-40)	HSCB	440	4	.040	.112	.312	.300	.470	.130	.170	#1	.156
UNIFIED	.138-32 (#6-32)	HSCB	632	4	.040	.138	.352	.300	.470	.130	.170	#2	.178

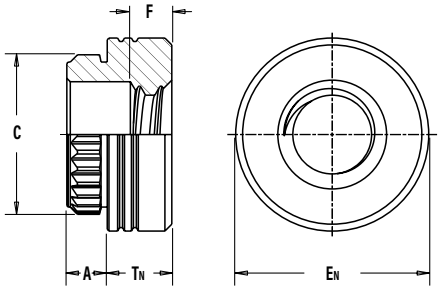
All dimensions are in millimeters.

	Thread Size x Pitch	Type	Thread Code	Length Code "L" ±0.4	Min. Sheet Thickness	Hole Size in Sheet +0.08	Es ±0.25	H1 Ref.	H2 Ref.	Ts Min.	Screw Factor (SF)	Driver Size	Min. Dist Hole ℄ To Edge
				8.13									
METRIC	M3 x 0.5	HSCB	M3	3	1	3	8.18	7.67	12	3.3	4.32	#1	4.13

NOTE: HSCB screws, HSR nuts and HSL springs are sold separately.

(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.
(2) See PEM Technical Support section of our website (www.pemnet.com) for related plating standards and specifications.
(3) HRB - Hardness Rockwell "B" Scale. HB - Hardness Brinell.

HSR™ BROACHING NUT/STANDOFF



HSR nuts are available for surface mounting. Contact our PEM technical support group at techsupport@pemnet.com.

Threads:
Internal, ASME B1.1, 2B / ASME B1.13M, 6H

Material:
Carbon steel

Finish:
ET - Electro-plated tin ASTM B 545, class B with clear preservative coating, annealed (1)

For use in sheet hardness:
HRB 60 / HB 107 or less (2)

PART NUMBER DESIGNATION

HSR - 440 - 2 ET

- HSR: Type
- 440: Thread Size Code
- 2: Length Code
- ET: Finish

Installation Data page 35. Performance Data page 40.

All dimensions are in inches.

	Thread Size	Type	Thread Code	Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C ±.003	EN ±.005	F ±.010	TN ±.005	Nut Factor (NF)	Min. Dist. Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	HSR	440	2	.060	.060	.166	.184	.219	.060	.065	.000	0.17
				3							.093	.031	
	.138-32 (#6-32)	HSR	632	2	.060	.060	.213	.231	.281	.060	.065	.000	0.22
				3							.093	.031	

All dimensions are in millimeters.

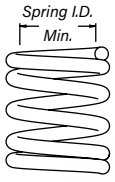
	Thread Size x Pitch	Type	Thread Code	Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +0.08	C ±0.08	EN ±0.13	F ±0.25	TN ±0.13	Nut Factor (NF)	Min. Dist. Hole ℄ To Edge
METRIC	M3 x 0.5	HSR	M3	2	1.53	1.53	4.22	4.68	5.56	1.3	2	.75	4.4
				3							3	1.75	

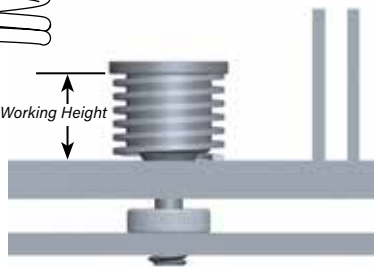
NOTE: HSCB screws, HSR nuts and HSL springs are sold separately.

(1) See PEM Technical Support section of our website (www.pemnet.com) for related plating standards and specifications.
(2) HRB - Hardness Rockwell "B" Scale. HB - Hardness Brinell.

HSL™ SPRINGS

HSL springs are engineered to provide a reliable and repeatable spring rate when assembled with mating PEM hardware. The spring rate is critical to the successful assembly of your heat sink. Clamp load will be determined by the spring rate and deflection that is designed into the joint.





Part Number	Minimum Inside Dia. (in.)	Minimum Inside Dia. (mm)	Load at Working Height ±10% (lbs.)	Load at Working Height ±10% (N)	Working Height Ref. (in.)	Working Height Ref. (mm)	Spring Rate k (lb/in)	Spring Rate k (N/mm)	Spring Material
HSL-574-35	.226	5.74	7.87	35	.270	6.86	74	12.96	17-7 Stainless Steel, Natural Finish
HSL-701-35	.276	7.01	7.87	35	.270	6.86	39	6.84	17-7 Stainless Steel, Natural Finish

NOTE: HSCB screws, HSR nuts and HSL springs are sold separately. HSL-574-35 spring fits screw thread sizes #4-40 and M3 and HSL-701-35 spring fits screw thread size #6-32.

The HSL **Inside Diameter Code** is expressed in hundredths of millimeters.
Example "574" indicates a minimum inside diameter of 5.74mm or .226".

The HSL **Load Code** is expressed in Newtons developed at the working height of the spring once the joint is assembled.
Example "35" indicates working load of 35 Newtons, or approximately 8 lbs.

For designs requiring a specific spring rate, contact our PEM Technical Support group at techsupport@pemnet.com

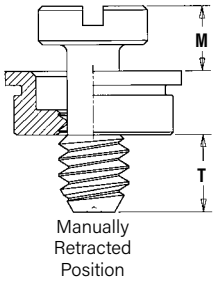
PART NUMBER DESIGNATION

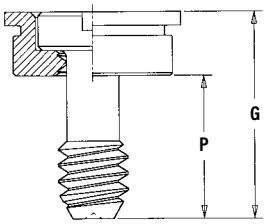
HSL - 574 - 35

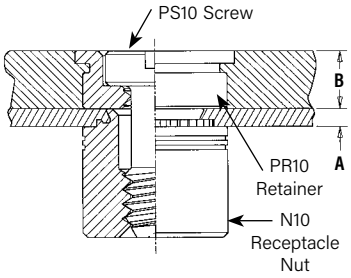
- HSL: Type
- 574: Inside Diameter Code
- 35: Load Code

PEM® PF10™ FLUSH-MOUNTED CAPTIVE PANEL SCREWS

- PF10 assembly sits flush in sheets as thin as .050" / 1.27 mm or flush on both sides in .125" / 3.2 mm sheets.
- PS10 screw remains captive in retainer when disengaged.
- PR10 retainer and F10 receptacle nut is for use in sheets of HRB 70 or less.
- N10 nut is for use in sheets of HRB 80 or less.
- Complies with UL 60950 standards.







Installation Data page 36. Performance Data page 41.

All dimensions are in inches.

	A Min.	B Nom.	G ± .010	M	P	T Nom.
UNIFIED	.04	.125	.40	.16	.28	.13

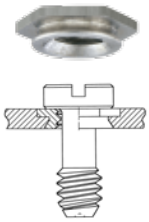
All dimensions are in millimeters.

	A Min.	B Nom.	G ± 0.25	M	P	T Nom.
METRIC	1	3.18	10.16	4.06	7.11	3.3

Floating Receptacle Nuts

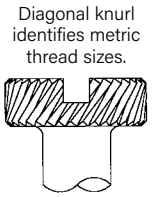
Available on special order F10 self-clinching floating receptacle nuts permit a minimum of .015"/0.38mm adjustment for mating hole misalignment.

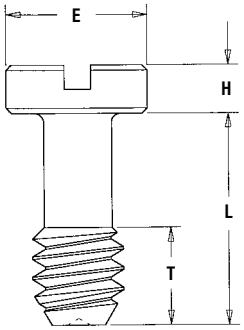
Flush Fasteners as retainers



For applications where the screw head may project above the sheet surface, PS10 screws may be used with PEMSERT® F fasteners as retainers. For dimensions and engineering data on F fasteners, see PEM Bulletin F.

PS10™ FLUSH MOUNTED SCREWS





Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g

Material:
300 Series Stainless Steel

Finish:
Passivated and/or tested per ASTM A380

PART NUMBER DESIGNATION

PS10 - 832 - 40

- PS10 → Type and Material
- 832 → Thread Size Code
- 40 → Screw Length Code

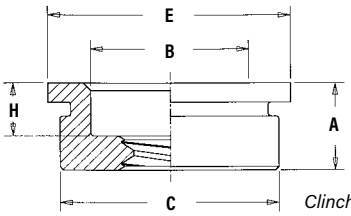
All dimensions are in inches.

	Thread Size	Type	Thread Code	Screw Length Code	E Nom.	H +.002 -.006	L ± .010	T Nom.
UNIFIED	.112-40 (#4-40)	PS10	440	40	.18	.075	.33	.13
	.138-32 (#6-32)	PS10	632	40	.21	.075	.33	.13
	.164-32 (#8-32)	PS10	832	40	.25	.075	.33	.13
	.190-32 (#10-32)	PS10	032	40	.28	.075	.33	.13

All dimensions are in millimeters.

	Thread Size x Pitch	Type	Thread Code	Screw Length Code	E Nom.	H +0.05 -0.15	L ± 0.25	T Nom.
METRIC	M3 x 0.5	PS10	M3	40	4.7	1.91	8.38	3.3
	M4 x 0.7	PS10	M4	40	6.3	1.91	8.38	3.3
	M5 x 0.8	PS10	M5	40	7.1	1.91	8.38	3.3

PR10™ SELF-CLINCHING FLUSH-MOUNTED RETAINERS



Clinching profile may vary.

PART NUMBER DESIGNATION

PR10 - 832

PR10: Type

832: Thread Size Code

Threads: Internal, ASME B1.1, 2B / ASME B1.13M, 6H (1)

Material: 300 Series Stainless Steel

Finish: Passivated and/or tested per ASTM A380

For use in sheet hardness: HRB 70 or less (Hardness Rockwell "B" Scale) HB 125 or less (Hardness Brinell)

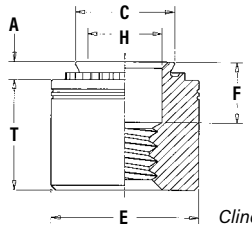
All dimensions are in inches.

	Thread Size	Type	Thread Code	A (Shank) Max.	Min. Sheet for Self-Clinching	Min. Sheet for Flush Installation	Hole Size in Sheet +.003 -.000	B Nom.	C Max.	E Nom.	H Nom.	Min. Dist. Hole ℄ to Edge
UNIFIED	.112-40 (#4-40)	PR10	440	.125	.050	.125	.281	.195	.280	.31	.075	.31
	.138-32 (#6-32)	PR10	632	.125	.050	.125	.312	.225	.311	.34	.075	.33
	.164-32 (#8-32)	PR10	832	.125	.050	.125	.344	.255	.343	.37	.075	.34
	.190-32 (#10-32)	PR10	032	.125	.050	.125	.375	.290	.374	.41	.075	.36

All dimensions are in millimeters.

	Thread Size x Pitch	Type	Thread Code	A (Shank) Max.	Min. Sheet for Self-Clinching	Min. Sheet for Flush Installation	Hole Size in Sheet + 0.08	B Nom.	C Max.	E Nom.	H Nom.	Min. Dist. Hole ℄ to Edge
METRIC	M3 x 0.5	PR10	M3	3.18	1.27	3.18	7.14	4.75	7.12	7.87	1.91	7.87
	M4 x 0.7	PR10	M4	3.18	1.27	3.18	8.74	6.48	8.72	9.53	1.91	8.64
	M5 x 0.8	PR10	M5	3.18	1.27	3.18	9.53	7.37	9.5	10.41	1.91	9.14

N10™ SELF-CLINCHING RECEPTACLE NUTS(4)



Clinching profile may vary.

PART NUMBER DESIGNATION

N10 - 832 - 1 ZI

N10: Type

832: Thread Size Code

1: Shank Code

ZI: Finish

Threads: Internal, ASME B1.1, 2B / ASME B1.13M, 6H (2)

Material: Hardened Carbon Steel

Finish: ZI - Zinc plated, 5µm, colorless (standard) (3)

For use in sheet hardness: HRB 80 or less (Hardness Rockwell "B" Scale) HB 150 or less (Hardness Brinell)

All dimensions are in inches.

	Thread Size	Type	Thread Code	Shank Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C Max.	E Nom.	F ±.010	H Nom.	T ±.005	Min. Dist. Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	N10	440	1	.038	.040	.187	.186	.28	.130	.126	.24	.22
	.138-32 (#6-32)	N10	632	1	.038	.040	.213	.212	.31	.130	.156	.24	.27
	.164-32 (#8-32)	N10	832	1	.038	.040	.250	.249	.34	.130	.187	.24	.28
	.190-32 (#10-32)	N10	032	1	.038	.040	.277	.276	.37	.130	.213	.24	.31

All dimensions are in millimeters.

	Thread Size x Pitch	Type	Thread Code	Shank Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + 0.08	C Max.	E Nom.	F ± 0.25	H Nom.	T ± 0.13	Min. Dist. Hole ℄ To Edge
METRIC	M3 x 0.5	N10	M3	1	0.97	1	4.75	4.73	7.11	3.3	3.2	6	5.59
	M4 x 0.7	N10	M4	1	0.97	1	6.35	6.33	8.64	3.3	4.75	6	7.11
	M5 x 0.8	N10	M5	1	0.97	1	7.04	7.01	9.53	3.3	5.41	6	7.87

(1) The purpose of the thread is for component screw retention only, thread may not accept 2B/6H Go threaded plug gage, but class 3A/4h screw must pass with finger torque, may not reject NoGo threaded plug gage and minor diameter may exceed 2B/6H maximum.

(2) 2B (unified) and 6H (metric) go gauge may stop at pilot end but class 3A (unified) and 4h (metric) screws will pass through with finger torque.

(3) See PEM Technical Support section of our website (www.pemnet.com) for related plating standards and specifications.

(4) Also available on special order F10 self-clinching floating receptacle nuts.

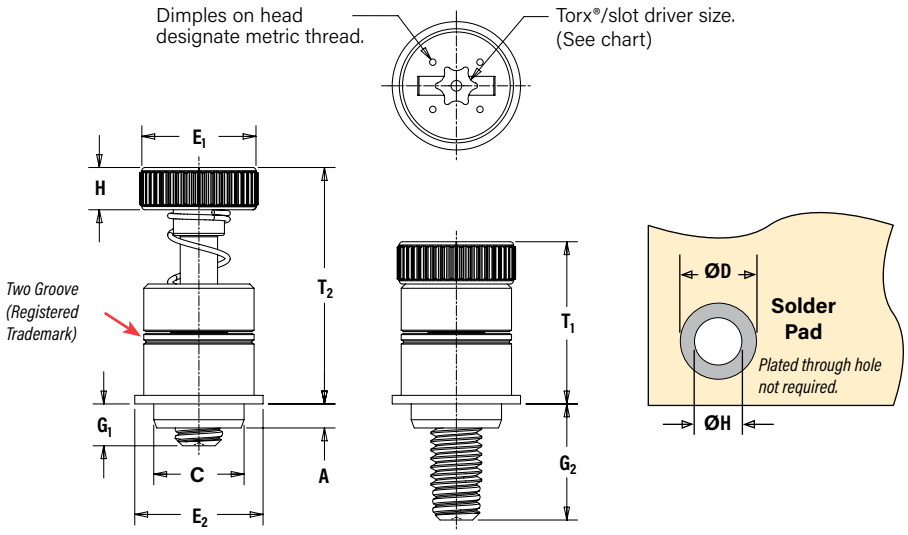
REELFAST® SMTPFLSM™ SURFACE MOUNT CAPTIVE PANEL SCREWS

- All metal captive screw assembly installs in one piece utilizing pick and place method.
- Combination drive, Torx®/slot.
- Solderable finish.

Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g (1)

Material:
Retainer: Carbon Steel
Screw: Hardened Carbon Steel
Spring: 300 Series Stainless Steel

Finish:
Retainer: ET - Electro-plated tin ASTM B545, Class B with preservative coating, annealed (2)
Screw: ZI - Zinc plated, 5µm, colorless (3)
Spring: Natural Finish



PART NUMBER DESIGNATION

SMTPF	LS	M -	440 -	0	ET
Type	Driver	Anti-cross Thread Feature	Thread Code	Length Code	Finish

Installation Data page 36. Performance Data page 41.

All dimensions are in inches.

	Thread Size	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	C Max.	E_1 ±.010	E_2 Nom	G_1 ±.025	G_2 ±.025	H ±.010	T_1 Nom.	T_2 Nom.	ØK Hole Size in Sheet +.003 -.000	ØD Min. Solder Pad	Driver Size
UNIFIED	.112-40 (#4-40)	SMTPFLSM	440	0	.063	.063	.215	.280	.300	.040	.210	.100	.38	.55	.220	.340	T15
				1						.100	.270						
	.138-32 (#6-32)	SMTPFLSM	632	0	.063	.063	.247	.310	.320	.040	.240	.100	.42	.62	.252	.400	T15
				1						.100	.300						

All dimensions are in millimeters.

	Thread Size	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	C Max.	E_1 ±0.25	E_2 Nom	G_1 ±0.64	G_2 ±0.64	H ±0.25	T_1 Nom.	T_2 Nom.	ØK Hole Size in Sheet +0.08	ØD Min. Solder Pad	Driver Size
METRIC	M3 x 0.5	SMTPFLSM	M3	0	1.6	1.6	5.46	7	7.6	1	5.3	2.5	9.6	14	5.6	8.6	T15
				1						2.5	6.8						
	M3.5 x 0.6	SMTPFLSM	M3.5	0	1.6	1.6	6.27	7.9	8.13	1	6.1	2.5	10.7	15.7	6.4	10.2	T15
				1						2.5	7.62						

NUMBER OF PARTS PER REEL

Thread Size	Parts Per Reel
440	200
632	150
M3	200
M3.5	150

Packaged on 330 mm recyclable reels. Tape width is 24 mm.
Supplied with polyimide patch for vacuum pick up. Reels conform to EIA-481.

(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2
(2) Optimal solderability life noted on packaging.
(3) See PEM Technical Support section of our website (www.pemnet.com) for related plating standards and specifications.

REELFAST® SMTPF™ SURFACE MOUNT CAPTIVE PANEL SCREWS

- Retainer installed using conventional surface mount techniques.
- Simply snap screw into retainer to complete assembly.
- Black ABS knob standard.
- Optional molded-through colors available.
- Available with Torx® recess.

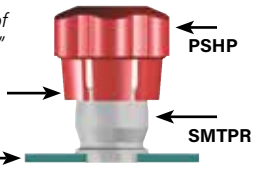
Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g (1)

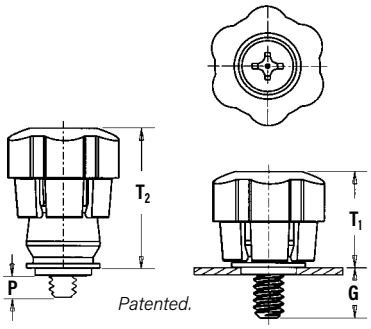
Material:
Knob: ABS (2)
Retainer: Carbon Steel
Screw: Carbon Steel

Finish:
Retainer: ET - Electro-plated tin ASTM B545, Class B with preservative coating, annealed
Screw: CN - Bright nickel over copper flash per ASTM B689

When Assembled

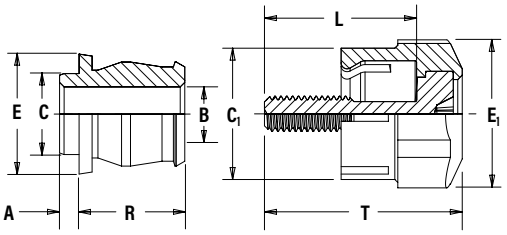
Spring action of plastic "fingers" holds screw in retracted position.





Patented.

Installation Data page 36.
Performance Data page 41.



All dimensions are in inches.

	Thread Size	Screw Part Number: Type	Thread Code	Screw Length Code	Retainer Part Number	Assembly Dimensions: G ±.025	P ±.025	T_1 Nom.	T_2 Nom.	Total Radial Float	Screw Dimensions: C_1 ±.010	E_1 ±.010	L ±.015	T Nom.	Retainer Dimensions: A (Shank) Max.	Min. Sheet Thick.	B ±.003	C Max.	E Nom.	R ±.005
UNIFIED	.112-40 (#4-40)	PSHP	440	0	SMTPR-6-1	.188	.000	.478	.646	.015	.440	.542	.510	.663	.060	.060	.167	.249	.375	.325
				1		.248	.026						.570	.723						
	.138-32 (#6-32)	PSHP	632	0	SMTPR-6-1	.188	.000	.478	.646	.020	.440	.542	.510	.663	.060	.060	.167	.249	.375	.325
				1		.248	.026						.570	.723						

All dimensions are in millimeters.

	Thread Size x Pitch	Screw Part Number: Type	Thread Code	Screw Length Code	Retainer Part Number	Assembly Dimensions: G ± 0.64	P ± 0.64	T_1 Nom.	T_2 Nom.	Total Radial Float	Screw Dimensions: C_1 ±0.25	E_1 ±0.25	L ±0.38	T Nom.	Retainer Dimensions: A (Shank) Max.	Min. Sheet Thick.	B ±0.08	C Max.	E Nom.	R ±0.13
METRIC	M3 x 0.5	PSHP	M3	0	SMTPR-6-1	4.78	0	12.14	16.41	.38	11.18	13.77	12.95	16.84	1.53	1.53	4.24	6.33	9.53	8.26
				1		6.3	.66						14.48	18.36						
	M3.5 x 0.6	PSHP	M3.5	0	SMTPR-6-1	4.78	0	12.14	16.41	.51	11.18	13.77	12.95	16.84	1.53	1.53	4.24	6.33	9.53	8.26
				1		6.3	.66						14.48	18.36						

RETAINER - *Packaged on 330 mm recyclable reels of 465 pieces. Tape width is 24 mm. Supplied with Kapton® patch for vacuum pick up. Reels conform to EIA-481.*

SCREW - *Packaged in bags. Retainers and screws are sold separately.*

PART NUMBER DESIGNATION FOR SCREW

PSHP - 632 - 0 L 001

- PSHP: Type
- 632: Thread Code
- 0: Length Code
- L: Cap Style (Lobed)
- 001: Color Code (Standard Black)

PART NUMBER DESIGNATION FOR RETAINER

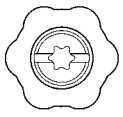
SMTPR - 6 - 1 ET

- SMTPR: Type
- 6: Retainer Size
- 1: Shank Code
- ET: Finish

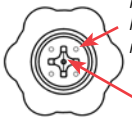
COLOR CAPABILITIES FOR PSHP SCREW

The colors shown here (codes #002 thru #007) are non-stocked standards and available on special order. Since actual cap colors may vary slightly from those shown here, we recommend that you request samples for color verification. If you require a custom color or you need a "color matched" cap, please contact us.

Non-flammable UL 94-V0 plastic caps are available on special order.

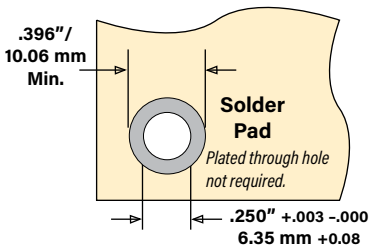


Available with Torx® recess on special order.



Four dimples on head designate metric thread.

Metal Phillips Recess
#4-40 & M3 = #1
#6-32 & M3.5 = #2



Stencil Masking Examples

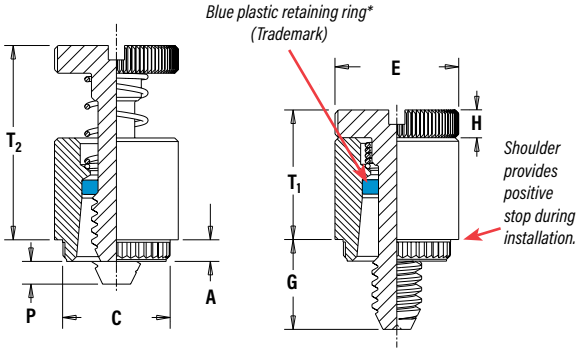
(1) *As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.*

(2) *See PEM Technical Support section of our website (www.pemnet.com) for related plating standards and specifications.*

PFK™ BROACHING CAPTIVE PANEL SCREWS

- For permanent and reliable installation in PC boards.
- Screw assemblies remain captive for easy mounting and removal.

Diagonal knurl identifies metric thread sizes



Installation Data page 33. Performance Data page 41.

Threads:
External, ASME B1.1, 2A / ASME B1.13M, 6g

Material:
Retainer: 300 Series Stainless Steel
Screw: 300 Series Stainless Steel
Spring: 300 Series Stainless Steel
Retaining Ring: Nylon, temperature limit 200˚ F / 93˚ C

Finish:
Retainer: Passivated and/or tested per ASTM A380
Screw: Passivated and/or tested per ASTM A380
Spring: Natural Finish

For use in:
PC Boards

PART NUMBER DESIGNATION

PFK - 632 - 40

- PFK: Type
- 632: Thread Size Code
- 40: Screw Length Code

All dimensions are in inches.

	Thread Size	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C ± .003	E ±.010	G ± .016	H ± .005	P ± .025	T_1 Max.	T_2 Nom.	Min. Dist. Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	PFK	440	40	.060	.060	.265	.283	.312	.250	.072	.000	.36	.54	.20
				62						.375		.125			
				84						.500		.250			
	.138-32 (#6-32)	PFK	632	40	.060	.060	.281	.299	.344	.250	.072	.000	.36	.54	.26
				62						.375		.125			
				84						.500		.250			

All dimensions are in millimeters.

	Thread Size x Pitch	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +0.08	C ± 0.08	E ±.25	G ± 0.4	H ± 0.13	P ± 0.64	T_1 Max.	T_2 Nom.	Min. Dist. Hole ℄ To Edge
METRIC	M3 x 0.5	PFK	M3	40	1.53	1.53	6.73	7.19	7.92	6.4	1.83	0	9.14	13.72	5.08
				62						9.5		3.2			
				84						12.7		6.4			

VALUE-ADDED CAPABILITIES

ATCA Solutions

Use PF11PM captive panel screw and TPXS pin in conjunction to satisfy the requirements of the PICMG 3.0 of the Advanced TCA®.

Tight Seal Solutions

Consider adding an o-ring to our PEM C.A.P.S.® captive panel screw. When fastened, it provides a tight seal above the panel.

Nylon Locking Patch

Nylon locking patch is available to be added to any of PEM captive panel screws for applications requiring a locking element.

Thread-forming Opportunity

PennEngineering is official licensee for REMFORM®, TAPTITE®, PT®, and DELTA PT® fastener products.

REMFORM® and TAPTITE® are trademarks of REMINC®.
PT® and DELTA PT® are trademarks of EJOT®.

MAThread® Anti Cross-thread Technology

PennEngineering is a licensee of MAThread® Anti Cross-Threading Technology. This unique design allows the threads to self-align and drive easily with reduced effort. This helps speed assembly, reduce or eliminate failures, repairs, scrap, downtime, and warranty service associated with thread damage. This option is available on most types of PEM captive panel screws.

MAThread® is a registered trademark of MAThread inc.

Anti Cross-Thread Feature

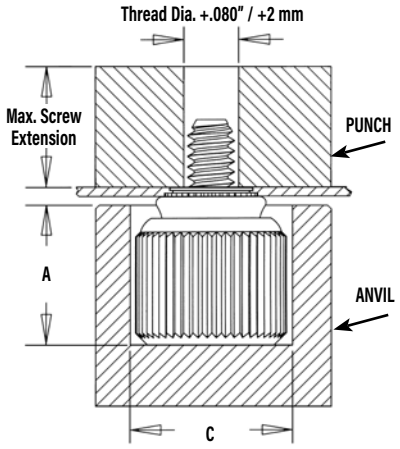
CAPTIVE PANEL SCREW INSTALLATION

INSTALLATION NOTES

- For best results we recommend using a PEMSERTER® press for installation of PEM self-clinching fasteners. Please check our website for more information.
- Visit the Animation Library on our website to view the installation process for this product.

PF11™/PF12™/PF11M™/PF12M™/PEM C.A.P.S.® FASTENERS

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into recessed anvil, and place workpiece (preferably the punch side) over shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.



PEMSERTER® Installation Tooling(1)

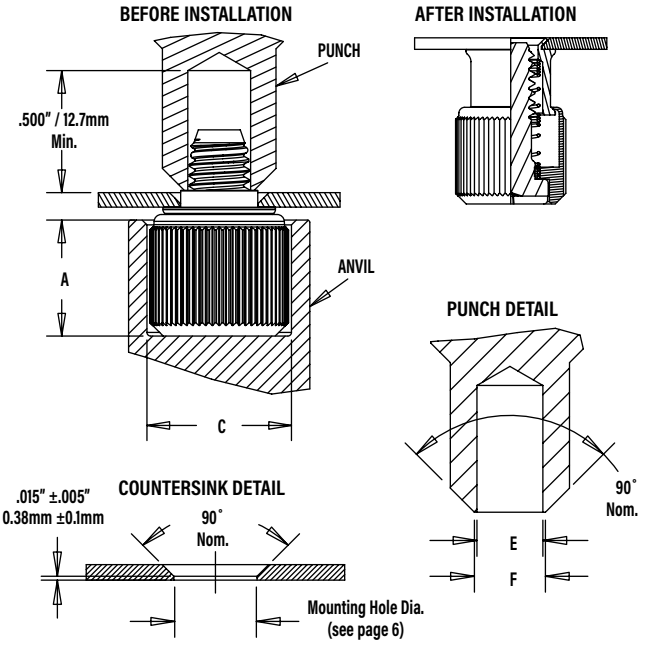
	Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Anvil Part Number	Punch Part Number
UNIFIED	440	.260	.437	8003521	8003518
	632	.390	.468	8003522	8003519
	832	.390	.531	8003523	8003520
	032	.390	.531	8003523	8004350
	0420	.480	.598	8004351	8004352

	Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Anvil Part Number	Punch Part Number
METRIC	M3	6.6	11.1	8003521	8003518
	M3.5	9.91	11.89	8003522	8003519
	M4	9.91	13.49	8003523	8003520
	M5	9.91	13.49	8003523	8004350
	M6	12.19	15.19	8004351	8004352

(1) Punches and anvils should be hardened.

PF11MF™/PF12MF™ FASTENERS (flare-mount installation)

1. Prepare properly sized mounting hole in sheet with countersink.
2. Place fastener into recessed anvil, and place workpiece over shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force to flare the retainer of the fastener.



PEMSERTER® Installation Tooling(1)

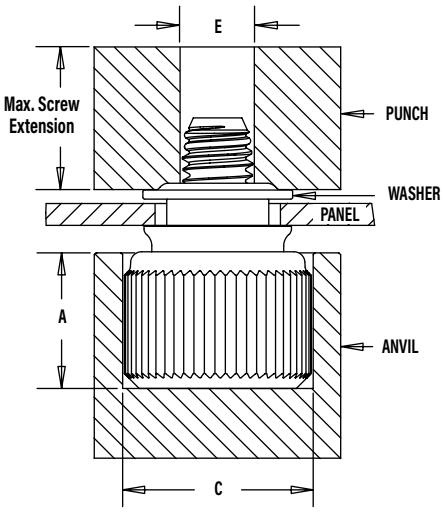
	Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Punch Dimensions (in.) E +.003 -.000	Punch Dimensions (in.) F ±.002	Anvil Part No.	Punch Part No.
UNIFIED	440	.260	.437	.123	.133	8003521	8013670
	632	.390	.468	.143	.156	8003522	8013671
	832	.390	.531	.202	.210	8003523	8013672
	032	.390	.531	.202	.210	8003523	8013672
	0420	.480	.598	.255	.264	8004351	8013674

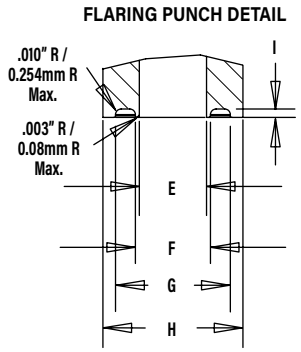
	Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Punch Dimensions (mm) E +0.08	Punch Dimensions (mm) F ±0.05	Anvil Part No.	Punch Part No.
METRIC	M3	6.6	11.1	3.12	3.38	8003521	8013670
	M4	9.91	13.49	5.13	5.33	8003523	8013672
	M5	9.91	13.49	5.13	5.33	8003523	8013672
	M6	12.19	15.19	6.48	6.71	8004351	8013674

(1) Punches and anvils should be hardened.

PF11MW™/PF12MW™ FASTENERS

1. Prepare properly sized mounting hole in sheet.
2. Place fastener into recessed anvil, place workpiece over shank of fastener, then place the washer over the shank of the fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force with flaring punch.





PEMSERTER® Installation Tooling(1)

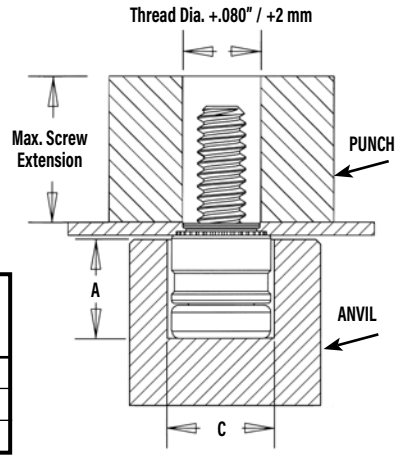
	Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.001	Punch Dimensions (in.) E +.003 -.000	Punch Dimensions (in.) F ±.001	Punch Dimensions (in.) G ±.003	Punch Dimensions (in.) H Min.	Punch Dimensions (in.) I ±.004	Anvil Part No.	Punch Part No.
UNIFIED	440	.260	.437	.120	.135	.204	.250	.015	8003521	8014304
	632	.390	.468	.140	.159	.249	.300	.015	8003522	8014305
	832	.390	.531	.201	.217	.340	.400	.028	8003523	8014306
	032	.390	.531	.201	.217	.340	.400	.028	8003523	8014306
	0420	.480	.598	.252	.271	.430	.500	.028	8004351	8014307

	Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.03	Punch Dimensions (mm) E +0.08	Punch Dimensions (mm) F ±0.03	Punch Dimensions (mm) G ±0.08	Punch Dimensions (mm) H Min.	Punch Dimensions (mm) I ±0.1	Anvil Part No.	Punch Part No.
METRIC	M3	6.6	11.1	3.05	3.43	5.18	6.35	.381	8003521	8014304
	M3.5	9.9	11.9	3.56	4.04	6.32	7.62	.381	8003522	8014305
	M4	9.9	13.5	5.11	5.51	8.64	10.16	.711	8003523	8014306
	M5	9.9	13.5	5.11	5.51	8.64	10.16	.711	8003523	8014306
	M6	12.2	15.2	6.4	6.88	10.92	12.7	.711	8004351	8014307

(1) Punches and anvils should be hardened.

PFHV™ FASTENERS

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into recessed anvil, and place workpiece (preferably the punch side) over shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.



PEMSERTER® Installation Tooling(1)

	Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Anvil Part Number	Punch Part Number
UNIFIED	440	.220	.285	8004688	970200009400
	632	.250	.301	8004689	8015656
	832	.285	.332	8005439	970200230400

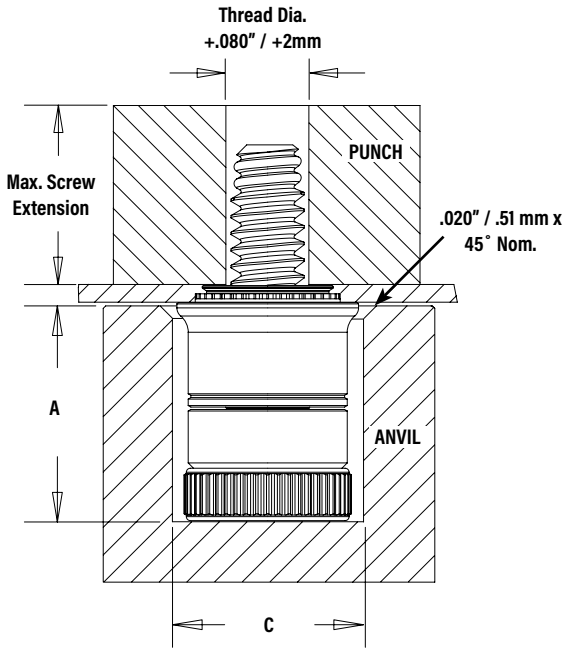
	Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Anvil Part Number	Punch Part Number
METRIC	M3	5.59	7.24	8004688	970200020400
	M3.5	6.35	7.65	8004689	8015656
	M4	7.24	8.43	8005439	970200230400

(1) Punches and anvils should be hardened.

CAPTIVE PANEL SCREW INSTALLATION

PF7M™ FASTENERS

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into recessed anvil, and place workpiece (preferably the punch side) over the shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.



PEMSERTER® Installation Tooling(1)

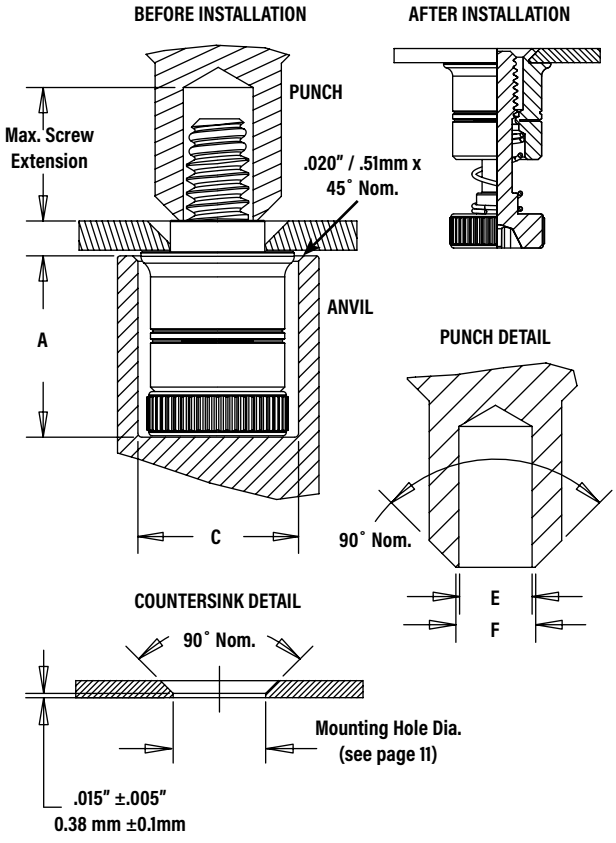
	Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Anvil Part Number	Punch Part Number
UNIFIED	440	.319	.290	8016175	8003518
	632	.333	.330	8016176	8003519
	832	.353	.385	8016177	8003520

	Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Anvil Part Number	Punch Part Number
METRIC	M3	8.1	7.34	8016175	8003518
	M4	8.9	9.8	8016177	8003520

(1) Punches and anvils should be hardened.

PF7MF™ FASTENERS (flare-mount installation)

1. Prepare properly sized mounting hole in sheet with countersink. Do not perform any secondary operations such as deburring.
2. Place fastener into recessed anvil, and place workpiece over the shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force to flare the retainer of the fastener.



PEMSERTER® Installation Tooling(1)

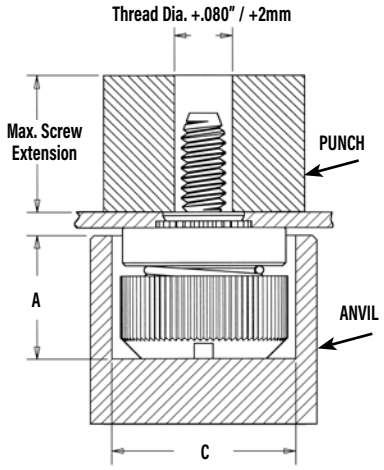
	Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Punch Dimensions (in.) E +.003 -.000	Punch Dimensions (in.) F ±.002	Anvil Part No.	Punch Part No.
UNIFIED	440	.319	.290	.123	.133	8016175	8013670
	632	.333	.330	.143	.156	8016176	8013671
	832	.353	.385	.202	.210	8016177	8013672

	Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Punch Dimensions (mm) E +0.08	Punch Dimensions (mm) F ±0.05	Anvil Part No.	Punch Part No.
METRIC	M3	8.1	7.34	3.12	3.38	8016175	8013670
	M4	8.9	9.8	5.13	5.33	8016177	8013672

(1) Punches and anvils should be hardened.

PF30™/PF31™/PF32™ FASTENERS

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into recessed anvil, and place workpiece (preferably the punch side) over shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.



PEMSERTER® Installation Tooling(1)

UNIFIED

Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Anvil Part Number	Punch Part Number
440	.295	.421	975201060	975200060
632	.295	.453	975201061	975200061
832	.310	.484	975201062	975200062
032	.310	.546	975201063	975200063
0420	.365	.640	975201064	975200064

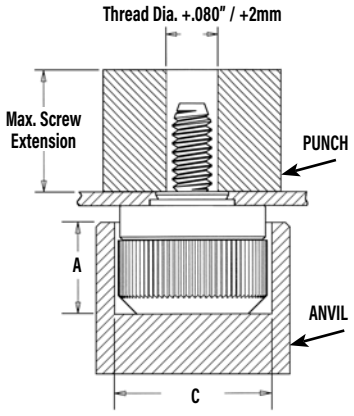
METRIC

Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Anvil Part Number	Punch Part Number
M3	7.49	10.69	975201060	975200060
M4	7.87	12.29	975201062	975200062
M5	7.87	13.87	975201063	975200063
M6	9.27	16.26	975201064	975200064

(1) Punches and anvils should be hardened.

PF50™/PF51™/PF52™/PF60™/PF61™/PF62™ FASTENERS

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into recessed anvil, and place workpiece (preferably the punch side) over shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.



PEMSERTER® Installation Tooling(1)

UNIFIED

Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Anvil Part Number	Punch Part Number
440	.295	.421	975201060	975200060
632	.295	.453	975201061	975200061
832	.310	.484	975201062	975200062
032	.310	.546	975201063	975200063
0420	.365	.640	975201064	975200064

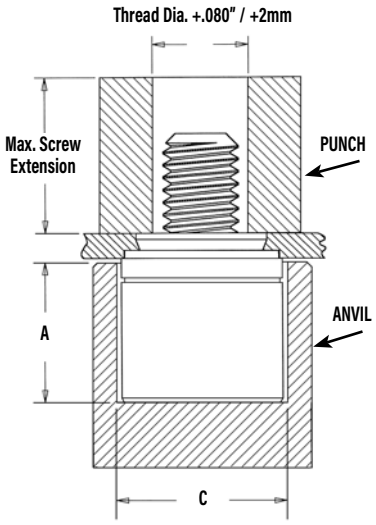
METRIC

Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Anvil Part Number	Punch Part Number
M3	7.49	10.69	975201060	975200060
M3.5	7.49	11.51	975201061	975200061
M4	7.87	12.29	975201062	975200062
M5	7.87	13.87	975201063	975200063
M6	9.27	16.26	975201064	975200064

(1) Punches and anvils should be hardened.

PFC4™ FASTENERS

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into recessed anvil, and place workpiece (preferably the punch side) over shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.



Installation Requirements

1. Sheet hardness must be less than 88 on the Rockwell "B" scale.
2. Hole punch should be kept sharp to minimize work hardening around hole.
3. Fastener should be installed in punch side of hole.
4. Fastener should not be installed near bends or other highly cold worked areas where sheet hardness may be greater than 88 on the Rockwell "B" scale.

PEMSERTER® Installation Tooling(1)

	Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Anvil Part Number	Punch Part Number
UNIFIED	440	.345	.358	975200027	975200060
	632	.345	.390	975201243	975200061
	832	.435	.421	975200029	975200062
	032	.435	.452	975201244	975200063

	Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Anvil Part Number	Punch Part Number
METRIC	M3	8.76	9.09	975200027	975200060
	M4	11.05	10.69	975200029	975200062
	M5	11.05	11.48	975201244	975200063

(1) Punches and anvils should be hardened.

PFC2P™ FASTENERS

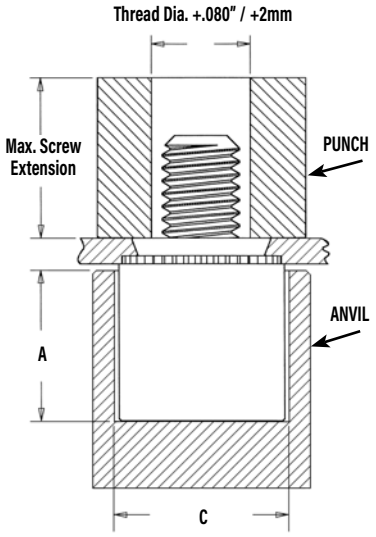
1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into recessed anvil, and place workpiece (preferably the punch side) over shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.

PEMSERTER® Installation Tooling(1)

	Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Anvil Part Number	Punch Part Number
UNIFIED	440	.345	.323	975200026	975200060
	632	.345	.358	975200027	975200061
	832	.435	.386	975200028	975200062
	032	.435	.421	975200029	9752000063

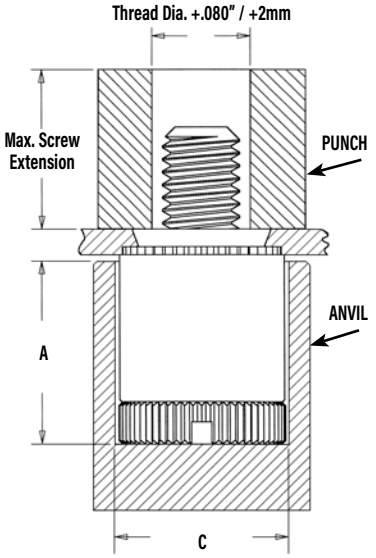
	Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Anvil Part Number	Punch Part Number
METRIC	M3	8.76	8.2	975200026	9752000060
	M4	11.05	9.8	975200028	9752000062
	M5	11.05	10.69	975200029	9752000063

(1) Punches and anvils should be hardened.



PFC2™/PFS2™ FASTENERS

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into recessed anvil, and place workpiece (preferably the punch side) over shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.



PEMSERTER® Installation Tooling(1)

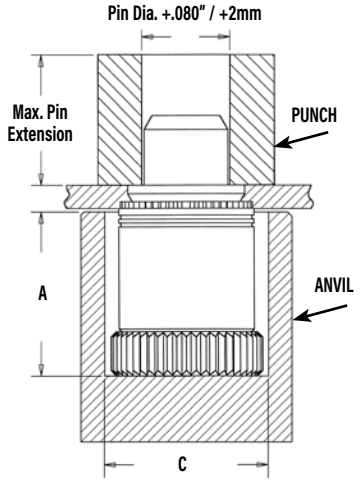
	Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Anvil Part Number	Punch Part Number
UNIFIED	440	.345	.323	975200026	975200060
	632	.345	.358	975200027	975200061
	832	.435	.386	975200028	975200062
	032	.435	.421	975200029	975200063
	0420	.565	.484	975200030	975200064

	Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Anvil Part Number	Punch Part Number
METRIC	M3	8.76	8.2	975200026	975200060
	M4	11.05	9.8	975200028	975200062
	M5	11.05	10.69	975200029	975200063
	M6	14.35	12.29	975200030	975200064

(1) Punches and anvils should be hardened.

PTL2™/PSL2™ FASTENERS

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into recessed anvil, and place workpiece (preferably the punch side) over shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.



PEMSERTER® Installation Tooling(1)

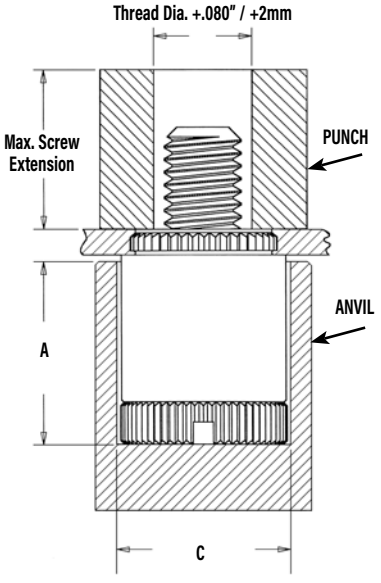
	Plunger Diameter Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Anvil Part Number	Punch Part Number
UNIFIED	04	.580	.520	975201245	970200013300

	Plunger Diameter Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Anvil Part Number	Punch Part Number
METRIC	04	14.86	13.21	975201245	970200013300

(1) Punches and anvils should be hardened.

PFK™ FASTENERS

1. Prepare properly sized mounting hole in board.
2. Place fastener into recessed anvil, and place workpiece over shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the board.



PEMSERTER® Installation Tooling(1)

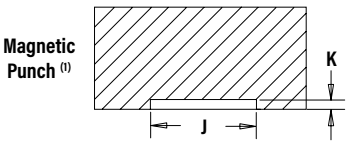
	Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Anvil Part Number	Punch Part Number
UNIFIED	440	.320	.323	975200026	975200060
	632	.320	.358	975200027	975200061

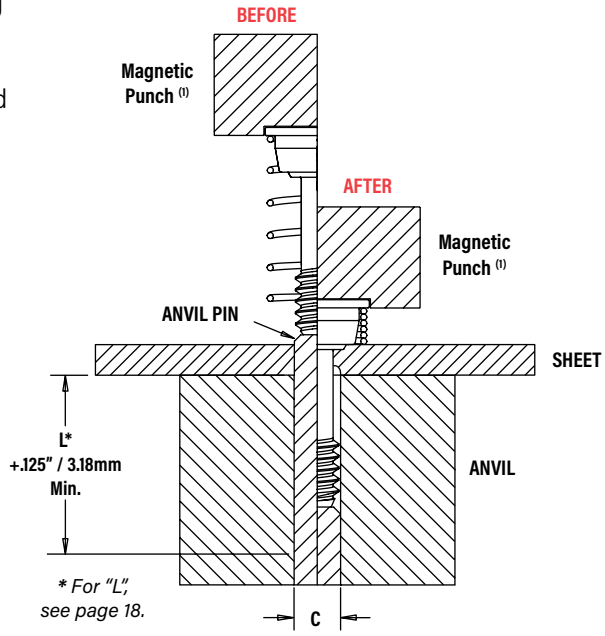
	Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Anvil Part Number	Punch Part Number
METRIC	M3	8.13	8.2	975200026	975200060

(1) Punches and anvils should be hardened.

SCBR™ FASTENERS

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring. If the hole is punched, be sure to install fastener into punched side of hole.
2. Assemble spring on screw by rotating spring counter clockwise and position assembly into recessed magnetic punch.
3. Position hole in workpiece over retractable anvil pin.
4. With installation punch and anvil surfaces parallel, apply squeezing force on top of the screw head and the underside of the sheet material. The squeezing action forces the displacer of the screw into the sheet, causing it to reduce the mounting hole diameter and captivate the screw.





PEMSERTER® Installation Tooling(1)

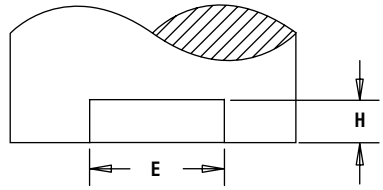
	Thread Code	Installation Tooling Dimensions (in.)			Anvil Part Number	Magnetic Punch Part Number (2)
		C	J	K		
UNIFIED	440	.113 - .116	.354 – .357	.035	970200048300	8016210
	632	.139 - .142	.387 – .390	.035	970200052300	8016211
	832	.165 - .168	.416 – .419	.035	970200054300	8016212

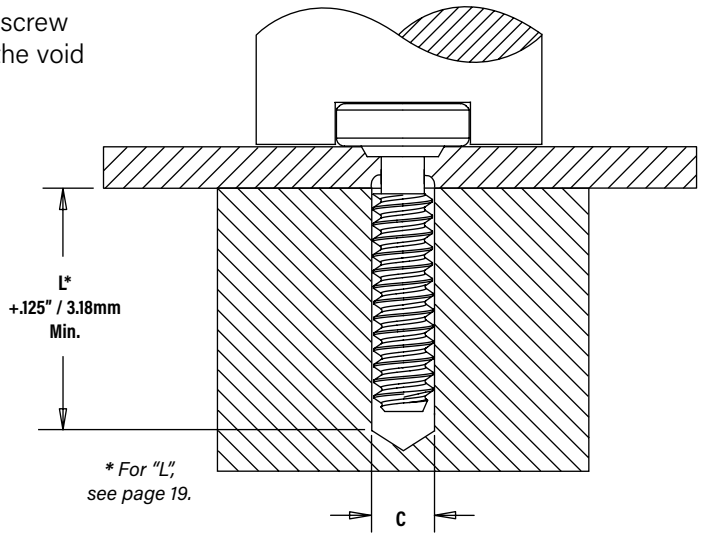
	Thread Code	Installation Tooling Dimensions (mm)			Anvil Part Number	Magnetic Punch Part Number (2)
		C	J	K		
METRIC	M3	3.03 - 3.11	9.25 – 9.32	0.89	970200049300	8016213
	M4	4.03 - 4.11	10.8 – 10.9	0.89	970200053300	8016214

(1) Punches and anvils should be hardened.
(2) Pneumatic punch may also be used. Please contact our PEMSERTER tooling division for punch part numbers.

SCB™/SCBJ™ FASTENERS

1. Prepare properly sized mounting hole in sheet.
2. Place the fastener through mounting hole and into anvil. A flat or recessed punch can be used.
3. With installation punch and anvil surfaces parallel, apply squeezing force to the top of the screw head and the underside of the sheet material. The squeezing action forces the shoulder of the screw into the sheet, displacing sheet material, causing it to fill the void under the head and shoulder of the screw.





PEMSERTER® Installation Tooling(1)

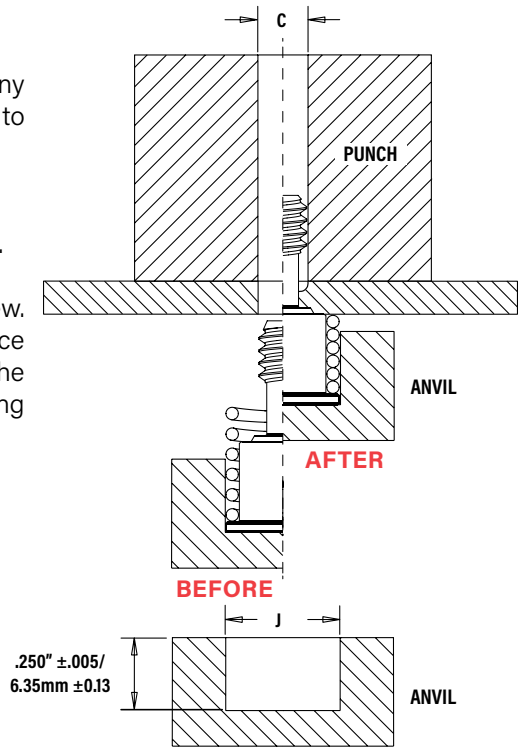
	Thread Code	Installation Tooling Dimensions (in.)		
		C	E	H
UNIFIED	440	.113 - .116	.270 - .280	.073 - .074
	632	.139 - .142	.308 - .318	.073 - .074

	Thread Code	Installation Tooling Dimensions (mm)		
		C	E	H
METRIC	M3	3.03 - 3.11	6.86 - 7.11	1.85 - 1.88
	M4	4.03 - 4.11	8.53 - 8.79	1.85 - 1.88

(1) Punches and anvils should be hardened.

HSCB™ FASTENER INTO HEAT SINK

1. Prepare properly sized mounting hole in heat sink. Do not perform any secondary operations such as deburring. If the hole is punched, be sure to install the fastener into the punch side of the hole.
2. Place the head of the screw into the recess of the installation anvil and position assembly into recessed magnetic punch.
3. Place the spring over the shoulder of the screw, maintaining concentricity.
4. Position the heat sink mounting hole over the screw.
5. Bring the heat sink down over the screw and onto the shoulder of the screw.
6. With installation punch and anvil surfaces parallel, apply a squeezing force to the heat sink and the head of the screw. The squeezing action forces the displacer of the screw into the heat sink, causing it to reduce the mounting hole diameter and captivate the screw and spring.



PEMSERTER® Installation Tooling(1)

	Thread Code	Installation Tooling Dimensions (in.)		Anvil Part Number	Punch Part Number
		C	J		
UNIFIED	440	.113 - .116	.322 - .324	8018043	970200006300
	632	.139 - .142	.362 - .364	8018044	970200007300

	Thread Code	Installation Tooling Dimensions (mm)		Anvil Part Number	Punch Part Number
		C	J		
METRIC	M3	3.03 - 3.11	8.43 - 8.48	8018045	970200229300

(1) Punches and anvils should be hardened.

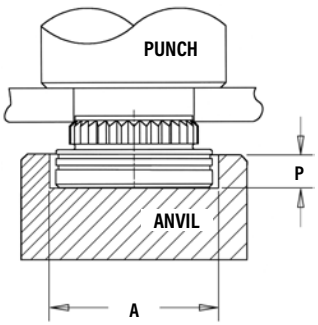
HSR™ NUT/STANDOFF

1. Prepare properly sized mounting hole in board.
2. Place fastener into the anvil hole and place the mounting hole over the shank of the fastener as shown in drawing.
3. With installation punch and anvil surfaces parallel, apply squeezing force until shoulder contacts the board.

PEMSERTER® Installation Tooling(1)

	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A	P ±.005		
UNIFIED	HSR-440	.228 - .231	.115	975200846300	975200048
	HSR-632	.290 - .293	.115	975200849300	975200048

	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A	P ±0.13		
METRIC	HSR-M3	5.8 - 5.86	2.92	975200846300	975200048



(1) Punches and anvils should be hardened.

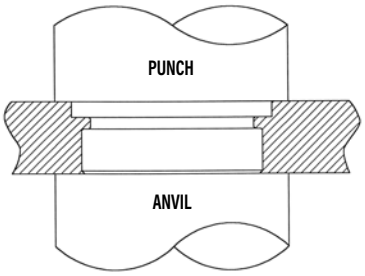
FINAL ASSEMBLY

Once the screw and spring are captivated, assemble the heat sink to the circuit board by tightening the screw into the receptacle nut or standoff until the audible "click" is heard. The screw will continue to rotate, but will no longer be engaged in the threads or continue to actively tighten.

CAPTIVE PANEL SCREW INSTALLATION

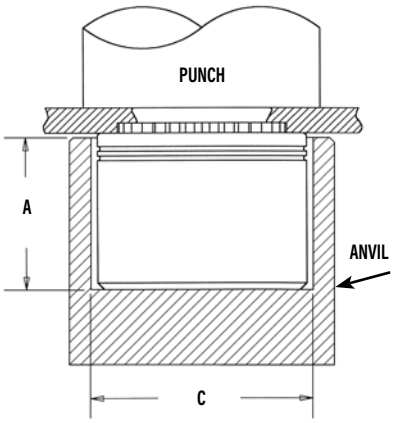
PR10™ FASTENERS

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into the mounting hole.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the retainer is flush in the sheet.



N10™ FASTENERS

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into recessed anvil, and place workpiece (preferably the punch side) over shank of fastener.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the shoulder of the nut comes in contact with the sheet material.



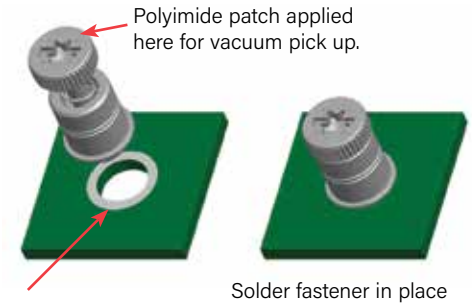
PEMSERTER® Installation Tooling(1)

	Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) C ±.002	Anvil Part Number	Punch Part Number
UNIFIED	440	.225	.298	8006124	975200048
	632	.225	.329	8006735	975200048
	832	.225	.361	8006736	975200048
	032	.225	.392	8006174	975200048

	Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) C ±0.05	Anvil Part Number	Punch Part Number
METRIC	M3	5.72	7.57	8006124	975200048
	M4	5.72	9.17	8006736	975200048
	M5	5.72	9.6	8006174	975200048

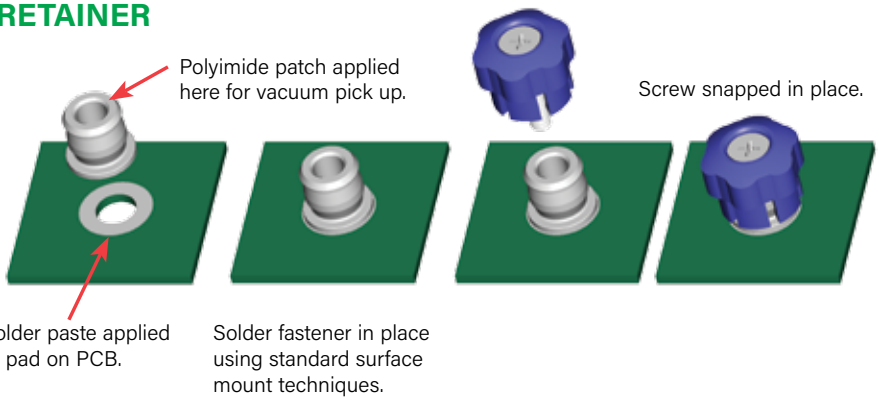
(1) Punches and anvils should be hardened.

SMTPFLSM™ CAPTIVE PANEL SCREWS



Installs in retracted/unfastened position

SMTPF™ RETAINER



CAPTIVE PANEL SCREW PERFORMANCE DATA[1]

PF11™/PF12™/PF11M™/PF12M™/PEM C.A.P.S.® FASTENERS

UNIFIED

Type	Thread Code	Test Sheet Material			
		Aluminum		Cold-Rolled Steel	
		Installation (lbs.)	Retainer Pushout (lbs.)	Installation (lbs.)	Retainer Pushout (lbs.)
PF11 PF12	440	1500	80	2500	145
	632	2000	95	3500	150
	832	3000	100	4500	160
	032	3000	100	4500	160
	0420	3500	105	5000	195

METRIC

Type	Thread Code	Test Sheet Material			
		Aluminum		Cold-Rolled Steel	
		Installation (kN)	Retainer Pushout (N)	Installation (kN)	Retainer Pushout (N)
PF11 PF12	M3	6.7	355	11.1	645
	M4	13.3	445	20	710
	M5	13.3	445	20	710
	M6	15.6	465	22.2	865

PF11MF™ FASTENERS

UNIFIED

Type	Thread Code	Installation (lbs.)	Retainer Pullout (lbs.)
PF11MF	440	250	81
	632	300	175
	832	350	180
	032	350	180
	0420	400	200

METRIC

Type	Thread Code	Installation (kN)	Retainer Pullout (N)
PF11MF	M3	1.1	360
	M4	1.5	800
	M5	1.5	800
	M6	2	890

PF11MW™ FASTENERS

UNIFIED

Type	Thread Code	Test Sheet Material	
		.060" Cold-rolled Steel	
		Swaging Force (lbs.)	Retainer Pullout (lbs.)
PF11MW	440	350	112
	632	400	138
	832	700	202
	032	700	202
	0420	900	212

METRIC

Type	Thread Code	Test Sheet Material	
		1.52mm Cold-rolled Steel	
		Swaging Force (N)	Retainer Pullout (N)
PF11MW	M3	1557	499
	M3.5	1779	612
	M4	3114	897
	M5	3114	897
	M6	4003	945

PFHV™ FASTENERS

UNIFIED

Type	Thread Code	Test Sheet Material			
		Aluminum		Cold-Rolled Steel	
		Installation (lbs.)	Retainer Pushout (lbs.)	Installation (lbs.)	Retainer Pushout (lbs.)
PFHV	440	1700	108	2200	118
	632	1850	117	2400	128
	832	2100	134	2700	147

METRIC

Type	Thread Code	Test Sheet Material			
		Aluminum		Cold-Rolled Steel	
		Installation (kN)	Retainer Pushout (N)	Installation (kN)	Retainer Pushout (N)
PFHV	M3	8.1	516	10.5	564
	M3.5	8.8	561	11.4	614
	M4	9.4	599	12.1	656

(1) Published installation forces are for general reference. Actual set-up and confirmation of complete installation should be made by observing proper seating of fastener as described in the installation steps. Other performance values reported are averages when all proper installation parameters and procedures are followed. Variations in mounting hole size, sheet material, and installation procedure may affect performance. Performance testing this product in your application is recommended. We will be happy to provide technical assistance and/or samples for this purpose.

CAPTIVE PANEL SCREW PERFORMANCE DATA(1)

PF7M™ FASTENERS

	Type	Thread Code	Rec. Tightening Torque (in. lbs.) (2)	Min. Screw Tensile (lbs.)	Test Sheet Material			
					Aluminum		Cold-rolled Steel	
					Installation (lbs.)	Retainer Pushout (lbs.)	Installation (lbs.)	Retainer Pushout (lbs.)
UNIFIED	PF7M	440	4.5	580	1500	80	2500	145
	PF7M	632	8.6	855	2000	95	3500	150
	PF7M	832	15.6	1300	3000	100	4500	160

	Type	Thread Code	Rec. Tightening Torque (N • m) (2)	Min. Screw Tensile (N)	Test Sheet Material			
					5052-H34 Aluminum		Cold-rolled Steel	
					Installation (kN)	Retainer Pushout (N)	Installation (kN)	Retainer Pushout (N)
METRIC	PF7M	M3	0.66	2900	6.7	355	11.1	645
	PF7M	M4	1.57	5010	13.3	445	20	710

PF7MF™ FASTENERS

	Type	Thread Code	Rec. Tightening Torque (in. lbs.) (2)	Min. Screw Tensile (lbs.)	Installation (lbs.)	Retainer Pullout (lbs.)
UNIFIED	PF7MF	440	4.5	580	250	81
	PF7MF	632	8.6	855	300	175
	PF7MF	832	15.6	1300	350	180

	Type	Thread Code	Rec. Tightening Torque (N•m) (2)	Min. Screw Tensile (N)	Installation (kN)	Retainer Pullout (N)
METRIC	PF7MF	M3	0.66	2900	1.1	360
	PF7MF	M4	1.57	5010	1.5	800

PF30™/PF31™/PF32™ FASTENERS

	Type	Thread Code	Test Sheet Material			
			Aluminum		Cold-Rolled Steel	
			Installation (lbs.)	Retainer Pushout (lbs.)	Installation (lbs.)	Retainer Pushout (lbs.)
UNIFIED	PF30	440	2200	64	5000	90
	PF31	440	2200	105	5000	110
	PF32	440	2200	185	5000	300
	PF30	632	2400	66	5500	90
	PF31	632	2400	105	5500	130
	PF32	632	2400	190	5500	300
	PF30	832	2800	68	6000	90
	PF31	832	2800	110	6000	130
	PF32	832	2800	200	6000	300
	PF30	032	3500	72	8000	95
	PF31	032	3500	150	8000	160
	PF32	032	3500	260	8000	425
	PF32	0420	4300	320	12000	450

	Type	Thread Code	Test Sheet Material			
			Aluminum		Cold-Rolled Steel	
			Installation (kN)	Retainer Pushout (N)	Installation (kN)	Retainer Pushout (N)
METRIC	PF30	M3	9.8	285	22.2	400
	PF31	M3	9.8	465	22.2	489
	PF32	M3	9.8	823	22.2	1334
	PF30	M4	12.5	302	26.7	400
	PF31	M4	12.5	489	26.7	578
	PF32	M4	12.5	890	26.7	1334
	PF30	M5	15.6	320	35.6	423
	PF31	M5	15.6	667	35.6	712
	PF32	M5	15.6	1156	35.6	1890
	PF32	M6	19.1	1423	53.4	2002

(1) Published installation forces are for general reference. Actual set-up and confirmation of complete installation should be made by observing proper seating of fastener as described in the installation steps. Other performance values reported are averages when all proper installation parameters and procedures are followed. Variations in mounting hole size, sheet material, and installation procedure may affect performance. Performance testing this product in your application is recommended. We will be happy to provide technical assistance and/or samples for this purpose.

(2) Torque values shown will produce a preload of 70% minimum tensile with nut factor "k" equal to .1

CAPTIVE PANEL SCREW PERFORMANCE DATA(1)

PF50™/PF51™/PF52™/PF60™/PF61™/PF62™ FASTENERS

UNIFIED

Type	Thread Code	Test Sheet Material			
		Aluminum		Cold-Rolled Steel	
		Installation (lbs.)	Retainer Pushout (lbs.)	Installation (lbs.)	Retainer Pushout (lbs.)
PF50/PF60	440	2200	64	5000	90
PF51/PF61	440	2200	105	5000	110
PF52/PF62	440	2200	185	5000	300
PF50/PF60	632	2400	66	5500	90
PF51/PF61	632	2400	105	5500	130
PF52/PF62	632	2400	190	5500	300
PF50/PF60	832	2800	68	6000	90
PF51/PF61	832	2800	110	6000	130
PF52/PF62	832	2800	200	6000	300
PF50/PF60	032	3500	72	8000	95
PF51/PF61	032	3500	150	8000	160
PF52/PF62	032	3500	260	8000	425
PF52/PF62	0420	4300	320	12000	450

METRIC

Type	Thread Code	Test Sheet Material			
		Aluminum		Cold-Rolled Steel	
		Installation (kN)	Retainer Pushout (N)	Installation (kN)	Retainer Pushout (N)
PF50/PF60	M3	9.8	285	22.2	400
PF51/PF61	M3	9.8	465	22.2	489
PF52/PF62	M3	9.8	823	22.2	1334
PF50/PF60	M3.5	10.7	294	24.4	400
PF51/PF61	M3.5	10.7	465	24.4	578
PF52/PF62	M3.5	10.7	845	24.4	1334
PF50/PF60	M4	12.5	302	26.7	400
PF51/PF61	M4	12.5	489	26.7	578
PF52/PF62	M4	12.5	890	26.7	1334
PF50/PF60	M5	15.6	320	35.6	423
PF51/PF61	M5	15.6	667	35.6	712
PF52/PF62	M5	15.6	1156	35.6	1890
PF52/PF62	M6	19.1	1423	53.4	2002

PFC4™ FASTENERS

UNIFIED

Type	Thread Code	Test Sheet Material	
		304 Stainless Steel	
		Installation (lbs.)	Retainer Pushout (lbs.)
PFC4	440	9100	350
	632	10300	400
	832	10800	450
	032	11800	550

METRIC

Type	Thread Code	Test Sheet Material	
		304 Stainless Steel	
		Installation (kN)	Retainer Pushout (N)
PFC4	M3	40.5	1557
	M4	48	2002
	M5	52.5	2447

PFC2™/PFS2™/PFC2P™ FASTENERS

UNIFIED

Type	Thread Code	Test Sheet Material			
		Aluminum		Cold-Rolled Steel	
		Installation (lbs.)	Retainer Pushout (lbs.)	Installation (lbs.)	Retainer Pushout (lbs.)
PFC2 PFS2 PFC2P	440	2400	240	3000	300
	632	2700	275	3500	350
	832	2900	300	3800	400
	032	3000	400	4000	500
	0420	3500	400	5000	600

METRIC

Type	Thread Code	Test Sheet Material			
		Aluminum		Cold-Rolled Steel	
		Installation (kN)	Retainer Pushout (N)	Installation (kN)	Retainer Pushout (N)
PFC2 PFS2 PFC2P	M3	10.7	1068	13.3	1334
	M4	12.9	1334	16.9	1779
	M5	13.3	1779	17.8	2224
	M6	15.6	1779	22.2	2669

PTL2™/PSL2™ FASTENERS

UNIFIED

Type	Test Sheet Material			
	Aluminum		Cold-Rolled Steel	
	Installation (lbs.)	Retainer Pushout (lbs.)	Installation (lbs.)	Retainer Pushout (lbs.)
PTL2 PSL2	3000	400	4000	500

METRIC

Type	Test Sheet Material			
	Aluminum		Cold-Rolled Steel	
	Installation (kN)	Retainer Pushout (N)	Installation (kN)	Retainer Pushout (N)
PTL2 PSL2	13.3	1779	17.8	2224

(1) Published installation forces are for general reference. Actual set-up and confirmation of complete installation should be made by observing proper seating of fastener as described in the installation steps. Other performance values reported are averages when all proper installation parameters and procedures are followed. Variations in mounting hole size, sheet material, and installation procedure may affect performance. Performance testing this product in your application is recommended. We will be happy to provide technical assistance and/or samples for this purpose.

CAPTIVE PANEL SCREW PERFORMANCE DATA(1)

SCBR™ FASTENERS

	Type	Thread Code	Rec. Tightening Torque (in. lbs.) (2)	Min. Screw Tensile (lbs.)	Test Sheet Material			
					5052-H34 Aluminum		Cold-rolled Steel	
					Installation (lbs.)	Pushout (lbs.)	Installation (lbs.)	Pushout (lbs.)
UNIFIED	SCBR	440	5	590	1900	130	2600	145
	SCBR	632	9	990	2000	175	3500	200
	SCBR	832	17	1460	2250	225	3825	260

	Type	Thread Code	Rec. Tightening Torque (N • m) (2)	Min. Screw Tensile (N)	Test Sheet Material			
					5052-H34 Aluminum		Cold-rolled Steel	
					Installation (kN)	Pushout (N)	Installation (kN)	Pushout (N)
METRIC	SCBR	M3	0.74	3400	8	580	12	650
	SCBR	M4	1.7	5700	10	1000	17	1150

SCB™/SCBJ™ FASTENERS

	Type	Thread Code	Rec. Tightening Torque (in. lbs.) (2)	Min. Screw Tensile (lbs.)	Test Sheet Material			
					5052-H34 Aluminum		Cold-rolled Steel	
					Installation (lbs.)	Pushout (lbs.)	Installation (lbs.)	Pushout (lbs.)
UNIFIED	SCB / SCBJ	440	5	590	1900	130	2600	145
	SCB / SCBJ	632	9	990	2000	175	3500	200

	Type	Thread Code	Rec. Tightening Torque (N • m) (2)	Min. Screw Tensile (N)	Test Sheet Material			
					5052-H34 Aluminum		Cold-rolled Steel	
					Installation (kN)	Pushout (N)	Installation (kN)	Pushout (N)
METRIC	SCB / SCBJ	M3	0.74	3400	8	580	12	650
	SCB / SCBJ	M4	1.7	5700	10	1000	17	1150

HSCB™ FASTENERS

	Type	Thread Code	Test Sheet Material			
			Aluminum		Cold-rolled Steel	
			Installation (lbs.)	Pushout (lbs.)	Installation (lbs.)	Pushout (lbs.)
UNIFIED	HSCB	440	1900	60	2600	80
	HSCB	632	2000	90	3500	120

	Type	Thread Code	Test Sheet Material			
			Aluminum		Cold-rolled Steel	
			Installation (kN)	Pushout (N)	Installation (kN)	Pushout (N)
METRIC	HSCB	M3	8	265	12	355

HSR™ FASTENERS

	Type	Thread Code	Test Sheet Material	
			.060" FR-4 Panel	
			Installation (lbs.)	Pushout (lbs.)
UNIFIED	HSR	440	400	65
	HSR	632	500	80

	Type	Thread Code	Test Sheet Material	
			1.5mm FR-4 Panel	
			Installation (kN)	Pushout (N)
METRIC	HSR	M3	2.2	290

(1) Published installation forces are for general reference. Actual set-up and confirmation of complete installation should be made by observing proper seating of fastener as described in the installation steps. Other performance values reported are averages when all proper installation parameters and procedures are followed. Variations in mounting hole size, sheet material, and installation procedure may affect performance. Performance testing this product in your application is recommended. We will be happy to provide technical assistance and/or samples for this purpose.

(2) Torque values shown will produce a preload of 70% minimum tensile (125 ksi / 935 MPa) with nut factor "k" equal to .1

CAPTIVE PANEL SCREW PERFORMANCE DATA[1]

PR10™ FASTENERS

UNIFIED				
Type	Thread Code	Test Sheet Material		
		Aluminum	Cold-Rolled Steel	
		Installation (lbs.)	Installation (lbs.)	
PR10	440	2100	3000	
	632	2100	3000	
	832	2100	3600	
	032	2400	4200	

METRIC			
Type	Thread Code	Test Sheet Material	
		Aluminum	Cold-Rolled Steel
		Installation (kN)	Installation (kN)
PR10	M3	9.3	13.3
	M4	9.3	16
	M5	10.7	18.7

N10™ FASTENERS

UNIFIED					
Type	Thread Code	Test Sheet Material			
		Aluminum		Cold-Rolled Steel	
		Installation (lbs.)	Pushout (lbs.)	Installation (lbs.)	Pushout (lbs.)
N10	440	2500	95	3600	130
	632	2500	105	4000	145
	832	3000	110	5000	180
	032	3500	120	6300	200

METRIC					
Type	Thread Code	Test Sheet Material			
		Aluminum		Cold-Rolled Steel	
		Installation (kN)	Pushout (N)	Installation (kN)	Pushout (N)
N10	M3	11.1	423	16	578
	M4	13.3	489	22.2	800
	M5	15.6	534	28	890

REELFAST® SMTPFLSM™ FASTENERS[2]

UNIFIED				
Type and Thread Size	Min. Tensile Strength (lbs.)	Rec. Tightening Torque (in. lbs.) [3]	Test Sheet Material	
			.060" P.C. Board	
			Pull-off (lbs.) [4]	
SMTPFLSM-440	556	4.4	100	
SMTPFLSM-632	724	7.0	105	

METRIC				
Type and Thread Size	Min. Tensile Strength (N)	Rec. Tightening Torque (N·m) [3]	Test Sheet Material	
			1.5 mm P.C. Board	
			Pull-off (N) [4]	
SMTPFLSM-M3	2900	0.61	445	
SMTPFLSM-M3.5	3269	0.8	465	

REELFAST® SMTPR™ RETAINER[2]

Part Number	Test Sheet Material	
	.062" Single Layer RF-4	
	Pushout (lbs.)	Pushout (N)
SMTPR-6-1ET	161.4	718

TESTING CONDITIONS FOR SMTPFLSM FASTENERS AND SMTPR RETAINER

Oven	Quad ZCR convection oven
High Temp	473˚F / 245˚C
Spokes	2 Spoke Pattern
Board Finish	62% Sn, 38% Pb
Screen Printer	Ragin Manual Printer
Vias	None
Paste	Amtech NC559LF Sn96.5/3.0Ag/0.5Cu (SAC305) **(SMTPR)** Alpha CVP-390 Sn96.5/3.0Ag/0.5Cu (SAC305) **(SMTPFLSM)**
Stencil	.0067" / 0.17 mm thick **(SMTPR)** .005" / 0.13 mm thick **(SMTPFLSM)**

PFK™ FASTENERS

UNIFIED				
Type	Thread Code	Test Sheet Material		
		FR-4 Fiberglass		
		Installation (lbs.)	Pushout (lbs.)	
PFK	440	250	55	
	632	400	60	

METRIC			
Type	Thread Code	Test Sheet Material	
		FR-4 Fiberglass	
		Installation (kN)	Pushout (N)
PFK	M3	1.1	245

(1) Published installation forces are for general reference. Actual set-up and confirmation of complete installation should be made by observing proper seating of fastener as described in the installation steps. Other performance values reported are averages when all proper installation parameters and procedures are followed. Variations in mounting hole size, sheet material, and installation procedure may affect performance. Performance testing this product in your application is recommended. We will be happy to provide technical assistance and/or samples for this purpose.

(2) With lead-free paste. Average values of 30 test points. The data presented here is for general comparison purposes only. Actual performance is dependent upon application variables. We will be happy to provide samples for you to install. If required, we can also test your installed hardware and provide you with the performance data specific to your application.

(3) Torque values shown will produce a preload of 70% minimum tensile with a nut factor "k" equal to .1.

(4) Failure occurred at the solder joint. Screw retention strength is greater than the retainer.

MOST COMMONLY USED AND RECOMMENDED CAPTIVE MATING HARDWARE FOR USE WITH CAPTIVE PANEL SCREWS

SELF-CLINCHING NUTS MATED WITH CAPTIVE PANEL SCREW

(See PEM® Bulletin CL)

- S/CLS/SS/CLSS provide load-bearing threads in thin sheets with high pushout and torque-out resistance.
- SP nuts provide load-bearing threads in stainless steel sheets with a hardness of HRB 90 (Rockwell "B" scale) / HB 192 (Hardness Brinell) or less.
- CLA aluminum nuts are recommended for aluminum sheets with a hardness of HRB 50 (Rockwell "B" scale) / HB 89 (Hardness Brinell) or less.
- SMPS nuts are for installation into ultra-thin sheets and can be mounted closer to the edge of a sheet than other self-clinching nuts.
- SL nuts have a unique TRI-DENT® locking feature which meets demanding locking performance requirements.

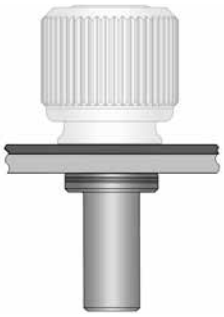
AS/AC/A4 FLOATING NUTS MATED WITH CAPTIVE PANEL SCREW

(See PEM® Bulletin ALA)

- AS (carbon steel) and AC (300 series stainless steel) floating nuts install into sheets with hardness up to HRB 70 / HB 125 on the Rockwell "B" scale.
- A4 (400 series stainless steel) floating nuts install into sheets with hardness up to HRB 88 / HB 183 on the Rockwell "B" scale.
- Thread locking versions also available.

B/BS BLIND NUTS MATED WITH CAPTIVE PANEL SCREW

(See PEM® Bulletin B)



- B/BS nuts are used in applications requiring closed thread ends.
- Provides barrier to protect threads against foreign matter.
- Protects internal components from intrusion of screws.

F FLUSH NUTS MATED WITH CAPTIVE PANEL SCREW

(See PEM® Bulletin F)

- Designed to be completely flush in sheets as thin as .060"/1.5mm.
- Ideal for applications where a thin sheet requires load-bearing threads but still must remain smooth, with no protrusions on either surface.
- The hexagonal head ensures high axial and torsional strength.
- F nuts can be ordered to conform to US NASM45938/4 specifications.

PC BOARD NUTS MATED WITH CAPTIVE PANEL SCREW

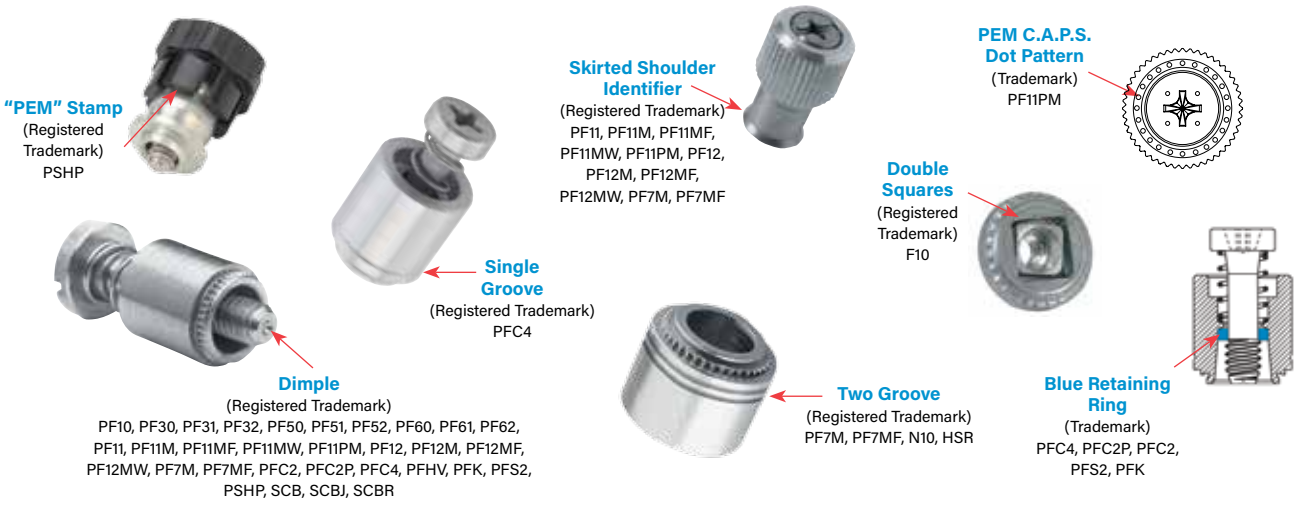
(See PEM® Bulletin K)

- KF2/KFS2 broaching nuts utilize specially formed axially groves that can be mounted into a hole to provide a permanent, strong, threaded attachment point in PC boards.
- SMTSO surface mount nuts also available.

For the best mating hardware for your application please contact our Tech Support line or your local representative.

PEM® FASTENER IDENTIFICATION AND TRADEMARKS

To be sure that you are getting genuine PEM® brand fasteners, look for the unique PEM product markings and identifiers.



These panel fastener styles are protected by U.S. patents:

No. 6,814,530 | No. D656,392S | No. D603,693S

Fastener drawings and models are available at www.pemnet.com

All PEM® products meet our stringent quality standards. If you require additional industry or other specific quality certifications, special procedures and/or part numbers are required. Please contact your local sales office or representative for further information.

Regulatory compliance information is available in Technical Support section of our website. Specifications subject to change without notice. See our website for the most current version of this bulletin.

PennEngineering®

PEM®

North America: Danboro, PA USA • E-mail: info@pemnet.com • Tel: +1-215-766-8853 • Fax: +1-215-766-0143 • 800-237-4736 (USA Only)
Europe: Galway, Ireland • E-mail: europe@pemnet.com • Tel: +353-91-751714 • Fax: +353-91-753541
Asia/Pacific: Singapore • E-mail: singapore@pemnet.com • Tel: +65-6-745-0660 • Fax: +65-6-745-2400
Shanghai, China • E-mail: china@pemnet.com • Tel: +86-21-5868-3688 • Fax: +86-21-5868-3988

Visit our PEMNET™ Resource Center at www.pemnet.com

Technical support e-mail: techsupport@pemnet.com