

PennEngineering®

PEM® CAPTIVE PANEL SCREWS



BULLETIN









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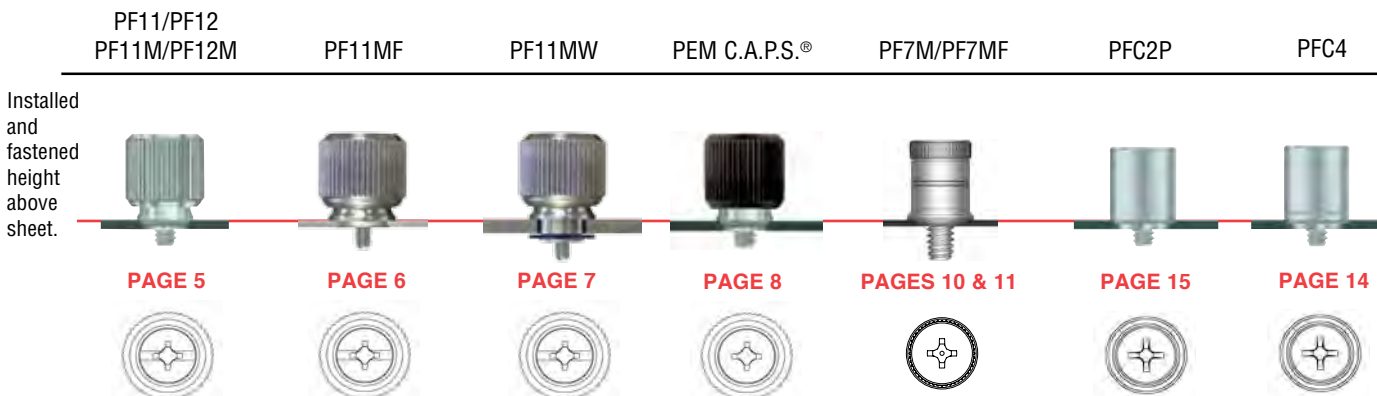
612  
REV 213

# 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.

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## HEIGHT COMPARISON GUIDE AND STANDARD DRIVER RECESS



# CAPTIVE PANEL SCREW SELECTOR GUIDE

PEM® Panel Fastener Type	Page No.	Application Requires:													
		UL Approved	High corrosion resistance	Spring loaded	Actuation		Installs into				Multiple screw lengths	Flush mounted top side	Available in black	Available in custom colors	Includes anti cross-threading feature
					Tool	Hand	Any thin material	Printed circuit boards	Stainless steel sheet	Painted panels					
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				•						•				
PF10	20-21	•	•		•							•	•		
ReelFast PF	22-23				•	•		•			•		•(1)	•	
PFK	24		•	•	•	•		•			•		•		

(1) Standard color is black.

PFC2/PFS2  
PFK

PF50/PF51/PF52  
PF60/PF61/PF62

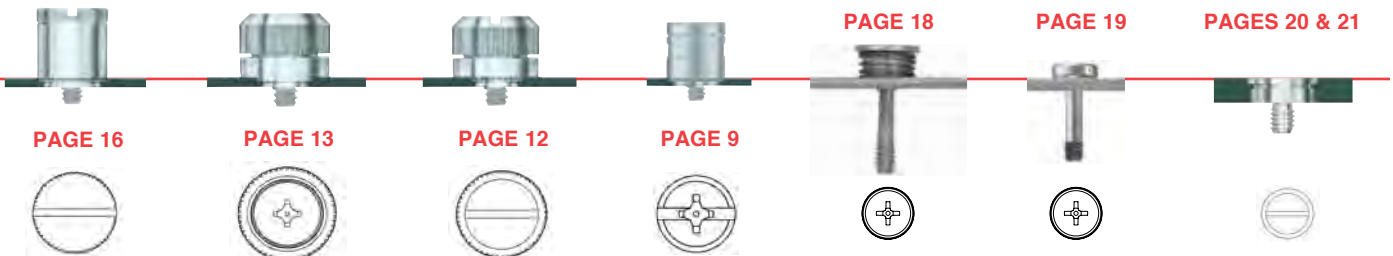
PF30/31/32

PFHV

SCBR

SCB/SCBJ

PF10



# PEM® TYPE PF11™/PF12™ CAPTIVE PANEL SCREWS

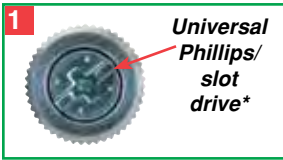
The PEM® Type PF11/PF12 family of panel fasteners provide design flexibility by offering three styles of installation types, each having the same profile or look above the sheet or panel into which it is installed. The various mounting types include self-clinching, flare-mounted, and floating styles. 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). Cap selection is dependent upon your service access and/or color requirements.



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. 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.*



\* 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®/Torx Plus®**  
(Optional)



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

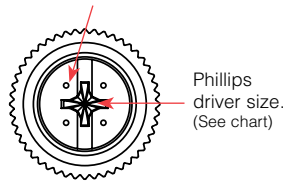


**Type PF11**  
Knurled Cap  
Patented

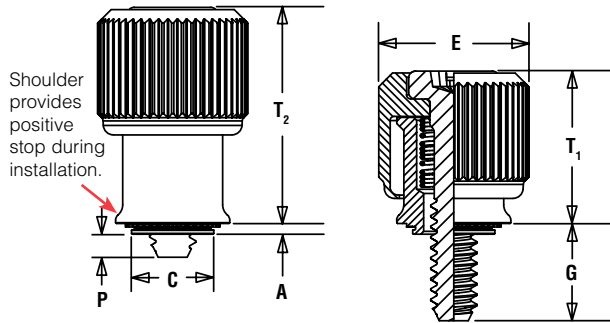


**Type PF12**  
Smooth Cap

Dimples on head designate metric thread.



Phillips driver size. (See chart)

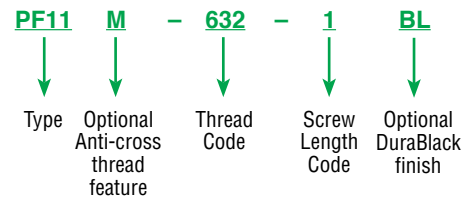


Shoulder provides positive stop during installation.

Min. Radial Float - .020" / 0.51 mm total.

<b>Threads:</b> External, ASME B1.1, 2A / ASME B1.13M, 6g	
<b>Material:</b> Knob: Aluminum Retainer: Heat-treated Carbon Steel Screw (Type PF11/PF12): 400 Series Stainless Steel Screw (Type PF11M/PF12M): Heat-treated Carbon Steel <sup>(1)</sup> Spring: 300 Series Stainless Steel	
<b>Finish:</b> Knob: Natural Finish Retainer: Bright nickel over copper flash per ASTM B689 Screw (Type PF11/PF12): Passivated and/or tested per ASTM A380 Screw: (Type PF11M/PF12M): Zinc plated, 5µm, colorless <sup>(3)</sup>	<b>Optional Finish (BL):</b> Knob: Black anodize <sup>(2)</sup> Screw: Black nitride <sup>(2)</sup>
<b>For use in sheet hardness:</b> HRB 80 or less (Hardness Rockwell "B" Scale) / HB 150 or less (Hardness Brinell)	

### PART NUMBER DESIGNATION



Installation Data page 26. Performance Data page 34.

All dimensions are in inches.

UNIFIED	Thread Size	Type		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 <sub>1</sub> Nom.	T <sub>2</sub> Nom.	Driver Size	Min. Dist. Hole Ø To Edge
		Knurled Cap	Smooth Cap													
.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.

METRIC	Thread Size x Pitch	Type		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 <sub>1</sub> Nom.	T <sub>2</sub> Nom.	Driver Size	Min. Dist. Hole Ø To Edge
		Knurled Cap	Smooth Cap													
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.

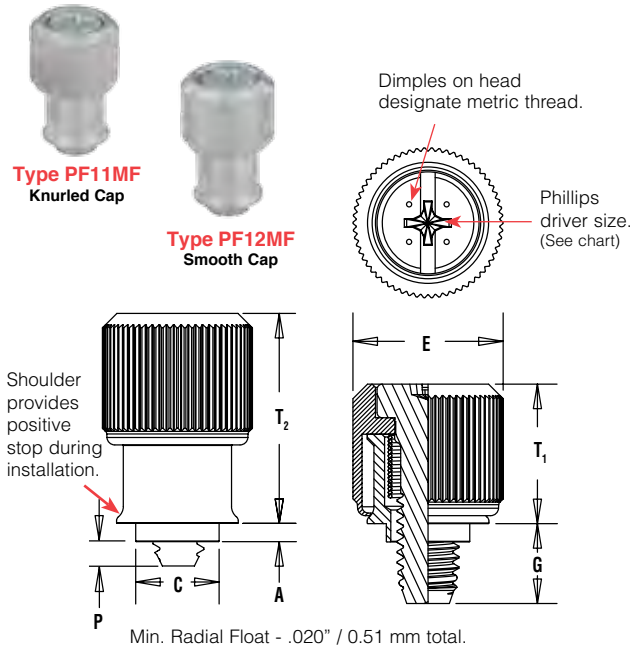
(2) "BL" suffix will be added to part number to designate DuraBlack™ finish.

(3) See PEM Technical Support section of our web site ([www.pemnet.com](http://www.pemnet.com)) for related plating standards and specifications.



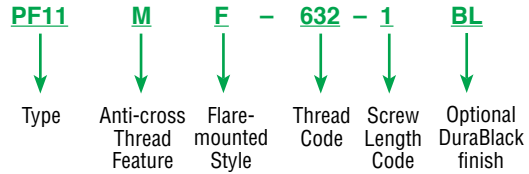


# PEM® TYPE PF11MF™ FLARE-MOUNTED CAPTIVE PANEL SCREWS



<b>Threads:</b> External, ASME B1.1, 2A / ASME B1.13M, 6g <sup>(1)</sup>
<b>Material:</b> Knob: Aluminum Retainer: Aluminum Screw: Heat-treated Carbon Steel Spring: 300 Series Stainless Steel
<b>Finish:</b> Knob: Natural Finish Retainer: Natural Finish Screw: Zinc plated, 5µm, colorless <sup>(3)</sup>
<b>Optional Finish (BL):</b> Knob: Black anodize <sup>(2)</sup> Screw: Black nitride <sup>(2)</sup>

## PART NUMBER DESIGNATION



Installation Data page 26. Performance Data page 34.

All dimensions are in inches.

UNIFIED	Thread Size	Type		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 <sub>1</sub> Nom.	T <sub>2</sub> Nom.	Driver Size
		Knurled Cap	Smooth Cap												
	.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.

METRIC	Thread Size x Pitch	Type		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 <sub>1</sub> Nom.	T <sub>2</sub> Nom.	Driver Size
		Knurled Cap	Smooth Cap												
	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			

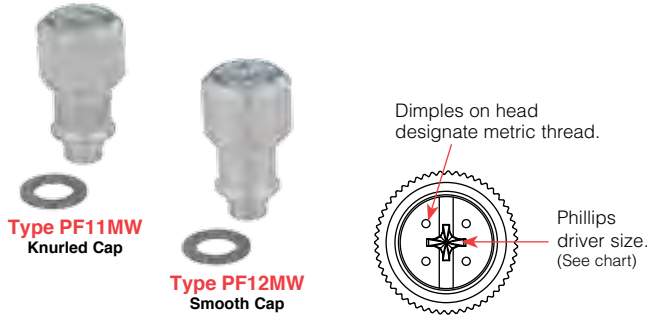
(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

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

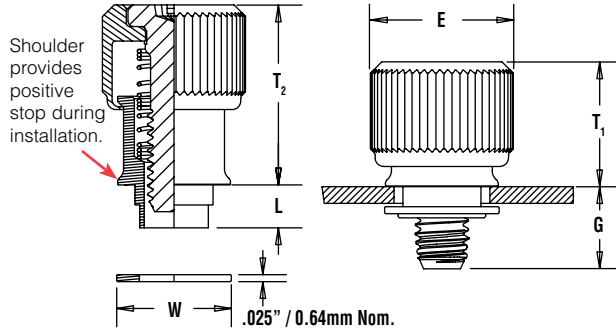
(3) See PEM Technical Support section of our web site ([www.pemnet.com](http://www.pemnet.com)) for related plating standards and specifications.



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

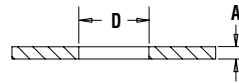


<b>Threads:</b> External, ASME B1.1, 2A / ASME B1.13M, 6g <sup>(1)</sup>	
<b>Material:</b> Knob: Aluminum Retainer: Aluminum Screw: Heat-treated Carbon Steel Spring: 300 Series Stainless Steel Washer: 300 Series Stainless Steel	
<b>Finish:</b> Knob: Natural Finish Retainer: Natural Finish Screw: Zinc plated, 5µm, colorless <sup>(3)</sup>	<b>Optional Finish (BL):</b> Knob: Black anodize <sup>(2)</sup> Screw: Black nitride <sup>(2)</sup>

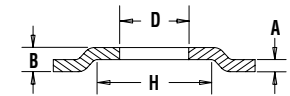


Installation Data page 27. Performance Data page 34.

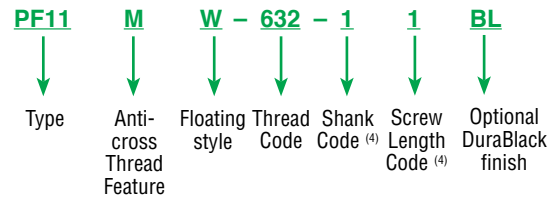
**PANEL CONFIGURATION 1**  
For applications where a space between mating panels is acceptable.



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



## PART NUMBER DESIGNATION



Type PF11MW panel fasteners are shipped with mating washers.

All dimensions are in inches.

UNIFIED	Thread Size	Type		Thread Code	Shank Code (4)	Screw Length Code (4)	A Max. Sheet Thickness	B Min.	D Hole Size In Sheet +0.03 -0.01	E ±0.10	G Nom.	H Min.	L Nom.	T <sub>1</sub> Nom.	T <sub>2</sub> Nom.	Driver Size	Min. Float	W Nom.
		Knurled Cap	Smooth Cap															
.112-40 (#4-40)	PF11MW	PF12MW	440	1	1	.063	.111	.250	.417	.230 .290	.375	.137	.310	.450	#1	.073	.312	
																		2
.138-32 (#6-32)	PF11MW	PF12MW	632	1	1	.063	.115	.283	.450	.290 .350	.413	.149	.450	.640	#2	.076	.344	
																		2
.164-32 (#8-32)	PF11MW	PF12MW	832	1	1	.063	.121	.346	.514	.290 .350	.469	.157	.450	.640	#2	.076	.407	
																		2
.190-32 (#10-32)	PF11MW	PF12MW	032	1	1	.063	.121	.346	.514	.290 .350	.469	.157	.450	.640	#2	.076	.407	
																		2
.250-20 (1/4-20)	PF11MW	PF12MW	0420	1	1	.063	.128	.413	.575	.350 .410	.531	.157	.530	.790	#3	.081	.468	
																		2

All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type		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 <sub>1</sub> Nom.	T <sub>2</sub> Nom.	Driver Size	Min. Float	W Nom.
		Knurled Cap	Smooth Cap															
M3 x 0.5	PF11MW	PF12MW	M3	1	1	1.6	2.82	6.35	10.59	5.84 7.37	9.52	3.48	7.87	11.43	#1	1.85	7.92	
																		2
M3.5 x 0.6	PF11MW	PF12MW	M3.5	1	1	1.6	2.92	7.19	11.43	7.37 8.89	10.49	3.78	11.43	16.26	#2	1.93	8.74	
																		2
M4 x 0.7	PF11MW	PF12MW	M4	1	1	1.6	3.07	8.79	13.06	7.37 8.89	11.91	3.99	11.43	16.26	#2	1.93	10.34	
																		2
M5 x 0.8	PF11MW	PF12MW	M5	1	1	1.6	3.07	8.79	13.06	7.37 8.89	11.91	3.99	11.43	16.26	#2	1.93	10.34	
																		2
M6 x 1	PF11MW	PF12MW	M6	1	1	1.6	3.25	10.49	14.61	8.89 10.41	13.48	3.99	13.46	20.07	#3	2.06	11.89	
																		2

(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 web site ([www.pemnet.com](http://www.pemnet.com)) for related plating standards and specifications.

(4) Other shank and screw lengths available.

# PEM® C.A.P.S.® CAPTIVE PANEL SCREWS

## Color Capabilities <sup>(1)</sup>

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

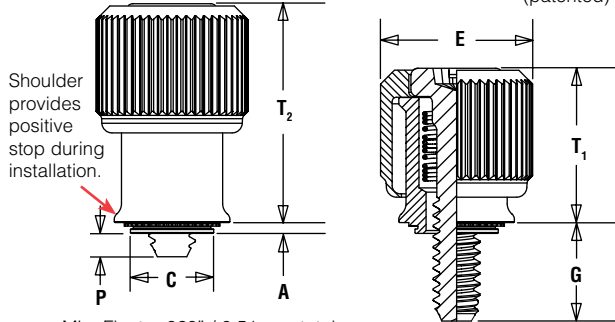
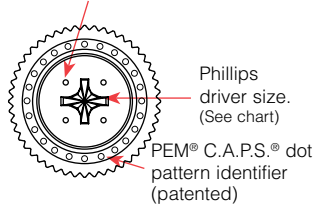


Patented.



Black = B  
(Standard)

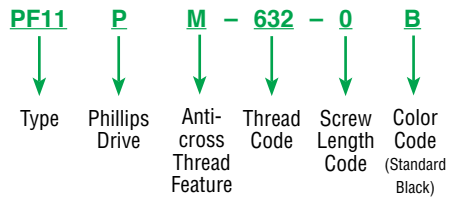
Dimples on head designate metric thread.



Installation Data page 26. Performance Data page 34.

<b>Threads:</b> External, ASME B1.1, 2A / ASME B1.13M, 6g <sup>(2)</sup>
<b>Material:</b> Knob: PC/ABS (UL 94V-0, halogen-free) <sup>(3)</sup> Retainer: Heat-treated Carbon Steel Screw: Heat-treated Carbon Steel Spring: 300 Series Stainless Steel
<b>Finish:</b> Retainer: CN - Bright nickel over copper flash per ASTM B689 Screw: Zinc plated, 5µm, colorless <sup>(4)</sup>
<b>For use in sheet hardness:</b> HRB 80 or less (Hardness Rockwell "B" Scale) HB 150 or less (Hardness Brinell)

## PART NUMBER DESIGNATION



All dimensions are in inches.

UNIFIED	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	P ± .025	T <sub>1</sub> Nom.	T <sub>2</sub> Nom.	Driver Size	Min. Dist. Hole Φ To Edge
		Knurled Cap													
.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.

METRIC	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	P ± 0.64	T <sub>1</sub> Nom.	T <sub>2</sub> Nom.	Driver Size	Min. Dist. Hole Φ To Edge
		Knurled Cap													
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 web site ([www.pemnet.com](http://www.pemnet.com)) for related plating standards and specifications.



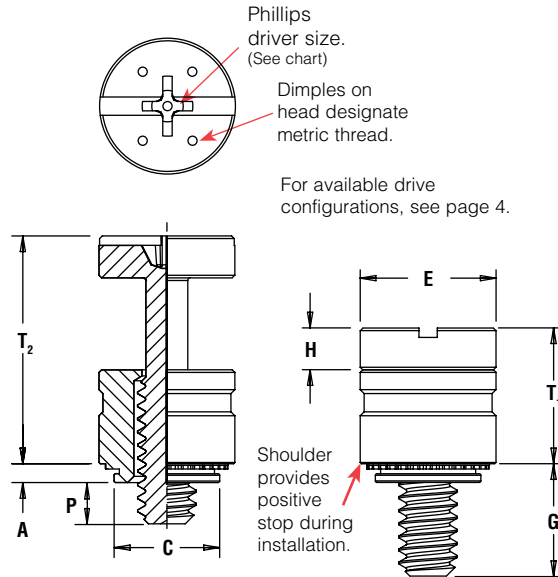


# PEM® TYPE PFHV™ CAPTIVE PANEL SCREWS

- 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.

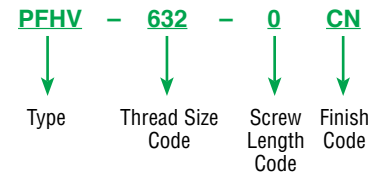


Patented



<b>Threads:</b> External, ASME B1.1, 2A / ASME B1.13M, 6g <sup>(1)</sup>
<b>Material:</b> Retainer: Carbon Steel Screw: Heat-treated Carbon Steel
<b>Finish:</b> Retainer: CN - Bright nickel over copper flash per ASTM B689 Screw: CN - Bright nickel over copper flash per ASTM B689 <sup>(1)</sup>
<b>For use in sheet hardness:</b> HRB 60 or less (Hardness Rockwell "B" Scale) HB 107 or less (Hardness Brinell)

## PART NUMBER DESIGNATION



Installation Data page 27. Performance Data page 34.

All dimensions are in inches.

UNIFIED	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 <sub>1</sub> Nom.	T <sub>2</sub> Nom.	Driver Size	Min. Dist. Hole $\Phi$ To Edge
	.112-40 (#4-40)	PFHV	440	0	1	.036	.036	.203	.202	.260	.216	.080	.000	.260	.436	#1
					.316						.095					
.138-32 (#6-32)	PFHV	632	0	1	.036	.036	.219	.218	.276	.234	.092	.000	.290	.484	#2	.23
										.359		.120				
.164-32 (#8-32)	PFHV	832	0	1	.036	.036	.252	.251	.309	.259	.111	.000	.335	.555	#2	.26
										.371		.106				

All dimensions are in millimeters.

METRIC	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 <sub>1</sub> Nom.	T <sub>2</sub> Nom.	Driver Size	Min. Dist. Hole $\Phi$ To Edge
	M3 x 0.5	PFHV	M3	M3	0	0.92	0.92	5.5	5.49	6.95	5.55	2.03	0	6.69	11.25	#1
1					7.56						1.9					
M3.5 x 0.6	PFHV	M3.5	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	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® TYPES PF7M™/PF7MF™ CAPTIVE PANEL SCREWS

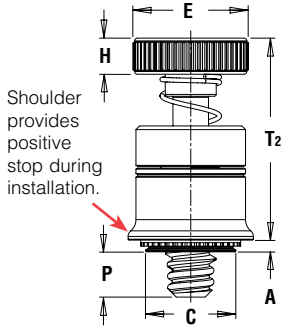
- Small, compact and low-profile design for limited access areas.
- MATHread® anti cross-thread technology. (See page 4 for more information).
- Installs flush on back side of panel.
- Type PF7M Self-clinching mounting design provides high pushout resistance.
- Type PF7M does not require special hole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



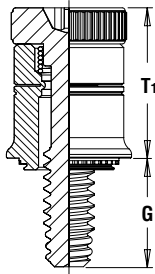
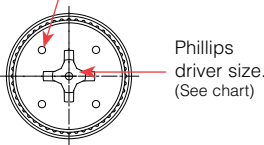
## TYPE PF7M™ SELF-CLINCHING CAPTIVE PANEL SCREWS



Patented.



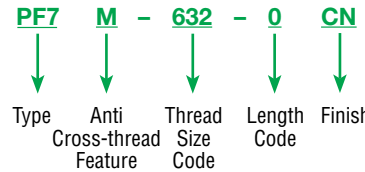
Dimples on head designate metric thread.



**NEW!**

<b>Threads:</b> External, ASME B1.1, 2A / ASME B1.13M, 6g <sup>(1)</sup>
<b>Material:</b> Retainer: Carbon Steel Screw: Heat-treated Carbon Steel Spring: 300 Series Stainless Steel
<b>Finish:</b> Retainer: CN - Bright nickel over copper flash per ASTM B689 Screw: CN - Bright nickel over copper flash per ASTM B689
<b>For use in sheet hardness:</b> HRB 60 or less (Hardness Rockwell "B" Scale) HB 107 or less (Hardness Brinell)

### PART NUMBER DESIGNATION



Installation Data page 28. Performance Data page 35.

All dimensions are in inches.

UNIFIED	Thread Size	Type	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 $\varnothing$ To Edge
		Fastener Material Steel														
	.112-40 (#4-40)	PF7M	440	0	.036	.036	.219	.218	.280	.100	.210	.000	.380	.550	#2	.28
				1							.270	.065				
	.138-32 (#6-32)	PF7M	632	0	.036	.036	.250	.249	.310	.100	.240	.000	.410	.610	#2	.29
				1							.300	.065				
	.164-32 (#8-32)	PF7M	832	0	.036	.036	.312	.311	.370	.120	.240	.000	.430	.630	#2	.33
				1							.300	.065				

All dimensions are in millimeters.

METRIC	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	H ±0.25	G ±0.64	P ±0.64	T1 Nom.	T2 Nom.	Driver Size	Min. Dist. Hole $\varnothing$ To Edge
		Fastener Material Steel														
	M3 x 0.5	PF7M	M3	0	0.92	0.92	5.56	5.54	7	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	9.4	3	6.1	0	10.92	16	#2	8.38
				1							7.62	1.65				

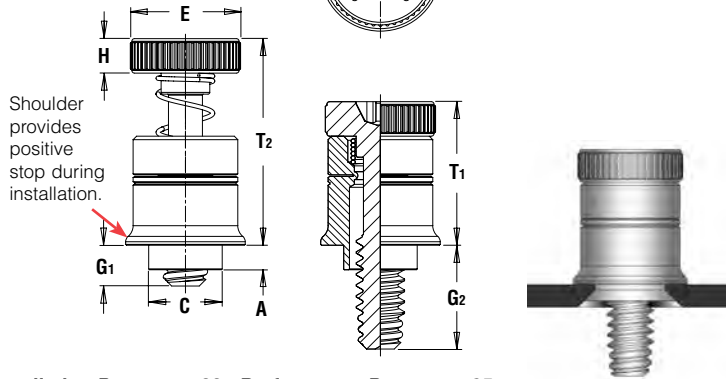
(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

# PEM® TYPE PF7M™/PF7MF™ CAPTIVE PANEL SCREWS

## TYPE PF7MF™ FLARE-MOUNTED CAPTIVE PANEL SCREWS



Patented.



Dimples on head designate metric thread.

**NEW!**

Phillips driver size. (See chart)

Shoulder provides positive stop during installation.

### Threads:

External, ASME B1.1, 2A / ASME B1.13M, 6g <sup>(1)</sup>

### Material:

Retainer: Aluminum  
Screw: Heat-treated Carbon Steel  
Spring: 300 Series Stainless Steel

### 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 28. Performance Data page 35.

All dimensions are in inches.

UNIFIED	Thread Size	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.005 -.000	C Max.	E ±.010	H ±.010	G1	G2	T1 Nom.	T2 Nom.	Driver Size
		Fastener Material Steel									±.025	±.025			
	.112-40 (#4-40)	PF7MF	440	0	.041	.031	.187	.186	.280	.100	.040	.210	.380	.550	#2
				1							.100	.270			
	.138-32 (#6-32)	PF7MF	632	0	.072	.060	.213	.212	.310	.100	.040	.240	.410	.610	#2
				1							.100	.300			
	.164-32 (#8-32)	PF7MF	832	0	.072	.060	.266	.265	.370	.120	.040	.240	.430	.630	#2
				1							.100	.300			

All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type	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	G2	T1 Nom.	T2 Nom.	Driver Size
		Fastener Material Steel									±0.64	±0.64			
	M3 x 0.5	PF7MF	M3	0	1.05	0.79	4.75	4.73	7	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	9.4	3	1.02	6.1	10.92	16	#2
				1							2.54	7.62			

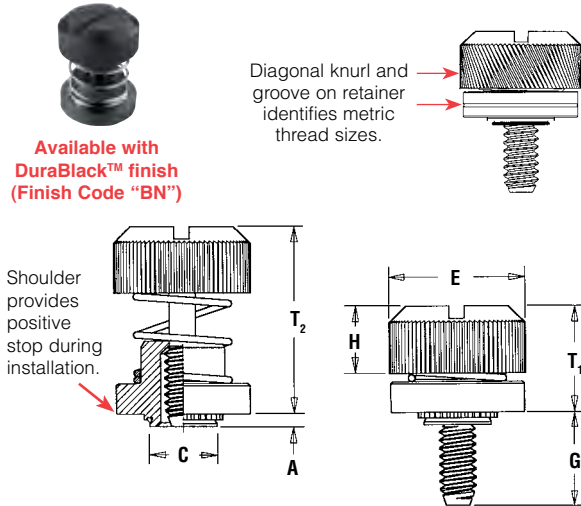
(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

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

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



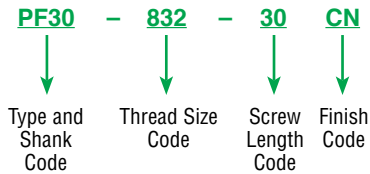
## TYPE PF30™ LOW-PROFILE CAPTIVE PANEL SCREWS



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

<b>Threads:</b> External, ASME B1.1, 2A / ASME B1.13M, 6g <sup>(1)</sup>
<b>Material:</b> Retainer: Carbon Steel Screw: Heat-treated Carbon Steel (#4-40 and M3 sizes only) Carbon Steel (all other sizes) Spring: 300 Series Stainless Steel
<b>Finish:</b> Retainer: CN - Bright nickel over copper flash per ASTM B689 Screw: CN - Bright nickel over copper flash per ASTM B689
<b>Optional Finish:</b> Retainer: BN - Black nitride Screw: BN - Black nitride
<b>For use in sheet hardness:</b> HRB 60 or less (Hardness Rockwell "B" Scale) HB 107 or less (Hardness Brinell)

### PART NUMBER DESIGNATION



Installation Data page 29. Performance Data page 35.

All dimensions are in inches.

UNIFIED	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 <sub>1</sub> Max.	T <sub>2</sub> Nom.	Min. Dist. Hole ⌀ To Edge
	.112-40 (#4-40)	PF30	PF31	440	30	.030	.030	.203	.202	.406	.300	.202	.325	.595
.038						.040								
.058						.060								
.138-32 (#6-32)	PF30	PF31	632	30	.030	.030	.219	.218	.438	.300	.202	.325	.595	.28
					.038	.040								
					.058	.060								
.164-32 (#8-32)	PF30	PF31	832	30	.030	.030	.250	.249	.468	.300	.207	.330	.600	.29
					.038	.040								
					.058	.060								
.190-32 (#10-32)	PF30	PF31	032	30	.030	.030	.312	.311	.530	.300	.220	.335	.605	.33
					.038	.040								
					.058	.060								
.250-20 (1/4-20)	PF32		0420	35	.058	.060	.375	.374	.625	.350	.242	.385	.675	.38

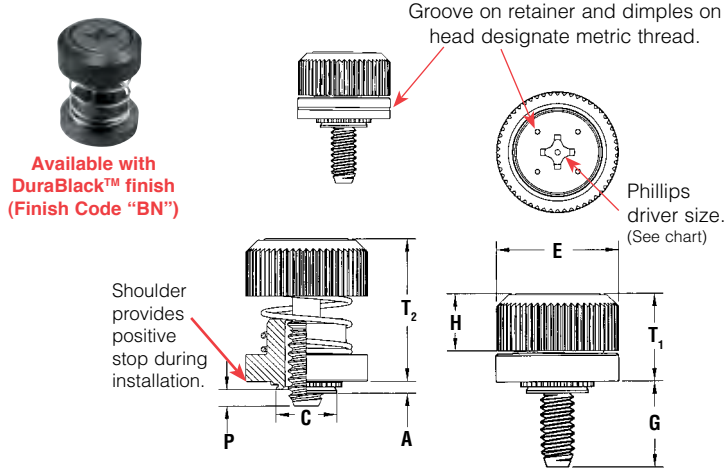
All dimensions are in millimeters.

METRIC	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 <sub>1</sub> Max.	T <sub>2</sub> Nom.	Min. Dist. Hole ⌀ To Edge
	M3 x 0.5	PF31	M3	M3	30	0.97	1	5.5	5.48	10.31	7.62	5.13	8.26	15.11
1.48						1.5								
M4 x 0.7	PF31	M4	M4	30	0.97	1	6.4	6.38	11.89	7.62	5.26	8.38	15.24	7.37
					1.48	1.5								
M5 x 0.8	PF31	M5	M5	30	0.97	1	8	7.98	13.46	7.62	5.59	8.51	15.37	8.38
					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.

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

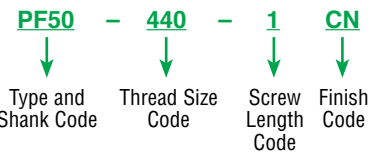
## TYPE PF50™ AND PF60™ LOW-PROFILE CAPTIVE PANEL SCREWS



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

<b>Threads:</b> External, ASME B1.1, 2A / ASME B1.13M, 6g (1)
<b>Material:</b> Knob: Carbon Steel    Retainer: Carbon Steel Screw: Carbon Steel    Spring: 300 Series Stainless Steel
<b>Finish:</b> 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
<b>Optional Finish:</b> Knob: BN - Black Nitride    Retainer: BN - Black Nitride Screw: BN - Black Nitride
<b>For use in sheet hardness:</b> HRB 60 or less (Hardness Rockwell "B" Scale) HB 107 or less (Hardness Brinell)

### PART NUMBER DESIGNATION



Installation Data page 29. Performance Data page 36.

All dimensions are in inches.

UNIFIED	Thread Size	Type		Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C Max.	E +0.015 -0.005	G ±0.025	H ±0.008	P ±0.025	T <sub>1</sub> Max.	T <sub>2</sub> Nom.	Driver Size	Min. Dist Hole To Edge
		Knurled Cap	Smooth Cap														
	.112-40 (#4-40)	PF50	PF60	440	0 1	.030	.030	.203	.202	.406	230 290	.207	.000 .060	.340	.520	#1	.26
		PF51	PF61	440	0 1	.038	.040	.203	.202	.406	230 290	.207	.000 .052	.340	.520	#1	.26
		PF52	PF62	440	0 1	.058	.060	.203	.202	.406	230 290	.207	.000 .032	.340	.520	#1	.26
	.138-32 (#6-32)	PF50	PF60	632	0 1	.030	.030	.219	.218	.438	230 290	.207	.000 .060	.340	.520	#2	.28
		PF51	PF61	632	0 1	.038	.040	.219	.218	.438	230 290	.207	.000 .052	.340	.520	#2	.28
		PF52	PF62	632	0 1	.058	.060	.219	.218	.438	230 290	.207	.000 .032	.340	.520	#2	.28
	.164-32 (#8-32)	PF50	PF60	832	0 1	.030	.030	.250	.249	.468	230 290	.217	.000 .060	.340	.520	#2	.29
		PF51	PF61	832	0 1	.038	.040	.250	.249	.468	230 290	.217	.000 .052	.340	.520	#2	.29
		PF52	PF62	832	0 1	.058	.060	.250	.249	.468	230 290	.217	.000 .032	.340	.520	#2	.29
.190-32 (#10-32)	PF50	PF60	032	0 1	.030	.030	.312	.311	.530	230 290	.225	.000 .060	.340	.530	#2	.33	
	PF51	PF61	032	0 1	.038	.040	.312	.311	.530	230 290	.225	.000 .052	.340	.530	#2	.33	
	PF52	PF62	032	0 1	.058	.060	.312	.311	.530	230 290	.225	.000 .032	.340	.530	#2	.33	
.250-20 (1/4-20)	PF52	PF62	0420	0 1	.058	.060	.375	.374	.625	280 340	.246	.000 .060	.395	.600	#2	.38	

All dimensions are in millimeters.

METRIC	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 +0.4 -0.13	G ±0.64	H ±0.2	P ±0.64	T <sub>1</sub> Max.	T <sub>2</sub> Nom.	Driver Size	Min. Dist Hole To Edge
		Knurled Cap	Smooth Cap														
	M3 x 0.5	PF50	PF60	M3	0 1	0.77	0.8	5.5	5.48	10.3	5.84 7.37	5.26	0 1.52	8.64	13.21	#1	6.6
		PF51	PF61	M3	0 1	0.97	1	5.5	5.48	10.3	5.84 7.37	5.26	0 1.32	8.64	13.21	#1	6.6
		PF52	PF62	M3	0 1	1.48	1.5	5.5	5.48	10.3	5.84 7.37	5.26	0 0.81	8.64	13.21	#1	6.6
	M3.5 x 0.6	PF50	PF60	M3.5	0 1	0.77	0.8	5.56	5.54	11.1	5.84 7.37	5.26	0 1.52	8.64	13.21	#2	7.1
		PF51	PF61	M3.5	0 1	0.97	1	5.56	5.54	11.1	5.84 7.37	5.26	0 1.32	8.64	13.21	#2	7.1
		PF52	PF62	M3.5	0 1	1.48	1.5	5.56	5.54	11.1	5.84 7.37	5.26	0 0.81	8.64	13.21	#2	7.1
	M4 x 0.7	PF50	PF60	M4	0 1	0.77	0.8	6.4	6.38	11.9	5.84 7.37	5.51	0 1.52	8.64	13.46	#2	7.4
		PF51	PF61	M4	0 1	0.97	1	6.4	6.38	11.9	5.84 7.37	5.51	0 1.32	8.64	13.46	#2	7.4
		PF52	PF62	M4	0 1	1.48	1.5	6.4	6.38	11.9	5.84 7.37	5.51	0 0.81	8.64	13.46	#2	7.4
M5 x 0.8	PF50	PF60	M5	0 1	0.77	0.8	8	7.98	13.5	5.84 7.37	5.72	0 1.52	8.64	13.46	#2	8.4	
	PF51	PF61	M5	0 1	0.97	1	8	7.98	13.5	5.84 7.37	5.72	0 1.32	8.64	13.46	#2	8.4	
	PF52	PF62	M5	0 1	1.48	1.5	8	7.98	13.5	5.84 7.37	5.72	0 0.81	8.64	13.46	#2	8.4	
M6 x 1	PF52	PF62	M6	0 1	1.48	1.5	9.5	9.48	15.9	7.11 8.64	6.25	0 1.52	10.04	15.24	#2	9.7	

(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® TYPES PFC2/PFS2 CAPTIVE PANEL SCREWS

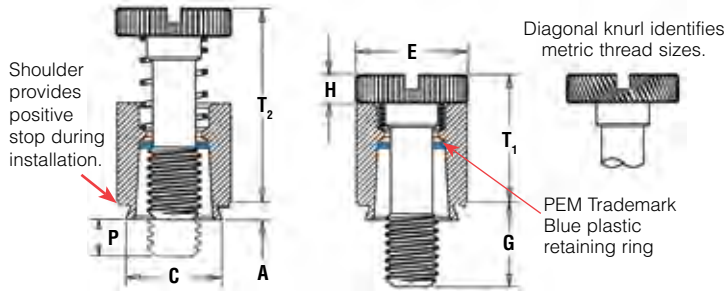
- Types PFC2/PFS2 are for tool or finger operation.



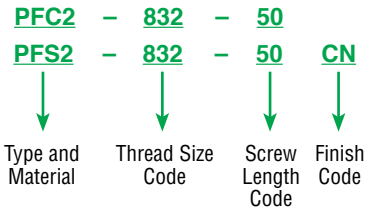
Type PFC2/PFS2

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

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



### PART NUMBER DESIGNATION



Installation Data page 31. Performance Data page 36.

All dimensions are in inches.

UNIFIED	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	H ± .005	P ± .025	T <sub>1</sub> Max.	T <sub>2</sub> Nom.	Min. Dist. Hole ⌀ To Edge	
		Stainless Steel	Steel														
.112-40 (#4-40)	PFC2	PFS2	440	40	.060	.060	.265	.264	.312	.250	.072	.000	.360	.540	.25		
																.375	.125
.138-32 (#6-32)	PFC2	PFS2	632	40	.060	.060	.281	.280	.344	.250	.072	.000	.360	.540	.28		
																.375	.125
																.500	.250
.164-32 (#8-32)	PFC2	PFS2	832	50	.060	.060	.312	.311	.375	.312	.082	.000	.450	.690	.31		
																.437	.125
																.562	.250
.190-32 (#10-32)	PFC2	PFS2	032	50	.060	.060	.344	.343	.406	.312	.082	.000	.450	.690	.34		
																.437	.125
																.562	.250
.250-20 (1/4-20)	PFC2	PFS2	0420	60	.060	.060	.413	.412	.468	.375	.097	.000	.580	.880	.38		
																.500	.125
																.625	.250

All dimensions are in millimeters.

METRIC	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 ± .25	G ± 0.4	H ± 0.13	P ± 0.64	T <sub>1</sub> Max.	T <sub>2</sub> Nom.	Min. Dist. Hole ⌀ To Edge	
		Stainless Steel	Steel														
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		
																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		
																11.1	3.2
																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		
																11.1	3.2
																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		
																12.7	3.2
																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.

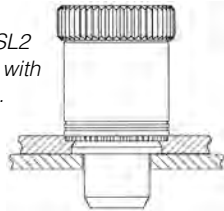


# PEM® TYPES PTL2/PSL2 SPRING-LOADED PLUNGER ASSEMBLIES

- 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.
- Type PTL2 has quick lockout feature to hold plunger in fully retracted position.
- For use in sheets of HRB 80 or less.
- Available as Type PSL2 without lockout feature on special order.

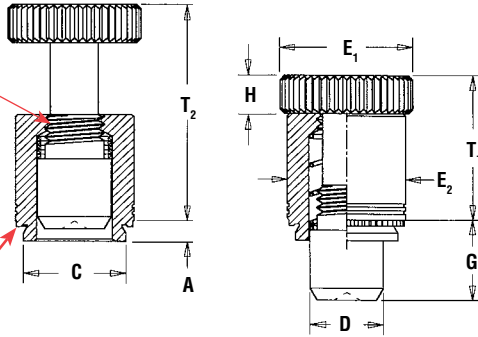


Type PTL2/PSL2 installed and with mating panel.



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

Shoulder provides positive stop during installation.



Installation Data page 31. Performance Data page 36.

**Material:**

Plunger: Heat-treated Carbon Steel  
Retainer: Heat-treated Carbon Steel

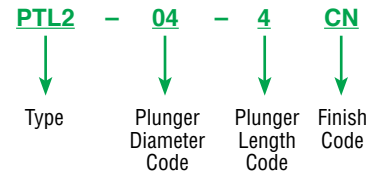
**Finish:**

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

**For use in sheet hardness:**

HRB 80 or less (Hardness Rockwell "B" Scale)  
HB 150 or less (Hardness Brinell)

**PART NUMBER DESIGNATION**



All dimensions are in inches.

UNIFIED	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 <sub>1</sub> ± .010	E <sub>2</sub> ± .010	G ± .010	H ± .010	T <sub>1</sub> ± .010	T <sub>2</sub> Nom.	Min. Dist. Hole $\varnothing$ To Edge
	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.

METRIC	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 <sub>1</sub> ± 0.25	E <sub>2</sub> ± 0.25	G ± 0.25	H ± 0.25	T <sub>1</sub> ± 0.25	T <sub>2</sub> Nom.	Min. Dist. Hole $\varnothing$ To Edge
	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® TYPES 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 (Type SCBR), axial float (Type SCB), or jacking feature (Type SCBJ).
- Appropriate for close centerline-to-edge applications.



Type SCBR



Type SCB



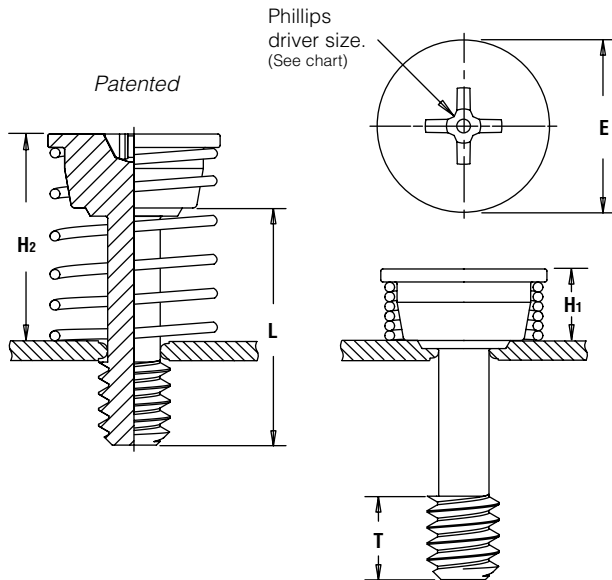
Type SCBJ

## TYPE SCBR™ SPINNING CLINCH BOLT WITH SELF-RETRACTING FEATURE

Type SCBR retracted



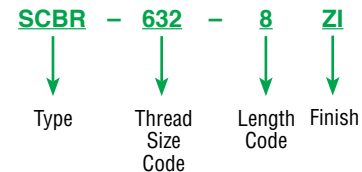
Type SCBR engaged



Installation Data page 32. Performance Data page 37.

<b>Threads:</b>	External, ASME B1.1, 2A / ASME B1.13M, 6g <sup>(1)</sup>
<b>Material:</b>	Screw - Heat-treated Carbon Steel Spring - 300 series stainless steel
<b>Finish:</b>	Screw - ZI - Zinc plated, 5µm, colorless (standard) <sup>(2)</sup>
<b>For use in sheet hardness:</b>	HRB 80 or less (Hardness Rockwell "B" Scale) HB 150 or less (Hardness Brinell)

### PART NUMBER DESIGNATION



All dimensions are in inches.

UNIFIED	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 +.005 -.010	H <sub>1</sub> ±.005	H <sub>2</sub> Ref.	T Nom.	Driver Size	Min. Dist Hole $\Phi$ To Edge
				.500								
	.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.

METRIC	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 <sub>1</sub> ±0.13	H <sub>2</sub> Ref.	T Nom.	Driver Size	Min. Dist Hole $\Phi$ To Edge
	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 web site ([www.pemnet.com](http://www.pemnet.com)) for related plating standards and specifications.

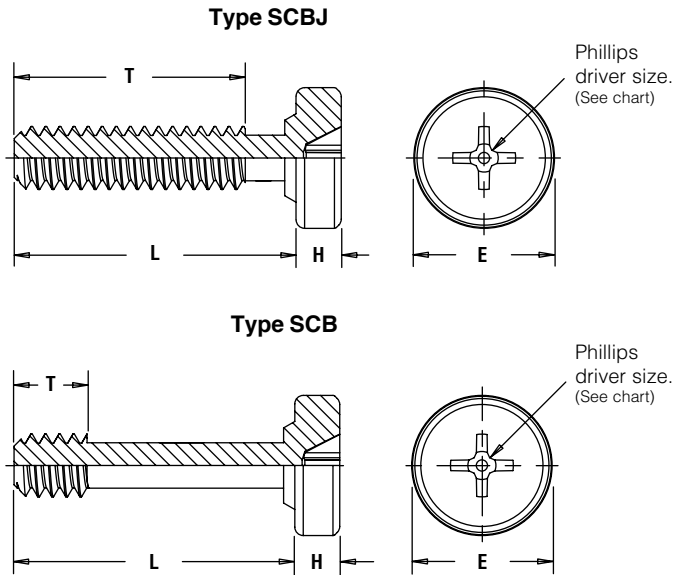
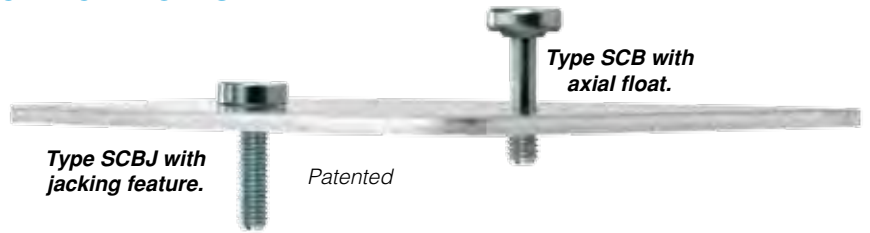
**NOTE:** Type SCBR screws are shipped with mating springs.

For designs requiring a specific spring rate, contact our PEM Technical Support group at [techsupport@pemnet.com](mailto:techsupport@pemnet.com).



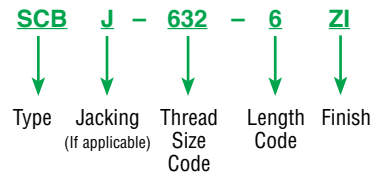
# PEM® TYPES SCBR™/SCB™/SCBJ™ CAPTIVE PANEL SCREWS

## TYPES SCB™/SCBJ™ SPINNING CLINCH BOLTS



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

### PART NUMBER DESIGNATION



Installation Data page 32. Performance Data page 37.

All dimensions are in inches.

UNIFIED	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 $\varnothing$ To Edge
		Jacking	Non-jacking		.250	.375	.500					-4	-6	-8			
	.112-40 (#4-40)	SCBJ	—	440	4	6	8	.040	.112	.250	.080	.160	.285	.410	NA	#1	.13
		—	SCB		NA	NA	8					NA	NA	.130			
	.138-32 (#6-32)	SCBJ	—	632	4	6	8	.040	.138	.291	.080	.160	.285	.410	NA	#2	.15
		—	SCB		NA	NA	8					NA	NA	.130			

All dimensions are in millimeters.

METRIC	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 $\varnothing$ To Edge
		Jacking	Non-jacking		6	10	12	14					-6	-10	-12	-14			
	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	NA	#1	3.3
		—	SCB		NA	NA	12	14					NA	NA	3.3	5.3			
	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	NA	#2	5
		—	SCB		NA	NA	12	14					NA	NA	3.3	5.3			

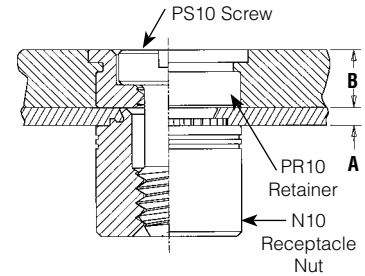
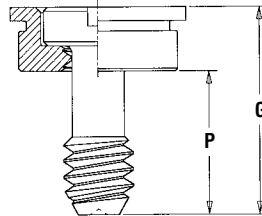
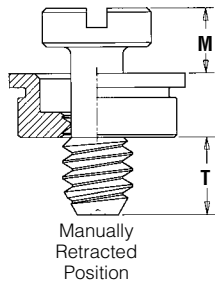
(1) As with all Class 2A/6g external threads with an additive finish, the maximum major and pitch, after plating, may equal basic sizes and be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

(2) See PEM Technical Support section of our web site for related plating standards and specifications.

NA - Not Available.

# PEM® TYPE PF10 FLUSH-MOUNTED CAPTIVE PANEL SCREWS

- Type PS10 screw head is flush in sheets as thin as .125" / 3.2 mm.
- Type PS10 screw remains captive in retainer when disengaged.
- Type PR10 retainer and F10 receptacle nut is for use in sheets of HRB 70 or less.
- Type N10 nut is for use in sheets of HRB 80 or less.
- Complies with UL 60950 standards.



Installation Data page 33. Performance Data page 37-38.

All dimensions are in inches.

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

All dimensions are in millimeters.

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

## Floating Receptacle Nuts



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

## Type F Fasteners as retainers

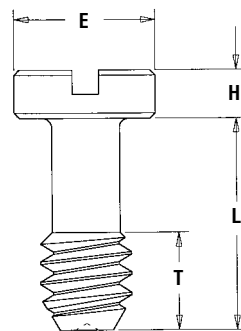


For applications where the screw head may project above the sheet surface, PS10 screws may be used with PEMSERT® Type F fasteners as retainers. For dimensions and engineering data on Type F fasteners, see PEM Bulletin F.

## PS10 FLUSH MOUNTED SCREWS



Diagonal knurl identifies metric thread sizes.



### 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

Type and Material

Thread Size Code

Screw Length Code

All dimensions are in inches.

UNIFIED	Thread Size	Type	Thread Code	Screw Length Code	E	H	L	T
					Nom.	+ .002 - .006	± .010	Nom.
	.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

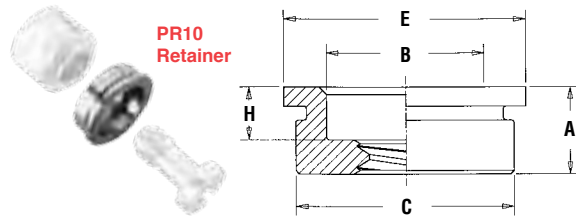
All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type	Thread Code	Screw Length Code	E	H	L	T
					Nom.	+ 0.05 - 0.15	± 0.25	Nom.
	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

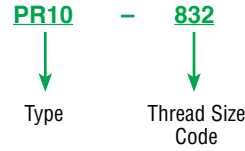


# PEM® TYPE PF10 FLUSH-MOUNTED CAPTIVE PANEL SCREWS

## PR10 SELF-CLINCHING FLUSH-MOUNTED RETAINERS



### PART NUMBER DESIGNATION



<b>Threads:</b> Internal, ASME B1.1, 2B / ASME B1.13M, 6H <sup>(1)</sup>
<b>Material:</b> 300 Series Stainless Steel
<b>Finish:</b> Passivated and/or tested per ASTM A380
<b>For use in sheet hardness:</b> HRB 70 or less (Hardness Rockwell "B" Scale) HB 125 or less (Hardness Brinell)

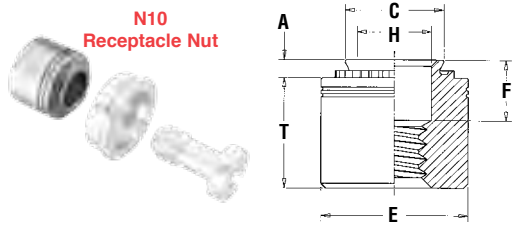
All dimensions are in inches.

UNIFIED	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 $\varnothing$ to Edge
	.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

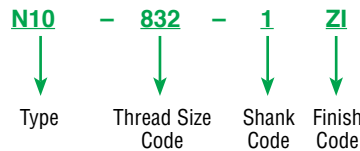
All dimensions are in millimeters.

METRIC	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 $\varnothing$ to Edge
	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<sup>(3)</sup>



### PART NUMBER DESIGNATION



<b>Threads:</b> Internal, ASME B1.1, 2B / ASME B1.13M, 6H <sup>(1)</sup>
<b>Material:</b> Heat-treated Carbon Steel
<b>Finish:</b> ZI - Zinc plated, 5µm, colorless (standard) <sup>(2)</sup>
<b>For use in sheet hardness:</b> HRB 80 or less (Hardness Rockwell "B" Scale) HB 150 or less (Hardness Brinell)

All dimensions are in inches.

UNIFIED	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 $\varnothing$ To Edge
	.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.

METRIC	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 $\varnothing$ To Edge
	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) 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.

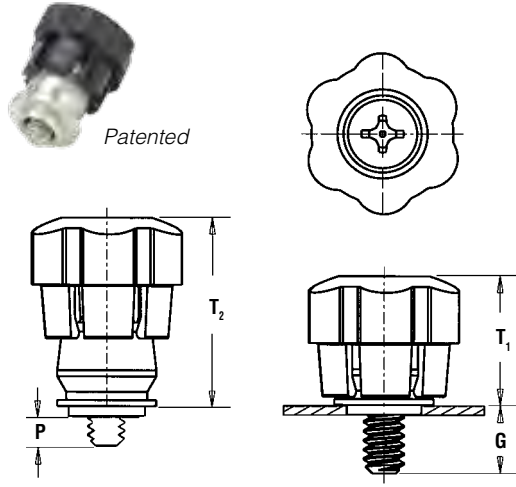
(2) See PEM Technical Support section of our web site ([www.pemnet.com](http://www.pemnet.com)) for related plating standards and specifications.

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

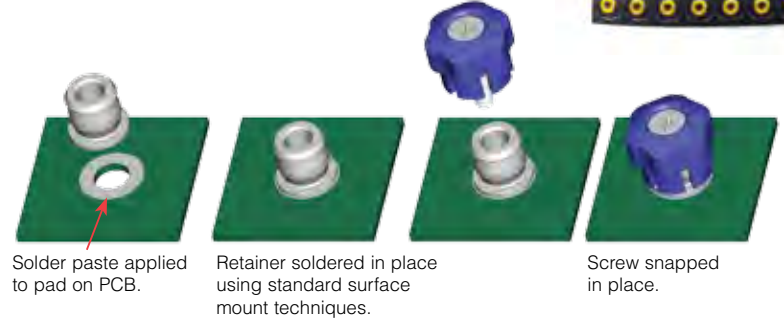
# REELFAST® SMT PANEL SCREW COMPONENTS AND ASSEMBLY DATA

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

<b>Threads:</b> External, ASME B1.1, 2A / ASME B1.13M, 6g <sup>(1)</sup>
<b>Material:</b> Knob: ABS <sup>(2)</sup> Retainer: Carbon Steel Screw: Carbon Steel
<b>Finish:</b> Retainer: ET - Electro Plated Bright Tin ASTM B545, Class B with Preservative coating (standard) DT - Matte Electro-tin ASTM B545, Class A with Preservative Coating, Annealed (optional) Screw: CN - Bright nickel over copper flash per ASTM B689



Performance Data page 38.



All dimensions are in inches.

UNIFIED	Thread Size	Screw Part Number			Retainer Part Number	G ± .025	P ± .025	T <sub>1</sub> Nom.	T <sub>2</sub> Nom.	Total Radial Float
		Type	Thread Code	Screw Length Code						
	.112-40 (#4-40)	PSHP	440	0	SMTPR-6-1	.188	.000	.478	.646	.015
				1		.248	.026			
	.138-32 (#6-32)	PSHP	632	0	SMTPR-6-1	.188	.000	.478	.646	.020
				1		.248	.026			

All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Screw Part Number			Retainer Part Number	G ± 0.64	P ± 0.64	T <sub>1</sub> Nom.	T <sub>2</sub> Nom.	Total Radial Float
		Type	Thread Code	Screw Length Code						
	M3 x 0.5	PSHP	M3	0	SMTPR-6-1	4.78	0	12.14	16.41	.38
				1		6.3	.66			
	M3.5 x 0.6	PSHP	M3.5	0	SMTPR-6-1	4.78	0	12.14	16.41	.51
				1		6.3	.66			

- (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) Temperature limit is 200° F / 93° C.

## Color Capabilities

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

The colors shown (except for black) are non-stocked standards and available on special order. Since actual color knob and retainer 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 or retainer, please contact us.



Black = 001 (Standard)



Red = 002



Orange = 003



Yellow = 004



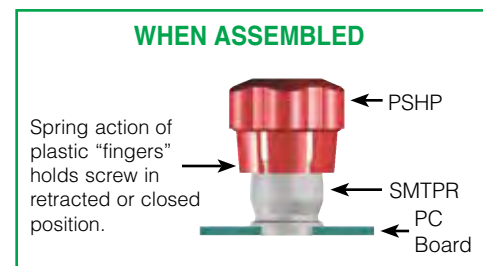
Green = 005



Blue = 006



Violet = 007



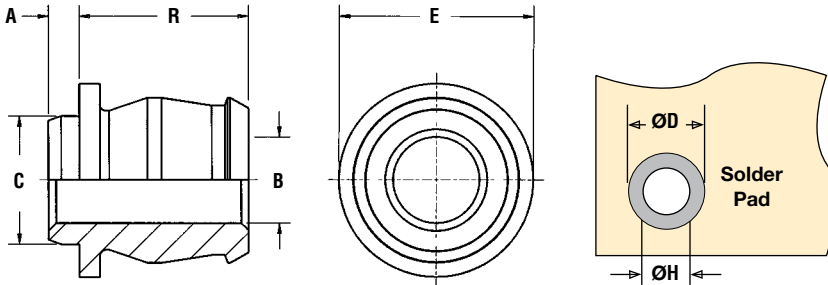
# REELFAST® SMT PANEL SCREW COMPONENTS AND ASSEMBLY DATA

## TYPE SMTPR RETAINER

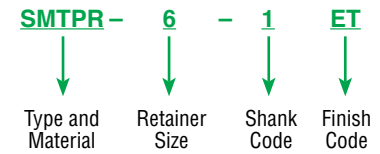
Supplied on 13" recyclable reels of 465 pieces. Tape width is 24mm.  
Supplied with polyamide patch for vacuum pick up. Reels conform to EIA-481.



SMTPR Retainer



### PART NUMBER DESIGNATION



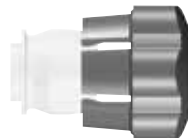
All dimensions are in inches.

UNIFIED	Retainer Part Number	A (Shank) Max.	Min. Sheet Thickness	B ±.003	C Max.	E Nom.	R ±.005	ØH Hole Size In Sheet +.003 -.000	ØD Min. Solder Pad
		SMTPR-6-1	.060	.060	.167	.249	.375	.325	.250

All dimensions are in millimeters.

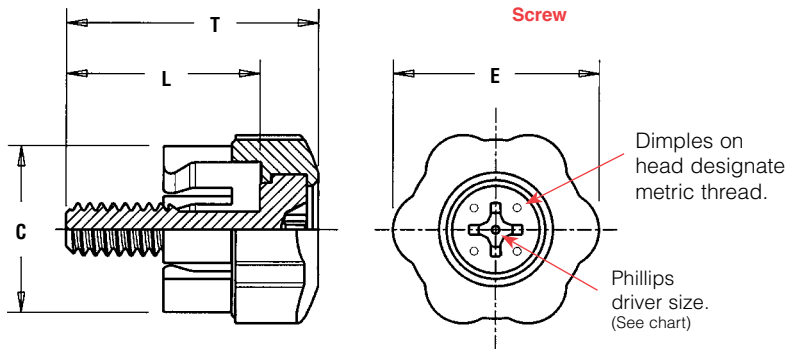
METRIC	Retainer Part Number	A (Shank) Max.	Min. Sheet Thickness	B ±0.08	C Max.	E Nom.	R ±0.13	ØH Hole Size In Sheet +0.08	ØD Min. Solder Pad
		SMTPR-6-1	1.53	1.53	4.24	6.33	9.53	8.26	6.35

## TYPE PSHP SCREW

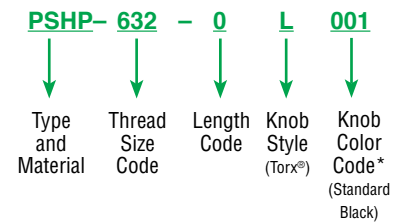


PSHP Screw

Available with Torx® recess on special order.



### PART NUMBER DESIGNATION



\*For color capabilities see page 22.

All dimensions are in inches.

UNIFIED	Type	Thread Code	Screw Length Code	C ±.010	E ±.010	L ±.015	T Nom.	Driver Size
	PSHP	440		0	.440	.542	.510	.663
1				.570			.723	
PSHP	632		0	.440	.542	.510	.663	#2
			1			.570	.723	

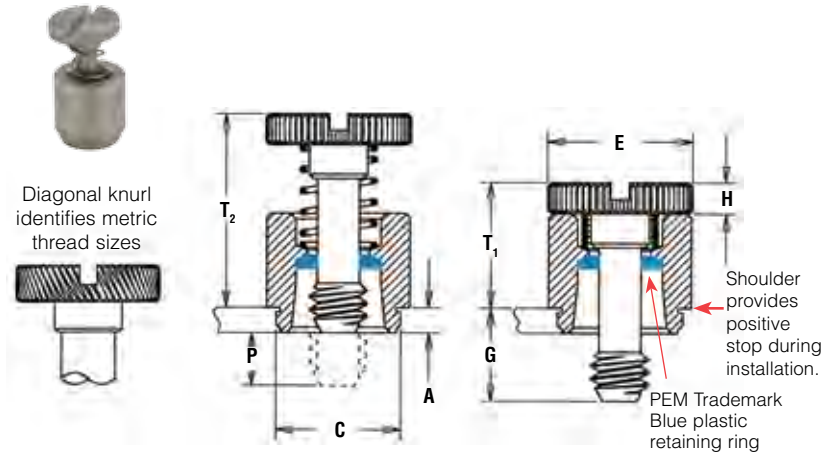
All dimensions are in millimeters.

METRIC	Type	Thread Code	Screw Length Code	C ±0.25	E ±0.25	L ±0.38	T Nom.	Driver Size
	PSHP	M3		0	11.18	13.77	12.95	16.84
1				14.48			18.36	
PSHP	M3.5		0	11.18	13.77	12.95	16.84	#2
			1			14.48	18.36	



# TYPE PFK BROACHING CAPTIVE PANEL SCREWS

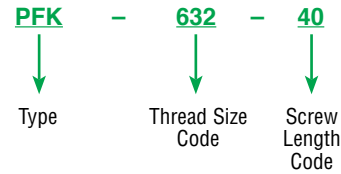
- For permanent and reliable installation in PC boards and sheets of HRB 70 or less.
- Screw assemblies remain captive for easy mounting and removal.



Installation Data page 31. Performance Data page 38.

<b>Threads:</b> External, ASME B1.1, 2A / ASME B1.13M, 6g
<b>Material:</b> Retainer: 300 Series Stainless Steel Screw: 300 Series Stainless Steel Spring: 300 Series Stainless Steel Retaining Ring: Nylon, temperature limit 200° F / 93° C
<b>Finish:</b> Retainer: Passivated and/or tested per ASTM A380 Screw: Passivated and/or tested per ASTM A380
<b>For use in:</b> PC Board and sheets HRB 70 or less (Hardness Rockwell "B" Scale) HB 125 or less (Hardness Brinell)

## PART NUMBER DESIGNATION



All dimensions are in inches.

UNIFIED	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 <sub>1</sub> Max.	T <sub>2</sub> Nom.	Min. Dist. Hole $\varnothing$ To Edge
	.112-40 (#4-40)	PFK	440		40	.060	.060	.265	.283	.312	.250	.072	.000	.36	.54
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.

METRIC	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 <sub>1</sub> Max.	T <sub>2</sub> Nom.	Min. Dist. Hole $\varnothing$ To Edge
	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
62					9.5						3.2				
84					12.7						6.4				

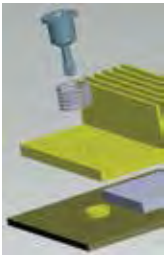






# CAPTIVE PANEL SCREW CAPABILITIES

## RECOMMENDED USES OF PEM® CAPTIVE PANEL SCREWS

<i>Installation into</i>			
<i>Stainless Panels</i>	<i>Painted Panels</i>	<i>P.C. Boards</i>	<i>Non-ductile Materials</i>
PFC4 	PF11MF 	SMTPF 	PF11MW 
PF11MF 	PF7MF 	PF11MW 	PFK 
PF11MW 		PFK 	PF11MF 
PF7MF 			PF7MF 

## VALUE-ADDED CAPABILITIES

Heat Sink Fastening Solutions	ATCA Solutions	Tight Seal Solutions
 <p>Captivated screw and spring eliminate loose hardware, and when used with the mating nut or standoff will provide accurate and reliable clamp loads, while preventing damage to P.C. Board.</p>	 <p>Use Type PF11PM captive panel screw and Type TPXS pin in conjunction to satisfy the requirements of the PICMG 3.0 of the Advanced TCA®.</p>	 <p>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.</p>
Washer Locking Feature	Nylon Locking Patch	Thread-forming Opportunity
 <p>Consider a modified Type PF7MF with integrated split washer for applications requiring a high cycle lockout feature. And it prevents loosening due to vibration.</p>	 <p>Nylon locking patch is available to be added to any of PEM captive panel screws for applications requiring a locking element. And it prevents loosening due to vibration.</p>	<p>PennEngineering named official licensee for TRILOBULAR™ and REMFORM® fastener products. Both proprietary thread-forming fastener families are designed to promote lower overall assembly costs. Contact us to learn more.</p> <p>E-mail us at: <a href="mailto:techsupport@pemnet.com">techsupport@pemnet.com</a>.</p>

# CAPTIVE PANEL SCREW INSTALLATION <sup>(1)</sup>

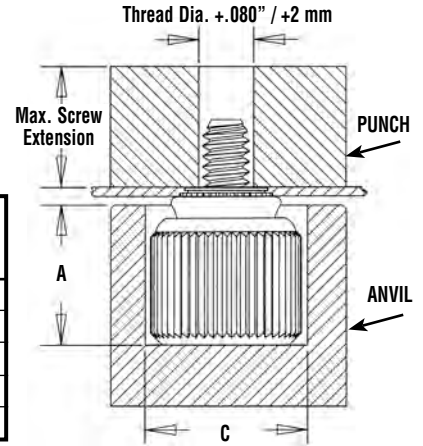
## TYPE PF11/PF12/PF11M/PF12M/PEM C.A.P.S.®

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 punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.

### Installation Tooling

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	C ±.002		
	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

METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	C ±0.05		
	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



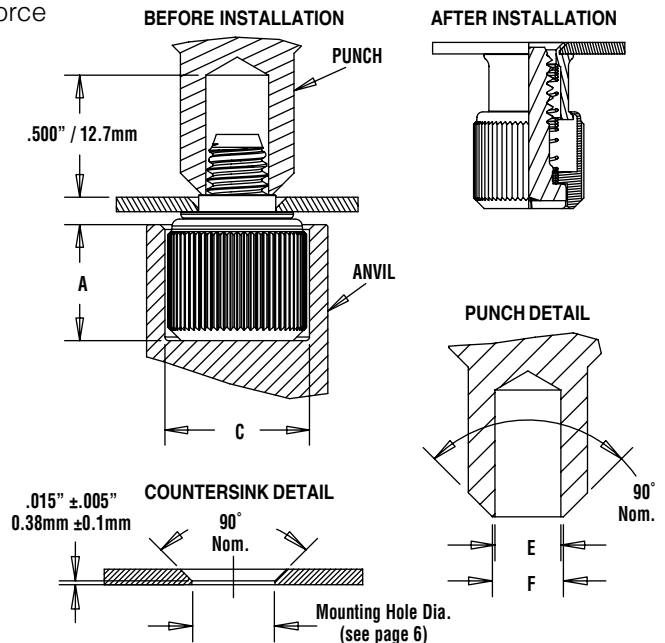
## TYPE PF11MF/PF12MF (flare-mount installation)

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 punch and anvil surfaces parallel, apply squeezing force to flare the retainer of the fastener.

### Installation Tooling

UNIFIED	Thread Code	Anvil Dimensions (in.)		Punch Dimensions (in.)		Anvil Part No.	Punch Part No.
		A ±.002	C ±.002	E +.003 - .000	F ±.002		
	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

METRIC	Thread Code	Anvil Dimensions (mm)		Punch Dimensions (mm)		Anvil Part No.	Punch Part No.
		A ±0.05	C ±0.05	E +0.08	F ±0.05		
	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	8016374

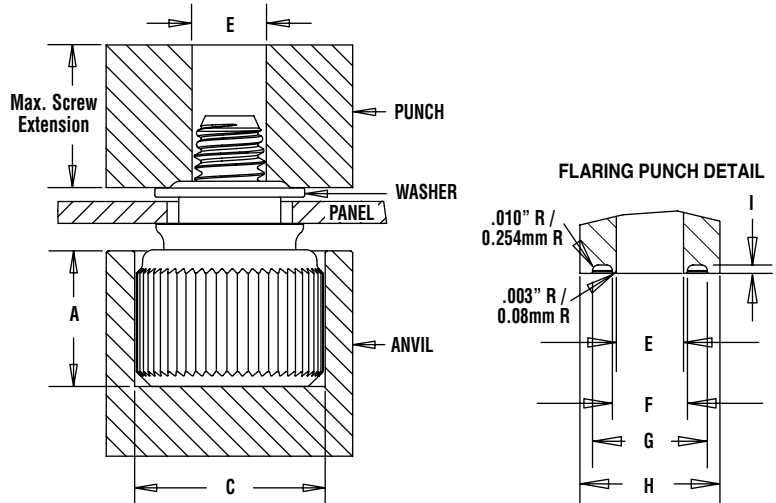


(1) Punches and anvils should be hardened.

# CAPTIVE PANEL SCREW INSTALLATION

## TYPE PF11MW/PF12MW

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 punch and anvil surfaces parallel, apply squeezing force with flaring punch.



### Installation Tooling

UNIFIED	Thread Code	Anvil Dimensions (in.)		Punch Dimensions (in.)					Anvil Part No.	Punch Part No.
		A ±.002	C ±.001	E +.003 - .000	F ±.001	G ±.003	H Min.	I ±.004		
	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

METRIC	Thread Code	Anvil Dimensions (mm)		Punch Dimensions (mm)					Anvil Part No.	Punch Part No.
		A ±0.05	C ±0.03	E +0.08	F ±0.03	G ±0.08	H Min.	I ±0.1		
	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

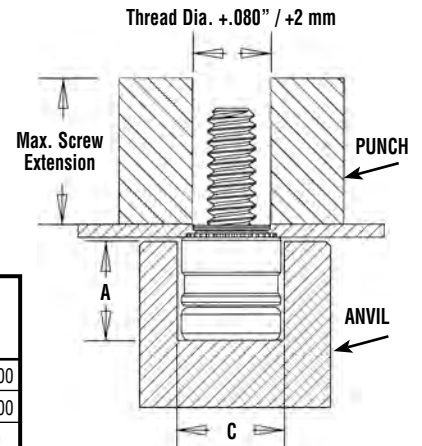
## TYPE PFHV

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 punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.

### Installation Tooling

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	C ±.002		
	440	.220	.285	8004688	97020006400
	632	.250	.301	8004689	97020007400
	832	.285	.332	8005439	970200060

METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	C ±0.05		
	M3	5.59	7.24	8004688	97020006400
	M3.5	6.35	7.65	8004689	97020007400
	M4	7.24	8.43	8005439	970200060



# CAPTIVE PANEL SCREW INSTALLATION

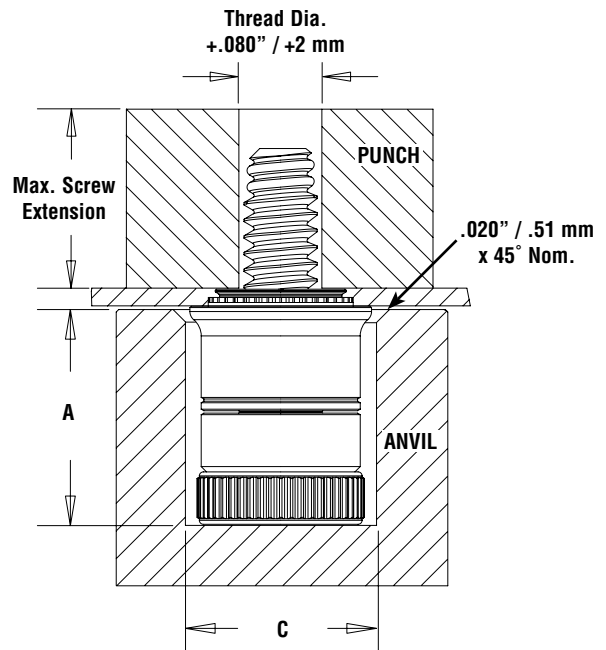
## TYPE PF7M

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 punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.

### Installation Tooling

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

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



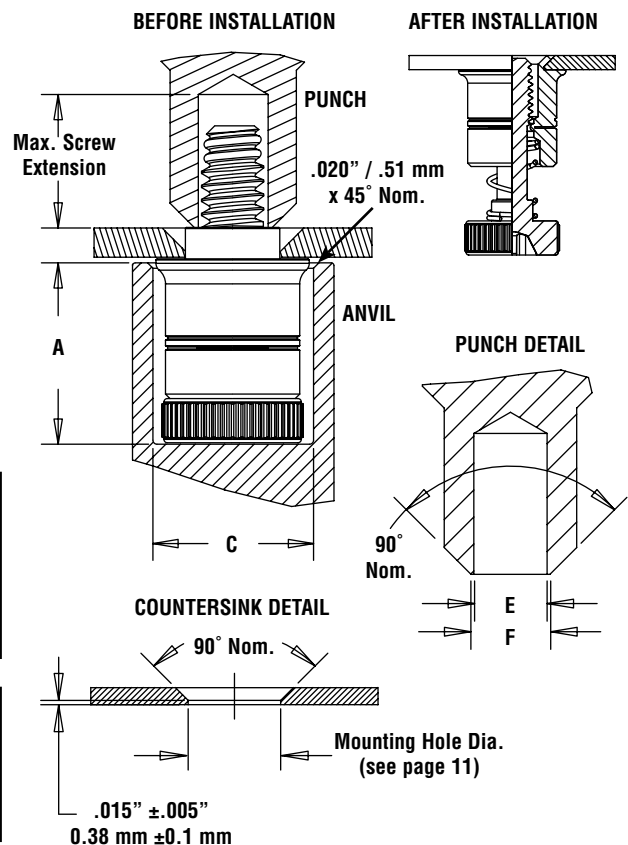
## TYPE PF7MF (flare-mount installation)

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 (preferably the punch side) over the shank of fastener.
3. With punch and anvil surfaces parallel, apply squeezing force to flare the retainer of the fastener.

### Installation Tooling

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

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





# CAPTIVE PANEL SCREW INSTALLATION

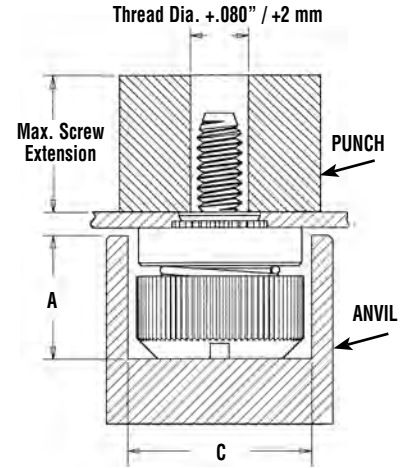
## TYPE PF30/PF31/PF32

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 punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.

### Installation Tooling

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	C ±.002		
	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)		Anvil Part Number	Punch Part Number
		A ±0.05	C ±0.05		
	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	



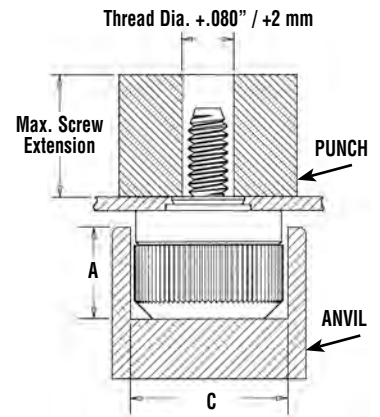
## TYPE PF50/PF51/PF52/PF60/PF61/PF62

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 punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.

### Installation Tooling

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	C ±.002		
	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	

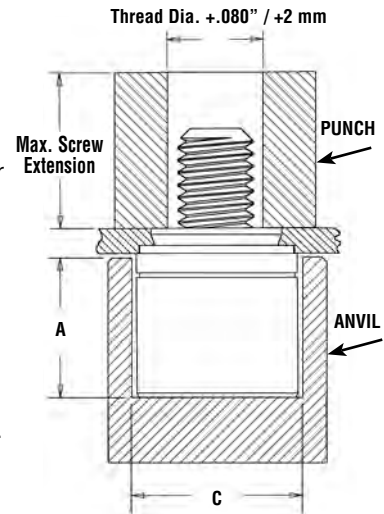
METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	C ±0.05		
	M3	7.49	10.69	975201060	975200060
M3.5	7.49	11.51	975201061	975200061	
M4	7.87	12.29	975201062	975200062	
M5	7.87	13.87	975201063	975200063	
M6	9.27	16.26	975201064	975200064	



# CAPTIVE PANEL SCREW INSTALLATION

## TYPE PFC4

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 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.

### Installation Tooling

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

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

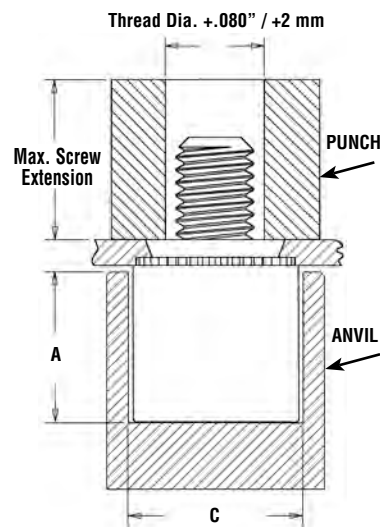
## TYPE PFC2P

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 punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.

### Installation Tooling

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

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



# CAPTIVE PANEL SCREW INSTALLATION

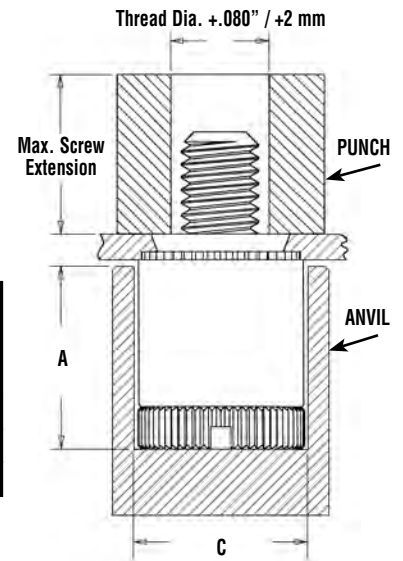
## TYPE PFC2/PFS2

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 punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.

### Installation Tooling

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	C ±.002		
	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	

METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	C ±0.05		
	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	



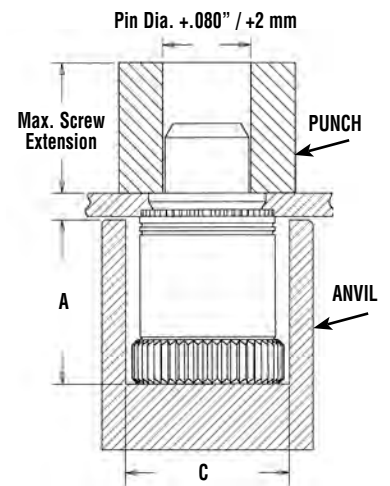
## TYPE PTL2/PSL2

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 punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.

### Installation Tooling

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

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



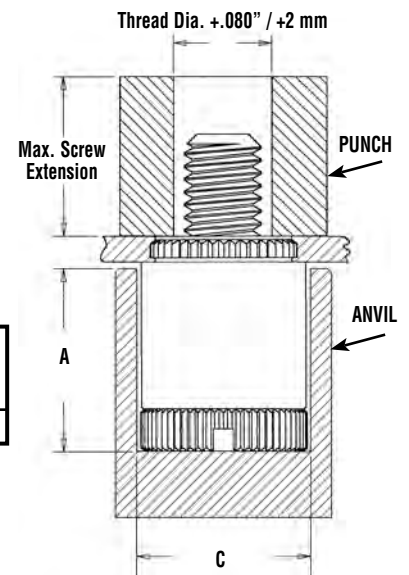
## TYPE PFK

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

### Installation Tooling

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

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



# CAPTIVE PANEL SCREW INSTALLATION

## TYPE SCBR

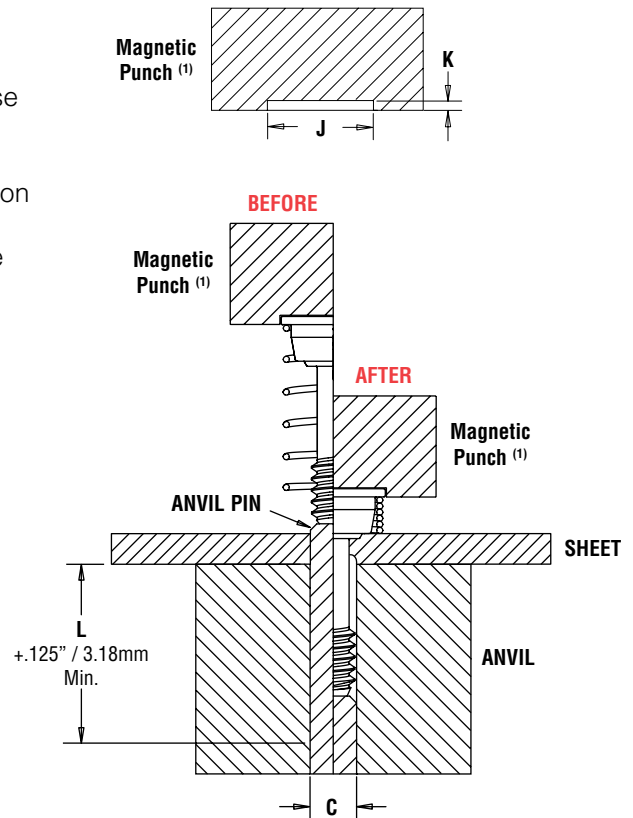
1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring. If the hole is punched, be sure to install fastener into punched side of hole.
2. Assemble spring on screw by rotating spring counter clockwise and position assembly into recessed magnetic punch.
3. Position hole in workpiece over retractable anvil pin.
4. With 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.

### Installation Tooling

UNIFIED	Thread Code	Installation Tooling Dimensions (in.)			Anvil Part Number	Magnetic Punch Part Number (1)
		C	J	K		
	440	.113 - .116	.354 - .357	.035	970200048300	8016210
	632	.139 - .142	.387 - .390	.035	970200052300	8016211
	832	.165 - .168	.416 - .419	.035	970200054300	8016212

METRIC	Thread Code	Installation Tooling Dimensions (mm)			Anvil Part Number	Magnetic Punch Part Number (1)
		C	J	K		
	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) Pneumatic punch may also be used. Please contact our PEMserter tooling division for punch part numbers.



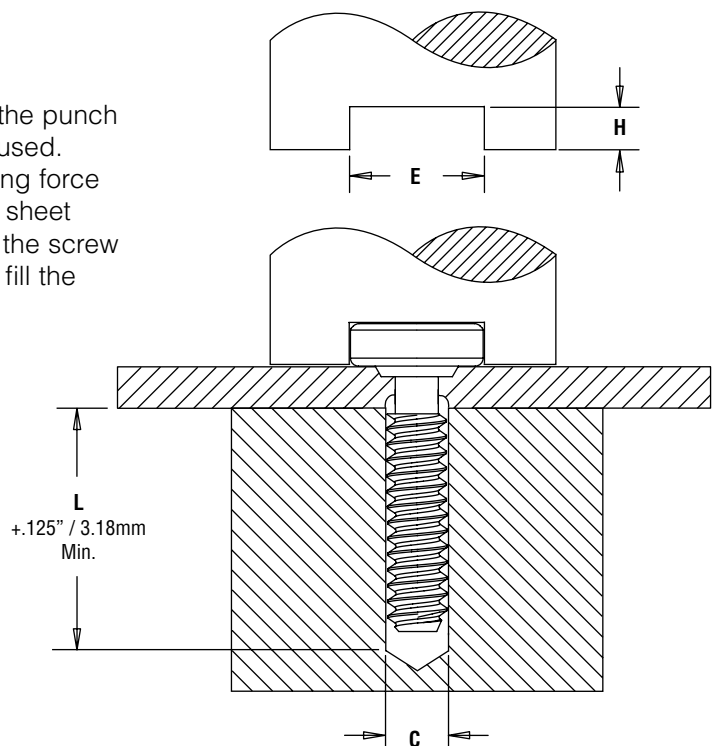
## TYPE SCB/SCBJ

1. Prepare properly sized mounting hole in sheet.
2. Place the fastener through mounting hole (preferably the punch side) and into anvil. A flat or recessed punch can be used.
3. With 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.

### Installation Tooling

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

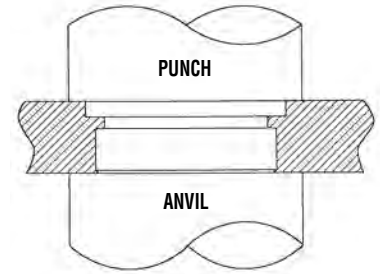
METRIC	Thread Code	Installation Tooling Dimensions (mm)		
		C	E	H
	M3	3.03 - 3.11	6.86 - 7.11	1.85 - 1.88
	M4	4.03 - 4.11	8.53 - 8.79	1.85 - 1.88



# CAPTIVE PANEL SCREW INSTALLATION

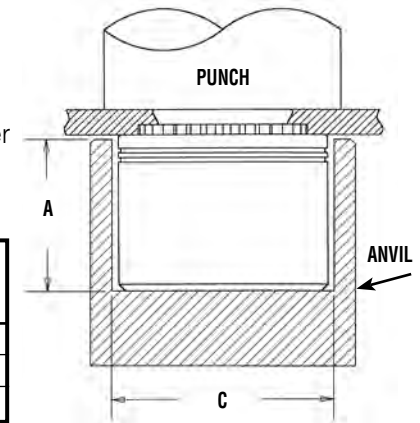
## TYPE PR10

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



## TYPE N10

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 punch and anvil surfaces parallel, apply squeezing force until the shoulder of the nut comes in contact with the sheet material.



### Anvil Dimensions

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

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



# CAPTIVE PANEL SCREW PERFORMANCE DATA<sup>(1)</sup>

## TYPE PF11/PF12/PF11M/PF12M/PEM C.A.P.S.<sup>®</sup>

UNIFIED	Type	Thread Code	Test Sheet Material			
			Aluminum		Cold-Rolled Steel	
			Installation (lbs.)	Retainer Pushout (lbs.)	Installation (lbs.)	Retainer Pushout (lbs.)
PF11	440	1500	80	2500	145	
	632	2000	95	3500	150	
PF12	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	

## TYPE PF11MF

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

## TYPE PF11MW

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	

## TYPE PFHV

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) Performance values reported are averages when all installation specifications and procedures are followed. Variations in mounting hole size, sheet material and installation force (or swaging force for Type PF11MW) will affect results. Performance testing of this product in your application is recommended. We will be happy to provide 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<sup>(1)</sup>

## TYPE PF7M

UNIFIED	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.)
	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

METRIC	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)
	PF7M	M3	0.66	2900	6.7	355	11.1	645
	PF7M	M4	1.57	5010	13.3	445	20	710

## TYPE PF7MF

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

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

## TYPE PF30/PF31/PF32

UNIFIED	Type	Thread Code	Test Sheet Material			
			Aluminum		Cold-Rolled Steel	
			Installation (lbs.)	Retainer Pushout (lbs.)	Installation (lbs.)	Retainer Pushout (lbs.)
	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

METRIC	Type	Thread Code	Test Sheet Material			
			Aluminum		Cold-Rolled Steel	
			Installation (kN)	Retainer Pushout (N)	Installation (kN)	Retainer Pushout (N)
	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) Performance values reported are averages when all installation specifications and procedures are followed. Variations in mounting hole size, sheet material and installation force (or swaging force for Type PF11MW) will affect results. Performance testing of this product in your application is recommended. We will be happy to provide 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<sup>(1)</sup>

## TYPE PF50/PF51/PF52/PF60/PF61/PF62

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	

## TYPE PFC4

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	

## TYPE PFC2/PFS2/PFC2P

UNIFIED	Type	Thread Code	Test Sheet Material			
			Aluminum		Cold-Rolled Steel	
			Installation (lbs.)	Retainer Pushout (lbs.)	Installation (lbs.)	Retainer Pushout (lbs.)
PFC2	440	2400	240	3000	300	
	632	2700	275	3500	350	
PFS2	832	2900	300	3800	400	
PFC2P	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	M3	10.7	1068	13.3	1334	
	M4	12.9	1334	16.9	1779	
PFS2	M5	13.3	1779	17.8	2224	
PFC2P	M6	15.6	1779	22.2	2669	

## TYPE PTL2/PSL2

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) Performance values reported are averages when all installation specifications and procedures are followed. Variations in mounting hole size, sheet material and installation force will affect results. Performance testing of this product in your application is recommended. We will be happy to provide 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<sup>(1)</sup>

## TYPE SCBR

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

METRIC	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)
	SCBR	M3	0.74	3400	8	580	12	650
	SCBR	M4	1.7	5700	10	1000	17	1150

## TYPE SCB/SCBJ

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

METRIC	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)
	SCB / SCBJ	M3	0.74	3400	8	580	12	650
	SCB / SCBJ	M4	1.7	5700	10	1000	17	1150

## TYPE PR10

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

(1) Unless specified, performance values reported are averages when all installation specifications and procedures are followed. Variations in mounting hole size, sheet material and installation force will affect results. Performance testing of this product in your application is recommended. We will be happy to provide 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<sup>(1)</sup>

## TYPE N10

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® TYPE SMTPR RETAINER<sup>(2)</sup>

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

### TESTING CONDITIONS

**Oven** Quad ZCR convection oven with 4 zones  
**High Temp** 518°F / 270°C  
**Board Finish** 62% Sn, 38% Pb  
**Screen Printer** Ragin Manual Printer  
**Vias** None

**Spokes** 2 Spoke Pattern  
**Paste** Amtech NC559LF Sn96.5/3.0Ag/0.5Cu (SAC305) - Lead-free  
**Stencil** .0067" / 0.17mm thick

## TYPE PFK

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

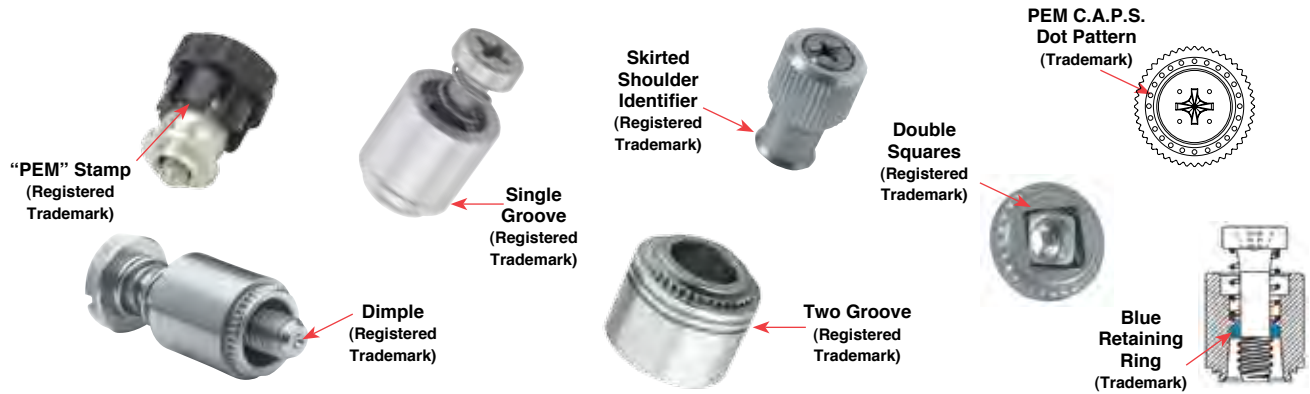
METRIC	Type	Thread Code	Test Sheet Material	
			FR-4 Fiberglass	
			Installation (kN)	Pushout (N)
PFK	M3	1.1	245	

(1) Performance values reported are averages when all installation specifications and procedures are followed. Variations in mounting hole size, sheet material and installation force (or swaging force for Type PF11MW) will affect results. Performance testing of this product in your application is recommended. We will be happy to provide 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.

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No. D400,430



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# CAPTIVE PANEL SCREWS

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