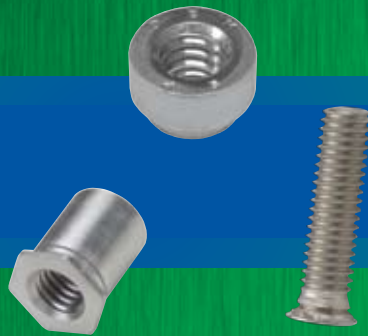


PennEngineering®

FASTENERS FOR USE IN  
STAINLESS STEEL SHEETS



BULLETIN

SS



707  
REV. 309

## FASTENERS FOR USE IN STAINLESS STEEL SHEETS

One of the very basics of self-clinching is that the fastener must be harder than the host sheet. Only then will the fastener perform as intended. This is particularly challenging when installing fasteners into stainless steel sheets.

Therefore we have developed this line of specially hardened stainless steel fasteners. When pressed in they become an integral part of the sheet. They allow the use of stainless steel sheet to satisfy applications, which require lighter, stronger designs that must perform in challenging environments. Effectively eliminate welding and reduce loose hardware.

**PEM® Type SP nuts (page SS-3)** provide strong load-bearing threads in stainless steel sheets as thin as .030"/0.8mm.

**Type SO4 and BSO4 standoffs (pages SS-4 and SS-5)** provide a permanently mounted fastener that can be used for stacking or spacing components to or from stainless steel panels.

**Type FH4 and FHP self-clinching, flush-head studs (page SS-6)** can be mounted in stainless steel sheets as thin as .040"/1mm.

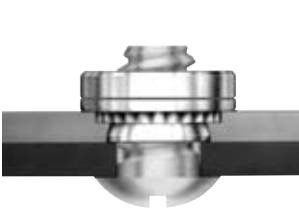
**Type TP4 self-clinching pins (page SS-7)** are specifically designed for installation into stainless steel sheets as thin as .040"/1 mm.

**Type PFC4 panel fasteners (page SS-8)** provide "tool only" access to your stainless steel assemblies.

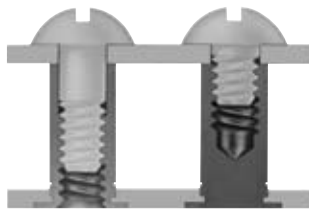
**PEM® non-locking Type A4 and self-locking Type LA4 self-clinching floating nuts (page SS-9)** will permit up to .030"/0.76mm total adjustment for mating hole misalignment in stainless steel sheets.

**Type SFP SpotFast® fasteners (page SS-10)** are ideal for flush-mount attachment applications in stainless steel sheets as thin as .030"/0.8mm.

Fasteners made from precipitation hardened grade stainless are particularly useful in applications such as outdoor equipment, medical devices and chemical and food processing equipment or anywhere corrosive element exposure is possible.



*Type SP nuts with single ring  
(See page SS-3)*



*Type SO4 and BSO4 Standoffs  
(See pages SS-4 and SS-5)*



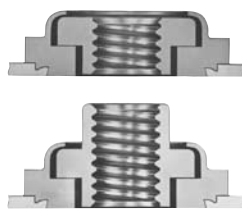
*Type FH4 and FHP studs  
(See page SS-6)*



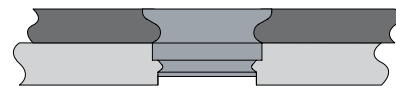
*Type TP4 Pins  
(See page SS-7)*



*Type PFC4 Panel Fasteners  
(See page SS-8)*



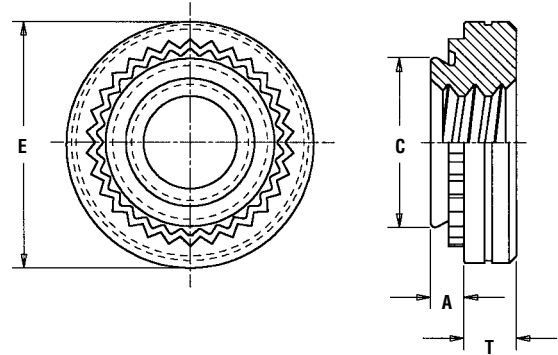
*Type A4 and LA4 floating nuts  
(See page SS-9)*



*Type SFP SpotFast® Fastener  
(See page SS-10)*

# TYPE SP™ PEM 300® SELF-CLINCHING NUTS

- After installation, reverse side of sheet remains flush and smooth.
- For use in sheets of HRB 90 or less.
- Corrosion resistance similar to 300 series stainless steel.



All dimensions are in inches.

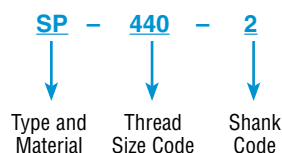
UNIFIED	Thread Size	Type	Thread Code	Shank Code	A (Shank) Max.	Sheet Thickness	Hole Size In Sheet +.003-.000 (2)	C Max.	E ±.010	T ±.010	Min. Dist. Hole C/L To Edge (1)
	.112-40 (#4-40)	SP	440		0	.030	.030 - .039	.166	.165	.250	.070
1					.038	.040 - .055					
2					.054	.056 Min.					
.138-32 (#6-32)	SP	632		0	.030	.030 - .039	.1875	.187	.280	.070	.22
				1	.038	.040 - .055					
				2	.054	.056 Min.					
.164-32 (#8-32)	SP	832		0	.030	.030 - .039	.213	.212	.310	.090	.27
				1	.038	.040 - .055					
				2	.054	.056 Min.					
.190-32 (#10-32)	SP	032		0	.030	.030 - .039	.250	.249	.340	.090	.28
				1	.038	.040 - .055					
				2	.054	.056 Min.					
.250-20 (1/4-20)	SP	0420	1	.054	.056 Min.	.344	.343	.440	.170	.34	
.313-18 (5/16-18)	SP	0518	1	.054	.056 Min.	.413	.412	.500	.230	.38	

All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type	Thread Code	Shank Code	A (Shank) Max.	Sheet Thickness	Hole Size In Sheet +0.08 (2)	C Max.	E ±0.25	T ±0.25	Min. Dist. Hole C/L To Edge (1)
	M3 x 0.5	SP	M3		0	0.77	0.8 - 1	4.22	4.2	6.3	1.5
1					0.97	1.01 - 1.39					
2					1.38	1.4 Min.					
M4 x 0.7	SP	M4		0	0.77	0.8 - 1	5.41	5.39	7.9	2	6.9
				1	0.97	1.01 - 1.39					
				2	1.38	1.4 Min.					
M5 x 0.8	SP	M5		0	0.77	0.8 - 1	6.35	6.33	8.7	2	7.1
				1	0.97	1.01 - 1.39					
				2	1.38	1.4 Min.					
M6 x 1	SP	M6	1	1.38	1.4 Min.	8.75	8.73	11.1	4.1	8.6	
M8 x 1.25	SP	M8	1	1.38	1.4 Min.	10.5	10.47	12.65	5.47	9.7	

- (1) To minimize sheet distortion and maximize product performance, use a centerline-to-edge value greater or equal to the value specified.  
 (2) Hole punch diameter must be maintained at +.001" / .025mm over mounting hole diameter. Hole punch should be kept sharp to minimize local work hardening around hole. Fasteners should be installed in the punch side of the hole.

## PART NUMBER DESIGNATION



# TYPE S04™ THRU-HOLE THREADED STANDOFFS

- Installed with heads flush with one surface of the mounting sheet.
- Available unthreaded for spacing multi-panel assemblies.
- For use in sheets of HRB 88 or less.

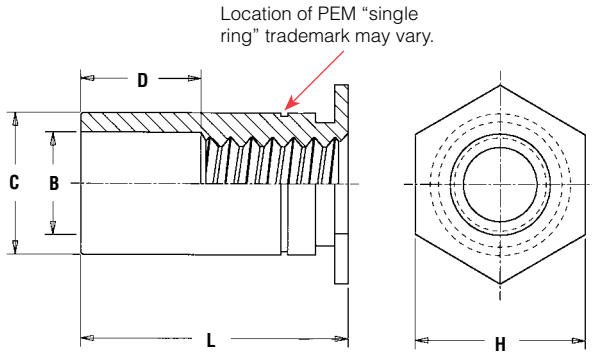
## GENERAL DIMENSIONAL DATA

All dimensions are in inches.

UNIFIED	Thread Code	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	B Counter-Bore Dia. ±.005	C +.000 -.005	H Nom.	Min. Dist. Hole C/L To Edge(1)
	440	.040	.166	.125	.165	.187	.23
	6440	.040	.213	.125	.212	.250	.28
	632	.040	.213	.156	.212	.250	.28
	8632	.050	.281	.156	.280	.312	.33
	832	.050	.281	.188	.280	.312	.33
	032	.050	.281	.203	.280	.312	.33

All dimensions are in millimeters.

METRIC	Thread Code	Min. Sheet Thickness	Hole Size In Sheet +0.08	B Counter-Bore Dia. ±0.13	C -0.13	H Nom.	Min. Dist. Hole C/L To Edge(1)
	M3	1.02	4.22	3.25	4.2	4.8	6
	3.5M3	1.02	5.41	3.25	5.39	6.4	7.1
	M3.5	1.02	5.41	3.9	5.39	6.4	7.1
	M4	1.27	7.14	4.8	7.12	7.9	8.4
	M5	1.27	7.14	5.35	7.12	7.9	8.4



Clinching profile may vary.



## THREAD SIZE AND LENGTH SELECTION DATA

All dimensions are in inches.

UNIFIED	Thread Size	Type	Thread Code	Length "L" +.002 -.005 (Length Code in 32nds of an inch)															
				.125	.187	.250	.312	.375	.437	.500	.562	.625	.687	.750	.812	.875	.937	1.00	1.062
	.112-40 (#4-40)	S04	440	4	6	8	10	12	14	16	18	20	22	24	NA	NA	NA	NA	NA
			6440(2)																
	.138-32 (#6-32)	S04	632	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34
			8632(2)																
	.164-32 (#8-32)	S04	832	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34
			032																
D Dimension ±.010				None			.187			.312			.437						

All dimensions are in millimeters.

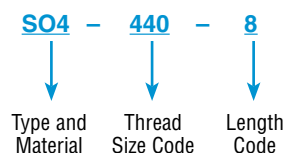
METRIC	Thread Size x Pitch	Type	Thread Code	Length "L" +0.05 -0.13 (Length Code in millimeters)														
				3	4	6	8	10	12	14	16	18	20	22	25			
	M3 x 0.5	S04	M3	3	4	6	8	10	12	14	16	18	NA	NA	NA			
			3.5M3(2)															
	M3.5 x 0.6	S04	M3.5	3	4	6	8	10	12	14	16	18	20	22	25			
			M4															
			M5															
D Dimension ±0.25				None			4			8			11					

(1) To minimize sheet distortion and maximize product performance, use a centerline-to-edge value greater or equal to the value specified.

(2) Standoffs with thread codes 6440, 8632, and 3.5M3 offer greater wall thickness for thread sizes 440, 632, and M3 respectively.

NA Not Available.

## PART NUMBER DESIGNATION

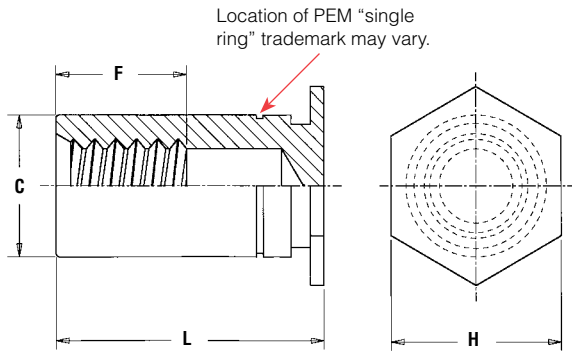


# TYPE BSO4™ BLIND THREADED STANDOFFS

- Ideal for stacking or spacing.
- Installed with heads flush with one surface of the mounting sheet.
- Outer sheet surface is not only flush, but closed as well.
- For use in sheets of HRB 88 or less.

## GENERAL DIMENSIONAL DATA

All dimensions are in inches.



Clinching profile may vary.



UNIFIED	Thread Code	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C +.000 -.005	H Nom.	Min. Dist. Hole C/L To Edge(1)
	440	.040	.166	.165	.187	.23
	6440	.040	.213	.212	.250	.28
	632	.040	.213	.212	.250	.28
	8632	.050	.281	.280	.312	.33
	832	.050	.281	.280	.312	.33
	032	.050	.281	.280	.312	.33

All dimensions are in millimeters.

METRIC	Thread Code	Min. Sheet Thickness	Hole Size In Sheet +0.08	C -0.13	H Nom.	Min. Dist. Hole C/L To Edge(1)
	M3	1.02	4.22	4.2	4.8	6
	3.5M3	1.02	5.41	5.39	6.4	7.1
	M3.5	1.02	5.41	5.39	6.4	7.1
	M4	1.27	7.14	7.12	7.9	8.4
	M5	1.27	7.14	7.12	7.9	8.4

## THREAD SIZE AND LENGTH SELECTION DATA

All dimensions are in inches.

UNIFIED	Thread Size	Type	Thread Code	Length "L" +.002 -.005 (Length Code in 32nds of an inch)												
				.312	.375	.437	.500	.562	.625	.687	.750	.812	.875	.937	1.00	1.062
	.112-40 (#4-40)	BSO4	440	10	12	14	16	18	20	22	24	26	28	30	32	34
			6440 <sup>(2)</sup>													
	.138-32 (#6-32)	BSO4	632	10	12	14	16	18	20	22	24	26	28	30	32	34
			8632 <sup>(2)</sup>													
	.164-32 (#8-32)	BSO4	832	10	12	14	16	18	20	22	24	26	28	30	32	34
			032													
	.190-32 (#10-32)															
F Dimension Min.					.156	.187	.250			.375						

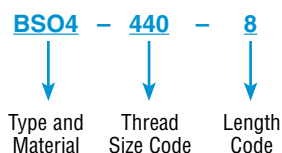
All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type	Thread Code	Length "L" +0.05 -0.13 (Length Code in millimeters)											
				6	8	10	12	14	16	18	20	22	25		
	M3 x 0.5	BSO4	M3												
			3.5M3 <sup>(2)</sup>												
	M3.5 x 0.6	BSO4	M3.5												
			M4	6	8	10	12	14	16	18	20	22	25		
	M4 x 0.7														
	M5 x 0.8														
F Dimension Min.					3.2	4	5	6.5			9.5				

(1) To minimize sheet distortion and maximize product performance, use a centerline-to-edge value greater or equal to the value specified.

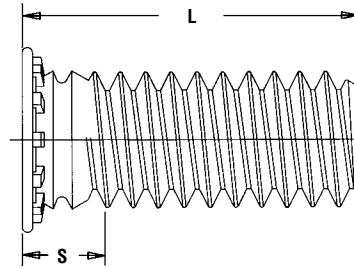
(2) Standoffs with thread codes 6440, 8632, and 3.5M3 offer greater wall thickness for thread sizes 440, 632, and M3 respectively.

## PART NUMBER DESIGNATION

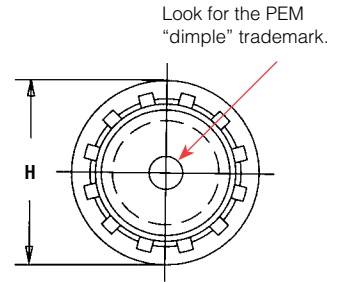


# TYPE FH4™ AND FHP™ FLUSH-HEAD STUDS

- Permanent installation into stainless steel sheets as thin as .040" / 1 mm.
- For use in sheets of HRB 92 or less.



unthreaded length



Look for the PEM  
"dimple" trademark.

All dimensions are in inches.

UNIFIED	Thread Size	Type		Thread Code	Length Code "L" ±.015 (Length code in 16ths of an inch)								Sheet Thickness	Hole Size in Sheet +.003 -.000	Max. Hole in Attach. Parts	H ±.015	S Max.	Min. Dist. Hole C/L to Edge		
					.250	.312	.375	.500	.625	.750	.875	1.00							1.25	1.50
	.112-40 (#4-40)	FH4	FHP	440	4	5	6	8	10	12 <sup>NS</sup>	14 <sup>NS</sup>	16 <sup>NS</sup>	NA	NA	.040-.095	.112	.135	.176	.085	.219
	.138-32 (#6-32)	FH4	FHP	632	4	5	6	8	10	12	14	16	20	24 <sup>NS</sup>	.040-.095	.138	.160	.206	.090	.250
	.164-32 (#8-32)	FH4	FHP	832	4	5	6	8	10	12	14	16	20	24 <sup>NS</sup>	.040-.095	.164	.185	.237	.090	.281
	.190-32 (#10-32)	FH4	FHP	032	NA	5 <sup>NS</sup>	6	8	10	12	14	16	20	24	.040-.095	.190	.210	.256	.100	.281
	.250-20 (1/4-20)	FH4	NA	0420	NA	NA	6 <sup>NS</sup>	8	10	12	14	16	20	24	.062-.117	.250	.270	.337	.135	.312

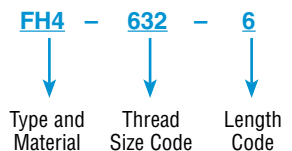
All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type		Thread Code	Length Code "L" ±0.4 (Length Code in millimeters)								Sheet Thickness	Hole Size in Sheet +0.08	Max. Hole in Attach. parts	H ±0.4	S Max.	Min. Dist. Hole C/L to Edge		
					6 <sup>NS</sup>	8	10	12	15	18	20 <sup>NS</sup>	25 <sup>NS</sup>							NA	NA
	M3 x 0.5	FH4	FHP	M3	6 <sup>NS</sup>	8	10	12	15	18	20 <sup>NS</sup>	25 <sup>NS</sup>	NA	NA	1 - 2.4	3	3.6	4.6	2.1	5.6
	M4 x 0.7	FH4	FHP	M4	6 <sup>NS</sup>	8	10	12	15	18	20	25	30 <sup>NS</sup>	35 <sup>NS</sup>	1 - 2.4	4	4.6	5.9	2.4	7.2
	M5 x 0.8	FH4	FHP	M5	NA	8 <sup>NS</sup>	10	12	15	18	20	25	30 <sup>NS</sup>	35 <sup>NS</sup>	1 - 2.4	5	5.6	6.5	2.7	7.2
	M6 x 1	FH4	NA	M6	NA	NA	10	12	15	18	20	25	30	35	1.6 - 3	6	6.6	8.2	3	7.9

NS Not Stocked, available on special order.

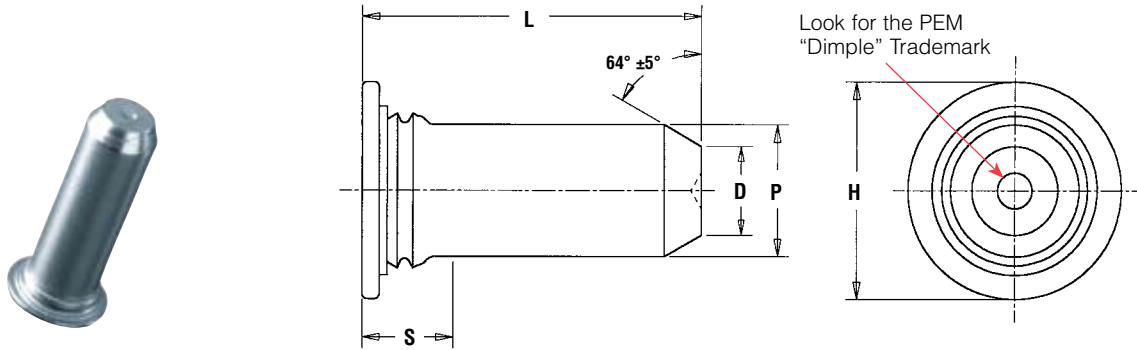
NA Not Available.

## PART NUMBER DESIGNATION



# TYPE TP4™ SELF-CLINCHING PINS

- Flush-mounted.
- Satisfies a wide range of positioning, pivot, and alignment applications.
- Chamfered end makes mating hole location easy.



All dimensions are in inches.

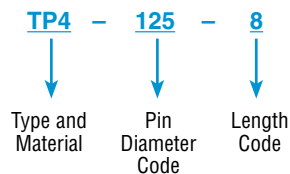
UNIFIED	Pin Diameter P ±.002	Type	Pin Diameter Code	Length Code "L" ± .015 (Length Code in 16ths of an inch)					Min. Sheet Thickness	Hole Size in Sheet +.003 -.000	D ±.006	H ±.015	S Max. (1)	Min. Distance Hole C/L to Edge
		Stainless Steel		.375	.500	.625	.750	1.00						
	.125	TP4	125	6	8	10	12	NA	.040	.144	.090	.205	.090	.250
	.187	TP4	187	6	8	10	12	16	.040	.205	.132	.270	.090	.280
	.250	TP4	250	NA	8	10	12	16	.040	.272	.177	.335	.090	.310

All dimensions are in millimeters.

METRIC	Pin Diameter P ±0.05	Type	Pin Diameter Code	Length Code "L" ± 0.4 (Length Code in millimeters)					Min. Sheet Thickness	Hole Size in Sheet +0.08	D ±0.15	H ±0.4	S Max. (1)	Min. Distance Hole C/L to Edge
		Stainless Steel		8	10	12	16	NA						
	3	TP4	3mm	8	10	12	16	NA	1	3.5	2.05	5.2	2.29	6.4
	4	TP4	4mm	8	10	12	16	NA	1	4.5	2.82	6.12	2.29	7.1
	5	TP4	5mm	NA	10	12	16	20	1	5.5	3.53	7.19	2.29	7.6
	6	TP4	6mm	NA	NA	12	16	20	1	6.5	4.24	8.13	2.29	7.9

(1) Pin diameter may exceed max. in this region.  
NA Not Available.

## PART NUMBER DESIGNATION

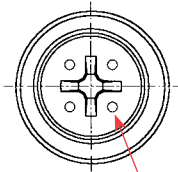


# TYPE PFC4™ PANEL FASTENERS

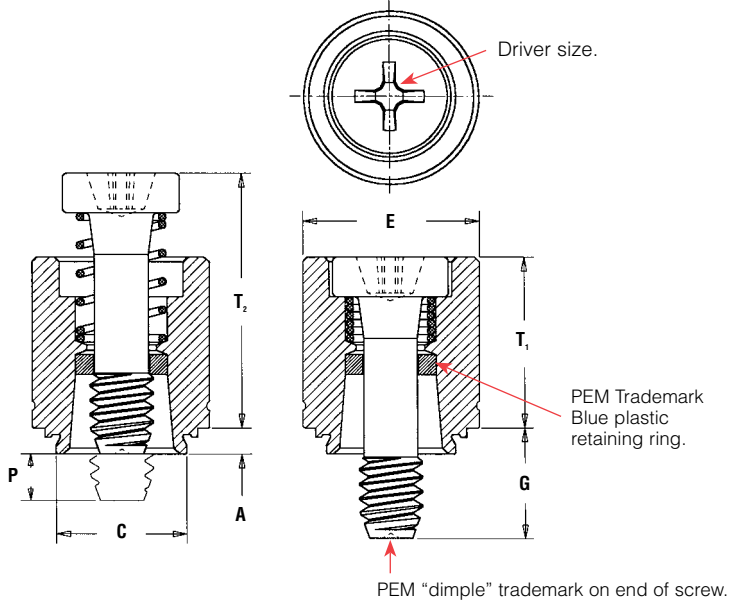
- Meets UL 1950 “service area access” requirements.
- Assorted screw lengths for most applications.
- For use in sheets of HRB 88 or less.



**RU** US  
Patented.



Four dimples on head designates metric thread.



All dimensions are in inches.

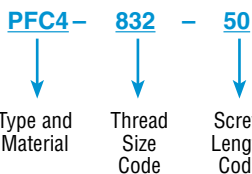
UNIFIED	Thread Size	Type	Thread Code	Screw Length Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet + .003 - .000	C Max.	E ± .010	G ± .016	P ± .025	T <sub>1</sub> Max.	T <sub>2</sub> Nom.	Driver Size	Min. Dist. Hole C/L To Edge (1)
	.112-40 (#4-40)	PFC4	440		40	.060	.060	.265	.264	.344	.250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

All dimensions are in millimeters.

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	P ± 0.64	T <sub>1</sub> Max.	T <sub>2</sub> Nom.	Driver Size	Min. Dist. Hole C/L To Edge (1)
	M3 x 0.5	PFC4	M3		40	1.53	1.53	6.73	6.71	8.74	6.4	0	9.4	13.72	#1
62 <sup>NS</sup>					9.5						3.2				
M4 x 0.7	PFC4	M4		50	1.53	1.53	7.92	7.9	10.31	7.9	0	12.19	17.91	#2	7.87
				72 <sup>NS</sup>						11.1	3.2				
				94 <sup>NS</sup>						14.3	6.4				
M5 x 0.8	PFC4	M5		50	1.53	1.53	8.74	8.72	11.1	7.9	0	12.45	17.91	#2	8.63
				72						11.1	3.2				
				94 <sup>NS</sup>						14.3	6.4				

(1) To minimize sheet distortion and maximize product performance, use a centerline-to-edge value greater or equal to the value specified. NS Not Stocked, available on special order.

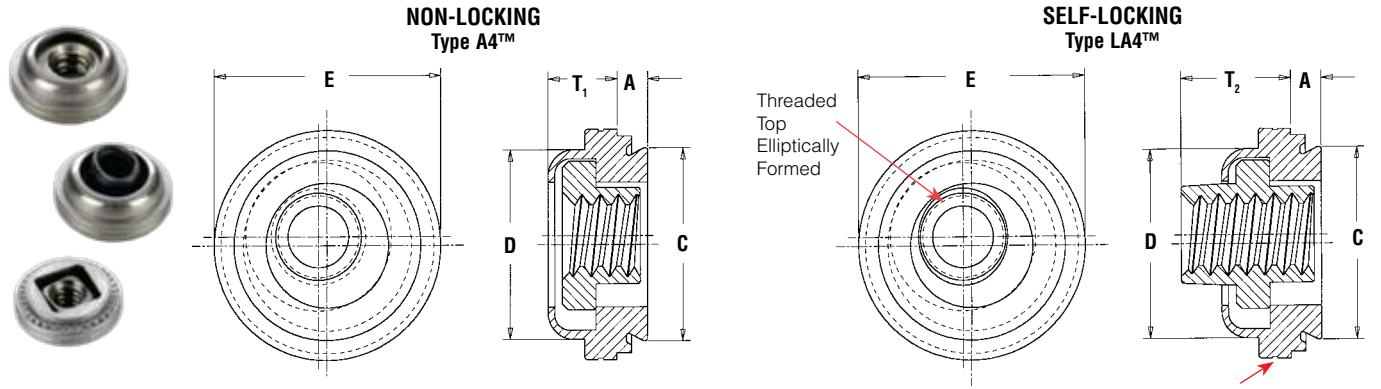
## PART NUMBER DESIGNATION





# TYPE A4™ AND LA4™ FLOATING SELF-CLINCHING FASTENERS

- Speeds assembly by compensating for mating hole misalignment.
- Permanent installation into stainless steel sheets as thin as .038" / 0.97 mm and greater.
- Provides high torque-out and pushout resistance in stainless panels.



Float – .015" / 0.38 mm minimum, in all directions from center, .030" / 0.76 mm total.

All dimensions are in inches.

	Thread Size	Type		Thread Code	Shank Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size in Sheet +.003 –.000	C Max.	D Max.	E ± .015	T <sub>1</sub> Max.	T <sub>2</sub> Max.	Min. Dist. Hole C/L To Edge
		Non-Locking	Self-Locking											
UNIFIED	.112-40 (#4-40)	A4	LA4	440	1	.038	.038	.290	.289	.290	.360	.130	.190	.30
	.138-32 (#6-32)	A4	LA4	632	1	.038	.038	.328	.327	.335	.390	.130	.200	.32
	.164-32 (#8-32)	A4	LA4	832	1	.038	.038	.368	.367	.365	.440	.130	.210	.34
	.190-32 (#10-32)	A4	LA4	032	1	.038	.038	.406	.405	.405	.470	.170	.270	.36

All dimensions are in millimeters.

	Thread Size x Pitch	Type		Thread Code	Shank Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size in Sheet + 0.08	C Max.	D Max.	E ± 0.38	T <sub>1</sub> Max.	T <sub>2</sub> Max.	Min. Dist. Hole C/L To Edge
		Non-Locking	Self-Locking											
METRIC	M3 x 0.5	A4	LA4	M3	1	0.97	0.97	7.37	7.35	7.37	9.14	3.31	4.83	7.62
	M4 x 0.7	A4	LA4	M4	1	0.97	0.97	9.35	9.33	9.28	11.18	3.31	5.34	8.64
	M5 x 0.8	A4	LA4	M5	1	0.97	0.97	10.31	10.29	10.29	11.94	4.32	6.86	9.14

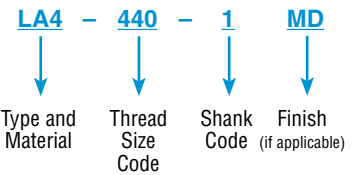
Double squares are a registered trademark

Always look for the square insert in a square retainer to be sure you are getting PEM brand fasteners and the best in self-clinching performance.



Bottom view (same for both type fasteners)

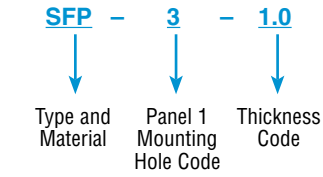
## PART NUMBER DESIGNATION



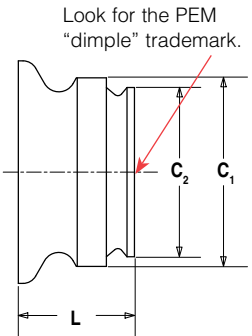
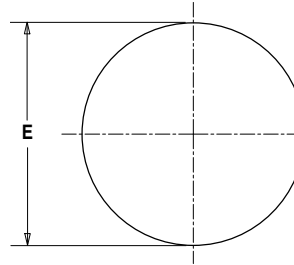
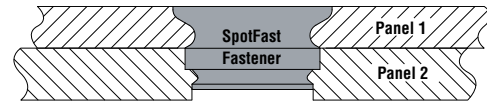
# TYPE SFP™ SPOTFAST® FASTENERS

- Allows permanent joining of two metal sections.
- Installs smooth with top sheet and flush or sub-flush with the bottom sheet.
- Can be used as single flush-mounted pivot point.

## PART NUMBER DESIGNATION



SpotFast® fastener used as a single flush-mounted pivot point. Top panel rotates about the SpotFast fastener.



Patent pending.

Type and Size	Thickness Code	Panel 1 Thickness ±0.08mm / ±.003"		Panel 1 Mounting Hole +0.08mm / +.003" - .000"		Panel 2 Thickness Min. (1)		Panel 2 Mounting Hole +0.08mm / +.003" - .000"		C <sub>1</sub> Max.		C <sub>2</sub> Max.		E Max.		L Max.		Min. Dist Hole C/L To Edge	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
SFP-3	1.0	1	.039	3	.118	1	.039	2.5	.098	2.98	.117	2.48	.097	3.76	.148	1.9	.075	2.54	0.1
SFP-3	1.2	1.2	.047	3	.118	1.2	.047	2.5	.098	2.98	.117	2.48	.097	3.76	.148	2.31	.091	2.54	0.1
SFP-3	1.6	1.6	.063	3	.118	1.6	.063	2.5	.098	2.98	.117	2.48	.097	3.76	.148	3.12	.123	2.54	0.1
SFP-5	1.0	1	.039	5	.197	1	.039	4.5	.177	4.98	.196	4.47	.176	5.56	.219	1.9	.075	3.56	0.14
SFP-5	1.2	1.2	.047	5	.197	1.2	.047	4.5	.177	4.98	.196	4.47	.176	5.56	.219	2.31	.091	3.56	0.14
SFP-5	1.6	1.6	.063	5	.197	1.6	.063	4.5	.177	4.98	.196	4.47	.176	5.56	.219	3.12	.123	3.56	0.14

(1) Fastener will provide flush application at minimum sheet thickness.

## MATERIAL AND FINISH SPECIFICATIONS

Type	Threads			Fastener Materials				Finish		For Use in Sheet Hardness (1)			Corrosion Resistance	Magnetic	
	Internal, ANSI B1.1 2B/ANSI/ASME B1.13M, 6H	External, ANSI B1.1 2A/ANSI/ASME B1.13M, 6g	Self-locking, Internal ANSI B1.1, 3B/ANSI/ASME B1.13M, 6H	Precipitation Hardening Grade Stainless Steel	400 Series Stainless Steel	300 Series Stainless Steel	A286 Stainless	Passivated and/or Tested per ASTM A380	Black Dry-film Lubricant	HRB 92 / HB 202 or less	HRB 90 / HB 192 or less	HRB 88 / HB 183 or less			
SP Stamped	•						•	•			•		Excellent	No	
SP Grooved	•			•				•			•		Excellent	Yes	
S04	•				•			•				•	Fair	Yes	
BS04	•				•			•				•	Fair	Yes	
FH4		•			•			•		•			Fair	Yes	
FHP		•			•			•		•			Excellent	No	
TP4					•			•		•			Fair	Yes	
PFC4 (Retainer) (Screw) (Spring)					•			•				•	Fair	Yes	
A4	•				• (retainer)	• (insert)		•				•	Fair	Yes	
LA4			•		• (retainer)	• (insert)		• (retainer)	• (insert)			•	Fair	Yes	
SFP				•				•				•	Excellent	Yes	
Part number codes for finishes								None	MD						

(1) HRB - Hardness Rockwell "B" Scale. HB - Hardness Brinell.

# INSTALLATION

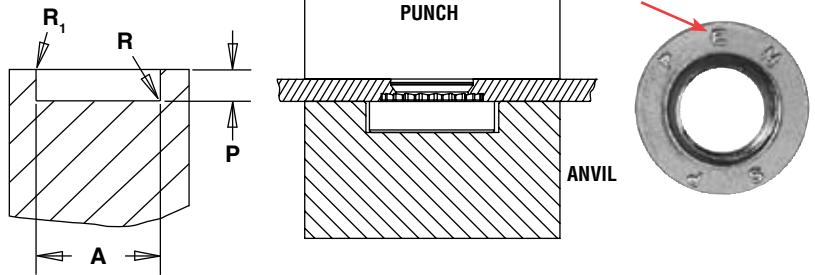
## Type SP<sup>(1)</sup> - Identified With Stamp

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into the recommended counterbored anvil hole and place the mounting hole over the shank of the fastener as shown in diagram.
3. With punch and anvil surfaces parallel, apply squeezing force until the head of the nut comes into contact with the sheet material.

UNIFIED	Thread Code	Anvil Dimensions (in.)				Anvil Part No.
		A ±.002	P +.000 -.001	R Max.	R <sub>1</sub> +.005	
	440	.255	.064	.010	.005	8012821
	632	.286	.064	.010	.005	8012822
	832	.317	.082	.010	.005	8012823
	032	.348	.082	.010	.005	8012824
	0420	.443	.163	.010	.005	8012825
	0518	.505	.230	.010	.005	8015359

METRIC	Thread Code	Anvil Dimensions (mm)				Anvil Part No.
		A ±0.05	P -0.03	R Max.	R <sub>1</sub> +0.13	
	M3	6.48	1.63	0.25	0.13	8012821
	M3.5	7.26	1.63	0.25	0.13	8012822
	M4	8.05	2.08	0.25	0.13	8012823
	M5	8.84	2.08	0.25	0.13	8012824
	M6	11.25	4.14	0.25	0.13	8012825
	M8	12.83	5.41	0.25	0.13	8015360

RECOMMENDED  
COUNTERBORED  
INSTALLATION  
ANVIL



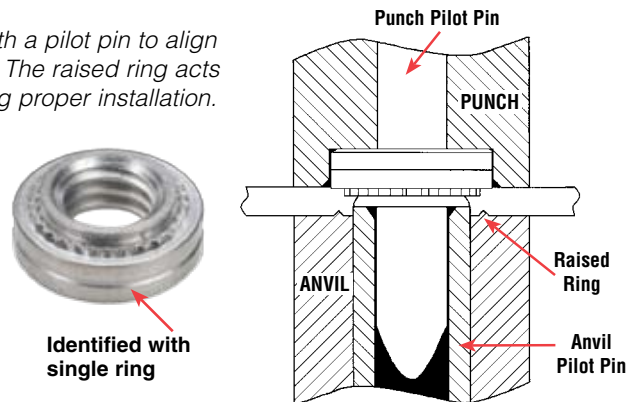
(1) To meet the published performance data, we recommend using the installation punch and anvil shown. Deviations from recommended installation tooling may result in sheet distortion and reduced performance.

**NOTE:** Variations in hole preparation, installation tooling, installation force, and sheet material type, thickness, and hardness will affect both performance and tooling life.

## Type SP<sup>(1)</sup> - Identified With Single Ring

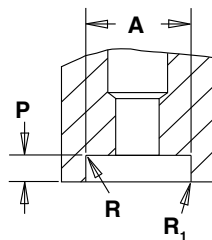
A special punch with a pilot pin to align the nut and a special anvil with a pilot pin to align the sheet and a raised ring is required to create a proper installation. The raised ring acts as a second displacer of the stainless sheet material, thereby ensuring proper installation.

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place sheet on raised ring anvil.
3. Place fastener in hole.
4. With punch and anvil surfaces parallel, apply squeezing force until the head of the nut comes into contact with the sheet material.



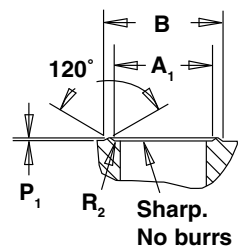
UNIFIED	Thread Code	Punch Dimensions (in.)				Punch Part No.
		A ±.002	P ±.001	R Max.	R <sub>1</sub> +.005	
	440	.255	.066	.010	.005	8002691
	632	.286	.066	.010	.005	8002692
	832	.317	.089	.010	.005	8002693
	032	.348	.089	.010	.005	8002694
	0420	—	—	—	—	(3)

RECOMMENDED  
COUNTERBORED  
INSTALLATION  
PUNCH



UNIFIED	Thread Code	Anvil Dimensions (in.)				Anvil Part No.
		A <sub>1</sub> ±.002	B Nom.	P <sub>1</sub> (2) +.001 - .000	R <sub>2</sub> Max.	
	440	.199	.261	.009	.003	8002687
	632	.218	.280	.009	.003	8002688
	832	.243	.305	.009	.003	8002689
	032	.288	.350	.009	.003	8002690
	0420	—	—	—	—	(3)

RECOMMENDED  
RAISED RING  
INSTALLATION  
ANVIL



METRIC	Thread Code	Punch Dimensions (mm)				Punch Part No.
		A ±0.05	P ±0.03	R Max.	R <sub>1</sub> +0.13	
	M3	6.48	1.42	0.25	0.13	8002695
	M3.5	7.26	1.42	0.25	0.13	8002696
	M4	8.05	1.93	0.25	0.13	8002697
	M5	8.84	1.93	0.25	0.13	8002698
	M6	—	—	—	—	(3)

METRIC	Thread Code	Anvil Dimensions (mm)				Anvil Part No.
		A <sub>1</sub> ±0.05	B Nom.	P <sub>1</sub> (2) +0.03	R <sub>2</sub> Max.	
	M3	5.05	6.63	.23	.08	8002687
	M3.5	5.54	7.11	.23	.08	8002688
	M4	6.17	7.75	.23	.08	8002689
	M5	7.34	7.75	.23	.08	8002690
	M6	—	—	—	—	(3)

(1) To meet the published performance data, we recommend using the installation punch and anvil shown. Deviations from recommended installation tooling may result in sheet distortion and reduced performance.

(2) We recommend replacing installation anvil when the height of the "P1" dimension is reduced to .005" / 0.13mm due to wear. Reductions in performance may occur as the height of the protrusion wears.

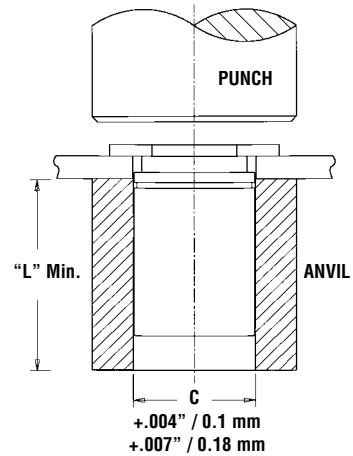
(3) Special installation tooling for #0420 and M6 thread sizes is not required.

**NOTE:** Variations in hole preparation, installation tooling, installation force, and sheet material type, thickness, and hardness will affect both performance and tooling life.

# INSTALLATION

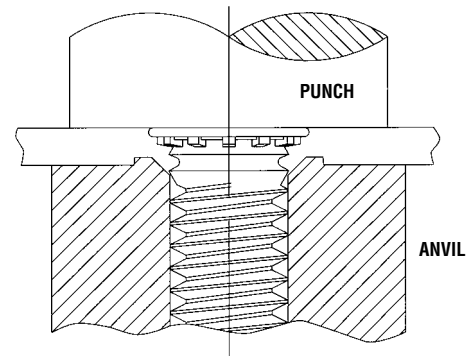
## Types SO4 and BS04

1. Prepare properly sized round mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Insert standoff through mounting hole of sheet and into anvil as shown in drawing.
3. With punch and anvil surfaces parallel, apply only enough squeezing force to embed the standoff's head flush in the sheet.



## Type FH4 and FHP

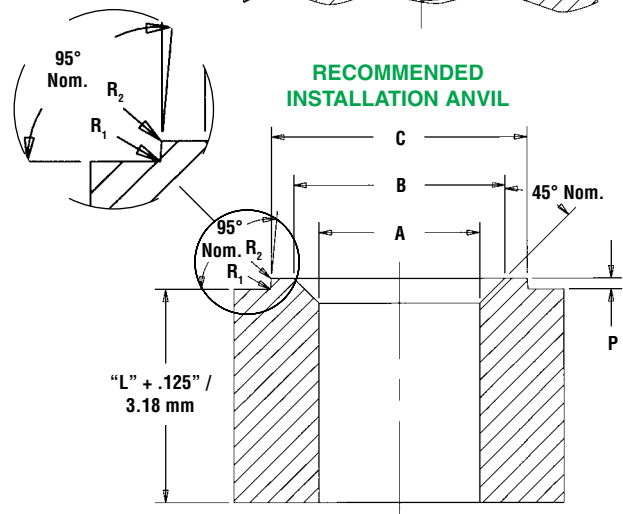
1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into the anvil hole and place the mounting hole over the shank of the fastener.
3. With punch and anvil surfaces parallel, apply squeezing force until head of fastener is flush with sheet. A special anvil with a raised ring is required to create a proper installation. The raised ring acts as a second displacer of the stainless sheet material, thereby ensuring that the annular groove of the stud is filled.



### Anvil Dimensions <sup>(1)</sup>

UNIFIED	Thread Code	Anvil Dimensions (in.)					Anvil Part No.	
		A +.003 -.000	B ±.002	C ±.002	P ±.001	R <sub>1</sub> Max.		R <sub>2</sub> Max.
	440	.113	.144	.174	.010	.003	.005	8001645
	632	.140	.170	.200	.010	.003	.005	8001644
	832	.166	.202	.236	.010	.003	.005	8001643
	032	.191	.235	.275	.010	.003	.005	8001642
	0420	.252	.324	.360	.020	.003	.005	8002535

METRIC	Thread Code	Anvil Dimensions (mm)					Anvil Part No.	
		A +0.08	B ±0.05	C ±0.05	P ±.025	R <sub>1</sub> Max.		R <sub>2</sub> Max.
	M3	3.05	3.81	4.57	0.25	0.08	0.13	8001678
	M4	4.04	4.95	5.82	0.25	0.08	0.13	8001677
	M5	5.08	6.15	7.16	0.25	0.08	0.13	8001676
	M6	6.05	7.87	8.79	0.51	0.08	0.13	8002536



(1) We recommend replacing installation anvil when the height of the "P" dimension is reduced to .005" / 0.13 mm due to wear. Reductions in performance may occur as the height of the protrusion wears. Variations in hole preparation, installation force, and sheet material type, thickness, and hardness will affect both performance and tooling life.

# INSTALLATION

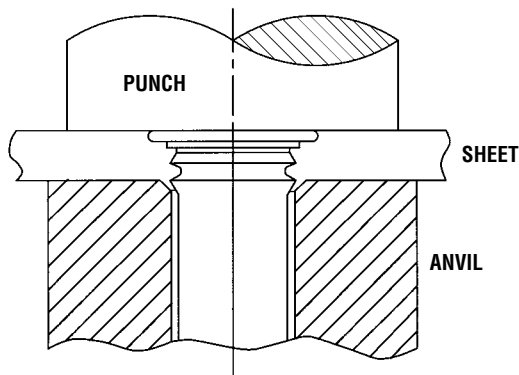
## Type TP4

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Insert pin through mounting hole of sheet and into anvil hole.
3. With punch and anvil surfaces parallel, apply squeezing force to embed the pin's head flush in the sheet.

All dimensions are in inches.

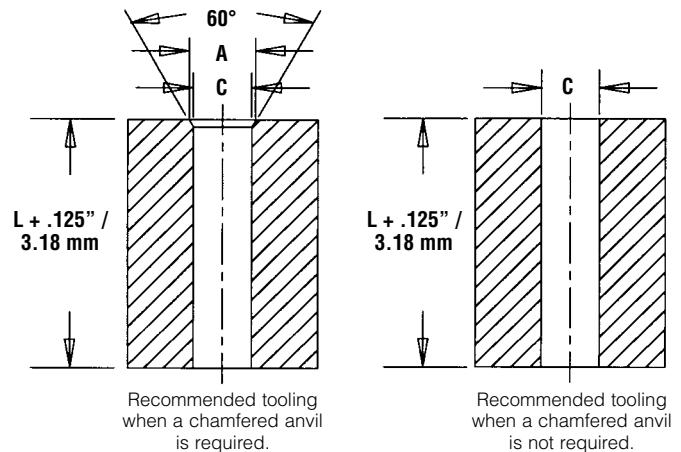
UNIFIED	Type	Pin Dia. Code	Test Sheet Thickness	Anvil Dimensions	
				A ±.002	C ±.002
UNIFIED	TP4	125	.040 - .060	.160	.130
			Over .060	(1)	
UNIFIED	TP4	187	.040 - .065	.220	.192
			Over .065	(1)	
UNIFIED	TP4	250	.040 - .075	.285	.255
			Over .075	(1)	

(1) Chamfered anvil not required.



All dimensions are in millimeters.

METRIC	Type	Pin Dia. Code	Test Sheet Thickness	Anvil Dimensions	
				A ±0.05	C ±0.05
METRIC	TP4	3mm	1 - 1.7	3.88	3.11
			Over 1.7	(1)	
METRIC	TP4	4mm	1 - 1.7	4.88	4.11
			Over 1.7	(1)	
METRIC	TP4	5mm	1 - 1.8	5.89	5.13
			Over 1.8	(1)	
METRIC	TP4	6mm	1 - 1.9	6.89	6.12
			Over 1.9	(1)	



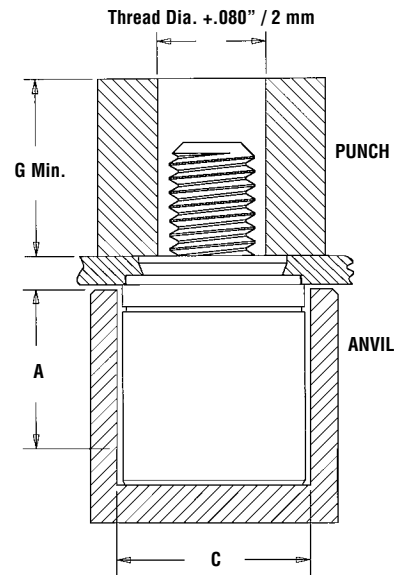
## Type PFC4

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into the anvil hole and place the mounting hole over the shank of the fastener.
3. With punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer 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		
UNIFIED	440	.345	.358	975200027	975200060
UNIFIED	632	.345	.390	975201243	975200061
UNIFIED	832	.435	.421	975200029	975200062
UNIFIED	032	.435	.452	975201244	975200064

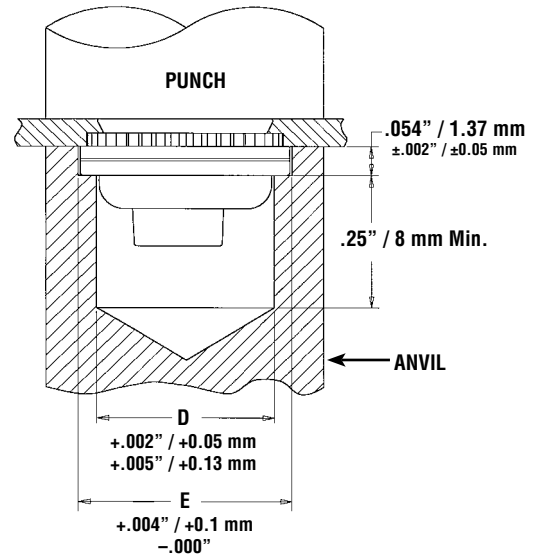
METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	C ±0.05		
METRIC	M3	8.76	9.09	975200027	975200060
METRIC	M4	11.05	10.69	975200029	975200062
METRIC	M5	11.05	11.48	975201244	975200064



# INSTALLATION

## Type A4 and LA4

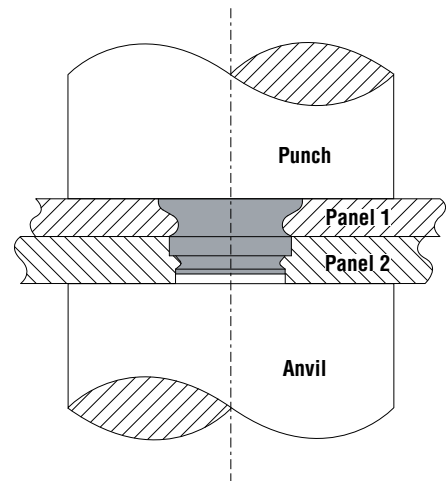
1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into the anvil hole and place the mounting hole over the shank of the fastener.
3. With punch and anvil surfaces parallel, apply sufficient squeezing force until the flange contacts the sheet material.



## Type SFP

1. Prepare properly sized mounting hole in both panels. Do not perform any secondary operations such as deburring.
2. Place Panel 2 with smaller mounting hole on anvil and align Panel 1 mounting hole with the mounting hole of Panel 2. Place the smaller diameter end of the fastener through the mounting holes as shown in the drawing to the right.
3. With punch and anvil surfaces parallel, apply squeezing force until the fastener is flush with the top of Panel 1.

**NOTE:** To use as a flush-mounted pivot point, for best results, install SpotFast fastener into Panel 1 first, then place Panel 2 over fastener and squeeze again.



# PERFORMANCE DATA<sup>(1)</sup>

Part Number	Max. Nut Tightening Torque (in. lbs.)	Max. Rec. Tightening Torque For Mating Screw (in. lbs.)	Test Sheet Material – 300 Series Stainless Steel			
			Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)	Pull Thru (lbs.)
SP-440-0	—	—	8000	130	14	—
SP-440-1	—	—	9000	165	17	—
SP-440-2	—	—	10000	290	18	—
SP-632-0	—	—	8500	140	18	—
SP-632-1	—	—	9500	170	24	—
SP-632-2	—	—	10500	340	28	—
SP-832-0	—	—	9000	145	30	—
SP-832-1	—	—	10000	180	37	—
SP-832-2	—	—	11000	360	45	—
SP-032-0	—	—	9500	180	35	—
SP-032-1	—	—	10500	230	45	—
SP-032-2	—	—	11500	400	60	—
SP-0420-1	—	—	13500	450	150	—
SP-0518-1	—	—	14800	470	170	—
S04/BSO4-440	—	4.75	5500	360	17	600
S04/BSO4-6440	—	4.75	9500	647	17	680
S04/BSO4-632	—	8.75	9500	647	30	680
S04/BSO4-8632	—	8.75	10500	900	30	1392
S04/BSO4-832	—	18	10500	900	53	1517
S04/BSO4-032	—	32	10500	900	71	1368
FH4-440-L	6	—	9000	450	16	800
FH4-632-L	11	—	9500	540	27	1350
FH4-832-L	21	—	11200	780	58	1800
FH4-032-L	33	—	12000	1050	95	2250
FH4-0420-L	70	—	23000	1600	156	3900
FHP-632-L	11	—	9500	670	19.5	940
FHP-832-L	21	—	11200	785	37.5	1415
TP4-125	—	—	8000	350	—	—
TP4-187	—	—	12000	570	—	—
TP4-250	—	—	14000	650	—	—
PFC4-440	—	—	9100	350	—	—
PFC4-632	—	—	10300	400	—	—
PFC4-832	—	—	10800	450	—	—
PFC4-032	—	—	11800	550	—	—
A4/LA4-440	—	—	9000	200 <sup>(2)</sup>	85	—
A4/LA4-632	—	—	10000	200 <sup>(2)</sup>	85	—
A4/LA4-832	—	—	12000	200 <sup>(2)</sup>	85	—
A4/LA4-032	—	—	13000	250 <sup>(2)</sup>	125	—
SFP-3-1.0	—	—	3000	140	—	—
SFP-3-1.2	—	—	4500	186	—	—
SFP-3-1.6	—	—	5000	340	—	—
SFP-5-1.0	—	—	4000	222	—	—
SFP-5-1.2	—	—	6000	260	—	—
SFP-5-1.6	—	—	7500	701	—	—

Part Number	Max. Nut Tightening Torque (N•m)	Max. Rec. Tightening Torque For Mating Screw (N•m)	Test Sheet Material – 300 Series Stainless Steel			
			Installation (kN)	Pushout (N)	Torque-out (N•m)	Pull Thru (N)
SP-M3-0	—	—	35.6	575	1.58	—
SP-M3-1	—	—	40	725	1.92	—
SP-M3-2	—	—	44.5	1290	2.03	—
SP-M4-0	—	—	40	645	3.38	—
SP-M4-1	—	—	44.5	800	4.18	—
SP-M4-2	—	—	49	1600	5.08	—
SP-M5-0	—	—	42.3	800	3.95	—
SP-M5-1	—	—	46.7	1025	5.08	—
SP-M5-2	—	—	51.2	1775	6.77	—
SP-M6-1	—	—	60	2000	17	—
SP-M8-1	—	—	66	2100	19	—
S04/BSO4-M3	—	0.55	24.5	1493	2.36	2650
S04/BSO4-3.5M3	—	0.55	42.3	2877	2.36	3025
S04/BSO4-M3.5	—	0.91	42.3	2877	3.06	3025
S04/BSO4-M4	—	2	46.7	4003	6.34	6458
S04/BSO4-M5	—	3.6	46.7	4003	8.89	6226
FH4-M3-L	.9	—	40	2220	1.8	3500
FH4-M4-L	2.1	—	50	3210	6.5	8000
FH4-M5-L	4.3	—	53	3575	10.7	10000
FH4-M6-L	7.2	—	71	4200	15.9	14900
FHP-M5-L	1.3	—	53	3890	7.35	7320
TP4-3mm	—	—	35	1556	—	—
TP4-4mm	—	—	45	2335	—	—
TP4-5mm	—	—	54	2535	—	—
TP4-6mm	—	—	60	1891	—	—
PFC4-M3	—	—	40.5	1557	—	—
PFC4-M4	—	—	48	2002	—	—
PFC4-M5	—	—	52.5	2447	—	—
A4/LA4-M3	—	—	40	890	9.6	—
A4/LA4-M4	—	—	53	890	9.6	—
A4/LA4-M5	—	—	57	1100	14.1	—
SFP-3-1.0	—	—	13.5	620	—	—
SFP-3-1.2	—	—	20	830	—	—
SFP-3-1.6	—	—	22	1500	—	—
SFP-5-1.0	—	—	18	990	—	—
SFP-5-1.2	—	—	27	1158	—	—
SFP-5-1.6	—	—	33	3117	—	—

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

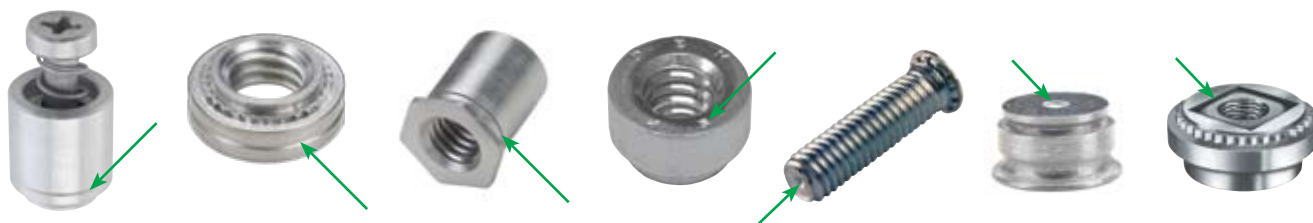
# INSTALLATION INTO STAINLESS STEEL SHEETS DO'S AND DON'TS

## “Do’s”

- DO** select the proper fastener material to meet corrosion requirements.
- DO** make certain that hole punch is kept sharp to minimize work hardening around hole.
- DO** provide mounting hole of specified size for each fastener.
- DO** make certain that shank (or pilot) is within hole before applying installation force.
- DO** apply squeezing force between parallel surfaces.
- DO** utilize recommended installation tooling when installing fasteners.
- DO** install fastener in punch side of hole
- DO** apply sufficient force to totally embed clinching ring around entire circumference and to bring shoulder squarely in contact with sheet. For some fasteners, installation will be complete when the head is flush with the panel surface.

## “Don’ts”

- DON'T** attempt to install a 300 series stainless steel fastener into a stainless steel sheet.
- DON'T** deburr mounting holes on either side of sheet before installing fasteners – deburring will remove metal required for clinching fastener into sheet.
- DON'T** install fastener closer to edge of sheet than minimum edge distance – unless a special fixture is used to restrict bulging of sheet edge.
- DON'T** install fastener near bends or other highly cold worked areas where sheet hardness may be greater than the limit for the fastener.
- DON'T** over-squeeze. It will crush the head, distort threads, and buckle the sheet. Be certain to determine optimum installation force by test prior to production runs.
- DON'T** attempt to insert fastener with a hammer blow – under any circumstances. A hammer blow won't permit the sheet metal to flow and develop an interlock with the fastener's contour.
- DON'T** install screw in the head side of fastener. Install from opposite side so that the fastener load is toward sheet. The clinching force is designed only to hold the fastener during handling and to resist torque during assembly.



To be sure that you are getting genuine PEM® brand self-clinching fasteners, look for the “single ring”, “dimple”, “double squares” or “SP” stamp trademark. On actual parts, location of ring on fastener may be different than shown in photo.

RoHS compliance information can be found on our website.

Specifications subject to change without notice.  
Check our website for the most current version of this bulletin.

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