

PennEngineering®

SELF-CLINCHING NUTS



BULLETIN **CL**



1016
Rev 517

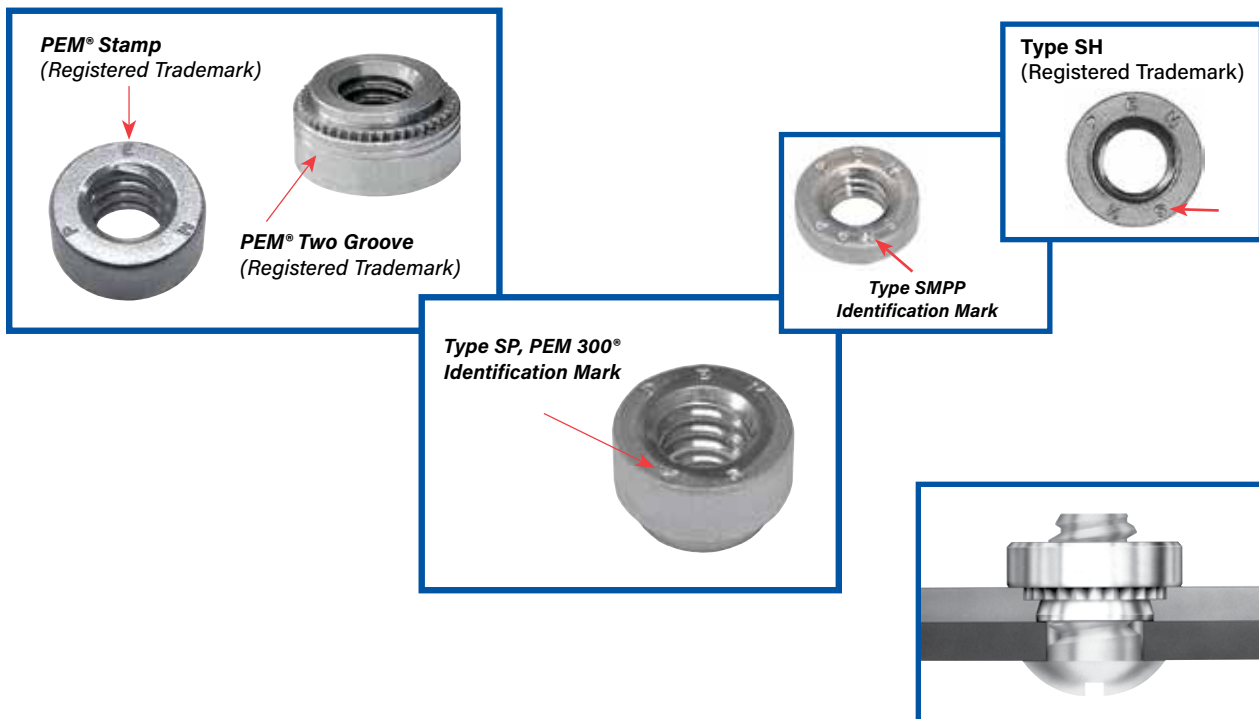
SELF-CLINCHING NUTS

Self-clinching nuts are installed by placing them in properly sized holes in sheets and applying a parallel squeezing force to the head of the nut. The sheet metal surrounding the head cold flows into an undercut thereby making the fastener an integral part of the sheet. A serrated clinching ring prevents the fastener from rotating after installation.

Types S/SS/CLA/CLS/CLSS nuts provide load-bearing threads in thin sheets with high pushout and torque-out resistance - PAGES 4 and 5		Type SMPS/SMPP nuts are for thinner sheet/close-to-edge applications - PAGE 7	
Type SP, PEM 300® nuts provide strong load-bearing threads in stainless steel sheets as thin as .030"/0.8 mm - PAGES 4 and 5		Type SL self-locking nuts are designed with a unique and economical TRI-DENT® locking feature, meeting 3 cycle locking performance requirements - PAGE 8	
Type SH hard panel nuts install into thin, harder, high strength steel materials - PAGE 6		Material and finish specifications - PAGE 9	
Type H (non-locking) and Type HNL (locking) nuts have threads that provide high pushout and torque-out resistance - PAGE 7		Installation - PAGES 10 and 11	
		Performance data - PAGES 12 - 14	

Many PEM self-clinching nuts in this bulletin are dimensionally equivalent to nuts manufactured to NASM45938/1 specifications. Consult our Marketing department for a complete Military Specifications and National Aerospace Standards guide (Bulletin NASM) on our website.

Screws for use with PEM self-clinching locking fasteners should be Class 3A/4h fit or no smaller than Class 2A/6g.



SELF-CLINCHING NUTS

PEM® SELF-CLINCHING NUT SELECTOR GUIDE

PEM Nut Type	Page No.	Application Requires:								
		Recommended panel material (1)	Thinnest sheet .025" / 0.64 mm	Self-locking	Closest centerline-to-edge distance	Superior corrosion resistance	Recommended for installation into stainless steel sheets	Compatible with aluminum anodizing	Harder high strength steel material	Non-magnetic
S/SS/H	4, 5	steel / aluminum								
CLS/CLSS	4, 5	steel / aluminum				▪				▪
CLA	5	aluminum				▪		▪		▪
SH	6	hardened alloy steel							▪	
SP	4, 5	stainless steel				▪	▪			▪
HNL	7	aluminum		▪						
SMPS	7	steel / aluminum	▪		▪	▪				▪
SMPP	7	stainless steel	▪		▪	▪	▪			▪
SL	8	steel / aluminum		▪						

(1) Describes "best practice" for typical applications. Fasteners can be used in other panel materials not listed here if specified hardness limits are met. In all cases "For Use in Sheet Hardness" information is shown in chart on page 9.

Thread Mask

PEM® Blu-Coat™ thread mask is available for applications where hardware is installed prior to painting. During assembly, the threads of the mating hardware will remove paint, electro deposited automotive under coatings, and weld spatter upon application of torque. PEM nuts can be specially ordered with thread mask applied.



"BC" suffix will be added to part number to designate Blu-Coat thread mask to fastener.



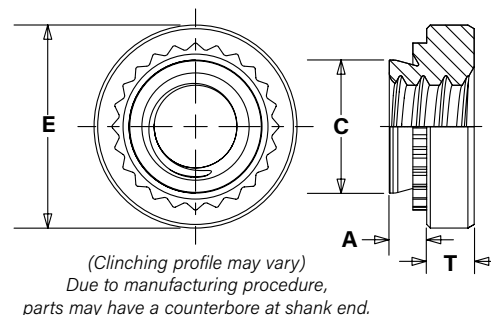
Fastener drawings and models are available at www.pemnet.com

SELF-CLINCHING NUTS

- Types S/SS are recommended for use in steel or aluminum sheets HRB 80 / HB 150 or less.
- Types CLS/CLSS are recommended for use in steel or aluminum sheets HRB 70 / HB 125 or less.
- Type SP is recommended for use in stainless steel sheets HRB 90 / HB 192 or less.
- Type CLA is recommended for use in steel or aluminum sheets HRB 50 / HB 82 or less.

PART NUMBER DESIGNATION

<u>S</u>	-	<u>632</u>	-	<u>1</u>	<u>ZI</u>
<u>SS</u>	-	<u>632</u>	-	<u>1</u>	<u>ZI</u>
<u>CL</u>	<u>S</u>	-	<u>632</u>	-	<u>1</u>
<u>CLS</u>	<u>S</u>	-	<u>032</u>	-	<u>1</u>
<u>S</u>	<u>P</u>	-	<u>632</u>	-	<u>1</u>
<u>CL</u>	<u>A</u>	-	<u>632</u>	-	<u>1</u>
Type	Material Code	Thread Size Code	Shank Code	Finish Code	



TYPES S/SS/CLS/CLSS/SP

All dimensions are in inches.

Thread Size	Type Fastener Material			Thread Code	Shank Code	A (Shank) Max.	Rec. Min. Sheet Thickness (1)	Hole Size In Sheet +.003 -.000	C Max.	E ±.010	T ±.010	Min. Dist. Hole To Edge
	Carbon Steel	Stainless Steel	Hardened Stainless Steel									
.086-56 (#2-56)	S	CLS	SP	256	0	.030	.030	.166	.165	.250	.070	.19
					1	.038	.040					
					2	.054	.056					
.099-48 (#3-48)	S	CLS	—	348	0	.030	.030	.166	.165	.250	.070	.19
					1	.038	.040					
					2	.054	.056					
.112-40 (#4-40)	S	CLS	SP	440	0	.030	.030	.166	.165	.250	.070	.19
					1	.038	.040					
					2	.054	.056					
					3 (2)	.087	.090					
.138-32 (#6-32)	S	CLS	SP	632	0	.030	.030	.1875	.187	.280	.070	.22
					1	.038	.040					
					2	.054	.056					
					3 (2)	.087	.090					
.164-32 (#8-32)	S	CLS	SP	832	0	.030	.030	.213	.212	.310	.090	.27
					1	.038	.040					
					2	.054	.056					
					3 (2)	.087	.090					
.190-24 (#10-24)	SS	CLSS	SP	024	0	.030	.030	.250	.249	.340	.090	.28
					1	.038	.040					
					2	.054	.056					
					3 (2)	.087	.090					
.190-32 (#10-32)	SS	CLSS	SP	032	0	.030	.030	.250	.249	.340	.090	.28
					1	.038	.040					
					2	.054	.056					
					3 (2)	.087	.090					
.216-24 (#12-24)	S	CLS	—	1224	1	.038	.040	.277	.276	.370	.130	.31
					2	.054	.056					
					3	.087	.090					
.250-20 (1/4-20)	S (3)	CLS	SP	0420	0	.045	.047	.344	.343	.440	.170	.34
					1	.054	.056					
					2	.087	.090					
					3 (2)	.120	.125					
.250-28 (1/4-28)	S	CLS	—	0428	1	.054	.056	.344	.343	.440	.170	.34
					2	.087	.090					
					3	.120	.125					
.313-18 (5/16-18)	S (3)	CLS	SP	0518	1	.054	.056	.413	.412	.500	.230	.38
					2	.087	.090					
					3 (2)	.120	.125					
.313-24 (5/16-24)	S	CLS	SP	0524	1	.054	.056	.413	.412	.500	.230	.38
					2	.087	.090					
					3 (2)	.120	.125					
.375-16 (3/8-16)	S	CLS	SP	0616	1	.087	.090	.500	.499	.560	.270	.44
					2	.120	.125					
					3 (2)	.235	.250					
.375-24 (3/8-24)	S	CLS	SP	0624	1	.087	.090	.500	.499	.560	.270	.44
					2	.120	.125					
					3 (2)	.235	.250					
.438-20 (7/16-20)	S	—	—	0720	1	.087	.092	.562	.561	.687	.311	.562
.500-13 (1/2-13)	S	CLS	—	0813	1	.120	.125	.656	.655	.810	.360	.63
					2	.235	.250					
.500-20 (1/2-20)	S	CLS	—	0820	1	.120	.125					
					2	.235	.250					

- For maximum performance, we recommend that you use the maximum shank length for your sheet thickness.
- This shank code not available for Type SP.
- This thread size Type S nut, with a -2 shank code, can be installed successfully without the need to pre punch a mounting hole in a separate operation. See page 15 for more information.

The increased hardness of stainless steel panels requires careful consideration when installing self-clinching fasteners. See page 16 or refer to Fastener Installation Dos and Don'ts on our web site.



SELF-CLINCHING NUTS

TYPES S/SS/CLS/CLSS/SP (See drawing at top of page 4) All dimensions are in millimeters.

METRIC	Thread Size	Type			Thread Code	Shank Code	A (Shank) Max.	Rec. Min. Sheet Thickness (I)	Hole Size In Sheet +0.08	C Max.	E ±0.25	T ±0.25	Min. Dist. Hole  To Edge
		Fastener Material											
		Carbon Steel	Stainless Steel	Hardened Stainless Steel									
	M2 x 0.4	S	CLS	SP	M2	0 ⁽²⁾	0.77	0.8	4.22	4.2	6.35	1.5	4.8
						1	0.97	1					
						2	1.38	1.4					
	M2.5 x 0.45	S	CLS	SP	M2.5	0	0.77	0.8	4.22	4.2	6.35	1.5	4.8
						1	0.97	1					
						2	1.38	1.4					
	M3 x 0.5	S	CLS	SP	M3	0	0.77	0.8	4.22	4.2	6.35	1.5	4.8
						1	0.97	1					
						2	1.38	1.4					
	M3.5 x 0.6	S	CLS	—	M3.5	0	0.77	0.8	4.75	4.73	7.11	1.5	5.6
						1	0.97	1					
2						1.38	1.4						
M4 x 0.7	S	CLS	SP	M4	0	0.77	0.8	5.41	5.38	7.87	2	6.9	
					1	0.97	1						
					2	1.38	1.4						
M5 x 0.8	SS	CLSS	SP	M5	0	0.77	0.8	6.35	6.33	8.64	2	7.1	
					1	0.97	1						
					2	1.38	1.4						
M6 x 1	S ⁽³⁾	CLS	SP	M6	00 ⁽²⁾	0.89	0.92	8.75	8.73	11.18	4.08	8.6	
					0 ⁽²⁾	1.15	1.2						
					1	1.38	1.4						
					2	2.21	2.29						
M8 x 1.25	S ⁽³⁾	CLS	SP	M8	1	1.38	1.4	10.5	10.47	12.7	5.47	9.7	
					2	2.21	2.29						
M10 x 1.5	S	CLS	SP	M10	1	2.21	2.29	14	13.97	17.35	7.48	13.5	
					2 ⁽²⁾	3.05	3.18						
M12 x 1.75	S	—	—	M12	1	3.05	3.18	17	16.95	20.57	8.5	16	

TYPE CLA (See drawing at top of page 4) All dimensions are in inches.

UNIFIED	Thread Size	Type	Thread Code	Shank Code	A (Shank) Max.	Min. Sheet Thickness (t)	Hole Size In Sheet ±.003 - .000	C Max.	E ±.010	T ±.010	Min. Dist. Hole $\varnothing$ To Edge
		Fastener Material									
		Aluminum									
	.086-56 (#2-56)	CLA	256	1	.038	.040	.166	.165	.250	.070	.19
				2	.054	.056					
	.112-40 (#4-40)	CLA	440	1	.038	.040	.1875	.187	.250	.090	.22
				2	.054	.056					
	.138-32 (#6-32)	CLA	632	1	.038	.040	.213	.212	.280	.090	.27
				2	.054	.056					
	.164-32 (#8-32)	CLA	832	1	.038	.040	.234	.233	.310	.130	.28
				2	.054	.056					
	.190-24 (#10-24)	CLA	024	1	.038	.040	.296	.295	.370	.160	.31
				2	.054	.056					
	.190-32 (#10-32)	CLA	032	1	.038	.040	.296	.295	.370	.160	.31
				2	.054	.056					
	.250-20 (1/4-20)	CLA	0420	1	.054	.056	.344	.343	.440	.170	.34
				2	.087	.091					
				3	.120	.125					

(See drawing at top of page 4) All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type	Thread Code	Shank Code	A (Shank) Max.	Min. Sheet Thickness (t)	Hole Size In Sheet +0.08	C Max.	E ±0.25	T ±0.25	Min. Dist. Hole $\varnothing$ To Edge
		Fastener Material									
		Aluminum									
	M2 x 0.4	CLA	M2	1	0.98	1	4.22	4.2	6.35	1.5	4.8
				2	1.38	1.4					
	M3 x 0.5	CLA	M3	1	0.98	1	4.75	4.73	6.35	2	5.6
				2	1.38	1.4					
	M3.5 x 0.6	CLA	M3.5	1	0.98	1	5.41	5.38	7.11	2	6.9
				2	1.38	1.4					
	M4 x 0.7	CLA	M4	1	0.98	1	5.94	5.92	7.8	3	7.1
				2	1.38	1.4					
	M5 x 0.8	CLA	M5	1	0.98	1	7.52	7.49	9.4	3.8	7.9
				2	1.38	1.4					
	M6 x 1	CLA	M6	1	1.38	1.4	8.75	8.73	11.18	4.08	8.6
				2	2.21	2.3					

(1) For maximum performance, we recommend that you use the maximum shank length for your sheet thickness.

(2) This shank code not available for Type SP.

(3) This thread size Type S nut, with a -2 shank code, can be installed successfully without the need to pre punch a mounting hole in a separate operation. See page 15 for more information.



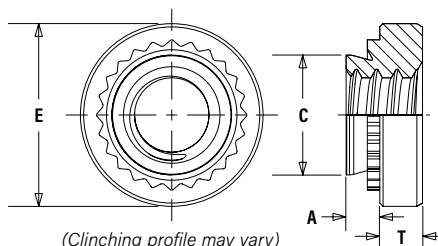
SELF-CLINCHING NUTS

TYPE SH™ HARD PANEL NUTS

- Installs into harder, high strength steel materials (high strength steel sheets up to 975MPa tensile strength).
- Hardened nut material provides stronger thread strength.

PART NUMBER DESIGNATION

SH - **0420** - **1** **X**
 ↓ ↓ ↓ ↓
 Type Thread Size Code Shank Code Finish Code



(Clinching profile may vary)
Due to manufacturing procedure, parts may have a counterbore at shank end.

All dimensions are in inches.

UNIFIED	Thread Size	Type	Thread Code	Shank Code	A (Shank) Max.	Min. Sheet Thickness ⁽¹⁾	Hole Size in Sheet +.003 -.000	C Max.	E ±.010	T ±.010	Min. Dist Hole To Edge
		Fastener Material									
		Hardened Alloy Steel									
	.250-20 (1/4-20)	SH	0420	1	.054	.056	.344	.343	.440	.170	.34
				2	.087	.090					
	.313-18 (5/16-18)	SH	0518	1	.054	.056	.413	.412	.500	.230	.38
				2	.087	.090					
	.375-16 (3/8-16)	SH	0616	1	.087	.090	.500	.499	.623	.270	.44

All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type	Thread Code	Shank Code	A (Shank) Max.	Min. Sheet Thickness ⁽¹⁾	Hole Size in Sheet +0.08	C Max.	E ±0.25	T ±0.25	Min. Dist Hole To Edge
		Fastener Material									
		Hardened Alloy Steel									
	M6 x 1	SH	M6	1	1.38	1.4	8.75	8.73	11.18	4.08	8.6
				2	2.21	2.29					
	M8 x 1.25	SH	M8	1	1.38	1.4	10.5	10.47	12.7	5.47	9.7
				2	2.21	2.29					
	M10 x 1.5	SH	M10	1	2.21	2.29	14	13.97	17.35	7.48	13.5

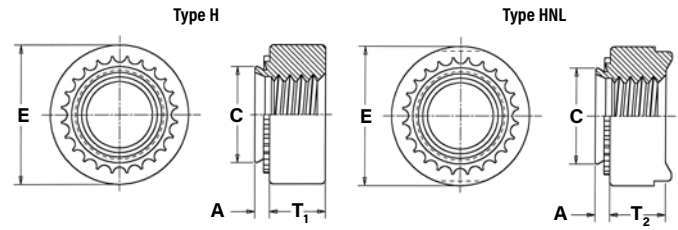
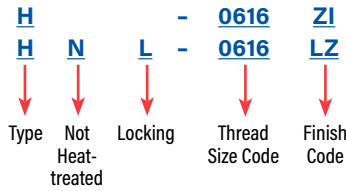
(1) For maximum performance, we recommend that you use the maximum shank length for your sheet thickness.

SELF-CLINCHING NUTS

STEEL, SELF-LOCKING AND NON-LOCKING NUTS - TYPES H/HNL

- Meets torque requirements for IFI 100/107 Grade B (unified) and ANSI B18.16.1M (metric) locknuts.
- Type H is recommended for use in sheets HRB 80 / HB 150 or less.
- Type HNL is recommended for use in sheets HRB 60 / HB 107 or less.

PART NUMBER DESIGNATION



Clinching profile may vary.

All dimensions are in inches.

UNIFIED	Thread Size	Type		Thread Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.005 -.000	C Max.	E ±.010	T ₁	T ₂	Min. Dist. Hole To Edge
		Non-Locking	Self-Locking (1)							Non-locking	Self-locking	
										±.005	±.010	
	.250-20 (1/4-20)	—	HNL	0420	.058	.058	.344	.343	.500	.189		.380
	.313-18 (5/16-18)	—	HNL	0518	.058	.058	.413	.412	.575	.240		.420
	.375-16 (3/8-16)	H	HNL	0616	.058	.058	.500	.499	.650	.300		.480

All dimensions are in millimeters.

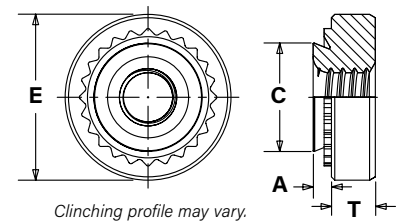
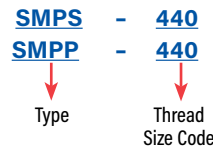
METRIC	Thread Size x Pitch	Type		Thread Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.013	C Max.	E ±0.25	T ₁	T ₂	Min. Dist. Hole To Edge
		Non-Locking	Self-Locking (1)							Non-locking	Self-locking	
										±0.13	±0.25	
	M6 x 1	—	HNL	M6	1.48	1.48	8.75	8.72	12.7	5		10
	M8 x 1.25	—	HNL	M8	1.48	1.48	10.5	10.47	14.6	6.3		11
	M10 x 1.5	H	HNL	M10	1.48	1.48	12.7	12.67	16.5	7.9		12

- (1) During installation, the projections on the heads of Type HNL self-locking nuts may be flattened. This is not detrimental in any way and will not affect self-locking or self-clinching performance.

TYPES SMPS™/SMPP™

- Installs into sheets as thin as .025" / 0.64 mm.
- Reduced outer dimensions and thinner sheet capabilities compared to Type S/SP thread sizes.
- Type SMPS recommended for use in sheets HRB 70 / HB 125 or less.
- Type SMPP recommended for use in stainless steel sheets HRB 90 / HB 192 or less.

PART NUMBER DESIGNATION



Clinching profile may vary.

All dimensions are in inches.

UNIFIED	Thread Size	Type		Thread Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C Max.	E ±.010	T ±.010	Min. Dist. Hole To Edge	
		Fastener Material									SMPS	SMPP
		Stainless Steel	Hardened Stainless Steel									
	.086-56 (#2-56)	SMPS	SMPP	256	.024	.025	.136	.135	.220	.065	.15	.16
.112-40 (#4-40)	SMPS	SMPP	440	.024	.025	.166	.165	.220	.065	.17	.20	
.138-32 (#6-32)	SMPS	SMPP	632	.024	.025	.187	.186	.252	.065	.20	.22	

All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type		Thread Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +0.08	C Max.	E ±0.25	T ±0.25	Min. Dist. Hole ⌀ To Edge	
		Fastener Material									SMPS	SMPP
		Stainless Steel	Hardened Stainless Steel									
M2.5 x 0.45	SMPS	SMPP	M2.5	0.61	0.64	3.8	3.79	5.6	1.4	3.7	3.9	
M3 x 0.5	SMPS	SMPP	M3	0.61	0.64	4.24	4.22	5.6	1.4	4.3	5.1	
M3.5 x 0.6	SMPS	SMPP	M3.5	0.61	0.64	4.75	4.73	6.4	1.4	5.1	5.5	



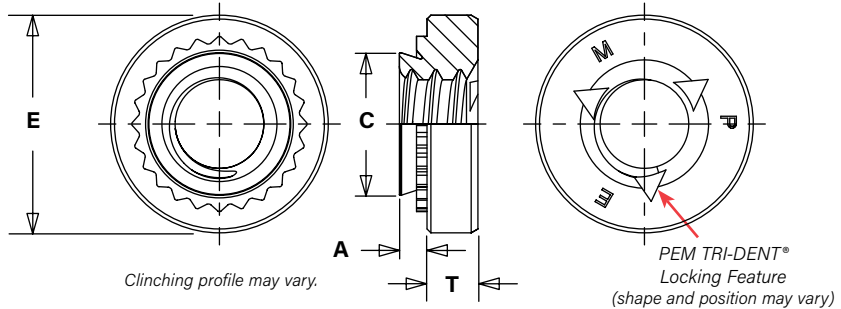
SELF-CLINCHING NUTS

TRI-DENT® LOCKNUTS - TYPE SL™

- 3 cycle locking performance. ⁽¹⁾
- Recommended for use in sheets HRB 80 / HB 150 or less.

PART NUMBER DESIGNATION

S **L** - **632** - **1** **ZI**
 ↓ ↓ ↓ ↓ ↓
 Type Locking Thread Size Code Shank Code Finish Code



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 ±.010	T ±.010	Min. Dist. Hole To Edge
	.112-40 (#4-40)	SL	440	1	.038	.040	.166	.165	.250	.070	.19
				2	.054	.056					
	.138-32 (#6-32)	SL	632	1	.038	.040	.1875	.187	.280	.070	.22
				2	.054	.056					
	.164-32 (#8-32)	SL	832	1	.038	.040	.213	.212	.310	.090	.27
				2	.054	.056					
	.190-32 (#10-32)	SL	032	1	.038	.040	.250	.249	.340	.090	.28
				2	.054	.056					
	.250-20 (1/4-20)	SL	0420	1	.054	.056	.344	.343	.440	.170	.34
				2	.087	.091					
	.313-18 (5/16-18)	SL	0518	1	.054	.056	.413	.412	.500	.230	.38
				2	.087	.091					
	.375-16 (3/8-16)	SL	0616	1	.087	.090	.500	.499	.625	.270	.44
				2	.120	.125					

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 ±0.25	T ±0.25	Min. Dist. Hole To Edge
	M3 x 0.5	SL	M3	1	0.98	1	4.22	4.2	6.35	1.5	4.8
				2	1.38	1.4					
	M3.5 x 0.6	SL	M3.5	1	0.98	1	4.75	4.73	7.11	1.5	5.6
				2	1.38	1.4					
	M4 x 0.7	SL	M4	1	0.98	1	5.41	5.38	7.87	2	6.9
				2	1.38	1.4					
	M5 x 0.8	SL	M5	1	0.98	1	6.35	6.33	8.64	2	7.1
				2	1.38	1.4					
	M6 x 1	SL	M6	1	1.38	1.4	8.75	8.73	11.18	4.08	8.6
				2	2.21	2.3					
	M8 x 1.25	SL	M8	1	1.38	1.4	10.5	10.47	12.7	5.47	9.7
				2	2.21	2.3					
	M10 x 1.5	SL	M10	1	2.21	2.29	14	13.97	17.35	7.48	13.5
				2	3.05	3.18					

(1) Achieved using steel socket head cap screws, 180 ksi / property class 12.9 with standard finish of thermal oxide and light oil.

SELF-CLINCHING NUTS

MATERIAL AND FINISH SPECIFICATIONS

Type	Threads			Fastener Materials						Standard Finishes				Optional Finish
	Internal ASME B1.1 2B/ASME B1.13M, 6H	Meets Torque Requirements for IFI 100/107 Grade B (unified) and ANSI B18.16.1M (metric) Locknuts	3 Cycle Locking Performance	Heat Treated Carbon Steel	300 Series Stainless Steel	Aluminum	Carbon Steel	Hardened Alloy Steel	Age Hardened A286 Stainless Steel	Passivated and/or Tested per ASTM A380	Zinc Plated, 5µm, Colorless (4)	Zinc Plated, 5µm, Colorless Plus Sealant/Lubricant (4)	No Finish (3)	Zinc Plated, 5µm, Yellow (4)
S	■			■							■			■
SS	■			■							■			■
CLS	■				■					■				
CLSS	■				■					■				
CLA	■					■							■ (2)	
SH	■							■					■ (5)	
SL	■		■	■							■			
SMPS	■				■					■				
SMPP	■								■	■				
SP	■								■	■				
H	■			■							■		■	
HNL	■	■					■					■		
Part number codes for finishes										None	ZI	LZ	X	ZC

For Use in Sheet Hardness: (8)						
Type	HRC 30 / HB 277 or less	HRB 90 / HB 192 or less (6) (7)	HRB 80 / HB 150 or less	HRB 70 / HB 125 or less	HRB 60 / HB 107 or less	HRB 50 / HB 82 or less
S			■			
SS			■			
CLS				■		
CLSS				■		
CLA						■
SH	■					
SL			■			
SMPS				■		
SMPP		■				
SP		■				
H			■			
HNL					■	

- (1) Special order with additional charge.
 (2) Part numbers for aluminum nuts have no plating suffix.
 (3) Unplated threads are sized to accept a basic go gauge after .00025" / 0.0064 mm plating.
 (4) See PEM Technical Support section of our web site for related plating standards and specifications.
 (5) With rust preventative oil.
 (6) Panel material should be in the annealed condition.
 (7) Fasteners should not be installed adjacent to bends or other highly cold-worked areas.
 (8) HRB - Hardness Rockwell "B" Scale. HRC - Hardness Rockwell "C" Scale. HB - Hardness Brinell.

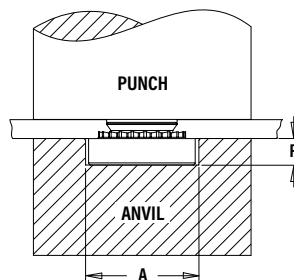
SELF-CLINCHING NUTS

INSTALLATION - TYPES S/SL/SMPS/SS/CLS/CLSS/CLA/H/HNL

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 (preferably the punch side) over the shank of the fastener as shown in diagram to the right.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the head of the nut comes into contact with the sheet material.

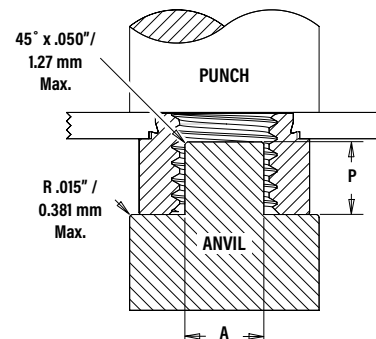
COUNTERBORE ANVIL

Thread Sizes #2-56 to 5/16
and M2 to M8



PROTRUSION ANVIL ⁽¹⁾

Types CLS/S/SL Thread Sizes 3/8, 7/16, 1/2, M10 and M12
Types H/HNL Thread Sizes 5/16, 3/8, M8 and M10



PEMSERTER® Installation Tooling

CLS/CLSS/S/SS

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	P ±.005		
	256/440	.267	.045	975200034	975200048
	632	.298	.045	975200035	975200048
	832	.330	.070	975200036	975200048
	024/032	.361	.070	975200037	975200048
	1224	.415	.080	975200786300	975200048
	0420	.454	.150	975200038	975200048
	0518	.517	.200	975200039	975200048
	0616	.280	.250	975200045 ⁽¹⁾	975200048
	0720	.338	.295	8020361 ⁽¹⁾	975200901400
	0813	.375	.345	975200900300 ⁽¹⁾	975200901400

METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	P ±0.13		
	M2/M3	6.78	1.14	975200034	975200048
	M3.5	7.57	1.14	975200035	975200048
	M4	8.38	1.78	975200036	975200048
	M5	9.17	1.78	975200037	975200048
	M6	11.53	3.81	975200038	975200048
	M8	13.08	5.08	975200039	975200048
	M10	7.62	6.35	8005682 ⁽¹⁾	975200901400
	M12	9.53	8.76	975200900300 ⁽¹⁾	975200901400

CLA

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	P ±.005		
	256/440	.267	.045	975200034	975200048
	632	.298	.045	975200035	975200048
	832	.330	.070	975200036	975200048
	024/032	.392	.140	975200782300	975200048
	0420	.454	.150	975200038	975200048

METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	P ±0.13		
	M3	6.78	1.14	975200034	975200048
	M3.5	7.57	1.14	975200035	975200048
	M4	8.38	1.78	975200036	975200048
	M5	9.96	3.56	975200782300	975200048
	M6	11.53	3.81	975200038	975200048

SL

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	P ±.005		
	440	.267	.045	975200034	975200048
	632	.298	.045	975200035	975200048
	832	.330	.070	975200036	975200048
	032	.361	.070	975200037	975200048
	0420	.454	.150	975200038	975200048
	0518	.515	.200	975200039	975200048
	0616	.280	.250	975200045 ⁽¹⁾	975200048

METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	P ±0.13		
	M3	6.78	1.14	975200034	975200048
	M3.5	7.57	1.14	975200035	975200048
	M4	8.38	1.78	975200036	975200048
	M5	9.17	1.78	975200037	975200048
	M6	11.53	3.81	975200038	975200048
	M8	13.08	5.08	975200039	975200048
	M10	7.62	6.35	8005682 ⁽¹⁾	975200901400

SMPS

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	P ±.005		
	256/440	.236	.045	975200904300	975200048
	632	.267	.045	975200034	975200048

METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	P ±0.13		
	M2.5/M3	5.99	1.14	975200904300	975200048
	M3.5	6.78	1.14	975200034	975200048

H/HNL

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	P ±.005		
	0420	.517	.200	975200039	975200048
	0518	.220	.250	975200783300 ⁽¹⁾	975200048
	0616	.280	.250	975201240 ⁽¹⁾	8003076

METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	P ±0.13		
	M6	13.13	5.08	975200039	975200048
	M8	5.59	6.35	975200783300 ⁽¹⁾	975200048
	M10	7.62	6.35	8005682 ⁽¹⁾	8003076

(1) Large nut anvils use protrusion to locate part instead of counterbore.



SELF-CLINCHING NUTS

INSTALLATION - TYPES SP/SMPP⁽¹⁾

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

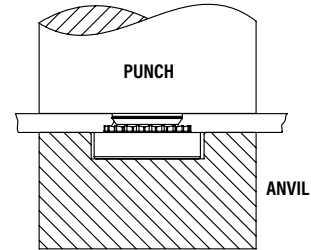
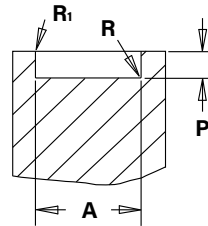
PEMSERTER® Installation Tooling

SP

UNIFIED	Thread Code	Anvil Dimensions (in.)					Anvil Part Number	Punch Part Number
		A ±.002	P +.000 -.001	R Max.	R _i +.005			
	440	.255	.064	.010	.005		8012821	975200048
	632	.286	.064	.010	.005		8012822	
	832	.317	.082	.010	.005		8012823	
	024/032	.348	.082	.010	.005		8012824	
	0420	.443	.163	.010	.005		8012825	8003076
	0518	.505	.230	.010	.005		8015359	
	0616/0624	.570	.263	.010	.005		8015863	

METRIC	Thread Code	Anvil Dimensions (mm)					Anvil Part Number	Punch Part Number
		A ±0.05	P -0.03	R Max.	R _i +0.13			
	M2	6.48	1.63	0.25	0.13		8012821	975200048
	M2.5-0	6.48	1.42	0.25	0.13		8019477	
	M2.5-1,2	6.48	1.63	0.25	0.13		8012821	
	M3	6.48	1.63	0.25	0.13		8012821	
	M3.5	7.26	1.63	0.25	0.13		8012822	8003076
	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	8015886
	M10	17.58	7.47	0.25	0.13		8015886	

RECOMMENDED COUNTERBORE ANVIL



SMPP

UNIFIED	Thread Code	Anvil Dimensions (in.)					Anvil Part Number	Punch Part Number
		A ±.002	P +.000 -.001	R Max.	R _i +.005			
	256	.223	.060	.010	.005		8020023	975200048
	440	.233	.060	.010	.005		8021386	
	632	.255	.060	.010	.005		8020024	

METRIC	Thread Code	Anvil Dimensions (mm)					Anvil Part Number	Punch Part Number
		A ±0.05	P -0.03	R Max.	R _i +0.13			
	M2.5	5.66	1.27	0.25	0.13		8020025	975200048
	M3	5.9	1.27	0.25	0.13		8021474	
	M3.5	6.48	1.27	0.25	0.13		8020026	

(1) For best results, 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.

INSTALLATION - TYPE SH

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 (preferably the punch side) over the shank of the fastener as shown in diagram to the right.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the head of the nut comes into contact with the sheet material.

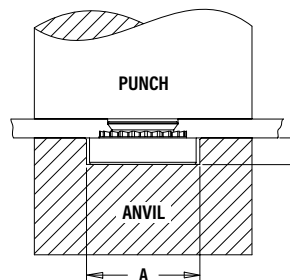
PEMSERTER® Installation Tooling

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	P ±.005		
	0420	.454	.150	975200038	975200048
	0518	.517	.200	975200039	975200048
	0616	.280	.250	8020084 ⁽¹⁾	9752000901400

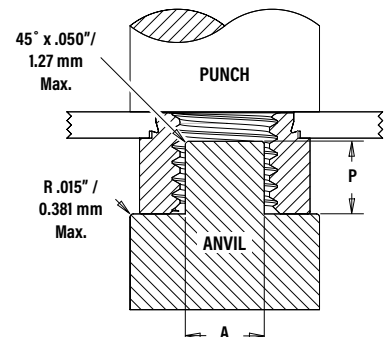
METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	P ±0.13		
	M6	11.53	3.81	975200038	975200048
	M8	13.13	5.08	975200039	975200048
	M10	7.62	6.35	8005682 ⁽¹⁾	9752000901400

(1) Large nut anvils use protrusion to locate part instead of counterbore.

COUNTERBORE ANVIL Thread Sizes 1/4-20 to 5/16 and M5 to M8



PROTRUSION ANVIL Thread Sizes 3/8 and M10



INSTALLATION NOTES

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



SELF-CLINCHING NUTS

PERFORMANCE DATA⁽¹⁾

TYPE S/CLS/CLSS

Type	Thread Code	Shank Code	Test Sheet Material	Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
S CLS	256 348 440	0	5052-H34 Aluminum	1500-2000	63	8
		1			90	10
		2			170	13
		3			170	13
		0			105	13
		1	Cold-rolled Steel	2500-3500	125	15
		2			230	18
		3			230	18
		0			63	16
		1			95	17
S CLS	632	2	5052-H34 Aluminum	2500-3000	190	22
		3			190	22
		0			110	16
		1			130	20
		2			275	28
		3	Cold-rolled Steel	3000-6000	275	28
		0			68	21
		1			105	23
		2			220	35
		3			220	35
S CLS	832	0	5052-H34 Aluminum	2500-3000	110	26
		1			145	35
		2			285	45
		3			285	45
		0	Cold-rolled Steel	4000-6000	68	26
		1			110	32
		2			190	50
		3			225	50
		0			120	32
		1			180	40
SS CLSS	024 032	2	5052-H34 Aluminum	2500-3500	320	60
		3			320	60
		0			120	32
		1			180	40
		2			320	60
		3	Cold-rolled Steel	4000-9000	320	60
		0			120	32
		1			180	40
		2			320	60
		3			320	60
S CLS	1224	1	5052-H34 Aluminum	2500-6500	120	63
		2			285	70
		3			285	70
		0			200	74
		1			350	80
		2	Cold-rolled Steel	5000-6500	350	80
		3			350	80
		0			220	70
		1			360	125
		2			315	115
S CLS	0420	3	5052-H34 Aluminum	4000-7000	400	150
		0			315	115
		1			400	150
		2			315	115
		3			400	150
		0	Cold-rolled Steel	6000-8000	315	115
		1			400	150
		2			315	115
		3			400	150
		0			315	115
S CLS	0518 0524	1	5052-H34 Aluminum	4000-7000	380	120
		2			380	160
		3			420	165
		0			420	180
		1			420	180
		2	Cold-rolled Steel	6000-8000	420	180
		3			420	180
		0			420	180
		1			420	180
		2			420	180
S CLS	0616 0624	1	5052-H34 Aluminum	5000-8000	400	270
		2			400	270
		3			460	320
		0			460	320
		1			460	320
		2	Cold-rolled Steel	7000-11000	460	320
		3			460	320
		0			460	320
		1			460	320
		2			460	320
S CLS	0720	1	5052-H34 Aluminum	9000-13000	450	340
		2			450	340
		3			450	340
		0			450	340
		1			450	340
		2	Cold-rolled Steel	10000-15000	1050	735
		3			1050	735
		0			1050	735
		1			1050	735
		2			1050	735

Type	Thread Code	Shank Code	Test Sheet Material	Installation (kN)	Pushout (N)	Torque-out (N-m)
S CLS	M2 M2.5 M3	0	5052-H34 Aluminum	6.7-8.9	280	0.9
		1			400	1.13
		2			750	1.47
		0			470	1.47
		1			550	1.7
		2	Cold-rolled Steel	11.2-15.6	1010	2.03
		0			280	1.8
		1			400	1.92
		2			840	2.5
		0			480	1.8
S CLS	M3.5	1	5052-H34 Aluminum	11.2-13.5	570	2.3
		2			1210	2.3
		0			300	2.37
		1			470	2.6
		2			970	4
		0	Cold-rolled Steel	13.4-26.7	490	2.95
		1			645	4
		2			1250	5.1
		0			300	3
		1			480	3.6
S CLS	M4	2	5052-H34 Aluminum	11.2-13.4	845	5.7
		0			530	3.6
		1			800	4.5
		2			1112	6.8
		0	Cold-rolled Steel	18-27	750	6.5
		1			970	7.9
		2			1580	10.2
		0			900	10
		1			1380	13
		2			1760	17
SS CLSS	M5	00	5052-H34 Aluminum	11.2-15.6	1570	13.6
		0			1870	18.7
		1			20.3	
		2			1760	32.7
		0	Cold-rolled Steel	18-38	2020	36.2
		1			2113	39.5
		2			4670	83.1
		0			750	6.5
		1			970	7.9
		2			1580	10.2
S CLS	M6	00	5052-H34 Aluminum	18-32	900	10
		0			1380	13
		1			1760	17
		2			1760	17
		0	Cold-rolled Steel	27-36	1760	17
		1			1760	17
		2			1760	17
		0			1760	17
		1			1760	17
		2			1760	17
S CLS	M8	1	5052-H34 Aluminum	18-32	1570	13.6
		2			1870	18.7
		0			20.3	
		1			1760	32.7
		2			2020	36.2
		0	Cold-rolled Steel	32-50	2113	39.5
		1			4670	83.1
		2			4670	83.1
		0			4670	83.1
		1			4670	83.1
		2			4670	83.1
S CLS	M10	1	5052-H34 Aluminum	22-36	1760	32.7
		2			2020	36.2
		0			2113	39.5
		1			4670	83.1
		2			4670	83.1
		0	Cold-rolled Steel	31-40	2113	39.5
		1			4670	83.1
		2			4670	83.1
		0			4670	83.1
		1			4670	83.1
		2			4670	83.1
S CLS	M12	1	5052-H34 Aluminum	31-40	2113	39.5
		2			4670	83.1
		0			4670	83.1
		1			4670	83.1
		2			4670	83.1
		0	Cold-rolled Steel	44-67	4670	83.1
		1			4670	83.1
		2			4670	83.1
		0			4670	83.1
		1			4670	83.1
		2			4670	83.1

TYPE CLA

UNIFIED	Type	Thread Code	Shank Code	Test Sheet Material	Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
	CLA	440	1	5052-H34 Aluminum	800 - 1500	100	6
			2	5052-H34 Aluminum	800 - 1500	120	9
	CLA	632	1	5052-H34 Aluminum	1000 - 1500	110	21
			2	5052-H34 Aluminum	1200 - 1700	155	24
	CLA	832	1	5052-H34 Aluminum	1000 - 1500	120	27
			2	5052-H34 Aluminum	1300 - 1800	170	29
	CLA	032	1	5052-H34 Aluminum	1700 - 2200	130	34
			2	5052-H34 Aluminum	2600 - 3100	200	50

SELF-CLINCHING NUTS

PERFORMANCE DATA

TYPE SH

UNIFIED	Thread Code	Shank Code	Test Sheet Thickness and Material (in.)	Sheet Hardness HRC	Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
	0420	1	.098" S700MC	23	11700	950	150
		2	.098" S700MC	23	12900	1000	170
	0518	1	.098" S700MC	23	12600	1050	265
		2	.098" S700MC	23	12900	1100	265
	0616	1	.098" S700MC	23	15300	1200	500

METRIC	Thread Code	Shank Code	Test Sheet Thickness and Material (mm)	Sheet Hardness HRC	Installation (kN)	Pushout (N)	Torque-out (N-m)
	M6	1	2.5 mm S700MC	23	52.1	4200	17
		2	2.5 mm S700MC	23	57.4	4500	19
	M8	1	2.5 mm S700MC	23	56.1	4600	30
		2	2.5 mm S700MC	23	57.4	4900	30
	M10	1	2.5 mm S700MC	23	71.2	5400	56

TYPE H

UNIFIED	Type	Thread Code	Test Sheet Thickness and Sheet Material	Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
	H	0616	.090" 5052-H34 Aluminum	4900	380	190
			.088" Cold-rolled Steel	7400	460	240

METRIC	Type	Thread Code	Test Sheet Thickness and Sheet Material	Installation (kN)	Pushout (N)	Torque-out (N-m)
	H	M10	2.29 mm 5052-H34 Aluminum	22	1760	21.5
			2.24 mm Cold-rolled Steel	33	2020	271

TYPE SP

UNIFIED	Type	Thread Code	Shank Code	Test Sheet Material	Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
	SP	256	0	304 Stainless Steel	8000	130	14
			1		9000	165	17
			2		10000	290	18
	SP	440	0	304 Stainless Steel	8000	130	14
			1		9000	165	17
			2		10000	290	18
	SP	632	0	304 Stainless Steel	8500	140	18
			1		9500	170	24
			2		10500	340	28
	SP	832	0	304 Stainless Steel	9000	145	30
			1		10000	180	37
			2		11000	360	45
	SP	024/032	0	304 Stainless Steel	9500	180	35
			1		10500	230	45
			2		11500	400	60
	SP	0420	1	304 Stainless Steel	13500	450	150
			2		13500	600	170
	SP	0518	1	304 Stainless Steel	14800	470	170
			2		14800	750	250
	SP	0524	1	304 Stainless Steel	14800	470	170
			2		14800	750	250
	SP	0616/0624	1	304 Stainless Steel	16000	600	300
			2		20000	700	370

METRIC	Type	Thread Code	Shank Code	Test Sheet Material	Installation (kN)	Pushout (N)	Torque-out (N-m)
	SP	M2	1	304 Stainless Steel	40	725	1.92
			2		44.5	1290	2.03
	SP	M2.5	0	304 Stainless Steel	35.6	575	1.58
			1		40	725	1.92
			2		44.5	1290	2.03
	SP	M3	0	304 Stainless Steel	35.6	575	1.58
			1		40	725	1.92
			2		44.5	1290	2.03
	SP	M4	0	304 Stainless Steel	40	645	3.38
			1		44.5	800	4.18
			2		49	1600	5.08
	SP	M5	0	304 Stainless Steel	42.3	800	3.95
			1		46.7	1025	5.08
			2		51.2	1775	6.77
	SP	M6	1	304 Stainless Steel	60	2000	17
			2		60	2600	19
	SP	M8	1	304 Stainless Steel	66	2100	19
			2		80	4500	23
	SP	M10	1	304 Stainless Steel	80	2150	38

TYPE SMPS

UNIFIED	Type	Thread Code	Test Sheet Material		
			Cold-rolled Steel		
			Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
	SMPS	256	1500	35	8
	SMPS	440	1800	60	12
	SMPS	632	2000	65	14

METRIC	Type	Thread Code	Test Sheet Material		
			Cold-rolled Steel		
			Installation (kN)	Pushout (N)	Torque-out (N-m)
	SMPS	M2.5	6.7	156	1.13
	SMPS	M3	8	267	1.35
	SMPS	M3.5	8.8	289	1.58



SELF-CLINCHING NUTS

PERFORMANCE DATA

TYPE SMPP

UNIFIED	Thread Code	Max. Tightening Torque (in. lbs.) (1) (2)	Test Sheet Thickness and Material (in.)	Sheet Hardness HRB	Installation (lbs.) (3)	Pushout (lbs.)	Torque-out (in. lbs.)	Tensile Strength (lbs.) (1) (2)	Test Bushing Hole Size For Pull Thru Tests (in.)
	256	7.5	.029" 304 Stainless Steel	89	4500	50	10	640	.104
	440	13	.029" 304 Stainless Steel	89	4500	75	15	850	.112
	632	20	.029" 304 Stainless Steel	89	6000	75	20	1020	.138

METRIC	Thread Code	Max. Tightening Torque (N-m) (1) (2)	Test Sheet Thickness and Material (mm)	Sheet Hardness HRB	Installation (kN) (3)	Pushout (N)	Torque-out (N-m)	Tensile Strength (kN) (1) (2)	Test Bushing Hole Size For Pull Thru Tests (mm)
	M2.5	1.05	0.7 mm 304 Stainless Steel	89	20	200	1.35	3.05	3
	M3	1.5	0.7 mm 304 Stainless Steel	89	20	300	1.85	3.63	3.5
	M3.5	2.1	0.7 mm 304 Stainless Steel	89	27	300	1.9	4.25	4

TYPE SL

UNIFIED	Thread Code	Shank Code	Prevailing Torque Specifications (4)		Test Sheet Material					
			Max. Torque (1st thru 3rd) (in. lbs.)	Min. Torque (1st thru 3rd) (in. lbs.)	5052-H34 Aluminum			Cold-rolled Steel		
					Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)	Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
	440	1 2	5.75	0.4	1500 - 2000	90 170	10 13	2500 - 3500	125 230	15 18
	632	1 2	10.5	0.8	2500 - 3000	95 190	17 22	3000 - 6000	130 275	20 28
	832	1 2	18	1.2	2500 - 3000	105 220	23 35	4000 - 6000	145 285	35 45
	032	1 2	21	1.65	2500 - 3000	110 190	32 50	4000 - 9000	180 250	40 60
	0420	1 2	35	3.75	4000 - 7000	360 360	90 125	6000 - 9000	400 400	150 150
	0518	1 2	53	4.75	4000 - 7000	380 380	120 160	6000 - 8000	420 420	165 180
	0616	1 2	95	6.3	5000 - 8000	400 400	270 270	7000 - 11000	460 460	320 320

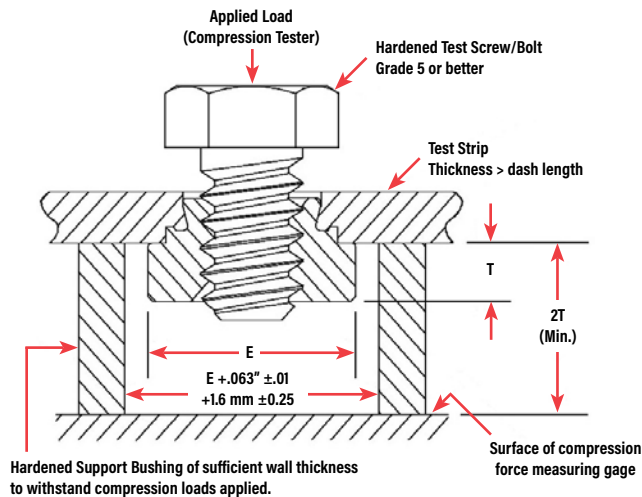
METRIC	Thread Code	Shank Code	Prevailing Torque Specifications (4)		Test Sheet Material					
			Max. Torque (1st thru 3rd) (N-m)	Min. Torque (1st thru 3rd) (N-m)	5052-H34 Aluminum			Cold-rolled Steel		
					Installation (kN)	Pushout (N)	Torque-out (N-m)	Installation (kN)	Pushout (N)	Torque-out (N-m)
	M3	1 2	0.67	0.04	6.7 - 8.9	400 750	1.13 1.47	11.2 - 15.6	550 1010	1.7 2.03
	M3.5	1 2	1.2	0.08	11.2 - 13.5	400 840	1.92 2.5	13.4 - 26.7	570 1210	2.3 2.3
	M4	1 2	2.1	0.13	11.2 - 13.4	470 970	2.6 4	18 - 27	645 1250	4 5.1
	M5	1 2	2.4	0.18	11.2 - 15.6	480 845	3.6 5.7	18 - 38	800 1112	4.5 6.8
	M6	1 2	4	0.3	18 - 32	1580 1580	10.2 14.1	27 - 36	1760 1760	17 17
	M8	1 2	6	0.5	18 - 32	1570 1570	13.6 18.1	27 - 36	1870 1870	18.7 20.3
	M10	1 2	12	0.8	22 - 36	1760 1760	32.7 32.7	32 - 50	2020 2020	36.2 36.2

- (1) Head size is adequate to ensure failure in threaded area when tested with industry standard tensile bushing diameter.
- (2) Tightening torque shown will induce preload of 70% of min axial strength assuming K or nut factor is equal to 0.20. In some applications tightening torque may need to be adjusted based on the actual K value. All tightening torques shown are based on 180 ksi/ Property Class 12.9 screws. For lower strength screws the tightening torque is proportionately less. For example, for 120 ksi screws, torque is 67% of value shown. For 900 MPa screws (Property Class 9.8) torque value is 74% of value shown.
- (3) Installation controlled by proper cavity depth in installation tooling.
- (4) 3 cycle locking performance. Max. on / Min. off torque for 1st through 3rd cycles.

SELF-CLINCHING NUTS

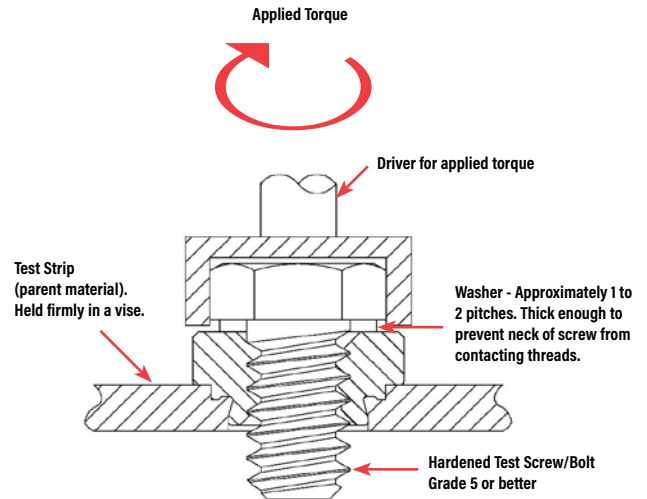
PUSHOUT TEST

Pushout tests shall be performed from the grip or shank side of the installed fastener. An axial load shall be applied to the fastener as shown using a hardened test screw, while evenly supporting the test strip around the fastener. The typical position rate is .25" / 6.35 mm per minute. Dimensions are identified per PEM Bulletins where "E" equals head diameter and "T" (or "L") equals head height. The pushout force is measured using a force or compression tester with a range that will cover the expected forces.



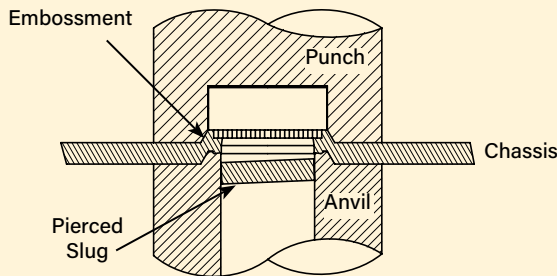
TORQUE-OUT TEST

Torque-out tests shall be performed from the shoulder or head side of the installed fastener. Torque shall be applied to the fastener in the manner illustrated, using a hardened test screw and washer, while firmly holding the test strip. Test screws should be of sufficient tensile strength to resist thread stripping. A minimum of two screw threads must extend beyond the fastener.



SELF-PIERCING, SELF-CLINCHING TOOLING

Specialized PEMserter® tooling allows installation of Type S self-clinching nuts into aluminum sheets (sizes 1/4", 5/16", M6, and M8) in one pierce/press operation.



For more information, see our web site for Tech Sheet PEM® - Ref / Self-piercing, self-clinching tooling. To locate, simply type "self-piercing" in site search box.

SELF-CLINCHING NUTS

SELF-CLINCHING NUT INSTALLATION DOS AND DON'TS

"Dos"

- DO** select the proper fastener material to meet corrosion requirements.
- DO** make certain that panel material is in the annealed condition.
- 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** maintain the hole punch diameter to no greater than $+.001"/.025$ mm over the minimum recommended mounting hole for type SP nuts into stainless steel sheets.
- DO** install fastener into hole punch side of sheet.
- DO** make certain that shank (or pilot) is within hole before applying installation force.
- DO** make certain that fastener is not installed adjacent to bends or other highly cold-worked areas.
- DO** apply squeezing force between parallel surfaces.
- DO** utilize recommended installation tooling when installing fasteners.
- DO** apply sufficient force to totally embed clinching ring around entire circumference and to bring shoulder squarely in contact with sheet.

"Don'ts"

- DON'T** attempt to install any self-clinching nut other than a type SP fastener into a stainless steel sheet.
- DON'T** install steel or stainless steel fasteners in aluminum panels before anodizing or finishing.
- 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 indicated by manufacturer – unless a special fixture is used to restrict bulging of sheet edge.
- DON'T** over-squeeze. It will crush the head, distort threads, and buckle the sheet. Approximate installation forces are listed in performance data tables. Use this info as a guide. 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.
- DON'T** install fastener on pre-painted side of panel.

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

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

PennEngineering®



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

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

Technical support e-mail: techsupport@pemnet.com