

PennEngineering®

SELF-CLINCHING NUTS



BULLETIN





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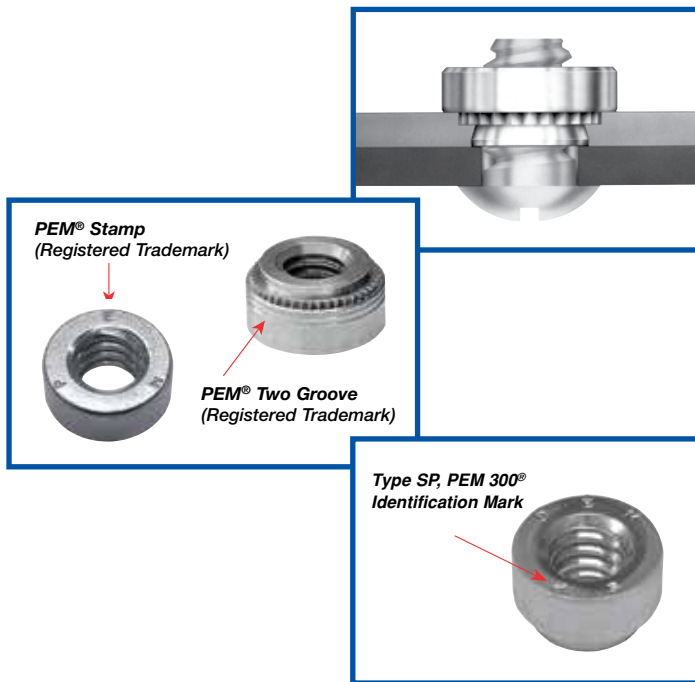
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SELF-CLINCHING NUTS

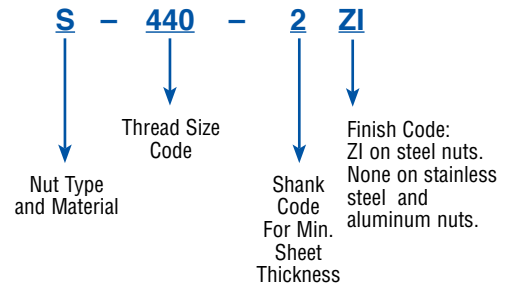
Self-clinching nuts are installed by placing them in properly sized holes in sheets and applying a parallel squeezing force to the head of the nut. The sheet metal surrounding the head cold flows into an undercut thereby making the fastener an integral part of the sheet. A serrated clinching ring prevents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

<p>Types S/SS/CLS/CLSS nuts provide load-bearing threads in thin sheets with high pushout and torque-out resistance - PAGES 4 and 5</p>		<p>Type SMPS self-clinching nuts are for installation into ultra-thin sheets. They feature a lower profile and can be mounted closer to the edge of a sheet than other self-clinching nuts - PAGE 6</p>	
<p>Type SP, PEM 300® nuts provide strong load-bearing threads in stainless steel sheets as thin as .030"/0.8mm - PAGES 4 and 5</p>		<p>Type SL self-locking nuts are designed with a unique and economical TRI-DENT® locking feature, which meets demanding locking performance requirements - PAGE 7</p>	
<p>Type CLA aluminum nuts are recommended for use in aluminum sheet with a hardness of HRB 50 or less on the Rockwell "B" scale - PAGES 4 and 5</p>		<p>Material and finish specifications - PAGE 8</p>	
<p>Type H/HN (non-locking) and Type HNL (locking) nuts self-clinching nuts - PAGE 6</p>		<p>Installation - PAGES 8 - 9</p>	
		<p>Performance data - PAGES 10 - 12</p>	

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) or check our website.



PART NUMBER DESIGNATION



SELF-CLINCHING NUTS

PEM® SELF-CLINCHING NUT SELECTOR GUIDE

PEM Nut Type	Page No.	Recommended Application						
		Sheet thickness as thin as .025" / 0.64mm	Self-locking	Reduced centerline-to-edge distance	Max. corrosion resistance	Recommended for use in steel or aluminum panels within specified hardness limits	Recommended for use in aluminum panels within specified hardness limits	Recommended for use in stainless steel panels within specified hardness limits
S/SS	4, 5					•		
CLS/CLSS	4, 5				•	•		
CLA	4, 5				•		•	
SP	4, 5				•			•
H	6					•		
HN	6					•		
HNL	6		•			•		
SMPS	6	•		•	•	•		
SL	7		•			•		

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.

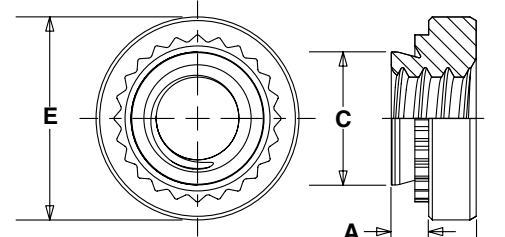
SELF-CLINCHING NUTS

- Types S/SS are recommended for use in steel or aluminum sheets HRB (Rockwell "B" scale) 80 or less and HB (Hardness Brinell) 150 or less.
- Types CLS/CLSS are recommended for use in steel or aluminum sheets HRB (Rockwell "B" scale) 70 or less and HB (Hardness Brinell) 125 or less.
- Type SP is recommended for use in stainless steel sheets HRB (Rockwell "B" scale) 90 or less and HB (Hardness Brinell) 185 or less.
- Type CLA is recommended for use in steel or aluminum sheets HRB (Rockwell "B" scale) 50 or less and HB (Hardness Brinell) 82 or less.

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

TYPES S/SS/CLS/CLSS/SP

All dimensions are in inches.



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

Thread Size	Type			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 ϕ To Edge (2)
	Fastener Material											
	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					
.138-32 (#6-32)	S	CLS	SP	632	0	.030	.030	.1875	.187	.280	.070	.22
					1	.038	.040					
					2	.054	.056					
.164-32 (#8-32)	S	CLS	SP	832	0	.030	.030	.213	.212	.310	.090	.27
					1	.038	.040					
					2	.054	.056					
.190-24 (#10-24)	SS	CLSS	SP	024	0	.030	.030	.250	.249	.340	.090	.28
					1	.038	.040					
					2	.054	.056					
.190-32 (#10-32)	SS	CLSS	SP	032	0	.030	.030	.250	.249	.340	.090	.28
					1	.038	.040					
					2	.054	.056					
.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 ⁽⁴⁾	CLS	SP	0420	0	.045	.047	.344	.343	.440	.170	.34
					1	.054	.056					
					2	.087	.090					
.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 ⁽⁴⁾	CLS	SP	0518	1	.054	.056	.413	.412	.500	.230	.38
					2	.087	.090					
					3 ⁽³⁾	.120	.125					
.313-24 (5/16-24)	S	CLS	SP	0524	1	.054	.056	.413	.412	.500	.230	.38
					2	.087	.090					
					3 ⁽³⁾	.120	.125					
.375-16 (3/8-16)	S	CLS	SP	0616	1	.087	.090	.500	.499	.560	.270	.44
					2	.120	.125					
					3 ⁽³⁾	.235	.250					
.375-24 (3/8-24)	S	CLS	—	0624	1	.087	.090	.500	.499	.560	.270	.44
					2	.120	.125					
					3	.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	.656	.655	.810	.360	.63
					2	.235	.250					

- (1) For maximum performance, we recommend that you use the maximum shank length for your sheet thickness.
- (2) To minimize sheet distortion and maximize product performance, use a centerline-to-edge value greater or equal to the value specified.
- (3) This shank code not available for Type SP.
- (4) 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 12 for more information.

SELF-CLINCHING NUTS

TYPES S, SS, CLS, CLSS, AND 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 (1)	Hole Size In Sheet +0.08	C Max.	E ±0.25	T ±0.25	Min. Dist. Hole \varnothing To Edge (2)
		Fastener Material											
		Carbon Steel	Stainless Steel	Hardened Stainless Steel									
M2 x 0.4	S	CLS	—	M2	0	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	—	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 (4)	CLS	SP	M6	00 (3)	0.89	0.92	8.75	8.73	11.18	4.08	8.6	
					0 (3)	1.15	1.2						
					1	1.38	1.4						
					2	2.21	2.29						
M8 x 1.25	S (4)	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 (3)	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 (1)	Hole Size In Sheet +.003 - .000	C Max.	E ±.010	T ±.010	Min. Dist. Hole \varnothing To Edge (2)
		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 (1)	Hole Size In Sheet +0.08	C Max.	E ±0.25	T ±0.25	Min. Dist. Hole \varnothing To Edge (2)
		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							

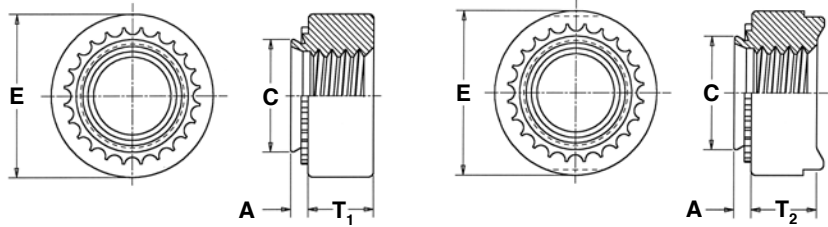
- (1) For maximum performance, we recommend that you use the maximum shank length for your sheet thickness.
- (2) To minimize sheet distortion and maximize product performance, use a centerline-to-edge value greater or equal to the value specified.
- (3) This shank code not available for Type SP.
- (4) 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 12 for more information.



SELF-CLINCHING NUTS

STEEL, SELF-LOCKING AND NON-LOCKING NUTS - TYPES H/HN/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 (Rockwell "B" scale) 80 or less and HB (Hardness Brinell) 150 or less.
- Types HN/HNL are recommended for use in sheets HRB (Rockwell "B" scale) 60 or less and HB (Hardness Brinell) 107 or less.



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 \varnothing To Edge (2)
		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 HN	HNL	0616	.058	.058	.500	.499	.650		.300	.480	

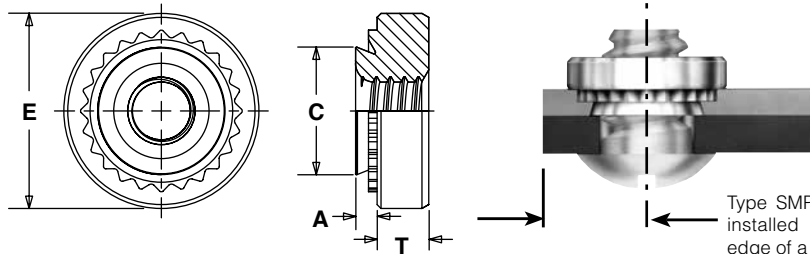
All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type		Thread Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +0.13	C Max.	E ±0.25	T ₁	T ₂	Min. Dist. Hole \varnothing To Edge (2)
		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 HN	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.
- (2) To minimize sheet distortion and maximize product performance, use a centerline-to-edge value greater or equal to the value specified.

NUTS FOR ULTRA-THIN SHEETS - TYPE SMPS™

- Installs into sheets as thin as .025"/0.64mm.
- Recommended for use in sheets HRB (Rockwell "B" scale) 70 or less and HB (Hardness Brinell) 125 or less.



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 \varnothing To Edge										
											.086-56 (#2-56)	SMPS	256	.024	.025	.136	.135	.220	.065	.15
											.112-40 (#4-40)	SMPS	440	.024	.025	.166	.165	.220	.065	.17
.138-32 (#6-32)	SMPS	632	.024	.025	.187	.186	.252	.065	.20											

All dimensions are in millimeters.

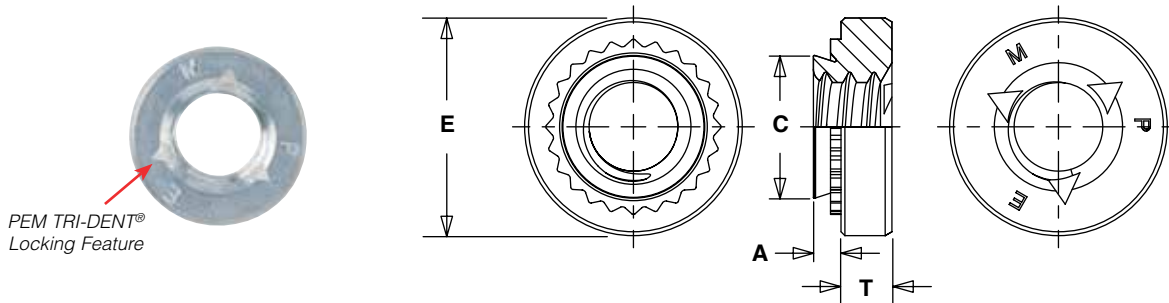
METRIC	Thread Size x Pitch	Type	Thread Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +0.08	C Max.	E ±0.25	T ±0.25	Min. Dist. Hole \varnothing To Edge										
											M2.5 x 0.45	SMPS	M2.5	0.61	0.64	3.8	3.79	5.6	1.4	3.7
											M3 x 0.5	SMPS	M3	0.61	0.64	4.24	4.22	5.6	1.4	4.3
M3.5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



SELF-CLINCHING NUTS

TRIDENT® LOCKNUTS - TYPE SL™

- 3 cycle locking performance. ⁽¹⁾
- Recommended for use in sheets HRB (Rockwell “B” scale) 80 or less and HB (Hardness Brinell) 150 or less.



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						

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						

(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 Finishes (1)		For Use in Sheet Hardness: (6)					
	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 PEM spec PRS-C90	Heat Treated Carbon Steel	300 Series Stainless Steel	Aluminum	Carbon Steel	Age Hardened A286 Stainless Steel	Passivated and/or Tested per ASTM A380	Zinc Plated, 5µm, Colorless (7)	Zinc Plated, 5µm, Colorless Plus Sealant/Lubricant (7)	No Finish (2) (3)	Zinc Plated, 5µm, Yellow (7)	Cadmium Spec SAE AMS-QQ-P-416, Type I, Class 3, Plus Clear Chromate Passivation	HRB 90/ HB 185 or Less (4) (5)	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	•					•					•								•
SL	•		•	•					•										
SMPS	•				•				•										
SP	•							•	•						•				
H	•			•					•		•				•				
HN	•						•		•		•								•
HNL	•	•					•			•			•						•
Part number codes for finishes								None	ZI	LZ	X	ZC	CI						

- (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"/0.0064mm plating.
- (4) Panel material should be in the annealed condition.
- (5) Fasteners should not be installed adjacent to bends or other highly cold-worked areas.
- (6) HRB - Hardness Rockwell "B" Scale. HB - Hardness Brinell.
- (7) See PEM Technical Support section of our web site for related plating standards and specifications.

INSTALLATION - TYPE SP⁽¹⁾

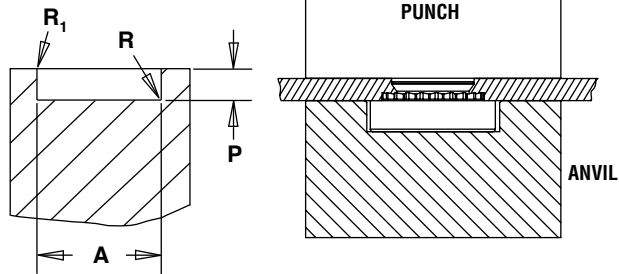
1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into the recommended counterbored anvil hole and place the mounting hole over the shank of the fastener as shown in diagram.
3. With installation punch and anvil surfaces parallel,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

Installation Tooling

UNIFIED	Thread Code	Anvil Dimensions (in.)				Anvil Part Number	Punch Part Number
		A ±.002	P +.000 - .001	R Max.	R ₁ +.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	.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 ₁ +0.13		
	M3	6.48	1.63	0.25	0.13	8012821	975200048
	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	8003076
	M8	12.83	5.41	0.25	0.13	8015360	
	M10	17.58	7.47	0.25	0.13	8015886	

RECOMMENDED COUNTERBORED INSTALLATION ANVIL



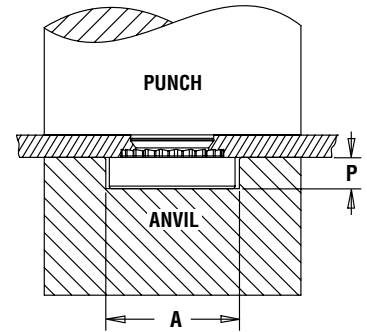
- (1) To meet the published performance data, we recommend using the installation punch and anvil shown. Deviations from recommended installation tooling may result in sheet distortion and reduced performance.

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

SELF-CLINCHING NUTS

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



Installation Tooling

CLS/CLSS/S/SS

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	P +.000 -.001		
	256/440	.267	.045	975200034	975200048
	632	.298	.045	975200035	975200048
	832	.330	.070	975200036	975200048
	1032	.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
	0813	.375	.345	975200900300 ⁽¹⁾	975200901400

METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	P -0.03		
	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	13.13	5.08	975200039	975200048
	M10	7.62	6.35	8005682 ⁽¹⁾	975200901400

CLA

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	P +.000 -.001		
	256/440	.267	.045	975200034	975200048
	632	.298	.045	975200035	975200048
	832	.330	.070	975200036	975200048
	1024/1032	.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 -0.03		
	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

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

SL

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	P +.000 -.001		
	440	.267	.045	975200034	975200048
	632	.298	.045	975200035	975200048
	832	.330	.070	975200036	975200048
	1032	.361	.070	975200037	975200048
	0420	.454	.150	975200038	975200048

METRIC	Thread Code	Anvil Dimensions (mm)		Anvil Part Number	Punch Part Number
		A ±0.05	P -0.03		
	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

SMPS

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	P +.000 -.001		
	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 -0.03		
	256/440	5.99	1.14	975200904300	975200048
	632	6.78	1.14	975200034	975200048

H/HN/HNL

UNIFIED	Thread Code	Anvil Dimensions (in.)		Anvil Part Number	Punch Part Number
		A ±.002	P +.000 -.001		
	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 -0.03		
	M6	13.13	5.08	975200039	975200048
	M8	5.59	6.35	975200783300 ⁽¹⁾	975200048
	M10	7.62	6.35	8005682 ⁽¹⁾	8003076

PEMSERTER® PRESSES

For best results we recommend using a PEMSERTER® press for either manual or automatic installation of PEM type S, SL, SMPS, SS, CLS, CLSS, CLA, H, HN, HNL, and SP nuts. For more information on our line of presses call 1-800-523-5321, or check our web site.



SELF-CLINCHING NUTS

PERFORMANCE DATA⁽¹⁾

TYPE S/CLS/CLSS

UNIFIED	Type	Thread Code	Shank Code	Test Sheet Material	Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
	UNIFIED	S CLS	256 348 440	0	5052-H34 Aluminum	1500-2000	63
1				90			10
2				170			13
3				170	13		
0				Cold-rolled Steel	105		13
1					125		15
2		230	18				
S CLS		632	0	5052-H34 Aluminum	2500-3000	63	16
			1			95	17
			2			190	22
			3	190		22	
			0	Cold-rolled Steel		110	16
			1			130	20
2		275	28				
S CLS		832	0	5052-H34 Aluminum	2500-3000	68	21
			1			105	23
			2			220	35
			3	220		35	
			0	Cold-rolled Steel		110	26
			1			145	35
2		285	45				
SS CLSS		024 032	0	5052-H34 Aluminum	2500-3500	68	26
			1			110	32
			2			190	50
	3		225	50			
	0		Cold-rolled Steel	120		32	
	1			180		40	
2	320	60					
S CLS	1224	1	5052-H34 Aluminum	2500-6500	120	63	
		2			285	70	
		3			285	70	
		1	Cold-rolled Steel		200	74	
		2			350	80	
		3			350	80	
S CLS	0420	0	5052-H34 Aluminum	4000-7000	220	70	
		1			360	90	
		2			360	125	
		3	315		115		
		0	Cold-rolled Steel		315	115	
		1			400	150	
2	400	150					
S CLS	0518 0524	1	5052-H34 Aluminum	4000-7000	380	120	
		2			380	160	
		3			380	160	
		1	Cold-rolled Steel		420	165	
		2			420	180	
		3			420	180	
S CLS	0616 0624	1	5052-H34 Aluminum	5000-8000	400	270	
		2			400	270	
		3			400	270	
		1	Cold-rolled Steel		460	320	
		2			460	320	
		3			460	320	
S	0720	1	Cold-rolled Steel	9000-13000	450	340	
		1			450	340	
S CLS	0813 0820	1	5052-H34 Aluminum	7000-9000	475	350	
		2			475	350	
		1	Cold-rolled Steel		1050	735	
		2			1050	735	

METRIC	Type	Thread Code	Shank Code	Test Sheet Material	Installation (kN)	Pushout (N)	Torque-out (N•m)					
	METRIC	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				Cold-rolled Steel	470		1.47					
1					550		1.7					
2					1010		2.03					
S CLS		M3.5	0	5052-H34 Aluminum	11.2-13.5	280	1.8					
			1			400	1.92					
			2			840	2.5					
			0	Cold-rolled Steel		480	1.8					
			1			570	2.3					
			2			1210	2.3					
S CLS		M4	0	5052-H34 Aluminum	11.2-13.4	300	2.37					
			1			470	2.6					
			2			970	4					
			0	Cold-rolled Steel		490	2.95					
			1			645	4					
			2			1250	5.1					
SS CLSS		M5	0	5052-H34 Aluminum	11.2-15.6	300	3					
			1			480	3.6					
			2			845	5.7					
			0	Cold-rolled Steel		530	3.6					
			1			800	4.5					
			2			1112	6.8					
S CLS		M6	00	5052-H34 Aluminum	18-32	750	6.5					
			0			970	7.9					
			1			1580	10.2					
			2			1580	14.1					
			00			Cold-rolled Steel	900	10				
			0				1380	13				
		S CLS	M8	1	5052-H34 Aluminum	18-32	1570	13.6				
				2			1570	18.1				
				1			Cold-rolled Steel	1870	18.7			
				2				1870	20.3			
				S CLS			M10	1	5052-H34 Aluminum	22-36	1760	32.7
								2			1760	32.7
1	Cold-rolled Steel	2020	36.2									
2		2020	36.2									
S	M12	1	5052-H34 Aluminum	23-30	1390	35.2						
		1			Cold-rolled Steel	3065	73.9					

TYPE H

UNIFIED	Type	Thread Code	Test Sheet Thickness and Sheet Material	Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
	UNIFIED	H	0616	.090" 5052-H34 Aluminum	4900	380
.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)
	METRIC	H	M10	2.29 mm 5052-H34 Aluminum	22	1760
2.24 mm Cold-rolled Steel				33	2020	27.1

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

SELF-CLINCHING NUTS

PERFORMANCE DATA

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					
SP	0616	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	M2.5	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	

TYPE SL

UNIFIED	Type	Thread Code	Shank Code	Thread Locking Specifications (1)		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.)
				SL	440	1	5.75	0.4	1500 - 2000	90	10
	2	170	13	230		18					
SL	632	1	10.5	0.8	2500 - 3000	95	17	3000 - 6000	130	20	
		2				190	22		275	28	
SL	832	1	18	1.2	2500 - 3000	105	23	4000 - 6000	145	35	
		2				220	35		285	45	
SL	032	1	21	1.65	2500 - 3000	110	32	4000 - 9000	180	40	
		2				190	50		250	60	
SL	0420	1	35	3.75	4000 - 7000	360	90	6000 - 9000	400	150	
		2				360	125		400	150	
SL	0518	1	53	4.75	4000 - 7000	380	120	6000 - 8000	420	165	
		2				380	160		420	180	

METRIC	Type	Thread Code	Shank Code	Thread Locking Specifications (1)		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)
				SL	M3	1	0.67	0.04	6.7 - 8.9	400	1.13
	2	750	1.47	1010		2.03					
SL	M3.5	1	1.2	0.08	11.2 - 13.5	400	1.92	13.4 - 26.7	570	2.3	
		2				840	2.5		1210	2.3	
SL	M4	1	2.1	0.13	11.2 - 13.4	470	2.6	18 - 27	645	4	
		2				970	4		1250	5.1	
SL	M5	1	2.4	0.18	11.2 - 15.6	480	3.6	18 - 38	800	4.5	
		2				845	5.7		1112	6.8	
SL	M6	1	4	0.3	18 - 32	1580	10.2	27 - 36	1760	17	
		2				1580	14.1		1760	17	
SL	M8	1	6	0.5	18 - 32	1570	13.6	27 - 36	1870	18.7	
		2				1570	18.1		1870	20.3	

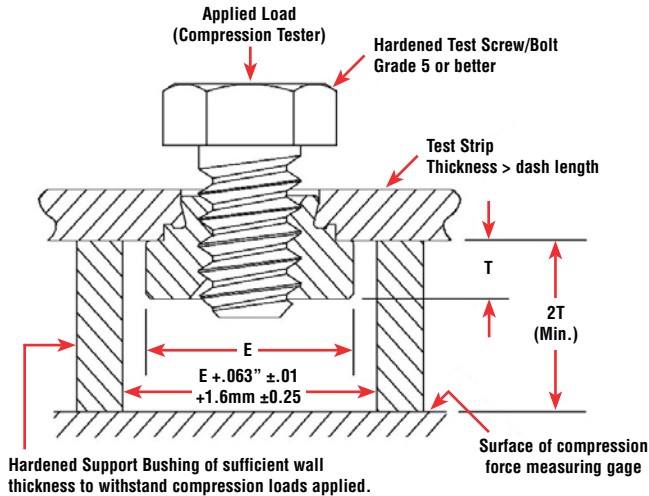
(1) 3 cycle locking performance.

PEM spec PRS-C90 Max. on / Min. off torque for 1st thru 3rd cycles.

SELF-CLINCHING NUTS

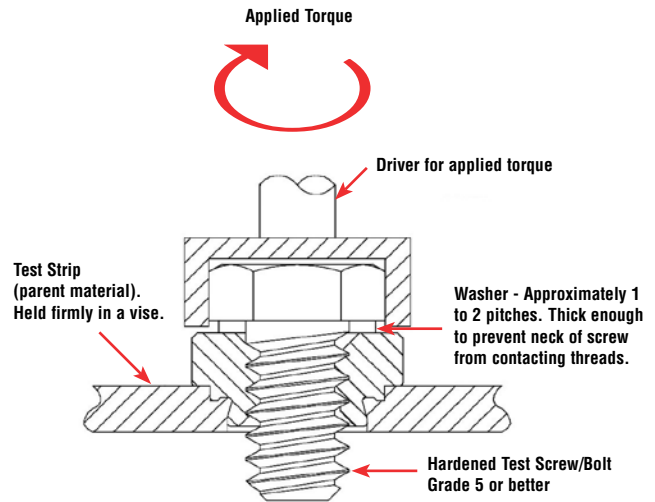
PUSHOUT TEST

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" / 6.35mm 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.



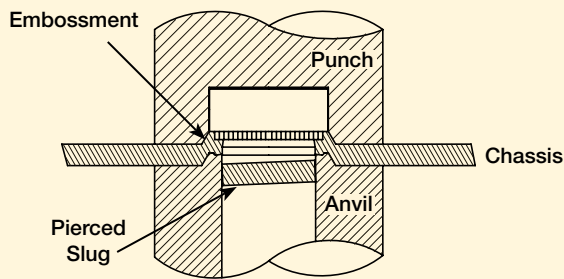
TORQUE-OUT TEST

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 self-clinching nuts into aluminum sheets (sizes 1/4-20, 5/16-18, 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.

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