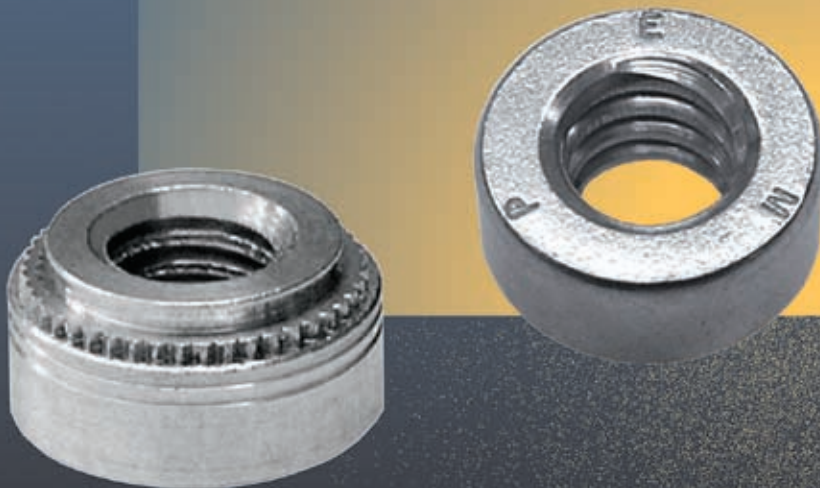




SELF-CLINCHING  
NUTS

# BULLETIN



CL 706

# PEM® SELF-CLINCHING NUTS

For load-bearing threads in thin sheets – aluminum, steel, and other ductile materials.

## Proved Performance

For over 60 years, PEM brand self-clinching fasteners have satisfied production and fastening requirements wherever load-bearing threads are required in thin metal sections too thin to tap.

## Quick, convenient assembly using standard tools

Installation of PEM brand self-clinching nuts is simple, quick, and convenient. Just insert them in punched or drilled holes, then apply a squeezing force to embed the clinching ring completely in the sheet metal.

## High pushout & torque-out resistance

The clinching ring locks the displaced metal behind the tapered shank, ensuring high pushout resistance. High torque-out resistance is ensured when the knurled platform is embedded in the sheet metal.

## Distortion-free installation

Proper installation forces will not distort or damage the threads in PEM nuts because the recommended shank length is always less than the minimum sheet thickness.

## Reverse side remains flush

All clinching takes place on the fastener side of the sheet. The reverse side remains flush and smooth.

## Self-clinching Locknuts

These locknuts (Type SL™) are designed with a unique and economical TRI-DENT® locking feature, which meets demanding locking performance requirements.

## Thin Sheet Self-clinching Nuts

These nuts (Type SMPS™) feature a lower profile and can be mounted closer to the edge of a sheet than standard self-clinching nuts.

## Self-clinching nuts for stainless steel

PEM 300® self-clinching nuts (Type SP™) are especially designed for permanent installation into stainless steel sheets as thin as .030”/ 0.8 mm.

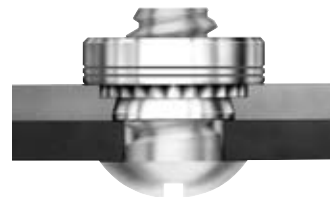
Machined from a specialty stainless steel, these fasteners are then heat-treated to a hardness higher than most 300 Series stainless steels. This feature enables PEM 300 fasteners to be installed into stainless steel sheets, employing the same self-clinching principle which has proved successful over the years in thousands of applications.



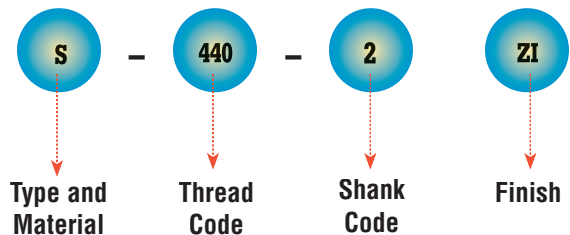
Look for the PEM® trademarks



The PEM 300® Identification Marks

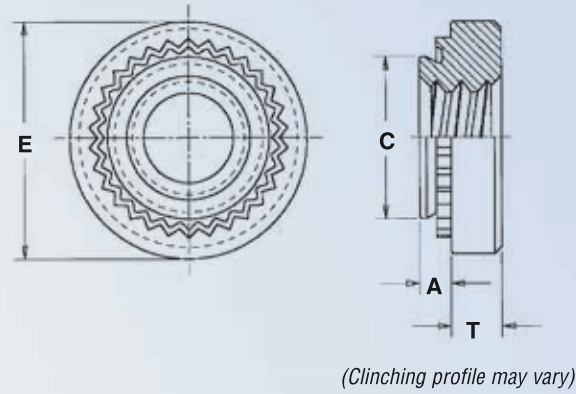


## Part Number Designation



† Many PEM self-clinching nuts meet NASM45938/1 specifications. Consult our Marketing department for a complete Military Specifications and National Aerospace Standards guide (Bulletin NASM) or check our website.

# STEEL AND STAINLESS STEEL NUTS (Unified) - TYPES S, SS, CLS, and CLSS

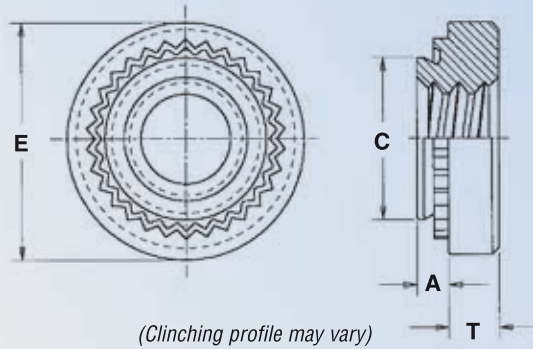


All dimensions are in inches.

Thread Size	Type		Thread Code	Shank Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C Max.	E ±.010	T ±.010	Min. Dist. Hole C/L To Edge (1)
	Fastener Material										
	Carbon Steel	Stainless Steel									
.086-56 (#2-56)	S	CLS	256	0	.030	.030	.166	.165	.25	.07	.19
				1	.038	.040					
				2	.054	.056					
.099-48 (#3-48)	S	CLS	348 <sup>NS</sup>	0	.030	.030	.166	.165	.25	.07	.19
				1	.038	.040					
				2	.054	.056					
.112-40 (#4-40)	S	CLS	440	0	.030	.030	.166	.165	.25	.07	.19
				1	.038	.040					
				2	.054	.056					
				3	.087	.091					
.138-32 (#6-32)	S	CLS	632	0	.030	.030	.1875	.187	.28	.07	.22
				1	.038	.040					
				2	.054	.056					
				3	.087	.091					
.164-32 (#8-32)	S	CLS	832	0	.030	.030	.213	.212	.31	.09	.27
				1	.038	.040					
				2	.054	.056					
				3	.087	.091					
.190-24 (#10-24)	SS	CLSS	024	0	.030	.030	.250	.249	.34	.09	.28
				1	.038	.040					
				2	.054	.056					
				3	.087	.091					
.190-32 (#10-32)	SS	CLSS	032	0	.030	.030	.250	.249	.34	.09	.28
				1	.038	.040					
				2	.054	.056					
				3	.087	.091					
.216-24 (#12-24)	S	CLS	1224	1 <sup>NS</sup>	.038	.040	.277	.276	.37	.13	.31
				2	.054	.056					
				3	.087	.091					
				0	.045	.047					
.250-20 (1/4-20)	S	CLS	0420	1	.054	.056	.344	.343	.44	.17	.34
				2	.087	.091					
				3	.120	.125					
				1	.054	.056					
.250-28 (1/4-28)	S	CLS	0428	2	.087	.091	.344	.343	.44	.17	.34
				3 <sup>NS</sup>	.120	.125					
				1	.054	.056					
.313-18 (5/16-18)	S	CLS	0518	2	.087	.091	.413	.412	.50	.23	.38
				3	.120	.125					
				1	.054	.056					
.313-24 (5/16-24)	S	CLS	0524 <sup>NS</sup>	2	.087	.091	.413	.412	.50	.23	.38
				3	.120	.125					
				1	.087	.091					
.375-16 (3/8-16)	S	CLS	0616	2	.120	.125	.500	.499	.56	.27	.44
				3	.235	.250					
				1	.087	.091					
.375-24 (3/8-24)	S	CLS	0624 <sup>NS</sup>	2	.120	.125	.500	.499	.56	.27	.44
				3	.235	.250					
				1	.120	.125					
.500-13 (1/2-13)	S	CLS <sup>NS</sup>	0813	2	.235	.250	.656	.655	.81	.36	.63
				1	.120	.125					
.500-20 (1/2-20)	S	CLS <sup>NS</sup>	0820	1	.120	.125	.656	.655	.81	.36	.63
				2	.235	.250					

(1) For closer distances consult our Engineering Department.  
(NS) Not Stocked, available on special order.

# STEEL AND STAINLESS STEEL NUTS (Metric) - TYPES S, SS, CLS, and CLSS



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 C/L To Edge (1)
		Fastener Material										
		Carbon Steel	Stainless Steel									
M2 x 0.4	S	CLS <sup>NS</sup>	M2	0	0.77	0.8-1	4.25	4.22	6.3	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	0.8-1	4.25	4.22	6.3	1.5	4.8	
				1	0.97	1						
				2	1.38	1.4						
M3 x 0.5	S	CLS	M3	0	0.77	0.8-1	4.25	4.22	6.3	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	0.8-1	4.75	4.73	7.1	1.5	5.6	
				1	0.97	1						
				2	1.38	1.4						
M4 x 0.7	S	CLS	M4	0	0.77	0.8-1	5.4	5.38	7.9	2	6.9	
				1	0.97	1						
				2	1.38	1.4						
M5 x 0.8	SS	CLSS	M5	0	0.77	0.8-1	6.4	6.38	8.7	2	7.1	
				1	0.97	1						
				2	1.38	1.4						
M6 x 1	S	CLS	M6	00	0.89	0.92	8.75	8.72	11.05	4.08	8.6	
				0	1.15	1.2						
				1	1.38	1.4						
				2	2.21	2.3						
M8 x 1.25	S	CLS <sup>NS</sup>	M8	1	1.38	1.4	10.5	10.47	12.65	5.47	9.7	
				2	2.21	2.3						
M10 x 1.5	S	CLS	M10 <sup>NS</sup>	1	2.21	2.31	14	13.97	17.35	7.48	13.5	
				2	3.05	3.18						

# ALUMINUM SELF-CLINCHING NUTS (Unified) - TYPE CLA

(See drawing at top of page) 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 C/L To Edge (1)
		Fastener Material										
		Aluminum										
.086-56 (#2-56)	CLA	256 <sup>NS</sup>	1	.038	.040	.166	.165	.25	.07	.19		
			2	.054	.056							
.112-40 (#4-40)	CLA	440	1	.038	.040	.1875	.187	.25	.09	.22		
			2	.054	.056							
.138-32 (#6-32)	CLA	632	1	.038	.040	.213	.212	.28	.09	.27		
			2	.054	.056							
.164-32 (#8-32)	CLA	832	1	.038	.040	.234	.233	.31	.13	.28		
			2	.054	.056							
.190-24 (#10-24)	CLA	024 <sup>NS</sup>	1	.038	.040	.296	.295	.37	.16	.31		
			2	.054	.056							
.190-32 (#10-32)	CLA	032	1	.038	.040	.296	.295	.37	.16	.31		
			2	.054	.056							
.250-20 (1/4-20)	CLA	0420	1	.054	.056	.344	.343	.44	.17	.34		
			2	.087	.091							
			3	.120	.125							

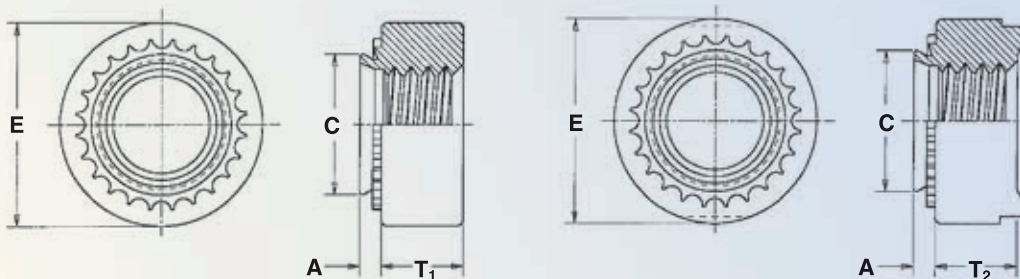
(1) For closer distances consult our Engineering Department.  
(NS) Not Stocked, available on special order.

# ALUMINUM SELF-CLINCHING NUTS (Metric) - TYPE CLA

(See drawing at top of page CL-4) 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 C/L To Edge (1)
		Fastener Material									
		Aluminum									
M2 x 0.4	CLA	M2 <sup>NS</sup>	1	0.98	1	4.25	4.22	6.3	1.5	4.8	
			2	1.38	1.4						
M3 x 0.5	CLA	M3	1	0.98	1	4.75	4.73	6.3	2	5.6	
			2	1.38	1.4						
M3.5 x 0.6	CLA	M3.5 <sup>NS</sup>	1	0.98	1	5.4	5.38	7.1	2	6.9	
			2	1.38	1.4						
M4 x 0.7	CLA	M4	1	0.98	1	6	5.97	7.9	3	7.1	
			2	1.38	1.4						
M5 x 0.8	CLA	M5 <sup>NS</sup>	1	0.98	1	7.5	7.47	9.5	3.8	7.9	
			2	1.38	1.4						
M6 x 1	CLA	M6 <sup>NS</sup>	1	1.38	1.4	8.75	8.72	11.05	4.08	8.6	
			2	2.21	2.3						

# STEEL, SELF-LOCKING AND NON-LOCKING NUTS - TYPES H, HN, HNL



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 <sub>1</sub>	T <sub>2</sub>	Min. Dist. Hole C/L To Edge (1)
		Non-Locking	Self-Locking*							Non-locking	Self-locking	
										±.005	±.010	
.250-20 (1/4-20)	NA	HNL	0420	.058	.058	.344	.343	.500	.189		.380	
									.240			
									.300			
.313-18 (5/16-18)	NA	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 <sub>1</sub>	T <sub>2</sub>	Min. Dist. Hole C/L To Edge (1)
		Non-Locking	Self-Locking*							Non-locking	Self-locking	
										±0.13	±0.25	
M6 x 1	NA	HNL	M6	1.48	1.48	8.75	8.72	12.7	5		10	
M8 x 1.25	NA	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	

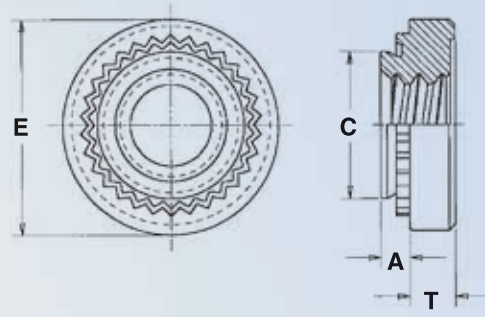
(1) For closer distances consult our Engineering Department.

(NS) Not Stocked, available on special order.

(NA) Not Available - Use Type S instead.

\* 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.

# PEM 300® SELF-CLINCHING NUTS FOR STAINLESS STEEL TYPE SP™



All dimensions are in inches.

UNIFIED	Thread Size	Type	Thread Code	Shank Code	A (Shank) Max.	Sheet Thickness (2)	Hole Size In Sheet +.003-.000 (3)	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	.25	.07	.19
				1	.038	.040-.055					
				2	.054	.056 Min.					
	.138-32 (#6-32)	SP	632	0	.030	.030-.039	.1875	.187	.28	.07	.22
				1	.038	.040-.055					
				2	.054	.056 Min.					
.164-32 (#8-32)	SP	832	0	.030	.030-.039	.213	.212	.31	.09	.27	
			1	.038	.040-.055						
			2	.054	.056 Min.						
.190-32 (#10-32)	SP	032	0	.030	.030-.039	.250	.249	.34	.09	.28	
			1	.038	.040-.055						
			2	.054	.056 Min.						
.250-20 (1/4-20)	SP	0420	1	.054	.056 Min.	.344	.343	.44	.17	.34	

All dimensions are in millimeters.

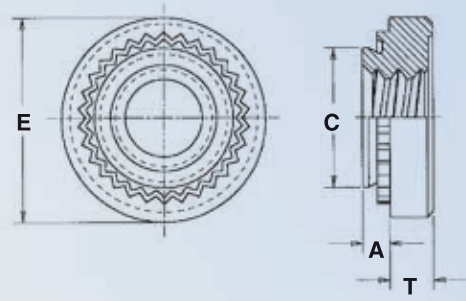
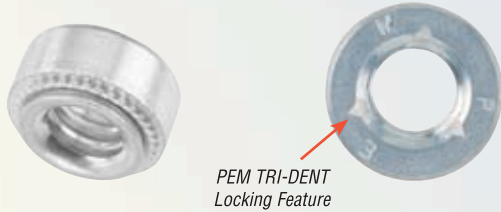
METRIC	Thread Size x Pitch	Type	Thread Code	Shank Code	A (Shank) Max.	Sheet Thickness (2)	Hole Size In Sheet +0.08 (3)	C Max.	E ±0.25	T ±0.25	Min. Dist. Hole C/L To Edge (1)
	M3 x 0.5	SP	M3	0	0.77	0.8-1	4.25	4.22	6.3	1.5	4.8
				1	0.97	1.01-1.39					
				2	1.38	1.4 Min.					
	M4 x 0.7	SP	M4	0	0.77	0.8-1	5.4	5.38	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	6.4	6.38	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	8.72	11.1	4.1	8.6	

(1) For closer distances consult our Engineering Department.

(2) Sheets thinner than .060" / 1.5mm may work harden during installation and cause reduced performance.

(3) 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.

# TRI-DENT® SELF-CLINCHING LOCKNUTS TYPE SL™



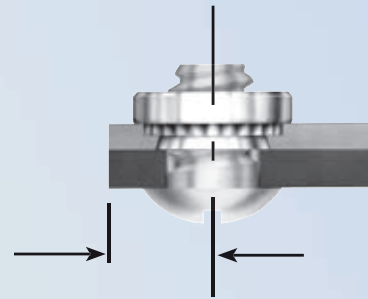
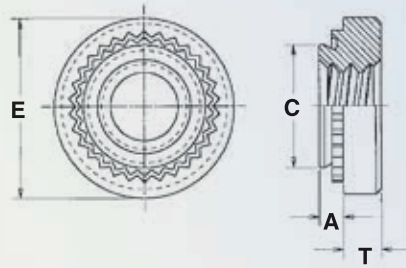
All dimensions are in inches.

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 C/L To Edge
	.112-40 (#4-40)	SL	440		1	.038	.040	.166	.165	.250	.070
2					.054	.056					
.138-32 (#6-32)	SL	632		1	.038	.040	.1875	.187	.280	.070	.220
				2	.054	.056					
.164-32 (#8-32)	SL	832		1	.038	.040	.213	.212	.310	.090	.270
				2	.054	.056					
.190-32 (#10-32)	SL	032		1	.038	.040	.250	.249	.340	.090	.280
				2	.054	.056					
.250-20 (1/4-20)	SL	0420		1	.054	.056	.344	.343	.440	.170	.340
				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 C/L To Edge
	M3 x 0.5	SL	M3		1	0.98	1	4.25	4.22	6.3	1.5
2					1.38	1.4					
M3.5 x 0.6	SL	M3.5		1	0.98	1	4.75	4.73	7.1	1.5	5.6
				2	1.38	1.4					
M4 x 0.7	SL	M4		1	0.98	1	5.4	5.38	7.9	2	6.9
				2	1.38	1.4					
M5 x 0.8	SL	M5		1	0.98	1	6.4	6.38	8.7	2	7.1
				2	1.38	1.4					
M6 x 1	SL	M6		1	1.38	1.4	8.75	8.72	11.05	4.08	8.6
				2	2.21	2.3					

# SELF-CLINCHING NUTS FOR ULTRA-THIN SHEETS TYPE SMPS™



Depending on thread size, Type SMPS nuts can be installed up to 40% closer to the edge of a sheet than standard self-clinching nuts.

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 C/L To Edge
	.086-56 (#2-56)	SMPS	256	.024	.025	.136	.135	.220	.065	.145
	.112-40 (#4-40)	SMPS	440	.024	.025	.166	.165	.220	.065	.170
	.138-32 (#6-32)	SMPS	632	.024	.025	.187	.186	.252	.065	.200

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 C/L 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

## 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.



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

## 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 1 2 3	5052-H34 Aluminum	1500-2000	63	8	
					90	10	
					170	13	
			170		13		
			105		13		
			125		15		
	S CLS	632	0 1 2 3	5052-H34 Aluminum	2500-3000	63	16
						95	17
						190	22
			190	22			
110			16				
130			20				
S CLS	832	0 1 2 3	5052-H34 Aluminum	2500-3000	68	21	
					105	23	
					220	35	
		220	35				
		110	26				
		145	35				
	S CLS	1224	0 1 2 3	5052-H34 Aluminum	2500-6500	285	45
						285	45
						68	26
			110	32			
190			50				
225			50				
S CLS	024 032	0 1 2 3	5052-H34 Aluminum	2500-3500	120	32	
					180	40	
					250	60	
		320	60				
		120	63				
		285	70				
	S CLS	0518 0524	0 1 2 3	5052-H34 Aluminum	4000-7000	220	70
						360	125
						315	115
			120	120			
160			160				
165			165				
S CLS	0616 0624	0 1 2 3	5052-H34 Aluminum	5000-8000	400	270	
					460	320	
					475	350	
		475	350				
		475	350				
		475	350				
S CLS	0813 0820	0 1	5052-H34 Aluminum	7000-9000	475	350	
					1050	735	
		1 2	Cold-rolled Steel		1050	735	
					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 1 2	5052-H34 Aluminum	6.7-8.9	280	0.9		
					400	1.13		
					750	1.47		
		0 1 2	Cold-rolled Steel		11.2-15.6	470	1.47	
						550	1.7	
						1010	2.03	
S CLS	M3.5	0 1 2	5052-H34 Aluminum	11.2-13.5		280	1.8	
						400	1.92	
						840	2.5	
		0 1 2	Cold-rolled Steel		13.4-26.7	480	1.8	
						570	2.3	
						1210	2.3	
S CLS	M4	0 1 2	5052-H34 Aluminum	11.2-13.4		300	2.37	
						470	2.6	
						970	4	
		0 1 2	Cold-rolled Steel		18-27	490	2.95	
						645	4	
						1250	5.1	
SS CLSS	M5	0 1 2	5052-H34 Aluminum	11.2-15.6		300	3	
						480	3.6	
						845	5.7	
		0 1 2	Cold-rolled Steel		18-38	530	3.6	
						800	4.5	
						1112	6.8	
S CLS	M6	00 0 1 2	5052-H34 Aluminum	18-32		750	6.5	
						970	7.9	
						1580	10.2	
		00 0 1 2	Cold-rolled Steel		27-36	900	10	
						1380	13	
						1760	17	
	S CLS	M8	1 2	5052-H34 Aluminum		18-32	1570	13.6
							1870	20.3
			1 2	Cold-rolled Steel			27-36	18.7
					20.3			20.3
S CLS	M10	1 2	5052-H34 Aluminum	22-36	1760	32.7		
					1760	32.7		
		1 2	Cold-rolled Steel		32-50	2020	36.2	
						2020	36.2	

## TYPE H

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

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	27.1

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

# PERFORMANCE DATA (Continued)

## TYPE SL

UNIFIED	Type	Thread Code	Shank Code	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	304 Stainless Steel	3000-5000	130	14	1500 - 2000	90	10	2500 - 3500	125	15
		2						170	13		230	18
SL	632	1	304 Stainless Steel	4000-7000	140	18	2500 - 3000	95	17	3000 - 6000	130	20
		2						190	22		275	28
SL	832	1	304 Stainless Steel	4000-7000	180	37	2500 - 3000	105	23	4000 - 6000	145	35
		2						220	35		285	45
SL	032	1	304 Stainless Steel	6000-9000	230	45	2500 - 3000	110	32	4000 - 9000	180	40
		2						190	50		250	60
SL	0420	1	304 Stainless Steel	9000-11000	450	150	4000 - 7000	360	90	6000 - 9000	400	150
		2						360	125		400	150

METRIC	Type	Thread Code	Shank Code	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	304 Stainless Steel	13-22	575	1.58	6.7 - 8.9	400	1.13	11.2 - 15.6	550	1.7
		2						750	1.47		1010	2.03
SL	M3.5	1	304 Stainless Steel	22-31	800	4.18	11.2 - 13.5	400	1.92	13.4 - 26.7	570	2.3
		2						840	2.5		1210	2.3
SL	M4	1	304 Stainless Steel	26-40	800	3.95	11.2 - 13.4	470	2.6	18 - 27	645	4
		2						970	4		1250	5.1
SL	M5	1	304 Stainless Steel	40-48	2000	17	11.2 - 15.6	480	3.6	18 - 38	800	4.5
		2						845	5.7		1112	6.8
SL	M6	1	304 Stainless Steel	40-48	2000	17	18 - 32	1580	10.2	27 - 38	1760	17
		2						1580	14.1		1760	17

(1) 3 cycle locking performance. PEM spec PRS-C90 Max. on / Min. off torque for 1st thru 3rd cycles.

## TYPE SP

UNIFIED	Type	Thread Code	Shank Code	Test Sheet Material	Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)							
								SP	440	0	304 Stainless Steel	3000-5000	130	14
										1				
SP	632	0	304 Stainless Steel	4000-7000	140	18								
		1												
SP	832	0	304 Stainless Steel	4000-7000	145	30								
		1												
SP	032	0	304 Stainless Steel	6000-9000	180	37								
		1												
SP	0420	0	304 Stainless Steel	9000-11000	180	35								
		1												

METRIC	Type	Thread Code	Shank Code	Test Sheet Material	Installation (kN)	Pushout (N)	Torque-out (N•m)							
								SP	M3	0	304 Stainless Steel	13-22	575	1.58
										1				
SP	M4	0	304 Stainless Steel	22-31	800	4.18								
		1												
SP	M5	0	304 Stainless Steel	26-40	800	3.95								
		1												
SP	M6	0	304 Stainless Steel	40-48	2000	17								
		1												

## 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	7.5	156	1.13	
SMPS	M3	8	267	1.35	
SMPS	M3.5	8.8	289	1.58	

# INSTALLATION

## Types S, SL, SMPS, SS, CLS, CLSS, CLA, H, HN, and HNL

1. Punch or drill 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 punch and anvil surfaces parallel, apply squeezing force until the head of the nut comes into contact with the sheet material.



### 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.

### Type SP<sup>(1)</sup>

PEM Type SP nuts are installed by placing them in punched or drilled holes in the sheet material and squeezing them into place with any standard press. 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 that the annular groove of the nut is filled.

### INSTALLATION REQUIREMENTS

1. Sheet hardness must be less than 90 on the Rockwell "B" scale.
2. Hole punch should be kept sharp to minimize work hardening around hole.
3. Nuts should be installed in punch side of hole.
4. Nuts should not be installed near bends or other highly cold worked areas where sheet hardness may be greater than 90 on the Rockwell "B" scale.

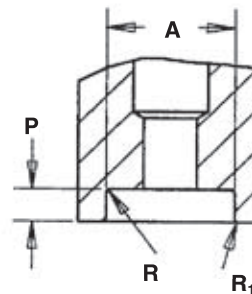
UNIFIED	Thread Code	Punch Dimensions (in.)				Punch Part No.
		A ±.002	P ±.001	R Max.	R <sub>1</sub> +.005	
	440	.255	.066	.010	.005	8002691
	632	.286	.066	.010	.005	8002692
	832	.317	.089	.010	.005	8002693
	032	.348	.089	.010	.005	8002694

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

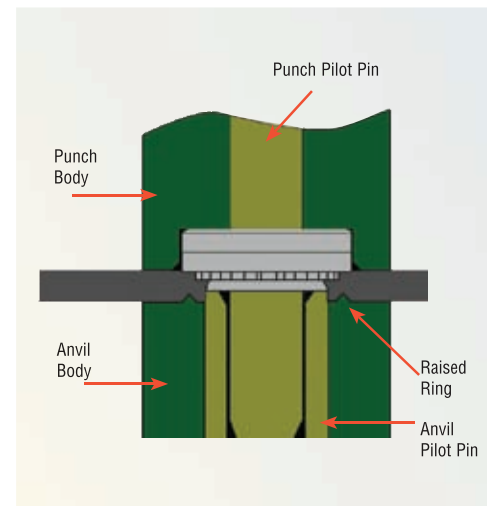
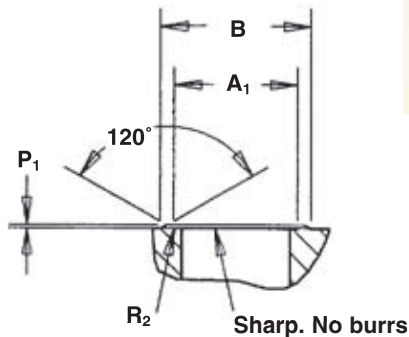
UNIFIED	Thread Code	Anvil Dimensions (in.)				Anvil Part No.
		A <sub>1</sub> +.002-.000	B Nom.	P <sub>1</sub> (2) +.001-.000	R <sub>2</sub> Max.	
	440	.199	.261	.009	.003	8002687
	632	.218	.280	.009	.003	8002688
	832	.243	.305	.009	.003	8002689
	032	.288	.350	.009	.003	8002690

METRIC	Thread Code	Anvil Dimensions (mm)				Anvil Part No.
		A <sub>1</sub> +.05	B Nom.	P <sub>1</sub> (2) +.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	8.89	.23	.08	8002690

### RECOMMENDED INSTALLATION PUNCH



### RECOMMENDED INSTALLATION ANVIL



- (1) To meet the published performance data, we recommend using the installation punch and anvil shown. You may use a flat punch and anvil, but reduced performance may result.
- (2) We recommend replacing installation anvil when the height of the "P" dimension is reduced to .005" / 0.13mm 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.

# MATERIAL & FINISH SPECIFICATIONS

Type	Threads			Fastener Materials				Standard Finishes				Optional Finishes (1)		For Use in Sheet Hardness:					
	Internal ANSI B1.1 2B/ANSI/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	2024-T4 Aluminum	Carbon Steel	Precipitation Hardening Grade Stainless Steel	Passivated and/or Tested per ASTM A380	Zinc per ASTM B 633 SC1 (5µm), Colorless	Zinc per ASTM B 633 SC1 (5µm), Type III, Colorless Plus Sealant/Lubricant	No Finish (2) (3)	Zinc per ASTM B 633 SC1 (5µm), Type II, Yellow	Cadmium Spec SAE AMS-QQ-P-416, Type I, Class 3, Plus Clear Chromate Passivation	90 or Less on the Rockwell "B" Scale (4) (5)	80 or Less on the Rockwell "B" Scale	70 or Less on the Rockwell "B" Scale	60 or Less on the Rockwell "B" Scale	50 or Less on the Rockwell "B" Scale
S	•			•					•			•			•				
SL	•		•	•					•						•				
SMPS	•				•			•									•		
SS	•			•					•			•			•				
CLS	•				•			•									•		
CLSS	•				•			•									•		
CLA	•					•					•								•
H	•			•					•		•				•				
HN	•						•		•		•							•	
HNL	•	•					•			•			•					•	
SP	•							•							•				
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 guage after .00025" 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.

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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