



SELF-CLINCHING
NUTS

BULLETIN



CL 706
Revised 608

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.

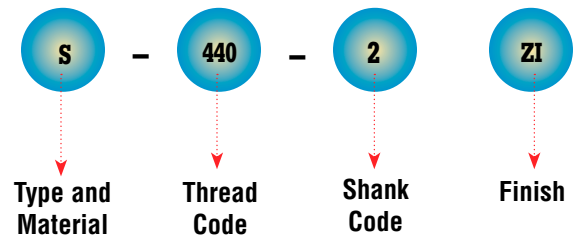
Self-clinching nuts for stainless steel

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.

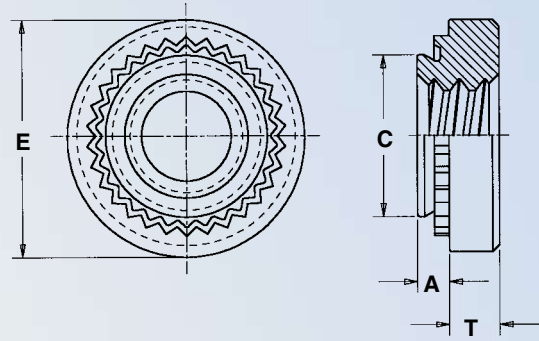


Part Number Designation



† 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



(Clinging profile may vary)

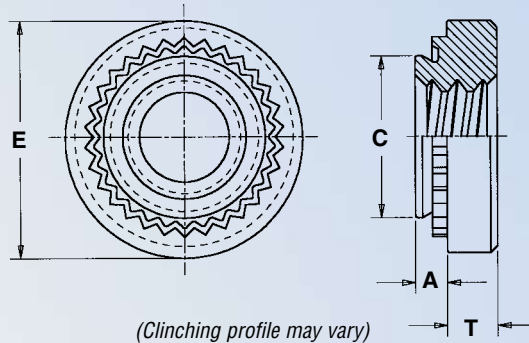
All dimensions are in inches.

	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									
UNIFIED	.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 ^{NS}	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 ^{NS}	.038	.040	.277	.276	.37	.13	.31
					2	.054	.056					
					3	.087	.091					
	.250-20 (1/4-20)	S	CLS	0420	0	.045	.047	.344	.343	.44	.17	.34
					1	.054	.056					
					2	.087	.091					
3					.120	.125						
.250-28 (1/4-28)	S	CLS	0428	1	.054	.056	.344	.343	.44	.17	.34	
				2	.087	.091						
				3 ^{NS}	.120	.125						
.313-18 (5/16-18)	S	CLS	0518	1	.054	.056	.413	.412	.50	.23	.38	
				2	.087	.091						
				3	.120	.125						
.313-24 (5/16-24)	S	CLS	0524 ^{NS}	1	.054	.056	.413	.412	.50	.23	.38	
				2	.087	.091						
				3	.120	.125						
.375-16 (3/8-16)	S	CLS	0616	1	.087	.091	.500	.499	.56	.27	.44	
				2	.120	.125						
				3	.235	.250						
.375-24 (3/8-24)	S	CLS	0624 ^{NS}	1	.087	.091	.500	.499	.56	.27	.44	
				2	.120	.125						
				3	.235	.250						
.500-13 (1/2-13)	S	CLS ^{NS}	0813	1	.120	.125	.656	.655	.81	.36	.63	
				2	.235	.250						
.500-20 (1/2-20)	S	CLS ^{NS}	0820	1	.120	.125						
				2	.235	.250						

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

(NS) Not Stocked, available on special order.

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 ^{NS}	M2	0	0.77	0.8-1	4.22	4.2	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	4.22	4.2	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	4.22	4.2	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	5.41	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	6.35	6.33	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 ^{NS}	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 ^{NS}	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 ^{NS}	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 ^{NS}	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) To minimize sheet distortion and maximize product performance, use a centerline-to-edge value greater or equal to the value specified.

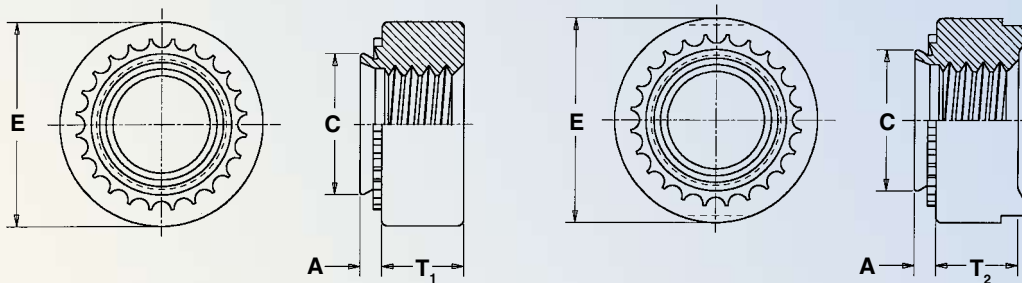
(NS) Not Stocked, available on special order.

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 ^{NS}	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 ^{NS}	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 ^{NS}	1	0.98	1	7.5	7.47	9.5	3.8	7.9
				2	1.38	1.4					
	M6 x 1	CLA	M6 ^{NS}	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 ₁	T ₂	Min. Dist. Hole C/L To Edge (1)
		Non-Locking	Self-Locking*							Non-locking ±.005	Self-locking ±.010	
	.250-20 (1/4-20)	NA	HNL	0420	.058	.058	.344	.343	.500	.189		.380
	.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 ₁	T ₂	Min. Dist. Hole C/L To Edge (1)
		Non-Locking	Self-Locking*							Non-locking ±0.13	Self-locking ±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

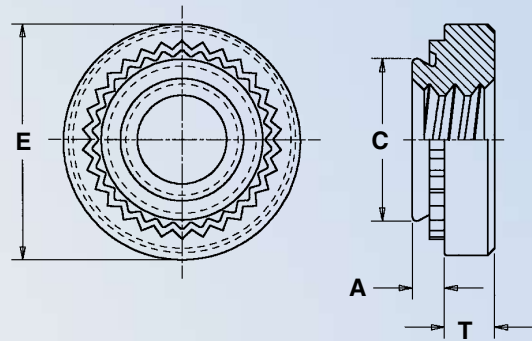
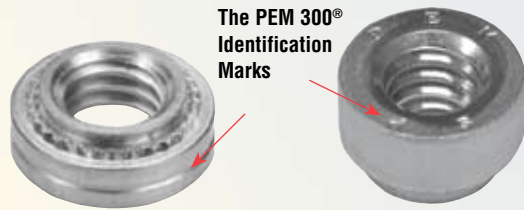
(1) To minimize sheet distortion and maximize product performance, use a centerline-to-edge value greater or equal to the value specified.

(NS) Not Stocked, available on special order.

(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	Hole Size In Sheet +.003-.000 (2)	C Max.	E ±.010	T ±.010	Min. Dist. Hole C/L To Edge (1)
	.112-40 (#4-40)	SP	440	0	.030	.030 - .039	.166	.165	.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	Hole Size In Sheet +0.08 (2)	C Max.	E ±0.25	T ±0.25	Min. Dist. Hole C/L To Edge (1)
	M3 x 0.5	SP	M3	0	0.77	0.8 - 1	4.22	4.2	6.3	1.5	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	5.41	5.39	7.9	2	6.9
				1	0.97	1.01 - 1.39					
				2	1.38	1.4 Min.					
	M5 x 0.8	SP	M5	0	0.77	0.8 - 1	6.35	6.33	8.7	2	7.1
				1	0.97	1.01 - 1.39					
				2	1.38	1.4 Min.					
	M6 x 1	SP	M6	1	1.38	1.4 Min.	8.75	8.73	11.1	4.1	8.6

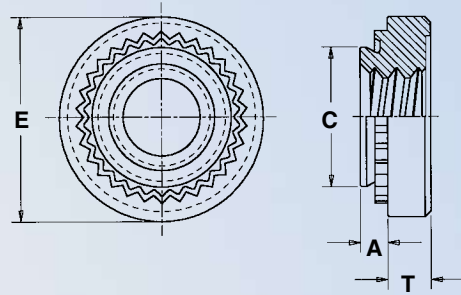
(1) To minimize sheet distortion and maximize product performance, use a centerline-to-edge value greater or equal to the value specified.

(2) Hole punch diameter must be maintained at $\pm .001"$ / $\pm .025\text{mm}$ 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™



PEM TRI-DENT
Locking Feature



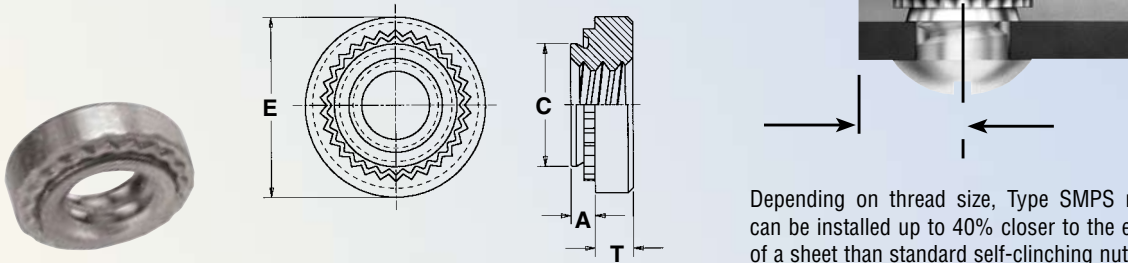
All dimensions are in inches.

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	.190
				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	4.8
				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⁽¹⁾

TYPE S, CLS, CLSS

UNIFIED	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	Cold-rolled Steel	2500-3500	105	13
			1			125	15
			2			230	18
			3			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	3000-6000	110	16
			1			130	20
			2			275	28
			3			275	28
UNIFIED	S CLS	832	0	5052-H34 Aluminum	2500-3000	68	21
			1			105	23
			2			220	35
			3			220	35
			0	Cold-rolled Steel	4000-6000	110	26
			1			145	35
			2			285	45
			3			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	4000-9000	120	32
			1			180	40
			2			250	60
			3			320	60
UNIFIED	S CLS	1224	1	5052-H34 Aluminum	2500-6500	120	63
			2			285	70
			3			285	70
			1	Cold-rolled Steel	6000-8000	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	6000-8000	315	115
			1			400	150
			2			400	150
			3			400	150
UNIFIED	S CLS	0518 0524	1	5052-H34 Aluminum	4000-7000	380	120
			2			380	160
			3			420	165
			1	Cold-rolled Steel	6000-8000	420	180
			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	7000-11000	460	320
			2			460	320
			3			460	320
	S CLS	0813 0820	1	5052-H34 Aluminum	7000-9000	475	350
			2			475	350
			1	Cold-rolled Steel	10000-15000	1050	735
			2			1050	735

METRIC	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	Cold-rolled Steel	11.2-15.6	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	13.4-26.7	480	1.8
			1			570	2.3
			2			1210	2.3
METRIC	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	18-27	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	18-38	530	3.6
			1			800	4.5
			2			1112	6.8
METRIC	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	27-36	900	10
			0			1380	13
			1			1760	17
			2			1760	17
METRIC	S CLS	M8	1	5052-H34 Aluminum	18-32	1570	13.6
			2			1570	18.1
			1	Cold-rolled Steel	27-36	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	32-50	2020	36.2
			2			2020	36.2

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 .088" Cold-rolled Steel	4900 7400	380 460	190 240

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 2.24 mm Cold-rolled Steel	22 33	1760 2020	21.5 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	5.75	0.4	1500 - 2000	90	10	2500 - 3500	125	15
			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	

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	0.67	0.04	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	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	0.30	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	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	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

METRIC	Type	Thread Code	Shank Code	Test Sheet Material	Installation (kN)	Pushout (N)	Torque-out (N•m)
	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

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

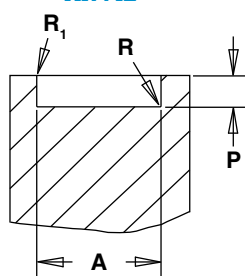
Type SP⁽¹⁾ - Identified With Stamp

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

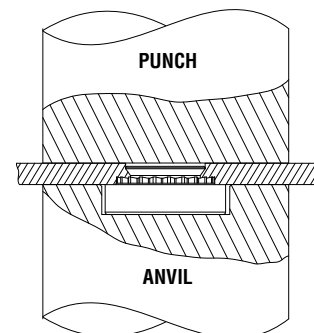
UNIFIED	Thread Code	Anvil Dimensions (in.)				Anvil Part No.
		A ±.002	P +.000 -.001	R Max.	R ₁ +.005	
	440	.255	.064	.010	.005	8012821
	632	.286	.064	.010	.005	8012822
	832	.317	.082	.010	.005	8012823
	032	.348	.082	.010	.005	8012824
	0420	.443	.163	.010	.005	8012825

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

RECOMMENDED COUNTERBORED INSTALLATION ANVIL



Identified With Stamp



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

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

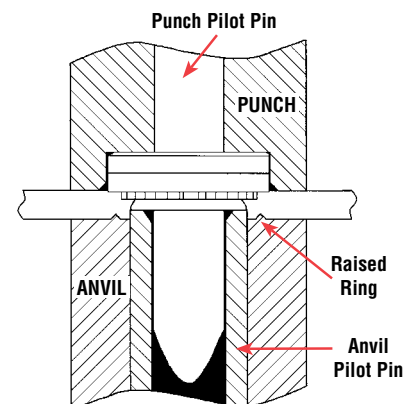
Type SP⁽¹⁾ - Identified With Single Ring

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

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

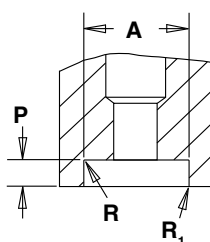


Identified with single ring



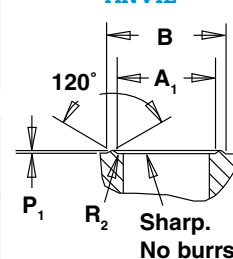
UNIFIED	Thread Code	Punch Dimensions (in.)				Punch Part No.
		A ±.002	P ±.001	R Max.	R ₁ +.005	
	440	.255	.066	.010	.005	8002691
	632	.286	.066	.010	.005	8002692
	832	.317	.089	.010	.005	8002693
	032	.348	.089	.010	.005	8002694
	0420	—	—	—	—	(3)

RECOMMENDED COUNTERBORED INSTALLATION PUNCH



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

RECOMMENDED RAISED RING INSTALLATION ANVIL



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

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

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

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

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

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

INSTALLATION (continued)

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.

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 Plated, 5µm, Colorless (6)	Zinc Plated, 5µm, Colorless Plus Sealant/Lubricant (6)	No Finish (2) (3)	Zinc Plated, 5µm, Yellow (6)	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.
- (6) See PEM Technical Support section of our web site for related plating standards and specifications.

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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