PennEngineering®

FLOATING SELF-CLINCHING FASTENERS

BULLETIN **ALA**

PEM®

216
Rev 816

FLOATING SELF-CLINCHING FASTENERS

Locking and Non-locking Threads

- Provide load-bearing threads in thin sheets
- Permit a minimum of .030"/0.76 mm adjustment for mating hole misalignment.
- Sheet remains flush on one side, and the fastener is permanently locked in place.
- Threads of the floating nut extend into the retainer shank for extra strength and support in assembly.

Non-Locking Threads
Type AC/AS/A4 self-clinching, floating nuts provide free running threads. Type A4 nuts are specifically designed for installing into stainless steel sheets.

Types AC/AS

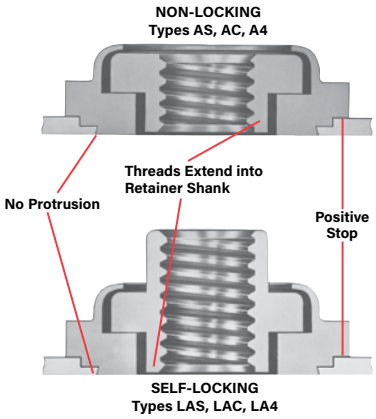
Type A4

Locking Threads
Types LAC/LAS/LA4 self-clinching, floating nuts provide prevailing torque locking threads with performance equivalent to applicable NASM25027 specifications(1). Type LA4 nuts are specifically designed for installing into stainless steel sheets.

Types LAC/LAS

Type LA4

(1) To meet national aerospace standards and to obtain testing documentation, product must be ordered to US NASM45938/11 specifications. Check our web site for a complete Military Specification and National Aerospace Standards Reference Guide (Bulletin NASM). Screws for use with PEM self-clinching locking fasteners should be Class 3A/4h fit or no smaller than Class 2A/6g.



PART NUMBER DESIGNATION

A	C	-	440	-	1	
A	S	-	440	-	1	ZI
A	4	-	440	-	1	
LA	C	-	440	-	1	MD
LA	S	-	440	-	1	MD
LA	4	-	440	-	1	MD
↓ Type	↓ Retainer Material Code		↓ Thread Size Code		↓ Shank Code	↓ Finish Code

PEM® Double Squares (Registered Trademark)

PEM® Single groove (Registered Trademark) *Identifies product for installation into stainless steel sheets (Types A4 and LA4)*

AXIAL STRENGTH AND TIGHTENING TORQUE - TYPES LAC/LAS/LA4

UNIFIED	Thread Code	Locknut Min. Axial Strength (1) (lbs.)	Mating Screw Strength Level (1) (ksi)	Mating Screw Tightening Torque (2) (in. lbs.)
	440	1085	180	15.8
	632	1636	180	29.4
	832	2522	180	53.8
	032	3600	180	88.9
	0420	5728	180	186

METRIC	Thread Code	Locknut Min. Axial Strength (1) (kN)	Mating Screw Strength Level (1) (MPa)	Mating Screw Tightening Torque (2) (N·m)
	M3	6.14	1220	2.39
	M4	10.71	1220	5.57
	M5	17.3	1220	11.2
	M6	24.55	1220	19.1

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

(1) All type LAC, LAS and LA4 locknuts have axial strength exceeding the minimum tensile strength of 180 ksi/Property Class 12.9 screws. Contact techsupport regarding assemble strength for higher strength screws.

(2) Tightening torque shown will induce preload of 65% of locknut minimum axial strength with 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% value shown. For 900 MPa screws (Property Class 9.8) torque value is 74% of value shown.

A NOTE ABOUT FASTENERS FOR STAINLESS STEEL PANELS

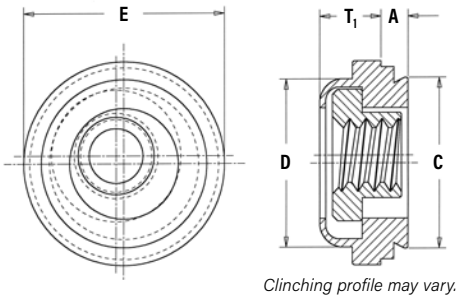
In order for self-clinching fasteners to work properly, the fastener must be harder than the sheet into which it is being installed. In the case of stainless steel panels, fasteners made from 300 Series Stainless Steel do not meet this hardness criteria. It is for this reason that 400 series fasteners are offered (Types A4 and LA4). However, while these 400 Series fasteners install and perform well in 300 Series stainless sheets they should not be used if the end product:

- Will be exposed to any appreciable corrosive presence.
- Requires non-magnetic fasteners.
- Will be exposed to any temperatures above 300˚F (149˚C)

If any of the these are issues, please contact techsupport@pemnet.com for other options.

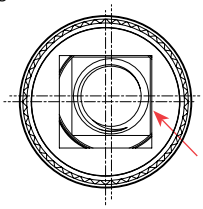
FLOATING SELF-CLINCHING FASTENERS

NON-LOCKING
Types AS/AC/A4



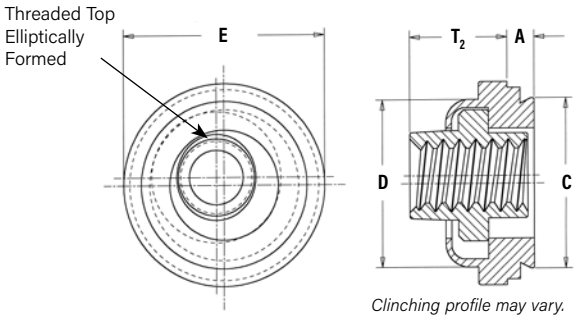
Clinching profile may vary.

PEM® Double Squares are a registered trademark.



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

SELF-LOCKING
Types LAS/LAC/LA4



Clinching profile may vary.

All dimensions are in inches.

	Thread Size	Type: Non-Locking Fastener Material: Steel	Non-Locking: 300 Series Stainless	Non-Locking: 400 Series Stainless	Self-Locking: Steel	Self-Locking: 300 Series Stainless	Self-Locking: 400 Series Stainless	Thread Code	Shank Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size in Sheet +.003 -.000	C Max.	D Max.	E ±.015	T_1 Max.	T_2 Max.	Min. Dist. Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	AS	AC	A4	LAS	LAC	LA4	440	1	.038	.038	.290	.289	.290	.360	.130	.190	.30
									2 (1)	.054	.054							
	.138-32 (#6-32)	AS	AC	A4	LAS	LAC	LA4	632	1	.038	.038	.328	.327	.335	.390	.130	.200	.32
									2 (1)	.054	.054							
	.164-32 (#8-32)	AS	AC	A4	LAS	LAC	LA4	832	1	.038	.038	.368	.367	.365	.440	.130	.210	.34
									2 (1)	.054	.054							
	.190-24 (#10-24)	AS	AC	A4	LAS	LAC	LA4	024	1	.038	.038	.406	.405	.405	.470	.170	.270	.36
									2 (1)	.054	.054							
	.190-32 (#10-32)	AS	AC	A4	LAS	LAC	LA4	032	1	.038	.038	.406	.405	.405	.470	.170	.270	.36
									2 (1)	.054	.054							
	.250-20 (1/4-20)	AS	AC	–	LAS	LAC	–	0420	2	.054	.054	.515	.514	.510	.600	.210	.310	.42
	.250-28 (1/4-28)	AS	AC	–	LAS	LAC	–	0428	2	.054	.054	.515	.514	.510	.600	.210	.310	.42

All dimensions are in millimeters.

	Thread Size x Pitch	Type: Non-Locking Fastener Material: Steel	Non-Locking: 300 Series Stainless	Non-Locking: 400 Series Stainless	Self-Locking: Steel	Self-Locking: 300 Series Stainless	Self-Locking: 400 Series Stainless	Thread Code	Shank Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size in Sheet +0.08	C Max.	D Max.	E ±0.38	T_1 Max.	T_2 Max.	Min. Dist. Hole ℄ To Edge
METRIC	M3 x 0.5	AS	AC	A4	LAS	LAC	LA4	M3	1	0.97	0.97	7.37	7.35	7.37	9.14	3.31	4.83	7.62
									2 (1)	1.38	1.38							
	M4 x 0.7	AS	AC	A4	LAS	LAC	LA4	M4	1	0.97	0.97	9.35	9.33	9.28	11.18	3.31	5.34	8.64
									2 (1)	1.38	1.38							
	M5 x 0.8	AS	AC	A4	LAS	LAC	LA4	M5	1	0.97	0.97	10.31	10.29	10.29	11.94	4.32	6.86	9.14
									2 (1)	1.38	1.38							
	M6 x 1	AS	AC	–	LAS	LAC	–	M6	2	1.38	1.38	13.08	13.06	12.96	15.24	5.34	7.88	10.67

(1) This shank code is not available for Types A4 and LA4.

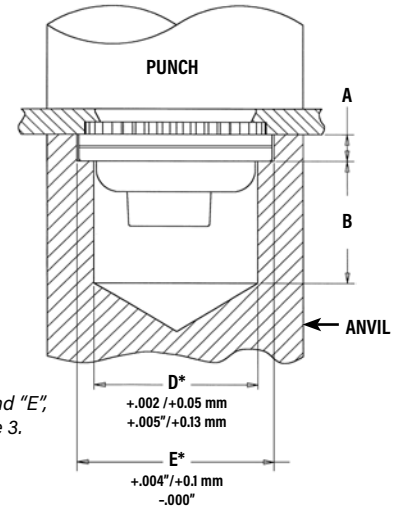
MATERIAL AND FINISH SPECIFICATIONS

	Threads: Non-locking	Threads: Self-locking	Fastener Materials: Retainer			Fastener Materials: Nut		Standard Finishes: Non-locking Retainer & Nut	Standard Finishes: Non-locking Retainer & Nut	Standard Finishes: Self-locking Retainer	Standard Finishes: Self-locking Retainer	Standard Finishes: Self-locking Nut	For Use In Sheet Hardness (2)	
Type	Internal, ASME B1.1, 2B/ ASME B1.13M, 6H	Internal, UNJ Class 3B per ASME B1.15 / MJ Class 4H6H per ASME B1.21M (M6 thread 4H5H)	Hardened Carbon Steel	Hardened 400 Series Stainless Steel	300 Series Stainless Steel	Carbon Steel	300 Series Stainless Steel	Zinc Plated, 5µm, Colorless (3)	Passivated and/or tested per ASTM A380	Zinc Plated, 5µm, Colorless (3)	Passivated and/or tested per ASTM A380	Black Dry-film Lubricant (4)	HRB 70/ HB 125 or Less	HRB 88/ HB 183 or Less
AS	▪		▪			▪		▪					▪	
AC	▪				▪		▪		▪				▪	
A4	▪			▪			▪		▪					▪
LAS		▪	▪				▪			▪		▪	▪	
LAC		▪			▪		▪				▪	▪	▪	
LA4		▪		▪			▪				▪	▪		▪
Part number codes for finishes							ZI	None		MD				

(2) HRB - Hardness Rockwell "B" Scale. HB - Hardness Brinell.
(3) See PEM Technical Support section of our web site (www.pemnet.com) for related plating standards and specifications.
(4) Temperature limit 400˚ F / 204˚ C.

INSTALLATION

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.
3. With installation punch and anvil surfaces parallel, apply sufficient squeezing force until anvil contacts the mounting sheet. Drawing shows suggested tooling for applying these forces.



** For "D" and "E", see page 3.*

PEMSERTER® Installation Tooling - Types AC/AS/LAC/LAS/A4/LA4

Thread Code	Counterbore A		Hole Depth Below Counterbore B		Anvil Part Number	Punch Part
	±.001	±0.03	±.005	±0.13		
440/M3	.054	1.37	.258	6.55	8013889	975200048
632	.054	1.37	.258	6.55	8013890	975200048
832/M4	.054	1.37	.258	6.55	8013891	975200048
032/M5	.071	1.8	.241	6.12	8013892	975200048
0420/M6	.092	2.34	.220	5.59	8021392	8012030

PERFORMANCE DATA(1)(2)

Types AC/AS/LAC/LAS

	Thread Code	Shank Code	Test Sheet Material: 5052-H34 Aluminum Installation (lbs.)	5052-H34 Aluminum Retainer Pushout (lbs.)	5052-H34 Aluminum Retainer Torque-out (in. lbs.)	Cold-Rolled Steel Installation (lbs.)	Cold-Rolled Steel Retainer Pushout (lbs.)	Cold-Rolled Steel Retainer Torque-out (in. lbs.)
UNIFIED	440	1	1500	215	65	3000	300	85
		2	2000	225	80			150
	632	1	2000	240	140	3000	300	150
		2		250	150			175
	832	1	2000	250	140	3000	300	150
		2		265	150		400	200
	032	1	2000	300	150	3500	400	150
		2		350	175		450	200
	0420 0428	2	3000	400	325	5000	500	325

	Thread Code	Shank Code	Test Sheet Material: 5052-H34 Aluminum Installation (kN)	5052-H34 Aluminum Retainer Pushout (N)	5052-H34 Aluminum Retainer Torque-out (N·m)	Cold-Rolled Steel Installation (kN)	Cold-Rolled Steel Retainer Pushout (N)	Cold-Rolled Steel Retainer Torque-out (N·m)
METRIC	M3	1	6.7	956	7.3	13.3	1334	9.6
		2	8.9	1000	9	13.3	1334	16.9
	M4	1	8.9	1112	15.8	13.3	1334	16.9
		2	8.9	1178	16.9	13.3	1779	22.6
	M5	1	8.9	1334	16.9	15.6	1779	16.9
		2	8.9	1556	19.7	15.6	2001	22.6
	M6	2	13.3	1779	36.7	22.2	2224	36.7

Types A4/LA4 (3)

	Thread Code	Test Sheet Material: 300 Series Stainless Steel Installation (lbs.)	300 Series Stainless Steel Retainer Pushout (lbs.)	300 Series Stainless Steel Retainer Torque-out (in. lbs.)
UNIFIED	440	9000	200	85
	632	10000	200	85
	832	12000	200	85
	032	13000	250	125

	Thread Code	Test Sheet Material: 300 Series Stainless Steel Installation (kN)	300 Series Stainless Steel Retainer Pushout (N)	300 Series Stainless Steel Retainer Torque-out (N·m)
METRIC	M3	40	890	9.6
	M4	53	890	9.6
	M5	57	1100	14.1

(3) Specifically designed for installation into stainless steel.

(1) Published installation forces are for general reference. Actual set-up and confirmation of complete installation should be made by observing proper seating of fastener as described in the installation steps. Other performance values reported are averages when all proper installation parameters and procedures are followed. Variations in mounting hole size, sheet material, and installation procedure may affect performance. Performance testing this product in your application is recommended. We will be happy to provide technical assistance and/or samples for this purpose.

(2) For Types LAC, LAS and LA4 fasteners, thread locking performance is equivalent to applicable NASM25027 specifications. Consult document PEM-REF25027 for details.

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®

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