

# TECH SHEET

## PEM® REF/ SELF-PIERCING, SELF-CLINCHING TOOLING

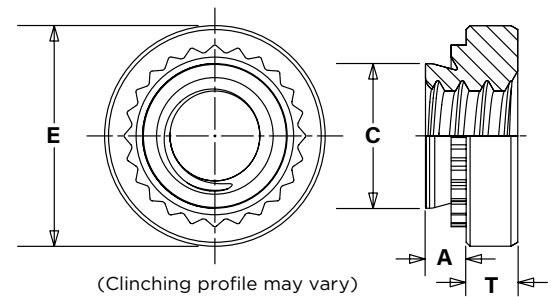
### SUBJECT: SPECIALIZED PEMSERTER® TOOLING ALLOWS INSTALLATION OF SELF-CLINCHING NUTS IN ONE PIERCE/PRESS OPERATION



In certain situations, PEM Type S nuts can be installed successfully without the need to pre punch a mounting hole in a separate operation. If these criteria are met, the fastener, along with the tooling, can create the mounting hole during the fastener installation process.

These criteria include:

- Fastener will be installed into aluminum sheet.
- Sheet is no harder than HB 79.7 (HRB 40).
- Sheet must be between 1.5 - 2.0 mm (.059 - .079”) in thickness.
- Fasteners with thread sizes 1/4-20, 5/16-18, M6, and M8 can be installed in this manner.
- S nuts with a -2 shank length must be used.
- Utilize punch and anvil specifically designed for this purpose.
- We can provide in-die installation equipment for this application.



UNIFIED	Thread Size	Type	Thread Code	Shank Code	A (Shank) Max.	Sheet Thickness	C Max.	E ±.010	T ±.010	Min. Dist. Hole CL To Edge (1)
		Fastener Material								
	Carbon Steel									
	.250-20 (1/4-20)	S	0420	2	.087	.059 - .079	.343	.440	.170	.34
	.313-18 (5/16-18)	S	0518	2	.087	.059 - .079	.412	.500	.230	.38

METRIC	Thread Size x Pinch	Type	Thread Code	Shank Code	A (Shank) Max.	Sheet Thickness	C Max.	E ±0.25	T ±0.25	Min. Dist. Hole CL To Edge (1)
		Fastener Material								
	Carbon Steel									
	M6 x 1	S	M6	2	2.21	1.5 - 2.0	8.73	11.1	4.08	8.6
	M8 x 1.25	S	M8	2	2.21	1.5 - 2.0	10.47	12.65	5.47	9.7

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

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The PEMSERTER® tooling utilized for this application consists of a special modified punch and anvil (**see exhibit A**). The anvil will have a raised portion in the area of fastener installation. There are several reasons for the “raised ring” on the anvil. It allows the fastener to pierce its own mounting hole and then assists in the final clinching process. It also creates an embossment in the panel allowing the fastener to be installed sub-flush on the shank side of the sheet. During the process, the slug that is produced (**see exhibit B**) will fall away allowing for a clean installation.

**EXHIBIT A**

All dimensions are in inches.

UNIFIED	Thread Size	ØA	ØB	C	D	ØE	ØF	ØG	H	K
	.250-20 (1/4-20)	.445	.516	.212 / .214	60°	.445	.411	.344 / .343	.047	82°
	.313-18 (5/16-18)	.508	.601	.274 / .276	45°	.516	.457	.413 / .412	.047	78°

All dimensions are in millimeters.

METRIC	Thread Size	ØA	ØB	C	D	ØE	ØF	ØG	H	K
	M6 x 1	11.3	13.1	5.11 / 5.16	60°	11.3	10.45	8.73 / 8.75	1.2	82°
	M8 x 1.25	12.9	15.26	6.47 / 6.53	45°	13.1	11.6	10.5 / 10.47	1.2	78°

**Auto Tooling Punch and Anvil Part Numbers**

O420	8017376
O518	8017378
M6	8017377
M8	8017379

**EXHIBIT B**

If not using in-die installation equipment, a fixture, template or some other location device should be used to be sure that the fastener is consistently located in the proper position on to the sheet.

### PERFORMANCE DATA

UNIFIED	Type	Thread Code	Shank Code	Test Sheet Material	Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
	S	O420	2	Aluminum (5052-H34)	11,000 to 15,000	335	90
	S	O518	2	Aluminum (5052-H34)	11,000 to 15,000	363	79

METRIC	Type	Thread Code	Shank Code	Test Sheet Material	Installation (kN)	Pushout (N)	Torque-out (N•m)
	S	M6	2	Aluminum (5052-H34)	49 to 67	1170	7.4
	S	M8	2	Aluminum (5052-H34)	49 to 67	1570	9.5

The values reported are averages when all installation specifications and procedures are followed. Consult PEM® Bulletin CL for general information on Type S Fasteners.