

TECH SHEET

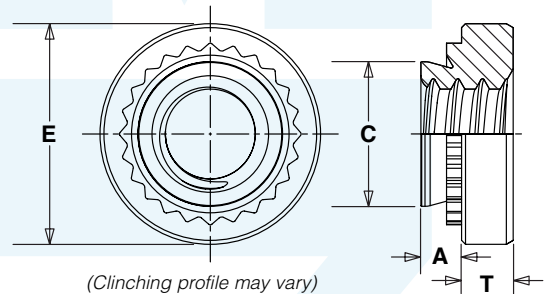
PEM® - REF / SELF-PIERCING, SELF-CLINCHING TOOLING

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 ϕ To Edge (1) |
|---------|-------------------|-------------------|-------------|------------|----------------|-----------------|--------|---------|---------|------------------------------------|
| | (1/4-20) | 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 Pitch | Type | Thread Code | Shank Code | A (Shank) Max. | Sheet Thickness | C Max. | E ±0.25 | T ±0.25 | Min. Dist. Hole ϕ 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.

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

| | |
|------|---------|
| 0420 | 8017376 |
| 0518 | 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 | 0420 | 2 | Aluminum (5052-H34) | 11,000 to 15,000 | 335 | 90 |
| | S | 0518 | 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.