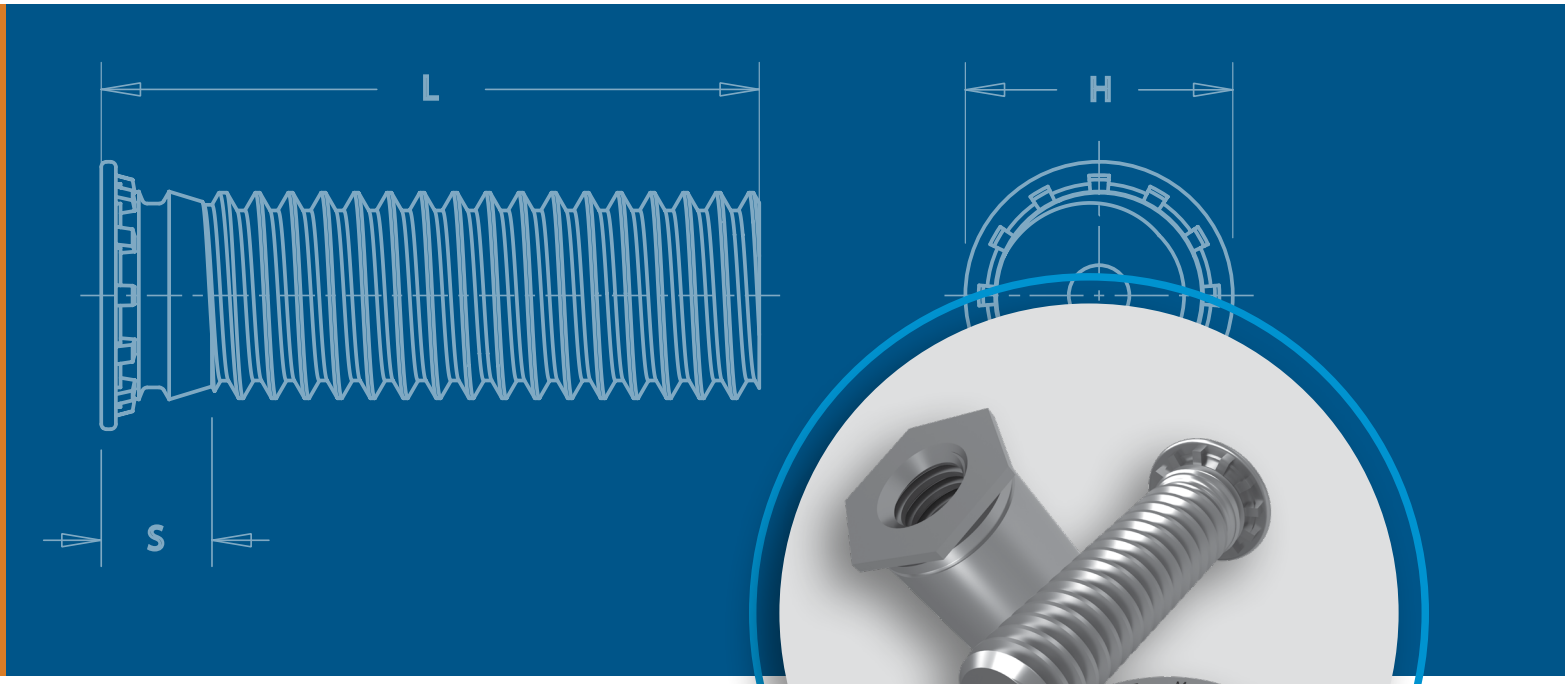
# SS™

# FASTENERS FOR USE IN STAINLESS STEEL SHEETS




These PEM® fasteners install permanently; reduce hardware; and promote thinner and lighter designs in stainless applications.

One of the very basics of self-clinching is that the fastener must always be harder than the host sheet to ensure proper and permanent installation. This is particularly challenging when installing fasteners into stainless steel sheets. Therefore we have developed this line of specially hardened stainless steel fasteners for installation into stainless steel. **Refer to "Dos and Don'ts" on page 27 for further information.**

Fasteners made from precipitation hardened grade stainless including A286 stainless are particularly useful in applications such as outdoor equipment, medical devices and chemical and food processing equipment or anywhere corrosive element exposure is possible.

Fastener drawings and models are available at www.pemnet.com.
Custom sizes are available on special order. Contact us for more information.

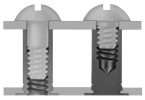
**SP™ PEM 300®** nuts provide **strong load-bearing internal threads** in stainless steel sheets as thin as .030"/0.8mm - — PAGE 3

**SMPP™** nuts install into stainless steel sheets as thin as .025"/0.64mm. Reduced outer dimensions and thinner sheet capabilities compared to Type SP thread sizes — PAGE 4

**A4™ and LA4™** internally threaded floating nuts allow for **mating hole misalignment** and **locking threads** if desired. — PAGE 5

**F4™** fasteners are ideal for flush applications where a stainless steel sheet requires load-bearing threads — PAGE 6

**SO4™ and BSO4™** standoffs provide internally threaded fasteners for **stacking or spacing** applications — PAGE 7-8



**TSO4™** through hole threaded standoffs **for clinching into thinner sheets** than Type SO4. Install into sheets as thin as .025"/0.63mm. Also, threaded at the barrel end minimizing length of screw required — PAGE 9

**FH4™ and FHP™** studs offer **externally threaded attachment points** in two stainless materials, depending on the level of corrosion resistance required. (See page 24 for other non-clinching stud solutions) — PAGE 10

**SGPC™ Swaging Collar Studs** can install into most panel material and accommodate multiple panels as long as the total thickness does not exceed the maximum sheet thickness — PAGE 11

**TP4™** pins provide an **unthreaded solution** for a wide range of positioning, pivot and alignment applications. — PAGE 12

**PFC4™** captive panel screws provides a tool only, **captive screw solution** for stainless steel sheets. (See page 24 for other non-clinching captive screw solutions) — PAGE 13

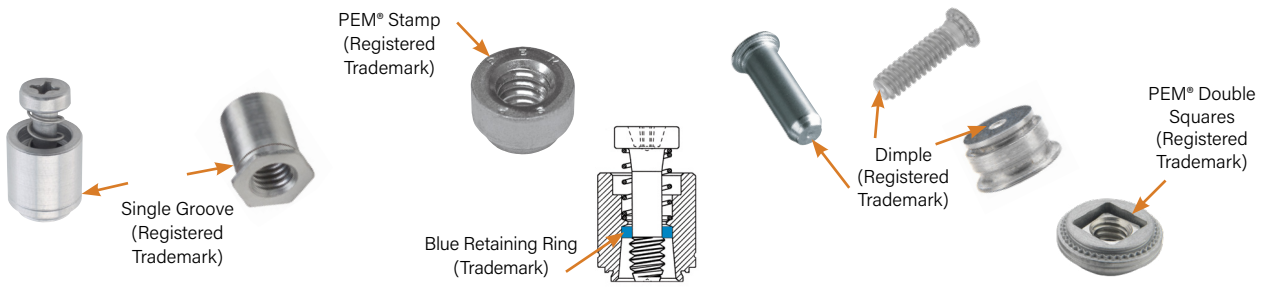
**SFP™** SpotFast® fasteners provide a solution for **flush "face-on-face" sheet attachment** in stainless steel — PAGE 14

**Material and finish specifications** — PAGE 15

**Installation** — PAGE 16-22

**Performance data** — PAGE 23-25

**For more information on these and other PEM® products, visit our PEMNET ™ Resource Center at www.pemnet.com.**




To be sure that you are getting genuine PEM® brand fasteners, look for the unique PEM® product markings and identifiers. On actual parts, location of groove on fastener may be different than shown in photo.

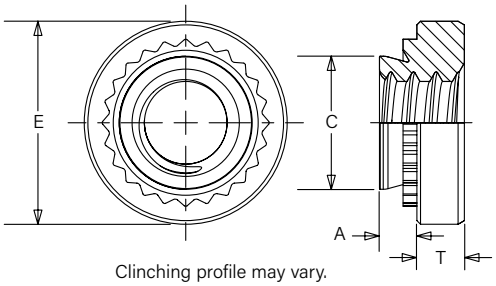
## SP™ PEM 300® Self-Clinching Nuts

- After installation, reverse side of sheet remains flush and smooth.
- For use in stainless steel sheets HRB 90 / HB 192 or less.
- Corrosion resistance similar to 300 series stainless steel.


### Part Number Designation

SP - 440 - 2

- SP: Type and Material
- 440: Thread Code
- 2: Shank Code




Clinching profile may vary.

All dimensions are in inches.

| | Thread Size | Type | Thread Code | Shank Code | A (Shank) Max. | Rec. Min. Sheet Thickness | Hole Size In Sheet +.003 -.000 | C Max. | E ±.010 | T ±.010 | Min. Dist. Hole C/L to Edge (1) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unified | .086-56 (#2-56) | SP | 256 | 0 | .030 | .030 | .166 | .165 | .250 | .070 | .19 |
| | | | | 1 | .038 | .040 | | | | | |
| | | | | 2 | .054 | .056 | | | | | |
| | .112-40 (#4-40) | SP | 440 | 0 | .030 | .030 | .166 | .165 | .250 | .070 | .19 |
| | | | | 1 | .038 | .040 | | | | | |
| | | | | 2 | .054 | .056 | | | | | |
| | .138-32 (#6-32) | SP | 632 | 0 | .030 | .030 | .1875 | .187 | .280 | .070 | .22 |
| | | | | 1 | .038 | .040 | | | | | |
| | | | | 2 | .054 | .056 | | | | | |
| | .164-32 (#8-32) | SP | 832 | 0 | .030 | .030 | .213 | .212 | .310 | .090 | .27 |
| | | | | 1 | .038 | .040 | | | | | |
| | | | | 2 | .054 | .056 | | | | | |
| | .190-24 (#10-24) | SP | 024 | 0 | .030 | .030 | .250 | .249 | .340 | .090 | .28 |
| | | | | 1 | .038 | .040 | | | | | |
| | | | | 2 | .054 | .056 | | | | | |
| | .190-32 (#10-32) | SP | 032 | 0 | .030 | .030 | .250 | .249 | .340 | .090 | .28 |
| | | | | 1 | .038 | .040 | | | | | |
| | | | | 2 | .054 | .056 | | | | | |
| | .250-20 (1/4-20) | SP | 0420 | 1 | .054 | .056 | .344 | .343 | .440 | .170 | .34 |
| | | | | 2 | .087 | .090 | | | | | |
| | .313-18 (5/16-18) | SP | 0518 | 1 | .054 | .056 | .413 | .412 | .500 | .230 | .38 |
| | | | | 2 | .087 | .090 | | | | | |
| | .313-24 (5/16-24) | SP | 0524 | 1 | .054 | .056 | .413 | .412 | .500 | .230 | .38 |
| | | | | 2 | .087 | .090 | | | | | |
| | .375-16 (3/8-16) | SP | 0616 | 1 | .087 | .090 | .500 | .499 | .560 | .270 | .44 |
| | | | | 2 | .120 | .125 | | | | | |
| | .375-24 (3/8-24) | SP | 0624 | 1 | .087 | .090 | .500 | .499 | .560 | .270 | .44 |
| | | | | 2 | .120 | .125 | | | | | |

All dimensions are in millimeters.

| | Thread Size x Pitch | Type | Thread Code | Shank Code | A (Shank) Max. | Rec. 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Metric | M2 x 0.4 | SP | M2 | 1 | 0.97 | 1 | 4.22 | 4.2 | 6.35 | 1.5 | 4.8 |
| | | | | 2 | 1.38 | 1.4 | | | | | |
| | M2.5 x 0.45 | SP | M2.5 | 0 | 0.77 | 0.8 | 4.22 | 4.2 | 6.35 | 1.5 | 4.8 |
| | | | | 1 | 0.97 | 1 | | | | | |
| | | | | 2 | 1.38 | 1.4 | | | | | |
| | M3 x 0..5 | SP | M3 | 0 | 0.77 | 0.8 | 4.22 | 4.2 | 6.35 | 1.5 | 4.8 |
| | | | | 1 | 0.97 | 1 | | | | | |
| | | | | 2 | 1.38 | 1.4 | | | | | |
| | M4 x 0.7 | SP | M4 | 0 | 0.77 | 0.8 | 5.41 | 5.38 | 7.87 | 2 | 6.9 |
| | | | | 1 | 0.97 | 1 | | | | | |
| | | | | 2 | 1.38 | 1.4 | | | | | |
| | M5 x 0.8 | SP | M5 | 0 | 0.77 | 0.8 | 6.35 | 6.33 | 8.64 | 2 | 7.1 |
| | | | | 1 | 0.97 | 1 | | | | | |
| | | | | 2 | 1.38 | 1.4 | | | | | |
| | M6 x 1 | SP | M6 | 1 | 1.38 | 1.4 | 8.75 | 8.73 | 11.18 | 4.08 | 8.6 |
| | | | | 2 | 2.21 | 2.29 | | | | | |
| | M8 x 1.25 | SP | M8 | 1 | 1.38 | 1.4 | 10.5 | 10.47 | 12.7 | 5.47 | 9.7 |
| | | | | 2 | 2.21 | 2.29 | | | | | |
| | M10 x 1.5 | SP | M10 | 1 | 2.21 | 2.29 | 14 | 13.97 | 17.35 | 7.48 | 13.5 |

(1) For more information on proximity to bends and distance to other clinch hardware, see PEM® Tech Sheet C/L To Edge.

The increased hardness of stainless steel panels requires careful consideration when installing self-clinching fasteners. Refer to "Dos and Don'ts" on page 27 for further information.

NOTE: Occasionally, users of our self-clinching fasteners encounter thread binding issues when assembling fasteners made from stainless steel. This problem is typically related to galling. Technical paper, PEM® REF/THREAD GALLING, answers many of the typical questions that we receive surrounding this problem.

## SMPP™ Self-Clinching Nuts

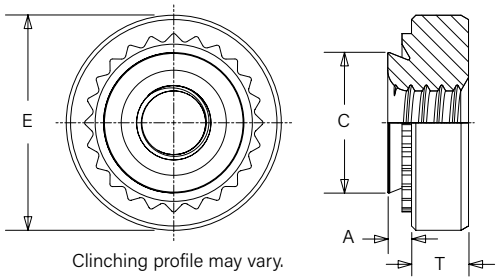
- Installs into stainless steel sheets as thin as .025"/0.64mm.
- Corrosion resistance similar to 300 series stainless steel.
- Reduced outer dimensions and thinner sheet capabilities compared to SP nut thread sizes.
- Recommended for use in stainless steel sheets HRB 90 / HB 192 or less.

### Part Number Designation

SMPP – 440

SMPP: Type and Material

440: Thread Code




Clinching profile may vary.

All dimensions are in inches.

| | 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 (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| Unified | .086-56 (#2-56) | SMPP | 256 | .024 | .025 | .136 | .135 | .220 | .065 | .16 |
| | .112-40 (#4-40) | SMPP | 440 | .024 | .025 | .166 | .165 | .220 | .065 | .20 |
| | .138-32 (#6-32) | SMPP | 632 | .024 | .025 | .187 | .186 | .252 | .065 | .22 |

All dimensions are in millimeters.

| | Thread Size x Pitch | | 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 (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| Metric | M2.5 x 0.45 | SMPP | M2.5 | 0.61 | 0.64 | 3.8 | 3.79 | 5.6 | 1.4 | 3.9 |
| | M3 x 0.5 | SMPP | M3 | 0.61 | 0.64 | 4.24 | 4.22 | 5.6 | 1.4 | 5.1 |
| | M3.5 x 0.6 | SMPP | M3.5 | 0.61 | 0.64 | 4.75 | 4.73 | 6.4 | 1.4 | 5.5 |

(1) For more information on proximity to bends and distance to other clinch hardware, see PEM® Tech Sheet C/L To Edge.

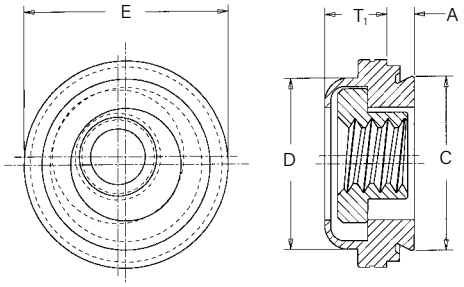
The increased hardness of stainless steel panels requires careful consideration when installing self-clinching fasteners.
Refer to "Dos and Don'ts" on page 24 for further information.

NOTE: Occasionally, users of our self-clinching fasteners encounter thread binding issues when assembling fasteners made from stainless steel. This problem is typically related to galling. Technical paper, PEM® REF/THREAD GALLING, answers many of the typical questions that we receive surrounding this problem.

## A4™/LA4™ Floating Self-Clinching Fasteners

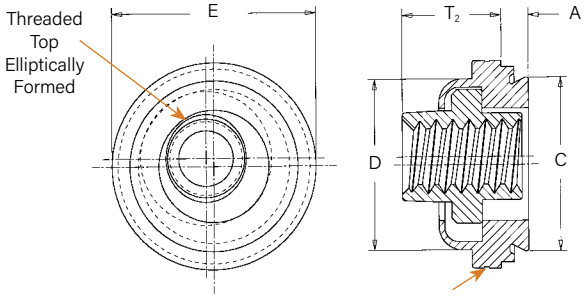
- Speeds assembly by compensating for mating hole misalignment.
- Permanent installation into stainless steel sheets as thin as .038"/0.97mm and greater.
- Provides high torque-out and pushout resistance in stainless panels.
- LA4 nut thread locking torque performance is equivalent to applicable NASM25027 specifications.(1)
- For use in stainless steel sheets HRB 88 / HB 183 or less.

**A4™ NON-LOCKING NUTS**




Clinching profile may vary.

**LA4™ SELF-LOCKING NUTS**




Clinching profile may vary. Single "groove" identifier.

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

## Part Number Designation

A4 - 440 - 1
LA4 - 440 - 1 MD

Type and Material | Thread Code | Shank Code | Finish (if applicable)

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. | D Max. | E ± .015 | $T_1$ Max. | $T_2$ Max. | Min. Dist. Hole C/L to Edge (1) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Non-Locking | Self-Locking | | | | | | | | | | | |
| Unified | .112-40 (#4-40) | A4 | LA4 | 440 | 1 | .038 | .038 | .290 | .289 | .290 | .360 | .130 | .190 | .30 |
| | .138-32 (#6-32) | A4 | LA4 | 632 | 1 | .038 | .038 | .328 | .327 | .335 | .390 | .130 | .200 | .32 |
| | .164-32 (#8-32) | A4 | LA4 | 832 | 1 | .038 | .038 | .368 | .367 | .365 | .440 | .130 | .210 | .34 |
| | .190-32 (#10-32) | A4 | LA4 | 032 | 1 | .038 | .038 | .406 | .405 | .405 | .470 | .170 | .270 | .36 |

All dimensions are in millimeters.

| | Thread Size x Pitch | Type | | 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 C/L to Edge (1) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Non-Locking | Self-Locking | | | | | | | | | | | |
| Metric | M3 x 0.5 | A4 | LA4 | M3 | 1 | 0.97 | 0.97 | 7.37 | 7.35 | 7.37 | 9.14 | 3.31 | 4.83 | 7.62 |
| | M4 x 0.7 | A4 | LA4 | M4 | 1 | 0.97 | 0.97 | 9.35 | 9.33 | 9.28 | 11.18 | 3.31 | 5.34 | 8.64 |
| | M5 x 0.8 | A4 | LA4 | M5 | 1 | 0.97 | 0.97 | 10.31 | 10.29 | 10.29 | 11.94 | 4.32 | 6.86 | 9.14 |

(1) For more information on proximity to bends and distance to other clinch hardware, see PEM® Tech Sheet C/L To Edge.

The increased hardness of stainless steel panels requires careful consideration when installing self-clinching fasteners. Refer to "Dos and Don'ts" on page 27 for further information.

(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.

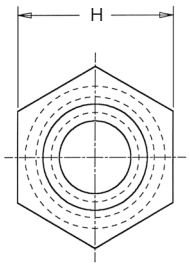
## F4™ PEMSERT® Self-Clinching Flush Fasteners

- Can be installed into sheets as thin as .060"/1.53mm.
- Ideal for flush applications where a stainless steel sheet requires load-bearing threads.
- Can be installed before bending and forming to provide strong threads while still remaining flat with no protrusions on either surface.
- For use in stainless steel sheets HRB 88 / HB 183 or less.

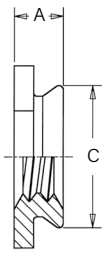
### Part Number Designation

F4 - 440 - 1

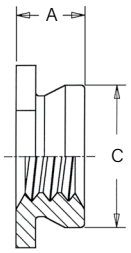
- F4 — Type and Material
- 440 — Thread Code
- 1 — Shank Code




**Profile for -1 shank code.**




**Profile for -2, -3, -4, & -5 shank codes.**




Clinching profile may vary.

All dimensions are in inches.

| | Thread Size | Type | Thread Code | Shank Code | A (Shank) Max. | Sheet Thickness | Hole Size In Sheet +.003 -.000 | C Max. | H Nom. | Min. Dist. Hole C/L to Edge (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| Unified | .086-56 (#2-56) | F4 | 256 | 1 | .060 | .060-.090 | .172 | .171 | .188 | .23 |
| | | | | 2 | .090 | .091 Min. | | | | |
| | .112-40 (#4-40) | F4 | 440 | 1 | .060 | .060-.090 | .172 | .171 | .188 | .23 |
| | | | | 2 | .090 | .091 Min. | | | | |
| | .138-32 (#6-32) | F4 | 632 | 1 | .060 | .060-.090 | .213 | .212 | .250 | .27 |
| | | | | 2 | .090 | .091 Min. | | | | |
| | .164-32 (#8-32) | F4 | 832 | 1 | .060 | .060-.090 | .290 | .289 | .312 | .28 |
| | | | | 2 | .090 | .091 Min. | | | | |
| | .190-32 (#10-32) | F4 | 032 | 1 | .060 | .060-.090 | .312 | .311 | .343 | .31 |
| | | | | 2 | .090 | .091 Min. | | | | |
| | .250-20 (1/4-20) | F4 | 0420 | 3 | .120 | .125-.155 | .344 | .343 | .375 | .34 |
| | | | | 4 | .151 | .156-.186 | | | | |
| | | | | 5 | .182 | .187 Min. | | | | |

All dimensions are in millimeters.

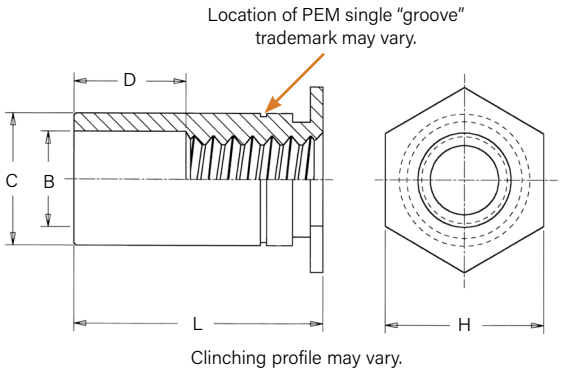
| | Thread Size x Pitch | Type | Thread Code | Shank Code | A (Shank) Max. | Sheet Thickness | Hole Size In Sheet +0.08 | C Max. | H Nom. | Min. Dist. Hole C/L to Edge (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| Metric | M2 x 0.4 | F4 | M2 | 1 | 1.53 | 1.53-2.3 | 4.37 | 4.35 | 4.8 | 6 |
| | | | | 2 | 2.3 | 2.32 Min. | | | | |
| | M2.5 x 0.45 | F4 | M2.5 | 1 | 1.53 | 1.53-2.3 | 4.37 | 4.35 | 4.8 | 6 |
| | | | | 2 | 2.3 | 2.32 Min. | | | | |
| | M3 x 0.5 | F4 | M3 | 1 | 1.53 | 1.53-2.3 | 4.37 | 4.35 | 4.8 | 6 |
| | | | | 2 | 2.3 | 2.32 Min. | | | | |
| | M4 x 0.7 | F4 | M4 | 1 | 1.53 | 1.53-2.3 | 7.37 | 7.35 | 7.9 | 7.2 |
| | | | | 2 | 2.3 | 2.32 Min. | | | | |
| | M5 x 0.8 | F4 | M5 | 1 | 1.53 | 1.53-2.3 | 7.92 | 7.9 | 8.7 | 8 |
| | | | | 2 | 2.3 | 2.32 Min. | | | | |
| | M6 x 1 | F4 | M6 | 3 | 3.05 | 3.18-3.94 | 8.74 | 8.72 | 9.5 | 8.8 |
| | | | | 4 | 3.84 | 3.96-4.72 | | | | |
| | | | | 5 | 4.63 | 4.75 Min. | | | | |

(1) For more information on proximity to bends and distance to other clinch hardware, see PEM® Tech Sheet C/L To Edge.

The increased hardness of stainless steel panels requires careful consideration when installing self-clinching fasteners. Refer to "Dos and Don'ts" on page 27 for further information.

## SO4™ Thru-Hole Threaded Standoffs

- Ideal for stacking or spacing.
- Installed with head flush with one surface of the mounting sheet.
- For use in stainless steel sheets HRB 88 / HB 183 or less.




### Part Number Designation

SO4 - 440 - 8

- SO4 — Type and Material
- 440 — Thread Code
- 8 — Length Code

### General Dimensional Data

All dimensions are in inches.

| | Thread Code | Min. Sheet Thickness | Hole Size In Sheet +.003 -.000 | B Counter-Bore Dia. ±.005 | C +.000 -.005 | H Nom. | Min. Dist. Hole C/L to Edge (1) | D ±.010 |
|---|---|---|---|---|---|---|---|---|
| Unified | 440 | .040 | .166 | .125 | .165 | .187 | .23 | Varies according to length. See length charts below. |
| | 6440 | .040 | .213 | .125 | .212 | .250 | .27 | |
| | 632 | .040 | .213 | .156 | .212 | .250 | .27 | |
| | 8632 | .050 | .281 | .156 | .280 | .312 | .31 | |
| | 832 | .050 | .281 | .188 | .280 | .312 | .31 | |
| | 032 | .050 | .281 | .203 | .280 | .312 | .31 | |

All dimensions are in millimeters.

| | Thread Code | Min. Sheet Thickness | Hole Size In Sheet +0.08 | B Counter-Bore Dia. ±0.13 | C -0.13 | H Nom. | Min. Dist. Hole C/L to Edge (1) | D ±0.25 |
|---|---|---|---|---|---|---|---|---|
| Metric | M3 | 1 | 4.22 | 3.25 | 4.2 | 4.8 | 6 | Varies according to length. See length charts below. |
| | 3.5M3 | 1 | 5.41 | 3.25 | 5.39 | 6.4 | 6.8 | |
| | M3.5 | 1 | 5.41 | 3.9 | 5.39 | 6.4 | 6.8 | |
| | M4 | 1.27 | 7.14 | 4.8 | 7.12 | 7.9 | 8 | |
| | M5 | 1.27 | 7.14 | 5.35 | 7.12 | 7.9 | 8 | |

(1) For more information on proximity to bends and distance to other clinch hardware, see PEM® Tech Sheet C/L To Edge.

### Thread Size And Length Selection Data

All dimensions are in inches.

| | Thread Size | Type | Thread Code | Length "L" +.002 -.005 (Length Code in 32nds of an inch) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | .125 | .187 | .250 | .312 | .375 | .437 | .500 | .562 | .625 | .687 | .750 | .812 | .875 | .937 | 1.00 | 1.062 |
| Unified | .112-40 (#4-40) | SO4 | 440 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | – | – | – | – | – |
| | | | 6440(2) | | | | | | | | | | | | | | | | |
| | .138-32 (#6-32) | SO4 | 632 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 |
| | | | 8632(2) | | | | | | | | | | | | | | | | |
| | .164-32 (#8-32) | SO4 | 832 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 |
| | .190-32 (#10-32) | SO4 | 032 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 |
| | D Dimension ±.010 | | | None | | | | .187 | | | | .312 | | | | .437 | | | |

All dimensions are in millimeters.

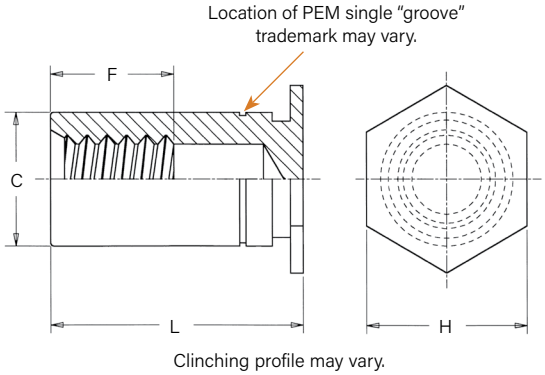
| | Thread Size x Pitch | Type | Thread Code | Length "L" +0.05 -0.13 (Length Code in millimeters) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Metric | M3 x 0.5 | SO4 | M3 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | – | – | – |
| | | | 3.5M3(2) | | | | | | | | | | | | |
| | M3.5 x 0.6 | SO4 | M3.5 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 25 |
| | M4 x 0.7 | SO4 | M4 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 25 |
| | M5 x 0.8 | SO4 | M5 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 25 |
| | D Dimension ±0.25 | | | None | | | | 4 | | | | 8 | | | 11 |

(2) Standoffs with thread codes 6440, 8632, and 3.5M3 offer greater wall thickness for thread sizes 440, 632, and M3 respectively.

The increased hardness of stainless steel panels requires careful consideration when installing self-clinching fasteners. Refer to "Dos and Don'ts" on page 27 for further information.

# BSO4™ Blind Threaded Standoffs

- Ideal for stacking or spacing.
- Installed with closed end head flush with one surface of the mounting sheet.
- For use in stainless steel sheets HRB 88 / HB 183 or less.




Clinching profile may vary.

## Part Number Designation

BSO4 - 440 - 8

- BSO4 — Type and Material
- 440 — Thread Code
- 8 — Length Code

## General Dimensional Data

All dimensions are in inches.

| | Thread Code | Min. Sheet Thickness | Hole Size In Sheet +.003 -.000 | C +.000 -.005 | H Nom. | Min. Dist. Hole C/L to Edge (1) | F Min. |
|---|---|---|---|---|---|---|---|
| Unified | 440 | .040 | .166 | .165 | .187 | .23 | Varies according to length. See length charts below. |
| | 6440 | .040 | .213 | .212 | .250 | .27 | |
| | 632 | .040 | .213 | .212 | .250 | .27 | |
| | 8632 | .050 | .281 | .280 | .312 | .31 | |
| | 832 | .050 | .281 | .280 | .312 | .31 | |
| | 032 | .050 | .281 | .280 | .312 | .31 | |

All dimensions are in millimeters.

| | Thread Code | Min. Sheet Thickness | Hole Size In Sheet +0.08 | C -0.13 | H Nom. | Min. Dist. Hole C/L to Edge (1) | F Min. |
|---|---|---|---|---|---|---|---|
| Metric | M3 | 1 | 4.22 | 4.2 | 4.8 | 6 | Varies according to length. See length charts below. |
| | 3.5M3 | 1 | 5.41 | 5.39 | 6.4 | 6.8 | |
| | M3.5 | 1 | 5.41 | 5.39 | 6.4 | 6.8 | |
| | M4 | 1.27 | 7.14 | 7.12 | 7.9 | 8 | |
| | M5 | 1.27 | 7.14 | 7.12 | 7.9 | 8 | |

(1) For more information on proximity to bends and distance to other clinch hardware, see PEM® Tech Sheet C/L To Edge.

## Thread Size And Length Selection Data

All dimensions are in inches.

| | Thread Size | Type | Thread Code | Length "L" +.002 -.005 (Length Code in 32nds of an inch) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | .312 | .375 | .437 | .500 | .562 | .625 | .687 | .750 | .812 | .875 | .937 | 1.00 | 1.062 |
| Unified | .112-40 (#4-40) | BSO4 | 440 / 6440(2) | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 |
| | .138-32 (#6-32) | BSO4 | 632 / 8632(2) | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 |
| | .164-32 (#8-32) | BSO4 | 832 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 |
| | .190-32 (#10-32) | BSO4 | 032 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 |
| | F Dimension Min. | | | .156 | | .187 | .250 | | | .375 | | | | | | |

All dimensions are in millimeters.

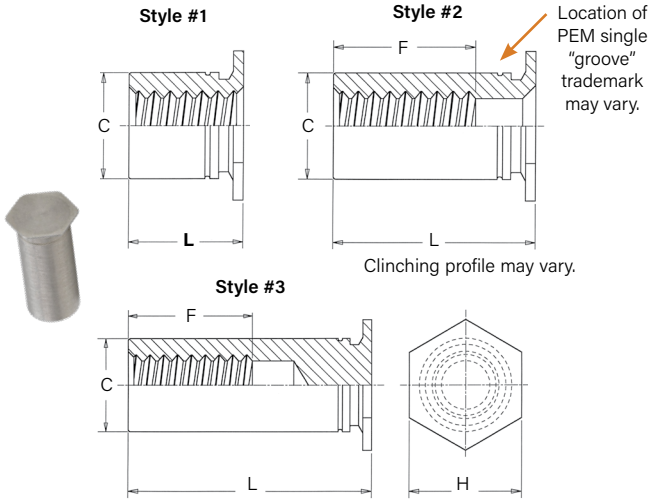
| | Thread Size x Pitch | Type | Thread Code | Length "L" +0.05 -0.13 (Length Code in millimeters) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Metric | M3 x 0.5 | BSO4 | M3 / 3.5M3(2) | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 25 |
| | M3.5 x 0.6 | BSO4 | M3.5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 25 |
| | M4 x 0.7 | BSO4 | M4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 25 |
| | M5 x 0.8 | BSO4 | M5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 25 |
| | F Dimension Min. | | | 3.2 | 4 | | 5 | 6.5 | | 9.5 | | | |

(2) Standoffs with thread codes 6440, 8632, and 3.5M3 offer greater wall thickness for thread sizes 440, 632, and M3 respectively.

The increased hardness of stainless steel panels requires careful consideration when installing self-clinching fasteners. Refer to "Dos and Don'ts" on page 27 for further information.

# TSO4™ Standoffs For Installation Into Ultra-Thin Stainless Steel Sheets

- For installation into ultra-thin stainless steel sheets as thin as .025"/0.63mm.
- Threads on barrel end eliminate the need for long screws.
- For use in stainless steel sheets HRB 88 / HB 183 or less.




## General Dimensional Data

All dimensions are in inches.

| | Thread Code | Min. Sheet Thickness | Hole Size In Sheet +.003 -.000 | C +.000 -.005 | F Min. Thread Depth | H Nom. | Min. Dist. Hole C/L to Edge (5) |
|---|---|---|---|---|---|---|---|
| Unified | 256 | .025 | .166 | .165 | .200 | .187 | .23 |
| | 6256 | .025 | .213 | .212 | | .250 | .27 |
| | 440 | .025 | .166 | .165 | .220 | .187 | .23 |
| | 6440 | .025 | .213 | .212 | | .250 | .27 |
| | 632 | .025 | .213 | .212 | .270 | .250 | .27 |

All dimensions are in millimeters.

| | Thread Code | Min. Sheet Thickness | Hole Size In Sheet +0.08 | C -0.13 | F Min. Thread Depth | H Nom. | Min. Dist. Hole C/L to Edge (5) |
|---|---|---|---|---|---|---|---|
| Metric | M25 | 0.63 | 4.22 | 4.2 | 5.2 | 4.8 | 5.8 |
| | 6M25 | 0.63 | 5.41 | 5.39 | | 6.4 | 7.1 |
| | M3 | 0.63 | 4.22 | 4.2 | 6.2 | 4.8 | 5.8 |
| | 6M3 | 0.63 | 5.41 | 5.39 | | 6.4 | 7.1 |
| | M35 | 0.63 | 5.41 | 5.39 | 7 | 6.4 | 7.1 |

(5) For more information on proximity to bends and distance to other clinch hardware, see PEM® Tech Sheet C/L To Edge.

## Thread Size And Length Selection Data

All dimensions are in inches.

| | Thread Size | Type | Thread Code | Length "L" ±.003 For other lengths / thread depth data see chart at bottom of page. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | .090 | .125 | .187 | .250 | .312 | .375 | .437 | .500 | .562 | .625 | .687 | .750 |
| | | | | Length Code (Length "L" without decimal point) | | | | | | | | | | | |
| Unified | .086-56 (#2-56) | TSO4 | 256 / 6256(4) | 090(1) | 125(1) | 187(1) | 250(1) | 312(2) | 375(2) | 437(3) | 500(3) | 562(3) | 625(3) | 687(3) | 750(3) |
| | .112-40 (#4-40) | TSO4 | 440 / 6440(4) | 090(1) | 125(1) | 187(1) | 250(1) | 312(2) | 375(2) | 437(2) | 500(3) | 562(3) | 625(3) | 687(3) | 750(3) |
| | .138-32 (#6-32) | TSO4 | 632 | - | 125(1) | 187(1) | 250(1) | 312(1) | 375(2) | 437(2) | 500(2) | 562(3) | 625(3) | 687(3) | 750(3) |

All dimensions are in millimeters.

| | Thread Size x Pitch | Type | Thread Code | Length "L" ±0.08 For other lengths / thread depth data see chart at bottom of page. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2.00 | 3.00 | 4.00 | 6.00 | 8.00 | 10.00 | 12.00 | 14.00 | 16.00 | 18.00 | 19.00 |
| | | | | Length Code (Length "L" without decimal point) | | | | | | | | | | |
| Metric | M2.5 x 0.45 | TSO4 | M25 / 6M25(4) | 200(1) | 300(1) | 400(1) | 600(1) | 800(2) | 1000(3) | 1200(3) | 1400(3) | 1600(3) | 1800(3) | 1900(3) |
| | M3 x 0.5 | TSO4 | M3 / 6M3(4) | 200(1) | 300(1) | 400(1) | 600(1) | 800(2) | 1000(2) | 1200(3) | 1400(3) | 1600(3) | 1800(3) | 1900(3) |
| | M3.5 x 0.6 | TSO4 | M35 | - | 300(1) | 400(1) | 600(1) | 800(1) | 1000(2) | 1200(2) | 1400(3) | 1600(3) | 1800(3) | 1900(3) |

(1) Style #1. Thru-threaded.
(2) Style #2. Screw might not pass through unthreaded end. Tapped to minimum full thread depth shown. Incomplete threads on tap may allow screw to pass through.
(3) Style #3. Blind.
(4) Standoffs with thread codes 6256, 6440, 6M25 and 6M3 offer oversized body for increased bearing surface, wall thickness and performance.
Please contact your local PEM® distributor for availability, minimum quantity, and pricing information.

## Length/Style Data

All dimensions are in inches.
(Length can be specified in .001" increments.)

| | Thread Code | Length "L" (Style #1) | Length "L" (Style #2) | Length "L" (Style #3) |
|---|---|---|---|---|
| Unified | 256 / 6256 | .090 - .250 | .251 - .375 | .376 - .750 |
| | 440 / 6440 | .090 - .280 | .281 - .450 | .451 - .750 |
| | 632 | .120 - .350 | .351 - .540 | .541 - .750 |

All dimensions are in millimeters.
(Length can be specified in .02 mm increments.)

| | Thread Code | Length "L" (Style #1) | Length "L" (Style #2) | Length "L" (Style #3) |
|---|---|---|---|---|
| Metric | M25 / 6M25 | 2.00 - 6.30 | 6.32 - 9.50 | 9.52 - 19.00 |
| | M3 / 6M3 | 2.00 - 7.50 | 7.52 - 11.00 | 11.02 - 19.00 |
| | M35 | 3.00 - 8.80 | 8.82 - 12.80 | 12.82 - 19.00 |

## Part Number Designation

TSO4 - 440 - 250

- TSO4: Type and Material
- 440: Thread Code
- 250: Length Code

The increased hardness of stainless steel panels requires careful consideration when installing self-clinching fasteners.
Refer to "Dos and Don'ts" on page 27 for further information.

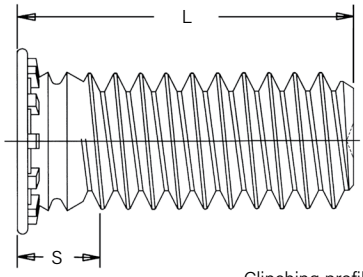
## FH4™/FHP™ Flush-Head Studs

- Permanent installation into stainless steel sheets as thin as .040"/1mm.
- FHP studs offers highest corrosion resistance and ideal for medical, food service, and marine applications.
- For use in stainless steel sheets HRB 92 / HB 202 or less.

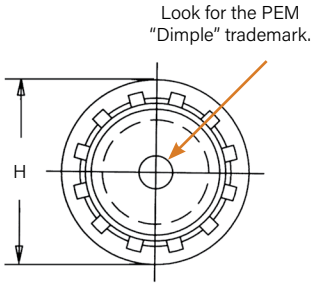
### Part Number Designation

FH4 - 632 - 6
FHP - 632 - 6

Type and Material | Thread Code | Length Code




unthreaded length




Clinching profile may vary.

All dimensions are in inches.

| | Thread Size | Type | | Thread Code | Length Code "L" ±.015 (Length code in 16ths of an inch) | | | | | | | | | | Sheet Thickness (1) | Hole Size in Sheet +.003 -.000 | Max. Hole in Attach. Parts | H ±.015 | S Max. (2) | Min. Dist. Hole C/L to Edge (3) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | .250 | .312 | .375 | .500 | .625 | .750 | .875 | 1.00 | 1.25 | 1.50 | | | | | | |
| Unified | .112-40 (#4-40) | FH4 | FHP | 440 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | — | — | .040-.095 | .111 | .131 | .176 | .085 | .219 |
| | .138-32 (#6-32) | FH4 | FHP | 632 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 24 | .040-.095 | .137 | .157 | .206 | .090 | .250 |
| | .164-32 (#8-32) | FH4 | FHP | 832 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 24 | .040-.095 | .163 | .183 | .237 | .090 | .281 |
| | .190-32 (#10-32) | FH4 | FHP | 032 | — | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 24 | .040-.095 | .189 | .209 | .256 | .100 | .281 |
| | .250-20 (1/4-20) | FH4 | — | 0420 | — | — | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 24 | .062-.117 | .249 | .269 | .337 | .135 | .312 |

All dimensions are in millimeters.

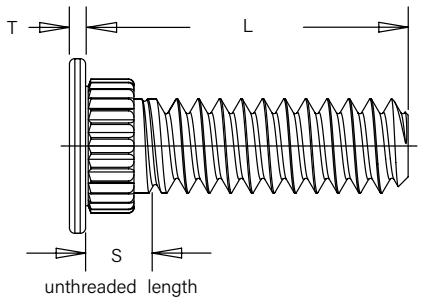
| | Thread Size x Pitch | Type | | Thread Code | Length Code "L" ±0.4 (Length Code in millimeters) | | | | | | | | | | Sheet Thickness (1) | Hole Size in Sheet +0.08 | Max. Hole in Attach. parts | H ±0.4 | S Max. (2) | Min. Dist. Hole C/L to Edge (3) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Metric | M3 x 0.5 | FH4 | FHP | M3 | 6 | 8 | 10 | 12 | 15 | 18 | 20 | 25 | — | — | 1 - 2.4 | 3 | 3.3 | 4.6 | 2.1 | 5.6 |
| | M4 x 0.7 | FH4 | FHP | M4 | 6 | 8 | 10 | 12 | 15 | 18 | 20 | 25 | 30 | 35 | 1 - 2.4 | 4 | 4.7 | 5.9 | 2.4 | 7.2 |
| | M5 x 0.8 | FH4 | FHP | M5 | — | 8 | 10 | 12 | 15 | 18 | 20 | 25 | 30 | 35 | 1 - 2.4 | 5 | 5.3 | 6.5 | 2.7 | 7.2 |
| | M6 x 1 | FH4 | — | M6 | — | — | 10 | 12 | 15 | 18 | 20 | 25 | 30 | 35 | 1.6 - 3 | 6 | 6.8 | 8.2 | 3 | 7.9 |

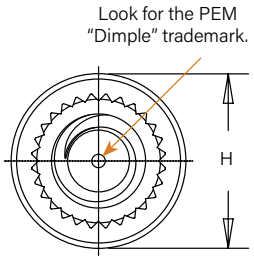
(1) Performance may be reduced for studs installed into thicker sheets.
(2) Threads are gaugeable to within 2 pitches of the "S" Max. dimension. A class 3B/5H maximum material commercial nut shall pass up to the "S" Max. dimension.
(3) For more information on proximity to bends and distance to other clinch hardware, see PEM® Tech Sheet C/L To Edge.

The increased hardness of stainless steel panels requires careful consideration when installing self-clinching fasteners.
Refer to "Dos and Don'ts" on page 27 for further information.

## SGPC™ Swaging Collar Studs

- Installs into sheets as thin as .024"/0.6mm.
- Can be used to attach dissimilar materials.
- Can accommodate multiple panels as long as the total thickness does not exceed the maximum sheet thickness.(1)
- Can be installed into most panel materials, including stainless steel.
- Allows for close centerline-to-edge distance.




### Part Number Designation

SGPC - 632 - 8

- SGPC: Type and Material
- 632: Thread Code
- 8: Length Code

All dimensions are in inches.

| | Thread Size | Type Fastener Material Stainless Steel | Thread Code | Length Code "L" ±.015 (Length Code in 16ths of an inch) .312 | .375 | .500 | .625 | .750 | .875 | 1.00 | 1.25 | 1.50 | Sheet Thickness (2) | Hole Size in Sheet +.003 -.000 | Hole Dia. of Attached Panel +.005 -.000 | H ±.010 | S Max. (3) | T ±.004 | Min. Dist. Hole C/L to Edge (4) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unified | .086-56 (#2-56) | SGPC | 256 | 5 | 6 | 8 | 10 | 12 | — | — | — | — | .024 - .047 | .145 | .182 | .189 | .093 | .020 | .130 |
| | .112-40 (#4-40) | SGPC | 440 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | — | .024 - .047 | .171 | .205 | .228 | .101 | .024 | .160 |
| | .138-32 (#6-32) | SGPC | 632 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 24 | .024 - .047 | .196 | .229 | .256 | .109 | .024 | .180 |
| | .164-32 (#8-32) | SGPC | 832 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 24 | .024 - .047 | .223 | .259 | .279 | .109 | .024 | .200 |
| | .190-32 (#10-32) | SGPC | 032 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 24 | .024 - .047 | .249 | .280 | .307 | .109 | .024 | .210 |
| | .250-20 (1/4-20) | SGPC | 0420 | — | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 24 | .024 - .047 | .309 | .343 | .366 | .131 | .028 | .250 |

All dimensions are in millimeters.

| | Thread Size x Pitch | Type Fastener Material Stainless Steel | Thread Code | Length Code "L" ±0.4 (Length Code in millimeters) 8 | 10 | 12 | 15 | 18 | 20 | 25 | 30 | 35 | Sheet Thickness (2) | Hole Size in Sheet +0.08 | Hole Dia. of Attached Panel +0.13 | H ±0.25 | S Max. (3) | T ±0.1 | Min. Dist. Hole C/L to Edge (4) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Metric | M2.5 x 0.45 | SGPC | M2.5 | 8 | 10 | 12 | 15 | 18 | — | — | — | — | 0.6 - 1.2 | 4 | 4.95 | 5 | 2.4 | 0.5 | 3.9 |
| | M3 x 0.5 | SGPC | M3 | 8 | 10 | 12 | 15 | 18 | 20 | 25 | — | — | 0.6 - 1.2 | 4.5 | 5.45 | 6 | 2.5 | 0.6 | 4.3 |
| | M4 x 0.7 | SGPC | M4 | 8 | 10 | 12 | 15 | 18 | 20 | 25 | 30 | — | 0.6 - 1.2 | 5.5 | 6.3 | 7 | 2.7 | 0.6 | 4.9 |
| | M5 x 0.8 | SGPC | M5 | 8 | 10 | 12 | 15 | 18 | 20 | 25 | 30 | 35 | 0.6 - 1.2 | 6.5 | 7.45 | 8 | 2.8 | 0.6 | 5.5 |
| | M6 x 1 | SGPC | M6 | — | 10 | 12 | 15 | 18 | 20 | 25 | 30 | 35 | 0.6 - 1.2 | 7.5 | 8.3 | 9 | 3 | 0.7 | 6.2 |

(1) When using the fastener to attach more than one sheet or panel, the stud may seem slightly loose after installation. This is a normal condition in some applications and will not affect the stud's performance.
(2) See installation data for tooling requirements. Contact Technical Support (techsupport@pemnet.com) for other thicknesses.
(3) Threads are gaugeable to within 2 pitches on the "S" Max. dimension. A class 3B/5H maximum material commercial nut shall pass up to the "S" Max. dimension.
(4) For more information on proximity to bends and distance to other clinch hardware, see PEM® Tech Sheet C/L To Edge.

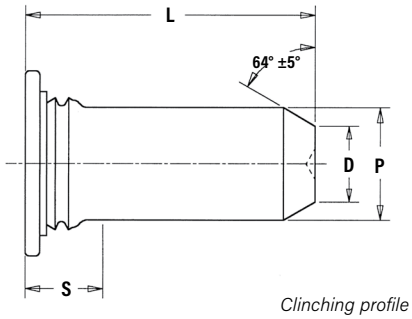
## TP4™ Flush-Head Pins

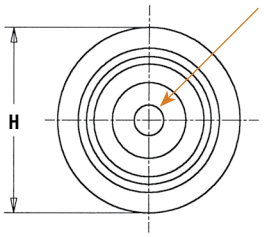
- Permanent installation into stainless steel sheets as thin as .040"/1mm.
- Satisfies a wide range of positioning, pivot, and alignment applications.
- Chamfered end makes mating hole location easy.
- For use in stainless steel sheets HRB 92 / HB 202 or less.

### Part Number Designation

TP4 - 125 - 8

- TP4: Type and Material
- 125: Pin Diameter Code
- 8: Length Code




*Clinching profile may vary.*

All dimensions are in inches.

| | Pin Diameter P ±.002 | Type | Pin Diameter Code | Length Code "L" ± .015 (Length Code in 16ths of an inch) | | | | | Min. Sheet Thickness | Hole Size in Sheet +.003 -.000 | D ±.006 | H ±.015 | S Max. (1) | Min. Dist. Hole C/L to Edge (2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | .375 | .500 | .625 | .750 | 1.00 | | | | | | |
| Unified | .125 | TP4 | 125 | 6 | 8 | 10 | 12 | — | .040 | .144 | .090 | .205 | .090 | .250 |
| | .187 | TP4 | 187 | 6 | 8 | 10 | 12 | 16 | .040 | .205 | .132 | .270 | .090 | .280 |
| | .250 | TP4 | 250 | — | 8 | 10 | 12 | 16 | .040 | .272 | .177 | .335 | .090 | .310 |

All dimensions are in millimeters.

| | Pin Diameter P ±0.05 | Type | Pin Diameter Code | Length Code "L" ± 0.4 (Length Code in millimeters) | | | | | Min. Sheet Thickness | Hole Size in Sheet +0.08 | D ±0.15 | H ±0.4 | S Max. (1) | Min. Dist. Hole C/L to Edge (2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Metric | 3 | TP4 | 3MM | 8 | 10 | 12 | 16 | — | 1 | 3.5 | 2.05 | 5.2 | 2.29 | 6.4 |
| | 4 | TP4 | 4MM | 8 | 10 | 12 | 16 | — | 1 | 4.5 | 2.82 | 6.12 | 2.29 | 7.1 |
| | 5 | TP4 | 5MM | — | 10 | 12 | 16 | 20 | 1 | 5.5 | 3.53 | 7.19 | 2.29 | 7.6 |
| | 6 | TP4 | 6MM | — | — | 12 | 16 | 20 | 1 | 6.5 | 4.24 | 8.13 | 2.29 | 7.9 |

(1) Pin diameter may exceed max. in this region.
(2) For more information on proximity to bends and distance to other clinch hardware, see PEM® Tech Sheet C/L To Edge.

The increased hardness of stainless steel panels requires careful consideration when installing self-clinching fasteners.
Refer to "Dos and Don'ts" on page 27 for further information.

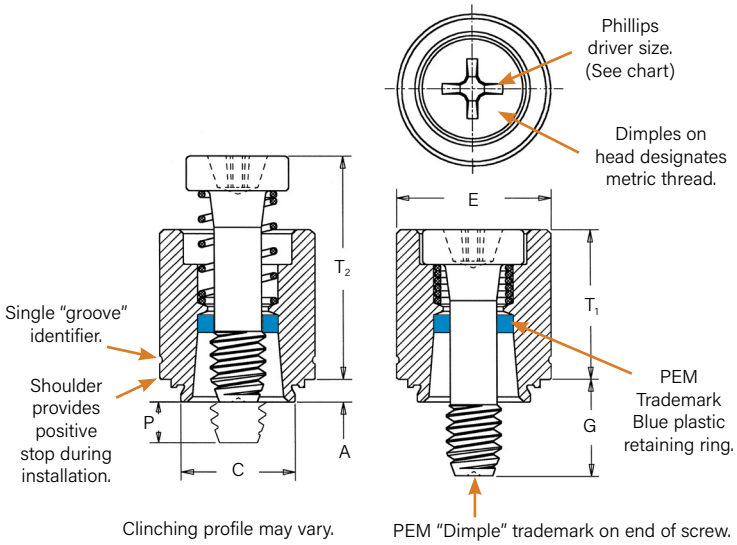
## PFC4™ Captive Panel Screws

- Tool only access meets UL 1950 "service area access" requirements and provides fixed screw solutions for the EC Machinery Directive.
- Assorted screw lengths for most applications.
- For use in stainless steel sheets HRB 88 / HB 183 or less.

### Part Number Designation

PFC4- 832 - 50

- PFC4- : Type and Material
- 832 : Thread Code
- 50 : Screw Length Code




All dimensions are in inches.

| | Thread Size | Type | Thread Code | Screw Length Code | A (Shank) Max. | Min. Sheet Thickness | Hole Size In Sheet +.003 -.000 | C Max. | E ± .010 | G ± .016 | P ±.025 | $T_1$ Max. | $T_2$ Nom. | Driver Size | Min. Dist. Hole C/L to Edge (1) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unified | .112-40 (#4-40) | PFC4 | 440 | 40 | .060 | .060 | .265 | .264 | .344 | .250 | .000 | .370 | .540 | #1 | .25 |
| | | | | 62 | | | | | | .375 | .125 | | | | |
| | .138-32 (#6-32) | PFC4 | 632 | 40 | .060 | .060 | .281 | .280 | .375 | .250 | .000 | .380 | .540 | #2 | .28 |
| | | | | 62 | | | | | | .375 | .125 | | | | |
| | | | | 84 | | | | | | .500 | .250 | | | | |
| | .164-32 (#8-32) | PFC4 | 832 | 50 | .060 | .060 | .312 | .311 | .406 | .312 | .000 | .480 | .705 | #2 | .31 |
| | | | | 72 | | | | | | .437 | .125 | | | | |
| | | | | 94 | | | | | | .562 | .250 | | | | |
| | .190-32 (#10-32) | PFC4 | 032 | 50 | .060 | .060 | .344 | .343 | .437 | .312 | .000 | .490 | .705 | #2 | .34 |
| | | | | 72 | | | | | | .437 | .125 | | | | |
| | | | | 94 | | | | | | .562 | .250 | | | | |

All dimensions are in millimeters.

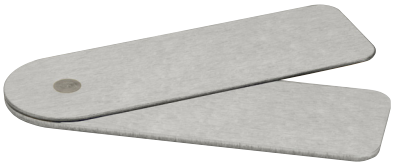
| | Thread Size x Pitch | Type | Thread Code | Screw Length Code | A (Shank) Max. | Min. Sheet Thickness | Hole Size In Sheet + 0.08 | C Max. | E ± 0.25 | G ± 0.4 | P ±0.64 | $T_1$ Max. | $T_2$ Nom. | Driver Size | Min. Dist Hole C/L to Edge (1) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Metric | M3 x 0.5 | PFC4 | M3 | 40 | 1.53 | 1.53 | 6.73 | 6.71 | 8.74 | 6.4 | 0 | 9.4 | 13.72 | #1 | 6.35 |
| | | | | 62 | | | | | | 9.5 | 3.2 | | | | |
| | M4 x 0.7 | PFC4 | M4 | 50 | 1.53 | 1.53 | 7.92 | 7.9 | 10.31 | 7.9 | 0 | 12.19 | 17.91 | #2 | 7.87 |
| | | | | 72 | | | | | | 11.1 | 3.2 | | | | |
| | | | | 94 | | | | | | 14.3 | 6.4 | | | | |
| | M5 x 0.8 | PFC4 | M5 | 50 | 1.53 | 1.53 | 8.74 | 8.72 | 11.1 | 7.9 | 0 | 12.45 | 17.91 | #2 | 8.63 |
| | | | | 72 | | | | | | 11.1 | 3.2 | | | | |
| | | | | 94 | | | | | | 14.3 | 6.4 | | | | |

(1) For more information on proximity to bends and distance to other clinch hardware, see PEM® Tech Sheet C/L To Edge.

The increased hardness of stainless steel panels requires careful consideration when installing self-clinching fasteners. Refer to "Dos and Don'ts" on page 27 for further information.

## SFP™ Spotfast® Fasteners

- Allows permanent joining of two metal sections.
- Offers high corrosion resistance.
- Can be used as single flush-mounted pivot point.
- Installs smooth with top sheet and flush or sub-flush with the bottom sheet.
- For use in sheets of HRB 88 / HB 183 or less.



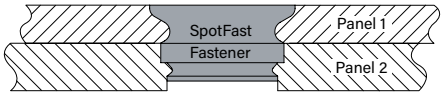
SpotFast® fastener used as a single flush-mounted pivot point. Top panel rotates about the SpotFast fastener.

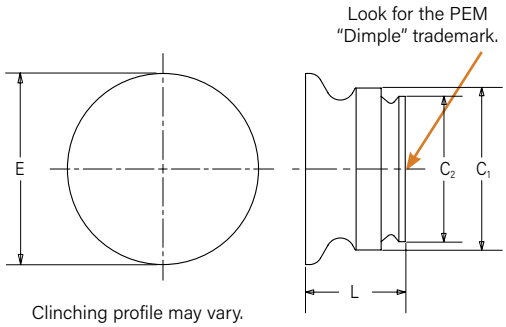
### Part Number Designation

SFP - 3 - 1.0

- SFP: Type and Material
- 3: Panel 1 Mounting Hole Code
- 1.0: Thickness Code

*Patented*




Clinching profile may vary.

| Type and Size | Thickness Code | Panel 1 Thickness ±0.08 mm / ±.003" | | Panel 1 Mounting Hole +0.08 mm / +.003" -.000" | | Panel 2 Thickness Min. (1) | | Panel 2 Mounting Hole +0.08 mm / +.003" -.000" | | $C_1$ Max. | | $C_2$ Max. | | E Max. | | L Max. | | Min. Dist. Hole C/L to Edge (2) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. |
| SFP-3 | 1.0 | 1 | .039 | 3 | .118 | 1 | .039 | 2.5 | .098 | 2.98 | .117 | 2.48 | .097 | 3.76 | .148 | 1.9 | .075 | 2.54 | .1 |
| SFP-3 | 1.2 | 1.2 | .047 | 3 | .118 | 1.2 | .047 | 2.5 | .098 | 2.98 | .117 | 2.48 | .097 | 3.76 | .148 | 2.31 | .091 | 2.54 | .1 |
| SFP-3 | 1.6 | 1.6 | .063 | 3 | .118 | 1.6 | .063 | 2.5 | .098 | 2.98 | .117 | 2.48 | .097 | 3.76 | .148 | 3.12 | .123 | 2.54 | .1 |
| SFP-5 | 1.0 | 1 | .039 | 5 | .197 | 1 | .039 | 4.5 | .177 | 4.98 | .196 | 4.47 | .176 | 5.56 | .219 | 1.9 | .075 | 3.6 | .14 |
| SFP-5 | 1.2 | 1.2 | .047 | 5 | .197 | 1.2 | .047 | 4.5 | .177 | 4.98 | .196 | 4.47 | .176 | 5.56 | .219 | 2.31 | .091 | 3.6 | .14 |
| SFP-5 | 1.6 | 1.6 | .063 | 5 | .197 | 1.6 | .063 | 4.5 | .177 | 4.98 | .196 | 4.47 | .176 | 5.56 | .219 | 3.12 | .123 | 3.6 | .14 |

(1) Fastener will provide flush application at minimum sheet thickness.
(2) For more information on proximity to bends and distance to other clinch hardware, see PEM® Tech Sheet C/L To Edge.

The increased hardness of stainless steel panels requires careful consideration when installing self-clinching fasteners.
Refer to "Dos and Don'ts" on page 27 for further information.

## Material And Finish Specifications

| | Threads | | | Fastener Materials | | | | Finish | | For Use in Sheet Hardness (1) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type | Internal, ASME B1.1 2B/ ASME B1.13M, 6H | External, ASME B1.1 2A/ ASME B1.13M, 6g | Internal, UNJ Class 3B per ASME B1.15 / MJ Class 4H6H per ASME B1.2M (M6 thread 4H5H) | Precipitation Hardening Grade Stainless Steel | Heat-Treated 400 Series Stainless Steel | 300 Series Stainless Steel | Age Hardened A286 Stainless Steel | Passivated and/or Tested per ASTM A380 | Black Dry-film Lubricant | HRB 92 / HB 202 or less | HRB 90 / HB 192 or less | HRB 88 / HB 183 or less | Any Sheet Hard-ness | Corrosion Resistance | Magnetic |
| SP | ▪ | | | | | | ▪ | ▪ | | | ▪ (2) (3) | | | Excellent | No |
| SMPP | ▪ | | | | | | ▪ | ▪ | | | ▪ | | | Excellent | No |
| A4 | ▪ | | | | ▪ (retainer) | ▪ (insert) | | ▪ | | | | ▪ | | Fair | Yes |
| LA4 | | | ▪ | | ▪ (retainer) | ▪ (insert) | | ▪ (retainer) | ▪ (insert) | | | ▪ | | Fair | Yes |
| F4 | ▪ | | | | ▪ | | | ▪ | | | | ▪ | | Fair | Yes |
| SO4 | ▪ | | | | ▪ | | | ▪ | | | | ▪ (4) | | Fair | Yes |
| BSO4 | ▪ | | | | ▪ | | | ▪ | | | | ▪ (4) | | Fair | Yes |
| TSO4 | ▪ | | | | ▪ | | | ▪ | | | | ▪ (4) | | Fair | Yes |
| FH4 | | ▪ | | | ▪ | | | ▪ | | ▪ | | | | Fair | Yes |
| FHP | | ▪ | | | | | ▪ | ▪ | | ▪ | | | | Excellent | No |
| SGPC | | ▪ | | | | ▪ | | ▪ | | | | | ▪ | Excellent | No |
| TP4 | Not threaded | | | | ▪ | | | ▪ | | ▪ | | | | Fair | Yes |
| PFC4 (Retainer) | | | | | ▪ | | | ▪ | | | | ▪ | | Fair | Yes |
| (Screw) | | ▪ | | | ▪ | | | ▪ | | | | | | | |
| (Spring) | | | | | | ▪ | | | | | | | | | |
| SFP | Not threaded | | | ▪ | | | | ▪ | | | | ▪ | | Excellent | Yes |
| Part number codes for finishes | | | | | | | | None | MD | | | | | | |

(1) HRB - Hardness Rockwell "B" Scale. HB - Hardness Brinell.
(2) Panel material should be in the annealed condition.
(3) Fasteners should not be installed adjacent to bends or other highly cold-worked areas.
(4) Also available, standoffs for installation into thinner, high strength, HSLA steel. See Innovation Brief "Standoffs For Hard Panels" on our website.

### A Note About 400 Series 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 (A4, LA4, F4, SO4, BSO4, TSO4, FH4, TP4, and PFC4 fasteners). 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.

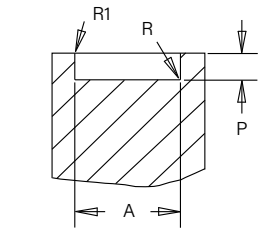
# Installation

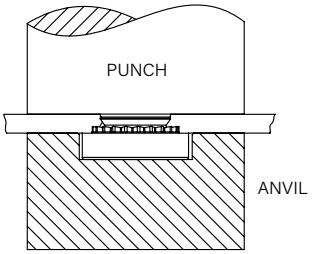
## SP™ Nuts

| | Thread Code | HAEGER® Part Number | | PEMSERTER® Part Number | | Anvil Dimensions (in.) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Lower Tool | Upper Tool | Anvil | Punch | A ±.002 | P +.000 -.001 | R Max. | R1 +.005 |
| Unified | 440 | H-183-4/M3-L | H-108-0020L | 8012821 | 975200048 | .255 | .064 | .010 | .005 |
| | 632 | H-183-6/M3.5-L | H-108-0020L | 8012822 | 975200048 | .286 | .064 | .010 | .005 |
| | 832 | H-183-8/M4-L | H-108-0020L | 8012823 | 975200048 | .317 | .082 | .010 | .005 |
| | 024/032 | H-183-10/M5-L | H-108-0020L | 8012824 | 975200048 | .348 | .082 | .010 | .005 |
| | 0420 | H-183-04/M6-L | H-108-0020L | 8012825 | 8003076 | .443 | .163 | .010 | .005 |
| | 0518 | — | — | 8015359 | 8003076 | .505 | .230 | .010 | .005 |
| | 0616/0624 | — | — | 8015863 | 8003076 | .570 | .263 | .010 | .005 |

| | Thread Code | HAEGER® Part Number | | PEMSERTER® Part Number | | Anvil Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Lower Tool | Upper Tool | Anvil | Punch | A ±0.05 | P -0.03 | R Max. | R1 +0.13 |
| Metric | M2 | — | — | 8012821 | 975200048 | 6.48 | 1.63 | 0.25 | 0.13 |
| | M2.5-0 | — | — | 8019477 | 975200048 | 6.48 | 1.42 | 0.25 | 0.13 |
| | M2.5-1,-2 | — | — | 8012821 | 975200048 | 6.48 | 1.63 | 0.25 | 0.13 |
| | M3 | H-183-4/M3-L | H-108-0020L | 8012821 | 975200048 | 6.48 | 1.63 | 0.25 | 0.13 |
| | M3.5 | H-183-6/M3.5-L | H-108-0020L | 8012822 | 975200048 | 7.26 | 1.63 | 0.25 | 0.13 |
| | M4 | H-183-8/M4-L | H-108-0020L | 8012823 | 975200048 | 8.05 | 2.08 | 0.25 | 0.13 |
| | M5 | H-183-10/M5-L | H-108-0020L | 8012824 | 975200048 | 8.84 | 2.08 | 0.25 | 0.13 |
| | M6 | H-183-04/M6-L | H-108-0020L | 8012825 | 8003076 | 11.25 | 4.14 | 0.25 | 0.13 |
| | M8 | — | — | 8015360 | 8003076 | 12.83 | 5.41 | 0.25 | 0.13 |
| | M10 | — | — | 8015886 | 8003076 | 17.58 | 7.47 | 0.25 | 0.13 |

### Recommended Counterbore Anvil




## SMPP™ Nuts

| | Thread Code | HAEGER® Part Number | | PEMSERTER® Part Number | | Anvil Dimensions (in.) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Lower Tool | Upper Tool | Anvil | Punch | A ±.002 | P +.000 -.001 | R Max. | R1 +.005 |
| Unified | 256 | 10-00278 | H-108-0020L | 8020023 | 975200048 | .223 | .060 | .010 | .005 |
| | 440 | 10-00279 | H-108-0020L | 8021386 | 975200048 | .233 | .060 | .010 | .005 |
| | 632 | 10-00280 | H-108-0020L | 8020024 | 975200048 | .255 | .060 | .010 | .005 |

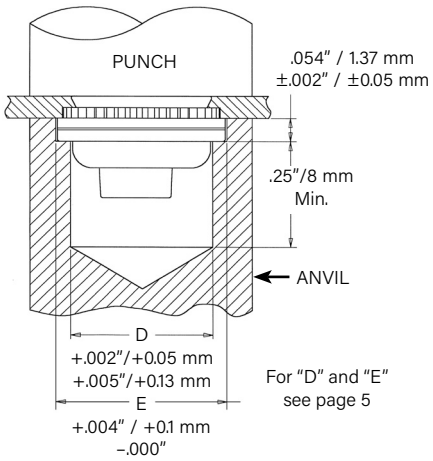
| | Thread Code | HAEGER® Part Number | | PEMSERTER® Part Number | | Anvil Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Lower Tool | Upper Tool | Anvil | Punch | A ±0.05 | P -0.03 | R Max. | R1 +0.13 |
| Metric | M2.5 | 10-00292 | H-108-0020L | 8020025 | 975200048 | 5.66 | 1.27 | 0.25 | 0.13 |
| | M3 | 10-00293 | H-108-0020L | 8021474 | 975200048 | 5.9 | 1.27 | 0.25 | 0.13 |
| | M3.5 | 10-00294 | H-108-0020L | 8020026 | 975200048 | 6.48 | 1.27 | 0.25 | 0.13 |

(1) For best results, 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.

## A4™/LA4™ Nuts

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 (punch side) over the shank of the fastener.
3. With installation punch and anvil surfaces parallel, apply sufficient squeezing force until the flange contacts the sheet material.




## Installation Tooling

| Thread Code | HAEGER® Part Number | | PEMSERTER® Part Number | | Counterbore A | | Hole Depth Below Counterbore B | |
|---|---|---|---|---|---|---|---|---|
| | Anvil | Punch | Anvil | Punch | ±.001" | ±0.03mm | ±.005" | ±0.13mm |
| 440/M3 | H-131-4/M3L | H-108-0020L | 8013889 | 975200048 | .054" | 1.37mm | .258" | 6.55mm |
| 632 | H-131-6/M3.5L | H-108-0020L | 8013890 | 975200048 | .054" | 1.37mm | .258" | 6.55mm |
| 832/M4 | H-131-8/M4L | H-108-0020L | 8013891 | 975200048 | .054" | 1.37mm | .258" | 6.55mm |
| 032/M5 | H-131-10/M5L | H-108-0020L | 8013892 | 975200048 | .071" | 1.8mm | .241" | 6.12mm |
| 0420/M6 | H-131-04/M6L | H-108-0020L | 8021392 | 975200048 | .092" | 2.34mm | .220" | 5.59mm |

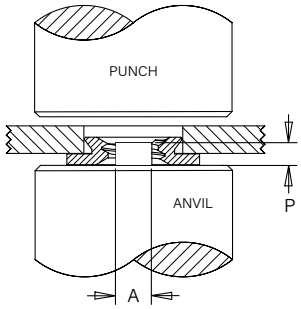
# Installation

## F4™ Nuts

1. Prepare properly sized round mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place shank of fastener into mounting hole (punch side) as show in the drawing.
3. With installation punch and anvil surfaces parallel, apply sufficient squeezing force only to embed hexagonal head flush in sheet. The metal displaced by the head flows evenly and smoothly around the back-tapered shank of the fastener, securely locking it into place with high pullout resistance while at the same time, the embedded hexagonal head provides high torque resistance.

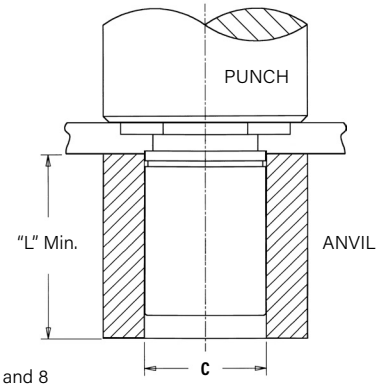
## Installation Tooling

| Thread Code | HAEGER® Part Number | | PEMSERTER® Part Number | | Anvil Dimensions | | | |
|---|---|---|---|---|---|---|---|---|
| | Anvil | Punch | Anvil | Punch | A | | P | |
| | | | | | +.002" -.000" | + 0.05mm | ±.005" | ±0.13mm |
| 256/M2/M2.5 | H-108-0018L | H-108-0018L | 8006193 | 975200048 | .060" | 1.52mm | .050" | 1.27mm |
| 440/M3 | H-108-0018L | H-108-0018L | 975200040 | 975200048 | .077" | 1.96mm | .050" | 1.27mm |
| 632 | H-108-0018L | H-108-0018L | 975200041 | 975200048 | .092" | 2.34mm | .050" | 1.27mm |
| 832/M4 | H-108-0018L | H-108-0018L | 975200042 | 975200048 | .124" | 3.15mm | .050" | 1.27mm |
| 032/M5 | H-108-0018L | H-108-0018L | 975200043 | 975200048 | .139" | 3.53mm | .050" | 1.27mm |
| 0420/M6 | H-108-0018L | H-108-0018L | 975200044 | 975200048 | .186" | 4.72mm | .100" | 2.54mm |




## SO4™/BSO4™ Standoffs

1. Prepare properly sized round mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Insert standoff barrel through mounting hole (punch side) in sheet and into anvil as shown.
3. With installation punch and anvil surfaces parallel, apply only enough squeezing force to embed the standoff's head flush in the sheet.




See pages 7 and 8 for "C" and "L".

+.004"/0.1mm
+.007"/0.18mm

## Installation Tooling

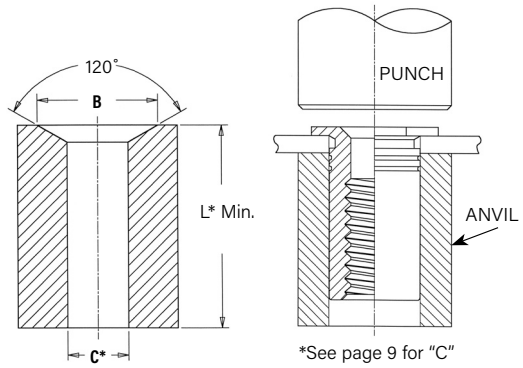
| Thread Code | HAEGER® Part No. | | PEMSERTER® Part Number | |
|---|---|---|---|---|
| | Anvil | Punch | Anvil | Punch |
| 440/M2/M2.5/M3 | H-109-4/M3L | H-108-0020L | 970200487300 | 975200048 |
| 632/6440/3.5M3/M3.5 | H-109-6/M3.5L | H-108-0020L | 970200012300 | 975200048 |
| 832/8632/032/M4/M5 | H-109-8-10/M5L | H-108-0020L | 970200013300 | 975200048 |
| 0420/M6 | H-109-04/M6L | H-108-0020L | 970200393300 | 975200048 |

## Installation

### TSO4™ Standoffs

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operation such as deburring.
2. Insert standoff through mounting hole (punch side) of sheet and into anvil as shown in drawing.
3. With installation punch and anvil surfaces parallel, apply only enough squeezing force to embed the standoff's head flush in the sheet. Drawing at right shows required installation anvil for sheet thickness of .025" to .032"/0.63 to 0.81mm. A chamfered anvil is not required for sheets over .032"/0.81mm.

Required Installation Anvil For Sheets Below .032"/0.81MM




*See page 9 for "C" and "L".

+.001" to +.004" / +0.03mm to +0.1mm

### Installation Tooling

| | Thread Code | HAEGER® Part Numbers | | | | PEMSERTER® Part Numbers | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Anvil Dimensions (in.) For Sheets Below .032" | | Anvil For sheets Over .032" | Punch | Anvil Dimensions (in.) For Sheets Below .032" | | Anvil For Sheets Over .032" | Punch |
| | | B | Anvil | | | B | Anvil | | |
| Unified | 256/440 | (1) | (1) | H-109-4/M3L | H-108-0020L | .187 - .194 | 8003291 | 970200487300 | 975200048 |
| | 6256/6440/632 | (1) | (1) | H-109-6/M3.5L | H-108-0020L | .250 - .257 | 8003292 | 970200012300 | 975200048 |

| | Thread Code | HAEGER® Part Numbers | | | | PEMSERTER® Part Numbers | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Anvil Dimensions (mm) For Sheets Below 0.81 mm | | Anvil For sheets Over 0.81 mm | Punch | Anvil Dimensions (mm) For Sheets Below 0.81 mm | | Anvil For Sheets Over 0.81 mm | Punch |
| | | B | Anvil | | | B | Anvil | | |
| Metric | M2.5/M3 | (1) | (1) | H-109-4/M3L | H-108-0020L | 4.75 - 4.93 | 8003291 | 970200487300 | 975200048 |
| | 6M25/6M3/M35 | (1) | (1) | H-109-6/M3.5L | H-108-0020L | 6.35 - 6.53 | 8003292 | 970200012300 | 975200048 |

(1) Click here for a quote on Haeger® custom anvil installation tooling.

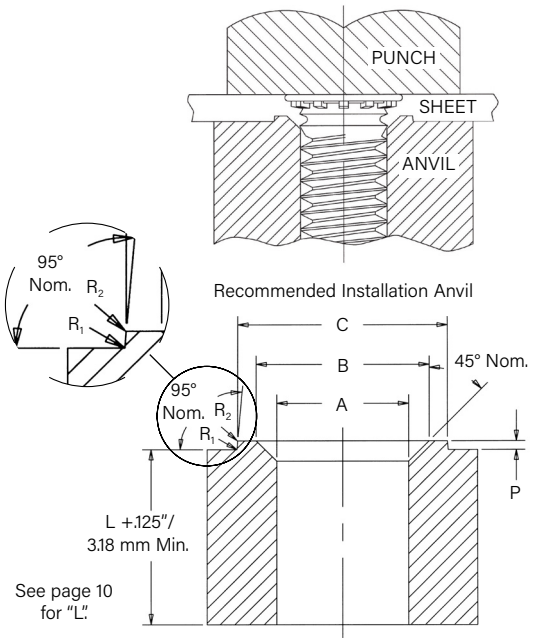
## Installation

### Installation - FH4™/FHP™ Studs For Stainless Steel Sheets

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Insert stud through mounting hole (punch side) of sheet and into anvil hole.
3. With punch and anvil surfaces parallel, apply squeezing force to embed the head of the stud flush in the sheet.

For FH4/FHP studs, a special anvil with 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 is filled. Please see page 10 for recommended sheet thickness range.

The special anvils are available from PEM stock or can be machined from suitable tool steel. A hardness of HRC 55 / HB 547 minimum is required to provide long anvil life. We recommend measuring the "P" dimension every 5000 installations to ensure that the anvil remains within specification.




### Installation Tooling

| | Thread Code | HAEGER® Part Number | | PEMSERTER® Part Number | | Anvil Dimensions (in.) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Anvil | Punch | Anvil | Punch | A +.003 -.000 | B ±.002 | C ±.002 | P ±.001 | $R_1$ Max. | $R_2$ Max. |
| Unified | 440 | H-181-4L | H-108-0020L | 8001645 | 975200048 | .113 | .144 | .174 | .101 | .003 | .005 |
| | 632 | H-181-6L | H-108-0020L | 8001644 | 975200048 | .140 | .170 | .200 | .010 | .003 | .005 |
| | 832 | H-181-8L | H-108-0020L | 8001643 | 975200048 | .166 | .202 | .236 | .010 | .003 | .005 |
| | 032 | H-181-10L | H-108-0020L | 8001642 | 975200048 | .191 | .235 | .275 | .010 | .003 | .005 |
| | 0420 | H-181-04L | H-108-0020L | 8002535 | 975200048 | .252 | .324 | .360 | .020 | .003 | .005 |

| | Thread Code | HAEGER® Part Number | | PEMSERTER® Part Number | | Anvil Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Anvil | Punch | Anvil | Punch | A ±0.08 | B ±0.05 | C ±0.05 | P ±0.025 | R1 Max. | R2 Max. |
| Metric | M3 | H-181-M3L | H-108-0020L | 8001678 | 975200048 | 3.05 | 3.81 | 4.57 | 0.25 | 0.08 | 0.13 |
| | M4 | H-181-M4L | H-108-0020L | 8001677 | 975200048 | 4.04 | 4.95 | 5.82 | 0.25 | 0.08 | 0.13 |
| | M5 | H-181-M5L | H-108-0020L | 8001676 | 975200048 | 5.08 | 6.15 | 7.16 | 0.25 | 0.08 | 0.13 |
| | M6 | H-181-M6L | H-108-0020L | 8002536 | 975200048 | 6.05 | 7.87 | 8.79 | 0.51 | 0.08 | 0.13 |

## Installation

### SGPC™ Studs

1. Prepare properly sized mounting hole in sheet.
2. Insert fastener through mounting hole (punch side) as shown in drawing.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the punch pushes over the protruding knurls of the stud.

### Installation Tooling

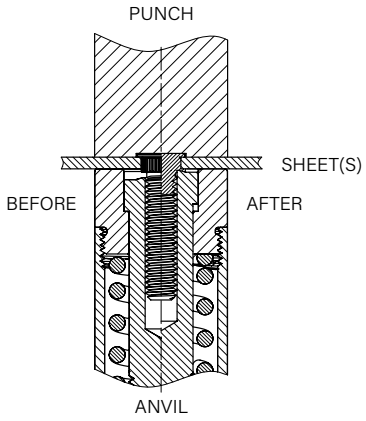
| | Thread Code | Punch Dimensions (in.) | | Punch Part Number [1] | Anvil Dimensions (in.) | | Anvil Part Number [1] |
|---|---|---|---|---|---|---|---|
| | | A +.004 -.000 | B +.000 -.001 | PEMSERTER® | C +.001 | P +.000 -.002 | PEMSERTER® |
| Unified | 256 | .209 | .019 | 8015111 | .087 | .014 | 8016983 |
| | 440 | .248 | .022 | 8015112 | .113 | .014 | 8016984 |
| | 632 | .276 | .022 | 8015113 | .139 | .014 | 8016985 |
| | 832 | .299 | .022 | 8015114 | .165 | .014 | 8016986 |
| | 032 | .327 | .022 | 8015115 | .191 | .014 | 8016987 |
| | 0420 | .386 | .026 | 8015116 | .251 | .014 | 8016988 |

| | Thread Code | Punch Dimensions (mm) | | Punch Part Number [1] | Anvil Dimensions (mm) | | Anvil Part Number [1] |
|---|---|---|---|---|---|---|---|
| | | A +0.1 | B -0.025 | PEMSERTER® | C +0.025 | P -0.05 | PEMSERTER® |
| Metric | M2.5 | 5.5 | 0.47 | 8015117 | 2.53 | 0.35 | 8016989 |
| | M3 | 6.5 | 0.57 | 8015118 | 3.03 | 0.35 | 8016990 |
| | M4 | 7.5 | 0.57 | 8015119 | 4.03 | 0.35 | 8016991 |
| | M5 | 8.5 | 0.57 | 8015120 | 5.03 | 0.35 | 8016992 |
| | M6 | 9.5 | 0.67 | 8015121 | 6.03 | 0.35 | 8016993 |

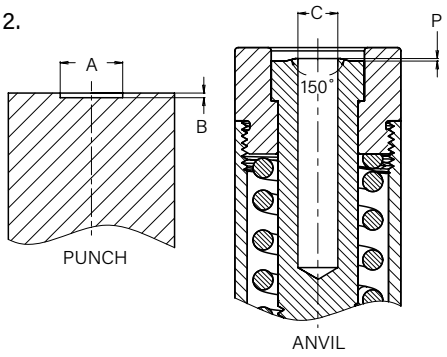
(1) Click here for a quote on Haeger® custom installation tooling.

NOTE: For panel design information, click here.

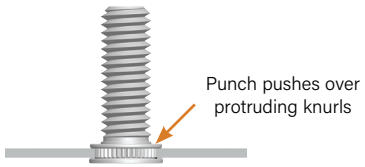
1.




2.




3.



## Installation

### TP4™ Pins

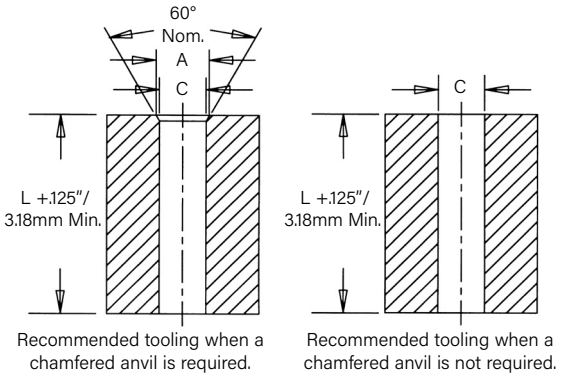
1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place pin end through mounting hole in sheet (punch side) and into anvil as shown
3. With installation punch and anvil surfaces parallel, apply squeezing force to embed the pin's head flush in the sheet.

### Installation Tooling

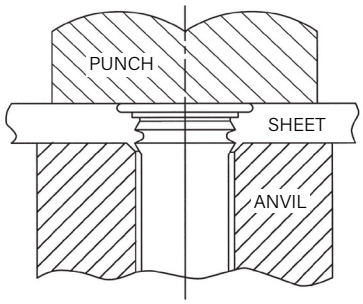
| | Pin Dia. Code | Test Sheet Thickness (in.) | Anvil Dimensions (in.) | | HAEGER® Part Number | | PEMSERTER® Part Number | |
|---|---|---|---|---|---|---|---|---|
| | | | A ±.002 | C ±.002 | Anvil | Punch | Anvil | Punch |
| Unified | 125 | .040 - .060 | .160 | .130 | H-106-125L-C | H-108-0020L | 8003284 | 975200048 |
| | | Over .060 | (1) | | H-106-125L | H-108-0020L | 8003278 | 975200048 |
| | 187 | .040 - .065 | .220 | .192 | H-106-187L-C | H-108-0020L | 8003285 | 975200048 |
| | | Over .065 | (1) | | H-106-187L | H-108-0020L | 8003279 | 975200048 |
| | 250 | .040 - .075 | .285 | .255 | H-106-250L-C | H-108-0020L | 8003286 | 975200048 |
| | | Over .075 | (1) | | H-106-250L | H-108-0020L | 8003280 | 975200048 |

| | Pin Dia. Code | Test Sheet Thickness (mm) | Anvil Dimensions (mm) | | HAEGER® Part Number | | PEMSERTER® Part Number | |
|---|---|---|---|---|---|---|---|---|
| | | | A ±0.05 | C ±0.05 | Anvil | Punch | Anvil | Punch |
| Metric | 3MM | 1 - 1.7 | 3.88 | 3.11 | H-106-3MML-C | H-108-0020L | 8008096 | 975200048 |
| | | Over 1.7 | (1) | | H-106-3MML | H-108-0020L | 8008095 | 975200048 |
| | 4MM | 1 - 1.7 | 4.88 | 4.11 | H-106-4MML-C | H-108-0020L | 8003287 | 975200048 |
| | | Over 1.7 | (1) | | H-106-4MML | H-108-0020L | 8003281 | 975200048 |
| | 5MM | 1 - 1.8 | 5.89 | 5.13 | H-106-5MML-C | H-108-0020L | 8003288 | 975200048 |
| | | Over 1.8 | (1) | | H-106-5MML | H-108-0020L | 8003282 | 975200048 |
| | 6MM | 1 - 1.9 | 6.89 | 6.12 | H-106-6MML-C | H-108-0020L | 8003289 | 975200048 |
| | | Over 1.9 | (1) | | H-106-6MML | H-108-0020L | 8003283 | 975200048 |

(1) Chamfered anvil not required.

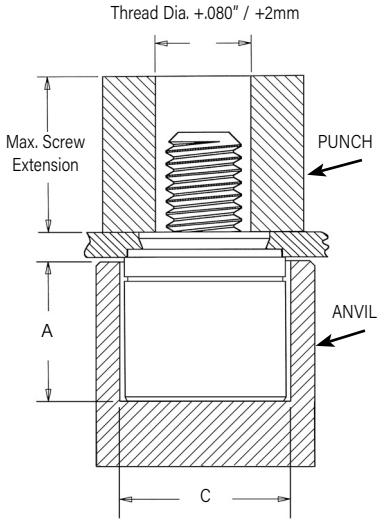



See page 12 for "L".




### PFC4™ Captive Panel Screws

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 (punch side) over the shank of the fastener retainer.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the shoulder of the retainer comes in contact with the sheet material.




### Installation Tooling[1][2]

| | Thread Code | PEMSERTER® Part Number | | Anvil Dimensions (in.) | |
|---|---|---|---|---|---|
| | | Anvil | Punch | A ±.002 | C ±.002 |
| Unified | 440 | 975200027 | 975200060 | .345 | .358 |
| | 632 | 975201243 | 975200061 | .345 | .390 |
| | 832 | 975200029 | 975200062 | .435 | .421 |
| | 032 | 975201244 | 975200063 | .435 | .452 |

| | Thread Code | PEMSERTER® Part Number | | Anvil Dimensions (mm) | |
|---|---|---|---|---|---|
| | | Anvil | Punch | A ±0.05 | C ±0.05 |
| Metric | M3 | 975200027 | 975200060 | 8.76 | 9.09 |
| | M4 | 975200029 | 975200062 | 11.05 | 10.69 |
| | M5 | 975201244 | 975200063 | 11.05 | 11.48 |

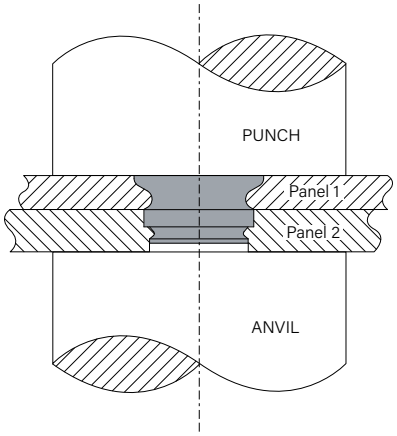
(1) Punches and anvils should be hardened.
(2) Click here for a quote on Haeger® custom installation tooling.

## Installation

### SFP™ Fasteners

1. Prepare properly sized mounting hole in both panels. Do not perform any secondary operations such as deburring.
2. Place Panel 2 with smaller mounting hole on anvil and align Panel 1 mounting hole with the mounting hole of Panel 2. Place the smaller diameter end of the fastener through the mounting holes as shown in the drawing to the right.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the fastener is flush with the top of Panel 1.

NOTE: To use as a flush-mounted pivot point, for best results, install SpotFast® fastener into Panel 1 first, then place Panel 2 over fastener and squeeze again.




### Installation Tooling

| Size | HAEGER® Part Number | | PEMSERTER® Part Number | |
|---|---|---|---|---|
| | Anvil | Punch | Anvil | Punch |
| SFP-3/SFP-5 | H-108-0019L | H-108-0019L | 975200046 | 975200048 |

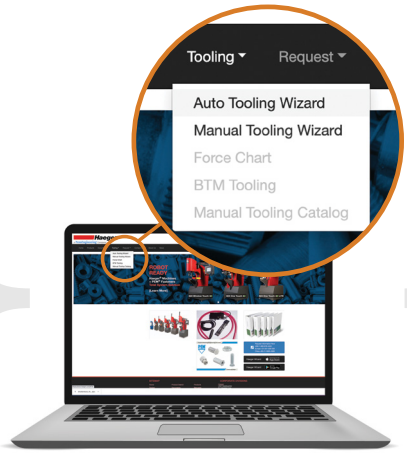
### Installation Notes

- For best results we recommend using a PEMSERTER® press for installation of PEM® self-clinching fasteners. Please check our website for more information.
- Visit the Animation Library on our website to view the installation process for select products.

## For Additional HAEGER® and PEMSERTER® Tooling Information / Part Numbers

HAEGER® MANUAL TOOLING CATALOG

HAEGER® AUTO TOOLING CATALOG




Go to haeger.com to access the Auto and Manual Tooling Wizards


Or download the **HAEGER WIZZARD** Phone App

PEMSERTER® MANUAL TOOLING CATALOG

PEMSERTER® AUTO TOOLING CATALOG

## Performance Data[1]

### SP™ Nuts

**Unified**

| Type | Thread Code | Shank Code | Test Sheet Material | Installation (lbs.) | Pushout (lbs.) | Torque-out (in. lbs.) |
|---|---|---|---|---|---|---|
| SP | 256 | 0 | 304 Stainless Steel | 8000 | 130 | 14 |
| | | 1 | | 9000 | 165 | 17 |
| | | 2 | | 10000 | 290 | 18 |
| 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 | 024/032 | 0 | 304 Stainless Steel | 9500 | 180 | 35 |
| | | 1 | | 10500 | 230 | 45 |
| | | 2 | | 11500 | 400 | 60 |
| SP | 0420 | 1 | 304 Stainless Steel | 13500 | 450 | 150 |
| | | 2 | | 13500 | 600 | 170 |
| SP | 0518 | 1 | 304 Stainless Steel | 14800 | 470 | 170 |
| | | 2 | | 14800 | 750 | 250 |
| SP | 0524 | 1 | 304 Stainless Steel | 14800 | 470 | 170 |
| | | 2 | | 14800 | 750 | 250 |
| SP | 0616/0624 | 1 | 304 Stainless Steel | 16000 | 600 | 300 |
| | | 2 | | 20000 | 700 | 370 |

**Metric**

| Thread Code | Shank Code | Test Sheet Material: 304 Stainless Steel | | |
|---|---|---|---|---|
| | | Installation (kN) | Pushout (N) | Torque-out (N·m) |
| M2 | 1 | 40 | 725 | 1.92 |
| | 2 | 44.5 | 1290 | 2.03 |
| M2.5 | 0 | 35.6 | 575 | 1.58 |
| | 1 | 40 | 725 | 1.92 |
| | 2 | 44.5 | 1290 | 2.03 |
| M3 | 0 | 35.6 | 575 | 1.58 |
| | 1 | 40 | 725 | 1.92 |
| | 2 | 44.5 | 1290 | 2.03 |
| M4 | 0 | 40 | 645 | 3.38 |
| | 1 | 44.5 | 800 | 4.18 |
| | 2 | 49 | 1600 | 5.08 |
| M5 | 0 | 42.3 | 800 | 3.95 |
| | 1 | 46.7 | 1025 | 5.08 |
| | 2 | 51.2 | 1775 | 6.77 |
| M6 | 1 | 60 | 2000 | 17 |
| | 2 | 60 | 2600 | 19 |
| M8 | 1 | 66 | 2100 | 19 |
| | 2 | 80 | 4500 | 23 |
| M10 | 1 | 80 | 2150 | 38 |

### SMPP™ Nuts

**Unified**

| Thread Code | Max. Nut Tightening Torque (in. lbs.) (2) (3) | Test Sheet Thickness and Material (in.) | Sheet Hardness HRB | Installation (lbs.) (4) | Pushout (lbs.) | Torque-out (in. lbs.) | Tensile Strength (lbs.) (2) (3) | Test Bushing Hole Size For Pull Thru Tests (in.) |
|---|---|---|---|---|---|---|---|---|
| 256 | 7.5 | .029" 304 Stainless Steel | 89 | 4500 | 50 | 10 | 640 | .104 |
| 440 | 13 | .029" 304 Stainless Steel | 89 | 4500 | 75 | 15 | 850 | .112 |
| 632 | 20 | .029" 304 Stainless Steel | 89 | 6000 | 75 | 20 | 1020 | .138 |

**Metric**

| Thread Code | Max. Nut Tightening Torque (N·m) (2) (3) | Test Sheet Thickness and Material (mm) | Sheet Hardness HRB | Installation (kN) (4) | Pushout (N) | Torque-out (N·m) | Tensile Strength (kN) (2) (3) | Test Bushing Hole Size For Pull Thru Tests (mm) |
|---|---|---|---|---|---|---|---|---|
| M2.5 | 1.05 | 0.7 mm 304 Stainless Steel | 89 | 20 | 200 | 1.35 | 3.05 | 3 |
| M3 | 1.5 | 0.7 mm 304 Stainless Steel | 89 | 20 | 300 | 1.85 | 3.63 | 3.5 |
| M3.5 | 2.1 | 0.7 mm 304 Stainless Steel | 89 | 27 | 300 | 1.9 | 4.25 | 4 |

### A4™/LA4™ Nuts

**Unified**

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

**Metric**

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

(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) Head size is adequate to ensure failure in threaded area when tested with industry standard tensile bushing diameter.

(3) Tightening torque shown will induce preload of 70% of nut min 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.

(4) Installation controlled by proper cavity depth in punch.

# Performance Data

## F4™ Nuts

| | Thread Code | Shank Code | Axial Tensile Strength (lbs.) (1) | Max. Screw Tightening Torque (2) (in. lbs.) | Test Sheet Material: 300 Series Stainless Steel | |
|---|---|---|---|---|---|---|
| | | | | | Installation (lbs.) | Pushout (lbs.) |
| Unified | 256 | 1 | 130 | 1.50 | 7200 | 270 |
| | | 2 | | | | |
| | 440 | 1 | 165 | 2.50 | 7200 | 270 |
| | | 2 | | | | |
| | 632 | 1 | 190 | 3.50 | 7200 | 290 |
| | | 2 | | | | |
| | 832 | 1 | 230 | 5.25 | 9000 | 450 |
| | | 2 | | | | |
| | 032 | 1 | 280 | 7.50 | 9000 | 450 |
| | | 2 | | | | |
| | 0420 | 3 | 1035 | 36 | 14000 | 1000 |
| | | 4 | | | | |
| | | 5 | | | | |

| | Thread Code | Shank Code | Axial Tensile Strength (kN) (1) | Max. Screw Tightening Torque (2) (N·m) | Test Sheet Material: 300 Series Stainless Steel | |
|---|---|---|---|---|---|---|
| | | | | | Installation (kN) | Pushout (N) |
| Metric | M2 | 1 | 0.57 | 0.16 | 32 | 1200 |
| | | 2 | | | | |
| | M2.5 | 1 | 0.68 | 0.23 | 32 | 1200 |
| | | 2 | | | | |
| | M3 | 1 | 0.85 | 0.36 | 32 | 1200 |
| | | 2 | | | | |
| | M4 | 1 | 1 | 0.58 | 40 | 2000 |
| | | 2 | | | | |
| | M5 | 1 | 1.3 | 0.88 | 40 | 2000 |
| | | 2 | | | | |
| | M6 | 3 | 4.5 | 3.7 | 65 | 4500 |
| | | 4 | | | | |
| | | 5 | | | | |

## SO4™/BSO4™ Standoffs

| | Thread Code | Max. Rec. Tightening Torque For Mating Screw (in. lbs.) | Test Sheet Material: .050" 300 Series Stainless Steel | | | |
|---|---|---|---|---|---|---|
| | | | Installation (lbs.) | Pushout (lbs.) | Torque-out (in. lbs.) (3) | Pull-thru (lbs.) (3) |
| Unified | 440 | 4.75 | 5500 | 336 | 17 | 600 |
| | 6440 | 4.75 | 9500 | 647 | 30 | 680 |
| | 632 | 8.75 | 9500 | 647 | 30 | 680 |
| | 8632 | 8.75 | 10500 | 900 | 71 | 1392 |
| | 832 | 18 | 10500 | 900 | 71 | 1517 |
| | 032 | 32 | 10500 | 900 | 71 | 1368 |

| | Thread Code | Max. Rec. Tightening Torque For Mating Screw (N·m) | Test Sheet Material: 1.3 mm 300 Series Stainless Steel | | | |
|---|---|---|---|---|---|---|
| | | | Installation (kN) | Pushout (N) | Torque-out (N·m) (3) | Pull-thru (N) (3) |
| Metric | M3 | 0.55 | 24.5 | 1493 | 2.36 | 2650 |
| | 3.5M3 | 0.55 | 42.3 | 2877 | 3.06 | 3025 |
| | M3.5 | 0.91 | 42.3 | 2877 | 3.06 | 3025 |
| | M4 | 2 | 46.7 | 4003 | 8.89 | 6458 |
| | M5 | 3.6 | 46.7 | 4003 | 8.89 | 6226 |

## TSO4™ Standoffs

| Standoff "C" Dimension | Test Sheet Material: .025" / 0.64 mm 300 series stainless steel | | | | | |
|---|---|---|---|---|---|---|
| | Installation | | Pushout | | Torque-out (3) | |
| | (lbs.) | (kN) | (lbs.) | (N) | (in. lbs.) | (N·m) |
| .165" / 4.2 mm | 5700 | 25.4 | 125 | 555 | 13 | 1.5 |
| .212" / 5.39 mm | 6800 | 30.3 | 160 | 710 | 22 | 2.5 |

## FH4™ Studs

| | Thread Code | Recommended Nut Tightening Torque (in. lbs.) (5) | Sheet Hardness HRB | Test Sheet Material: .060" Stainless Steel (4) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Installation (lbs.) | Pushout (lbs.) | Torque-out (in. lbs.) | Pull-thru (lbs.) |
| Unified | 440 | 11 | 87 | 9000 | 450 | 16 | 800 |
| | 632 | 22 | 87 | 9500 | 540 | 27 | 1350 |
| | 832 | 35 | 86 | 11200 | 780 | 58 | 1800 |
| | 032 | 51 | 86 | 12000 | 800 | 95 | 2250 |
| | 0420 | 117 | 86 | 23000 | 1600 | 156 | 3900 |

| | Thread Code | Recommended Nut Tightening Torque (N·m) (5) | Sheet Hardness HRB | Test Sheet Material: 1.5 mm Stainless Steel (4) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Installation (kN) | Pushout (N) | Torque-out (N·m) | Pull-thru (N) |
| Metric | M3 | 1.3 | 87 | 40 | 2220 | 1.8 | 3500 |
| | M4 | 3.8 | 86 | 50 | 3210 | 6.5 | 8000 |
| | M5 | 6 | 86 | 53 | 3560 | 10.7 | 10000 |
| | M6 | 11 | 86 | 100 | 4200 | 15.9 | 14900 |

(1) Failure occurs in screw stripping using a 60 ksi screw and the shortest shank length fastener.
(2) Torque values shown will produce a preload of 70% of axial tensile strength with nut factor "k" equal to .2. Threads may strip or head of the nut may bend and/or fail if screw is over-torqued beyond these values or if actual k value is less than .2.
(3) Joint failure in torque-out and pull-thru will depend on the strength and type of screw being used. In some cases the failure will be in the screw and not in the self-clinching standoff. Please contact our Applications Engineering group with any questions.
(4) Performance may be reduced for studs installed into thicker sheets.
(5) Tightening torque shown is a theoretical value calculated to induce a load of 75% of minimum axial yield strength of the stud with an assumed K.

## Performance Data

### FHP™ Studs

| | Thread Code | Recommended Nut Tightening Torque (in. lbs.) (2) | Sheet Hardness HRB | Test Sheet Material: .060" Stainless Steel (1) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Installation (lbs.) | Pushout (lbs.) | Torque-out (in. lbs.) | Pull-thru (lbs.) |
| Unified | 440 | 8.1 | 86 | 9000 | 520 | 10.6 | 605 |
| | 632 | 16 | 86 | 9500 | 670 | 19.5 | 940 |
| | 832 | 28 | 86 | 11200 | 785 | 37.5 | 1415 |
| | 032 | 34 | 86 | 12000 | 800 | 59.5 | 1500 |

| | Thread Code | Recommended Nut Tightening Torque (N·m) (2) | Sheet Hardness HRB | Test Sheet Material: 1.5 mm (for M4&M5) 2 mm (for M3) Stainless Steel (1) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Installation (kN) | Pushout (N) | Torque-out (N·m) | Pull-thru (N) |
| Metric | M3 | 1.3 | 86 | 40 | 2500 | 1.6 | 3500 |
| | M4 | 2.9 | 86 | 50 | 3000 | 3.9 | 6000 |
| | M5 | 4.4 | 86 | 53 | 3560 | 7.35 | 7320 |

### SGPC™ Studs

| | Thread Code | Max. Rec. Tightening Torque For Mating Nut (in. lbs.) | Sheet Hardness HRB | Test Sheet Material: Single sheet of .039" 300 Series Stainless Steel | | | |
|---|---|---|---|---|---|---|---|
| | | | | Installation (lbs.) | Pushout (lbs.) | Torque-out (in. lbs.) | Pull-thru (lbs.) |
| Unified | 256 | 2.3 | 92 | 4000 | 425 | 5.2 | 415 |
| | 440 | 5 | 92 | 5000 | 450 | 8 | 512 |
| | 632 | 9 | 92 | 5500 | 460 | 15.8 | 811 |
| | 832 | 17 | 92 | 6500 | 480 | 29.3 | 1133 |
| | 032 | 27 | 92 | 7300 | 545 | 42.8 | 1273 |
| | 0420 | 58 | 92 | 10000 | 565 | 76.7 | 1721 |

| | Thread Code | Max. Rec. Tightening Torque For Mating Nut (N·m) | Sheet Hardness HRB | Test Sheet Material: Single sheet of 1 mm 300 Series Stainless Steel | | | |
|---|---|---|---|---|---|---|---|
| | | | | Installation (kN) | Pushout (N) | Torque-out (N·m) | Pull-thru (N) |
| Metric | M2.5 | 0.41 | 92 | 20.1 | 2546 | 0.86 | 2561 |
| | M3 | 0.74 | 92 | 21.8 | 2051 | 1.35 | 2851 |
| | M4 | 1.7 | 92 | 28.5 | 2396 | 2.66 | 4000 |
| | M5 | 3.5 | 92 | 35.6 | 3200 | 5.96 | 4284 |
| | M6 | 5.9 | 92 | 42.3 | 3262 | 9.19 | 6311 |

### TP4™ Pins

| | Pin Diameter Code | Test Sheet Material: 300 Series Stainless Steel | |
|---|---|---|---|
| | | Installation (lbs.) | Pushout (lbs.) |
| Unified | 125 | 8000 | 350 |
| | 187 | 12000 | 570 |
| | 250 | 14000 | 650 |

| | Pin Diameter Code | Test Sheet Material: 300 Series Stainless Steel | |
|---|---|---|---|
| | | Installation (kN) | Pushout (N) |
| Metric | 3MM | 35 | 1556 |
| | 4MM | 45 | 2335 |
| | 5MM | 54 | 2535 |
| | 6MM | 60 | 2891 |

### PFC4™ Captive Panel Screws

| | Thread Code | Test Sheet Material: 300 Series Stainless Steel | |
|---|---|---|---|
| | | Installation (lbs.) | Retainer Pushout (lbs.) |
| Unified | 440 | 9100 | 350 |
| | 632 | 10300 | 400 |
| | 832 | 10800 | 450 |
| | 032 | 11800 | 550 |

| | Thread Code | Test Sheet Material: 300 Series Stainless Steel | |
|---|---|---|---|
| | | Installation (kN) | Retainer Pushout (N) |
| Metric | M3 | 40.5 | 1557 |
| | M4 | 48 | 2002 |
| | M5 | 52.5 | 2447 |

### SFP™ Fasteners

| Type and Size | Thickness Code | Test Sheet Material: Stainless Steel | | | |
|---|---|---|---|---|---|
| | | Installation | | Pushout of Panel 2 (3) | |
| | | kN | lbs. | N | lbs. |
| SFP-3 | 1.0 | 13.5 | 3000 | 620 | 140 |
| SFP-3 | 1.2 | 20 | 4500 | 830 | 186 |
| SFP-3 | 1.6 | 22 | 5000 | 1500 | 340 |
| SFP-5 | 1.0 | 18 | 4000 | 990 | 222 |
| SFP-5 | 1.2 | 27 | 6000 | 1158 | 260 |
| SFP-5 | 1.6 | 33 | 7500 | 3117 | 701 |

(1) Performance may be reduced for studs installed into thicker sheets.
(2) Tightening torque shown is a theoretical value calculated to induce a load of 75% of minimum axial yield strength of the stud with an assumed K.
(3) In most applications, pullout strength of the SpotFast® fastener in Panel 1 exceeds pushout strength of Panel 2.

## Other Fasteners For Consideration To Use In Stainless Steel Sheets

### PF11MW™ Captive Panel Screws
Floating captive panel screw with unique flare-mount feature allows fastener to "float" in mounting hole and compensate for mating thread alignment. (See PEM® PF Datasheet)

### PF11MF™ Cative Panel Screws
Flare-mounted captive panel screw that installs into any panel material and is flush on back side of panel. (See PEM® PF Datasheet)

### MPP™ Pins
Self-clinching microPEM® pins that can be installed into stainless steel sheets as thin as .02"/0.5mm. (See PEM® MPF Datasheet)

### MSO4™ Standoffs
Self-clinching microPEM® standoffs that can be installed into stainless steel sheets as thin as .016"/0.4mm. (See PEM® MPF Datasheet)

### T4™ Tackpin® Fasteners
microPEM® TackPin® fasteners enable sheet-to-sheet attachment in stainless steel sheets in applications where disassembly is not required. (See PEM® MPF Datasheet)

### WN/WNS Weld Nuts
Designed to overcome many problems such as burn-outs, complicated electrodes and pilots, indexing and re-tapping to remove weld spatter. (See PEM® WN Datasheet)

### ATLAS® Blind Threaded Inserts
Attach to panels of any hardness and provide strong and reusable permanent threads in sheet materials where only one side is accessible. (See ATLAS® Catalog)

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

Custom sizes are available on special order. Contact us for more information.

## Installation Into Stainless Steel Sheets Dos And Don'ts

### "DOS"

**DO** select the proper fastener material to meet corrosion requirements.
**DO** make certain that panel material is in the annealed condition.
**DO** make certain that hole punch is kept sharp to minimize work hardening around hole.
**DO** provide mounting hole of specified size for each fastener.
**DO** maintain the hole punch diameter to no greater than +.001"/.025 mm over the minimum recommended mounting hole.
**DO** make certain that fastener is properly positioned within hole before applying installation force.
**DO** make certain that fastener is not installed adjacent to bends or other highly cold-worked areas.
**DO** apply squeezing force between parallel surfaces.
**DO** utilize recommended installation tooling when installing fasteners.
**DO** install fastener in punched side of hole.
**DO** apply sufficient force to totally embed clinching ring (where applicable) around entire circumference and to bring shoulder squarely in contact with sheet. For all other fasteners, installation will be complete when the head is flush with the panel surface.

### "DON'TS"

**DON'T** attempt to install any self-clinching fastener other than types SP, SMPP, A4, LA4, F4, SO4, BSO4, TSO4, FH4, FHP, SGPC, TP4, PFC4, and SFP into a stainless steel sheet.
**DON'T** deburr mounting holes on either side of sheet before installing fasteners – deburring will remove metal required for clinching fastener into sheet.
**DON'T** install fastener closer to edge of sheet than minimum edge distance – unless a special fixture is used to restrict bulging of sheet edge.
**DON'T** install fastener near bends or other highly cold worked areas where sheet hardness may be greater than the limit for the fastener.
**DON'T** over-squeeze. It will crush the head, distort threads, and buckle the sheet. Be certain to determine optimum installation force by test prior to production runs.
**DON'T** attempt to insert fastener with a hammer blow – under any circumstances. A hammer blow won't permit the sheet metal to flow and develop an interlock with the fastener's contour.
**DON'T** install screw in the head side of fastener. Install from opposite side so that the fastener load is toward sheet. The clinching force is designed only to hold the fastener during handling and to resist torque during assembly.

All PEM® products meet our stringent quality standards. If you require additional industry or other specific quality certifications, special procedures and/or part numbers are required. Please contact your local sales office or representative for further information.

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.

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