

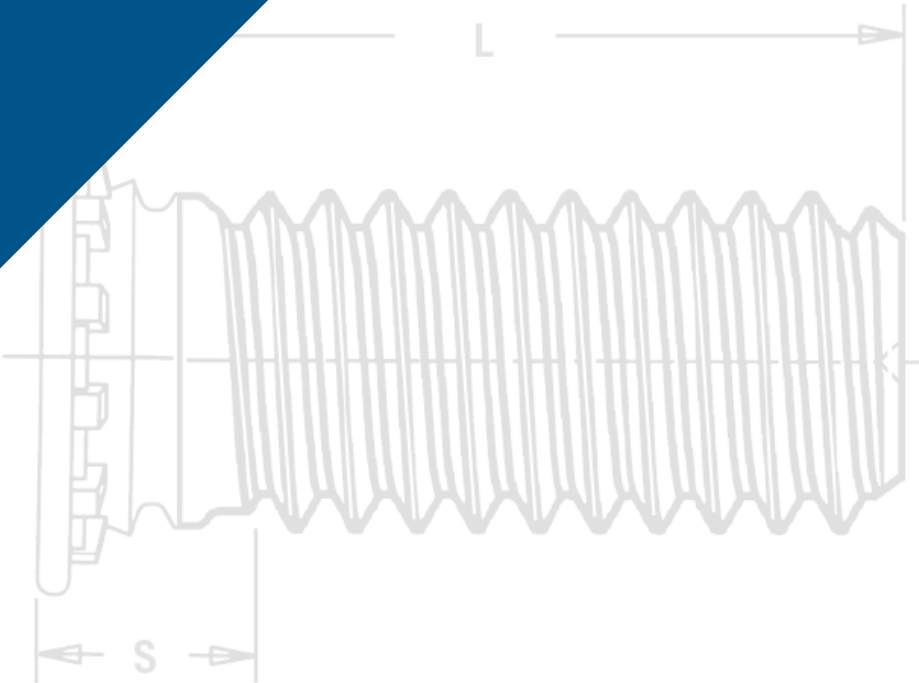


PEM® brand fasteners utilize self-clinching, broaching, flaring, surface mount, bonding or weld technology to provide strong, reusable, and permanent threads and mounting points in thin sheet metal, P.C. board or other rigid materials.



INDEX

QUICK PRODUCT LOCATOR



PEM® FASTENER IDENTIFICATION MARKS

To help you identify genuine PEM® brand fasteners, most are marked by one of our trademarks or identifiers. Genuine PEM fasteners can only be purchased from one of our authorized worldwide distributors. For a complete listing of these distributors, check our web site: www.pemnet.com.

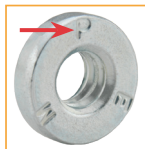
Trademark PEM® Dimple



CFHA, CFHC, CHA, CHC, FH, FH4, FHA, FHL, FHLS, FHP, FHS, FHX, HF109, HFG8, HFE, HFH, HFHB, HFHS, HFLH, HSCB, KFH, KSSB, MPP, PF10, PF30, PF31, PF32, PF50, PF51, PF52, PF60, PF61, PF62, PF11, PF11M, PF11MF, PF11MW, PF11PM, PF12, PF12M, PF12MF, PF12MW, PF7M, PF7MF, PFC2, PFC2P, PFC4, PFHV, PFK, PFS2, PSHP, SCB, SCBJ, SCBR, SF, SFK, SFP, SFW, SGPC, SKC, SKC-F, SMTPFLSM, SMTSS, SMTSK SSA, SSC, SSS, T, T4, TFH, TFHS, THFE, TK4, TKA, TP4, TPS, TPXS, and TS fasteners

Trademark PEM® Stamp

CLS, CLSS, H, HN, HNL, PSHP, S, SFN, SL, SMPP, SMPS, SS, and WN fasteners



Trademark PEM® Skirted Shoulder

PF11, PF11M, PF11MF, PF11MW, PF11PM, PF12, PF12M, PF12MF, PF12MW, PF7M, and PF7MF fasteners



Trademark PEM® "Two Groove"

B, BS, BSO, BSON, BSOS, CSOS, CSS, DSO, DSOS, HSR, KF2, KFB3, KFE, KFS2, KFSE, PF7M, PF7MF, SMTSO, SMTSOB, SMTPFLSM, SO, SOA, SOAG, SON, SOS, SOSG, TSO, TSOA, and TSOS fasteners



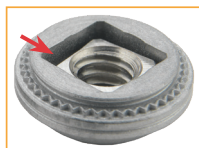
Trademark PEM® "Single Groove"

A4, BSO4, LA4, MSO4, PFC4, SO4, SP (Select sizes), and TSO4 fasteners



Trademark PEM® "Double Squares"

A4, AC, AS, LA4, LAC, and LAS fasteners



Trademark PEM® C.A.P.S.® Dot Pattern

PF11PM fastener



Trademark PEM® Circle on Pedestal

RAS fastener



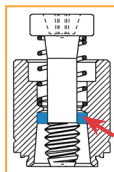
Trademark PEM® Double Notch

microPEM® SMTSO fastener



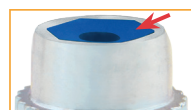
PEM® Blue Nylon Ring

PFC4, PFC2P, PFC2, PFS2, and PFK fasteners



Trademark PEM® Blue Nylon Locking Element

PL, PLC and CFN fasteners



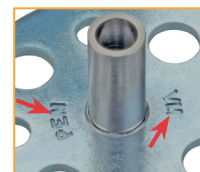
Trademark ATLAS® AE Stamp

MaxTite® and Plus+Tite® products



Trademark PEM VM® Stamp

(Both Sides)
VariMount™ Base Plates



Trademark PEM® SH Stamp

SH fasteners



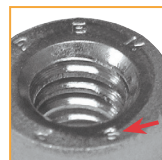
PEM® RT Stamp

S-RT fasteners



Trademark PEM® SP Stamp

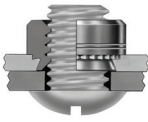

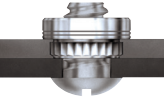
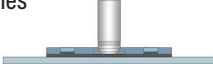
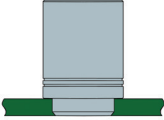
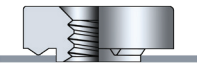
SP fasteners















PEM® SMPP Stamp














SMPP fasteners
















SC Self-clinching fasteners are pressed into sheet metal panels as thin as .016" / 0.4 mm. 	FM Flare Mounted fasteners can be installed into almost any rigid type of panel. 
B Broaching fasteners are pressed into P.C. board or other plastic materials as thin as .060" / 1.53 mm. 	VM VariMount® bonding fasteners are assemblies comprised of a standard PEM fastener mounted permanently into base plates. 
SM Surface Mounted fasteners on tape and reel are soldered to a PC board in the same way as other surface mount components. 	W Weld nuts are designed specially to be welded into place. 



























(Products are listed alphabetically by type. Refer to matching color square for mounting style)













A4, AC, AS Bulletin ALA  Nuts with load-bearing, non-locking threads that permits up to .030"/0.76mm adjustment for mating hole misalignment. SC	FE, FE0, FE0X, FEX Bulletin FE  Miniature nuts with strong threads. Available with locking or non-locking threads. SC
B, BS Bulletin B  Nuts used in applications requiring closed thread ends. Blind end limits screw penetration and excludes foreign matter. SC	FH, FH4, FHA, FHP, FHS Bulletin FH  Flush-head studs with high pushout and torque-out resistances. SC
BS0, BS04, BS0A, BS0S Bulletin S0  Blind threaded standoffs installed with their heads flush with one surface of the mounting sheets. SC	FHL, FHLS Bulletin FH  Low-displacement head studs can be installed close to the edge of a sheet without causing the edge to bulge. SC
CFN Bulletin LN  Broaching, nylon insert, self-locking nuts for use in thinner sheet, close-to-edge applications. SC	FHX Bulletin FH  Flush-head studs with X-Press™ thread profile are typically used with push-on or other plastic fasteners. SC
CFHA, CFHC, CHA, CHC Bulletin CH  Concealed-head studs installed into a blind milled hole where surface opposite stud must remain unmarred. SC	H, HNL Bulletin CL  Nuts with self-locking or non-locking threads that provide high pushout and torque-out resistances. SC
CLA, CLS, CLSS Bulletin CL  Nuts that provide load-bearing threads in thin sheets with high pushout and torque-out resistances. SC	HF109 Bulletin FH  Property class 10.9 high tensile strength studs meeting 1040 MPa minimum. SC
CS0S, CSS Bulletin CH  Concealed-head standoffs installed into a blind milled hole where surface opposite standoff must remain unmarred. SC	HFE Bulletin FH  Studs designed with an enlarged head diameter to provide high-strength in thin sheets. SC
DS0, DS0S Bulletin S0  Threaded standoffs for use in close-to-edge applications. SC	HF68 Bulletin FH  Grade 8 high tensile strength studs meeting 150 ksi minimum. SC
F, F4 Bulletin F  PEMCERT® flush fasteners are flush with both sides of the sheet. SC	HFH, HFHB, HFHS Bulletin FH  Studs for high-strength applications with high pull through resistance. SC












HFLH	Bulletin FH
 Studs are for installation into thin, harder, high-strength materials.	SC
HSCB	Bulletin PF
 Heat sink mounting system. HSCB (screw), HSR (nut) and HSL (spring).	SC B
KF2, KFS2	Bulletin K
 Nuts, internally threaded, for mounting on P.C. boards.	B
KFB3	Bulletin K
 Flare-mounted standoffs for mounting on P.C. boards with greater pullout performance.	B
KFE, KFSE	Bulletin K
 Threaded or unthreaded standoffs mounted on P.C. boards for stacking or spacing.	B
KFH	Bulletin K
 Threaded studs for use as solderable connectors or as permanently mounted studs on P.C. boards.	B
KSSB	Bulletins K & SSA
 SNAP-TOP® standoffs featuring a spring action to hold a P.C. Board securely without screws or threaded hardware.	SC
LA4, LAC, LAS	Bulletins ALA & LN
 Nuts with load-bearing, self-locking threads that permits up to .030" / 0.76 mm adjustment for mating hole misalignment.	SC
LK, LKA, LKS	Bulletin LN
 Nuts with a unique PEMFLEX® self-locking feature permitting repeated use and effective prevailing locking torque.	SC
MPP	Bulletin MPF
 microPEM® pins that can be installed into sheets as thin as 0.5 mm.	SC
MSIB	Bulletin MPF
 microPEM® symmetrical designed thru-threaded inserts for plastics for use in straight or tapered holes.	Inserts
MSO4	Bulletin MPF
 microPEM® standoffs that can be installed into sheets as thin as .016" / 0.4 mm.	SC
MSOFS	Bulletin MPF
 microPEM® flaring standoffs attached permanently in panels as thin as .008" / 0.2 mm of any hardness including stainless steel.	FM

PEM C.A.P.S.®	Bulletin PF
 Colored Access Panel Screws with plastic cap. Key features include Phillips drive and MATHread® anti-cross threading feature.	SC FM
PF10	Bulletin PF
 Flush-mounted panel screw components. N10 (nut), PR10 (retainer) and PS10 (screw).	SC
PF11, PF11M	Bulletin PF
 Panel fastener assembly with knurled cap and universal slot/Phillips recess. Available with anti cross-thread feature.	SC
PF11MF	Bulletin PF
 Flare-mounted captive screw assembly with anti cross-thread feature.	FM
PF11MW	Bulletin PF
 Floating captive screw assembly allows for mating hole misalignment.	FM
PF12, PF12M	Bulletin PF
 Panel fastener assembly with smooth cap and universal slot/Phillips recess. Available with anti cross-thread feature.	SC
PF12MF	Bulletin PF
 Flare-mounted captive screw assembly with anti cross-thread feature.	FM
PF12MW	Bulletin PF
 Floating captive screw assembly allows for mating hole misalignment.	FM
PF30, PF31, PF32	Bulletin PF
 Low-profile panel fastener assembly with large knurled head for tool or hand operation.	SC
PF50	Bulletin PF
 Low-profile panel fastener assembly with large knurled cap and Phillips recess for tool or hand operation.	SC
PF60	Bulletin PF
 Low-profile panel fastener assembly with large smooth cap and Phillips recess for tool or hand operation.	SC
PF7M	Bulletin PF
 Small, compact, and low-profile self-clinching captive panel screws designed for limited access areas.	SC
PF7MF	Bulletin PF
 Small, compact, and low-profile flaring captive panel screws designed for limited access areas.	FM



PFC2, PFS2	Bulletin PF
	Spring-loaded panel fastener assembly for tool or hand operation. SC
PFC2P	Bulletin PF
	Panel fastener assembly with Phillips recess for tool only operation. SC
PFC4	Bulletin PF & SS
	Panel fastener assembly for installation into stainless steel sheets with Phillips recess for tool only operation. SC
PFHV	Bulletin PF
	Low-cost panel fastener assembly with universal slot/Phillips recess for tool or hand operation. SC
PFK	Bulletins K & PF
	Panel fastener assembly for mounting on P.C. boards. B
PL, PLC	Bulletin LN
	PEMHEX® self-locking nuts with a nylon hexagonal element to provide a reusable prevailing torque thread lock. SC
PSHP	Bulletin K
	Surface mount panel fastener screw that is used with Type SMTPR retainer. SM
PSL2, PTL2	Bulletin PF
	Spring-loaded plunger assembly. Quick lockout feature on Type PTL2 holds plunger in retracted position. SC
RAA	Bulletin RA
	Self-tapping R'ANGLE® fasteners provide strong right angle attachment points in thin sheets. SC
RAS	Bulletin RA
	Threaded R'ANGLE® fasteners provide strong right angle attachment points in thin sheets. SC
S, SS	Bulletin CL
	Nuts that provide load-bearing threads in thin sheets with high pushout and torque-out resistances. SC
S-RT	Bulletin CL
	Free-running locknuts with a thread form that creates a lock when clamp load is applied. SC
SCB	Bulletin PF
	The spinning clinch bolt with axial float installs captive in panel and still spins freely. SC
SCBJ	Bulletin PF
	The spinning clinch bolt with jacking feature installs captive in panel and still spins freely. SC
SCBR	Bulletin PF
	The spinning clinch bolt with axial float utilizes self-retracting spring. SC
SF, SFP	Bulletin SF
	SpotFast® self-clinching fasteners create a permanent, flush joining of two sheets of metal. SC
SFK	Bulletin SF
	SpotFast® self-clinching fasteners create a permanent, flush joining of metal to PCB or plastic panels. SC B
SFN	Bulletin SFN
	Spinning flare nut is a one-piece, flanged hex nut that is permanently captive and still spins freely in the sheet. FM
SH	Bulletin CL
	Nuts are for installation into thin, harder, high-strength materials. SC
SFW	Bulletin SF
	SpotFast® self-clinching fasteners create a permanent, flush joining of two sheets of metal. The washer allows for consistent pivoting of the two metal panels. SC
SGPC	Bulletin FH
	Install into most panel material, provide strong torque-out resistance and are suitable for close centerline-to-edge situations. FM
SKC	Bulletin SK
	KEYHOLE® standoffs designed for a board to be quickly slipped into place and removed by sliding it sideways and lifting it off. SC
SKC-F	Bulletin SK
	KEYHOLE® sheet joining fasteners designed to quickly join two sheets flat against each other and then can be removed. SC
SL	Bulletins CL & LN
	Locknuts designed with a unique TRI-DENT® locking feature, which meets demanding locking performance requirements. SC
SMPS, SMPP	Bulletin CL
	Nuts that feature a lower profile and can be mounted closer to the edge of a sheet than standard self-clinching nuts. SC
SMTPLSM	Bulletin K
	Surface mount spring-loaded captive panel screws. SM

SMTPR	Bulletin K
	Surface mount panel fastener retainer that is used with Type PSHP screw. SM
SMTRA	Bulletin K
	Surface mount R'ANGLE® fasteners provide strong re-usable threads at right angle to PC board. SM
SMTSK	Bulletins SMTSK & K
	Surface mount KEYHOLE® standoffs that eliminate the need for attaching screws. SM
SMTSO, SMTSOB	Bulletin K
	Surface mount spacers and nuts are available threaded and unthreaded. SM
SMTSS	Bulletin K
	Surface mount standoffs that eliminate the need for attaching screws. SM
S0, S04, S0A, S0S	Bulletin S0
	Thru-hole threaded and unthreaded standoffs installed with their heads flush with one surface of the mounting sheets. SC
SOAG, SOSG	Bulletin S0
	Grounding standoffs for clinching into metal chassis with "gripping teeth" at opposite end to firmly contact mating board. SC
SP	Bulletins CL & SS
	Specially hardened self-clinching nuts for installation into stainless steel sheets. SC
SSA, SSC, SSS	Bulletin SSA
	SNAP-TOP® standoffs featuring a spring action to hold a P.C. board securely without screws or threaded hardware. SC
T, T4	Bulletin MPF
	microPEM® TackPin® fasteners for compact electronic assemblies enable sheet-to-sheet attachment. SC
TD	Bulletin TD
	TY-D® self-clinching tie-mounts provide secure attachment points for mounting wires to electronic chassis or enclosure. SC
TD0	Bulletin TD
	TY-D® self-clinching hooks enable users to easily attach, remove, and return tie-bundled wires to their mounting points. SC

TFH, TFHS	Bulletin FH
	Non-flush studs for sheets as thin as .020" / 0.51 mm. SC
THFE	Bulletin FH
	Heavy-duty studs for sheets as thin as .031" / 0.8 mm. SC
TK4, TKA	Bulletin MPF
	microPEM® TackSert® pins designed to hold a top panel to a bottom panel by broaching into the bottom panel. B
TPS, TP4	Bulletin FH
	Flush-mounted pilot pins with chamfered end to make mating hole location easy. SC
TPXS	Bulletin FH
	Alignment pin for ATCA® faceplate fastening solutions. SC
TS	Bulletin MPF
	TackScrew® fasteners enable cost-effective sheet-to-sheet attachment by simply pressing into place. Can be removed by simply unscrewing. SC
TS04	Bulletin S0
	Standoffs for installation into ultra-thin stainless steel sheets as thin as .025" / 0.63 mm. SC
TS0, TS0A, TS0S	Bulletin S0
	Standoffs provide permanent threads in ultra-thin sheets. SC
U, UL	Bulletin FE
	Miniature nuts with strong threads. Available with locking or non-locking threads. SC
VM	Bulletin VM
	The PEM® VariMount® bonding fasteners are assemblies comprised of a standard PEM® fastener mounted permanently into base plates. VM
WN, WNS	Bulletin WN
	Self-locating projection weld nuts. The engineered projections prevent burn-outs in thin sheets. W

SELF-CLINCHING FASTENER INSTALLATION DOS AND DON'TS

"Dos"

Do provide mounting hole of specified size for each fastener.

Do install fastener into punch side of sheet.

Do make certain that shank (or pilot) is within hole before applying installation force.

Do apply squeezing force between parallel surfaces.

Do apply sufficient force to totally embed clinching ring around entire circumference and to bring shoulder squarely in contact with sheet. For some fasteners, installation will be complete when the head is flush with the panel surface.

"Don'ts"

Don't attempt to install a 300 series stainless steel fastener into a stainless steel sheet.

Don't install steel or stainless steel fasteners in aluminum panels before anodizing or finishing.

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 indicated by manufacturer – unless a special fixture is used to restrict bulging of sheet edge.

Don't over-squeeze. It will crush the head, distort threads, and buckle the sheet. Approximate installation forces are listed in performance data tables. Use this info as a guide. 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.

Don't install fastener on pre-painted side of panel.

PEM® FASTENER PROTOTYPE KIT

The PEM prototype kit contains a wide variety of PEM fasteners for your prototype needs. The kit contains over 1,000 different nuts, studs, standoffs, and panel fasteners of various types and sizes, so you can choose the one which will best suit your specific design requirements. The kit is available with unified or metric parts. Price U.S. \$99.00 (subject to change without notice).



HOW CAN WE HELP?

PennEngineering offers a wide range of technical support assistance. Let us put our expertise to work for you. We can provide:

Training

- ▶ On customer site group or individual training by a technical representative and/or PEM® factory personnel
- ▶ Tutorial materials on website

Global Network of Engineering Representatives to:

- ▶ Provide local company liaison
- ▶ Provide application review/product selection
- ▶ Provide technical materials
- ▶ Provide on-site product training and new product updates
- ▶ Assist with quotations
- ▶ The representative nearest you can be found on our website. [rep/distributor locator](#)

Application Engineering Services and Online Tools

- ▶ Application analysis/review
- ▶ Custom solutions
- ▶ Online technical papers
- ▶ Get answers to technical questions at techsupport@pemnet.com
- ▶ Customer assist performance testing
- ▶ Cost Savings Investigation (CSI)
- ▶ Custom design and product development
- ▶ Customer drawings
- ▶ Finite Element Analysis (FEA)
- ▶ Free samples on standard (catalog) products
- ▶ 3D Models (download or direct insert free on website)
- ▶ Free design PEMspec™ APP
- ▶ Instructional videos and animations

Stay connected to PennEngineering

Now you can follow us for the latest news releases, new products, bulletin updates, tech tips, videos and more.



Technical Lab Services - Complete testing in accordance with NASM 25027, 45938 and ASTM as well as PEM® fastener test specs and customer parameters.

- ▶ Mechanical testing
- ▶ Compression
- ▶ Micro hardness (Knoop, Rockwell and superficial)
- ▶ Image analysis
- ▶ Tensile strength
- ▶ In sheet performance
- ▶ Thermal Cycling
- ▶ Corrosion and plating issues and analysis

Prototype Development Center - Shop equipped with latest CNC equipment to provide prototype or short run samples and necessary installation tooling. Capabilities include:

- ▶ Turning
- ▶ Milling
- ▶ Drilling
- ▶ 3D Printing
- ▶ Installation
- ▶ Reaming
- ▶ Punching
- ▶ Grinding
- ▶ Assembly

Installation Equipment

We can assess your application and recommend equipment that helps you achieve your lowest installed cost. PEMserter® and Haeger® systems can be developed to handle multiple fastener types simultaneously or even in-die equipment to address challenging component handling and fastener installation. For more information call us at 800-523-5321 (USA only) or 215-766-8853 or visit us at www.pemnet.com.



Haeger® 824 OneTouch 4e PEMserter® In-Die System

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.

PennEngineering®



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North America: Danboro, Pennsylvania USA • E-mail: info@pemnet.com • Tel: +1-215-766-8853 • 800-237-4736 (USA)

Europe: Galway, Ireland • E-mail: europa@pemnet.com • Tel: +353-91-751714

Asia/Pacific: Singapore • E-mail: singapore@pemnet.com • Tel: +65-6-745-0660

Shanghai, China • E-mail: china@pemnet.com • Tel: +86-21-5868-3688

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