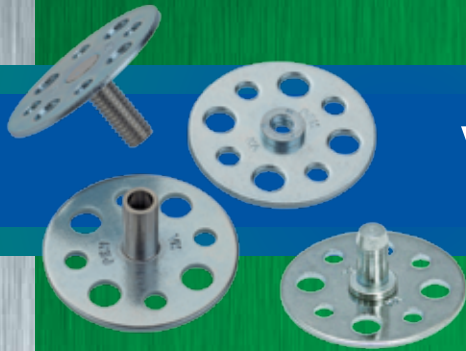PennEngineering®

NEW!

BULLETIN

VM™

**PEM® VARIMOUNT®
FASTENING SYSTEM**

PEM®

PEM® VARIMOUNT® FASTENING SYSTEM

The PEM® VariMount® fastening system is an assembly comprised of a standard PEM nuts, studs or standoffs mounted permanently into a base plate. The assembly can then be fastened or bonded to assorted panel types in a variety of ways:

Mounting Methods:
- Mold-in
- Laminate within composite layers
- Surface bonding
- Rivets
- Loose hardware (nuts, bolts, screws)

- Self-clinching fasteners
- Blind threaded rivets
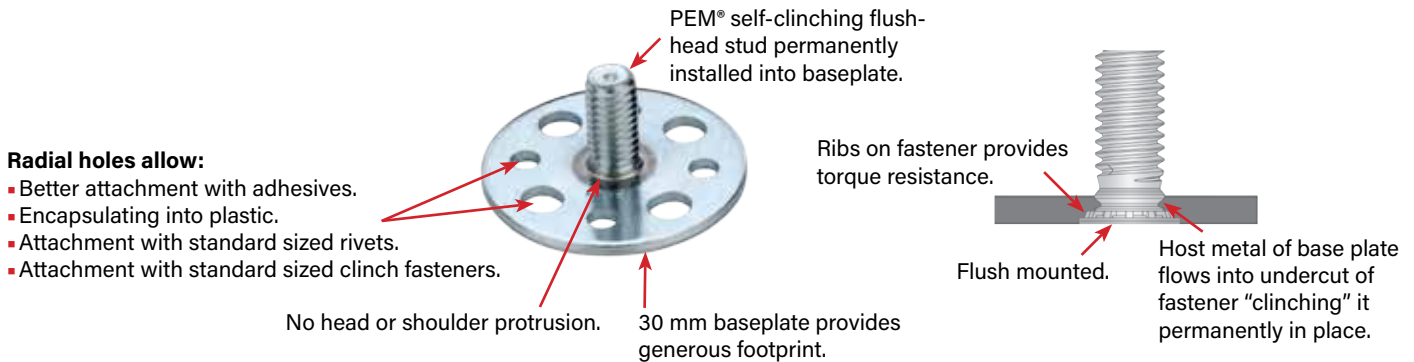- Hollow wall anchors
- Spot welding

Mounts on or in:
- Composites
- Plastics
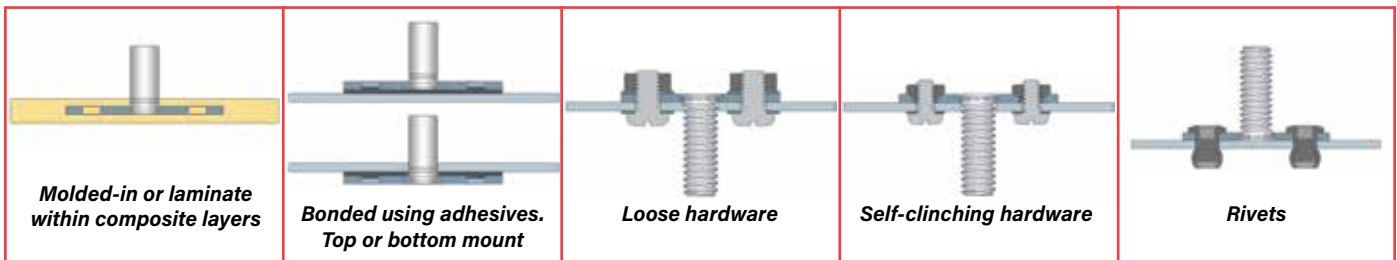- Metal
- Wall board
- Any rigid material or panel

VariMount assemblies are available with either steel or stainless steel base plates depending on the fastener that is selected. The VariMount base plate's radial holes provide various mounting options.

Base plates can also be purchased separately. See page 5 for dimensional data and part numbers.

VARIMOUNT® ASSEMBLY USING SELF-CLINCHING TECHNOLOGY

PEM® self-clinching flush-head stud permanently installed into baseplate.

Radial holes allow:
- Better attachment with adhesives.
- Encapsulating into plastic.
- Attachment with standard sized rivets.
- Attachment with standard sized clinch fasteners.

No head or shoulder protrusion.

30 mm baseplate provides generous footprint.

Ribs on fastener provides torque resistance.

Flush mounted.

Host metal of base plate flows into undercut of fastener "clinching" it permanently in place.

TYPICAL MOUNTING METHODS

Molded-in or laminate within composite layers	*Bonded using adhesives. Top or bottom mount*	*Loose hardware*	*Self-clinching hardware*	*Rivets*

ASSEMBLY PART NUMBER DESIGNATION

| VM | | 30 | FH – | 0420 – | 16 | ZI |
| VM | C | 30 | FHP – | 032 – | 16 | |

| VariMount Fastener Style | Base Plate Material Code [1] | Base Plate Diameter [2] | Fastener Type | Fastener Thread Code | Fastener Length Code | Fastener Finish Code [3] (if applicable) |

Base plate prefix | PEM® fastener part number

A VariMount® assembly part number includes a base plate prefix paired with a standard PEM® fastener part number.

(1) "Blank" equals steel base plate and "C" equals stainless steel base plate.
(2) See page 5 for complete dimensional information.
(3) Required on steel assemblies.

PEM® VARIMOUNT® FASTENING SYSTEM

The charts below show PEM® fastener types/sizes that are offered as standard VariMount assemblies.

Install screw from this side
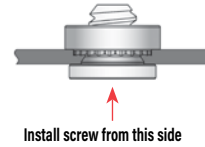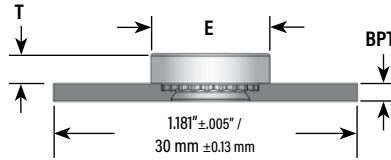
STANDARD NUTS

All dimensions are in inches.

	Thread Size	Type and Material		Thread Code	Shank Code	BPT ±.004	E ±.010	T ±.010
		Steel	Stainless Steel					
U N I F I E D	.112-40 (#4-40)	VM30S-	VMC30SP-	440	1	.048	.250	.070
	.138-32 (#6-32)	VM30S-	VMC30SP-	632	1	.048	.280	.070
	.164-32 (#8-32)	VM30S-	VMC30SP-	832	1	.048	.310	.090
	.190-32 (#10-32)	VM30SS-	VMC30SP-	032	2	.063	.340	.090

All dimensions are in millimeters.

	Thread Size x Pitch	Type and Material		Thread Code	Shank Code	BPT ±0.1	E ±0.25	T ±0.25
		Steel	Stainless Steel					
M E T R I C	M3 x 0.5	VM30S-	VMC30SP-	M3	1	1.2	6.35	1.5
	M4 x 0.7	VM30S-	VMC30SP-	M4	1	1.2	7.87	2
	M5 x 0.8	VM30SS-	VMC30SP-	M5	2	1.6	8.64	2

Closed End
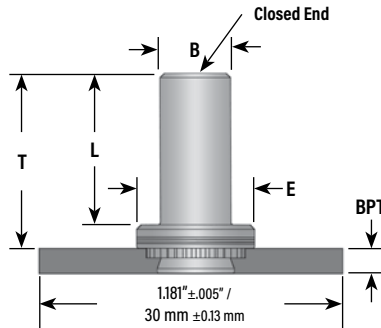
BLIND NUTS

All dimensions are in inches.

	Thread Size	Type and Material	Thread Code	Shank Code	BPT ±.004	B Max.	E ±.010	L Max.	T ±.010
		Steel							
U N I F I E D	.112-40 (#4-40)	VM30B-	440	1	.048	.150	.250	.335	.380
	.138-32 (#6-32)	VM30B-	632	1	.048	.169	.280	.335	.380
	.164-32 (#8-32)	VM30B-	832	1	.048	.204	.310	.385	.440
	.190-32 (#0-32)	VM30B-	032	2	.063	.235	.340	.385	.440

All dimensions are in millimeters.

	Thread Size	Type and Material	Thread Code	Shank Code	BPT ±0.1	B Max.	E ±0.25	L Max.	T ±0.25
		Steel							
M E T R I C	M3 x 0.5	VM30B-	M3	1	1.2	3.84	6.35	8.5	9.6
	M4 x 0.7	VM30B-	M4	1	1.2	5.2	7.95	9.8	11.2
	M5 x 0.8	VM30B-	M5	2	1.6	6.02	8.75	9.8	11.2

The charts below show PEM® fastener types/sizes that are offered as standard VariMount assemblies.

1.181"±.005" /
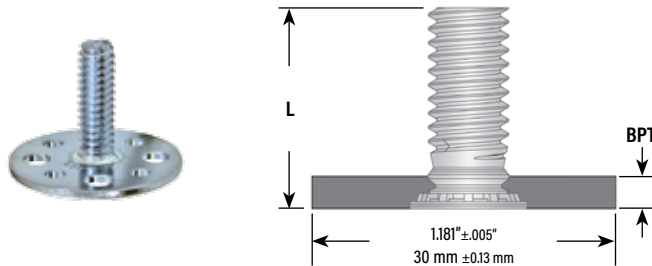30 mm ±0.13 mm

Closed end

STANDOFFS

All dimensions are in inches.

	Thread Size	Type and Material	Thread Code	Length Code "L" +.002 -.005 (Length code in 32nds of an inch)							BPT ±.004	C +.000 -.005
		Steel		.375	.437	.500	.562	.625	.687	.750		
UNIFIED	.112-40 (#4-40)	VM30BSO-	440	12	14	16	18	20	22	24	.048	.165
	.138-32 (#6-32)	VM30BSO-	632	12	14	16	18	20	22	24	.048	.212

All dimensions are in inches.

	Thread Size x Pitch	Type and Material	Thread Code	Length Code "L" +0.05 -0.13 (Length code in millimeters)				BPT ±0.1	C -0.13
		Steel							
METRIC	M3 x 0.5	VM30BSO-	M3	12	14	16	18	1.2	4.2
	M3.5 x 0.6	VM30BSO-	3.5M3	12	14	16	18	1.2	5.39

1.181"±.005"
30 mm ±0.13 mm

STUDS

All dimensions are in inches.

	Thread Size	Type and Material		Thread Code	Length Code "L" ±.015 (Length code in 16ths of an inch)						BPT ±.004
		Steel	Stainless Steel		.500	.625	.750	.875	1.00	1.25	
UNIFIED	.164-32 (#8-32)	VM30FH-	VMC30FHP-	832	8	10	12	14	16	20	.048
	.190-32 (#10-32)	VM30FH-	VMC30FHP-	032	8	10	12	14	16	20	.048
	.250-20 (1/4-20)	VM30FH-	—	0420	8	10	12	14	16	20	.067

All dimensions are in inches.

	Thread Size x Pitch	Type and Material		Thread Code	Length Code "L" ±0.4 (Length code in millimeters)						BPT ±0.1
		Steel	Stainless Steel								
METRIC	M4 x 0.7	VM30FH-	VMC30FHP-	M4	10	12	15	18	20	25	1.2
	M5 x 0.8	VM30FH-	VMC30FHP-	M5	10	12	15	18	20	25	1.2
	M6 x 1	VM30FH-	—	M6	10	12	15	18	20	25	1.7

BASE PLATE PART NUMBER, DIMENSIONS AND MATERIAL GUIDE

Center Hole X

(4) Radial Holes [1]
4.8 mm +0.08 mm
.189″ +.003″ -.000″

30 mm ±0.13 mm /
1.181″±.005″

Centers of 8 radial holes equally spaced
on 20 mm ±0.13 mm / .787″ ±.005″ nominal
diameter circle

(4) Radial Holes [2]
3.33 mm +0.13 mm
.131″ +.005″ -.000″

Shown actual size.

BASE PLATE PART NUMBER DESIGNATION

BP   1.2 – 422 – 30   ZI

BP   C   1.2 – 422 – 30

| Type | Plate Material Code [3] | Plate Thickness Code | Mounting Hole "X" Code | Base Plate Outside Dia. Code | Finish Code (for steel) |
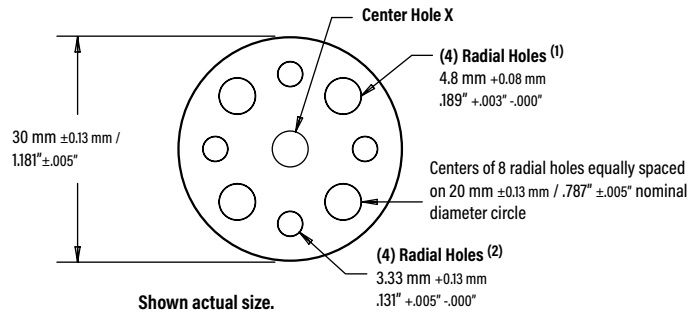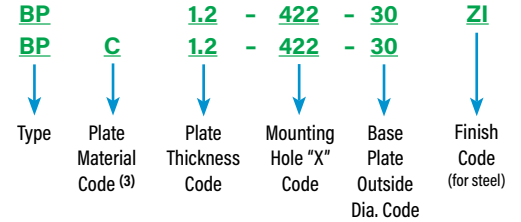
Base Plate Part Number [4]		Thickness ±0.1 mm / ±.004″	Center Hole X Diameter +0.08 mm / +.003″ -.000″
Steel [5]	Stainless Steel [6]		
BP1.2-422-30ZI	BPC1.2-422-30	1.2 mm / .048″	4.22 mm / .166″
BP1.2-480-30ZI	BPC1.2-480-30	1.2 mm / .048″	4.8 mm / .189″
BP1.2-541-30ZI	BPC1.2-541-30	1.2 mm / .048″	5.41 mm / .213″
BP1.6-635-30ZI	BPC1.6-635-30	1.6 mm / .063″	6.35 mm / .250″
BP1.2-400-30ZI	BPC1.2-400-30	1.2 mm / .048″	4 mm / .1575″
BP1.2-500-30ZI	BPC1.2-500-30	1.2 mm / .048″	5 mm / .1969″
BP1.6-600-30ZI	BPC1.6-600-30	1.6 mm / .063″	6 mm / .2362″
BP1.7-600-30ZI	BPC1.7-600-30	1.7 mm / .067″	6 mm / .2362″

(1) Accepts standard M3.5 / #6-32 self-clinching nuts. Also flush-head studs #10-24 / #10-32 sizes. May also accept 4.8 mm / 3/16″ rivet.
(2) Standard hole size for 3.2 mm / 1/8″ rivet.
(3) "Blank" equals steel base plate and "C" equals stainless steel base plate.
(4) Use this part number if ordering base plate separately. Minimum quantities may apply.
(5) Base plate is carbon steel, zinc plated 5μm, colorless.
(6) Base plate is 300 series stainless steel, passivated and/or tested per ASTM A380.

NOTE ABOUT PERFORMANCE

General performance of PEM® fasteners in thin metal panels can be found in their respective PEM Bulletins. Performance of the assembly (fastener and base plate) mounted to your specific material, in your application will have to be determined by testing. We recommend that you perform testing to be sure it is ideally suited to your application. We will be happy to provide technical assistance and/or samples to you for this purpose.

Look for the trademarks to identify genuine PEM fasteners.

"PEM" Stamp

Dimple

Two Grooves

"PEM SP" Stamp

"PEM VM" Stamp on both sides
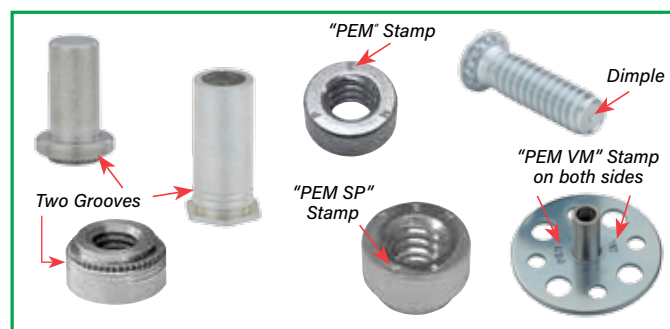
OTHER PEM FASTENER TYPES AND SIZES AVAILABLE *

While we have listed the standard offering of assemblies on the charts (pages 3 and 4), other PEM fasteners can be provided pre-installed into one of the base plates listed on page 5. The charts below give a review of these fastener types. To choose an assembly using one of these fasteners, simply create a part number as described on page 2.
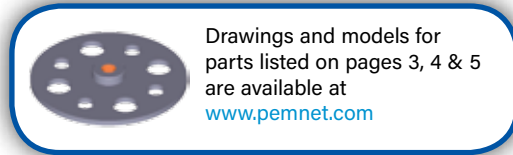
PEM® Fastener Types	Standard Size Codes
Self-clinching Nuts	
CLS	256 / 348 / 440 / 632 / 832 / M2 / M2.5 / M3 / M3.5 / M4
CLSS	024 / 032 / M5
S	256 / 348 / M2 / M2.5 / M3.5
SS	024
SP	256/ 024
SL	440 / 632 / 832 / 032 / M3 / M3.5 / M4 / M5
BS	440 / 632 / 832 / 032 / M3 / M4 / M5
PL, PLC	M3
LK, LKS	440 / M3
Self-clinching Studs	
FH	024 / Non-threaded
FH4	832 / 032 / 0420 / M4 / M5 / M6
FHS	832 / 024 / 032 / 0420 M4 / M5 / M6 / Non-threaded
HFH, HFHS	0420 / M6
HFE	032 / 0420 / M5 / M6

PEM® Fastener Types	Standard Size Codes
Self-clinching Standoffs	
DSO, DSOS	440 / M3
SSC, SSS	156 / 4MM
SOSG	6440 / 3.5M3
SO, *SO4*	6440 / 3.5M3 / M3.5 / Non-threaded
SOS	440 / 632 / 6440 / 3.5M3 / M3 / M3.5 / Non-threaded
BSO, BSOS, *BSO4*	440 / 632 / 6440 / M3 / 3.5M3 / M3.5
Panel Fasteners	
PF11, PF12, PF11M, PF12M	632
PF11MF, PF12MF	440 / M3
PF11MW, PF12MW	440 / M3
PF11PM	632
PF7M	632
PF7MF	440 / M3
PF30	832
PF31, PF32	832 / M4
PF50, PF51, PF52, PF60, PF61, PF62	832 / M4
SCB, SCBJ	M4
SCBR	832 / M4
N10	440 / 632 / 832 / M3

Types shown in bold italics can be installed into stainless steel base plates. Other types are not recommended for installation into stainless steel base plates.

* *Other fasteners, base plate configurations and assemblies are available on special order. For questions, please contact our global technical support team using the contact information listed at the bottom of this page. Appropriate minimum quantities may apply.*

Drawings and models for parts listed on pages 3, 4 & 5 are available at www.pemnet.com