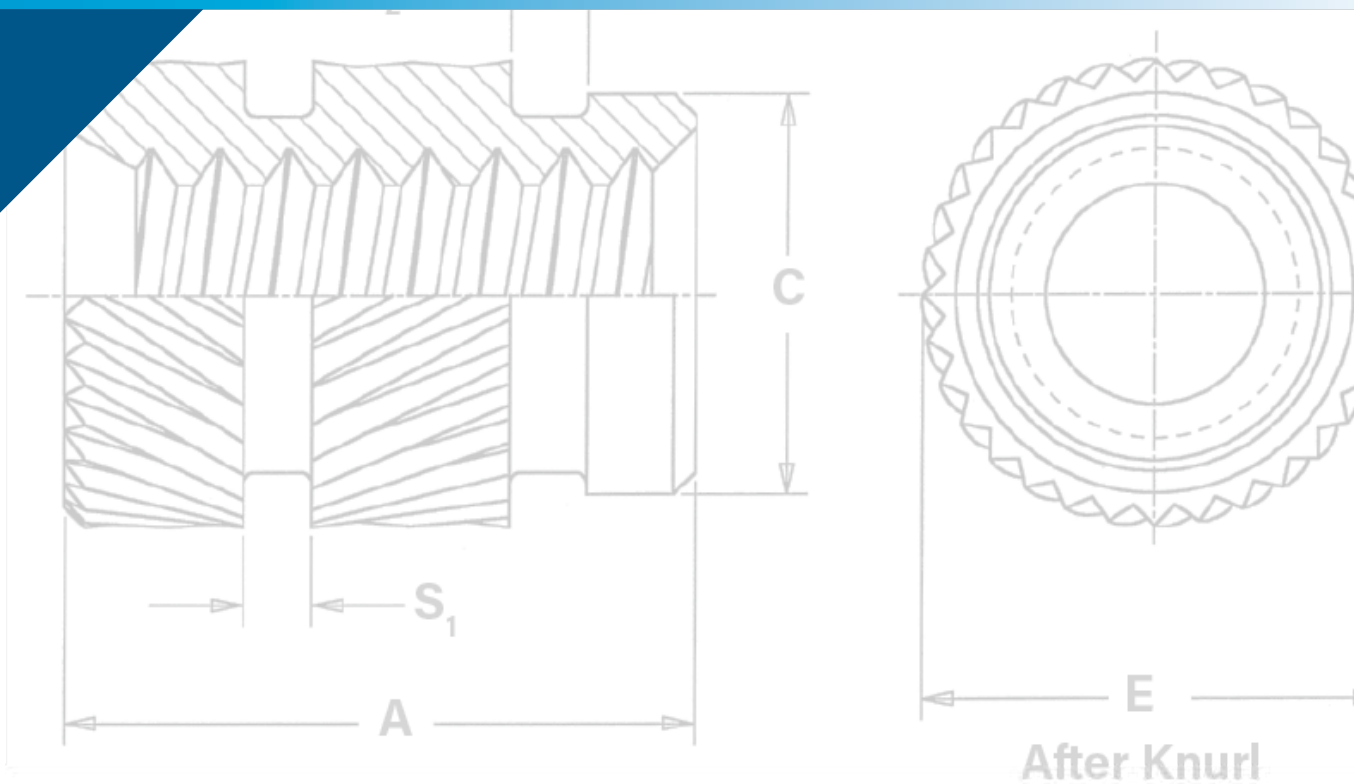




SI® brand inserts employ press-in, molded-in, or heat/ultrasonic installation methods to provide strong, reusable, permanent threads in plastic.

**SI®**

THREADED INSERTS FOR PLASTICS



SI® INSERTS FOR PLASTICS

- SI® inserts are typically specified in applications where strong, durable metal threads are required in plastic material, especially where frequent assembly and disassembly of the unit for service or repair is necessary.
- Applications for SI® products include: electronics (including wearables, smart phones and hand held devices), automotive, aerospace and defense, medical, transportation, industrial and recreational equipment.
- SI® inserts are available in brass, stainless steel and aluminum.
- SI® inserts are available in a large variety of ultrasonic / heat staking, molded-in or press-in types.
- Aluminum and stainless steel inserts for plastics offer lead-free alternatives to leaded brass typically used for brass inserts.
 - Lead-free inserts offer alternative to leaded brass to address environmental and end-of-life recycling concerns.
 - NEW aluminum inserts** are approximately 70% lighter than brass equivalents and made from lead-free aluminum.
 - Stainless steel inserts are typically stronger than brass and may offer better protection from certain types of corrosive agents.
- SI® microPEM® inserts provide threads as small as M1.

PART NUMBER DESIGNATION AND MATERIAL AND FINISH SPECIFICATIONS

IU **B** - **440** - **2**

Length Code (where applicable):

See individual product charts for actual corresponding dimensional lengths.

Thread Code:

Internal, ASME B1.1, 2B / ASME B1.13M, 6H (except where noted)

For PPB, PFLB, and PKB inserts collapsed slot and burrs may cause prevailing torque while thread accepts class 3A/4h screw.

See individual product charts for actual corresponding thread size.

Material Code:

B = Free-machining, leaded brass. Plain finish. Meets RoHS requirements.

C = 300 series stainless steel. Passivated and/or tested per ASTM A380.

A = Aluminum. Plain finish.

Type:

IU = Ultrasonic, tapered

IUT = Ultrasonic, straight wall

IS = Ultrasonic, symmetrical

MSI = microPEM®, Ultrasonic, symmetrical

IB = Molded-in, blind threaded

IBL = Molded-in, self-locking blind threaded

IT = Molded-in, thru-threaded

STK = Molded-in, knurled

NFP = Press-in, hexagonal

PP = Press-in, thru-threaded

PFL = Press-in, flange-head

PK = Press-in, straight knurl

Featuring
threads as
small as M1

micro**PEM**®
FASTENERS

Lead-free,
Lightweight,
Aluminum
Inserts



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

ULTRASONIC / HEAT STAKING INSERTS

- Ultrasonic - Installed by pressing the insert into the mounting hole with ultrasonic insertion equipment while simultaneously applying a high frequency vibration. Frictional heat caused by the vibration melts the plastic surrounding the insert allowing easy insertion. When the vibration ceases, the plastic solidifies, locking the insert permanently in place.
- Heat Staking - Installed by pressing the insert into the mounting hole with a thermal press to melt the plastic surrounding the insert.

IUA, IUB, IUC (Tapered, through threaded inserts) - **Page 4**

IUTA, IUTB, IUTC (Straight wall, through threaded inserts) - **Page 5**

ISA, ISB, ISC (Symmetrical, through threaded inserts) - **Page 6**

MSIA, MSIB (microPEM® symmetrical, through threaded inserts) - **Page 7**

Performance data for ultrasonic inserts - **Page 8**



MOLDED-IN INSERTS

- Installed during the molding process, the inserts are located in the mold cavity by core pins. When the mold opens, the core pins are withdrawn leaving the inserts permanently encapsulated in the plastic section with only the threads exposed.
- Installing the inserts during the molding process eliminates the need for secondary steps or installation equipment.

IBA, IBB, IBC (Blind threaded inserts) - **Page 9**

IBLC (Self-locking blind threaded inserts) - **Page 10**

ITA, ITB, ITC (Through threaded inserts) - **Page 11**

STKA, STKB, STKC (Knurled spacers) - **Page 12**

Performance data for molded-in inserts - **Page 13**



PRESS-IN INSERTS

- Installed by simply pressing the inserts into pre-molded or drilled holes. Installation is accomplished using any standard press at any time during the production process.
- Eliminates the need for molding-in inserts.
- Eliminates the need for heat or ultrasonic equipment.

NFPC, NFPA (Hexagonal, press-in inserts) - **Page 14**

PPA, PPB (Through threaded inserts) - **Page 15**

PFLA, PFLB (Flange-head inserts) - **Page 16**

PKA, PKB (Straight knurl inserts) - **Page 17**

Performance data for press-in inserts - **Page 18**



SI® Custom Designs - **Page 19**

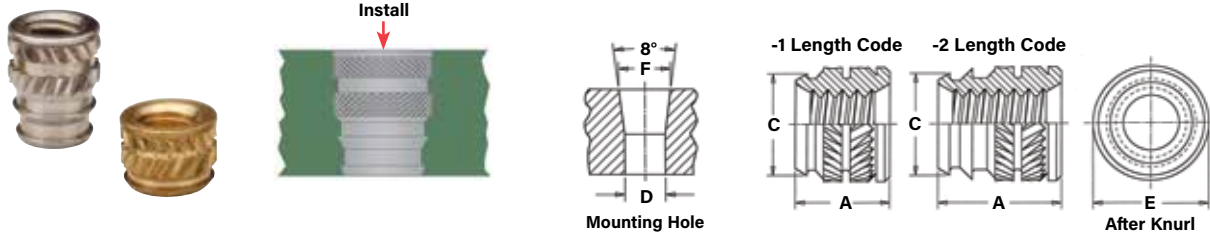
Hole Preparation Guidelines - **Page 19**

SI® Prototype Kit - **Page 20**

ULTRASONIC / HEAT STAKING INSERTS

Tapered Thru-Threaded, IUA™, IUB™ and IUC™ Inserts

- Designed for use in tapered holes.
- Tapered mounting hole allows for rapid and accurate alignment prior to installation.
- Aluminum inserts ideal for light weight designs.
- Aluminum and stainless steel inserts offer lead-free alternative.



All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type			Thread Code (I)	Length Code	A ± 0.13	E ± 0.13	C ± 0.13	Hole Size in Material		
		New Aluminum	Brass	Stainless Steel						Min. Hole Depth	D ± 0.05	F ± 0.05
	M2.5 x 0.45	IUA	IUB	IUC	M2.5	1	3.43	4.37	3.99	4.44	3.89	4.04
						2	5.56			6.58	3.58	
	M3 x 0.5	IUA	IUB	IUC	M3	1	3.43	4.37	3.99	4.44	3.89	4.04
						2	5.56			6.58	3.58	
	M3 x 0.5	IUAA	IUBB	IUCC	M3	1	3.81	5.56	5.16	4.83	5.05	5.23
						2	6.35			7.42	4.7	
	M3.5 x 0.6	IUA	IUB	IUC	M3.5	1	3.81	5.56	5.16	4.83	5.05	5.23
						2	6.35			7.42	4.7	
	M4 x 0.7	IUA	IUB	IUC	M4	1	4.7	6.35	5.84	5.72	5.74	5.94
						2	7.92			8.94	5.28	
	M5 x 0.8	IUA	IUB	IUC	M5	1	5.72	7.54	6.91	6.74	6.78	7.03
						2	9.53			10.55	6.25	
	M5 x 0.8	IUAA	IUBB	IUCC	M5	1	6.71	8.33	7.83	7.72	7.7	8
						2	11.1			12.12	7.06	
	M6 x 1	IUA	IUB	IUC	M6	1	7.62	9.52	8.99	8.64	8.86	9.22
						2	12.7			13.72	8.15	
	M8 x 1.25	IUA	IUB	IUC	M8	1	8.51	11.91	11.15	9.53	10.95	11.38
						2	14.27			15.29	10.19	

(1) Thread tapped thru, Class 3A/4h screw must pass with finger torque, but basic go gauge may stop at last thread.

ULTRASONIC / HEAT STAKING INSERTS

Straight Wall, Thru-Threaded, IUTA™, IUTB™ and IUTC™ Inserts

- Self-aligning lead-in of insert provides for accurate alignment prior to installation.
- Aluminum inserts ideal for light weight designs.
- Aluminum and stainless steel inserts offer lead-free alternative.



All dimensions are in millimeters.

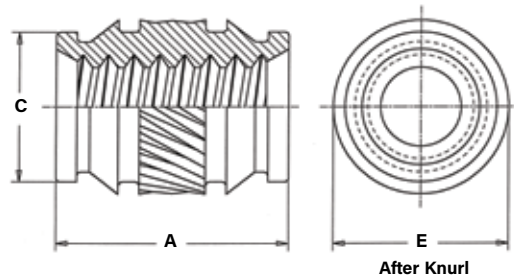
	Thread Size x Pitch	Type			Thread Code (1)	A ± 0.13	E ± 0.23	C ± 0.13	S ₁ Nom.	S ₂ Nom.	Hole Size in Material	
		New Aluminum	Brass	Stainless Steel							Min. Hole Depth	Hole Dia. + 0.08
METRIC	M2 x 0.4	IUTA	IUTB	IUTC	M2	4	3.73	3.07	0.79	0.79	4.76	3.23
	M2.5 x 0.45	IUTA	IUTB	IUTC	M2.5	5.74	4.55	3.86	0.79	0.79	6.5	4.01
	M3 x 0.5	IUTA	IUTB	IUTC	M3	5.74	4.55	3.86	0.79	0.79	6.5	4.01
	M3.5 x 0.6	IUTA	IUTB	IUTC	M3.5	7.14	5.33	4.65	0.79	0.79	7.9	4.81
	M4 x 0.7	IUTA	IUTB	IUTC	M4	8.15	6.17	5.51	0.79	1.02	8.91	5.67
	M5 x 0.8	IUTA	IUTB	IUTC	M5	9.52	6.93	6.27	1.17	1.17	10.28	6.43
	M6 x 1	IUTA	IUTB	IUTC	M6	12.7	8.69	7.87	1.17	1.58	13.46	8.03

(1) Thread tapped thru, Class 3A/4h screw must pass with finger torque, but basic go gauge may stop at last thread.

ULTRASONIC / HEAT STAKING INSERTS

Symmetrical, Thru-Threaded, ISA™, ISB™ and ISC™ Inserts

- Symmetrical design eliminates the need for orientation.
- Aluminum inserts ideal for light weight designs.
- Aluminum and stainless steel inserts offer lead-free alternative.



All dimensions are in millimeters.

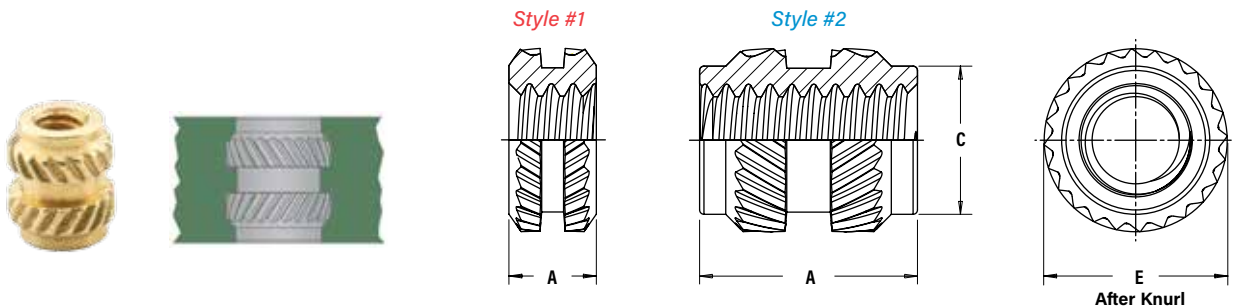
METRIC	Thread Size x Pitch	Type			Thread Code (1)	A ± 0.13	E ± 0.13	C ± 0.08	Hole Size in Material	
		New Aluminum	Brass	Stainless Steel					Hole Depth	Hole Dia. +0.08
	M3 x 0.5	ISA	ISB	ISC	M3	5.74	4.62	3.88	6.5	3.99
	M4 x 0.7	ISA	ISB	ISC	M4	8.15	6.22	5.51	8.92	5.62
	M5 x 0.8	ISA	ISB	ISC	M5	9.52	7.01	6.3	10.29	6.4
	M6 x 1	ISA	ISB	ISC	M6	12.7	8.58	7.9	13.46	8

(1) Thread tapped thru, Class 3A/4h screw must pass with finger torque, but basic go gauge may stop at last thread.

ULTRASONIC / HEAT STAKING INSERTS

microPEM® Symmetrical, Thru-Threaded, MSIA™ MSIB™ Inserts

- Threads as small as M1.
- Symmetrical design eliminates the need for orientation.
- Provides excellent performance in wide range of plastics.
- Aluminum inserts ideal for light weight designs.
- Aluminum inserts offer lead-free alternative.



All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type		Thread Code	Length Code	A ±0.1	E ± 0.1	C Max.	Mounting Hole in Material		
		New Aluminum	Brass						Min. Wall Thickness (6)	Hole Depth Min.	Hole Diameter +0.05
	M1 x 0.25 ⁽³⁾	MSIA	MSIB	M1	100 ⁽¹⁾	1	2.1	—	0.7	1.77	1.75
					250 ⁽²⁾	2.5		1.75		3.27	
	M1.2 x 0.25 ⁽³⁾	MSIA	MSIB	M1.2	100 ⁽¹⁾	1	2.1	—	0.7	1.77	1.75
					250 ⁽²⁾	2.5		1.75		3.27	
	M1.4 x 0.3 ⁽⁴⁾	MSIA	MSIB	M1.4	150 ⁽²⁾	1.5	2.5	2.15	0.8	2.27	2.15
					300 ⁽²⁾	3		3.77			
	M1.6 x 0.35 ⁽⁵⁾	MSIA	MSIB	M1.6	150 ⁽²⁾	1.5	2.5	2.15	0.8	2.27	2.15
					300 ⁽²⁾	3		3.77			

(1) **Style #1** - length codes less than 150

(2) **Style #2** - length codes 150 and greater

(3) Metric ISO 68-1, 5H

(4) Metric ISO 68-1, 6H

(5) Metric ASME B1.13M, 6H

(6) Refers to wall diameter of boss as tested in ABS and polycarbonate.

microPEM®
FASTENERS



PERFORMANCE DATA FOR ULTRASONIC / HEAT STAKING INSERTS

IUA, IUB, IUBB, IUC, and IUCC Inserts ⁽¹⁾

METRIC	Thread Code	ABS		Polycarbonate	
		Pullout (N)	Torque-out (N-m)	Pullout (N)	Torque-out (N-m)
	M2.5-1	334	0.3	400	0.7
	M2.5-2	334	0.3	400	0.7
	M3-1	356	0.5	712	0.8
	M3-2	356	0.5	712	0.8
	M3.5-1	645	1.7	734	2
	M3.5-2	1223	1.7	2002	2.7
	M4-1	912	2	1312	2.3
	M4-2	1646	2.1	2869	2.3
	M5-1	1201	5.1	1913	6.2
	M5-2	2491	6.8	4048	9
	M6-1	1664	7.3	2731	9.6
	M6-2	3025	7.3	6294	12.2

IUTA, IUTB, IUTC Inserts⁽¹⁾

METRIC	Thread Code	ABS		Polycarbonate	
		Pullout (N)	Torque-out (N-m)	Pullout (N)	Torque-out (N-m)
	M2.5/M3	730	1.58	1080	1.81
	M4	1450	4.07	1710	5.88
	M5	1710	6.1	2510	9.04
	M6	2130	15.26	2660	21.47

ISA, ISB and ISC Inserts⁽¹⁾

METRIC	Thread Code	ABS		Polycarbonate	
		Pullout (N)	Torque-out (N-m)	Pullout (N)	Torque-out (N-m)
	M3	680	1.62	1550	2.6
	M4	2080	3.58	2980	6.45
	M5	2470	5.9	4560	8.11
	M6	2700	11.1	-	-

MSIA and MSIB Inserts⁽¹⁾

METRIC	Thread Code	Length Code	ABS		Polycarbonate	
			Pullout (N)	Torque-out (N-cm) (2)	Pullout (N)	Torque-out (N-cm) (2)
	M1	100	50	3.5	50	4.5
		250	150	10	200	12
	M1.2	100	50	3.5	50	4.5
		250	150	10	200	12
	M1.4	150	100	15	140	15
		300	330	30	400	30
	M1.6	150	100	15	140	15
		300	330	30	400	30

- (1) The values reported are averages for ultrasonically inserted inserts when all installation specifications and procedures are followed. Variations in mounting hole size, sheet material and installation procedure will affect results. Performance testing of this product in your application is recommended. Samples can be provided for this purpose.
- (2) Torque-out performance will depend on the strength and type of screw being used. In most cases, the screw threads will fail before the insert threads. For testing purposes, inserts were installed using heat stake equipment into a flat sheet.

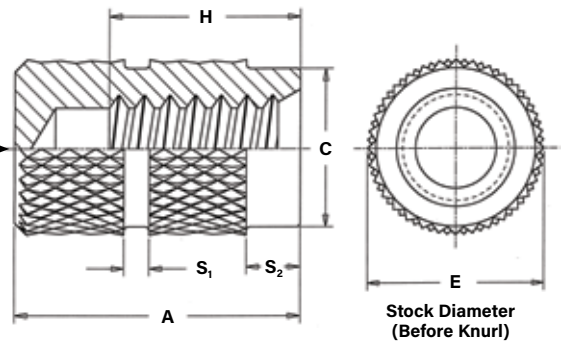
MOLDED-IN INSERTS

Blind Threaded, IBA™, IBB™ and IBC™ Inserts

- Blind-end protects the threads from plastic intrusion.
- Aluminum inserts ideal for light weight designs.
- Aluminum and stainless steel inserts offer lead-free alternative.



NOTE: Manufacturing techniques may leave a slight projection a maximum of .025" / 0.65 mm beyond the "A" dimension.



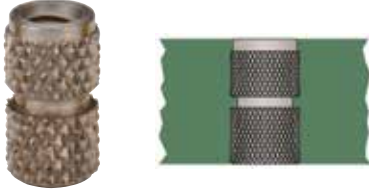
All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type			Thread Code	Length A ± 0.13 / H Min.					E Nom.	C ± 0.13	S ₁ Nom.	S ₂ Nom.	Minor Dia. Min./Max.
		New Aluminum	Brass	Stainless Steel		Min. No. of Full Threads									
						4	6	8	10	12					
	M2.5 x 0.45	IBA	IBB	IBC	M2.5	4.78/2.01	6.35/2.87	7.14/3.74	9.53/4.6	10.31/5.47	4.78	4.34	0.8	0.8	2.03/2.14
	M3 x 0.5	IBA	IBB	IBC	M3	5.21/2.21	7.13/3.21	8.73/4.21	10.31/5.21	11.13/6.21	4.78	4.34	0.8	0.8	2.47/2.59
	M3.5 x 0.6	IBA	IBB	IBC	M3.5	6.35/2.62	8.73/3.81	10.31/5.02	11.91/6.22	13.48/7.42	5.56	5.13	0.8	1.6	2.87/3.01
	M4 x 0.7	IBA	IBB	IBC	M4	6.35/3.08	8.73/4.47	10.31/5.89	11.91/7.29	13.48/8.69	6.35	5.74	1.2	1.6	3.25/3.42
	M5 x 0.8	IBA	IBB	IBC	M5	7.13/3.49	11.12/5.09	13.48/6.69	11.91/8.29	13.48/9.89	7.14	6.57	1.2	1.6	4.15/4.34
	M6 x 1	IBA	IBB	IBC	M6	8.73/4.37	13.49/6.37	15.87/8.37	18.26/10.57	20.8/12.37	8.74	8.15	1.6	2.4	4.94/5.16
	M8 x 1.25	IBA	IBB	IBC	M8	11.13/5.72	15.09/7.82	18.24/10.32	20.62/12.82	22.23/15.32	11.13	10.26	1.98	2.4	6.68/6.92

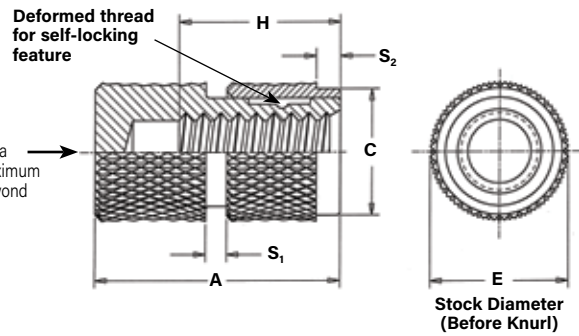
MOLDED-IN INSERTS

Self-Locking, Blind Threaded, IBLC™ Inserts

- Deformed threads create prevailing torque locking feature to prevent screw loosening due to vibration.
- Blind-end protects the threads from plastic intrusion.
- Stainless steel inserts offer lead-free alternative.



NOTE: Manufacturing techniques may leave a slight projection a maximum of .025" / 0.65 mm beyond the "A" dimension.



All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type	Thread Code	Length Code	A ± 0.13	E Nom.	C ± 0.13	S ₁ ± 0.13	S ₂ ± 0.13	(1) Minor Dia. Min/Max	H Min.	First Cycle on Locking Torque (N-m) (2)	
												Min.	Max.
	M3 x 0.5	IBLC	M3	8	8.73	4.78	4.57	0.8	0.8	2.48/2.59	4.21	0.06	0.6
	M4 x 0.7	IBLC	M4	8	10.31	6.35	5.97	1.2	1.6	3.26/3.42	5.89	0.16	1.6
	M5 x 0.8	IBLC	M5	8	13.48	7.14	6.86	1.2	1.6	4.15/4.34	6.69	0.23	2.1
	M6 x 1	IBLC	M6	8	15.87	8.73	8.26	1.6	2.4	4.95/5.15	8.37	0.37	3.2

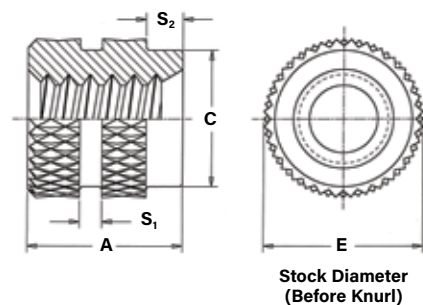
(1) Minor diameter may be below minimum in deformed thread area.

(2) Locking torque values shown apply when the mating screw has thread class of 3A for unified sizes and class 4h for metric sizes and is made from 300 series stainless steel with no additive finish. Other screws may be used, but the locking torque may not comply with the values shown.

MOLDED-IN INSERTS

Thru-Threaded, ITA™, ITB™ and ITC™ Inserts

- Pilot diameter and undercuts allow plastic to flow into grooves providing high pullout resistance.
- Aluminum inserts ideal for light weight designs.
- Aluminum and stainless steel inserts offer lead-free alternative.



All dimensions are in millimeters.

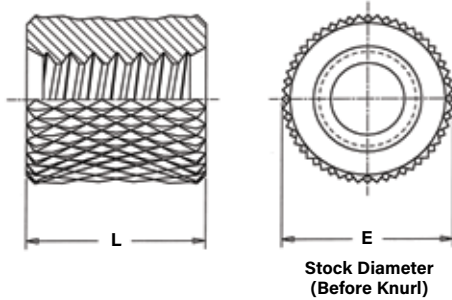
METRIC	Thread Size x Pitch	Type			Thread Code (1)	A ± 0.13	E Nom.	C ± 0.13	S ₁ Nom.	S ₂ Nom.	Minor Dia. Min./Max.
		New Aluminum	Brass	Stainless Steel							
	M3 x 0.5	ITA	ITB	ITC	M3	4.77	4.77	4.34	0.78	0.78	2.47/2.59
	M4 x 0.7	ITA	ITB	ITC	M4	6.35	6.35	5.74	1.16	1.57	3.25/3.42
	M5 x 0.8	ITA	ITB	ITC	M5	7.13	7.13	6.57	1.16	1.57	4.15/4.34
	M6 x 1	ITA	ITB	ITC	M6	9.53	8.74	8.15	1.57	2.38	4.94/5.16
	M10 x 1.5	ITA	ITB	ITC	M10	14.27	12.7	11.84	2.38	2.38	8.55/8.67

(1) Thread tapped thru, Class 3A/4h screw must pass with finger torque, but basic go gauge may stop at last thread.

MOLDED-IN INSERTS

Thru-Threaded, Knurled, STKA™, STKB™ and STKC™ Inserts

- Uniform knurl diameter reduces the risk of sink marks.
- Available in varying lengths for injection molding assemblies.
- Aluminum inserts ideal for light weight designs.
- Aluminum and stainless steel inserts offer lead-free alternative.



All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type			Thread Code (1)	Length Code "L" ±0.13 in millimeters								E Nom.	Minor Dia. Min./Max.
		New Aluminum	Brass	Stainless Steel											
	M3 x 0.5	STKA	STKB	STKC	M3	3	4	6	8	10	12	15	18	4.74	2.47/2.59
	M4 x 0.7	STKA	STKB	STKC	M4	3	4	6	8	10	12	15	18	6.35	3.25/3.42
	M5 x 0.8	STKA	STKB	STKC	M5	3	4	6	8	10	12	15	18	7.13	4.15/4.34

(1) Thread tapped thru, Class 3A/4h screw must pass with finger torque, but basic go gauge may stop at last thread.

NA Not Available.

PERFORMANCE DATA FOR MOLDED-IN INSERTS

IBA, IBB and IBC Inserts⁽¹⁾

METRIC	Thread Code	Length Code	ABS		Polycarbonate	
			Pullout (N)	Torque-out (N-m)	Pullout (N)	Torque-out (N-m)
	M2.5/M3	6 10	1110 / 1060 1120 / 1080	0.7 / 0.64 0.72 / 0.66	1170 / 1120 1190 / 1160	0.77 / 0.73 0.79 / 0.74
	M4	6 10	2350 / 2310 2370 / 2330	1.69 / 1.59 1.78 / 1.69	2420 / 2380 2430 / 2400	1.81 / 1.74 1.85 / 1.79
		6 10	2820 / 2770 2830 / 2790	6.44 / 5.87 6.55 / 6.1	2880 / 2840 2890 / 2870	6.66 / 6.32 6.78 / 6.44
	M6	6	4040 / 3980	12.2 / 11.6	4120 / 4050	12.5 / 12

IBLC Inserts⁽¹⁾

METRIC	Thread Code	ABS		Polycarbonate	
		Pullout (N)	Torque-out (N-m)	Pullout (N)	Torque-out (N-m)
	M3	1020 / 970	0.67 / 0.62	1050 / 1000	0.76 / 0.7
	M4	2200 / 2130	1.24 / 1.01	2220 / 2080	1.58 / 1.46
	M5	2630 / 2570	4.52 / 3.39	2630 / 2500	5.42 / 4.74
	M6	3380 / 3280	10.1 / 8.81	3540 / 3460	11.1 / 9.49

ITA, ITB and ITC Inserts⁽¹⁾

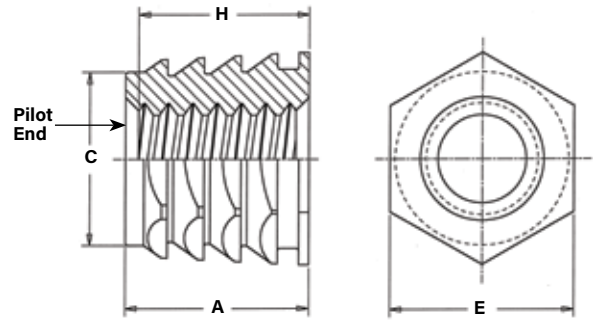
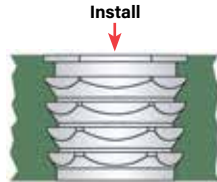
METRIC	Thread Code	ABS		Polycarbonate	
		Pullout (N)	Torque-out (N-m)	Pullout (N)	Torque-out (N-m)
	M3	770 / 730	0.67 / 0.62	820 / 760	0.77 / 0.7
	M4	1640 / 1630	1.58 / 1.53	1690 / 1650	1.8 / 1.66
	M5	1970 / 1920	6.22 / 5.65	2010 / 1970	6.44 / 5.87
	M6	2820 / 2750	8.47 / 7.91	2890 / 2820	11.6 / 11

(1) The values reported are high and low ranges when all installation specifications and procedures are followed. Variations in mounting hole size, workpiece material and installation procedure will affect results. Performance testing of this product in your application is recommended. Samples can be provided for this purpose.

PRESS-IN INSERTS

Hexagonal, NFPA™ and NFPC™ Inserts

- Press-fit insert provides strong, reusable threads. No heat or ultrasonics required.
- Hexagonal "barbed" configuration ensures high torque-out and pullout values.
- Aluminum inserts ideal for light weight designs.
- Aluminum and stainless steel inserts offer lead-free alternative.



All dimensions are in millimeters.

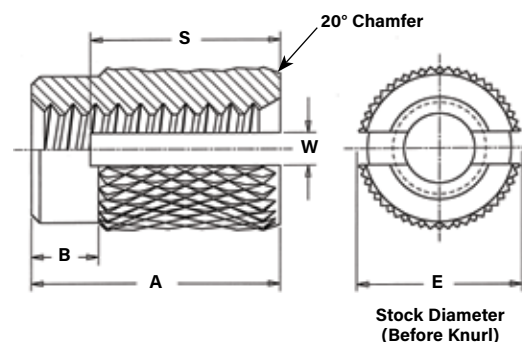
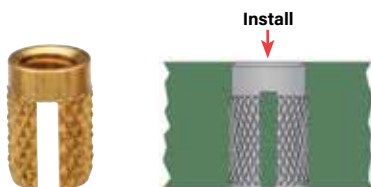
METRIC	Thread Size x Pitch	Type		Thread Code	A Max.	Min. Sheet Thickness	Hole Size in Sheet + 0.08	C Max.	E Nom.	Min. Boss Dia.	Min. Depth Full Thread H ⁽¹⁾
		Aluminum	Stainless Steel								
	M3 x 0.5	NFPA	NFPC	M3	5.84	6.1	4.75	4.72	4.75	12.7	5.38
	M3.5 x 0.6	NFPA	NFPC	M3.5	5.84	6.1	4.75	4.72	4.75	12.7	5.38
	M4 x 0.7	NFPA	NFPC	M4	6.73	6.99	6.35	6.32	6.35	15.88	6.3
	M5 x 0.8	NFPA	NFPC	M5	6.73	6.99	6.35	6.32	6.35	15.88	6.3
	M6 x 1	NFPA	NFPC	M6	8	8.33	7.92	7.89	7.92	19.05	7.62
	M8 x 1.25	NFPA	NFPC	M8	9.27	9.65	9.53	9.50	9.53	24.13	8.76

(1) Thread tapped thru, Class 3A/4h screw must pass with finger torque, but basic go gauge may stop at pilot end.

PRESS-IN INSERTS

Thru-Threaded, PPA™ and PPB™ Inserts

- Press-fit insert with strong, reusable threads.
- No heat or ultrasonics required.
- Slotted insert compresses allowing easy access into the mounting hole.
- Aluminum inserts ideal for light weight designs.
- Aluminum inserts offer lead-free alternative.



All dimensions are in millimeters.

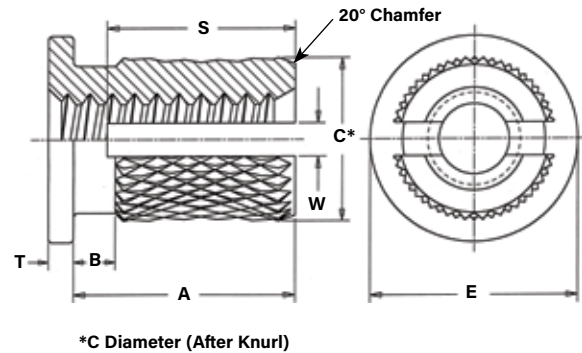
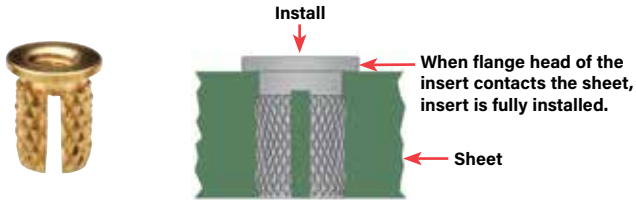
METRIC	Thread Size x Pitch	Type		Thread Code (1)	Length Code	A ± 0.13	Nom.	B ± 0.4	S Nom.	W ± 0.4	Hole Size in Material	
		New Aluminum	Brass								Min. Hole Depth	Hole Dia. ± 0.05
	M3 x 0.5	PPA	PPB	M3	1	4.77	3.96	1.14	3.56	0.5	5.79	3.96
					2	6.35		1.52	4.83		7.37	
	M4 x 0.7	PPA	PPB	M4	1	6.35	5.56	1.52	4.83	1.2	7.37	5.56
					2	7.95		1.91	5.97		8.97	
	M5 x 0.8	PPA	PPB	M5	1	7.95	6.35	1.91	5.97	1.6	8.97	6.35
					2	9.52		2.29	7.11		10.54	
	M6 x 1	PPA	PPB	M6	1	11.12	7.95	2.67	8.38	2	12.14	7.95
					2	12.7		3.05	9.53		13.72	

(1) Collapsed slot and burrs may cause prevailing torque while thread accepts class 3A/4h screw.

PRESS-IN INSERTS

Flange-Head, PFLA™ and PFLB™ Inserts

- Press-fit insert with strong, reusable threads. No heat or ultrasonics required.
- Flange-head eliminates direct contact of plastic with mating parts.
- Slotted insert compresses allowing easy access into the mounting hole.
- Aluminum inserts ideal for light weight designs.
- Aluminum inserts offer lead-free alternative.



All dimensions are in millimeters.

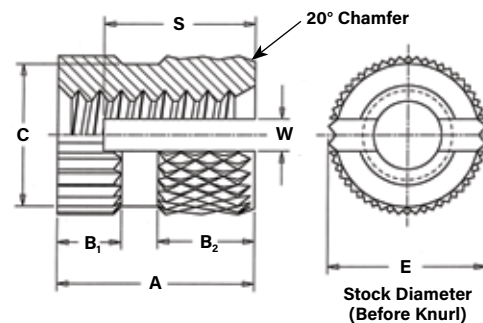
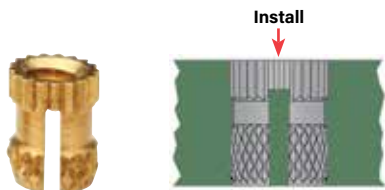
METRIC	Thread Size x Pitch	Type		Thread Code (1)	Length Code	A ± 0.13	E Nom.	C Nom.	T ± 0.13	B ± 0.25	S Nom.	W ± 0.4	Hole Size in Material	
		New Aluminum	Brass										Min. Hole Depth	Hole Dia. ± 0.05
	M3 x 0.5	PFLA	PFLB	M3	1	4.22	5.56	4.22	0.56	0.69	3.56	0.5	5.24	3.96
					2	5.8							6.82	
	M4 x 0.7	PFLA	PFLB	M4	1	6.25	7.14	5.84	0.89	1.02	5.33	1.14	7.27	5.56
					2	7.06							8.08	
	M5 x 0.8	PFLA	PFLB	M5	1	6.86	7.95	6.65	1.09	1.22	5.97	1.6	7.88	6.35
					2	8.43							9.45	
	M6 x 1	PFLA	PFLB	M6	1	9.86	9.53	8.51	1.27	1.40	8.38	2	10.88	7.95
					2	11.43							12.45	

(1) Collapsed slot and burrs may cause prevailing torque while thread accepts class 3A/4h screw.

PRESS-IN INSERTS

Straight Knurl, PKA™ and PKB™ Inserts

- Press-fit insert with strong, reusable threads. No heat or ultrasonics required.
- Straight knurls at the top end of the insert offers higher torsional resistance.
- Slotted insert compresses allowing easy access into the mounting hole.
- Aluminum inserts ideal for light weight designs.
- Aluminum inserts offer lead-free alternative.



All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type		Thread Code (1)	A ± 0.13	E Nom.	C ± 0.25	B ₁ ± 0.25	B ₂ ± 0.25	S Nom.	W ± 0.4	Hole Size in Material	
		New Aluminum	Brass									Min. Hole Depth	Hole Dia. ± 0.05
	M3 x 0.5	PKA	PKB	M3	4.78	3.96	3.48	1.42	2.01	3.56	0.5	5.8	3.96
	M4 x 0.7	PKA	PKB	M4	7.92	5.56	4.98	2.39	3.33	5.97	1.19	8.94	5.56
	M5 x 0.8	PKA	PKB	M5	9.53	6.35	5.94	2.84	4.01	7.11	1.57	10.55	6.35
	M6 x 1	PKA	PKB	M6	12.7	7.92	7.39	3.81	5.33	9.53	1.98	13.72	7.92

(1) Collapsed slot and burrs may cause prevailing torque while thread accepts class 3A/4h screw.

PERFORMANCE DATA FOR PRESS-IN INSERTS

NFPA and NFPC Inserts⁽¹⁾

METRIC	Thread Code	ABS			Polycarbonate		
		Install. Force (kN)	Pullout (N)	Torque-out (N · m)	Install. Force (kN)	Pullout (N)	Torque-out (N · m)
	M3	1	556	0.45	2.67	1245	1.8
	M4	1.33	600	1.13	2.67	1690	4.74
	M5	1.33	600	1.13	2.67	1690	4.74
	M6	1.78	1045	3.16	–	–	–

PPA and PPB Inserts⁽¹⁾

METRIC	Thread Code	Length Code	Phenolic		Polycarbonate	
			Pullout (N)	Torque-out (N · m)	Pullout (N)	Torque-out (N · m)
	M3	1	360	2.35	330	1.73
		2	860	4.36	760	2.85
	M4	1	560	4.16	520	3.57
		2	1110	6.76	1000	5.15
	M5	1	650	5.09	610	4.47
		2	1230	7.86	1130	6.28
	M6	1	850	6.96	810	6.33
		2	1490	10.31	1370	8.66

PFLA and PFLB Inserts⁽¹⁾

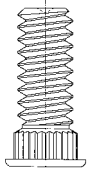
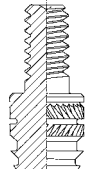
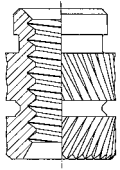
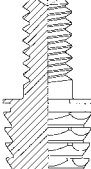
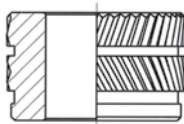
METRIC	Thread Code	Length Code	Phenolic		Polycarbonate	
			Pullout (N)	Torque-out (N · m)	Pullout (N)	Torque-out (N · m)
	M3	1	180	1.66	130	1.66
		2	280	1.66	200	1.66
	M4	1	280	3.25	240	3.25
		2	320	3.25	300	3.25
	M5	1	340	4.02	290	4.02
		2	450	4.02	360	4.02
	M6	1	450	5.63	400	5.63
		2	560	5.63	460	5.63

PKA and PKB Inserts⁽¹⁾

METRIC	Thread Code	Phenolic		Polycarbonate	
		Pullout (N)	Torque-out (N · m)	Pullout (N)	Torque-out (N · m)
	M3	190	2.51	140	1.63
	M4	370	4.75	320	3.82
	M5	470	5.79	420	4.86
	M6	660	8.02	610	7.01

(1) The values reported are averages when all installation specifications and procedures are followed. Variations in mounting hole size, work piece material and installation procedure will affect results. Performance testing of this product in your application is recommended. Samples can be provided for this purpose.

If you can not find a standard product in this catalog to meet your requirements, our Application Engineering Department will assist you to design a custom fastener to satisfy your requirements. Below are a few examples of custom insert designs.

<h3>THIN SHEET STUDS</h3> <p>Provide external threads in material as thin as 3.175 mm. SI® studs are available in lengths from 6.35 to 19.05 mm in thread sizes M3 to M6. These inserts can be provided in aluminum, brass, steel and stainless steel and can be pressed into pre-molded or drilled holes.</p>	
<h3>ULTRASONIC STUDS</h3> <p>Tapered body provides easy insertion in pre-molded or drilled holes. They are available in lengths from 6.35 to 19.05 mm in thread sizes M2 to M6. These inserts can be provided in aluminum, brass, steel and stainless steel.</p>	
<h3>SELF-LOCKING ULTRASONIC INSERTS</h3> <p>The self-locking feature prevents screw loosening and is advantageous in applications where vibration is present. They are available in thread sizes M2 to M6 and are designed for ultrasonic installation into straight or tapered holes.</p>	
<h3>PRESS-IN STUDS</h3> <p>Allows for mounting a component on the external thread. They are available in lengths from 4.76 to 25.4 mm. Thread sizes M3 to M6. SI® press-in studs can be provided in aluminum, brass, steel and stainless steel and can be installed into pre-molded or drilled holes without the use of heat or ultrasonics.</p>	
<h3>COMPRESSION LIMITER</h3> <p>Thru-hole metal insert designed for use in plastic components. It provides bolt clearance, while the wall of the compression limiter withstands the compressive force induced during the assembly of the mating screw or bolt.</p>	

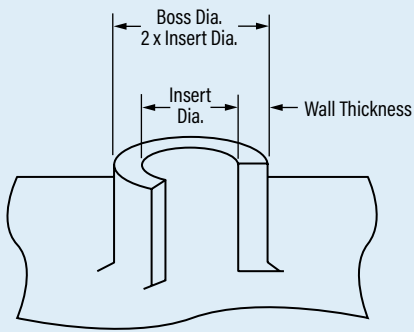
PEM® VARIMOUNT® BONDING FASTENERS

- Laminate within composite layers.
- Mold into plastics.
- Surface bond to panels from front or back side.
- Available with studs, nuts, or standoffs to meet a variety of applications.



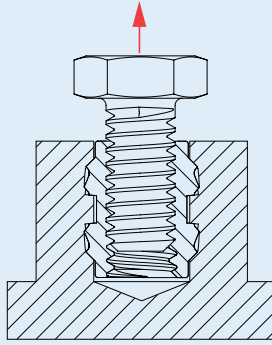
For more information, see [PEM® Bulletin VM](#).

HOLE PREPARATION GUIDELINES



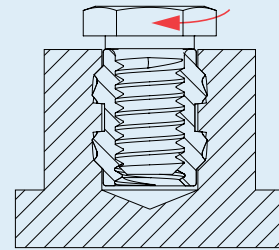
Thinner walls and bosses may be used but will affect performance.

PULLOUT



Pullout is the force required to pull the insert from the sheet.

TORQUE OUT



Torque-out is the torque required to turn the fastener in the parent material after installation without inducing clamp load on the fastener.



The SI® prototype kit contains a wide variety of SI® threaded inserts for plastics for your prototype needs. The kit contains over 1,000 ultrasonic, molded-in, and press-in inserts of various types and sizes, so you can choose the one which will best suit your specific design requirements. The kit contains both unified and metric parts.

PEM Part #PKSI-100. Price - US \$50.00 (Subject to change without notice).

All specifications in this bulletin are presented as accurately and up-to-date as possible. We reserve the right to make changes to any information contained in this bulletin without notice.

We recommended that you test a particular product to be sure it is ideally suited to your application. We will be happy to provide samples for this purpose and our authorized distributors can also help you with your selection.

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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