

SI Product Line

Engineering Points

Categorizing SI Parts

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 5](#)
 IUTA, IUTB, IUTC (Straight wall, through threaded inserts) - [Page 6](#)
 IUTFB (Flanged, Straight wall, through threaded inserts) - [Page 7](#)
 ISA, ISB, ISC (Symmetrical, through threaded inserts) - [Page 8](#)
 MSIA, MSIB (microPEM® symmetrical, through threaded inserts) - [Page 9](#)
 Performance data for ultrasonic inserts - [Page 10-11](#)

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 When the mold opens, the core pins are withdrawn leaving the inserts permanently encapsulated in the plastic section with only the threads exposed.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 12](#)
 IBLC (Self-locking blind threaded inserts) - [Page 13](#)
 ITA, ITB, ITC (Through threaded inserts) - [Page 14](#)
 STKA, STKB, STKC (Knurled inserts) - [Page 15](#)
 Performance data for molded-in inserts - [Page 16](#)

PRESS-IN INSERTS

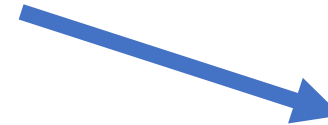
- Installed by simply pressing the inserts into pre-molded or drilled holes. Installation is accomplished using any standard press at any time during the production process.
- Eliminates the need for molding-in inserts.
- Eliminates the need for heat or ultrasonic equipment.









NFPC, NFPA (Hexagonal, press-in inserts) - [Page 17](#)
 PPA, PPB (Through threaded inserts) - [Page 18](#)
 PFLA, PFLB (Flange-head inserts) - [Page 19](#)
 PKA, PKB (Straight knurl inserts) - [Page 20](#)
 Performance data for press-in inserts - [Page 21](#)

Can SI parts be grouped by their installation method and series?

If a customer is limited to a specific installation method, they must sift through inserts used with other installation methods to find the part they need.

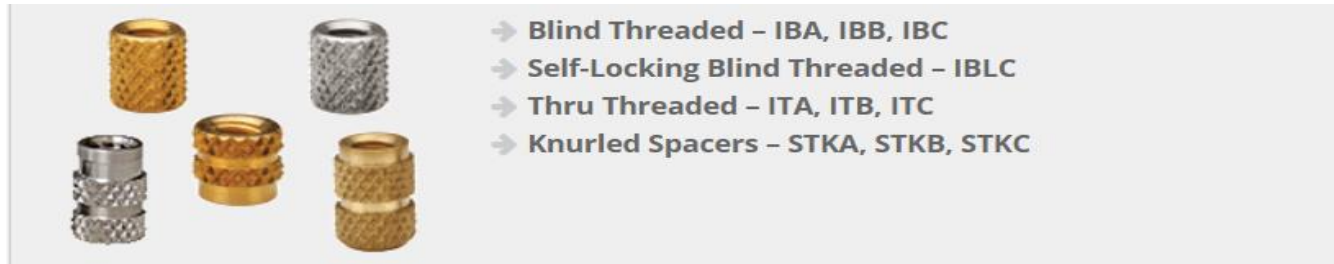


Select	Image	Part #
<input type="checkbox"/>	 Enlarge	<i>Mfr. Part #</i> IUTFB-M3 <i>Mouser Part #</i> 153-IUTFB-M3  New Product
<input type="checkbox"/>	 Enlarge	<i>Mfr. Part #</i> ITB-440 <i>Mouser Part #</i> 153-ITB-440
<input type="checkbox"/>	 Enlarge	<i>Mfr. Part #</i> IBB-832-4 <i>Mouser Part #</i> 153-IBB-832-4
<input type="checkbox"/>	 Enlarge	<i>Mfr. Part #</i> IBB-832-12 <i>Mouser Part #</i> 153-IBB-832-12
<input type="checkbox"/>	 Enlarge	<i>Mfr. Part #</i> 4256 <i>Mouser Part #</i> 485-4256

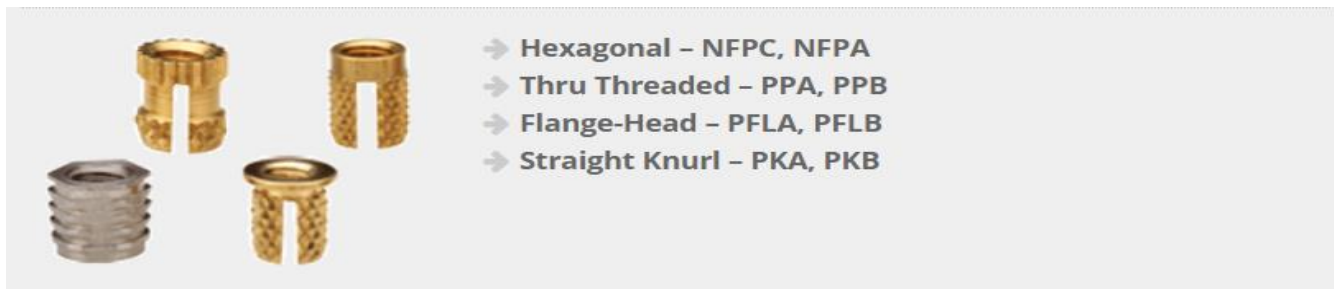
Inserts in the catalog are categorized by their installation method



Ultrasonic/Heat staked



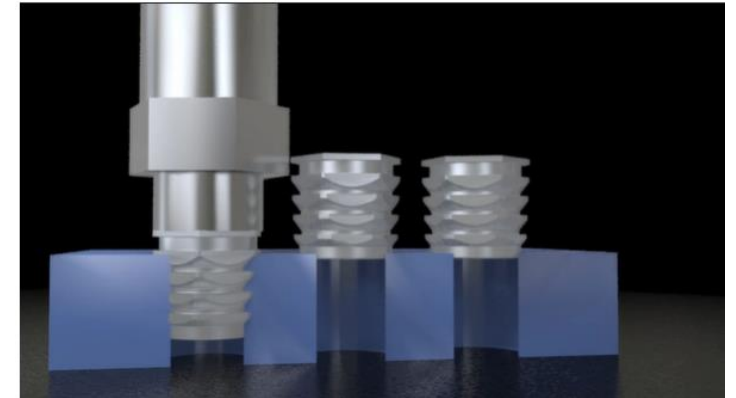
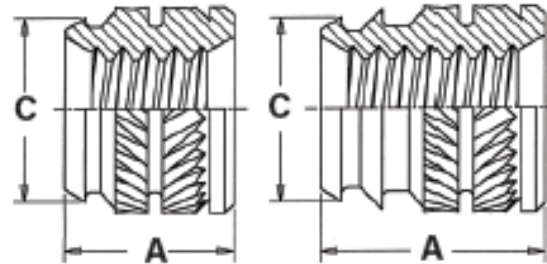
Molded-In



Cold Press-In

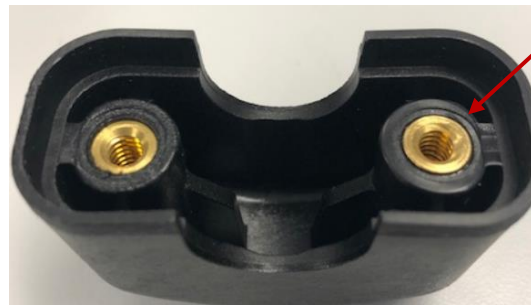
What is a Threaded Insert?

Threaded Inserts are precision machined metal components with engineered external features that secure them into plastic



Why Are Threaded Inserts Used?

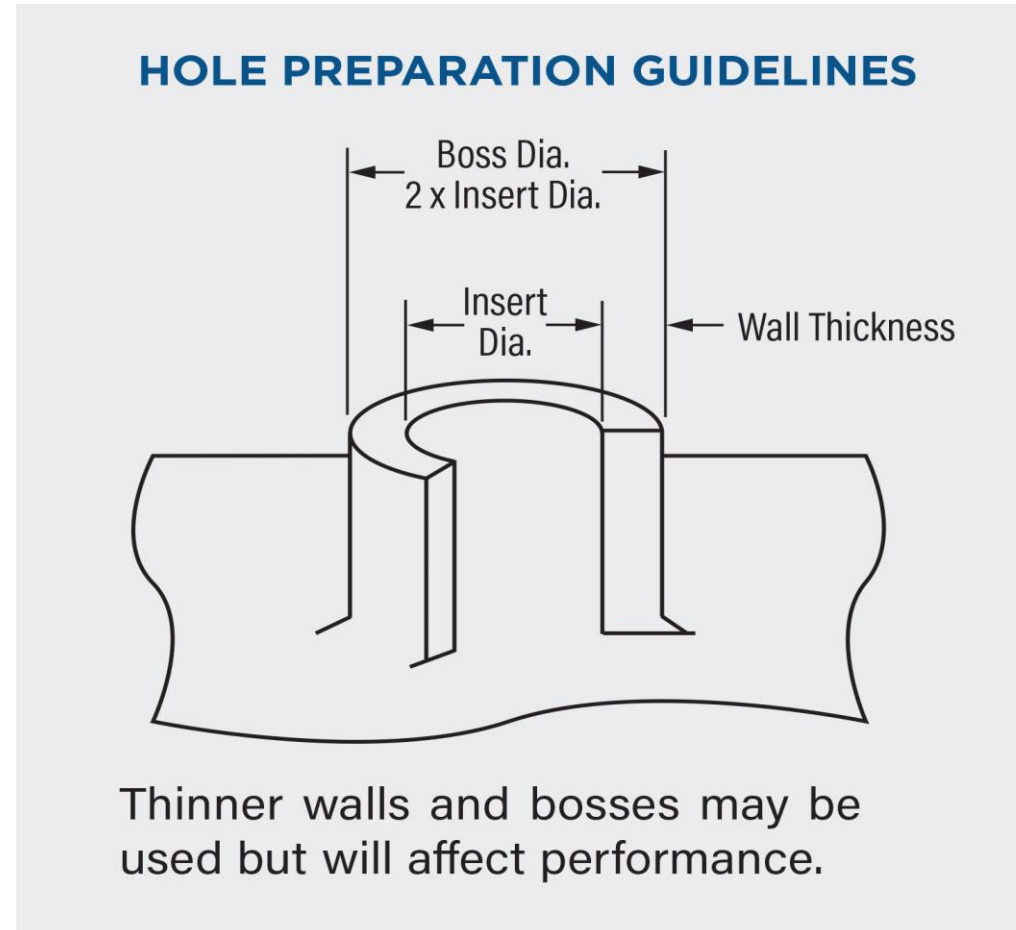
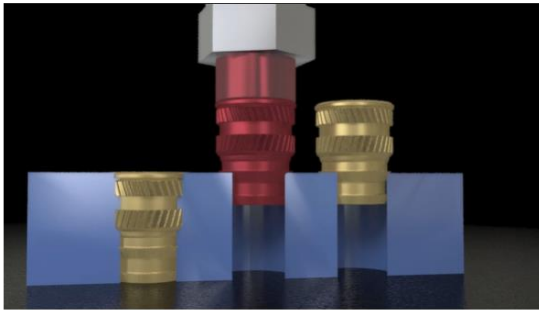
- To provide strong reusable “wear resistant” threads in plastic where assembly & disassembly is required
- To provide an electrical contact in plastic
- To provide close tolerance threads for the mating component
 - Unified: Class 2B (internal)
 - Metric: 6H (internal)
- To avoid using thread cutting screws that will degrade plastic with repeated use.



Hole Preparation during post molding installation

Installation methods include:

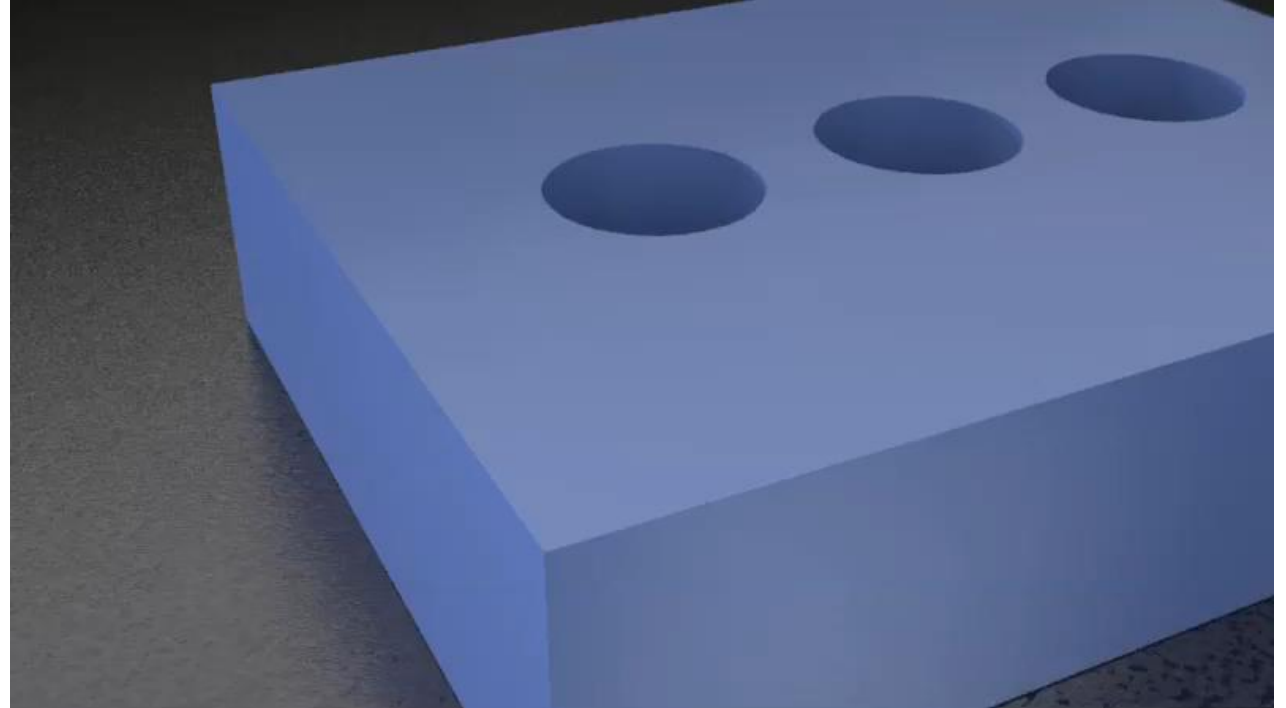
- Ultrasonic Insertion
- Thermal or Heat Insertion
- Cold Press Insertion



Ultrasonic Insertion

During this process, the insert is placed into a molded or predrilled hole

- The insert is hit with an ultrasonic welding horn at 20KHZ (vibrating 20,000 times per second).
- Vibrations travel thru. the insert and frictional heat is generated melting the plastic in a localized area as the insert is driven into the part.
- Ultrasonic vibrations cease, the plastic re-solidifies and the insert is bonded into the plastic.



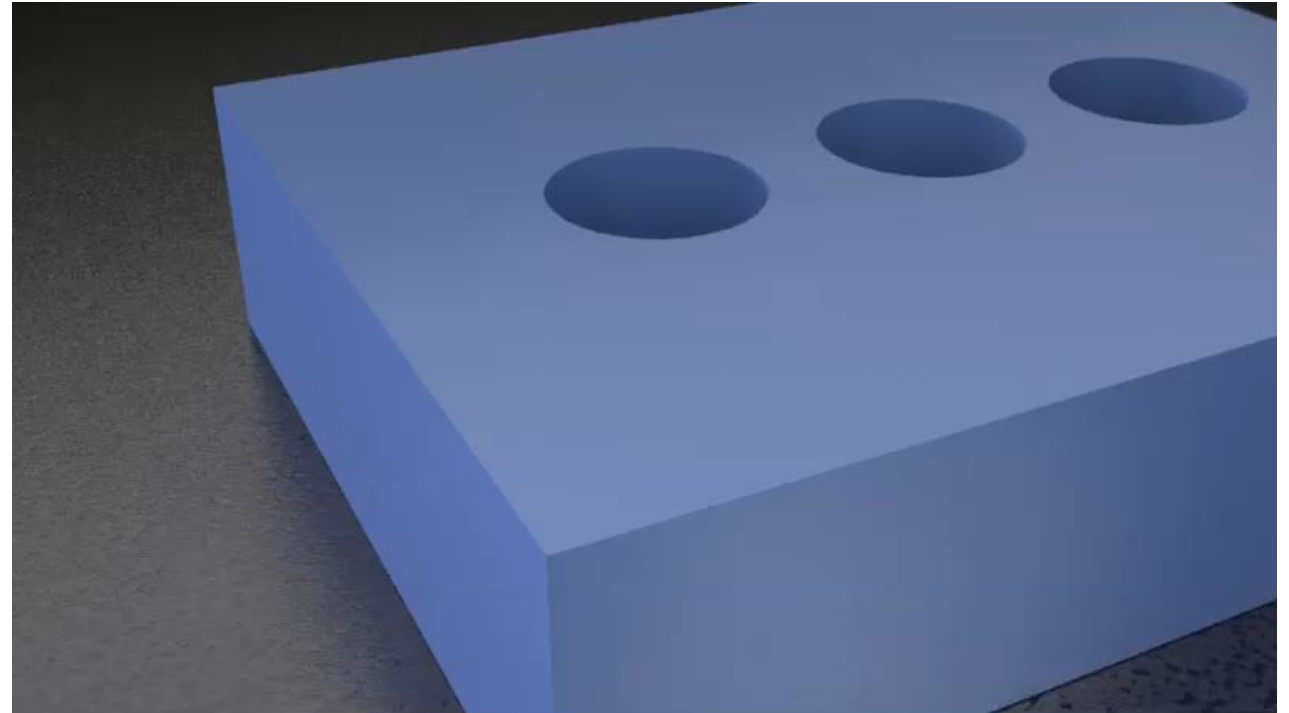
Ultrasonic insertion is noisy. Hearing protection required.



Thermal Heat Staking Insertion

During this process, the insert is placed into a molded or predrilled hole.

- A heated probe contacts the insert heating it to at or above the melt temperature of the plastic.
- Localized melting occurs as the insert is driven into place.
- The probe is retracted and the plastic re-solidifies around the insert.

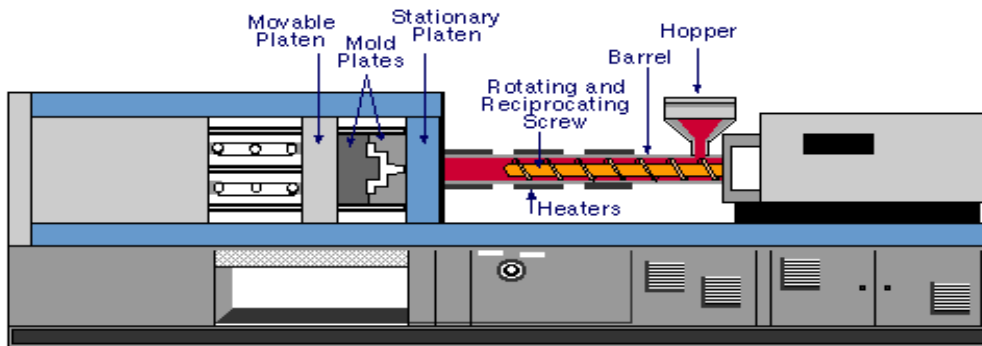


Molded In

Inserts are installed during the injection mold operation

The insert is placed on a core pin in the injection mold and the plastic is molded around the insert.

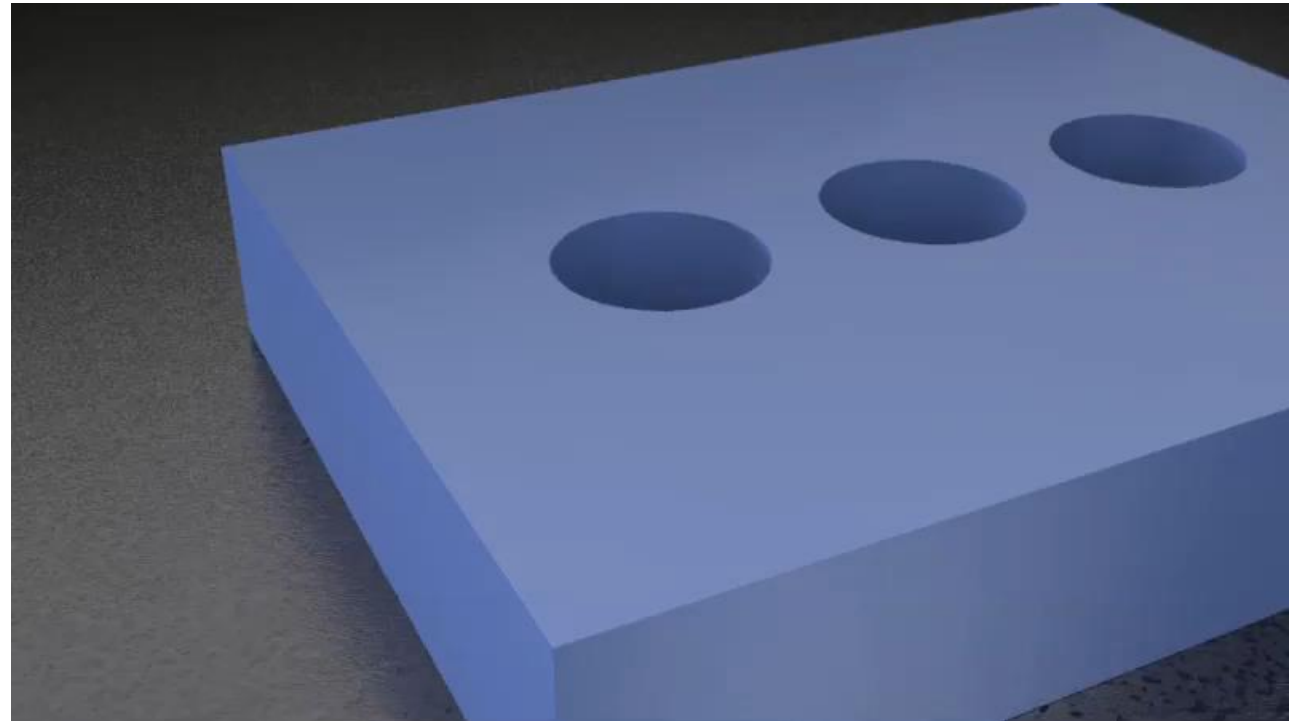
Proper pin size is important to retain insert in place.



Cold Press Insertion

Press-in Inserts for Plastics

- Install by simply pressing the insert into pre-molded or drilled holes.
- Eliminates the need for heat or ultrasonic equipment.
- No melting of plastic. Holding values may be lower.



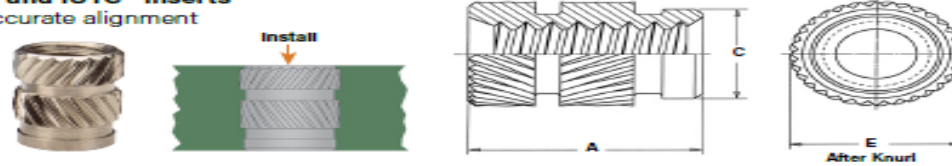
Featured Product Series – IUTB, IUTC and IUTA straight wall insert



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 inches.

UNIFIED	Thread Size	Type			Thread Code (I)	Length Code	A ± .005	E ± .005	C ± .005	Hole Size in Material	
		Aluminum	Brass	Stainless Steel						Min. Hole Depth	Hole Dia. +.003 -.000
	.086-56 (#2-56)	IUTA	IUTB	IUTC	256	125	.125	.147	.121	.155	.127
						—	.157			.187	
	.112-40 (#4-40)	IUTA	IUTB	IUTC	440	135	.135	.179	.152	.165	.158
						—	.226			.256	
	.138-32 (#6-32)	IUTA	IUTB	IUTC	632	150	.150	.210	.183	.180	.189
						—	.281			.311	
	.164-32 (#8-32)	IUTA	IUTB	IUTC	832	185	.185	.243	.217	.215	.223
						—	.321			.351	
	.190-24 (#10-24)	IUTA	IUTB	IUTC	024	225	.225	.273	.247	.255	.253
						—	.375			.405	
	.190-32 (#10-32)	IUTA	IUTB	IUTC	032	225	.225	.273	.247	.255	.253
						—	.375			.405	
	.250-20 (1/4-20)	IUTA	IUTB	IUTC	0420	300	.300	.342	.310	.330	.316
						312	.312			.530	
						—	.500			.530	
	.250-28 (1/4-28)	IUTA	IUTB	IUTC	0428	—	.500	.342	.310	.530	.316
	.313-18 (5/16-18)	IUTA	IUTB	IUTC	0518	—	.500	.406	.374	.530	.378
	.313-24 (5/16-24)	IUTA	IUTB	IUTC	0524	—	.500	.406	.374	.530	.378
	.375-16 (3/8-16)	IUTA	IUTB	IUTC	0616	—	.500	.509	.462	.530	.468
	.375-24 (3/8-24)	IUTA	IUTB	IUTC	0624	—	.500	.509	.462	.530	.468

All dimensions are in millimeters.

METRIC	Thread Size	Type			Thread Code (I)	Length Code	A ± 0.13	E ± 0.13	C ± 0.13	Hole Size in Material	
		Aluminum	Brass	Stainless Steel						Min. Hole Depth	Hole Dia. +0.08
	M2 x 0.4	IUTA	IUTB	IUTC	M2	318	3.18	3.73	3.07	3.94	3.23
						—	.4			4.76	
	M2.5 x 0.45	IUTA	IUTB	IUTC	M2.5	—	5.74	4.55	3.86	6.5	4.01
						343	3.43			4.19	
	M3 x 0.5	IUTA	IUTB	IUTC	M3	—	5.74	4.55	3.86	6.5	4.01
						—	.74			.79	
	M3.5 x 0.6	IUTA	IUTB	IUTC	M3.5	—	.74	5.33	4.65	.79	4.81
						470	4.7			5.46	
	M4 x 0.7	IUTA	IUTB	IUTC	M4	—	8.15	6.17	5.51	8.91	5.67
						572	5.72			6.48	
	M5 x 0.8	IUTA	IUTB	IUTC	M5	—	9.52	6.93	6.27	10.28	6.43
						762	7.62			8.38	
	M6 x 1	IUTA	IUTB	IUTC	M6	—	12.7	8.69	7.87	13.46	8.03
						—	12.7			13.46	
	M8 x 1.25	IUTA	IUTB	IUTC	M8	—	12.7	10.31	9.5	13.46	9.6
						—	12.7			13.46	