

Product Information Report

Locking Threaded Inserts



Keyserts®

Overview

Locking threaded inserts provide an easy-to-install threaded insert to replace damaged, stripped or worn threads in a wide range of materials such as castings, forgings and mechanical components (except cast iron or other brittle materials).

Made from tough, high-quality carbon steel or stainless steel, locking threaded inserts are especially suitable for use in heavy wear and high vibration applications such as mining and earth-moving equipment, as well as everyday maintenance repairs.

They are available in thinwall and heavy-duty designs in imperial and metric thread forms. Each insert features either two or four locking keys which provide a positive mechanical lock and prevent loosening from rotation and torsion. Whatever the project, locking threaded inserts are reliable under the toughest conditions.

Features/Benefits



- Easy to install and remove
- Standard drills and taps can be used
- Same size fastener can be reinstalled after repair
- Locking keys prevent insert from backing out
- Can support loads generated by Tuff-Torq® fasteners

Applications

- Marine equipment
- Engine repair
- Heavy equipment
- Food processing
- Machinery
- Trucks
- Molds
- Tooling
- Dies



Installation and Removal

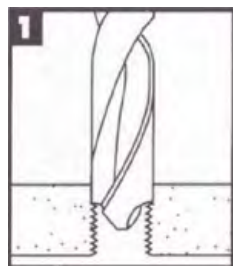


Installing inserts is simple and easy. The only tools required are a drill, countersink*, tap and the insert. The following pages list the proper size drill and tap to use to ensure a proper installation. The drill size listed for the tap is slightly oversize when compared to the standard tap drill size. This is because the external threads of the insert are truncated.** These locking inserts are not stackable.

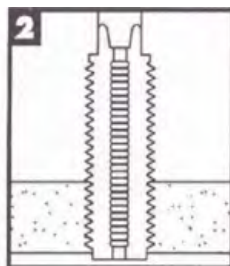
*The countersink is not a full countersink. It is just to clean up the edge of the hole.

**For more information on truncated threads see Engineering Quick Tip on Truncated Threads.

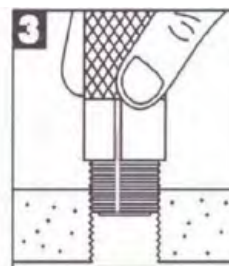
Installation



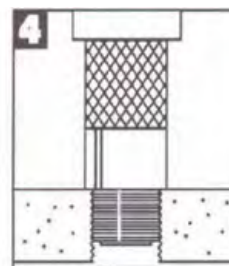
1. Drill out old threads with a standard drill. NOTE: Drill is oversize – see charts for proper dimensions. Chamfer the hole with a standard countersink (82° – 100°).



2. Tap new threads with a standard tap. See charts for proper size and depth.

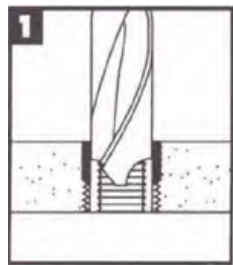


3. Screw in the insert until it is slightly below the surface.

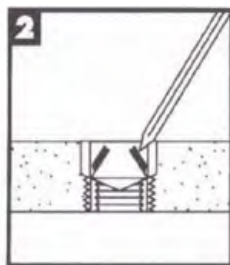


4. Drive keys down with several hammer taps on the proper installation tool.

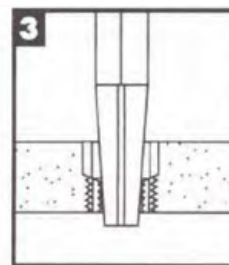
Removal



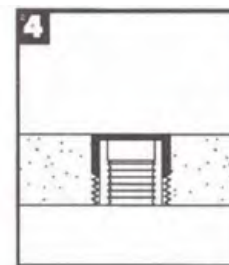
1. Drill out material between keys and internal thread with standard drill to specified depth. Refer to charts for proper dimensions.



2. Deflect keys inward and break off.



3. Remove insert using a screw extractor or similar tool.



4. The same size replacement insert may be installed in the original hole.

Solid One-Piece Keyserts® Specifications and Technical Information

Materials

Inserts – Thinwall, Heavy-Duty and Metric Inserts are available in C1215 Steel or equivalent, or 303 Stainless Steel

Keys – 302 Stainless Steel

Finish

Carbon Steel – Zinc phosphate and oil
Stainless Steel – Passivated

Tolerances

±0.01" (±0.25mm) unless otherwise specified

Thread Class

Fractional Sizes:

Steel External: Modified 2A

Steel Internal: 3B #10 to 5/8", 2B for #8 and 3/4" and up

Stainless External: Modified 2A, Modified 3A for #8

Stainless Internal: 3B

Metric Sizes:

External: 6g

Internal: 6H

Applications

Thinwall and Metric Keyserts® can only be used on fastening systems with an ultimate tensile strength of 125,000 PSI (830 Mpa) or less.

Heavy-Duty Keyserts® can be used on fastening systems with an ultimate tensile strength of 150,000 PSI (1,040 Mpa) or less.

**Solid One-Piece Keyserts®
Specifications and
Technical Information
(cont.)**

Thinwall

Insert			Installation				Removal	
Internal Thread Size	External Thread Size	Length (Inches)	Tap Drill Size	Countersink Dia. (Inches)	Tap Size	Minimum Thread Depth (Inches)	Drill Size (Inches)	Depth (Inches)
10-24 10-32	5/16-18	0.310	I	0.320	5/16-18	0.370	7/32	1/8
1/4-20 1/4-28								
5/16-18 5/16-24	3/8-16	0.370	Q	0.380	3/8-16	0.430	9/32	3/16
3/8-16 3/8-24								
7/16-14 7/16-20	7/16-14	0.430	X	0.440	7/16-14	0.500	11/32	3/16
1/2-13 1/2-20								
1/2-13 1/2-20	1/2-13	0.500	29/64"	0.510	1/2-13	0.560	13/32	3/16
7/16-14 7/16-20								
1/2-13 1/2-20	9/16-12	0.560	33/64"	0.570	9/16-12	0.620	15/32	3/16
1/2-13 1/2-20								
1/2-13 1/2-20	5/8-11	0.620	37/64"	0.630	5/8-11	0.680	17/32	3/16
1/2-13 1/2-20								

Heavy-Duty

Insert			Installation				Removal	
Internal Thread Size	External Thread Size	Length (Inches)	Tap Drill Size	Countersink Dia. (Inches)	Tap Size	Minimum Thread Depth (Inches)	Drill Size (Inches)	Depth (Inches)
8-32 10-24 10-32	5/16-18	0.310	I	0.320	5/16-18	0.370	7/32	1/8
1/4-20 1/4-28								
5/16-18 5/16-24	3/8-16	0.310	Q	0.380	3/8-16	0.370	9/32	1/8
3/8-16 3/8-24								
7/16-14 7/16-20	7/16-14	0.370	X	0.440	7/16-14	0.430	11/32	3/16
1/2-13 1/2-20								
5/16-18 5/16-24	1/2-13	0.430	29/64"	0.510	1/2-13	0.500	13/32	3/16
3/8-16 3/8-24								
7/16-14 7/16-20	9/16-12	0.500	33/64"	0.570	9/16-12	0.560	15/32	3/16
1/2-13 1/2-20								
5/8-11 5/8-18	5/8-11	0.620	37/64"	0.630	5/8-11	0.680	17/32	3/16
3/4-10 3/4-16								
7/8-9 7/8-14	3/4-16	0.620	45/64"	0.760	3/4-16	0.680	21/32	3/16
1-8 1-12								
1-12 1-14	3/4-16	0.810	45/64"	0.760	3/4-16	0.940	21/32	3/16
1-12 1-14								
1-12 1-14	7/8-14	0.870	53/64"	0.880	7/8-14	1.000	25/32	5/16
1-12 1-14								
1-12 1-14	1-1/8-12	1.120	1-1/16"	1.140	1-1/8-12	1.310	31/32	5/16
1-12 1-14								
1-12 1-14	1-1/4-12	1.250	1-3/16"	1.270	1-1/4-12	1.440	1-3/32	5/16
1-12 1-14								
1-12 1-14	1-3/8-12	1.370	1-5/16"	1.390	1-3/8-12	1.560	1-7/32	5/16
1-12 1-14								

Metric

Insert			Installation				Removal	
Internal Thread Size	External Thread Size	Length (mm)	Tap Drill Size (mm)	Countersink Dia. (mm)	Tap Size	Minimum Thread Depth (mm)	Drill Size (mm)	Depth (mm)
M5 x 0.8 M6 x 1.0	M8 x 1.25	8.0	0.9 (H)	8.25	M8 x 1.25	9.5	5.5	4.00
M8 x 1.0 M8 x 1.25								
M10 x 1.25 M10 x 1.5	M10 x 1.25	10.0	8.8 (S)	10.25	M10 x 1.25	11.5	7.5	4.75
M12 x 1.75 3/8-24								
M8 x 1.0 M8 x 1.25	M12 x 1.25	12	10.8 (27/64")	12.25	M12 x 1.25	13.5	9.5	4.75
M10 x 1.25 M10 x 1.5								
M12 x 1.75 3/8-24	M14 x 1.5	14.0	12.8 (1/2")	14.25	M14 x 1.5	15.5	11.5	4.75
M12 x 1.75 3/8-24								
M12 x 1.75 3/8-24	M16 x 1.5	16.0	14.75 (37/64")	16.25	M16 x 1.5	17.5	13.5	4.75
M12 x 1.75 3/8-24								

**Supertanium® Thinwall
Threaded Inserts
Specifications and
Technical Information**

Materials

Inserts – Thinwall Inserts are available in 303
Stainless Steel
Keys – 302 Stainless Steel

Finish

Stainless Steel – Passivated

Tolerances

±0.01" (±0.25mm) unless otherwise specified

Thread Class

Stainless Internal: 3B

Fractional

Insert			Installation				Removal	
Internal Thread Size	External Thread Size	Length (Inches)	Tap Drill Size (Inches)	Countersink Dia. (Inches)	Tap Size	Minimum Thread Depth (Inches)	Drill Size (Inches)	Depth (Inches)
1/4–20	3/8–16	0.370	Q	0.380	3/8–16	0.430	9/32	3/16
5/16–18	7/16–14	0.430	X	0.440	7/16–14	0.500	11/32	3/16
3/8–16	1/2–13	0.500	29/64"	0.510	1/2–13	0.500	13/32	3/16
7/16–14	9/16–12	0.560	33/64"	0.570	9/16–12	0.620	15/32	3/16
1/2–13	5/8–11	0.620	37/64"	0.630	5/8–11	0.680	17/32	3/16