Threaded Insert Installation Guide

> **Tip:** Set your PDF viewer to "Actual size" before printing to maintain scale.

Installation Procedures by Insert Type

Insert Type	Installation Steps	Tools Required	Key Tips
HeliCoil (Standard)	1. Drill hole to size 2. Tap with STI tap 3. Thread coil on mandrel 4. Screw into hole 5. Break off tang	Drill, STI tap, Installation mandrel, Tang break tool	MUST use STI tap, not standard tap. Coil should be 1/4-1/2 turn below surface
Tangless HeliCoil	1. Drill hole to size 2. Tap with STI tap 3. Use special tool to install 4. No tang to remove	Drill, STI tap, Tangless installation tool	Easier than standard, no tang debris, good for blind holes
Key-Locking Inserts	1. Drill hole precisely 2. Broach keyways 3. Align keys with slots 4. Drive in with tool	Drill, Broach, Installation driver	Broaching is critical - keys must engage. Cannot rotate when installed
Threaded Inserts (Wood)	1. Drill straight hole 2. Apply wax to threads 3. Drive with hex key 4. Stop when flush	Drill, Hex key or screwdriver	Don't overtighten - will strip wood. Brass easier to install than steel
Heat-Set Inserts	1. Drill hole to size 2. Heat iron to temp 3. Place insert on hole 4. Press with hot tip	Drill, Soldering iron or heat-set tool	Temperature critical - too hot melts too much, too cold won't seat
Self-Tapping Inserts	1. Drill hole 2. Chamfer entrance 3. Drive with hex key 4. Insert cuts threads	Drill, Hex key	Requires significant torque. Use cutting fluid in hard metals
Press-Fit Inserts	1. Drill/mold hole 2. Align insert 3. Press with steady force 4. Verify flush	Drill, Arbor press or installation tool	Can add epoxy for permanent installation. Press straight
Expansion Inserts	1. Drill hole 2. Insert into hole 3. Drive screw to expand 4. Remove screw	Drill, Screwdriver	Good for particleboard. Expansion critical for holding power

Installation Best Practices

Hole Preparation

- Use sharp drill bits - dull bits make oversized holes
- Drill perpendicular to surface - angled holes cause crooked inserts
- Use correct drill size - verify with micrometer if critical
- Deburr hole entrance after drilling
- For through-holes, deburr both sides
- Clean chips from blind holes before tapping

Tapping (HeliCoil/Tangless)

- MUST use STI (Screw Thread Insert) taps - standard taps create wrong thread form
- Use cutting fluid for metal - reduces tap wear and improves threads
- Start tap straight - first few threads set the angle
- Back off 1/4 turn every 2 turns forward to break chips
- Clean tap frequently to prevent chip packing
- Tap to full depth plus 1/4 turn for complete threads at bottom

Insert Installation

- Start insert straight - critical for proper seating
- Use proper installation tools - improvised tools damage inserts
- Apply steady, even pressure - don't rush
- Stop at correct depth - don't overdrive
- Verify insert doesn't rotate after installation (key-locking, self-tapping)
- For heat-set: Practice on scrap to dial in temperature and technique

Quality Verification

- Test with mating screw after installation
- Verify screw goes in smoothly without cross-threading
- Check insert depth - should be flush or slightly recessed
- Inspect threads for damage
- For critical applications, perform pull-out test on sample parts
- Document installation parameters for repeatability

Common Installation Mistakes to Avoid

- **Wrong tap type:** Using standard tap instead of STI tap for HeliCoil - won't work correctly
- **Incorrect hole size:** Too small damages insert, too large reduces holding power
- **Angled drilling:** Hole not perpendicular causes crooked insert and cross-threading
- **Insufficient depth:** Insert doesn't fully recess, interferes with mating part
- **Over-tightening:** Strips threads in wood or soft materials
- **Wrong temperature:** Heat-set inserts damaged or won't seat properly
- **Missing keyways:** Key-locking inserts will rotate without proper broaching
- **No test installation:** Discovering problems after drilling production parts
- **Rushing heat-set:** Moving iron too fast causes poor melt and weak installation
- **Reusing damaged inserts:** Damaged threads or bent inserts cannot be reused