

# Tapping Guide

## 10 Different Types of Thread Taps [Definitive Guide]

by [Bob Warfield](#) | [Beginner](#), [Blog](#), [Products](#), [Techniques](#)

There are many different types of thread taps, and knowing exactly when to use each kind is the goal of this guide.

**Note:** *If you're familiar with tap types, but need to learn best practices in their use to avoid breaking taps, try our article and video [7 Ways to Avoid Breaking Taps](#).*

A great variety of thread taps are available with varying advantages and disadvantages:

### Hand Taps (Tap Set Taps, Straight Flute Taps)

#### Bottoming Tap (1 - 1.5 Tapered Threads)



#### Plug Tap (3 - 5 Tapered Threads)



#### Taper Tap (8 - 10 Tapered Threads)



Hand taps, typically bought at the local hardware store, are the most common types of taps, but they are generally to be avoided for CNC work.

Buy some good quality taps and try tapping by hand versus the hardware store set of thread taps. You'll be surprised at how much better taps made for machines work.

One applicable standard for Hand

There are two types of Hand

Taps is ISO 529.

Taps:



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## Taper Tap

A taper tap has quite a lot of taper to help it ease into cutting threads gradually. Typically, the first 8 to 10 threads are tapered. Taper Taps are the most common types of taps and are typically what you'll have in a Tap and Die Set.

## Bottoming Tap

A bottoming tap has almost no taper at the end because it is designed to thread all the way to the bottom of its reach. Only 1 to 1.5 threads will be tapered.

Bottoming Taps are useful for threading blind holes. It's desirable to thread most of the hole with a Taper Tap first, and then finish the bottom of the hole with a Bottoming Tap.

## Plug Tap

Plug Taps are in between Bottoming and Taper Taps because they have 3-5 threads tapered, which is more than a Bottoming Tap and less than a Taper Tap.

Unfortunately, terminology is not always consistent. Some vendors call these "Second Taps" and refer to Bottoming Taps as Plug Taps. Check to be sure what you're getting and using.

## Power Taps

These are the types of taps you should choose from for CNC applications or for manual machining work.

## Spiral Point Taps (Gun Nose or Bull Nose Taps)



These thread taps have a spiral cut with relief grooves. They're common and look like most of the hand taps you'll see around. But, the spiral angle on the front cutting edges helps eject the chips and the angled edge also gives superior cutting performance. Hence, they're really the least expensive thread tap you might consider using for power tapping, and can be run at slightly higher speeds than hand taps.

Like hand taps, spiral point taps can be had as a taper tap has a tapered end, or a plug tap (intended for blind holes) has much less taper.

They're cheaper than the other two types, but I typically prefer the other two. The primary disadvantage of these is they push the chips ahead of the tap—down into the hole in other words. This is not a big deal for through holes, but is a bad idea for blind holes.



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## Spiral Flute Taps or Gun Taps



Spiral Flute Taps have an open spiral just like an endmill. Their primary advantage is they eject chips up and out of the hole. They're always preferable over spiral point taps when you have a blind hole.

They're also preferable for an interrupted hole where another feature intersects because the spiral helps restart the threading past the open feature.

Sometime, take a spiral flute tap and a regular hand tap and tap a couple of identical holes by hand. You'll be shocked at how much less effort the spiral flute tap requires. Choosing the right types of taps really helps!

### Interrupted Thread Tap

These thread taps only have a tooth for every other thread. The idea is to provide improved chip

removal. Removing every other



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tooth helps break chips and also provides more room for the chip to escape and for lubricant to come in and do its job.

## Pipe Taps



As you might expect, Pipe Taps are the types of thread taps used for tapping pipe threads. There are both straight and tapered pipe taps depending on whether the pipe thread is intended to be straight or tapered. The photo shows a typical NPT Thread Pipe Tap. You can see the taper of the NPT thread profile.

Taps for tapered pipe threads have to work harder because you can't drill a tapered hole. There's quite a lot more material they must remove at top of hole than bottom. Use a pipe taper reamer to taper the hole so the tap doesn't work so hard.

## Form or Roll Taps (Thread Forming Taps)



Thread Forming taps don't cut threads at all. Instead they cold form. Threads made this way are often called "rolled" threads.

With this process, the metal is pushed out of the way and compressed into position rather than being cut. There are no chips to remove. As a result, the taps themselves are less likely to break and the threads they make are stronger. If your application allows Form Taps, they are generally the best thing going for those reasons.

Form Taps do require different feeds and speeds and they require a different starting hole size, so be aware of that before using one.



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While many believe they're only good for soft materials like aluminum, they can actually be used on materials up to a hardness of 36 HRC, which is about 340 BHN. That covers a surprisingly wide range of materials including a lot of steels.

I will almost always choose a Form Tap over a Cutting Tap out of the available types of taps if the material isn't too hard for thread forming.

## Extension Taps (Long Shank Taps)

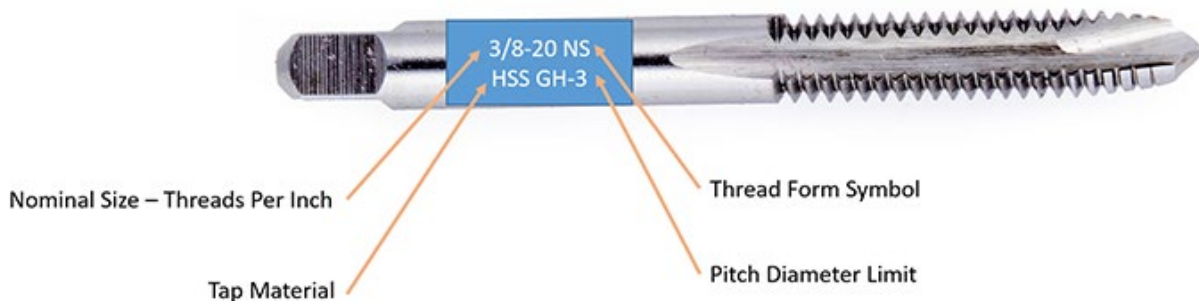
These are just thread taps with a long shank to facilitate reaching difficult holes that are blocked by other features on the part.

## Punch Taps



This proprietary technology jointly developed by Audi and Emuge can save you up to 75% of your tapping cycle time. Check out [our article for more about Punch Taps](#).

## Standard Tap Markings



Taps are marked on the shank so you can tell at a glance what kind of thread tap you're dealing with. The markings typically will include:



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- Nominal Size: This is the description of the thread size that tap will make.
- Thread Form Symbol: This describes the thread family.
- Tap Material: Usually Carbide or HSS
- Pitch Diameter Limit: Tells what tolerance thread will be made.

**Pitch Diameter Limits (Threads < 1" in diameter)**

**L1** = Basic to Basic minus .0005

**H1** = Basic to Basic plus .0005

**H2** = Basic plus .0005 to Basic plus .0010

**H3** = Basic plus .0010 to Basic plus .0015

**H4** = Basic plus .0015 to Basic plus .0020

**H5** = Basic plus .0020 to Basic plus .0025

**H6** = Basic plus .0025 to Basic plus .0030

**Note:** You can find these limits in [G-Wizard's thread database](#) too.

**Thread Form Symbols / Abbreviations**

**ACME 60° STUB** 60° Stub thread form

**ACME STUB** Stub Acme thread form

**ACME-C** Acme thread – centralizing

**ACME-G** Acme thread, general purpose

**ANPT** Aeronautica National Form taper pipe thread

**AWWA** American Water Works Association

**BA** British Association Standard thread form

**BSF** British Standard Fine thread series

**BSP** British Standard Pipe Parallel

**BSPT** British Standard Pipe Taper

**BSW** British Standard Whitworth

**MM ISO** Metric thread form

**N BUTT** American Buttress screw thread

**NC** American National Coarse thread series

**NEF** American National Extra-Fine thread series

**NF** American National Fine thread series

**NGO** American National gas outlet threads

**NGT** American National gas taper threads

**NH** American National hose & fire hose coupling

**NM** National Miniature thread series

**NPS** American Standard straight pipe thread

**NPSC** American Standard straight pipe thread in couplings

**NPSF** American Standard internal straight pipe thread (dryseal)

**NPSH** American Standard straight pipe thread for hose couplings & nipples

**NPSI** American Standard intermediate straight pipe thread (dryseal)

**NPSL** American Standard straight pipe thread for locknuts

**NPSM** American Standard straight pipe thread for mechanical joints

**NPT** American Standard taper pipe thread

**NPTF** Dryseal American Standard taper pipe thread

**NPTR** American Standard taper

**NS** Special threads of American

pipe thread for rail fittings  
National Form



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**PTF** Dryseal SAE Short Taper pipe thread  
**SGT** Special Gas Taper thread form  
**SPL-PTF** Dryseal Short Taper Pipe thread  
**STI** Special Threads for Helical Coil Wire Screw Thread Inserts  
**UN** Unified and American thread series  
**UNC** Unified and American Coarse thread series  
**UNEF** Unified and American Extra-Fine thread series  
**UNF** Unified and American Fine thread series  
**UNIV** Unified Miniature Thread Series  
**UNJ** Unified Thread Series with Controlled Root Radius  
**UNJC** Unified Coarse Thread Series with Controlled Root Radius  
**UNJF** Unified Fine Thread Series with Controlled Root Radius  
**UNR** Unified Constant Pitch thread series with Controlled Root Radius  
**UNRC** Unified Coarse Thread Series with Controlled Root Radius  
**UNRF** Unified Fine Thread Series with Controlled Root Radius  
**UNS** Unified and American threads of selected special diameters and pitches



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