

# Using and sharpening Carbide !

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## What Is a Carbide Insert Cutting tool ?



Well first of all, what is Carbide ?

Carbide is a binary compound of carbon mixed with another element. For cutting tools, the extra ingredient is typically either tungsten (i.e., tungsten carbide) or titanium.

Carbide (or more specifically tungsten carbide and titanium carbide) is a very common material used in many types of cutting tools: For example, saw blades, metal lathe cutting bits, woodturning cutting tool inserts, drill bits, router bits and dental drilling tips are all uses for Carbide. It is popular in these sorts of tools because it stays sharper longer than most other materials.

With something like a carbide-tipped saw blade or woodturning tool, the main body of the tool is made of steel. A good carbide tip might hold an edge ten to twenty times longer than tool steel.

***NOTE : All tools/cutting inserts whether the finest high speed steel or Carbide,,, will eventually need to be sharpened.***

## **Yes,,,, Carbide can be sharpened !**

*The Carbide insert manufactures and distributors have done a wonderful job in marketing their inserts as simple “throw away” items. Good for their bottom line, waste of our money.*

Carbide tips do get dull eventually. When they do, we sharpen them using a very specific method. Because Carbide is so hard, we must also use a specific type of abrasive.

**We sharpen Carbide inserts with something coated in diamond.**

If you know how diamonds work, you know that diamond (pure crystalline carbon) is the hardest material there is. Carbide ranges between 8 and 9 on the MOHS scale. It is hard, but diamond is harder.

I use a medium or fine diamond file (600-1000 grit) with a small amount of oil to sharpen my Carbide inserts.

**Why do we only use Carbide cutters instead of solid Carbide tool shafts ?**

In our woodturning endeavors, Carbide insert cutting tools are easy to use and have a reduced learning curve. These tools still use steel for the core components (shaft), which is stronger and more reliable than solid carbide.

## Why ?

Because solid carbide can be prone to fracturing. While the metal is resilient and keeps a clean cutting edge, if the tool shaft was made of Carbide, it would lose a lot of its strength. The high stress physical forces involved with woodturning would tend to make Carbide tool shafts rather dangerous. Steel shaft tools with carbide tips, make a safer and cost effective choice for woodturners.

## Advantages of using Carbide cutting tools

**IMHO: *I do not see Carbide inserts replacing HSS.***

***Carbide used in conjunction with HSS adds significant advantages and increases our effective tool armamentarium !***

## Cost-effective

Initially, the cost of switching over to these tools can seem expensive and unnecessary. An advantage that many of us have is that we can acquire tool steel shafts and make our own carbide tipped turning tools. Over time we will wind up saving money, which is why they can be a good investment.

## **Are carbide cutting tools better than High Speed Steel (HSS)?**

**It comes down to heat and general wear and tear.**

***Carbide is much better at dissipating heat than steel. When using carbide cutting inserts, we don't have to stop as often to sharpen. Also, this heat dissipation helps the Carbide stay stronger because it doesn't change the structure of the metal.***

***The other reason that carbide cutting tools are cost-effective is that they last longer when compared to steel. For the most part, carbide cutters are going to offer the most mileage and cutting power, with less sharpening so it may be worth the additional expense.***

## **Easy replacement**

**Carbide cutting inserts are cost effective to replace. We can typically rotate the cutting insert through 4 fresh cutting surfaces before a new replacement is required. It's easier to replace the cutting inserts than it is to buy a whole new tool.**

**When using carbide cutters, they can fracture, which means that we either rotate the cutter to reveal a new cutting edge or have a replacement on hand. I keep at least one replacement of each type in my shop. Fracturing will occur if the cutting insert comes into contact with a spinning chuck or if dropped onto the lathe bed.**

**Overall, carbide-tipped cutting tools have much lower maintenance costs and issues, which is why they are so effective.**

## Clean cuts and finishes

One crucial element of a carbide inserts is that the edge is going to stay sharper for longer. Unlike steel that can wear down almost immediately, the carbide won't break down or start to get dull for quite a while.

Because it maintains a sharper edge, that also means that you can get a clean, neat surface. Turning the wide variety of projects that we do, having cleaner results will save us sand paper, time and money. Rather than having to sand the imperfections out after turning, our pieces are going to be ready for final finishing more quickly.

Also, when cutting wood, carbide tools don't "catch" the grain as much. You can get great results with carbide, when like learning to use any other tools, you take the time and you practice to develop new skills.

***BUT !!!!***

***A Carbide insert will never produce the fine finish that a shear cut with a sharp, HSS tool provides.***

## Long lasting

When we combine the cutting capabilities of carbide inserts with long lasting durability and the ability to be sharpened, we get a quality turning tool that is built to last. We already mentioned that you can replace tips without swapping out for a new tool, so a high-quality carbide insert tool is going to outlast even the best HSS option.

The investment for changing over to carbide inserts may seem expensive at first, but you are getting a lot of value in the end, making it a great choice and addition to our woodturning shops..

# The bottom line on Carbide cutting tools

*We can get incredible results when using carbide insert cutting tools. If you're tired of replacing/sharpening your high-speed steel tools over and over again, now is the perfect time to see how carbide insert can transform your hobby.*

## Woodturning Carbide tool manufacturers/ suppliers

EasyWood

Woodpeckers

The dominant players

## Suppliers (Note: You get what you pay for, buyer beware)

Az Carbide

Woodcraft

Rockler

Packard

Craft Supply

Captain Eddy

Banggood

Amazon

PSI

Alibaba

AlieXpress

## **Types of Carbide cutters**

<b>Square</b>	<b>(roughing)</b>
<b>Square radius</b>	<b>(roughing)</b>
<b>Round</b>	<b>(finishing/shear scraping)</b>
<b>Diamond</b>	<b>(detailing/hollowing/parting)</b>
<b>Negative rake</b>	<b>Finishing cuts on bowls, pens/ acrylics</b>
<b>Parting insert</b>	

## **Carbide cutter sizes**

**Full size tool and cutters**

**Pen turning size and cutters**

## **Shank type**

**Round Steel**

**Angled/Oval steel**

**Gooseneck for hollowing**

## **Carbide cutter turning uses**

**Spindles**

**Finials**

**Bowls/hollowing**

**Pens**

**Acrylics**

**My Bottom line on Carbide insert tools is this.**

**I enjoy using all types of wood cutting tools.**

**I love to turn wood.**

**I love to make wood and acrylic bowls.**

**I love to make pens & bottle stoppers out of wood and acrylics.**

**I love to constantly try new cutting and shaping techniques.**

***I do not love to sharpen my HSS tools.***

**So,,,,, to make the edges on my HSS tools last as long as possible,,,,,**

**I use Carbide inserts to do all of the roughing, shaping and hollowing on all of my wood projects.**

**I use my beautifully sharpened gouges to make “finish” cuts.**

**I use Carbide inserts almost exclusively on acrylics and typically negative rake Carbide inserts.**



# Carbide Gets A Turn

*by David Heim, Woodcraft magazine*

When Easy Wood Tools introduced its carbide-insert tools in 2010, I was surprised to see the reactions from some of the turners I knew. Trained on gouges and skew chisels made from high-speed steel (or even older carbon steel), these veterans were skeptical, to say the least. They couldn't imagine how the newfangled scrapers could cut cleanly or require no sharpening. Myself, I tried to keep an open mind. I use scrapers a lot in my own turning work because I find them great for light finishing cuts.

At least seven other companies have brought out their own sets of carbide-insert tools since Easy Wood's introduction, and opinions about them continue to vary. So I decided to find out what woodworkers really think. I invited Alan, Andy, Sergio, and Steve—four friends from my local woodturning club—to join me for an intensive day of testing at our local Woodcraft store—The Woodworker's Club, in Norwalk, CT. The goal wasn't to identify winners and losers, but to learn how these new turning tools fit into the established arsenal.

My woodturning buddies brought their own high-speed-steel tools and I provided maple turning blanks and plans to follow. Easy Wood Tools and Woodpeckers provided 4 sets of carbide tools, enabling the group to get an intensive workout. Each guy made a small bowl, a spindle, and a lidded box—first with their regular tools, then with the carbide. That way, they could compare the two types of tools on identical pieces. Each project tested the tools in a different way. The shape of the spindle tested the tools' ability to get into tight quarters and produce crisp details without breaking the wood. In bowl-turning, the tool hits endgrain twice in each revolution, so torn grain is always a possibility—a good test for smooth cutting capability.

**The lidded box also posed a series of important challenges: roughing, hollowing end grain, smoothing, and creating a precise friction fit. For all the tests, the turners strived for the best finish they could get right off the tool, with no sanding.**

## **Carbide cutter types**



**The carbide turning tools shown above represent the three main types that are currently available. The types are based on the different shapes of the carbide inserts: Easy Wood and Woodpeckers, the two manufacturers who provided carbide tools for this test, offer their insert tools in several sizes. You can expect to pay between \$110 and \$140 for a medium-sized carbide tool like the ones shown here. Replacement inserts cost between \$10 and \$20 apiece.**

## **Roughing with the square insert: Carbide cuts best with a horizontal handle**



## **Bevel vs angle**

**The task of roughing a blank revealed a major difference in how a square carbide roughing tool works compared to a roughing gouge. To cut with a gouge, you drop the handle so the bevel contacts the wood, then raise the handle until the edge begins to take a shaving. But with the carbide rougher, you need to keep the tool shaft horizontal and the cutting edge aligned with the center of the stock. As the testing progressed, it became clear that old habits die hard. A couple of the guys had to be reminded to raise a carbide tool's handle to keep it on the level.**

**All 3 types can make finishing cuts.**



**Making a shear scrape is a technique that you can accomplish with steel and carbide tools.**

**With a conventional gouge, you roll the handle so the tool's flute faces the work, then drag the lower cutting edge along the work. To make this cut with the round carbide insert, you angle the cutting shaft and lightly touch the edge to the workpiece to shear off shavings. The diamond-shaped shafts on Woodpeckers tools register nicely on a tool rest for shear cuts. But some turners may prefer Easy Wood's square shaft or the round shaft found on other carbide insert tools.**

## **The detailing insert was a surprise favorite**

**Turns out, the detailer can do a lot more than detailing work. Using the detailer to turn spindles, Sergio got less torn grain than with his steel tools. Andy was surprised at how well the detailer could hollow out a small bowl (see photo at right). The turners agreed that a sharp-pointed detailer is more adept at producing crisp details than one with a slightly rounded tip. But both profiles produced impressive results, even when compared to tried-and-true HSS tools. Easy Wood offers both types of detailers, while Woodpeckers only has sharp-pointed detailing inserts.**

## **The final spin**

**After a day of intensive turning, my buddies agreed that carbide insert tools are a great addition to turning technology, even though they won't replace high speed steel tools. When making aggressive hollowing cuts with the roughing tool, the guys noted more chatter than you'd get with high speed steel tools. Bowls turned with carbide tools also showed more torn grain.**

**But in other areas, the advantages of carbide insert tooling are too good to pass up—sharp, durable edges that eliminate sharpening downtime and produce quality results.**

**Pen turners who like to work with hard acrylic blanks are certain to be fans of carbide turning tools because their hard, replaceable edges provide a big gain in productivity. Novice turners also benefit because an investment in three basic insert tools enables you to explore a wide range of turning work—no grinder required. And if your focus is making furniture rather than bowls, you still might need to turn out some spindles and tenons now and then. For these tasks, carbide is the easy answer.**

# **Take away facts :**

**Carbide inserts will “not” replace HSS tools**

**Carbide inserts will need to be sharpened**

## **When Do I Need To Sharpen ?**

**When you have to use increased cutting pressure and you notice chatter at the cutting edge.**

**Before you sharpen the insert,**

**Clean all sap and other material buildup off the insert**

**Check the Carbide insert for chips/nicks. You cannot remove these. It will be best to just use the undamaged cutting edges or replace the insert.**

**Sharpening materials >**

*Diamond file of 600-1000 grit*

*Liquid cutting agent/lapping fluid ie cutting oil, WD 40, Windex etc*

**Sharpen only the top, flat surface of the Carbide insert, never try to sharpen the angled edges. Changing the cutting angle will damage the cutting characteristics of the insert.**

**Use light, even pressure as you slide the insert in circles on the diamond file. 1-2 minutes should do it.**

**Handle sharpened inserts with care,, trust me on this, they will cut you just like a freshly sharpened high speed steel tool.**

## **Tips and Tricks**

**A bit of penetrating oil on the insert screws will help you to loosen the insert when it comes time to either rotate the insert or to remove for sharpening.**

**Mark a spot on the back of the insert before reinserting into the tool handle for later reference when rotating the insert.**

**Always rotate your inserts in a clockwise fashion, then you never have to remember which way to do it.**

## **DEMONSTRATION:**

**Tool/cutting insert types**

**Tool sizes**

**Tool sharpening Materials**

**Tool sharpening technique**