

Makin' Shavin's

Issue 1

Sharpen Up!

I guess the most challenging part of being a good woodturner is being a sharp woodturner. This hobby, sport, addiction, has gone from a business to a fantastic way for the creative to get creative. But, and there's always a but, this change now includes people who have no tool sharpening experience. Tool sharpening is an art, some may think it's a lost art. In order for you to have good sharp tools, you have to understand the difference in tools, what they do, and how.

Carbides and Scrapers

The introduction of carbide cutters was supposed to change the woodturning world. That did happen to some degree, but it also made turners aware that a good edge is a sharp edge. That included the carbon based tools you use for roughing, skew, parting, detailing, etc. Just ask yourself, "if I need a razor-sharp edge on my carbide, why don't I need that sharp of an edge on my other tools?" The answer is simply, not simple.

Carbides are created of a chemical mix, which gives them the ability to be razor sharp and maintain that edge. They are at their best when they are new, right out of the pack. If you were to take a jewelers loupe and check the edge of the cutter, you would see a very sharp corner, no burr, no workable bevel surface. To recreate this edge you need several things, and the first is patience.

- To sharpen, or resharpen, carbide cutters you need to be using a material which is harder than the carbide you are sharpening. Do you know anything at all about your carbide cutters and their consistency? Most carbide tools are created from a mix which can become 25-100 times sharper than steel. This only means, harder to sharpen and maintain.
- The sharpening surface (diamond stone) has to be even and smooth, no large stones or chips on the surface.
- The sharpening must be lubricated, regardless of the material, a little lubrication (not necessarily oil) is a very important part of this operation. I actually prefer to use a drop of water, or even spit. (but I didn't spit on the stone you're using.)
- And the sharpening surface cannot be one of those really cheap diamond stones at the discount center. That stone may be rated at 300 or 400, but are there any 80 grit stones laying in there, waiting for your cutter. Think about it, can it be cheap, and really good?



Carbide tools cut from the edge, normally without regard to the bevel position during the cut. The cutting action is very basic, introduce a sharp cutter to the wood, it cuts. But does it really cut, or are you plowing wood?

I learned from an old master, probably one of the most exact turners in the world, that most turning in the past was completed with scraper type tools. But they use a combination of an edge and a burr. I don't believe that you can get a burr on a material such as carbide because it does not flex, move or burnish. (no matter how hard you work at it)

Scrapers rely on that burr to do the fine cutting you often require correction or replacement. When I have turned lots of exotics, I discovered the lack of common grain in the wood. I also found that a sharp and burnished scraper was going to be a problem solver. The burr takes a very light and controlled cut. As shown, the scraper is just a carrier for the real cutting tool, the burr. I discovered that the best scraper I had in the woodshop was a Craftsman brand 1" half radius scraper. I was noted as being HSS on the handle, but to who's standard?



At one time manufacturers called all compressed or modified steel as High-Speed Steel without regard to the standards. Many of these tools are just one grade above pig iron and hold an edge or a burr about the same.

However, I loved this simple tool because I could sharpen it easily on a fine grinding wheel, with the top of the tool facing down on the tool rest, then accent the burr with a burnisher or a diamond stone. The edge was great for a pass or two and then I had to touch up the burr. Now, that doesn't mean back to the grinder, it means back to the burnisher, which is right there at the lathe bed. One or two quick passes and my burr is back, ready to make another cut.



Seems like a real pain in the butt, but that's how fine woodturning was done. Then along came the term "Negative Rake", it was the best thing to ever hit the woodturning world. Hell, I even fell for it, I allowed some demonstrator to re-sharpen my tools with a Negative Rake to improve my scraping and get into this new world. But then I discovered that this Negative Rake worked best if you kept the tool flat on the tool rest. There is no magic in that, but what if you changed it a little bit?



I didn't learn that from my mentor, he showed me how to twist my wrist, turn the tool up on that left shoulder and make what he called a Bias Cut (cut on an angle). This applied the cutting edge at an angle, with the ability to adjust the depth and angle of the cut. Making a softer, more controlled, smoother cut with that micro bevel. The advantages included a cut you can really control, not a plow with a sharp edge. The Negative Rake didn't hurt the methods I developed for doing bias cutting, but it sure didn't help it.

Since the introduction of Carbide Cutters, I have discovered that the Bias Cut works as well or better than a regular plow. It impacts the wood differently, allows you to cut more shapes, and generates little swirls of shavings, rather than chunks. While creating these little swirls doesn't seem like a big accomplishment, it sure changes the cut you make and the finish you leave. And get this, you don't need a negative rake to get it done.

I have a hard time explaining why the Negative Rake Carbide Cutters are okay, but not necessary. Learning how the tool cuts and how to sharpen the blade is necessary. I normally tell turners to slow down the speed, stop creating and start watching what that cutter is doing. Chuck up a piece of trash wood and start shaping it into whatever it becomes. Then you'll understand the tool, the technique and the cut.

Gouges

I have to say that the most used tool in my shop is a fairly simple 3/8" deep vee bowl gouge. I refer to it as my version of an Ellsworth/Avisera gouge. The name is derived from the two expert turners' sharpening techniques I have adapted to my gouge. David Ellsworth is a well-known turner, who brought woodturning into the limelight over 30 years ago. David brought, what was called the English Grind, to the American woodturning community. That grind is commonly entitled the Ellsworth Grind, and is accomplished with an elliptical jig on a positioned rest at your grinder.



The grind is fairly simple, you control the angle and amount, the jig controls the tip angle and swings the gouge across the face of the stone. If you create this grind, using one of the many jigs available, you are in control of the final shape. I have seen tools sharpened to a nice rounded end, or to an eagle's beak end. The pointy one has uses, but you will have to master that bite. I find that a gentle swoop is all I need at the point.



I find that if I control the pivot point, just like in scraping, I can control the bite of the cut. David Ellsworth published a flyer on how this edge is created and I have a link to that on my website. [Ellsworth Grind](http://www.eddiecastelin.com) (www.eddiecastelin.com)

As you will see, the only magic required to do this sharpening is the magic you bring to the tool. Don't go crazy at the grinder, all that metal on the floor comes off that expensive tool. David even refers to the good, bad and ugly versions of this grind. I originally started using this tool with a model produced by a catalog firm under David's guidance. I have since changed to the same shape and style this tool, but produced by D-Way Tools. This was an easy swap, because their quality control was the best I've seen. Others are now jumping onboard by paying closer attention to the flute, which needs to be true and ground flush (no ridges). A poorly ground flute can provide an irregular cutting surface, unless honed, and I don't do honing on gouges.

The Avisera portion of that title comes from a technique taught to me by Eli Avisera, a noted turner from the middle-east. He does wonderful work on barbells, finials and fine pieces with this grind. The grind removes steel from the back-side of the gouge, reducing the working bevel area, but increasing the abilities to perform smaller, more exact, cuts. The benefit of this grind is the benefit of not fighting your gouge to make a cut. I discovered this in a workshop at Arrowmont Arts and Crafts in Gatlinburg. After a quick sharpening school, I quickly went into turning mode for finials and delicately cut work. The reduced bevel allows me to make sharper turns, guide my tool into crevices and make those tiny swirly cuts I love to see. If examine the grind, you will notice that I'm removing steel that I would never be using in my cutting. This reduction will take some time to adapt to, but will give you great results. Keep in mind, this only works with a good sharpening system and some patience.

But good turning often starts with a tool which has earned an ugly name, Roughing Gouge. This tool is included in most tool kits, (which I never recommend to new turners, the kit that is) and is very misleading by its title. The roughing gouge is actually a pretty useful tool, if sharpened properly. Let's start with the fact that it can be sharpened simply by holding the end of the handle in one position and turning your wrist. The edge is ground at a 45 degree angle to the body, or vertical if you please. It is designed to really take a cut, but then you can adjust that. A Roughing Gouge is a deep fluted, stamped tool, which varies from about ½ to 1.5" They look and act coarse in most turners' hands. I learned how to re-sharpen mine to get a little better cut and action. Heck, I can do smooth planning cuts with this tool almost any time of the day. Most Roughing Gouges come from the factory with a 90 degree angle where the shaft meets the cutting edge. This makes it easy perform rough cuts, but what if you want to fine tune it? I grind my gouge back from the edge to provide a more curved surface to cut with, and the ability to read the bevel. As you can see, this looks like a big gouge, which is a nice addition to the tool set. I can make roughing cuts and keep going to planning cuts. Funny, with this tool I can do pen blanks, start to finish. The key here is a good angle (45 degrees) with a little back cut and keep it sharp with a fine grind. Don't go crazy, steel on the floor doesn't cut wood.



Skew

This is probably the most understood tool in your collection. When turners first get started, they find a Skew in their tool set. Most turners pick it up, ruin a good piece of wood, curse a little and then put it away, often forever. The Skew is a tool which is very easy to sharpen. Don't buy a jig or a rig for your grinder, get out your belt sander and do it some justice. The art in using this tool is to understand how it cuts, how you control it, and how to get out of trouble.



If you want to understand how a skew cuts then imagine that the skew works much like your pocket knife, or a block plane in order to get a good workable edge. It is a controlled cut, controlled by using the bevel as a guide surface. To create this surface, I recommend that you get out your belt sander, with a fairly smooth (120) belt. This is the perfect tool for shaping and beginning sharpening your Skew. . Sharp blade is controlled by the bevel or heel of the tool. As shown, the edge is composed of two equal angles which create a 25



degree point. Don't worry about the rake, but 15 degrees is good enough. The cutting edge is not flat, but rather curved outward, or convex. How does this work? The raised bevel (bump) rides on the stock while the edge contact is controlled by you twisting your wrist. Not raising your arm, shifting your weight or picking up one foot; all you do is twist your wrist.

The tool will take slices out of your turning piece when introduced this way. To cut properly, this tool has to be very sharp. I sand mine to the rough shape on the belt sander because I can control the angle and amount of cutting. The belt sander does not generate lots of heat and is easy to use flipped over. I have several sanders which have flat tops to help in this endeavor. I shape the cutting edge on the sander and then take it to the lathe for a touch-up. The edge you now have will probably cut something, but it's not ready to cut wood.

To fine tune the edge, I put the tool down on the workbench balancing the tool on the butt of its handle, blade facing up. I then take my fine diamond stone (600 – 1200 grit) and, by lapping it downward, improve the edge by removing the burr and polishing the cutting edge. If I'm holding the tool upward, looking at the edge, I can see how my stone is cutting, adjust the angle and be in complete control. Much better than if I put the stone on a table and try to control the edge from three feet away. When lapping, you can alternate sides and you don't impact the overall shape, just the edge. I don't hone or polish this edge; I need the teeth to dig in when I use it. But remember, we're using a fine diamond stone to create the teeth, they're really small and will cut nicely.

Touch-up is so easy; you'll probably never go back to the sander because steel on the floor doesn't cut wood. Keep the stone handy and keep that edge sharp. Oh, if it needs touching up, stay away from the grinder, all you need to do is give it a few laps.

Utility Tools

We all have what are called Utility Tools in our shop. They vary from a parting tool to a detail diamond tool. They all have to be sharp, but let's not go crazy when sharpening. Most of the tools come shaped from the manufacturer, they are shaped for a specific purpose, sharpened for sale and often not very sharp. But the intention was there and most of these tools were made to make cuts on either a scraping or plowing motion. Not a lot of terrifically accurate cutting is completed by these tools, but they do serve a purpose and deserve to be sharp.

- Parting Tools. I don't believe there is anything simpler, it's a blade of tool steel, sharpened to a point for plow cutting. The only trick to sharpening this tool is to recreate the edge without changing the shape of the tool thickness. If you sharpen the point with a diamond stone or carbon stone, you can improve the cutting action. But if you try to sharpen either of the vertical surfaces of the blade you will alter the tool's ability to make a clean slice of the material. The forward edge does all the cutting, touching up the sides accomplishes nothing, but could cause problems.
- Detail Tools. Most Detail Tools work only on rounded work and cut with a scraping action. This simple tool only needs the top cutting surface touched up. I've watched as master turners touched up their detail tool, or scraper, with the simple pass of a diamond stone. Just improve the cutting edge, don't change the shape or purpose. It would help, take a close-up photo with your phone to remind you of how it should look. Sometimes a sharpening system can be our worst enemy.



- Examples of parting and detail tools which only require the tip to be sharpened.

This **Makin' Shavin's** Newsletter is provided by **Cap'n Eddie Castelin** and **Big Guy Productions**. I welcome your input, comments and even your critique.

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