



President's Letter

Superfilers



John Owenby & Linda Coats
Northwest Hardwoods Sawmill
Centralia, WA

My Dad always taught that whatever you do then you should do the best you can. Jack had a lot of coffee cans of old carbide sitting around so he and Linda, purchasing, arranged to sell it to us. It would have been easier for them to just throw it away but he had about 300 pounds of it which meant an extra \$1,500 to the mill. \$1,500 isn't a lot of money to a mill but having employees which pay this kind of attention to their jobs is a big deal. Also the very best filers are the filers who pay a lot of attention to details and who are always looking for ways to make things better.

Jerrimy Snook

Snook's Saw Service - Salem, OR

Jerrimy is Dave Shook's son. He is maybe a little young to be called a superfiler yet but he is going to be. Snook's is looking at new equipment and Jerrimy called to ask me how I felt about induction versus torch brazing. He asked an awful lot of good, tough questions. Dave Snook has a reputation for being intelligent, thorough and hard working and it looks like Jerrimy will be as well.

Carbide Processors, Inc.

Northwest Research Institute, Inc.

Newsletter August, 2006

3847 S. Union Ave. Tacoma, WA. 98409 (800) 346-8274

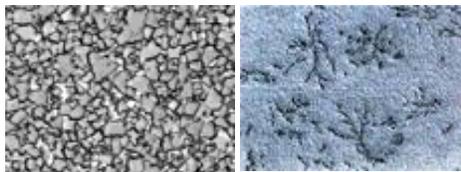
sales@carbideprocessors.com www.carbideprocessors.com

Our Strategy

Several grades of advanced materials for saw tips. In addition we sell them based on proven success in specific applications instead of by general grade number

Cermet II

World's Best Saw Tips



Advanced grain structure is just one of the many, many reasons Cermet II tips work so very well.

Super "C" grades



Less money than Cermet II but still longer life.

Sawmill Grade Super C is especially popular since it has the strength of a C-1 and the wear of a C-4.

Super "C" Nail cutting



See P. 2 for more information.

Filter Unit sale



We have a sale on two filter units that were used as sale demo units. They are fully guaranteed and great for filtering water based coolants. Call Emily to wheel and deal . 800 346-8274

Coolant Test Instruments

All you need for monthly coolant tests

Digital Brix Refractometer \$369.00 complete

Cobalt Test Strips \$75 per tube of 100

pH Test Strips \$25.90 per box of 100
Bacteria & Fungus Test Kit - Box of 10 - \$91.40

Graduated Cylinder \$19

Complete starter kit \$559.30 save \$21



Digital Refractometer and bug check kit

Successful Cermet II Applications

We called customers who had ordered and re-ordered and this is what they told us they were doing. The applications and the testimonials to success don't mean nearly as much as the fact that they keep reordering.

- trimming to size at plywood plant, any custom blade he makes, Rip saws cutting, Pine and Fir, Panel saws cutting Melamine
- running/making panel saws for tooling industry for shelving furniture and Laminated particleboard. He was using C-4 grade now and was looking for abrasion resistance.
- noticed improvements and keeps reordering for a customer of his who makes blades.
- Just got the blades back and they are lasting longer in Oak and Aspen.
- Tips went longer without sharpening.
- Cutting rail road ties
- Metal and all secondary applications
- Formica coated board, double sided fiber board and particleboard for cabinetry
- All cutting
- Pecan - working well blades came back sharper than usual with C3
- Finger joint plant very fast cuts in very dry wood. Used to have cracked carbide, but nail cutting grade solved the problem.

We carefully test all our new products in the real world.



We don't think the hand cranked chainsaw is going to make it.



Super "C" Nail cutting



(This is a letter from our customer and his customer. Dave Cessna is smart and pays a lot of attention to what really works and what doesn't. We are very proud that he likes our tips.)

"Dear Emily, Shannon & all at Carbide Processors.

Thank you for the WC7200N tips. They look very nice. What they can do is even better. I have proven the tips over many years. We have a 26" x 20 Kant gang here at the mill.

I once witnessed sawing badly frozen white oak for two days without a chipped tooth. The logs were so nasty, the head saw operator had to stop every half hour to grind the blade. We were running 28 blades in the gang at that time. The teeth we had in the gang before broke down terribly.

I am sending the letter I told you about from one of my portable mill customers. This is what he thinks of the tips.

Thanks for your help.
Dave (Dave Cessna)
Dave's Sharpening Service
The Carbide Saw Specialist
Winchester, VA 22602"

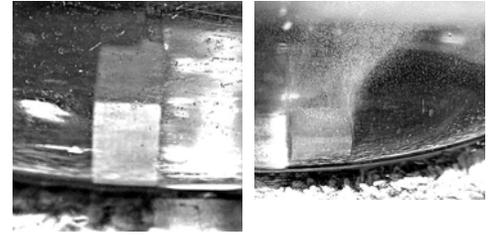
"Dave,
We're extremely happy with the teeth on our new six tooth blades. We cut through several strands of barbed wire embedded in a log and, while the teeth suffered a few chips, they're still cutting.

Thank you for your craftsmanship, detailed knowledge and friendly service. We'll be back."



Corrosion resistance

One of the many reasons our advanced grades work so well



Two saw tips in acid.

On the left is one of our advanced grade saw tips in acid. It just sits there and the acid does not affect it. On the right is an ordinary saw tip in the same acid. You can see the bubbles coming off from the reaction of carbide with acid.

We did this with lab acids. However wood acids are much more effective at dissolving metals. Plants grow by taking water and CO2 from the air. They also need trace minerals from the soil so they dissolve minerals in the soil to get and use the trace metals.

Saw Shop For Sale

David Sweet of Blademasters is retiring after 30 plus years in the business.

(209)357-2218

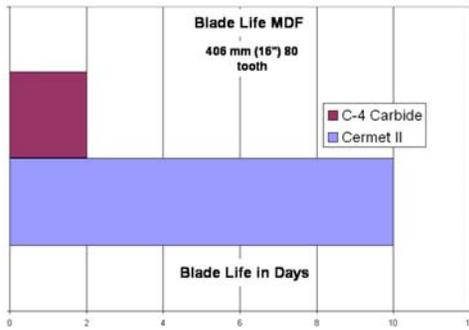
dsweeta@sbcglobal.net or

Blademasters is in rural, central California about two hours southeast of San Francisco. The county has a population of roughly 100-130k. Most work is dependent on the season in "Almond Country" The spring has a lot of animal clipper blades and pruning saws in the fall. They have a good customer base with clippers, animal dryers, sharpening handsaws, pruning saws, blades to 36" and carbide for the homeowners.

Blademasters is the only full service sharpening business in the county. It is open from 8am-5pm Mon-Fri, and Saturday by appt.

Merced County has 6 golf courses, 54 different parks, boat launches and historical landmarks. The schools have good teacher to student ratios and above average test scores. The area also has a new branch of the University of California.

Advanced Grades



Cermets, Cermet II, Comet M & X, Super C and other advanced grades

Technically Cermets are a any metal based (or metal bonded) ceramic. Definitions differ.

Technically Ordinary tungsten carbide is a cermet. There are a couple hundred grades of cermets available.

Through translation errors cermet has come to mean Titanium based grains of ceramic such as TiC, TiN or TiCN. They typically have a Nickel / Chrome binder.

Basically Tungsten Carbide would be WC with a cobalt binder. In fact steel cutting grades of Tungsten Carbide have had Titanium in them for several years and nickel has been used as a binder in carbide for many years as well.

All these materials have been used in metal working and other applications where they can be mechanically held. The problem has been to braze them successfully. Twenty years ago Weyerhaeuser tested cermets and ceramic saw tips with good results but they had to be epoxied and mechanically held so they were not viable in actual practice.

In November 27, 2001 I was granted United States Patent 6,322,871 (Walz, et al.) for a method to braze cermets and ceramics for use in saws, tools and other structures,

This made it possible to braze cermets and ceramics the same way tungsten carbide is brazed using the same equipment and for about the same cost.

We then started testing ceramics in sawing applications with mixed results. Cermets are much harder to make than tungsten carbide and we had serious quality problems with the first batches and had to recall them.

The second batch worked extremely well but were very hard to grind. They had to be ground with a 600 grit wheel using coolant clean to a level below one micron and then they had to have a land honed on them of about .0002". Many people who tried them ignored the directions and got very poor results. The most common mistake was to just grind them the same way they would carbide. This is roughly equivalent to replacing a manual grinder with a CNC and still trying to use it the same way.

In addition this generation of cermets had to be fed faster than carbide. You had to feed the material through 2 to 3 times as fast. If you didn't feed them faster then the cermet overheated and failed.

Even then we still got some excellent results. Forintek ran tests of Cermet against carbide in western red cedar where the cermet stayed sharp about four times as long as carbide.

We now have several grades of cermets available. We have our Cermet II grades which braze and grind like carbide but cut several times longer, 50% longer in fiberglass to 10 times as long in green hardwood. These cut about 2.5 to 8 times as fast as ordinary C-4 grades but do not have to be fed faster although they can be.

We also have Traditional Cermet grades that are well proven in steel cutting.

Lastly we have a true ceramic in test in both steel cutting and primary wood.

A big part of the success of the steel cutting saw blades (Kanefusa) is the design of the tips. The little square tips with the bevel and hook work very well. We currently have some samples coming from Kennametal in that shape for testing. If those work well then it will be about \$12,000 to buy the tooling to produce them.

CERMET II

Our very best grades. Up to ten times the life of good quality carbide. Superior grain structure and corrosion resistance. Superior strength and wear. About twice the price of carbide for about 5 times the performance on the average.

CR2MM - for manmade materials
CR2SM - for sawmills
CR2MTL - for metals

Super "C" Carbide Grades



Truly advanced carbide for maybe just a little more than ordinary carbide. Sometimes we deliver superior performance for about the same cost.

Comet M – for tough applications
Nail Cutting – for really tough uses
Comet X for extended wear

Royce Dupree of Oregon Carbide

Called about using TSP in an ultrasonic tank. Good Question.

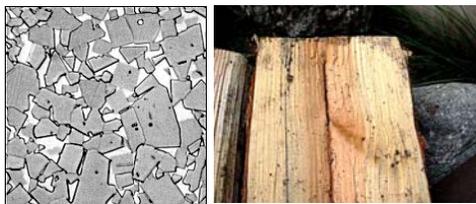
TSP is Trisodium Phosphate however there is now a "green" version of TSP that is phosphate free. Trisodium phosphate without phosphate is a different animal and most reports say that it works but not as well.

TSP is commonly used to clean before painting and a paint supply source may be a good supplier.

You can use TSP is an ultrasonic cleaner. Two considerations. 1. An ultrasonic cleaner can increase the chance of splashing and thus eye and skin contact. 2. Using an inappropriate cleaner can eat through the tank lining. A properly mixed solution of TSP shouldn't hurt a stainless steel lining. I did eat through the welds in a stainless steel tank with a 15% solution of acid at one time.

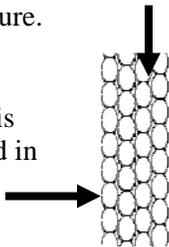
Crack Initiation and Propagation

This short article explains one of the many techniques we use to make superior grades of carbide.



Tungsten carbide and wood both have a grain structure.

Wood's structure looks something like this. It is individual cells arranged in tubes.



How well wood splits depends on where you hit it.



If you try to cut wood against the grain it is a lot of work.



When you cut wood down the grain it is much easier to separate it in smaller pieces than it is cutting across the grain.

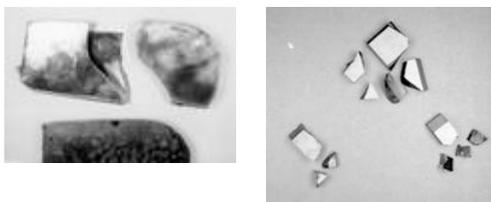
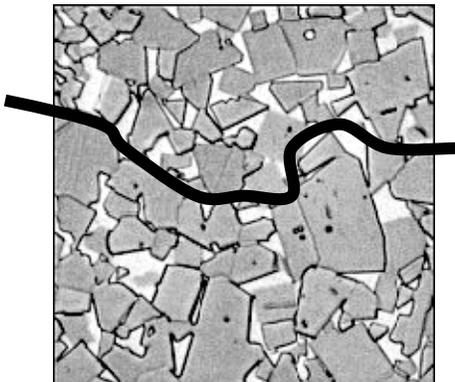
Crack initiation

Crack initiation deals with the fact that if you hit something hard enough you can put a crack in it. If you hit anything hard enough you will make an impression in it.

Crack propagation

Crack propagation deals with how far the crack runs. In many ways this is much more important.

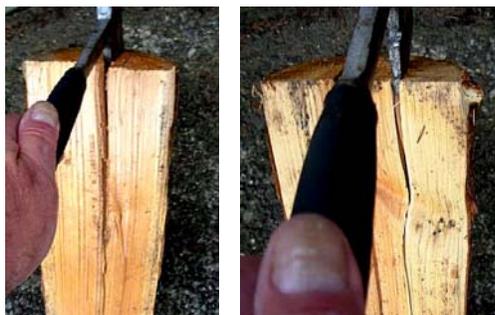
Quite often a crack in carbide runs through the carbide and destroys it.



Here are two examples of broken carbide showing crack propagation.

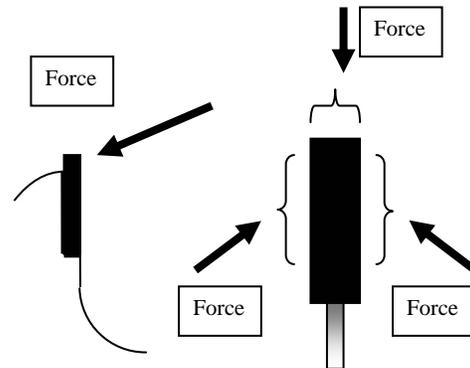
Preventing crack propagation

In traditional carbide grades they made the carbide tougher by making it with a much higher percentage of Cobalt which, as a metal, is softer than carbide grains. You can also make carbide tougher by using larger grains or even mixing larger and smaller grains.



The piece of clear, straight grained wood on the left split much further with a single blow than the knotty piece on the right.

A cutting tool tip has forces on it from many directions. Even a saw tip that theoretically cuts straight still has a great deal of stress on it from the sides as the density of the wood changes and the blade wanders.



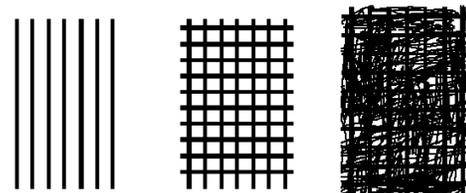
If you take log and make plywood out of it then you get a much tougher piece of material.



With repeated impacts you can split a piece of wood along the grain.



When you hit piece of plywood you can initiate a crack but it doesn't go anywhere. You have to keep cutting and cutting in the same place until you gnaw your way through it.



Ordinary carbide has tight grains like wood or the picture on the left. You can make carbide tougher with multi grains like knotty wood or the middle picture above. We make carbide really tough with a sophisticated grain structure and we use a special metalloid binder like the glue in plywood to get truly phenomenal strength.

Two Really Good Articles

Grinding Carbide Increases Strength

A significant compressive stress is present on the surface of the ground WC-Co materials, whereas a tensile stress is measured on the finish cut EDM surfaces. Moreover, the presence of high compressive stresses on the surface of ground samples results in a higher strength, while the tensile stress in the EDM samples deteriorates the strength.

This explains the general strength reduction of EDM compared to ground samples. Beside the tensile residual stress in the WC grains, Co depletion is another strength limiting factor of EDM samples as well as the significant amount of small thermal cracks observed in the WC grains. The flexural strength reduction between ground and EDM samples was found to be proportional to the thermal residual tensile stresses after EDM, which are inversely proportional to the thermal conductivity of the hardmetal grade and the average WC intercept length.

<http://www.mtm.kuleuven.be/Research/GBOU-IWT/pdf/Residual%20stresses%20in%20hardmetals%20PLANSEE.pdf>

Corrosion of Tools Used as Cutting Tools of Wood

Very good tests on carbide and steel
http://www.crittlorius.net/site/medias/images_actus/EtudeMGAUVENT-1.pdf

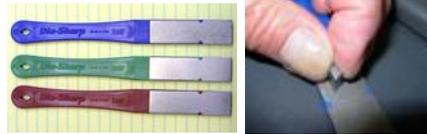


Here is a bunny with a pancake on his head.

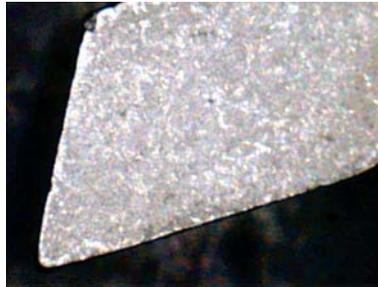
Sharpening Carbide with a Hand Hone

Apparently there are discussions on the Internet where an expert is telling people that they can sharpen their carbide saw blades by hand using a diamond hone.

Because I had a new camera, a set of hones that we sell and some spare time I decided to test this.



I used the coarse (blue) one. I used a 300 kerf tip and laid the hone flat on the desk top.



This is the tip before. I pushed the tip back and forth about an inch each way for 100 passes. Figure about half a minute for 100 passes.



This is the tip after 100 passes on each of the three sides shown. The light patch in the dark area is a dip in the surface that I didn't get down to.



As near as I can tell you would need about 500 to 1,000 passes with a coarse hone to "sharpen" this tip. 500 passes would be about two and a half minutes. The four sides of a saw tip would mean about ten minutes per tip. You could sharpen a 24 tooth saw blade in just four hours with a coarse diamond hone.



Here you can see the quality of the hone on the edge.

You could sharpen a carbide saw blade if you had a great deal of time and were incredibly steady.

Mostly though it's about like jumping off a building and calling it flying.

Hollywood News

We've been way behind on our Hollywood news, mostly because we don't care very much. However Macaulay Culkin (Home Alone movies as a kid) is on vacation with Mila Kunis of The 70's show.



If he can date her then I don't see why I shouldn't be dating Cindy Crawford. Sure, she advertises for Diet Pepsi and I drink Diet Coke but I think we can work through that.



Not only a pretty face but also great customer service

Here is Emily, who is always perky and always happy to help customers. Emily's job is to help people find carbide, silver solder, filter systems and everything else we sell. If we can't supply you but we know who can we will refer you. No matter what you want we will work really hard to find it.

IF you want special carbide, please place your order as soon as you can.

Because we are very good at finding and supplying carbide we get a lot of calls. Occasionally, after we find the carbide the customer isn't sure if they want it. When they call back to order the carbide sometimes it is no longer available. When we find it for you please order it as soon as you know you need it. We hate to disappoint anyone but we don't know a fairer way to do it than first come, first served.

Our Competition Was Right

They said their pretinning was cheaper than ours and boy is it cheap.

We got in a bind and had to go to a competitor to get some tips. All they had was pretinned tips. We bought 1,000 and sorted out the 250 they needed. Here are some of the bad ones.



The left column shows the face of the tips with a thick layer of braze alloy all over them. The bottom tip has piece of steel slag. This is going to cost a fortune to grind unless you just throw the tips away. The right hand column shows tips with globs of braze alloy on them. This is poor bonding and means the tips are more likely to come off or break.

We buy scrap carbide and swarf.

Price varies but figure \$200.00 per 2# coffee can for scrap or about \$5 / # depending on the market.



This is good pretinning. It is ours and it is what you should be buying. Demand it (well, ask for it, anyway) wherever you buy carbide.

Peerless Saw Co. Announces a New Multi-Grade Saw Tip

LT Grade for Long-lasting & Tough
Peerless has a new multi-grade saw tip. They are describing it as having a toughness of about a C1+ and a wear resistance of a C3+

As I understand it this is similar to our sawmill grade or manmade materials grade. It used to be that you could have either wear or toughness. It used to be that you had summer tires and winter tires for your car. Now advances in technology provide for materials that are superior to old materials in a whole range of applications. Whether it is the Peerless LT grade or the Carbide Processors Super C grade think of it as the steel belted, all weather radial of the saw tip world. Peerless (800) 973-3753

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