



President's Letter

**Superfiler - Marty Leber at Carbide Saw Inc. in High Point, NC.** He called Emily to tell her he was very thankful for the Freeborn Manual. However he thought he found a typo. Marty is correct. I confused the art on pages 44 and 45.

**Charles Lee - Head filer at Cascade Wood Products** and runs a business out of his home (Lee's Saw Sharp) Called because he saw the magazine Custom Woodworking Business where there was an ad for a new grade of carbide Freud was using. He called to ask me what was going on, if it was worth trying and if I could get him something similar. We are going to send him some of our super C grade. What is important here is that Charles reads and is not afraid to try ideas from other segments of the industry.

**The Three Stages of SystiMatic**

SystiMatic was started as a tool company. It made good tools, listened to the customers and were successful. Then there was a period when it was run by people who really didn't care how good their tools were and who just knew they were too smart to listen to the customers. Now SystiMatic is part of Simonds International and is run by tool people again.

Customer Reviews

"The SystiMatic sliced through leaving edges with virtually no splitting or chipping at all."  
"The SystiMatic combination blades performance has amazed me."

From Newwoodworker.com  
<http://www.newwoodworker.com/reviews/sysiblade.html>

# Carbide Processors, Inc.

Northwest Research Institute, Inc.

Newsletter September, 2005

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

sales@carbideprocessors.com [www.carbideprocessors.com](http://www.carbideprocessors.com)

## What's Hot

Sometimes some things here just sell a lot better than usual. Here are some that are hot right now.

### Wall Mount Filter Units

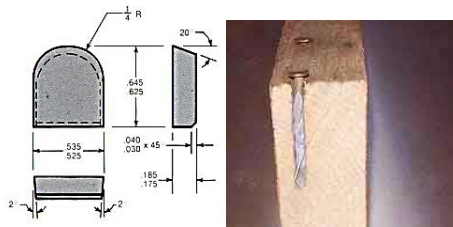


These are the heart of our filter systems. They are a bag filter followed by a cartridge filter. It sounds simple but it took us over a year to get them really right. The system, as shown, fits right in the coolant line in your grinder. It is only \$675 and pays for itself in maybe a month or two. You get about twice the diamond wheel life. West Coast Saws went from changing their coolant every month to once a year with our systems.

### "Super C" Carbide Saw Tips

Hard as a C-3 and tougher, a lot tougher than a C-1. This is a sub-micron grade tip with special additives and incredible performance values. A Transverse Rupture Strength of 537,000 P.S.I. and a hardness of 92.3 HRA

### Stump Grinder Tips & Nail Cutting Tips



### The Hot Rod Saw Tip Poker with Normalloy

Possibly the most overbuilt tool anyone every made.



Normalloy is technically an ASM classified Superalloy. This is a much better alloy than required for this use but we use and sell a lot of it so the price is right. Besides we like making really, really good tools. Birch wood handle with pin vise tip and Brass ferrule. Only \$12.95 See P. 2

### Coolube 220

Emily got some calls for this. Apparently someone has really raised the price. We found that we can get it and sell it at a good price.

### High Impact Braze Alloy

This is a cad free braze alloy that works better than any other cad free braze alloy. This has been proven in use for about seven years now. For some reason people are just starting to discover it. It is the easiest, simplest way to prevent tip loss and breakage.

### Rustlick Coolant

Carbide Power Grind

Biostable Synthetic Grinding Fluid Carbide Power Grind is a synthetic high performance diamond wheel grinding coolant which combines high rust protection while minimizing cobalt leaching from carbide. Carbide Power Grind is a biostable product, which is highly resistant to bacteria and fungus

## Sawfiler T Shirts

For Sale or Free with an order



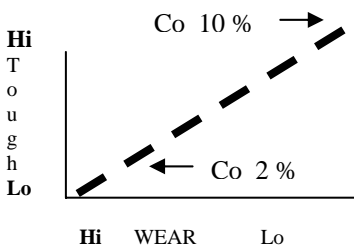
# Making Better Carbide

Our new "Super C" Carbide Saw Tips are as hard as a C-3 and tougher, than a C-1. This is a sub-micron grade tip with special additives and incredible performance values. A Transverse Rupture Strength of 537,000 P.S.I. and a hardness of 92.3 HRA

Tungsten carbide is typically cemented tungsten carbide grains in a cobalt matrix. To make this they take Cobalt (Co), Tungsten (W) and Carbon (C) as powers and mix them then sinter them. Sintering is heating the mix up to just below the melting point under a special atmosphere. If you do it right you get tungsten carbide grains in a cobalt matrix or binder. (WC/Co)

## Old Technology

Cobalt is softer than tungsten carbide so the more cobalt you have the softer the tip is. A softer tip is harder to break but doesn't wear as well as a harder tip.



## New Technology

There are several new techniques to make tips that are both harder and tougher.

### Better, Cleaner, Finer Powders

The finer and cleaner the powders are the better they mix.

### HIPing - Hot Isostatic Pressing

After sintering you take the carbide back up to just below the sintering point and you apply tons of pressure per square inch. This squeezes the soft carbide so all the bubbles, gaps and voids are squeezed out.

### Additives to the Binder

It is hard to make tungsten carbide with cobalt as a binder. It is a lot harder to use nickel and chrome although they have definite advantages. One of the

reasons carbide gets dull is chemical attack and nickel and chrome resist chemical attack better than cobalt. New technology makes it possible to create alloy binders that are tougher, harder and resist corrosion better.

### Grain Size

Smaller grains pack tighter and resist wear better. However Carbide grains want to keep getting bigger and bigger. It is easier to grow existing carbide grains bigger than to start new ones. This means it is harder to make a lot of small grains than fewer large ones. The solution is to add special chemicals to retard grain growth.

### Tungsten Carbide & Television Sets

Tungsten carbide and television sets are roughly the same age. The history of development has been similar in both. Technology in TV sets has gone two ways. You can now get black and white sets for a small fraction (maybe 10%) of what they cost originally. You can also get huge, high density full color sets that just weren't possible originally. With tungsten carbide you can now get standard carbide really cheap and you can get advanced grades with features that were just not possible even a few years ago.

### New Catalogs from Her-Saf



These are handy and very nicely done. They are 16 pages each and are packed full of clear, complete information on their products.

Her- Saf / Safranek Enterprises, Inc.  
Atascadero, CA 93422  
Toll Free 800-553-9344  
Phone 805-466-1563  
Fax 805-466-1947  
sales@hersaf.com

### Chip Load Formula

Known:  
Feed Speed ----- 90 fpm.  
No. of Teeth ----- 60  
RPM ----- 3600  
Unknown:  
Chip Load ----- ?  
Chip Load is -----0.005"

$$\frac{\text{Feed Speed (fpm)} \times 12}{\text{No. of Teeth} \times \text{rpm}} = \text{Chip Load}$$

### Tooth Quantity Formula

Known:  
Feed Speed ----- 90 fpm  
RPM ----- 3600  
Chip Load ----- 0.005"  
Unknown:  
No of Teeth ----- ?  
No of Teeth is ----- 60

### Formula

$$\frac{\text{Feeds speed (fpm)} \times 12}{\text{Rpm} \times \text{chip load}} = \text{no. teeth}$$

### Feed Speed Formula

Known:  
No. of Teeth ----- 60  
RPM ----- 3600  
Chip Load ----- 0.005"  
Unknown:  
Feed speed ----- ?  
Feed Speed is ----- 90 fpm  
Note: Feed Speed must be converted to inches. (90 x 12)

$$\frac{\text{Rpm} \times \text{no. teeth} \times \text{chip load}}{12 \text{ 9inches per foot}} = \text{FeedSpeed}$$

### Freeborn Saw Manual

Free by email or call for a hard copy for \$12.95

### Testing Coolant for \$0.75 per month

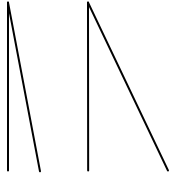
Lowering Cobalt Levels In Coolant Is Easy. Use Cobalt test strips to determine level then add cobalt remover in 4 oz amounts until you get the level where you want it.

### The Mike West / Big John Newell

**Tuna sandwich recipe.** Mike West says that Tabasco sauce on a tuna fish sandwich is really great. He got the recipe from Big John Newell. Mike says that the mayonnaise in the tuna mix cuts the heat out of the Tabasco and you get a really great flavor with no heat.

# An Idea for Grinding

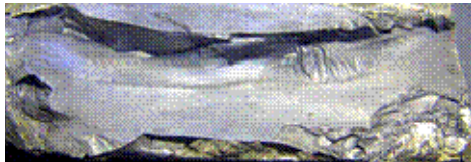
Grinding saw tips super sharp may not be that good an idea depending on the application.



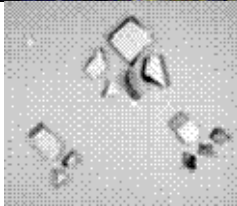
A sharper point cuts better. It is also thought that the sharper the saw is to start with the longer it will take to get dull. This is true if you are just looking at straight wear.

However a sharper point means a thinner cross section which means it is easier to break. It also means a larger surface area relative to the total mass so it is more susceptible to chemical attack.

Carbide can come off in chunks or in flakes.

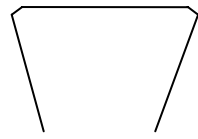
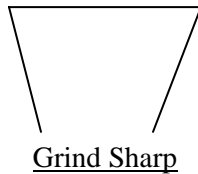


Broken carbide showing fracture plane above. broken carbide showing chunks right.



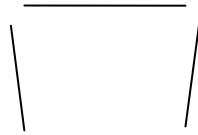
This is obsidian and it shows a material that fractured into chunks and slivers from a single impact.

# Possible ideas



## Grind Sharp and Hone

Most new automatic grinders can be set to make a honing pass

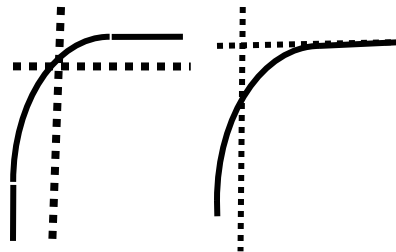


## Just don't grind so sharp

Instead of grinding to leave sharp corners just don't grind so close that the face, top and side passes overlap.



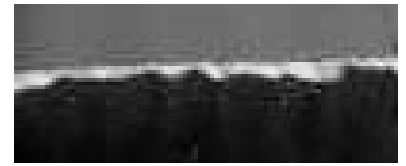
Every saw tip comes with a radius from the manufacturing. The idea is that you would just grind to leave a part of that radius.



The dotted lines are the grinding path. If you grind more like the right side then you leave some of the natural radius

However a smooth edge works best. The natural edge is not totally smooth. Usually a ground edge is not totally

smooth either. Below is a picture of a ground edge at 100 magnification.



The problem is that any crack serves as a force concentrator to pry the carbide apart.

## Advice for small shops

Small shops often have trouble competing with big shops because they don't have the equipment. What small shops do have is a low labor cost. The owner can work as long as he wants. (I am doing this newsletter on the weekend so the labor is free.) Anyway a small shop can afford to put a little more work into everything they do.

You might try honing the edges of the tools you sharpen. It can make a huge difference in tool life and increase customer satisfaction. I wouldn't get all excited and do this right off for everything but I would try few tools and see how it works.

We offer a 400 grit diamond hone for \$32.25 you might want to try.



## Really Good Advice

Here is a quote from Brian Wallinger of West Coast Saws in Tacoma, WA. Brian and his brother started with borrowed money and not much of that. West Coast Saws is now a successful and highly respected shop.

"Speed is liberating because those with quick minds and quick steps accept no limits. Don't waste any precious time avoiding, deterring, fearing, hesitating or regretting. You have the power to decide how the future will work out for you. The new business world has a new motto: You let up, you lose."

I have this on my wall next to my computer screen to remind me to quit worrying and try things.



## Mike West Takes Advantage of Poor Sweet Emily

“Good morning Emily, I was just reading over the latest newsletter and wanted to let you all know how much I appreciate it. I have always enjoyed reading it and always learn something from it. I have a question regarding the coffee cups. I love the one you sent me, I especially like the size. My dilemma is that I didn't dare show it to my crew for fear of starting the Great Filing Room Mutiny when they discovered I only had one and intended to keep it for myself. I have a rather large crew (10 warm bodies) and hate to ask for freebies, especially that many, but thought I might impose upon you to send me one every time I order carbide teeth until I finally have one for every member of the crew. That way I don't feel like I'm asking for the whole set of China for the hutch.

I really like the squeeze bottle flux thing, I'm going to need one of those and the Normalloy poker. Did Norm Brown really name that after himself?

Keep up the great work and tell Tom I said hi.

Thanks,  
Mike West, Cascade Hardwood”

### Be Nice to Norm Brown

My grandpa Kane used to use the term “Wizzeroo” so when we were looking for a project name for the Hot Rod saw tip poker we came up with “Wizzeroo”. We came up with “Normalloy” for the alloy. When we first presented it to Norm Brown he wasn't crazy about it. We told him it was just a working name and we could use whatever he wished. Norm took the Hot Rod, the names and the advertising layout to his bosses and they liked the name Normally so it stuck.

### Mike, Norm & Silly Names

Normalloy was a joke. Norm wasn't crazy about it because he is modest and he was afraid people would tease him about it. Of course people are teasing him. The important thing is that Norm and Mike are two of the nicest guys you will ever meet and the teasing is all in fun.

## Emily's New Invention

Emily had a customer call and ask if he could buy flux in a squeeze bottle. This makes lot of sense since it doesn't dry out, is really easy to keep mixed with shaking and it is easy to dispense. We've been using it this way in our shop for over twenty years. Anyway Emily invented the idea that maybe, since one customer wanted it that others might.



## Brazing with Hydrogen

Jerry Welch  
Jerry's Saw & Tool Sharpening Service  
Sylvania, Ohio 43560

### There are many reasons why this is worth reading

This letter is from 1996 but it is still good for many reasons. Jerry likes Hydrogen. Others have tried it and found it has drawbacks.

Several other things come out here that are good examples. Jerry tries new things. He realizes that you have to change your operation, here with the gauge, to try new things. He watches what he does very carefully. He calculates the whole cost of the operation.

Dear tom,

*I took the privilege to cross out acetylene and the kind of flux on your "causes of brazing problems". We have had success in doing it the way listed below for the last 10 years.*

*Acetylene: it is a very dirty burning gas that discolors the plate when brazing on the teeth.*

*Use" hydrogen: it burns very clean and very hot. You can regulate the heat that you need, depending on the size of the tooth being brazed.(see your supplier because you will have to have another gauge for the use of Hydrogen).*

*Kind of flux; take the guessing out. Use high temperature brazing flux "black". It is the highest temperature flux available and very affordable with the results that you will have.*

*Why do it this way? Because in the last year we have put on over 10,000 teeth with not one coming off due to poor Brazing. In brazing this many teeth 60% were up to 1.250 wide.*

*We have been sharpening since 1973, but began using pretinned teeth for the last 10 years. In the preceding years, We have encountered some difficulties which were corrected by the use of hydrogen and hi-temp black flux.*

*Your temperature scale of 12 different ways of determining temperature is a good guide, but only time and experience will tell you how to mix your oxygen & hydrogen for the application that you are doing.*

Jerry Welch

### Why It Is Hard To Find Speakers

After we spoke in Redding the comment was made that it is hard to find speakers. I have heard this from other saw filer groups. In my experience there are several reasons for this. First, I like speaking to filer's groups. Emily and I really like the people. However it is an expensive proposition for us. The two of us drove about 1,000 miles in two days and spent maybe \$800 in all. Second, it takes lot of time. When I give a speech I write a new one every time. It takes 40 or 50 hours spread over four to six weeks to do this.

In our experience speaking does not pay for itself short term. Many filers who show up are already customers of large companies and many of them are in sole source contracts where they cannot try anything new.

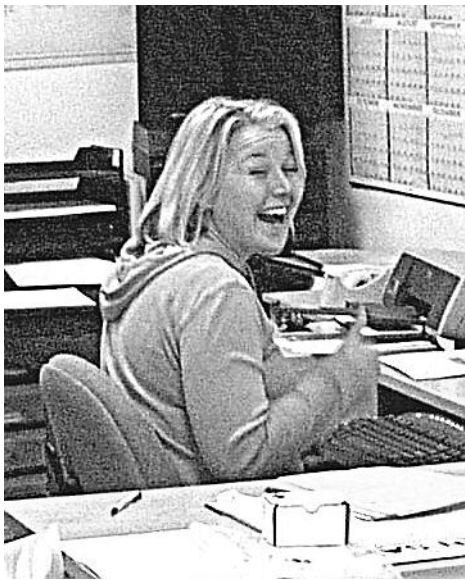
I like speaking and will continue to do it but many companies do not let their people speak because they say it just does not pay off.

I don't have any answers but I thought I would point out the problem since many people don't seem to be are of it.

**We Save You Money The Same Way Costco & Wal\*Mart Do On Carbide and Silver Solder**



**Need Braze Alloy / (Silver Solder)? We Got It and the Prices Are Good**

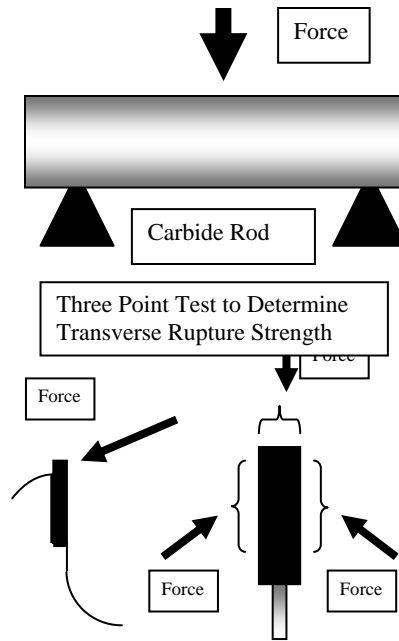


Call this nice lady for both low prices and hard to find parts. 800 346-8274

We shop world wide aggressively to get the very best prices on what we buy. We have seventeen silver suppliers and over forty regular carbide suppliers (over 1500 carbide suppliers total.) . We are a low overhead operation. We don't have outside salespeople so those that do a bit more work to call us can save some money.

**Testing Procedures And What They Mean**

The strength of tungsten carbide is measured by a slow force in a transverse rupture test. However a saw blade in a mill can run at 200 mph.



**What 200,000 To 400,000 Psi. Means**  
200,000 – 400,000 psi. can be produced by a hydraulic jack, a transverse rupture strength tester, dynamite or a tornado.



Tungsten Carbide	200,000 to 400,000
Pneumatic jack	200,000 .
Dynamite psi	66,717 to 212,000
.410 shell	13,000 psi.
Tornado	1,200 psi.

When the force is applied at great speed you can get entirely different results. A tornado generates a much smaller pressure measured as psi but it does things you can't do with slow pressure no matter how great.

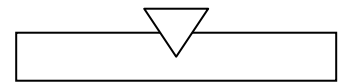
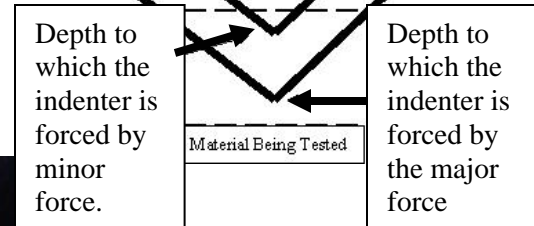


**Rockwell Hardness Test**

In a Rockwell Hardness test they take an indenter and let it rest on the material. Then they apply force to it and see how far in it pushes.



**Rockwell Tester Diamond Indenter**  
The relationship between the change in loads and the depths to which the indenter is forced form the basis for the Rockwell hardness values.



Rockwell on metal



**Tungsten Carbide is really hard little tungsten carbide grains in a metal matrix like nuts in a candy bar**

Tungsten Carbide is 92% to 99% grains and the rest is metal binder. When you push into this with a Rockwell tester you get a result that is harder than the metal but softer than the grains.

The metal binder used, the size of the grains and the arrangement of the grains can all contribute to the Rockwell reading.

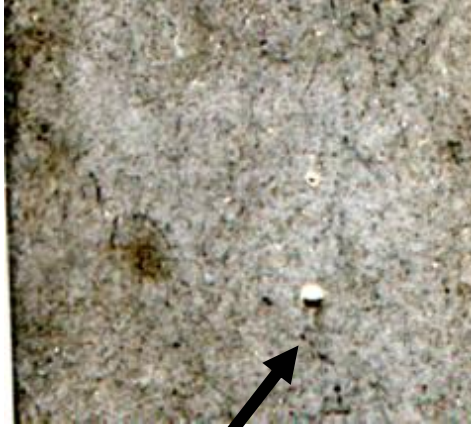




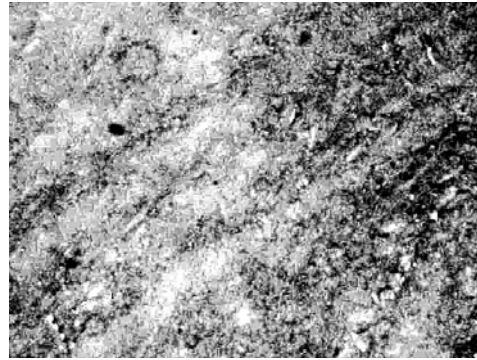
## Purified Flux

**Dozens and dozens like it. One guy doesn't.** That's not a bad average for Saw people.

You take ordinary Black Flux and take the impurities out of it. This gives you about 30% more effectiveness and there are no inert particles in the braze joint.



Ordinary flux with piece of inert material in it.



Purified flux

## New

### Steel Cutting Saw Blade

Andrew Dembicks of Andrews Tool Works (919 212 2245) is accepting applications for distributors for a new metal cutting saw blade. This is a circular blade with cermet tips similar to the Kanefusa TA Cold saw blade. This saw blade is excellent for cutting mild steel as well as alloy stainless steel steels. Due to superior cermet and brazing technology we believe that this blade is actually better than the very successful Kanefusa blade.

### A Really Cute Baby

This is Reese Taylor Aldous who is the new baby of Alisha at Murphy Saw in Redmond OR. This really is a cute baby and his mom said the bear and ducky we sent are adorable.



### New Idea

#### Maybe good, maybe Not

UPS offers free email notification when we ship your order to you. This way you know when and how we shipped it. We think this is a good idea. If you don't think this is a good idea then please let us know and we won't do it.

### Please Help

#### Emily lost a customer's name

He called and ordered four 4XL T shirts and Emily had such a good time talking to him that she forgot to write his name down. She has ordered the T shirts but doesn't know who to ship them to. If you ordered the T shirts will you call her /at 800 346 8274

#### Emily Says that giving stuff away is good for business.

I thought selling stuff was good for business but maybe she knows better. Anyway she has new coffee mugs that are big and have a picture on the front of the typical saw filer. Call an order something and she'll make you a deal.

#### Mike Santarone of National Carbide Saw & Tool in Philadelphia, PA

called. Mike ordered a couple hot rods as well as the purified flux; he is always looking for ways to improve his shop. He and I got laughing about Emily and the free coffee mugs. He says people tell him that all the time and it doesn't make any sense to him either.

**Carbide Processors, Inc.  
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