

Carbide Processors Inc.

Newsletter

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Why get into Cermets

1. You will make more money
2. Your competition is already doing it (see p.2)



(The torch flame is wrong. It is too yellow so it shows up better)

Cermets are Easy

You can make a cermet tipped saw the same way you make a carbide tipped saw. When we treat them they braze the same. Some really good brazers say they notice a difference. We don't see that when we do them but there are 'hands on' brazers much more experienced than we are. In any case you can use a torch, induction or whatever you are using now. (See p. 2)

Getting started in cermets

1. Buy some pretinned cermet tips, a set of diamond wheels and make your own saws.
2. Buy some cermet tipped saws for testing. (See "getting started" p.2)

3 braze alloys

We are now offering a new braze alloy.

Regular Cad free is easy to use and excellent for many uses.

High Impact to prevent breakage or tip loss especially in cold weather.

High strength for metal alloy, super tips. This melts at much higher temperature but gives much, much greater strength for really tough cutting situations.

Saving Bad Parts

If another pretinner or surface treater makes parts that don't work for you then we can probably fix them. This isn't something we really enjoy doing but we seem to be doing more of it lately. We do it because it is hard to refuse to help someone in trouble. It is also clear proof of the superiority of our technology and we usually get more work from it.

Save \$25,000 -Buy our book

One of our Canadian competitors is bragging that they spent \$25,000 on a university study about tip failure. The study showed that surface preparation, the kind of braze alloy and the techniques used all contributed to success or failure.

If you want the same information done better then please ask for our free little brazing book. We also have the big book, which we sell for \$90 including the second volume on solving tip failure

Brazing Tungsten Carbide and Ceramics For Saws, Tools & Wear Parts Including Failure and Breakage Analysis

Getting carbide in an emergency

We can get you tips now. Peerless has an inventory here. We also have one of the country's largest suppliers only an hour away. For about 20 years we have always done anything we could to help someone in trouble and worried about the cost later.

More time to help you

Because we are on the west coast things shut down later and we have that many more hours to solve your problem.

Prevent unscheduled saw changes

I got a call from a guy who does a little pretinning. This was one of those calls where they start out with a question but really want to brag. Anyway he said that he didn't need a lab like we have because he used a lot of carbide and he knew right away if it was any good by how it worked on the saw. Well he is right. All that counts is how it runs but it is darned nice to catch a problem before you start running the saw.

Brazing plate for the first time.

William Podmore of Cal Saw Canada called. We discussed tip loss and how it seems to be wore when plate is brazed for the first time. William has done a lot of research into this and has had some very good results. He says that more people are buying saw plate already tipped the first time and then retipping them the second time and after. William has an impressive scientific background and it shows in the quality of his work.

Why get into Cermets cont.

2. Cermet saws and tools are being developed by some of the largest saw companies in the world. The word 'developed' is very important. They are not testing them. They know they have definite advantages. Now they are developing special saws and tools for special markets.

Companies that are developing and selling cermet saws are already taking business away from companies that are not using cermets.

Cermets are easy cont.

You can use any good quality grinder. It must be a sturdy, rigid machine. Cermets are much more wear resistant than carbide so they are harder to grind.

You need a new set of diamond wheels. If you use carbide wheels to grind cermets they will grind them but there will be a huge amount of rubbing action and a lot of heat that will thermally stress the cermets.

You also need to grind about half as fast. We suggest that you grind to an edge that looks chip free at 30-power magnification. When you are through grinding you need to take a fine hone and lightly hone the edges. We recommend at least 400 grit.

Cermet edges can get much sharper than carbide. They can get so sharp that they are thin enough to chip easily. Once they chip they are rapidly destroyed. If you hone the edge you can prevent chipping and the cermets then run beautifully for many times as long as carbide.

One of our customers shipped several sets of cermet tipped saws to a plant in Texas. The Texas plant had heard from another of their plants just how good cermets are and he wanted to switch from

carbide. He was also cautious. When he got the saws he inspected them under a microscope and called. He saw the honed edge and assumed that they just hadn't been sharpened enough. We convinced him to try them and he called back saying that the saws worked great.

Getting started cont.

Buy pretinned tips or saws from us.

Titanium Carbonitride tipped saws		
diameter	tooth	list
10	30	\$154.00
10	40	\$176.00
10	60	\$220.00
10	80	\$264.00
12	40	\$198.00
12	60	\$242.00

Diamond wheels and grinding

Diamond Productions - Gary Miller
(800) 694-2863

U.S. Diamond Wheel - Ben
Broussard (800) 323-0727

Our interest in cermets

We want to license our technology
We can treat cermets and ceramics so you get very strong bonds with good temperature resistance for very little cost. When we treat ceramics and cermets you can braze them as you would carbide.

We wanted to prove this technology and prove that cermets had real advantages over carbide so we bought saw tips, paid to have the saws made and had tests run to prove that they would work

Cermets and ceramics will largely replace carbide in brazed tools as they have in mechanically held tools. The market will favor those who develop cermet saws first. Profit margins will be greater for cermets and ceramics. This will gradually erode over time due to competition. 3. Carbide tipped saws will drop in price since they will no longer be seen as premium items. (This whole cycle will repeat

as additional ceramics such as Al₂O₃ and Si₃N₄ come into use.) Many companies do not get into production unless there is a market. This is a safe way to do it. Some companies do introduce new products. This is a riskier strategy but the rewards can be huge as they have been for Sony, Microsoft, Hewlett Packard, Kennametal and others.

Using Dr. Szymani for Research

It can be very hard to run your current business and still look at new things such as cermets. If you need cutting tool research done then we would recommend Ryszard Szymani. Dr. Szymani could save you time and expense. Maybe more importantly he can do the things you don't have time to do. Dr. Ryszard Szymani wood machining Institute (925) 943-5240

Dr. Rudy of Sintex

In Memoriam

Dr. Irwin Rudy of Sintex (Pacific Hard Metals) passed away this fall. He was an incredibly gifted teacher and researcher. He built a very successful business developing and selling cermets and carbides for tools and other uses.

When we started looking for cermet suppliers, Dr. Rudy's name came up repeatedly as "The Expert". I knew him as a nice person who took the time to explain things to me. It wasn't until to the funeral that I realized how important he had also been to his community and his church.

Dr. Rudy will be deeply missed but the business will still run very well. Sintex has been quietly for sale for a while. It is an excellent facility with at least ten patents and a great deal of other research and technical information. For information on Sintex contact: Fernando Santisteban (615) 370-9818. To try Nicut tips call us. (800) 346-8274

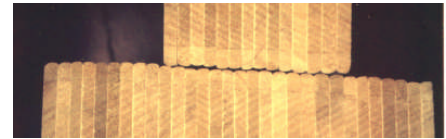
Ceramic Tipped Saws in Industry

Cutting Slats

Doubling feed and speed greatly improves performance

Cermets cut more material and cut it faster. Cermet tipped saws cut 30 slats at a time compared to only 14 for carbide tipped saws. The cuts were also cleaner. The top bundle of 14 slats has a line where the scoring saw cut. The bottom bundle of 30 slats also has a line from the scoring saw but the line is much fainter, which shows the better quality of cut. The test ran 10 weeks, which is much longer than carbide. This company is now converting all their plants to cermets.

End shot of cut slats



Ceramic tipped saws cut metal

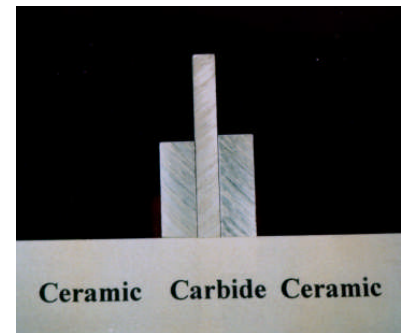
Ceramic tipped saws can break during grinding if they are ground wrong. If ceramic tipped saws are ground properly they will cut metal with no damage. The cut is smooth and easy and the saw stays cool. The operators were really impressed by the fact that the saw did not heat up as carbide does.



Two pieces of copper – left one cut with a carbide tipped blade and right one cut with a ceramic tipped blade



Interrupted cut in copper



Cut aluminum

Ceramic tipped saws cut chip free on problem materials

This is a hard laminate on a soft core. It is very difficult to cut without chipping or blow out. The ceramic tipped blade made beautiful cuts both face up and face down.



Ceramic tipped saws are tough enough for chop saws and they make clean cuts.



Cermets work very well

Run at increased

Material	Machine	Run like carbide	feed & speed
Cherry	table saw - hand fed	Much better than carbide - see Kwan report	no test
Non-ferrous	table saw - hand fed	Cooler cuts, 50% longer life	no test
Wooden slats	panel saw - power fed	Not quite as good as carbide	

We reran the wooden slat test. When the Cermet saw was run at twice the speed and feed it cut twice as much and twice as fast for 4x more productivity. It also stayed sharper much longer and gave much cleaner cuts

Red oak	table saw - hand fed	Much better than carbide - see Koschman	no test
General wood	table saw - hand fed	Much better than carbide - see Stubbs	no test
Hardwood 5 species	table saw - hand fed	Much better than carbide - see Sharp	no test
Hard & soft woods	Chop saw - manual	As good as carbide - no breakage	no test
Dry maple and alder	saw mill - cut off saw	Excellent - much longer life	no test
Sheet rock (gypsum)	standard gypsum line	As good as carbide	no test
Melamine	SCMI sliding Table	6:1 life over carbide and very clean cuts	no test
P-lam	SCMI sliding Table	6:1 life over carbide and very clean cuts	no test
Particleboard	SCMI sliding Table	5:1 life over carbide	no test
Phenolic	Hendricks Beam saw	As good as carbide	no test
Fiberglass		Not as good as carbide	no test
Cedar for windows	miter saw	Clean cuts, stayed very sharp	no test

Cermets work much better than carbide.

This is true even now when we are just starting to use them. As new grades develop and we learn how to use cermets better the success will be sensational.

We want to license the technology and we will be happy to help anyone make or test cermet saws and tools.

We can sell you tips or saws and refer you to grinding experts.

It is easy to use cermets.

Barry Stubbs

You couldn't sand finish a cut to be any smoother than the cuts made by the ceramic tip blade. You want to keep making cuts just to show friends how pretty the blade cuts. I don't know how you guys did it, but I figured your product would be hard to prove against the technology of the Forrest WoodWorker II blade.



The Woodworker's
Gazette



The Woodworker's
Gazette

Ken Sharp

I put the blade through its paces on four different projects with 5 species of wood (hardwood). IMHO, if you put the tips on good blanks, keep the price competitive, and most importantly, provide good customer support, you will be successful. You may even get a 17 year Forrest blade user to change his stripes.:-)

Stephen Koschmann

Ceramic blades WORK!! The ripping speed is FAST. With the ceramic blade, the blade will cut almost as fast as I can feed it. The ripping speed is noticeably faster than the WWII or my old standby, the 50-tooth combo Freud. The quality of the cut is very very good. The ceramic blade wasn't even hot after a couple of hours of solid ripping. The cut quality was the same on the first board and the last oak board and the feed speed was just as fast (no need to slow down the cut). I also tried the ceramic blade on two-side melamine. VERY good cut. Almost no chipout on the bottom. Net, ceramic cutting tools is a very exciting technology

Steven Kwan Ph. D. Material Science, Univ. of Pennsylvania and

Woodworker

The results are very favorable and I will not hesitate to purchase one myself or recommend it to others. My first impression with the Cermet blade was quite positive. I was able to feed solid cherry lumber and plywood through the Cermet blade as fast as I could and the Cermet blade took it all in stride. It was evident that the Cermet blade had an easier time with it. Compared to the WWII, the Cermet definitely has a lesser tendency to be gummed out. This would translate to longer time between cleaning.

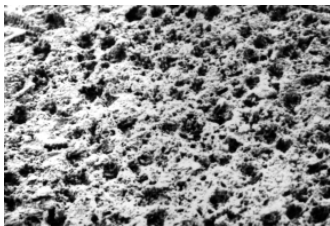
Next the Cermet blade was used to rip some solid cherry lumber and the freshly sawn edges examined to compare with the WWII. The edges were quite good with less burning than the WWII and very straight. With the Cermet blade, one can feed wood through this blade as fast as the WWII, if not faster, with less strain. It is really amazing what these tips can do. It performs well in rip and cross cuts in solid cherry lumber and also cherry veneer plywood. Now I must say the Cermet tips seem to perform as well if not better than the C4 carbides on the WWII.

When someone has trouble with “bad carbide” it is almost always good carbide with a bad surface. Steel needs to be made carefully and then treated to prevent rust for it to work well. Carbide also needs to be made carefully and treated so it will work well. Part of the problem in both cases is oxidation or rust on the surface.

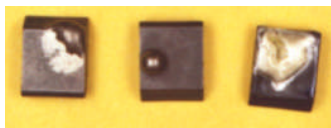
These are pictures of carbide surfaces magnified 600 times.



Untreated - Heavily oxidized. The surface is sealed and non-reactive



Treated – the surface is open for physical bonding and is chemically reactive.



Untreated



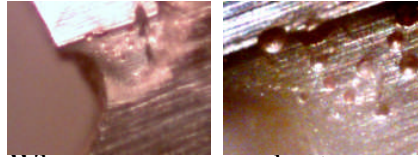
Treated



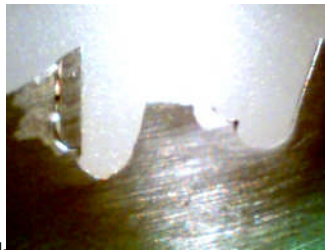
Above are examples of what can happen when you try to braze untreated carbide. You get poor bonding and gaps.

Why surface treatment is important

A common solution to a bad surface is to use more heat.



When you use more heat you weaken the braze alloy and effect the steel causing ripped shoulders. In the pictures above the braze alloy got hot enough to boil. You can see the bubbles in the left and middle pictures made by zinc boiling out of the alloy.



This picture shows a ripped shoulder caused by overheating the steel and making it brittle.

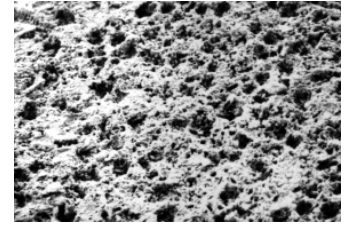
You cannot see most surface problems. The examples above are extreme but not uncommon. Most often the surface is not bad enough to show up but the tips come off in use.

A way to test bond strength is to put the tips on a saw and then push them off. A major saw company ran push off tests before approving our process.

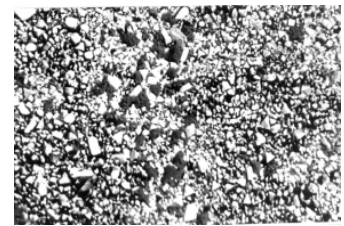
You can see below that treated carbide was dramatically better than untreated carbide and pretinned carbide was better yet.

	<u>Untreated</u>	<u>Treat</u>	<u>Pretin</u>
# Tests	60	79	24
Ave	173	261	271
High	262	323	331
Low	77	174	219

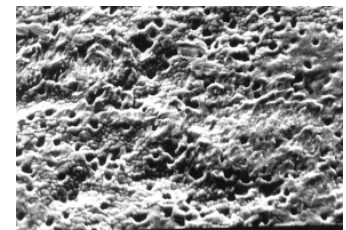
There are three kinds of effective surface treatments. (Sandblasting helps some but is not enough so we do not count it.) All start by creating a surface that is cleaned, etched & chemically activated



ARS - Cobalt & carbide – Simple, inexpensive and great for small batches.



ECP - carbide enhanced The most cost effective surface treatment

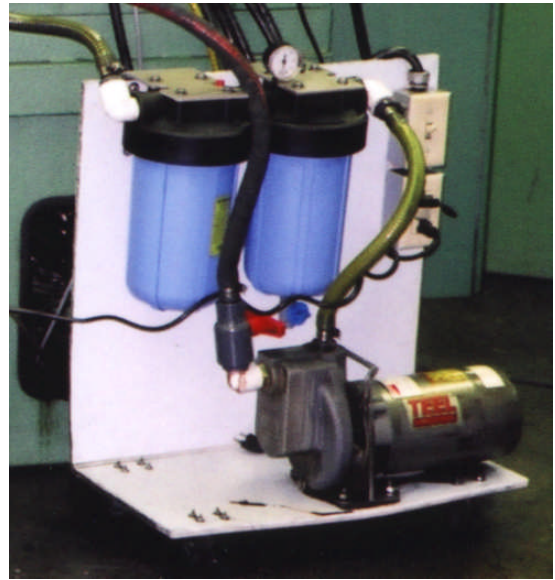


Tuffco® Cobalt enhanced This is the state of the art version of the most popular surface treatment process. It is much less expensive as well as much more effective and considerably more robust.

We are the only company in the world that uses all three treatments. We developed all three of these processes. We use them to pretin and we license rights to others.

If you want top quality pretinning or you want to set up your own treatment operation we can help.

New – A High Quality Filter System at a Great Low Price



CP 1000 \$399

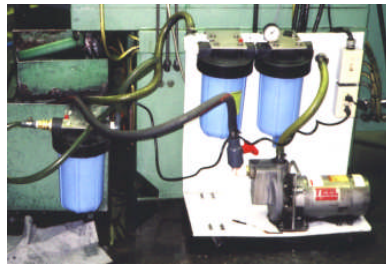
The finest low cost, filter system available - Easy mount bracket

Customer review

I want to thank you for choosing Fine tools to test your new small filter system. As you know we recently purchased the CP 2002, system and we have been very pleased with this unit.

As for the small filter system, it took only 15 minutes to hook up and has not required any service since. (From 8/1/00 to 9/25/00 - 8 weeks ed.) We changed the coolant at the time we installed your filter system. We have been extremely impressed since the coolant has remained clean and clear with the exception of a pink tint. The new filter system has been in operation 2 or 3 hours every day on our Oliver facing machine and has shown no sign of necessary filter change to date.

Sincerely,
James Dargel
Sales Manager
Fine Tools



High quality & low cost

The CP 1000 uses the same filters as the CP 2002. A filter unit is about moving coolant through a filter and that is all it is about. The CP 1000 does everything the CP 2002 does but on a smaller scale.

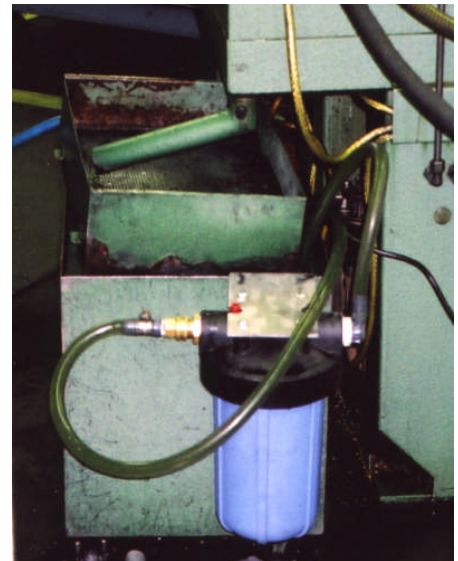
Use a CP 1000 system alone or with others

We sell filter systems to people who already have filter systems on their machines. Typically they buy for two reasons. 1. Ours are entirely external and are a lot easier to service. 2. Our filter systems work a lot better.

The CP 1000 can also provide additional filtering for bacteria and odor control or ultra fine filtering for precision

CP 2002 \$1699

The best system for the busy, high volume operation



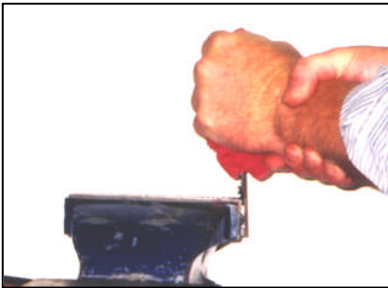
We ran tests in actual shops and the units were still filtering well after a month of constant use with no filter change. Your filter life will depend on how much you grind and the amount of oil and grease.

Testing Carbide Strength and Braze Joint Strength

This is a simple test to determine how easily your saw tips break and how good the braze joint is.



You braze a saw tip onto a narrow piece of plain, clean steel. Then you clamp the saw tip into a vise. Make sure that you clamp the tip and not the steel bar. Also if you clamp the tip too hard you will break it before you start testing.



You push on the bar until something gives. In some cases the tip breaks, and in other cases the tip comes off. (Safety notes: you might want gloves or some sort of padding to protect your hands. Also you have to use a lot of force so make sure that you are ready when it gives.)



Another test is to hit the bar with a hammer but be careful. It can really vibrate and it can really fly when it comes loose.

A good carbide braze joint is stronger than either the carbide or the steel. You will break the carbide and leave jagged chunks on the steel. There will be little or no area where the carbide does not stick.



These are very good braze joints. The carbide broke but didn't come off. If you do this with different grades of carbide you should be able to feel that some are harder to break than others.

When the tip comes off whole you can sometimes see that there is no braze alloy or very little braze alloy sticking to the steel. This usually means that the steel was dirty. It might also mean that the steel did not get hot enough.

If the tip comes off clean and there is no braze alloy sticking to the tip it often means a bad surface treatment on the tip or bad pretinning. When this happens look at the braze alloy left on the steel. If the tip was badly plated you may be able to see a gray layer on the braze alloy. The braze alloy stuck to the plating but the plating came off the tip. Also look for bubbles in the braze alloy to see if it was overheated.

Alloy tips

We got started on this because we were asked to by a manufacturer of powdered metal saw tips. There

were two questions. 1. Which breaks easier, carbide or metal alloy? 2. Do metal alloy tips come off easier?

It turns out that the tips were coming off because they were poorly pretinned. We solved that.



When we tested the metal alloy tips with our pretinning they never actually "came off". The braze alloy ripped in half. You can see a good amount of the gold colored alloy on both the steel and the tip.

Neither tip came off. This metal alloy tip did not break where this standard grade of carbide did break. (There are also grades of carbide that are much harder to break than this grade but we didn't test them.)

You need to get both carbide and metal alloy tips pretinned properly. This was another case where the tips were blamed because they came off. It was really good tips poorly pretinned.

You can eliminate most breakage and tip loss. There are alloy and carbide saw tips that are much harder to break. We did these with our regular braze alloy. We also have High Impact and High Strength braze alloys. The High Strength braze alloy melts about 1800 F instead of 1400 F for most alloys.

Too many mills spend a fortune on down time instead of a little more for better tips. A simple change for not much money can solve a lot of problems. Call us (800) 346-8274 and we will help.

Getting the best help fastest from
us

Call (800) 346-8274



Pam Logan



Wendy Sorensen



Bob Richardson



Jim Peterman

Pam runs the shop, Wendy is office manager, Bob is sales and Jim helps Wendy

When you need it we all do tips



Pam

Wendy



Tom

Wendy

CP 1000 test results



Customer Testimonial

"As you know we recently purchased the CP 2002, system and we have been very pleased with this unit.

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Sincerely,

James Dargel

Sales Manager Fine Tools, Inc.

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When we say cermet saws are now used successfully by real people in real shops this is what we mean

Northwest Research Institute, Inc.

Carbide Processors Inc.

Newsletter

3847 S. Union Ave.

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