Northwest Research Institute, Inc.

Carbide Processors Inc. Newsletter

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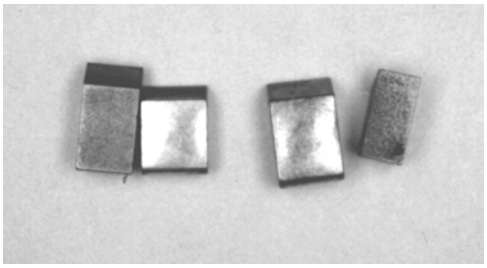
Pretinning
Better, Prettier



New, cleaner, shinier -Old process

We have a new cleaning process. This means your carbide will be shinier and prettier than ever when it comes from us. Because it is cleaner it will braze and bond better.

Why use hardfacing alloy?

Hardfacing alloys can be beneficial on saws. These alloys are generally Cobalt / Chromium alloys. They are sold as Talonite.

Hardfacing alloys give you many of the same benefits as tungsten carbide when compared to steel. Saws stay sharper longer and thus make better lumber longer with less need for changing.

Talonite is harder than band saw steel. Talonite is more acid resistant than tungsten carbide. Talonite is more wear resistant than saw steel. Generally Talonite wears about 4 times as long as saw steel and tungsten carbide wears about four times as long as Talonite or 16 times as long as saw steel.

(see hardfacing alloys p.5`)

Ceramic tipped saw #1

This saw has been in plants and shops of all sizes. It has been on table saws, chop saws and sliding panel saws. It has cut laminate, double laminate, brittle materials, soft materials, medium density particleboard, copper, aluminum, solid oak and everything else anyone wanted to feed it. It ran quieter and fed smoother. It out lasted carbide by about 5 to 1. It was sharpened five times but we never had to replace a tip. It even cut though two steel screws in particleboard without tip loss or breakage. When we took it off after five weeks, the guys hated to see it go. They wanted it back. They did agree to buy a new one for about twice the price of carbide.

New torch technology

Smith equipment has some new brazing technology called Quickbraze. (800) 843-7912

Multi - Metals
Quality all the way

Shawn Teague, Sales Manager, and Dave Bell, Technical Director came out to visit. We met them for dinner and I gave them a map so they could find the restaurant. The next morning I came into my office and there was the map. They had remembered to return it. It was only a couple dollars but it was a very courteous, thing to do. It is this kind of consideration and attention to detail that has made Multi-Metals as great as they are. (800) 527-8477

Mr. & Mrs. Todd Fulmer From Carmet

Todd Fulmer stopped by to visit. He was supposed to be on his honeymoon but he dropped by to talk a little business anyway. Pam and Wendy were very impressed by how pretty Todd's new wife is. We all noticed how patiently she sat and listened to us talk business especially since Todd had told her they were going skiing in Canada instead of working in Tacoma.

Saw Filer's conference in Portland

Tom Jones of Willamette Industries was this year's chairman. It was a good conference and a good party. If you do not go to these then you ought to consider them for the social and for the education.

Hardfacing alloys cont.

Generally steel runs about 2 - 4 hours, Talonite about 4 - 20 hours and carbide about 8- 40 hours. These are very rough numbers. They are also all evenly divisible into 8 hours, which is generally the average shift length. This reflects the fact that saws are generally changed once or twice a shift.

You can get about the same thin kerf with Talonite as you can with swaged steel. Figure 0.060" - 0.070" while tungsten carbide is pretty well limited to a low end of 0.100" - 0.110" in primary wood.

Talonite can generally be ground with cheaper wheels than you need to grind tungsten carbide.

If you have chemical corrosion such as green cedar then you need Talonite or cermet tips. If you have a straight wear situation then you need tungsten carbide or cermet. If you have impact breakage problems then you need a tough tungsten carbide or Talonite.

You need an expensive machine to use hardfacing alloys while you can tip with pretinned tungsten carbide by hand. The other side of the discussion is that an automatic machine can reduce labor. However many automatic machines seem to need careful tending.

You can generally regrind carbide several times without retipping while you pretty well have to retip hardfacing alloys every time you grind.

Carbide is hard but not tough

Treat it like diamond, not like steel. Do not put a carbide saw on anything harder than the material it will cut. Do not put a wood cutting saw on anything harder than wood.

When you get bad carbide

We do not know of any carbide supplier in the US that consistently sells bad carbide.

We hear a lot of stories about carbide from the same source where one size will break and the other sizes do not break. In some cases people will break .150" kerf but the .180" kerf does not break.

In every case of carbide problems only a few people have problems with any particular size. This does not make anybody right or wrong. You need to match a carbide supplier to your needs the same way you buy the right tires for your car. Whatever works for you is the right carbide to use. It is only good science to try different carbides from different manufacturers if you are having problems.

Carbide Breakage Analyses

We get asked to analyze failed carbide. Here are three recent cases.

Carbide Breakage Analysis #1

Good carbide used improperly

- Wrong braze alloy
- High temperature salt bath treatment
- Possibly improper cleaning
- Probably improper braze joint thickness
- Perhaps wrong flux

Analysis #2 Canadian Parts

The Canadian parts exhibit the classic "bowl with boat tail" rupture. The depth and shape of the rupture argue for that there was a great deal of stress in the parts. These were ground unevenly and the braze joint appears to be thinner than optimum.

There were problems with the braze alloy sticking to the saw as shown by the separation. Perhaps the plate was not cleaned properly. This is seen in a "gum and go" shop.

Part thickness	Braze joint thickness				
	A	B	C	D	E
#1	.128	.130	.127	.128	.127
#2	.127	.129	.128	.1283	.12825

Analysis #3 New Zealand parts

These were probably harder to break because they were larger parts. They appear to have been better brazed. There are some of the smooth, curved fracture planes characteristic of heat stress. They also have some of the signs of simple impact fracture. What is perhaps most interesting is that they are much less uniform than the Canadian parts in the fracture.

This could be a problem with the salt bath treatment process. It can cause thermal stress in larger parts. It is possible to destroy carbide with temperatures well below sintering temperatures with a heat soak that is long enough. Cobalt starts changing at 400 C (750 F). The CRC Handbook of Chemistry and Physics describes it well by saying that there is a "wide variation in reported data on physical properties".

Carbide Recyclers

Camden Iron & metal
Camden, NJ
800 scrap it (800) 727-2748

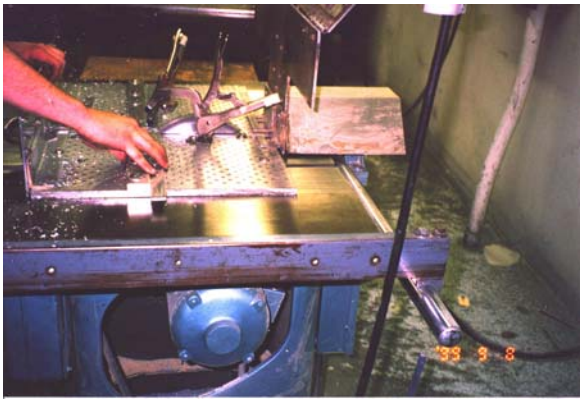
United Recycling
West Bloomfield, MI
(248) 681-5558

Carbide Recycling Co.
Walled lake, MI
(800) 526-3505

Clean Precious metals only
Scrap braze alloy (not carbide)
Hallmark Refining
Mt. Vernon, WA
(800) 255-1895

Ceramic tipped saws cut metal

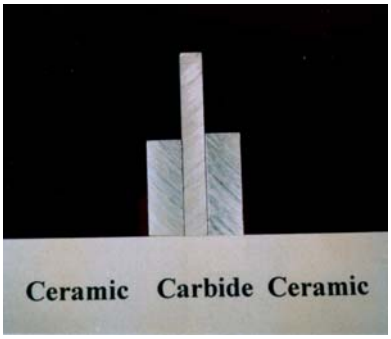
Ceramic tipped saws can break during grinding if they are ground wrong. If ceramic tipped saws are ground properly they will cut metal with no damage. The cut is smooth and easy and the saw stays cool. The operators were really impressed by the fact that the saw did not heat up.



This is the saw set up used to cut the

aluminum and copper

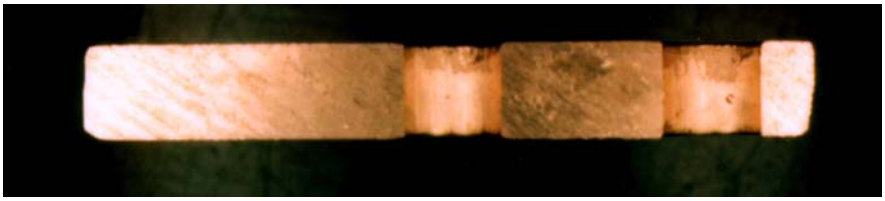
Two pieces of copper – left one cut with a carbide tipped blade and right one cut with a ceramic tipped blade



3 pieces of aluminum.

The outside two cut with

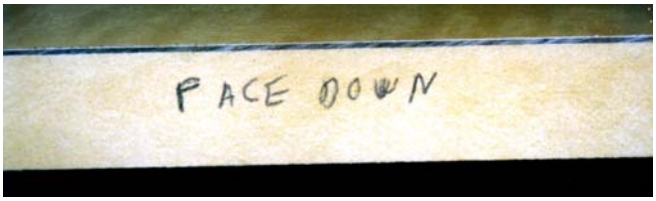
This piece of copper was cut with a ceramic tipped saw. The saw made interrupted cuts through the two holes and still kept cutting.



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



Ceramic tipped saws are excellent on particleboard

Ceramic tipped saws feed easier and smoother than carbide when cutting laminated particleboard. The edges are beautiful even without a scoring saw. We have saws that are now in the fifth week of testing when carbide only lasted a week.

Ceramic tipped saws make clean cuts in tough conditions

Ceramic tipped saws are tough enough for manual feed chop saws

Ceramic tipped saws are tough. They work beautifully on saws even under tough cutting conditions.

Why customers love our coolant filtration systems

"The air in the office doesn't seem to have that oily smell anymore"
Kathie Rundstrom - co-owner of Paso Robles Carbide in California

"The grinds are smoother, our wheels stay cleaner, and the oil and grease on our machinery is less than it was."
Alistair Moore - Shop Foreman at Cal Saw Canada in B.C. (They now own 3 of our units.)

" I don't have to clean my glasses as often as I did before."
Greg Sprague - Head Sawfiler for Potter Lumber in New York State (They've had a system 4 months.)

"in approximately an hour, the color of the coolant went from dark gray to green." He was amazed at how fast and efficient his system was, and could hardly wait to tell us.
Scott Whiting - Scott's Sharpening Service in Arizona.

Scott is the proud new owner of our model CP2002 that he just began using. Scott took time out from his busy schedule to tell us that on its maiden voyage, he filtered coolant that had been used to grind about 95,000 saw teeth! (1583 saws.)

Wright Machine

I visited Wright machine in August. I met with Dennis Parker,

Engineer, and Jim Wright were good enough to give me some of his time.

I was very impressed by the research they had done into both safety and coolant filtering. They have offered to talk to anyone who has questions. They have some excellent literature to give you also. Wright machine (541) 942-3712

Grinding Coolant Safety and Health

This is a very short version of a longer piece. Please call if you wish more information.

Legal disclaimer
This safety and health issue is extremely dangerous to discuss. My attorney wants me to make it clear to everyone that we are not experts in this field, we are not giving advice and we accept no responsibility for anything.

It all seems to come down to the fact that it is not good to put foreign material of any kind into your lungs.

Breathing grinding coolant causes problems at least five ways.

1. The coolant alone causes problems. It can cause a rash like dishpan hands. If you breathe in the mists then you can get these rashes in your throat and lungs.

2. Size
The human breathing system starts at the nose, which has nostrils about a quarter inch across. The respiratory system branches and splits and rebranches until you get down into the smallest part of part of the lungs, which handles air molecules that are about one ten billionth of an inch across.

If you have grinding particles that are about one ten millionth of an inch across they are going to be able to get pretty far into the lungs. These big particles block the lungs like a basketball dropped into a fish net.

3. These particles are typically rough chunks of tungsten carbide, diamond or cubic boron nitride. These little, sharp particles can get inhaled and plug up your lungs as well as cutting and scarring lungs.

Breathing these rough chunks is like putting broken glass between your lip and your gums.

4. Allergic reactions
Coolants dissolve metals. The dissolved metals can cause allergic reactions, which differ from person to person.

5. Bacteria grow in coolant. They make it smell bad and they are a health hazard.

Preventing Lung injury
There are lots of methods to prevent lung injury. They are all based on limiting exposure.

Filtering coolant can remove up to 90% of all cobalt and 99% of all particles.

Do not splash grinding coolant.

Keep the coolant away from the operator. Screens, shields, air intakes and cabinets can all be used to collect mist and prevent it from getting to an operator.

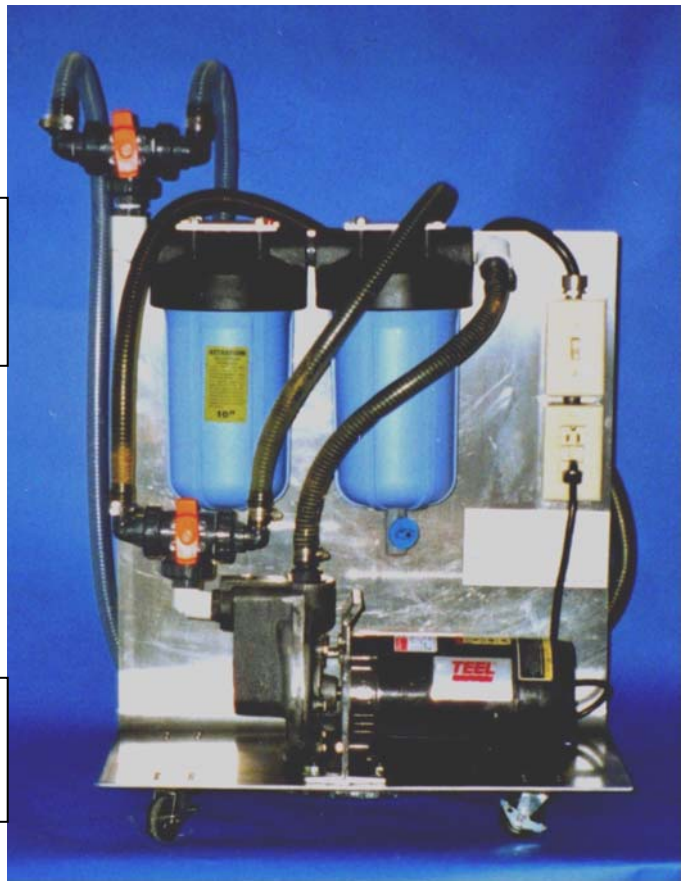
Experts in Grinding Coolant Health and Safety
We have about 30 different sources for expert information on this subject. We are not experts and you cannot rely on our advice. I strongly urge you to contact us or contact an expert for more information.

We are not experts.

We just researched and analyzed. You need to make your own decisions. We have a list of sources who are real experts. It is yours free for asking. 800 346-8274

3 way valve
Top & bottom
$2045
complete

2 way valves
Top & bottom
$1945



CP 2002 $1699

CP 2002 – 2 $2045

New - Filter two sumps easily

- ***Fast*** *- much less time and labor than moving hoses*
- **Easy –** turn off, move 2 valves, turn on
- **Simple –** valves point left for left sump & right for right sump
- **Save -** considerably cheaper than buying 2 units

You save money, time and effort - easier to use

Many shops have two grinders side by side. With other filter units you had to shut the unit off and move the hoses to change from one sump to another. This was time consuming, awkward and messy so it was not done as often as it should have been.

We still recommend filtering each grinder constantly. Filtering a grinder is the same as filtering oil in your car. Many shops need to start with a single filter system and add additional units as the CP filter systems prove how good they are.

Save an additional $100

The original "Dash 2" unit was designed with an ultra-high quality, three-way valve both top and bottom because the customer requested it. We can also supply a version with two high quality standard valves top and bottom instead of the one three way valve. This will save you $100 and make the price $1945 compared with $2045 for the three way valves or $3398 for two CP 2002 units.

Recommended Conference

Saw Tech 99

November 4- 5 in Seattle
Wood machining institute, Inc.
Dr. Szymani (925) 943-5240
www.woodmachining.com
This conference will present the newest technologies to industry. There is a heavy emphasis on the practical and on technologies that can be implemented immediately. Historically the participants have described Dr. Szymani's conferences as worth much more than the cost. Many regret not starting to attend them sooner.

Ceramic saw tips

We are selling pretinned ceramic saw tips to customers who are using them to build successful saws. One use is non-ferrous metal cutting. Another big success is medium density particleboard. The edge quality is excellent and the life is as much as five times that of carbide.

(More inside.)
Two pieces of sawn copper - cut with carbide blade on left and ceramic tipped blade on the right.

Ceramic tipped saw #1

We call this Sweet Saw #1 because the customers called her a sweet saw. Quieter, longer running, easier cutting and she worked on everything. In three months and 5 sharpenings we never had to replace a tip. (See front & inside)

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