

Northwest Research Institute, Inc.

Carbide Processors Inc.

Newsletter

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

March 1999

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Good Pretinning - Ours



These are our parts. They were pretinned using pieces of alloy wire cut within .001". They were heated in an oven controlled to 2 degrees. There is even flow to all four corners and there is a smooth surface.

An Ugly Message

We talk about the importance of clean shops and safety. Following is a strong message that explains why.

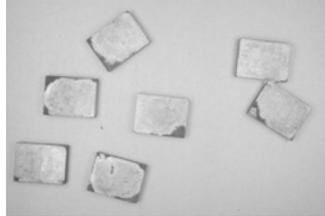
We have a free list of sources for air cleaning and we can direct you where to get free impartial information.

We sell filter systems to help clean coolant. I do not like selling on fear and this comes close. However this is very important. If nothing else, at least call for the free information.

Posted in a public Internet forum

Wonder if any of you machinists here can help? I've been a carbide tool grinder for 13 years and have done this kind of work in a non-ventilated shop, and without a dust mask. Now, I'm paying the price. I've had extreme coughing fits for a year. Have had 2 bronchoscopy surgeries with no results. Now in 2 days I get hospitalized to have a lung biopsy. All this to find out if carbide and/or its alloys are affecting me. Oh, I've also lost 25 pounds in the last 3 months. Now, my question is: is this rare or have I been an ignorant machinist? I'll let you know how the biopsy went....if my lungs blow back up. Thanks for letting me spill my...lungs. TK

Brand X Pretinning



The parts above were heated with a torch and pretinned using a stick of alloy. The amount of alloy varies. There is not a complete flow on all the tips maybe because of not enough alloy or because of a bad surface condition. The surface has been sandblasted after pretinning.

Why Use Tipping Alloy

We had a customer ask an excellent question. He had heard of Stellite® and Talonite® but never used them. He wanted to know what the advantages were.

Generally tungsten carbide outlasts Talonite®. It stays sharper longer. This is not necessarily true in high acid applications such as green cedar. The acids in green cedar dissolve the cobalt and destroy the carbide. Talonite® is a cobalt/chromium alloy and resists acid better than tungsten carbide with cobalt. You can use carbide with a nickel matrix. This generally gives superior performance over cobalt tungsten carbide or Talonite® in acid applications.

Talonite® is much easier to automate. It comes as a rod. In the rod form little fingers grab the end of the rod. A wheel cuts it off. /the fingers move the cut piece to the saw tip where it is welded in place. The same thing also happens with Talonite® shaped as triangles or rectangles.

Classy People

It was a good month. We had three people go out of their way to compliment us and thank us for helping them. George Frank from Industry Saw in Burbank, CA called to tell me how much he appreciated all Pam and Wendy did for him.

Bill Coomber of North Coast Saw & Supply in Arcata, CA sat down and wrote a page and a half about how much Pam and Wendy had helped him.

I have a lot of fine people I work with. They try really hard and it is really nice when somebody goes out of their way to show appreciation. Also, as every manager knows, a compliment from the boss is nice but a compliment from a customer really makes their day.

Thanks, gentlemen.

Finally, George Morgan, President of Carbide Alloys, called to tell me how much he appreciated the free booklets on Brazing Carbides and Tool Tip Materials. As always, when talking to George, I did a lot of thinking afterwards. I took some of what he said and wrote the article Why Carbide Really Breaks on the next page. I like George and really respect him. He is extremely intelligent and knows the business from top to bottom.

Like most guys, it is a little hard to admit that somebody is smarter than I am (or better looking for that matter.) I like to think George and I have the same computing power but it does seem that George is running a much faster processor than I am.

Apologies if I broke a promise

I promised to include some things in this issue that are not here. I had the issue about 80 percent written when we had a computer accident. We lost all the files off my hard drive. We did have a backup system that worked except it could not back up my password protected files. Of course, all the important files were password protected.

We had a consultant in here a couple days before to make sure that the backup was working. He set up my computer to back up. What he neglected to do was make sure it would back up the files. It is now Monday morning and I have spent all weekend working on this. I have lost all the information back to June of 1998. I have one temp here and another one coming in to re-enter information off paper copies. Luckily, the financial information was on another computer and is all good. Anyway, if I promised to include something and it is not here that is why.

If you have a back up make sure it really does back up what you want it to. Up until Saturday morning I would have told you ours did.

Free Cleaner

We have a case of ZEP cleaner. This is orange scented and is advertised as being a cleaner that is both effective and safe. It does come with a very good MSDS sheet. The major problems seem to be eye and skin irritation, which is common with any strong cleaner.

Wendy has used it. She says it works well but it really does have a strong orange scent. The salesman says that this cleaner has more D-Limonene than any other cleaner on the market. That gives it the good orange scent and makes it work really well. If you would like to try a bottle then call and we will send you one free. We are not going to sell this. We are just curious about what others think of it.

Why Carbide Really Breaks - one reason

Many of us in the carbide industries are spending huge amounts of money to improve our products. It is a source of constant frustration that we cannot get people to try the new things. A common explanation is that someone has been doing things one way for twenty (or 30 or 40) years and doesn't see a need to change

This same guy that does not want to change will turn around and complain about how everything else is changing. Materials are worse, saws have to be thinner, run longer and cost less. Customers and management always want more for less.

If the rest of the world changes and you do not, then sooner or later what you are doing will quit working.

I have lots of dandy charts and graphs on this but almost nobody understands them. Then, one night while I was swimming, an idea came to me. There is an old story about the kid who wanted to grow up to be the world's strongest man. He figured he would start by lifting a calf and keep on lifting the calf as it grew. Eventually he would be the only guy in the world who could lift a full-grown bull.

Everybody knows bulls grow faster than men do so the kid never made it. The kid ended up lifting the full-grown bull but he changed his technique to include a winch and a tractor with a power takeoff.

What they don't tell you was that there were a couple weeks when

the kid could sort of lift the bull sometimes. When he could lift the bull it seemed natural because it had always worked before. On days he could not lift the bull he blamed his mom for poor food, his teachers for working him too hard, his dad for giving him too many chores and his little brother for snoring and disturbing his sleep.

The kid blamed everybody else when he couldn't see the changes happening.

When I started in this business 18 years ago, saw tips sometimes stayed on and sometimes not. It just happened. Sometimes they broke and sometimes not. This was with big chunks of carbide. We have made a real science of keeping tips on the saw and keeping them from breaking, as have the carbide companies. If you are still doing what you did even five year ago you should be considering a change.

We have some really great, proven new technology in our High Impact alloy, Talonite, filter systems and our pretinning generally. We also have some brand new technology in ceramic saw tips and diamond coating.

We would very much like to see you try some of it and we will be happy to help you arrange tests.

A Hot Lead

We got a letter from a gentleman asking about information on saws to cut "Hard rocks". He wanted information on the largest sizes available. I was writing a letter and going to refer him on when I noticed the address. The address is FCI-Yazoo City. I looked it up and FCI stands for Federal Correctional Institution. I decided not to pursue the lead but I still have the letter if anyone is interested.

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Managing coolants

In the spring of 1996 we started doing research on grinding coolant. In the past year and a half we have heard from a great number of people who do not know how to dispose of coolant and who are very aware of the dangers they face.

The Problem:

This is an extremely complex and uncertain area of law and science.

Legal Example: One of the laws that apply is 40CFR. A single relevant part of Chapter 1 runs 142 pages.

The solution:

Since spring of 1996, we have spent two years and approximately \$50,000 on grinding coolant research. This has included developing relationships with two law firms that specialize in environmental laws, developing a coolant management program, earning a graduate level Certificate in Environmental Management from the University of Washington and developing a relationship with the State of Washington waste reduction programs and professionals in the Washington State Department of Ecology.

The individual sawmill, saw and tool shop and grinding shop cannot afford to invest eighteen months and \$50,000 to develop a coolant management program.

We are developing a program to manage the disposal of grinding cool that can be implemented for approximately \$1,000.

The Results:

The research has been focused in three areas.

1. Improving the performance of the coolant.
2. Extending coolant life and reducing coolant costs

3. Arranging for safe, legal disposal of coolant at the lowest cost possible.

History:

The original focus was to reduce operator exposure to metals in the coolant. Our solution was to filter the coolant to remove the metals and other particles. This does not make the coolant "safe" but it does reduce the number of metals and other particles in the coolant.

As part of the filtering we saw several unexpected benefits.

1. Coolant life was extended which means both the costs of replacement and disposal were dramatically reduced.
2. Grinding speeds and quality were both improved.
3. Machine life improved dramatically

Why

It makes you money

Proper coolant management makes you money. This is hard to see the same way oil changes in a car or tire rotation is hard to see. The grit in coolant will tear up a grinder the same way the grit in oil will tear up a car engine. Some grinder manufacturers recognize this and are adding a filter system. We are proud of the fact that we sell our filter systems for top end grinders that already have one because ours work a lot better.

It keeps you out of trouble

Illegal disposal of coolants can create a hazardous waste site. If you dump enough coolant the metals will accumulate and will cause high concentrations. If you dump it anywhere near water of any kind it is definitely illegal. If you dump it in a burn pile it may be legal if you have permission ahead of time. Asking permission after you get caught usually does not work.

It may be beneficial to your health and safety.

We are going to weasel like crazy here because we do not want to get sued. People ask us about this so we are going to answer by stating that we are not experts but we can refer you to people who are experts.

Here are some of the sources for information. Most of them are written well enough that you can pick out some information even without a lot of technical background.

1. Maintenance of Stellite and Tungsten Carbide Saw Tips: Determinants of Exposure to Cobalt and Chromium
Dr. Susan Kennedy et.al.
University of British Columbia.
Journal of the American Industrial Hygiene Association (56) July 1995
2. Toxicological Profile for Cobalt
US Dept. of Health & Human Services
Public Health Agency
Agency for Toxic Substances and Disease Registry Report # TP-91/10
3. Industrial Exposure and Control Technologies for OSHA Regulated Hazardous Substances
US Dept of Labor
March 1989
Volume 1 of 2 Substances A-1 Cobalt (CAS Number 7440-48-4)
4. Agency for Toxic Substances and Disease Registry
US Dept. of Health & Human Services
Public Health Service Cobalt 1048.01
5. The Respiratory Effects of Cobalt
David W. Cugell, M.D. et. al.
In Archives of Internal Medicine Vol. 150
January 1990
Request reprints:
University Hospital 339 Windermere Rd.
London , Ontario Canada N6A 5A5 (Dr. Morgan)
6. Criteria for Controlling Occupational Exposure to Cobalt
US Dept. of Health & Human Services
Public Health Service
Center for Disease Control October 1981
for sale by Supt. of Documents,
Washington DC

7. Cobalt in Hardmetal Manufacturing Dusts
Matti Koponen, et. al.
American Industrial Hygiene Journal (43)
9/82

8. Exposure to Airborne Metals in the Manufacture and Maintenance of Hard Metal and Stellite Blades
Markku Linnainmaa, et. Al.
American Industrial Hygiene Association Journal (57) February 1996

Why coolants are used

Coolants were originally an expensive addition to dry grinding. This is the same thing that happened with automobile engines. The liquid cooling systems came as performance increased and the engines started overheating.

The use of coolants was introduced for several reasons. One was to control temperatures during grinding. It used to be common to see tips get orange hot during a fast grind. The heat stress was terrible whether they were on a saw or not. With coolants you could grind faster and control the heat better.

Another reason was smoother, better grinds. Most coolants have a lubricity factor that makes the grinding smoother.

The coolants also moved a lot of material out of the grind area and this meant better wheel life and better grinds.

A final factor was operator safety. I was told in confidence that originally coolant was added to keep the dust down and out of lungs. Now nobody will mention health and safety for fear of a lawsuit. We do not do it either.

How Little Coolant Filtering Costs

We will sell you a unit for under \$1,000. We will make you a better deal on a unit for \$1,700 dollars. The larger unit requires a lot fewer filter changes.

Essentially you can run a month on about \$20 worth of filters and 20 minutes of time with the larger unit.

We are inserting a flier where we show a dirty filter and calculate how many saws you can grind.

Not everybody gets good filter life.

1. The major reason is that most people change the filter too soon. The coolant comes out like a garden hose at first. Then it slows to a drinking fountain. Finally it looks like a dribble. The dribble is usually 50 gallons an hour, which will run the average sump over twice. The filter takes a few days to settle in and really start working. Do not change it too soon.

2. The filter units are to keep coolant clean. You can greatly extend filter life by putting the hose maybe 1/3 of the way to the bottom instead of lying on the bottom. The stuff that falls to the bottom is not a problem.

3. Do not change the filter as long as the coolant is clean. Take a clear glass jar and pour coolant in it. Let it sit an hour. There should be just a light film covering the bottom. The coolant will be clear. Do not change the filters if they are still working.

We need your help, Please?

We really need some advice.

We are really good at research. Where should we be working to get the best business results? We like the research but we need to make a living. A lot of the work we do does not turn out to be profitable. We also do a lot of work free. Some of the free stuff we will keep doing but we would like to find more profitable work.

We like what we are doing and we are making a decent living at it but it does not seem to be working as well as it could be. We would really like suggestions as to what we could do differently, better or any other way.

We are good at research but just research does not usually pay well.

We like making a better world. However, I once had one of the richest guys in this industry tell me how much our industry needs someone like me. Friends, he is very wealthy and I definitely am not.

I don't know if this sounds like whining or not. I hope not. I hate whining. It is late. I am tired and years overdue for a vacation. I like the research, manufacturing and, customer service parts of the business. I am much too shy to be able to hard sell so we make the very finest products in the world and sell them usually for too little money.

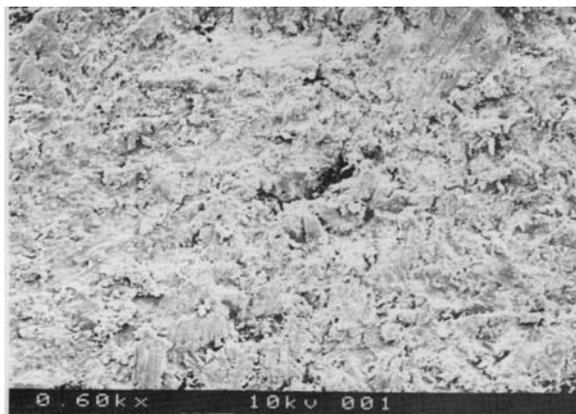
We would sincerely appreciate any suggestions as to how to do things better.

Why our pretinning is superior

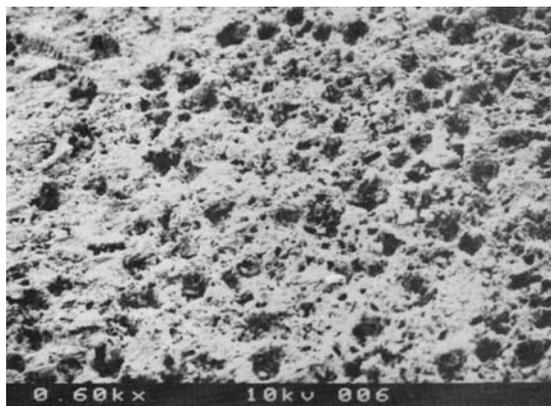
Sawtips should stay on the saw

Pretinning a tip covers a lot of things if you do it right. It makes the tip harder to break and easier to braze. It cuts costs and improves performance. It is definitely about keeping all the tips on the saw.

Nobody has done more work on pretinning than we have. (As a customer said -maybe we do too much research). What follows are photographs of tungsten carbide to show just one of the differences between the way we do it and the way everybody else does it.

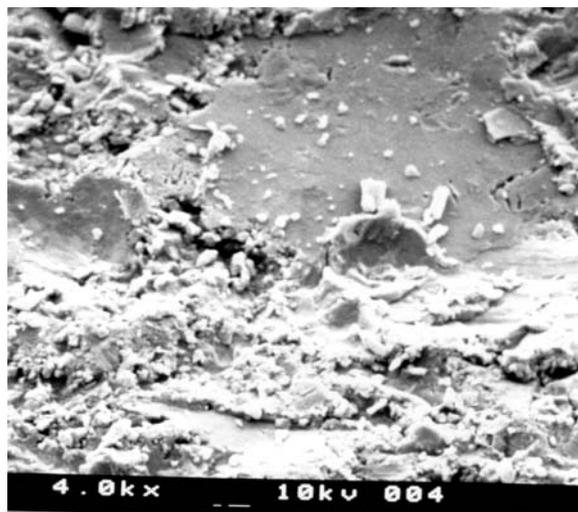


Untreated Tungsten Carbide 600X

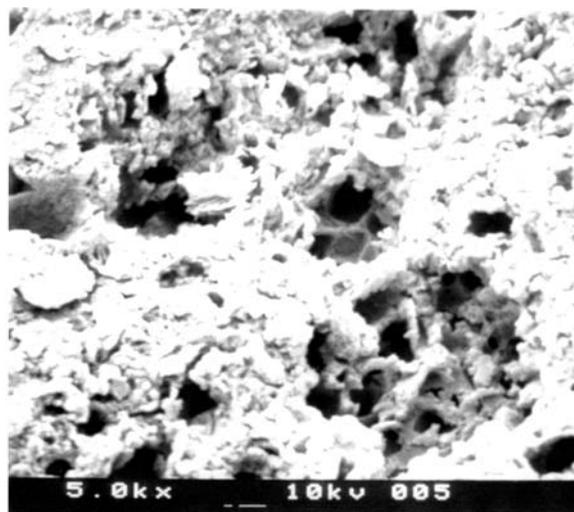


Treated Tungsten Carbide 600X

These microphotographs were taken through a scanning electron microscope at 10 kv power. The left picture is untreated carbide and the right has been treated by a process we invented. The left picture has a heavily oxidized surface. The hole in the middle, the streaks in the upper right and the general "leaf pile" appearance are all evidence of various kinds of oxidation. The right hand picture shows a consistent surface. The oxides have been removed and the surface has a sponge-like appearance which greatly improves capillary action and thus greatly improves wetting and brazing.



Untreated Tungsten Carbide 1,000X



Treated Tungsten Carbide 1,000X

These are the same tips at higher magnification. The left photo shows different oxides and other contaminants by the different shapes of the growths. There is also the underlying layer with the appearance of gray velvet that seals the carbide and prevents the wetting/cleaning action of the flux. The right photo shows the surface after the removal of the oxides. Please note the depth of the holes which allows the silver braze alloy to penetrate deep into the tungsten carbide thus greatly increasing physical bonding strength. The removal of the oxidized atoms leaves the remaining atoms with two electrons available for bonding so, in addition to greatly increased physical strength, we also have actual chemical bonding between the carbide and the solder.

Come See us in Portland

Wood Technology Clinic & Show March 24 - 26

Call for Free pass
(800) 346-8274

New Technology

- Pretinning
- High Impact Alloy

- Filter systems
- Talonite tipping rod
- Talonite triangles
- Talonite for knives
- Ceramic saw tips
- Diamond coating

Visit us

- Drawing - Prizes
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- Free Books

FREE Silver dollar

(A real one - A big classy, "weight in your pocket" dollar)

1. Stop by the booth
2. Show us this newsletter or a copy of the mailing label
3. Answer three short questions about carbide, tipping material and pretinning

We need some help, please? See p.4

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