President's Letter

Too Good For Sawmills?

"Super C" Carbide Costs 4 – 7% More and Works 30% Better.

We sell really good carbide, flux and braze alloy. We are told repeatedly that all sawmills care about is the very lowest price.

No matter how often you change saws a good grade of carbide will still give you better, cleaner, straighter cuts. It will greatly reduce tip replacement and will greatly reduce the amount of grinding needed to resharpen a tip.

Shawn Teague at Multi Metals uses the term Buyer /User to talk about customers who both buy and use the tips. This is different than filers who have to use tips someone else bought. We do really well in sawmills and saw shop where the filer gets to buy what he thinks he should.

When we sell you a box of tips there are 250 or 251 tips in it. We also guarantee that every tip is usable.

We are the best there is on quality and service. We are definitely the best on fast delivery and emergency orders. Strangely our prices are quite often lower than our competitors.

My Dad was religious man and he was really big on absolute honesty. He also preached that "whatever you do, you should do the very best you can." That's why we're the best in the world and constantly working to get better.

Carbide Processors, Inc.

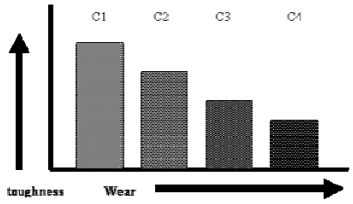
Northwest Research Institute, Inc.
Newsletter October, 2006

3847 S. Union Ave. Tacoma, WA. 98409 (800) 346-8274
sales@carbideprocessors.com www.carbideprocessors.com

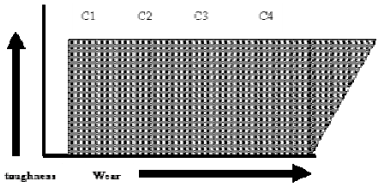
Stuff That Works Really Well

A lot of our new business comes from people with problems. Here is what has been working really well for a lot of folks the last few months.

"Super C" Carbide



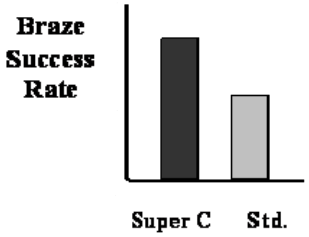
Standard grades



Super "C"

The complex structure gives much better performance than traditional simple grades. (See P. 5)

Hi Impact Braze alloy



Also:

- Purified flux
- Wizzeroo brazing tool
- CP 2002 filter system
- Pillow that takes tramp oil out of sumps

Getting Cheated On Saw Tip Counts

When I spoke in Portland the big response was from my comments that a lot of folks are not getting all the parts they ordered. The standard on part counts is minus zero and plus ¼ of 1%. On a box of 250 tips this means they ship you 250 or 251 parts.

Most people use a scale that costs $1,000 or so. This is accurate within ½ of 1% plus or minus. The problem is that saw tips vary in weight slightly so this is more likely to be about 2%.

This is our counting machine it costs much more than a scale but it is much more accurate. Every time a tip passes in front of the electric eye it registers. The only way it can make a mistake is if one tip hides behind another and then you get an extra tip. O.K. This is pretty obsessive but it is that important to us to deliver honest counts.

Brian Wallinger and Marcie Delancy
West Coast Saws, Tacoma, WA

We had some quotes form Brian last month but no picture. Here is his picture and his quotes again.

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

He also said that: "Owners are entitled to 5 weeks vacation a year. He then added that he'd sure like to figure out how take some of it."

Wendy Blum of Blums Saw

Wendy is well known in the Northwest for his activities in the filer's association and well respected for his skill and judgment. What is really remarkable about this picture is that Wendy is off his bike. When Sheila gave us this picture our first question was whether they had to give him a trophy to get him off the bike. Sheila laughed and said "No, Wendy won it honestly at a 4th of July competition"

Our high impact Braze Alloy

I just got my BAg-24 silver solder I ordered late last week - that was fast :) I tried it on a short piece of 1/16th inch bandsaw bladestock with a dab of white flux and a butane torch and it flowed like water and adhered completely - just like it is supposed to! I don't know what they sold me with the other solder I tried but it just beaded up and fell off usually - sometimes it would stick a little bit. This was obviously the problem I have been having with blades breaking. The .047" size is still a little big with the widest part of my blade being .0625", but I can reduce the solder with a wire draw-plate. Bottom line is that it really seems to work great from what I just saw and it looks like (some of) my troubles are about to go away. Thank you! Steve Garrison

Curtis Heard, Malheur Lumber

John Day, OR 97845

A note from Emily "I have spoken with Curt a few times in the past couple weeks; he seems like a very intelligent and warm man. He called today to order more of our Super C grade tips for immediate delivery as well as a blanket P.O. of 500 tips a month Curt is using Super C to cut Pine, Red, and Fir. He mentioned he would most likely need to keep making individual orders, but it makes him nervous e to run low on tips). Curt thanked me for all the wonderful service and said he really appreciates the quality of our products."

Rocky Mountain Sharp Shop
Bob & Harold in Loveland, Co

They are Interested in new and better things and very, very thorough. They sent us worn parts and brand new parts to make sure we all knew what we are talking about.

Filers Earn Bonuses

It has been reported that some filers are earning extra money by bring their own logs to work with them.

Cutter Grinders Handbook

A practical guide on the selection, grinding and setting of planing and profiling cutters and cutterheads for woodworking machines.

Highly Recommended

An excellent book from the United Kingdom Saw Doctor's Association. It has 290 pages and is very heavily illustrated. I am very impressed with it. What is even more important is that I took it to Portland for the West Coast Sawfilers meeting and the true experts were impressed with it as well.

This is the handbook for the Saw Doctor Association Training Course "Profile Cutters Solid and with Loose Knives ".

CONTENTS: Timber & Wood-based Materials, Early Machinery, Modern Machinery, Rotary Machining, Quality of Finish, Cutter Technology, Cutterhead Fitting & Jointing, Controlling Riving Ahead, Cutterhead Types, Cutter Materials, Grinding Wheels, Traditional Cutter Preparation, Modern Practices, Profile Grinding, CNC Profile Grinders

Produced by:
The U.K Saw Doctor Association

Distributed by:
Harlequin International Ltd.
United Kingdom
enquiries@harlequin-international.co.uk
Web www.harlequin-international.co.uk

New Regulations on Tricycles

Above is the new safety tricycle with the required speed limiting front wheel.

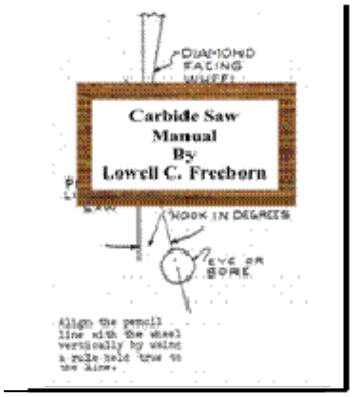
Books You Should Own

You can order these online or through us at 800 346-8274

Chisels on a Wheel
Jim Effner
1992, 199 pages, 231 Illustrations, 11 Chapters, 78 topics

Often described as the finest book ever written on woodworking tools. Widely used for training. Very, very good for the small shop and individual woodworker. The original book is long out of print. It can take months and cost up to $100 to find a copy. This is a copy of the original reproduced with and protected under the original copyright.

http://www.cafepress.com/chisels
Chisels on a Wheel (Reproduced)
(Paperback) $49.95



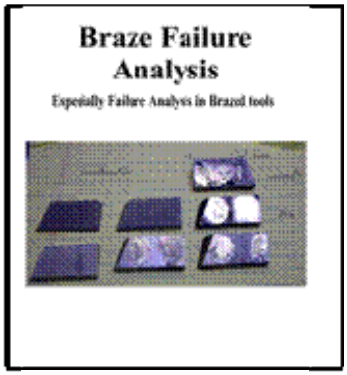
Carbide Saw Manual
Lowell Freeborn
1977, 55 pages, 54 Illustrations

Even thirty years later this book is still widely acclaimed by true experts in the tool field. Some of the information, such as tungsten carbide grades, is dated but the essential information is still accurate and clear. $24.95
www.cafepress.com/freebornmanual

Building Superior Brazed Tools
Selecting and Brazing Tungsten Carbide and Ceramics For Saws, Tools and Wear Parts Including Failure and Breakage Analysis

Tom Walz, Carbide Processors, Inc.
265 pages, 390 Ill. 70 chapters,
Written as an overview of current technologies. For those that wish to build the very best with the current and next generation technologies.

www.cafepress.com/superiortools
Building Superior Brazed Tools
(Paperback) $65.00



Braze Failure Analysis, Especially Failure Analysis in Brazed Tools
Tom Walz, Carbide Processors, Inc.

116 pages, 300 illustrations, 49 chapters
This book is a compilation of reports, analyses and answers to customer questions. We have been told repeatedly that these are the best pictures and the best information for braze failure analysis anywhere.
www.cafepress.com/brazefailure
(Paperback) $65.00

Managing Coolants from Machining and Grinding Operations
Tom Walz, 2002
144 pages, 30 illustrations ,26 chapters

Annual Cost and payback calculations, What you filter out, What Coolant Is and Does, Types, Water Quality, Coolant Management, Why Coolants Become Unusable, Sump Cleaning, Kinds of Filters, Testing, Sample Coolant Analysis, Disposal Of Used Fluids

www.cafepress.com/managecoolants
(Paperback) $49.95

Carbide Saw Specification Manual
This book has become the standard for quality tools at the top end of the industry. It is essential for anyone who builds or buys saw blades for important applications.

25 pages, 34 illustrations

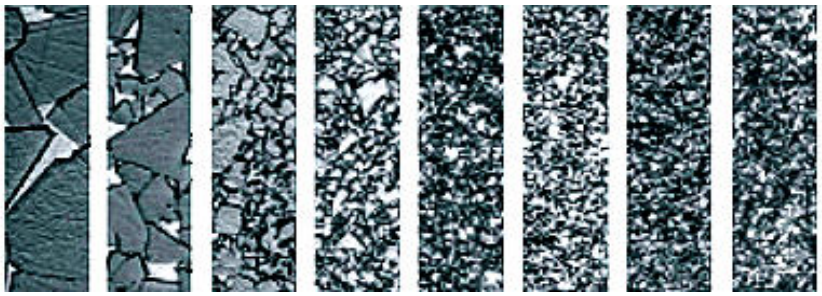
http://www.cafepress.com/Sawspecs
(Paperback) $24.95

Carbide Processors, Inc.
3847 S. Union Ave.
Tacoma, WA 98409
800 346-8274
sales@carbideprocessors.com

Carbide Grain Sizes

Grade	size in microns	comparison
X coarse	6 +	Weather balloon
Coarse	2.5 – 6.0	Beachball
Medium	1.3 – 2.5	Basketball
Fine	.9 – 1.3	Softball
Sub micron	.5 - .8	Baseball
Ultrafine	.2 - .5	Ping Pong
Nanograin	0.2	

Super "C" Sub Micro grain Carbide



Super "C" Carbide Grade (Tougher than C1 - Better wear than C3)

Super C	Hardness (HRA)	T.R.S. (psi)
	92.3	537,000

Typical C2 values	Hardness (HRA)	T.R.S. (psi)
C2	92.1	334,000
C2	91.8	334,000
C2	91.5	377,000
C2	90.4	435,000

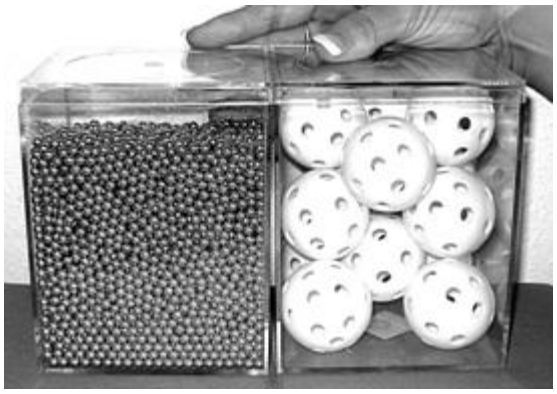
Typical C Values	Hardness (HRA)	T.R.S. (psi)
C1	89 - 92.4	350,000 - 360,000
C2	91.2 - 92.9	250,000 - 400,000
C3	91.4 - 93.6	270,000 - 350,000
C4	89.6 - 93	260,000 - 450,000

Superior Wear (Abrasion)
Abrasion or straight wear is countered by smaller, more consistent grain size. What is called abrasion is often thought of a straight wear. However a big part of it is actually pulling carbide grains out of the metal matrix. Smaller grains have less surface area for wear and less surface area exposed so are also less likely to be pulled out. Grains can also be more tightly packed. Both methods reduce grain exposure and loss.

Superior Wear (Adhesion and Diffusion Resistance (corrosion and chemical attack))
The materials used in tungsten carbide have an affinity to the materials being cut. This functions two ways. One way is adhesion where the material being cut actually sticks to the tungsten carbide in a sort of welding process. The second way is where the material being cut dissolves one or more of the materials in the tungsten carbide. Usually it is the cobalt binder, in the tungsten carbide. This is very readily seen cutting high acid woods. Super C grade of carbide has an extremely fine structure so there is very little binder presented to the material being cut. This, combined with the special metallurgical formulation the Super C binder (hint - it's not just plain Cobalt.

Why Our Super C Grade Works so Well

One reason is grain size. Our super c has a sub-micron grain size. This compares to ordinary carbide about like BB's compare to golf balls. As an example compare 0.5 microns for a sub-micron grade with 5 microns for a coarse grade. (A BB is 0.177" and a gold ball is 1.68")



Front shot showing packing

Top shot showing how spheres pack in corners

Neither one packs perfectly but the BB's pack a lot closer together simply because they are smaller.

These are balls in plastic boxes. If you look at the corners you can see why the sub-micron grains take and hold a tighter edge. Remember the spaces between the grains are filled with a relatively soft metal binder that is susceptible to corrosion. You need some metal binder or the carbide part would be too brittle.

- Transverse Rupture Strength above 525,000 psi.
- Rockwell A hardness well above 92.2
- Alloy binder for corrosion resistance
- Grain structure to inhibit both crack initiation and crack propagation

This makes these new grades 60% tougher than a typical C-1 and harder than many C-4's.

"Super C"	**Hardness (HRA)**	**T.R.S. (psi)**
	92 +	525,000 +

Typical C Values

	Hardness	T.R.S. (psi)
C1	89 - 92.4	350,000 - 360,000
C2	91.2 - 92.9	250,000 - 400,000
C3	91.4 - 93.6	270,000 - 350,000
C4	89.6 - 93	260,000 - 450,000

Typical C2 values

	Hardness (HRA)	T.R.S. (psi)
C2	92.1	334,000
C2	91.8	334,000
C2	91.5	377,000
C2	90.4	435,000

Quality Specifications for Carbide Saw Tips

We are really fussy about what we sell. We want you to have 100% good parts, 100% of the time. Here are just some of the specifications we use.

Counts
1. All counts will be – zero to +2 parts per 250.

Size
1. -0 / + .007" is industry standard.
2. -0 / +.004" is current practice.

Chips and cracks
1. Chips no more than one half the grinding tolerance.
2. Chips no more than 0.003" in any dimension.
3. No internal or external cracks.

We used 30 x magnifications for inspection with standard light. The gap on the right side of this tip is about 0.003". On the left side the gap goes up to about 0.007" with the largest chip about 0.003"

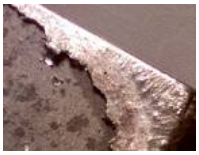
Edge radius, chips and parallelism
When the part is held next to a straight edge the maximum gap will be no more than 0.007" to account for the total of edge radius, chips and parallelism.

Wettability –
A small piece of silver solder (app. 1/5 the length of the surface will flow completely and evenly out to all four corners. A piece of silver solder 2/3 as long as the tip surface will flow out evenly to all four corners and will create a smooth, consistent hump.

Pretinning
Even flow to all four corners.

Average pretinned silver depth is 0.007" to 0.010".

Bond Strength
The tip will braze to the steel plate so that the carbide will break or the steel will rip but the tip will not come off. These two pictures show tips where the surface treatment peeled off.



Grades
Each grade will be specified and defined by grain size, chemistry, transverse rupture strength and hardness, preferably Rockwell hardness.

Specifications are extremely important otherwise you never know what you will get.

Suppose someone offers you a deal on a new car and a new sawmill. A Rumanian Sawmill Car fits the description but it may not be what you wanted.

Drive it to the site, unfold the blade and you are ready to cut lumber.

Fun to Drive

Take your Friends to town on Payday

Simple, easy controls

(Description off the Internet)
"These astonishing self-made multi-functional vehicles are used for cutting firewood and lumber on the spot. They are seen in sub-urban and rural areas where they are quite frequent and much in use.

These imports will surely enrich the West with the invigorating spirit and power of Romanian free enterprise.

Widia-Class vehicles are usually run by a team of 2–3 workers. Their wood cutting capacity amounts to 1ccm per 10 to 15 min. For bigger jobs often two Saw Blade Runners are used, one for rough cutting and one for more accurate lumber finishing.

Usually private households order the wood and lumber cutting services by mobile phone. Mouth-to-mouth propaganda is their most reliable advertising method.

One team covers an area of up to 200km from its home base. An average job lasts approximately 10 – 14 days. Chopping 1m3 of firewood costs 150.000 lei (=15 new lei ≈ 3.75 €) During their jobs the team stays in privately rented rooms."

The ***HOT ROD*** Saw Tip Poker

A multi-purpose saw tip manipulation tool for more effective and safer brazing.

With an advanced stainless steel type metal, it stays cooler much better than tungsten or steel and has none of the health risks associated with thoriated tungsten welding rod.

The Hot rod uses an alloy that is technically an ASM, ASTM, SAE classified Superalloy. It is one of the high performance metals developed for aerospace and military uses. Think of a navy fighter flying from Pensacola to a carrier and sucking seawater and sand into a jet engine running at 2300 F. Think of rapidly cycling knives in high temperature, highly corrosive industrial uses.

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.

Safer than a welding rod. The handle and the upper rod stay cooler, longer. However, unlike a welding rod, when this rod is hot you can see it. Here is our rod (top) and welding rod (bottom) at about 1800 F which is much higher than brazing temperatures.

You can customize the tip with a hammer

Many, Many Benefits

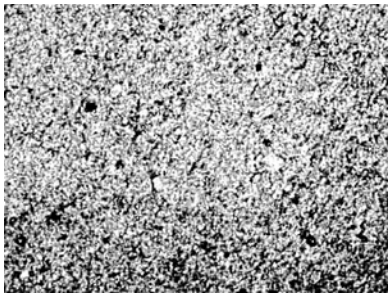
- 1800 degree working temperature
- Stays cooler longer than welding rods or files
  - 10 % of the thermal conductivity of tungsten
  - 50 % of the conductivity of tool steel
- Much lower cost
- None of the dangers of thoriated tungsten welding rod
- Non-galling – resists molten metal attachment
- High yield Strength
- Excellent high temperature oxidation resistance
- Excellent low temperature impact resistance
- Excellent stress corrosion cracking properties
- Excellent crevice corrosion resistance. properties
- Excellent high temperature service carburization inhibition
- Superior oxidation resistance
- Superior cavitation erosion resistance
- Superior galling resistance
- Resists wear, tearing or freeze up of both the primary and contact materials over a wide range of service temperatures.
- Excellent elevated temperature wear resistance

Purified Flux

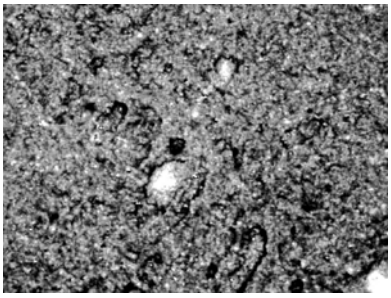
30% To 100% Better Braze Joints

Flux is made to prevent oxygen from getting to the parts as they are heated. Steel and especially tungsten carbide oxidize at room temperature. The hotter they get the more they oxidize. Above 1,000 F tungsten carbide oxidizes extremely rapidly and forms an unbrazeable surface. Purified flux is good for more time at higher temperatures, up to 1,700 F.

Purified flux is black flux that has had extra processing steps. These processing steps take the black article out and leave the flux a rich, creamy brown color. If you take a little of each flux and rub it between your fingers you can feel that Purified Flux is not only smoother but the particles are smaller and there are no extra large particles.



Purified flux at 50x magnification
Smooth, even and consistent



Standard flux at 50x magnification
Large grains of foreign material

You can see and feel the difference immediately.

The original idea with flux was that it was to be applied on top of the braze area. No special effort was made to purify the flux because it worked well and they wanted to keep the cost down.

However the critical part of saw and tool brazing is what goes on inside the braze joint. Ordinary flux is inexpensively made and has up to 10% odd size particles and non-active minerals in it. These odd size particles and non-active minerals get lodged in the braze area and can seriously effect the strength of the braze joint.

Purified flux is cleaner, smoother, creamier and much more effective.

5 # jars Case (6 jars @ 5#) $ 464.31
Single jar 87.39

1 # jars Case (25 jars) $ 452.03
Single jar $ 20.08

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.

We Would Really Like It If You Bought From Us

If you don't want to buy from us, we can handle that as well.

Cheap, Cheap, Cheap Carbide
Odds and ends really cheap – call 800 346-8274 for list and prices

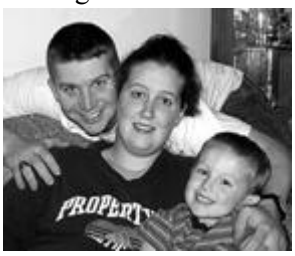
We Buy Scrap Carbide

Price varies but figure $200.00 per 2# coffee can for scrap or about $4.90 / # 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.

Our CP 2002 filter unit removes 99% of particles down to 1 micron.
Longer coolant life, lower diamond wheel cost, faster& smoother grinds

Emily & I went to the Portland Saw Filers Meeting
We had a good time. Thanks folks.



This is Shannon Grover, Emily's assistant, and her family. Below is her husband at work in Iraq.
He is a Staff Sergeant with the US Army Strykers.

Carbide Processors, Inc.
Northwest Research Institute, Inc.
3847 S. Union Ave.
Tacoma, WA. 98409