

EUGENE 5160 CLUB ~ SEPTEMBER 2018

<https://www.facebook.com/5160Club>

newsletter archive: <http://www.elementalforge.com/5160Club/>



SEPTEMBER MEETING

Thursday September 6th – 6:00pm at David Thompson's shop. Please do not arrive before 5:45pm. If you didn't get the directions in the meeting notice, email me for them: michael@elementalforge.com

Bring your show-n-tell!

Request from the Thompsons:
“Please **drive very slowly** down our lane. The maintenance is all ours. Thanks.”



NOTES AND REMINDERS

Jet Vertical/Horizontal Band Saw For Sale \$150 – Lynn Moore sent the note: I have an extra Jet vertical/horizontal band saw that I would like to find a new home for. I would like to get \$150 for it. It's in excellent shape & works very good, I just don't need two. Lynn 541-554-5294

Bacon Grease – Joel Puckerson also sent me a note – he used bacon grease in his quench (similar to “Goddard's Goop”) and had collected almost a half gallon for future use. He's retired now and the wife wants the grease gone! If you're interested contact Joel at jpcustomknives@gmail.com

Northwest Blacksmith Association – Mentoring at Cowlitz Expo – Longview WA. Intro Blacksmithing classes at White Salmon, WA; SwaptoberFest October 26-28 Longview, WA
<http://blacksmith.org/events/>

California Blacksmith Association puts on a slew of events to the south of us. Check out their list:
<http://calsmith.org/CBA-Events>

Bent River Forge aka Farrier Supplies – north of Monroe, OR has blacksmithing tools and supplies and ongoing intro to blacksmithing and other classes:
<https://www.facebook.com/FarrierSuppliesOR/>

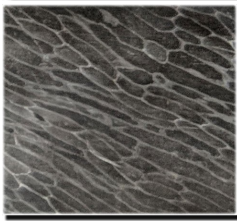
David Thompson – has coke and coal for sale (near Jerry's in Eugene, OR) – Talk to him at one of our meetings or call 541 688-2348.

Blade Show West returns to the Portland Convention Center on October 5-7. A table goes for \$350. <http://www.bladeshowsouth.com/>



AUGUST MEETING

MICHAEL KEMP (that would be me) started the meeting with a simple pass-around: a small bar of cable Damascus made from cable that Dennis Ellingsen got for the club.



I had cut off a chunk to give to Dennis as a “thank you.” In the close-up photo you can clearly see the cellular look of cable Damascus. I Parkerized these bars to test how it would work and I will definitely be using Parkerizing for a durable and lightly contrasting surface.

One of the folks asked why cable Damascus makes this patterning. “What I've heard” I said “is that the outer layer of each wire in the cable decarburizes enough to etch at a different rate from the core of the wire.” There seemed to be general agreement.

Martin Brandt noted that because you have so many strands decarburizing at their surfaces, you are lowering the carbon in the billet as a whole, and lowering the quenched hardness as a result.

It was noted that for a performance knife you might do a san mai with cable Damascus on the outside and a regular high carbon steel core.

At that point **DENNIS ELLINGSEN** announced that

he had some Micarta blocks and chopped up band saw blade from his lumber mill source in the trunk of his car – so we went out to relieve him of his burdens.



When we reconvened, Dennis passed around a kitchen paring knife that Frank Bobbio had made from the first batch of band saw blade that Dennis had brought for the club – some time ago. It was Frank's 2nd “stab” at making a paring knife from the bandsaw steel – which he gave to Dennis as a “thank you.”



“Elayne LOVES this knife” Dennis said “You'll have to understand something. I don't know the count of paring knives that we have in our kitchen, but it's a lot. Some of them are from famous names...”

“It's like a knife block warehouse” Craig Morgan interjected.

“Yes, but this is the one that's out all the time.” Dennis finished. “I asked her if she wanted me to mustard-ize it because it was staining. 'Nope!' she said, 'I want to stain it myself every time I use it!'”

“How's the edge holding up?” asked Frank. “She says it's the sharpest knife in the drawer.” Dennis replied.

His next pass-around was an early Wayne Goddard camp knife:



The last pass-around Dennis shared was a Wayne Goddard san mai with the outer layers in random Damascus. Elk stag handle:



... and here's a close-up.



BLAIR GOODMAN wandered in late. Carrying an anvil. Seriously. How could I *not* call on him to be next up?

“So – a friend of mine has this anvil. 50lb 8oz. He says it's worth at least 1,000 ~ ~ ~ memories – and he doesn't want it to go to someone who has one – he would much rather it go to someone who

doesn't have one. A newcomer. And he told me to vary the price.”

One of the regulars spoke up for Mica as a newbie

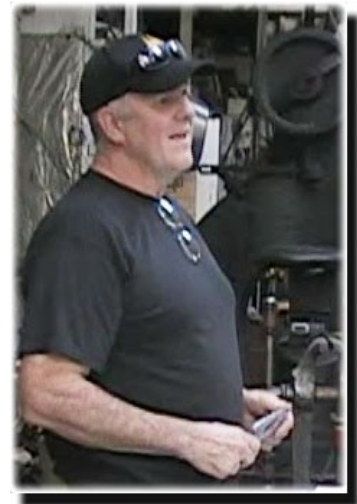
who has caught the knifemaker disease and would make a worthy recipient.



It his friend's father's anvil – an old cast anvil with a welded-on face plate. I think it was Martin who grabbed a hammer, tested it, and pronounced that it had an acceptable rebound. It showed some wear-n-tear but was still quite serviceable. I believe it did wind up going home from the meeting with a new, happy, owner.

Blair then expressed interest in making some tongs for himself and for other folks. He would like to collaborate with anyone interested.

CRAIG MORGAN came to the front next. He brought in an old piece of work that he did for one of Wayne's challenges to the club. That particular time Wayne had challenged folks to make a post-apocalyptic survival knife & have a story to go with it.



“When I was a kid I spent a lot of time in the Mojave Desert so my scenario was that I was lost in the Mojave Desert and I found this old linesman's shack and found stuff to make a knife...”

So he made his knife out of part of a hand-held cycle blade, a wrench, and copper wire “and a traditional Wayne-Goddard cardboard-n-duct-tape-n-brass-tack sheath.”





FRANK BOBBIO was up next, noting that he'd finished up three horizontal belt knives. "I said I wasn't going to make any more knives strictly for sale, but these are the knives I was making back in the '90s..." but at the knife show Dave Lisch and his wife came by

his table where he had one set out. The said they were going to make some of those "so I figured I'd better make some more first and put 'em on the website so it doesn't look like I'm copying him!"

I did not get a photo of the sheaths, but they were horizontal belt mounts with a satisfying "snap" when the blade was seated.

The blades have a blued and stone-washed finish. One handle is African blackwood. Another is bead blasted black Micarta. The third is green dyed stabilized Maple.



Frank has recently bought an induction furnace. Here's a video he posted on Facebook: <https://www.facebook.com/frank.bobbio.7/videos/1969016916463717/>

And once Frank gets his hands on a new toy he has to test it out. He decided to forge-weld a Damascus billet and then forge a chef knife out of it. He had to make a special coil for the forging process "I made coils that were long and skinny rather than round."

The handle is chechen and African blackwood.



Next Frank gave away a kitchen blade that he had worked part way out and decided he didn't want to finish. Normalized and ready for grinding and heat treating. "The only requirement is that you have to finish it in two months – so it doesn't just go in a drawer."

Frank had some metal-to-metal glue tests to break at the meeting. The steel was mostly bead blasted "you can get 30-50% better bond with bead blasting."

There were samples glued up with:

- Super Glue
- G-Flex
- JB Kwik Weld
- JB Kwik Weld ground to 36 grit (rather than bead blasted)
- JB Weld with black coloring



"I didn't bring one with 5 Minute Epoxy but in my last test it wasn't much better than Super Glue."

The steels that were glued with Super Glue broke apart pretty quickly with almost no bending.

The JB Kwik ground at 36 grit bent a little more before breaking and the glue delaminated in places from the steel.

The JB Kwik sand blasted bent a lot more before breaking with almost no delamination.

The G-Flex (cured 3 days) bent much further than the others before breaking.

The regular JB Weld (with black pigment added – since that's how he uses it on handles) did NOT bend very far at all before breaking the joint. "That was pretty disappointing!" Frank said "we're going to



have to revisit this – probably try one with color and one without.” And noted that in his previous test (without pigment added?) the JB Weld was the strongest of any of the glues.

A couple of other thoughts Frank had were that he had tightened down fairly firmly when clamping these test metal bars – and he might try testing thicker versus thinner glue joints. The other note was that he was looking into a construction adhesive called Sikaflex-11FC.

I brought up my go-to performance epoxy: Loctite E120-HP. Frank is using that in his current wood-to-wood glue wars test.

The strength of G-Flex surprised me because my own experience was that it didn't glue to steel very well – maybe I just didn't let it cure long enough before testing it!

Frank then noted a blog website that started in February called <https://KnifeSteelNerds.com> - “He has a PhD in metallurgy – works in the auto industry designing steel...” his father is the renowned Devin Thomas of Damascus blade steel fame. The blog articles are very technical and informative for those who want to get into the nitty gritty. I've added this link to the “Resources” section at the end of the newsletter.

There was quite a bit of discussion about induction forging. Frank noted that in a Damascus billet the outside heats much more quickly than the inside and so multiple passes are used to get the center up to welding heat. Also he boxed in his billet to keep oxygen from getting into the layers and creating scale. Regarding a question about electricity usage he feels that it draws so little that it is a fraction of the cost of running a propane forge.

Discussion ranged further afield to Forged in Fire antics, quenching and straightening tactics, tempering, yadda yadda yadda.

Frank noted that he'd done some quench-and-hardness testing on some samples from some bar stock that is up for grabs and is assumed to be 1030 or 1040 or some such. Parks 50 quenching oil gave 56-57 HRc, 90% brine water gave 55-59 HRc and

the brine “was so unpredictable that just in a 1-1/2inch square it was reading 4 points difference in 1/4inch!” Which sounds like local vapor jackets were forming.

Then he noted that some A36 mild steel flat bar measured minus 10 HRc before quenching – Superquench brought it up to 30 HRc.

My notes from 2016 are that Frank's version of Superquench is:

- 4-1/2 gal water
- 5# bag of salt
- 8oz bottle of original blue Dawn dish soap
- 8oz to 16oz Simple Green

Also Frank has been testing a different set of glues for wood-to-wood bonding. I'm hoping we'll see or hear about the results on Thursday.



EDWARD DAVIS got up next with a couple of folding knives that he restored/ modified. One is a super cheap Chinese with a lockback blade.

The plastic scales were falling off. “I pulled it completely apart. Made new brass liners and new brass bolsters, then put a burl handle on it. And did some file work on it.”

What he didn't notice until putting a lot of work into it is that the blade is slightly crooked. “I carried it for about a month and it works just fine. It holds an edge OK.”



“I put way more into this [second] knife than it's worth. I paid \$1.00 for it.” It had a “fake” handle – plastic scales that were colored to look like a metal bolster and wood scale.

“This is one where I learned that if you are doing a restoration on a cheap knife like this you don't want to re-use the mild steel liners that they come with because they're super thin and don't last real well.”

He put on real bolsters and used some of the Micarta from Dennis and “cut it the other way” like Erik Land has done – to across the grain rather than with the grain for a different Micarta look.



Here's the zippered case Edward made for it:



He's working on a set of 5 knives from scratch – so we *might* see some of those at Thursday's meeting.



MICA came forward to pass around a blade that he had made at the hammer-in with help from Lynn Moore. He also passed around a lost wax bronze casting of a fantasy character he'd made at LCC – a reimagined centaur having a rhino body with an orc head!



And here's the orc/rhino centaur:



So on that note: see you at the meeting!

Have fun and work safe -

Your Scribe ~ Michael Kemp



WEBSITE LINKS

5160 CLUB

5160 Club Newsletters are archived at:
<http://www.elementalforge.com/5160Club/>

Hint: to Google the archive for a specific knife style or presenter name, use a search like this:

sami site:<http://www.elementalforge.com/5160Club>
or this:

ron lake site:<http://www.elementalforge.com/5160Club>

OREGON KNIFE COLLECTORS ASSOCIATION (OKCA)

The OKCA hosts monthly dinner meetings where you are guaranteed to see treasures from the wide world of “things that go cut!” OKCA also puts on a small show in December and the big knife show in April – if you haven't seen it you've been missing something special!

<http://www.oregonknifeclub.org/index.html>

Go to the “Knewslettter” link and scan a recent newsletter for a membership form and contact info.

FORUMS

Bladesmith's Forum aka Don Fogg Forum
<http://www.bladesmithsforum.com/>

Knifedogs Forum (USA Knifemaker)
<http://knifedogs.com/forum.php>

American Bladesmith Society
<http://www.americanbladesmith.com/ipboard/>

Usual Suspects Network
<http://www.usualsuspect.net/forums/forum.php>

Blade Forums
<http://www.bladeforums.com/>

Hype-Free Blades
<http://www.hypefreeblades.com/forum>

Peter Newman of Bent River Forge/Farrier Supplies has a closed Facebook group for Oregon Blacksmiths
<https://www.facebook.com/groups/173156733117832>

REFERENCES

Wayne Goddard's books are available at Amazon:
<http://www.amazon.com/Wayne-Goddard/e/B001JS9M10>
And you can email the Goddards directly for his DVD at
wgoddard44@comcast.net

Most of the companies in the “Knife Maker General” links (below) have a section for how-to books and DVDs.

Verhoeven's Metallurgy For Bladesmiths PDF – this is a very deep dive, not an introduction.

<http://www.feine-klingen.de/PDFs/verhoeven.pdf>

Verhoeven's updated book:

<http://www.amazon.com/Steel-Metallurgy-Non-Metallurgist-J-Verhoeven/dp/0871708582>

ZKnives – Knife steel composition/comparison/etc.
<http://zknives.com/knives/steels>

Kevin Cashen's Bladesmithing Info
<http://www.cashenblades.com/info.html>

Knife Steel Nerds – a metallurgist's blog on the technical details of steel
<https://knifesteelnerds.com>

Tempil Basic Guide to Ferrous Metallurgy
http://www.tempil.com/wp-content/plugins/download-monitor/download.php?id=Basic_Guide_to_Ferrous_2010.pdf

From the Heat Treating Society of the ASM – the Heat Treater's Guide Companion for Android devices.

<https://play.google.com/store/apps/details?id=com.pfiks.mobile.heattreaters&hl=en>

My own “Knife Info” has some of my knife musings and cheat sheet charts – plus Oregon and Eugene knife laws:

http://elementalforge.com/tips_notes/

CLASSES FOR KNIFE MAKING, ETC.

Gene Martin offers personal instruction at his shop south of Grants Pass for a daily rate.
<http://www.customknife.com/>

Michael and Gabriel Bell of Dragonfly Forge offer an ongoing series of small group classes in Japanese style sword forging and fittings. Located on the southern Oregon Coast.
<http://dragonflyforge.com/>

Murray Carter offers small group classes in a variety of subjects, primarily focused on traditional Japanese cutlery. Located in Hillsboro, Oregon.
<http://www.cartercutlery.com/bladesmithing-courses/>

David Lisch is an ABS Master Smith who has taught classes in Washington. He recently moved his shop and has not restarted classes yet – keep an eye out on this page:
<http://www.davidlisch.com/Learn.html>

Jim Hrisoulas now offers both formal classes and mentoring sessions in 2 hour blocks at his shop in Henderson, Nevada:
<http://www.atar.com/joomla/> and click the “Bladesmithing Classes” link.

The ABS (American Bladesmith Society) offers classes in Washington, Arkansas and elsewhere – if you are up for traveling across the country to take classes, check out their “Schools” link:
<http://www.americanbladesmith.com/>

James Austin offers forging classes in Oakland, CA – axes, tongs, viking anvil, etc.:
http://forgedaxes.com/?page_id=148

Bladesmithing classes at Farrier Supplies aka Bent River Forge
26729 99W, Monroe, Oregon
Coal, coke, forges, parts, tools, classes...
<https://www.facebook.com/FarrierSuppliesOR>
(541) 847-5854

Bladesmithing and some bladesmithing workshops are hosted regularly by the Northwest Blacksmith Association: <http://blacksmith.org/>

USA Knifemaker has a lot of fun & informative videos on their YouTube channel:
<https://www.youtube.com/user/USAKnifemaker/videos>
... and hey - “free” is a hard price to beat!

Nick Wheeler also has a good YouTube channel with a lot of how-to videos:
<https://www.youtube.com/user/NickWheeler33/videos>

GENERAL TOOLS & SUPPLIES

Woodcraft of Eugene – thanks to Joe & the crew for six years of hosting 5160 Club meetings – we've had to move on, but the hospitality was appreciated.
<http://www.woodcraft.com/stores/store.aspx?id=515>

MSC Direct
<http://www.mscdirect.com/>

McMaster-Carr
<http://www.mcmaster.com>

Grainger
<http://www.grainger.com>

Surplus Center
<http://www.surpluscenter.com/>

Victor Machinery Exchange
<http://www.victornet.com/>

Zoro
<https://www.zoro.com/>

KNIFE MAKER GENERAL

Knife kits, steel, tools, machines, supplies such as handle material, fasteners, belts, glues, finishes, etc.

Jantz Supply – Davis, OK
<http://www.knifemaking.com>

Texas Knifemaker's Supply – Houston, TX
<http://www.texasknife.com>

USA Knife Maker's Supply – Mankato, MN
<http://www.usaknifemaker.com/>

Knife and Gun (K&G) – Lakeside, AZ
<http://www.knifeandgun.com/>

Alpha Knife Supply – ?Everett, WA?
<http://www.alphaknifesupply.com/>

True Grit – Ontario, CA
<http://www.trugrit.com>

Especially Abrasives – lower cost 2x72 belts
<http://www.especiallyabrasives.com/>

KNIFE STEEL SOURCES

New Jersey Steel Baron
<http://newjerseysteelbaron.com/>

Kelly Cupples (High Temp Tools) – Alabama
<http://www.hightemptools.com/steel.html>

Niagara Specialty Metals – New York
<http://www.nsm-ny.com> (click Products/Knife Steels)

SB Specialty Metals – New York & Texas
<http://shop.sbsm.com/>

Bohler Uddeholm – numerous U.S. locations
<http://www.bucorp.com/knives.htm>

Sandvic – stainless steels – Texas & Pennsylvania
<http://www.smt.sandvik.com/en/products/strip-steel/strip-products/knife-steel/sandvik-knife-steels/>

Pacific Machinery & Tool Steel – Portland, Oregon
<http://www.pmtsco.com/tool-die-steel.php>

Alpha Knife Supply – ?Everett, WA?
<http://www.alphaknifesupply.com/>

KNIFEMAKER EQUIPMENT

Beaumont (KMG) [Ohio] – the industry-benchmark 2x72 belt grinder
<http://www.beaumontmetalworks.com/shop/>

Travis Wuertz [Arizona] – premium versatile grinder
http://www.twuertz.com/Home_Page.php

Pheer [Gresham, Oregon] – affordable grinder made in Oregon
<http://www.2x72beltgrinder.com>

Oregon Blade Maker [Oregon] – affordable chassis and accessories, good reputation – you supply the motor
<http://stores.ebay.com/oregonblademaker>

AMK [Ohio] – affordable grinder, quick-change between platen & contact wheel
<http://amktactical.com/>

Northridge Tool [Ohio] – precision manufactured belt grinders
<http://www.northridgetool.com/>

Coote [Port Ludlow, Washington] – affordable, simple grinder – you supply the motor
<http://www.cootebeltgrinder.com>

Marinus Kuyl [Hillsboro, Oregon] – another affordable grinder made in Oregon – and parts – you provide the motor.
<http://oregonblademaker.com>

Grinder-In-A-Box – grinder kit, assembly required
http://www.polarbearforge.com/grinder_kit_order.html

The “No Weld Grinder” plans can be purchased from
<http://usaknifemaker.com>
either as a booklet or as a download – just use the search box to enter “no weld grinder”

Wayne Coe [Tennessee] – grinders, motors, VFDs...
<http://www.waynecoeartistblacksmith.com>

Contact Rubber Corp – wheels etc.
<http://contactrubber.com/contact-wheels.asp>

Sunray – drive wheels
<http://www.sunray-inc.com/drive-wheels/>

Renaissance Metal Art [Mulino, Oregon] – 80# ram air hammer
<http://www.rmetalart.com/tools.htm>

Anyang [Texas] – air hammers from 20# to 165#
<http://www.anyangusa.net/>

Meyer Machine Tool [Ohio] – treadle hammer
<http://www.meyermachinetool.com/Blacksmith-div-.html>

Spencer/Clontz tire hammer plans/workshops
http://www.alaforge.org/Trading_Post.html

Appalachian Power Hammer plans
<http://www.appaltnet.net/rusty/index.htm>

Helve Hammer and Quick-Change Dies Video – from a BladesmithsForum.com thread.
<https://www.youtube.com/watch?v=uzruqYkKGNM>

True Grit – under “Machines & Accessories”
<http://www.trugrit.com>

FORGE & REFRACTORY

Chile Forge
San Marcos, Texas
<http://www.chileforge.com/>

Mankel Forge – Muskegon, Michigan
<http://mankelforge.com/forges.html>

Western Industrial Ceramics Inc.
All things refractory – Tualatin, Oregon
<http://www.wicinc.com/>

High Temp Tools (scroll down the page for the category buttons) Tuscaloosa, Alabama
<http://www.hightemptools.com/supplies-mainpage.html>

High Temp Inc. has also been recommended for Kaowool etc. Portland, Oregon
<http://hightempinc.net/>

Omega – thermocouples & measuring equipment Stamford, Connecticut
<http://www.omega.com/>

Auber – more thermocouples and controllers, etc. Alpharetta, Georgia
<http://www.auberins.com>

Hybridburners – home of the venturi T-Rex Smithville, Georgia
<http://www.hybridburners.com/>

Pine Ridge Burners – for ribbon burners and all associated fittings, blowers, valves, etc. Conway, Massachusetts
<http://www.pineridgeburner.com>

Zoeller Forge – low cost venturi & parts: Z Burners Lanesville, Indiana
<http://zoellerforge.com/>

Here's the original article on making a ribbon burners that John Emmerling wrote back in 2005 for the NWBA Newsletter:
<http://blacksmith.org/2005-1-hot-iron-news/>
You can download the PDF from that site. John's article starts on page 11.

BLACKSMITH

Farrier Supplies aka Bent River Forge
26729 99W, Monroe, Oregon
Coal, coke, forges, parts, tools, classes...
<https://www.facebook.com/FarrierSuppliesOR>
(541) 847-5854

Blacksmith Depot
<http://www.blacksmithsdepot.com>

Pieh Tool
<http://www.piehtoolco.com>

Centaur Forge
<http://www.centaurforge.com>

Quick and Dirty Tool Co.
<http://quickanddirtytools.com/>

LOGO/ETCHING/STAMPS

Ernie Grospitch – Blue Lightening Stencil
<http://www.erniesknives.com/>

IMG International Marking Group
<http://img-electromark.com/>

Electro-Chem Etch
<http://www.ecemmi.com/products.html>

Steel Stamp, Inc.
www.steelstampsinc.com

HEAT TREAT SERVICES

Here are some folks who provide heat treating services for blades. While all of these have been recommended by one reputable person or another I have not had experience with them. If you use one, let us know how it went!

Paul Bos Heat Treating at Buck Knives. Paul Bos has retired and handed the torch to Paul Farner. Highly reputable. Post Falls, Idaho:
<http://www.buckknives.com/about-knives/heat-treating/>

Peters Heat Treating is another highly reputable operation. Meadville, Pennsylvania:
<http://www.petersheattreat.com/cutlery.html>

Texas Knifemaker's Supply offers heat treat services. Houston, Texas:
<http://www.texasknife.com/vcom/privacy.php#services>

Tru-Grit provides heat treat services. Ontario, California: https://trugrit.com/index.php?main_page=index&cPath=34

K&G also provides heat treat services but I can't find a reference on their web site – you'll have to contact them for details. Lakeside, Arizona:
<http://www.knifeandgun.com/default.asp>

Byington Blades heat treat service is in Santa Clara, California: <http://www.byingtonblades.com/>

It's my understanding that Chris Reeve Knives uses ACE Co in Boise Idaho – which is enough for me to add them to the list:
<http://www.aceco.com/heattreat/index.html>

WOOD SUPPLIERS

Burl Source – handle blocks/scales – So. Oregon
<http://www.burlsales.com/>

Shelton Pacific – stabilized wood – Shelton, WA
<http://stores.sheltonpacific.com/>

Gilmer Wood – N.W. Portland
<https://www.gilmerwood.com/>

North Woods Figured Wood – Gaston, OR
<http://www.nwfiguredwoods.com/>

WOOD STABILIZING

K&G (Knife and Gun) – Lakeside, AZ
Good reputation with everybody.
<http://www.kandgstabilizing.com>

Gallery Hardwoods – Eugene, OR
I've purchased stabilized blocks from them at the April show. They tend to be heavier, presumably more durable/stable but less wood-feel than others.
<http://www.galleryhardwoods.com/stabilized.htm>

WSSI (Wood Stabilizing Specialists International, Inc.) – Ionia, IA – some folks have had issues with them, some folks are totally happy.
<http://www.stabilizedwood.com/>

Alpha Knife Supply – ?Everett, WA?
<http://www.alphaknifesupply.com/>

Turn Tex Woodworks – San Marcos, TX
“Cactus Juice” and pressure chambers etc. for the do-it-yourself folks – your mileage may vary.
<https://www.turntex.com>

OTHER GOODIES

Sally Martin Mosaic Pins – So. Oregon
<http://customknife.com/index.php?cPath=13>

Oregon Leather – 810 Conger Eugene and 110 N.W. 2ND Portland
<http://www.oregonleatherco.com/>

Coyote Steel – wide variety of new steel, scrap, copper, brass, bronze – Garfield & Cross St. Eugene
<http://www.coyotesteel.com>

Cherry City Metals – Salem, Oregon – metal recycling and useful objects
<http://www.cherrycitymetals.com/>

Amtek – tool steel & cutting tools
<http://websales.amtektool.com>

Rio Grande – jewelry tools/supplies
<http://www.riogrande.com>

Otto Frei – jewelry tools/supplies
<http://www.ottofrei.com>

M3 Composite – space age mokume & other
<http://www.m3composite.com/>

Voodoo Resins – striking resin handle material
<http://www.voodooresins.com/>

Minarik automation & control
<http://www.minarik.com/>

The Engineering Toolbox (formula & info reference)
<http://www.engineeringtoolbox.com>

Valley Stainless (that does water-jet cutting) is one of Craig Morgan's customers. They told Craig “bring in a pattern” and they'd work with you on small batch cutting. They don't have a website yet. 29884 E Enid Rd, Eugene, Oregon 97402 (541) 686-4600.