

EUGENE 5160 CLUB ~ JANUARY 2017

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

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



JANUARY MEETING

January 5th – 6:00pm at David Thompson's shop. If you didn't get the directions in the meeting notice, email me for them: michael@elementalforge.com.

Bring your show-n-tell!

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



NOTES AND REMINDERS

Willamette Valley Arms Collectors Association Gun Show - March 18th-19th at the Lane Events Center. OKCA will have two knife tables.
http://www.wvaca.org/show_dates.html

OKCA Knife Show – April 7th (OKCA members only) – 8th & 9th (public) at Lane Events Center.
<http://www.oregonknifeclub.org/okcashow.html>

Bent River Forge aka Farrier Supplies – ongoing intro to blacksmithing and other classes:
<https://www.facebook.com/FarrierSuppliesOR/>

Northwest Blacksmith Association – see <http://blacksmith.org/events/> for all events.



Well now – *that* was quite a year & *that* was a quite a month. At the beginning of the month I missed the December 5160 Club meeting due to a wedding in the family (seriously sweet & fun & all that a wedding should be)...

then I had a great time at the December OKCA show on the 10th...

and next the ice storm brought down more trees on our property than any storm in the 20 years I've lived here. Amazingly, no damage to buildings or vehicles – but I had to chainsaw our way out of the driveway – a few firs, an oak, and a maple – our power (including the well) was out for 7 days...

at the end of the month a secret conspiracy was unveiled: family members from other states materialized for a whopping Christmas celebration! Whew!

As a side note, I don't normally go in for neon colors and plastic knife handles but seeing the scales from Voodoo Resins at the December show I decided I had to add them to the “Other Goodies” links at the end of the newsletter. <http://www.voodooresins.com/>





DECEMBER MEETING

I've got photos and audio of the December meeting... we'll see what I can make out of them – here goes!

JOVE LACHMAN-CURL brought the meeting to order and **DENNIS ELLINGSEN** gave away some more sections of circular saw steel (8670). Here's the spec's from the manufacturer:

Steel Name	8670	15N20	5160
Manufacturer	Generic	Uddeholm	Generic
Carbon:	.71%	.75%	.60%
Chromium:	.43%	--	.80%
Cobalt:	--	--	--
Manganese:	.50%	.40%	.87%
Molybdenum:	.07%	--	--
Nickel:	.88%	2.00%	--
Niobium:	--	--	--
Nitrogen:	--	--	--
Phosphorus:	.02%	.10%	.03%
Silicon:	.28%	.10%	.22%
Sulfur:	.01%	--	.04%
Tungsten:	--	--	--
Vanadium:	--	--	--
	© AKS 2013	© AKS 2011	© AKS 2011
Melt Notes	Cast	Cast	Cast
Data Sheet Y/N	-	-	-

This steel is used extensively in the lumber industry for making large circular saw blades.
 The nickel add toughness and there is enough carbon for good edge holding.
 There is not enough nickel to make a good shiny layer in damascus.
 Think of 8670 as an improved version of 5160, better toughness and edge holding.
 15N20 and 5160 are shown in the table above for comparison purposes.

It sounded like Erik Land looked up the heat treat info and said that they recommend heating to 1560-1635°F to austenitize, then quench in oil.

Dennis passed around a 15N20 paring knife that they use and enjoy – but it has the curious habit of getting a light blue patina.



Next he passed around a puukko knife that he'd purchased at a gun show. The seller divulged that he had purchased it in Helsinki, Finland in 1958. In consulting with a knife maker who specializes in

puukkos it sounds like this was made for personal use from a blade blank – with willow burl handle and reindeer horn sheath. The horn is not split, but is a single piece hollowed out.



Dennis then updated us on the progress of the Wayne Goddard tribute knife. It is a limited production of 50 available for purchase through the OKCA. This is from a Goddard pattern, with Osage Orange handle (one of Wayne's favorites). I believe this photo is of a Wayne Goddard original and a not-yet-finished knife and sheath from the set of tribute knives:



See the OKCA newsletter for details:
<http://www.oregonknifecub.org/knewsletters.html>

There was discussion of stress & fatigue in used lumber mill bandsaw steel (15N20 or L6). But when it's used in layered Damascus this is probably not an issue due to multiple layering and welding temps.

LYNN MOORE was up next. He showed a piece of cable Damascus that he and Jove worked on a year

ago. "I drew it out with my power – notched it and folded it, notched it and folded it – it's got 3 folds [layers] in it." Lynn was hoping that after the meeting they could fire up David's forge and draw it out to make a chef knife.



Then Lynn passed around some work-in-process pairing and kitchen utility knives from some of the bandsaw steel that Dennis gave away at the previous meeting. Lynn recommends cutting your blank across the width of the bandsaw steel because if you cut down the length of the original blade you may have issues with a slight curvature in the steel – even re-heat-treating after several normalizations.



On another tack, Lynn noted that he had purchased a Chicago plasma torch. From his experience with it he does not recommend this brand. But in dealing with it Lynn found Ron Vaughan of Welding Technical Services who he highly recommends. The replacement plasma torch Ron made up for Lynn "is a real nice machine – it'll cut up to 1/2" steel." *I don't find any on-line info on Ron – so ask Lynn for info if you have welding equipment support needs.*

FRANK BOBBIO started by showing the saw he uses to open up the hole on a stick-tang handle:



The handle is meant for a sawzall blade. Frank finds that a jigsaw blade's teeth are much sharper, so that's what he prefers to use.

Frank showed a knife he made from a Damascus billet he'd created from layers of bandsaw blade alternating with pallet strapping material. Pallet strapping comes in various grades (or lack thereof) and this grade is marked on the metal so that you know what you've got. The strapping he used is 1.25" x 0.032" – and when he test heat-treated it, it did snap after hardening. From Frank's research, when strapping is called "high carbon" they mean around 0.50% carbon – like 1050 steel – but with other alloys added.

The billet was 22 layers with extra sacrificial layers of strapping on the outside. Frank plans to go to 60-some layers on the next billet to get a higher layer count without cutting and re-welding.

Frank soaked the blade in ferric chloride to etch the pattern, then sanded it lightly and "Parkerized" it, then sanded it lightly again at 1500 grit. There are a couple of variations of Parkerizing. It was developed around 1900 to protect firearms as an alternative to the bluing process. You can get Parkerizing kits from Brownells. "The phosphoric acid removes atoms of steel from the surface and replaces them with manganese phosphate [for the manganese version of darker Parkerizing] so it's actually bonded to it" making it more permanent than cold bluing and more similar to hot bluing. Because it is a durable mat surface it holds protective oils very well.

Frank said it is a fairly quick process – immersing your stock in the heated/charged liquid – wait for the bubbling to stop – and rinse off.

Frank noted that in silver-soldering the guard "you can't make any mistakes because with the Damascus it's not like you can sand off any extra solder!"

The handle is African Blackwood from Gilmer Wood in Northwest Portland.



JIM JORDAN showed a “poultry hatchet” he picked up at Picc-A-Dilly, then passed around the rock hammer that he re-forged and has been engraving on:



Jim plans to put a long handle on it – for a “war axe” style. Someone suggested that contemporary marketing would dictate calling it a zombie killer. “But with that classy engraving it would be for vampires, not zombies.”

MARTIN BRANDT said he'd gotten a call from an estate sale alerting him a trove of old files – which he purchased, tempered “to around 475-480°F” and brought in for anyone interested in using them for stock removal knives. You'd have to keep a light touch on the grinder so as not to overheat them or else they'd need re-heat-treating. His tester shows about Rockwell 60.

Martin noted that his Rockwell tester varied from the results that Wayne's Rockwell tester had.

Martin advises heating the spine of the knife to blue to make it tougher and the tang up hotter (and cool slowly) so that you can drill holes in the tang.

Martin and Frank talked about using wet cotton rags to keep the knife edge cold while using a torch to heat the spine and tang. I'm fond of putting the parts I want to keep cool into wet sand – which holds the knife in place as well as cooling it.

STEVE GODDARD brought in a few things to share. First up was a partial tang 154CM (stainless) blade that Steve put the Micarta handle on.



Second was an L6 blade with matched maple scales.



“Dad said to always have something on your table under \$100, so I made these neck knives...” from some heat treated blanks that Wayne had left. RGS (Really Good Steel – probably L6) with maple handles.



I didn't quite decipher the audio recording of the meeting at this point – but here are some more Goddard father-son knives that went around:



There was discussion about glues (a perennial subject among knife makers). Ask five of us our favorite glue for scales or hidden tang knives and you're likely to get ten answers. Or more, depending on the materials being bonded.

EDWARD DAVIS said his name this time – so now I have it in the newsletter! Anyway, he brought in a folder kit from Knifekits.com that he put together. The handle is Kirinite. “The thing I learned is that the Kirinite will melt really fast with a fine grit belt.” He had to back off and hand sand for the finish. Martin noted that buffers will also melt this type of material.

In response to a question he noted that “the kit comes with the bolster spot welded on – all the pieces are cut and machined... so basically you're pinning it and forming the handle material. Part of the trick is that you have to fine tune the mechanisms... and it's already sharp which is kind of a hassle!”

Edward traced out all the parts so that he can build his next folder from scratch.



ARON JACOBSON came to the front to share his first 2 knives. He noted that he was new in Oregon and glad to have found the 5160 Club.

“These are from table saw blades” that he plasma cut, annealed, shaped, and heat treated.

Aron does sheet metal work and welding for a living and is setting up shop in Springfield.

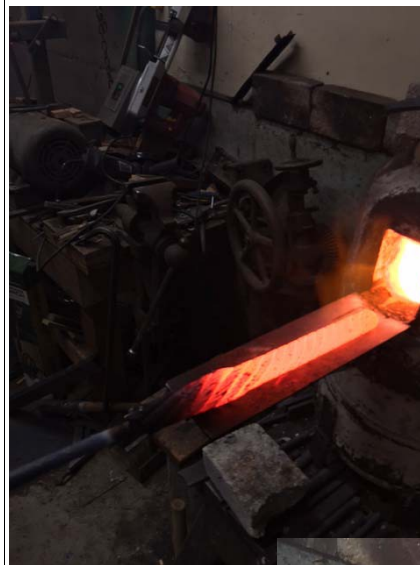


And that's what I learned about last month's meeting from the audio recording & photos – sounds like another good meeting!

See you Thursday!



Mike Johnson had sent me a few photos back in November that didn't make the last newsletter. Here's Mike's note & photos of a cable Damascus knife:



I didn't think my forge would weld. I was wrong. Just had to open the air up a little more. I left the gas pressure at 2 1/2 pounds and it got plenty hot. Now I will have to reline the bottom with some stuff I have that is supposed to resist flux.





Have fun all – and work safe!

~ ~ ~ Michael Kemp



FREE DE-CLASSIFIEDS

Email me a brief description of what you are selling/buying/looking for with your preferred contact (phone/email/...). Unless you let me know you want a shorter run, I'll run the note for 3 months and then send you an email to see if it's still valid. No charge – just email me at Michael@ElementalForge.com

Lynn Moore is setting up a new shop and has these “extra” items from the old shop for sale:

Propane forge \$50

DeWalt 12” abrasive wheel chop saw \$40

Heavy duty vice \$25

Contact: beeblues26@msn.com or 541 554-5294



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 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 “Knewsletter” 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/forums/forum.php>

Peter Newman of Bent River Forge/Farrier Supplies has a closed Facebook group for Oregon Blacksmiths

<https://www.facebook.com/groups/173156733117832>

Julious Griffith's knife groups on Facebook:

- Custom Knives For Sale by Maker - Available now
- Knifemaking - Works in Progress (w.i.p.'s)
- Knifemaking Equipment Buy, Sell, or Trade (used only)
- Knifemaking - Masters to paying Students connection
- Knife shop photos
- Knife Calendar - Events, shows, hammer-ins, schools, misc.

These are all closed groups – to keep them focused – so if you want to join one of the groups, click the “+ Join Group” button and also message Julious and give him some info on yourself so he knows you have real interest in the group.

REFERENCES

Our own 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>

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. Look up heat treating details on hundreds of steels in the palm of your hand.

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

My “Knife Info” has some 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 teaches classes in Washington. I've heard rave reviews from his students. Lisch is very skilled at blacksmithing in general and bladesmithing in particular.
<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

Blacksmithing 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

Blacksmithing 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/>

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>

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.pmtsc.com/tool-die-steel.php>

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>

AMK [Ohio] – affordable grinder, quick-change between platen & contact wheel

<http://amktactical.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
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

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

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

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

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.knifeandgun.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/>

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.