Your Mileage May Vary (Gary Guenther) **Tips** **Hints** **Ideas** **Tricks**

I watched the AAW Cindy Drozda demo of a dyed burl chalice a few days ago, and my take home was not about the turning or coloring, but rather about something she mentioned offhand about tool steels and sharpening.

Among other tools, she uses those from Doug Thompson, who makes all his tools from CPM-10V steel (a.k.a. "A11"). This is a Cryo-treated Powdered-Metal steel with 10% Vanadium. That turns out to be a sweet spot for hardness and toughness without becoming too brittle. The way the vanadium works is by forming carbides within the iron matrix.

When various carbide tools started becoming available to woodturners, it was said that although they lasted longer between sharpenings, they didn't get as sharp as tools made from regular steels. Cindy says that the reason for this is the old way the tools were sharpened – on aluminum oxide (AlOx) wheels, such as the white ones many of us used to use. *AlOx is softer than vanadium carbide and cannot sharpen it. Instead, what happens is that the carbide particles are simply mechanically ejected from the matrix, leaving a microscopically ragged and dull edge.* On the other hand, modern CBN (cubic boron nitride) wheels are harder than vanadium carbides and will actually sharpen the individual particles instead of kicking them out. Hence CPM-10V sharpened with a CBN wheel gets very sharp indeed. So if you needed one, here's a good reason to buy that CBN wheel you've been looking at. I personally recommend the ones from Ken Rizza at Woodturners Wonders -- and, no, I'm not being paid for that tip. :-)

So here's your YMMV in Cindy's own words:
http://cindydrozda.blogspot.com/2013/02/whats-difference-between-10v-steel-and.html?m=1

And here's what Doug Thompson says about CPM-10V:

> The tools are made from the best steel on the market, CPM10V (A-11) a powder metal manufactured by Crucible Materials Corporations with 10% vanadium content to hold an edge longer and has a proven history in woodturning. The steel is hardened to 62-64 Rockwell, triple tempered with a cryogenic treatment between the first and second temper. The cryogenic treatment at this stage transforms the bulk of the retained austenite to martensite and form very fine "eta" carbides much finer than tempering alone, this increases the durability and toughness of the steel. Nothing else can be done to this steel!

Always use common sense. Things that work in one situation may not work in another. Follow all Safety Rules. If it feels wrong, it probably is; stop and rethink. ***Y****our* ***M****ileage* ***M****ay* ***V****ary*