

## NHLA – “Hardwood Matters”

### Swage or Stellite?

The decision whether to stellite tip wide bandsaws or stay with swaging and shaping can be a difficult. Advocates for stellite tipping can make a great argument for its benefits, but the majority of mills (in North America) have not chosen to follow that path. Why is that?

Application of a stellite tip provides a cutting edge with some really superior properties. Specifically stellite can easily be made extremely sharp, much sharper than conventional wide bandsaw steel that has been swaged. It has greater resistance to fracture than a steel tooth, even though it is slightly harder. (Wide bandsaw steel is typically around 42 on the Rockwell C hardness scale, where stellite runs about 45 Rc.) Stellite is also has outstanding resistance to corrosion, so acidic woods don't cause it to break down and lose its sharp edge.

Stellite has metallurgical properties that are so superior to conventional steel that even at the end of its run it will have a sharper cutting edge than a conventional swaged saw has when it goes on the mill! This extraordinary cutting edge translates into less power consumption by the bandmill, the potential for higher feed speeds, and reduced deviation in the sawblade. One of the pioneers in the use of stellite in the U.S. was Sumner Oleson. Sumner became convinced over the years he worked with stellite that the reduced stain on the teeth while they were cutting translated into less fatigue in the gullets of the saw, allowing for longer run times between saw changes. Saws still have to be changed before the fatigue from the constant bending they endure causes gullet cracks, but stellite can stretch that interval.

With those kinds of benefits available everybody must be using stellite (or planning to), right? Well not exactly! The downside of the stellite equation is the additional filing room space, equipment, cost, and work that running stellite takes.

To add stellite to a filing room requires two additional pieces of machinery, a tipper / annealer, and a side grinder. In too many filing rooms there is simply not space enough to add these machines. If you are planning a filing room, do yourself a favor and build that extra space in. Even if you never make the move to stellite that additional floor space is a good investment. Look at how the addition of automatic leveling and tensioning machines has become standard, if your filing room does not have adequate space it can prevent you from taking advantage of these kind of technological leaps, and they are coming.

To purchase the tipper and the side grinder (new) will cost a minimum of about \$50,000 for a resistance type tipper. The equipment can range from there to over \$150,000 for the two basic pieces. The tipper can use either preformed tips that have a cost of about \$.15 - \$.25 each, depending on the style and size (at \$.20 each this is \$48 in tips for a 40' saw with 2" tooth spacing), or they can use stellite that comes in a rod form to reduce the cost per tip to about \$.08 each (\$19.20 for the same saw).

The process of applying the stellite (and annealing the teeth once they have been welded in) will take roughly 30-40 minutes for our example 40' saw with 240 teeth, side grinding the saw will take about that same amount of time. This adds to the time your filers need to get the saw ready to go back in the run so you may need a few extra saws in rotation, not a big deal. These are automatic machines so this extra hour or hour-and-a-half does not require that in man hours, just in machine time. Once saws have been tipped they can be pointed up by just profile grinding like you would a conventional saw, usually several times (5-10 times) before they need to be tipped and side ground again, presuming that they have not been damaged.

Stellite saws require careful handling, but really the same is true of swaged saws. Careless handling can readily knock out a tip, which then has to be repaired to keep the saw from marking. More and more we see mills that use tooth protector both going on the mill and coming off, that is the best practice and encourages everyone handling the saws to be careful with them.

If your mill sees a lot of damage from trash in the wood stellite will be difficult to justify. Each time a saw is damaged the teeth must be individually brought back to the same specifications as the rest of the saw. This is time consuming, requires careful attention to detail, and may make stellite impractical. One alternative is to look at adding stellite in steps, start with just the side grinder and once it's in place and working well add the tipper. Side grinding swaged saws has many benefits; in particular it will control side clearance and tooth geometry very precisely from tooth to tooth. This will put the corners of all the teeth in the same place and keep them genuinely sharp.

Stellite cuts like a dream, but before you make the leap do your homework and make sure that it fits in your operation. Then make sure that you give your filers all the tools and support they need to succeed!

**This article appeared in the June 2008 edition of "Hardwood Matters" and is reprinted with permission from the National Hardwood Lumber Association ([www.nhla.com](http://www.nhla.com)).**