

Sharp Is Not Enough

Overview

- **Objective:** To help you achieve the best possible results from your cutting tools.
 - Selecting the right tool for the job.
 - Sharpening the right tool.
 - Presenting the edge of the right sharp tool.
 - This will be covered in Part Two, to be scheduled later.

Outline

Selecting the right tool.

- What kind to buy.
- Tool steel.
 - Carbon steel.
 - Overheating (blue)
 - Loses temper, becomes soft.
 - Bushy spark pattern (lots of forking) that starts at the grinding wheel.
 - High speed steel.
 - M2.
 - Tolerates bluing.
 - High-speed steel faint red sparks at the tip.
 - Recommended baseline.
 - New and improved.
 - Alloys.
 - Cryogenic processing.
 - Nano particles.
 - Advantages and disadvantages.
 - Tungsten Carbide.
 - Difficult to sharpen (diamond)
- Grinders.
 - High speed – 3450 rpm.
 - Requires more finesse.
 - Low speed – 1725 rpm.
 - Recommended.
 - Tormek – 170 rpm – wet.

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- Requires more fixtures.
- Less general purpose.
- Generally more expensive.
- Abrasives.
 - Wheels and their codes.
 - Web search
 - Al₂O₃ – Aluminum Oxide.
 - Best general purpose.
 - 80 – 120 grit recommended.
 - cBN – Cubic Boron Nitride.
 - Carbon steel will clog them up.
 - Carbide may wear them out quickly.
 - SiC – Silicon Carbide – Carborundum.
 - Don't use. Not friable.
 - Diamond.
 - Other
 - Ceramic Alumina.
 - May or may not be better.
 - Zirconia Alumina – Zirc.
 - May or may not be better.
 - Garnet.
 - Don't use. Not friable.
 - What grit?
 - Grind angles.
 - Scrapers.
 - Conventional.
 - 60-80°.
 - Use the Burr or don't worry about it.
 - Negative Rake.
 - 50-70°.
 - Use the Burr.
 - Skews.
 - 25-35°.
 - Hone the burr off.
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 - Spindle gouges.
 - 30-40°.
 - Hone or not. Personal preference.
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 - Bowl Gouges.
 - Shallow bowls.

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- 40-45° or less.
 - Don't worry about the Burr.
 - Medium bowls (shallower than a hemisphere).
 - 40-45°.
 - Don't worry about the Burr.
 - Deep bowls.
 - 60° or more.
 - Don't worry about the Burr.
 - Parting tools.
- Profiles.
 - Scrapers.
 - Flat nose.
 - Skewed.
 - Round nose.
 - Rounded one side.
 - Skews.
 - Oval / rectangular.
 - Straight or Convex edge (never concave).
 - Personal preference.
 - Gouges.
 - So many labels!
 - Fingernail, Michelson, Ellsworth, Irish, 40/40, etc.
 - Differ in minor ways.
 - Difference in performance is very subjective.
 - Flute profiles.
 - "V," "U," parabolic, elliptical, etc.
 - Personal preference.
 - Wide tends toward more *"catchy"*.
 - You will need to alter the same grind for different flute profiles.
 - How pointy?
 - Personal preference.
 - Approaching a semicircle.
 - Guideline:
 - Start with a tip no more pointed than the radius of the bottom of the flute.
 - More pointy to get into small places.
 - Less pointy to make it less *catchy*.
 - Side grind.
 - How much?
 - Some... to keep the shoulder away from catching.

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- More for using “*shear scraping*” technique.
- Convex or flat. No “*bird’s beak*.”
- Secondary bevel.
 - Always - to avoid the heel crushing fibers on inside curves.
- Honing.
 - Purpose is to remove the bur.
 - When a bur would not be an advantage.
 - Usually don’t for general cutting.
 - Maybe for final cut.
 - Skews.

Sharpening.

- Importance.
- Methods.
- Dangers
- Importance.
 - Dull tools are dangerous.
- How do you know when you need to sharpen?
 - Slip off the cut.
 - Heat.
 - Pushing hard.
 - Shavings.
- Methods.
 - Freehand.
 - Traditional.
 - Spindle roughing gouge.
 - Bowl gouge.
 - Stuart Batty.
 - Setup jig.
 - Ruth Niles.
 - Less easily repeatable.
 - Jigs.
 - One-Way Wolverine Vari-grind.
 - Setup jig.
 - Wolverine 2 (corrects Wolverine 1 weakness).
 - Kodiak (corrects Wolverine 1 weakness).
 - Others.
- Dangers!
 - Wheels can disintegrate.
 - “Ring test.”
 - No sharpening on the side of the wheel.

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- Use care when nearing 90°.

Presenting the Edge.

- Types of cuts.
- Spindle work.
- Bowl work.
- Three types of cuts... the rest is semantics.
 - Scraping
 - (think windshield wipers, spreading butter, or skinning a carrot).
 - Edge angled away from oncoming fibers.
 - Poor quality of cut.
 - Peeling
 - (think making veneer from a log or unwinding a cinnamon roll).
 - Edge angled between oncoming growth rings.
 - Spindle examples.
 - Parting.
 - Bedan.
 - Skew.
 - Slicing.
 - (think sharpening a pencil with a knife).
 - Edge angled toward oncoming fibers.
 - Best quality of cut.
 - Shearing is a special case of slicing.
 - (think guillotine or slicing carrots).
 - Edge perpendicular to oncoming fibers.
- Semantics.
 - Planing a spindle. (actually a slicing cut).
 - *Shear scraping*. Shearing is not scraping, and scraping is not shearing.
- The edge may be angled relative to the oncoming wood fibers to encounter more or fewer simultaneously. (Like when a plane is held at an angle to the direction of movement.)
- Helpful to think about the just the edge segment in contact with the wood fibers.
- Different cuts can be made with the same tool.
- Spindle work.
 - Spindle roughing gouge.
 - Peeling.

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- Slicing.
- No scraping.
- Parting Tool.
 - Peeling.
 - Maybe scraping.
 - No slicing.
 - Bedan Tool.
- Skew.
 - Peeling. (roughing to cylinder).
 - Slicing. (planning, beads, [coves])
 - *Shearing*. V cuts.
 - Scraping. (sometimes).
- Bowl work.
 - Cuts alternate between end grain and face/side grain.
 - Tearout is most common on the trailing side of the end grain.
 - Gouges.
 - Starting a cut.
 - Roughing.
 - Hollowing.
 - Bevel guided cuts.
 - Outside.
 - Inside.
 - Bevel radius vs. profile radius.
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 - *Shear scraping vs shear cutting*.
 - Scrapers.
 - Can be used for hollowing.
 - Carbide tips are
 - *If the only tool you have for sale is a scraper, it is the “best tool” for the job!*
 - Light cuts result in better quality of cut.
 - Most useful for removing ridges and humps.
 - Negative rake scraper (NRS).
 - Special case of scraper.
 - Less aggressive than conventional scrapers.
 - Use for fine cleanup.
 - Depends on the bur for the best results.
 - A skew can be used as a NRS in a pinch.

References.

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Jim Echter, [Sharpener Alternatives](#), AW2705p27-32.pdf

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Grinding Wheel Basics.

<https://www.nortonabrasives.com/en-us/resources/expertise/grinding-wheel-basics>

Search for “woodturning tools grinding angles”

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