

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.
 - Don't use with carbon steel.
 - 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.
 -
 - Spindle gouges.
 - 30-40.
 - Hone or not. Personal preference.
 -
 - 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.
 - Skews.
 - Oval / Flat.
 - Straight / Convex.
 - Personal preference.
 - Gouges.
 - Narrow / Wide flute.
 - Personal preference.
 - Wide seem more "catchy".
 - How pointy?
 - Personal preference.
 - Approaching a semicircle.
 - Side grind.
 - How much?
 - Some to keep shoulder away from catching.
 - More for using "shear scraping" technique.
 - Convex or flat. No "bird's beak."
 - Secondary bevel.
 - Always - to avoid the heel crushing fibers.
- Honing.
 - Purpose is to remove the burr.
 - When a burr would not be an advantage.
 - Usually don't for general cutting.
 - Maybe for final cut.
 - Skews.

Sharpening.

- Importance.
 - Dull tools are dangerous. Fried potatoes mishap.
 - How do you know when you need to sharpen?
- Methods.

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- 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 (more controllable).
 - Kodiak.
 - Other.
- Dangers!
 - Wheels can disintegrate.
 - “Ring test.”
 - No sharpening on the side of the wheel.
 - Use care when nearing 90°.

Presentation. (teaser for next demo?)

- Types of cuts.
- Semantics.
- Slicing.
 - Shear cutting.
 - Planing.
- Peeling.
 - Parting.
- Scraping.
 - Shear scraping.
- Shearing.

References.

Alan Lacer, Alan Lacer on Sharpening, AW1803p52-59.pdf

Jim Echter, Sharpener Alternatives, AW2705p27-32.pdf

Search for “grinder wheel specification”

Grinding Wheel Basics.

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

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Search for “woodturning tools grinding angles”

Nick Cook, Sharpening Turning Tools Made Easy.

https://www.woodcraft.com/media/W1siZiIsIjIwMTcvMDgvMjIvNDQvMTUyLzYzZmYyV9LaW5kX1NoYXJwZW5pbmdfVHVybmluZ19Ub29sc19NYWRlX1NpbXBsZS5wZGYiXV0/79_4-of-a-Kind_Sharpening-Turning-Tools-Made-Simple.pdf?sha=10e306f973859a1c

About Cubic Boron Nitride

<https://www.sciencedirect.com/topics/materials-science/cubic-boron-nitride>

Stuart Batty - Negative Rake Scraper - Instruction-Manual.pdf

<https://www.woodworkersemporium.com/content/NRS-Instruction-Manual.pdf>

Mike Mahoney

<https://www.finewoodworking.com/2008/01/20/turning-techniques-the-difference-between-shear-scraping-shear-cutting-and-cutting>