

Grinding

Use your tool rest only as a fence

by Frank Klausz

Grinding is the first step in shaping the bevel on a cutting tool. It makes the edge straight and square and puts the bevel at the proper angle. It is not necessary to regrind every time you sharpen; a properly ground edge can be honed many times. I grind damaged tools and new tools that have been incorrectly ground. I also regrind tools after repeated sharpening has flattened the hollow grind; it's easier to hone a hollow grind. In my apprentice years, we did not use a motorized grinding wheel. We had a flat, rough whetstone about 8 in. by 4 in. by 3 in. that sat in a wooden basin with a couple of inches of water. I spent many hours at that stone, and every week the worst job in the shop was to change the water and clean out the wooden basin so you could see the bottom. Flat grinding on such a waterstone and honing on a fine, grey stone produces the best edge, and it holds up longer than a hollow-ground edge, but if you have to remove a lot of metal, it takes a long time to do and a lot of sweat.

For faster, easier grinding, use an electric grinder with a 60-grit aluminum-oxide wheel, rotating toward you at 3,000 RPM. I prefer a 1-in. or wider wheel at least 6 in. in diameter. Wheels smaller than 4 in. in diameter give too deep a hollow grind. I keep the wheel clean and dressed with a carborundum block; a glazed stone will not cut well, and can overheat the tool. My grinder has a cover around the back of the wheel and a transparent shield on top. I get gooseflesh when I see a grindstone spinning freely with no cover and no safety glass for the operator. Protect your eyes.

My grinder also has a standard tool rest whose angle and closeness to the wheel are adjustable. But I never change it. The only part of the tool rest I use is the lower edge, as a guide for my right index finger. The tool need not lay flat

against the surface of the tool rest. If it did, you'd have to adjust it for each tool, depending on the steel and the work. Less dense woods require more acute angles, and hard steel can hold its edge ground to such smaller angles. Chisel and plane blades should be ground to 25° or 30°. To determine these angles, compare the width of the bevel with the thickness of the blade. The face of a 30° bevel is twice as wide as the thickness of the blade; a 25° bevel is two and one-third times as wide as the thickness of the blade. By the time you get the tool-rest angle right, you can have finished grinding, if you use the tool rest only as a one-point guide.

Hold the blade in your right hand between your index finger and thumb, about in the middle of the blade. Lay the tool on the tool rest and bring the edge toward the wheel until your index finger touches the back edge of the tool rest. If the wheel touches only the tip of the blade, move your finger down a bit. If the wheel touches the blade before your finger touches the tool rest, move your finger up a bit. Once you've found the right place, keep your finger there and use it as a stop to slide against the tool rest. Move the blade right and left, applying light pressure on the blade with the fingers of your left hand. There are only two supports for the blade—the index finger at the bottom edge of the tool rest and the wheel itself. This ensures that the hollow grind will be even. Keep the blade moving back and forth across the wheel and dip the edge often in water. When the beads of water on the tool evaporate, dip again. Don't get any blue mark on the chisel because that means you have raised its temperature to where it has lost its temper and however sharp an edge you get, it will dull easily. As the grind nears the edge of the tool, the danger of burning increases because the thin metal heats up fast. This metal will be your cutting edge and its temper is critical. You should get sure enough of the position of the blade in your right hand to be able to free your left hand to spray the edge with water from a spray bottle as you grind. It takes practice, but no jig will provide the feelings you will learn to recognize when you are grinding properly.

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The proper position for the index finger of the right hand, which rides against the bottom of the tool rest, will produce an initial grind mark about in the middle of the bevel, left. If the grind mark is too high, lower your finger; if the mark is too low, raise your finger. While grinding, second photo from left, the blade does not necessarily rest on the

flat of the tool rest; the position of the index finger determines the bevel angle. As the grind nears the edge of the blade, it becomes easy to overheat it. Learn to control the tool with only your right hand, freeing your left to spray the edge with water as you grind, second photo from right. At right, the hollow-ground bevel directly off the grinder.