



Drill rod of "O 1" tool steel, 3/8" diameter, 9" length, mounted in a handle

At least a pint to quart of olive oil in a metal can with lid

Heat source: MAP Gas, acetylene, propane with oxygen, forge, etc.

Tempilstik Or brush-on version (optional) in 450 degrees

Mill file, sandpaper, soap and water

Needle nose pliers

Abrasive disc (Norzon 50 or 60 grit) on MDF wheel, wheel grinder for edge grinding, slipstone

#### KEY TERMS:

**Annealed:** in a softened state.

**Hardened:** Steel that has been heated to its critical temperature to bring to a very hard and brittle state.

**Tempering:** the process of bringing hardened steel to a softer, working hardness for a particular use.

**Oxidation color spectrum:** the color spectrum that results from the oxidation of cold steel as it slowly gets hot. First appearing is light yellow, medium to dark yellow, bronze, purple, then blues (dark to light), then back to silver.

#### PROCESS (DO THIS AWAY FROM FLAMMABLE MATERIALS!!!!):

1. With grinding disc on lathe, grind steel to shape shown in diagrams above (don't get the edge sharp at this time).
2. Heat last 1" or so to bright red and bend with needle nose pliers to create the hook—bending to left as viewed from above (cutting edge down). A "flute" that is about 1/4" to 3/8" across is about right—just be sure you can get inside the flute to hone.
3. Reheat hook area to bright cherry red (around 1500 degrees), hold for several minutes, quench in oil, stirring rapidly for at least 30 seconds. While heating, take your time and get a very even bright red consistently through the hook area.
4. Test for hardness by trying to file top of hook—should skate off
5. Clean the hook and rest of rod back about 3 inches—goal is to get the surface as clean and polished as possible (use soap and water, wet/dry paper).
6. Temper: heat about 3" behind hook very gradually—avoid bringing to any red—and let the oxidation colors develop. When the hook looks to be a medium to dark yellow color, quickly quench in water. Use the Tempilstik as an alternative.
7. Sharpen the outside bevel to achieve a cutting edge—cool in water regularly to avoid bluing the edge. Hone the freshly ground bevel with a slip stone, followed by honing the inside flute of the hook. A 10 to 15 degree bevel angle that is positive (away from the cutting edge when edge is held upright) is a nice compromise between extremes for your first hook tool.