

Parting Facts (Summary of Lathe Parting Notes)

1. Part-off Tool Selection.

- a. *HSS*. Cheaper, tougher, and can be reground.
- b. *Tungsten Carbide (WC)*. Can tolerate much more heat (2.5X > HSS). 2.5X stiffer than HSS. These parting tools are available as a small piece of tungsten carbide brazed to a steel blade or as an indexable parting blade designed to accept standardized, quickly replaceable WC inserts.
- c. *Coatings*. Quality carbide parting inserts are available with heat resistant coatings that allow higher surface (spindle) speeds and thus faster grooving or parting in tougher materials like steels and titanium. The most common tool coatings are TiN (titanium nitride), TiAlN (titanium aluminum nitride), and TiCN (titanium carbo nitride), which typically allow 25-30% higher surface speeds than uncoated tools.

2. Part-off Tool Inspection.

- a. Inspect the parting tool closely before using.
- b. When necessary, [grind and/or hone the cutting edge](#) to ensure it's sharp.
- c. If using an indexable parting tool, check that the insert is in good condition.

3. Maximize Cutting Stiffness.

- a. *Minimize Part Stickout*. It is better to perform part-off operations closer to the chuck because of the decreased deflection when parting. Within 1/8" of the chuck jaws is preferable.
- b. *Minimize Tool Stickout*. Always minimize the distance the part-off blade sticks out of the toolholder to increase tool stiffness during parting.

4. Part-off Tool Alignment.

- a. Use a [1-2-3 block or dial indicator](#) to align the parting blade holder **perfectly** parallel to the X-axis of motion.

5. Tool Height.

- a. Check / set the vertical height of the tool using the ruler or lathe gage.

6. Speed Calculation.

- a. When parting on a manual machine, [the parting tool should be run at approximately 60% of the recommended surface speed for the same workpiece/cutting tool materials](#) (like all manual machining operations).
- b. The reality is you will never overheat our carbide parting tools cutting aluminum or steel if you keep the speed under 600 rpm. So start at 300 rpm and work your way up if you're feeling brave.

7. Cutting.

- a. Never use the automatic feed when parting on the manual lathes in our lab.
- b. Use a lot of oil and apply it frequently because the parting process generates a lot of heat.
- c. Like drilling, use pecks to break up the chips.