

Case Study: Wood Branding Tool

Objective: Make a small brand that can be heated with a wood burning tool to burn a branding into wooden projects

Equipment & Materials

Filament: Bronze Filamet™

Printer: Ender 5 Plus with Micro-Swiss Direct Drive Hotend

Nozzle: 0.6mm Hardened Steel Nozzle

Furnace: FireX Sintering Kiln

Debinding Ballast: Al2O3 Ballast

Sintering Ballast: Magnesium Silicate

Crucible: 500mL Alumina Crucible

Crucible Cover: Kiln Paper

Why FFF Metal

Benefits: Lower barrier to entry and ease of use.

With no access to a CNC that can machine metal, FFF metal 3D printing provided an accessible, cost-effective, in-house solution to manufacture a custom, metal brand without expensive tooling or outsourced machining services.

Design & Assembly

Two-Part Print: The tool was split into two components for optimal print quality; the custom brand logo printed flat, and a cylindrical mount with a chamfered bottom edge. This was done to remove the need for supports. The green parts were solvent welded together into a single unified piece before debinding and sintering.

Shrinkage: To account for threading, the mounting cylinder was printed 10% oversized in diameter, leaving sufficient stock material to chase threads post-sintering.

Debinding and Sintering Process

Debinding: The green part was buried in Al2O3 ballast inside the 500mL Alumina Crucible, and run through the standard thermal debind profile in the FireX Sintering Kiln.

Sintering: Following debind, the part was repacked in Magnesium Silicate ballast and run through the bronze sintering schedule.

Results

Post-Processing: The oversized cylinder perfectly shrank to the diameter required to thread easily and cleanly.

Performance: The resulting metal brand mounts securely to the tool, heats evenly, and leaves a clean branded impression on finished wood projects.

