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Manufacturing Processes

As a mechanical design engineer, I know the importance of familiarity and experience with the associated manufacturing processes. Design for manufacturing must be paramount in engineering. I have been machining many of parts and assembling my own prototypes at my current employer. I have a background of about 2.5 years as a manufacturing engineer in a premier plant with the top metal cutting tool company in the world, and I do a great deal of prototyping and machining in my current employer's shop. I have been in the garage since I could hold a wrench, as the son of an engineer. I owned and operated my own LLC handyman business through high school and some of university. I build, test (including labor, planning, and documentation), and troubleshoot (when needed, which admittedly is often) my own prototypes any time schedules and regulations allow.

I have omitted some of the standard processes, such as hand drills, hammers, etc. There are certainly some processes that I have personally done, designed for, and/or witnessed. The list below was created from memory.

Designed AND physically used:		Designed for and witnessed	Finishing, etc.
<ul style="list-style-type: none">• Myriad controllers• Any and every hand tool• Drilling• Reaming• Angle grinder• Surface grinder• Bench grinder• 3D printing (FDM, SLS, and SLA) [PLA, ABS, TPU, TPE, PETG, PACF, PC, Resin, Powder (PA12 and PA6)]• Welding (mostly arc and stick)• CNC Machining (Programming and Running)<ul style="list-style-type: none">◦ Milling◦ Turning◦ Drilling◦ Tapping◦ Grinding• CMM and other inspection• Hydraulic and arbor press• Most any form of cutting of most materials	<ul style="list-style-type: none">• Manual mill• Manual lathe• Boring• Wiring• Deburring• Angle grinder• Press break	<ul style="list-style-type: none">• DMLS, DLS, SLS, MJF/PJF• Casting (both die and investment)• Injection molding• Sheet metal• Thread forming• Heat treatment• Extrusions• Wire EDM• Piping• Insulation• Brazing	<ul style="list-style-type: none">• Powder coating• Painting• Anodizing• Thermoforming• Autoclaving• Acetone bath• "Sand" blasting• Laser cutting• Sanding