

Process	Equipment	# of Machines (enter #s in highlighted cells)	# of Breaker Sockets Required
Laser Cutting	150W Laser Cutter	3	3
	Laser Chiller	3	3
Central Equipment	Central Air Compressor	1	2
	Central Exhaust Fan	1	2
Sewing	Automated Sewing Machine	3	6
CNC Routing	Light-Duty CNC Router	1	1
	Medium-Duty CNC Router	1	Custom-Installed
	Heavy-Duty CNC Router	0	Custom-Installed
	Vacuum Pump	1	2
Industrial Robot	6-axis Industrial Robot	1	Custom-Installed
Injection Molding	Small Electric / Hybrid Injection Press	1	Custom-Installed
	Resin Dryer	1	2
Workstation Power Outlets	Standard 4-Outlet Receptacle	17	17
		120V Circuits	23
		240V Circuits	7
		480V Circuits	3
		 Breakers Required	38

Process	Equipment	Notes
Laser Cutting	150W Laser Cutter	Laser & Chiller can each use a separate breaker, or share a single 120v 40A breaker Uses Plant air
	Laser Chiller	May be advantageous to run all laser cutters from a single centralized chiller
Central Equipment	Central Air Compressor	Single screw-type compressor with refrigerant dryer (prevents rust/contamination in the air supply) would provide 'plant air' throughout the entire facility. Some facilities may have the pipes for plant air already installed (though these are likely not rust-free and would need filters at each outlet). We used these machines at Branch and they are fantastic and very quiet.
	Central Exhaust Fan	A single high-flow central exhaust system is the industry standard configuration for providing exhaust to multiple machines (laser cutters, CNC, fume extraction for workstations where chemicals such as resins are mixed, etc. Ducts would feature a shut-off valve at each machine so that exhaust flow can be turned on/off at individual machines. The system would also incorporate a make-up air supply, which would pull input air from outside rather than exhausting conditioned air from the facility and driving up HVAC operating costs.
Sewing	Automated Sewing Machine	Uses plant air
CNC Routing	Light-Duty CNC Router	Light Duty: router that is smaller or meant for cutting soft non-metallic materials (can engrave or cut thin sheets of soft metals like aluminum) Uses plant air
	Medium-Duty CNC Router	Medium Duty: freestanding router with cutting area >= 1m ² , higher-power spindle meant for cutting non-metallic materials more quickly and capable of cutting soft metals like aluminum Uses plant air
	Heavy-Duty CNC Router	Heavy Duty: slab-anchored industrial router with large work area >2m ² and capable of cutting hard metals like steel (or lathe-type CNC e.g. HAAS) Uses plant air
	Vacuum Pump	provides suction through the CNC's work table to hold fixtures/material in place
Industrial Robot	6-axis Industrial Robot	Uses plant air (if end-of-arm tooling is pneumatic, as is typical)
Injection Molding	Small Electric / Hybrid Injection Press	Presses can be all electric, electric+hydraulic hybrid, or all hydraulic. Electric machines are quieter, cleaner, consume less energy, and are more precise, but are not capable of the high pressures that hydraulic machines can produce. Higher pressures are needed for large or thick-walled parts.
	Resin Dryer	Plastic resins will need to be dehydrated prior to processing. Dryers use a combination of heat and desiccant. They are closed-loop and do not need an exhaust system. Resin pellets are conveyed from the dryer to the molding machine via hoses equipped with suction devices that run on compressed air (plant air).
Workstation Power Outlets	Standard 4-Outlet Receptacle	Assume 1 workstation beside each machine, each having a standard 120v 4-outlet receptacle. Not every machine needs a workstation, but there will be a few non-production workstations such as desks, display monitors, power tool workbench, etc.
		These will almost always have breakers on the main panel as would an ordinary household outlet. If 3 phase, a transformer will be used.
		These circuits will typically combine 2 120V breaker sockets at the panel, and may or may not have a separate breaker from the main panel. If 3 phase, a transformer will be used.
		480V / 3 Phase equipment will have separate breakers from the main panel, and will incorporate transformers, etc. Power configuration will need to be specific to the frequency and amperage required by the machine. Assume any such power infrastructure will need to be installed with the machine.
		Not including custom-installed power supplies