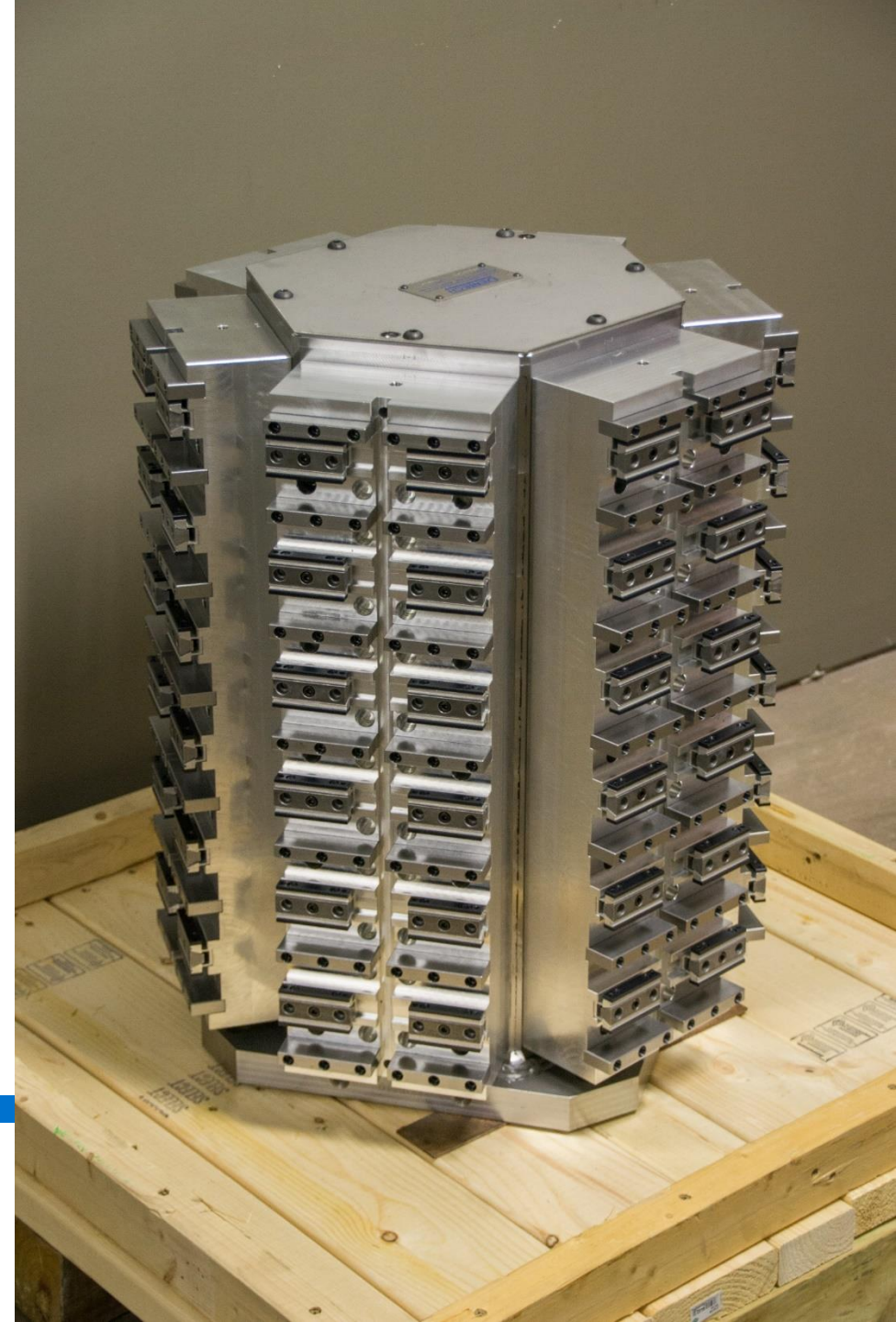


August 2022 Lunch and Learn Machine Shop Overview

What we're reviewing

- Machining processes
- Machines and their capabilities
- Machine shop customers



Machining Processes

Machining processes

What constitutes a part to be done a certain way?

- Tolerances
- Shape
 - Key process selection drivers:
 - Manufacturing volumes
 - The value of the product
 - Part geometry
 - Required tolerance
 - Required material
- Material
 - Raw material cost
 - Material machinability cost
 - Low material machineability = more expensive
- Geometric tolerance
 - Geometric Dimensioning and Tolerancing is a set of rules used for more accurate design, larger tolerances for less important design features, and cost savings for manufacturing

Machines and their capabilities

Machines and their capabilities

- **Prototrax** - A two-axis/three-axis CNC control design can create cycles like bolt hole circles, circular and rectangular pockets, and even complex profiles.
- **Vertical CNC Mill** - CNC technology - vertical machine centers (VMCs) have the capability to perform at very high speeds. They also have equipment available including rotary indexes that enable four-axis or five-axis machining.
- **Horizontal CNC Mill** - Same technologies as VMC. Used for larger applications, rigidity, and accuracy to keep machine shops productive.

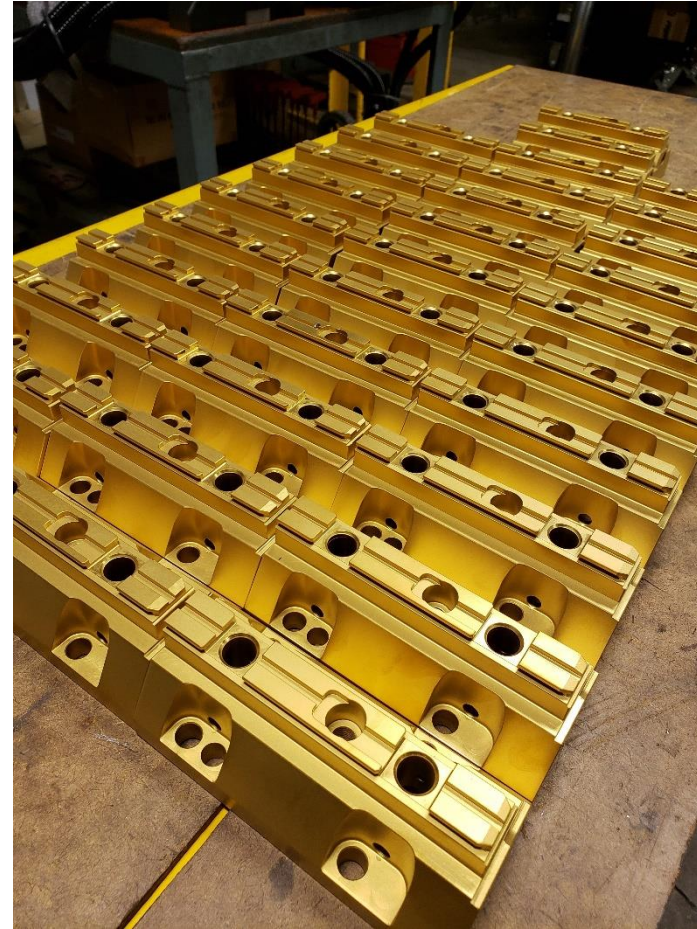
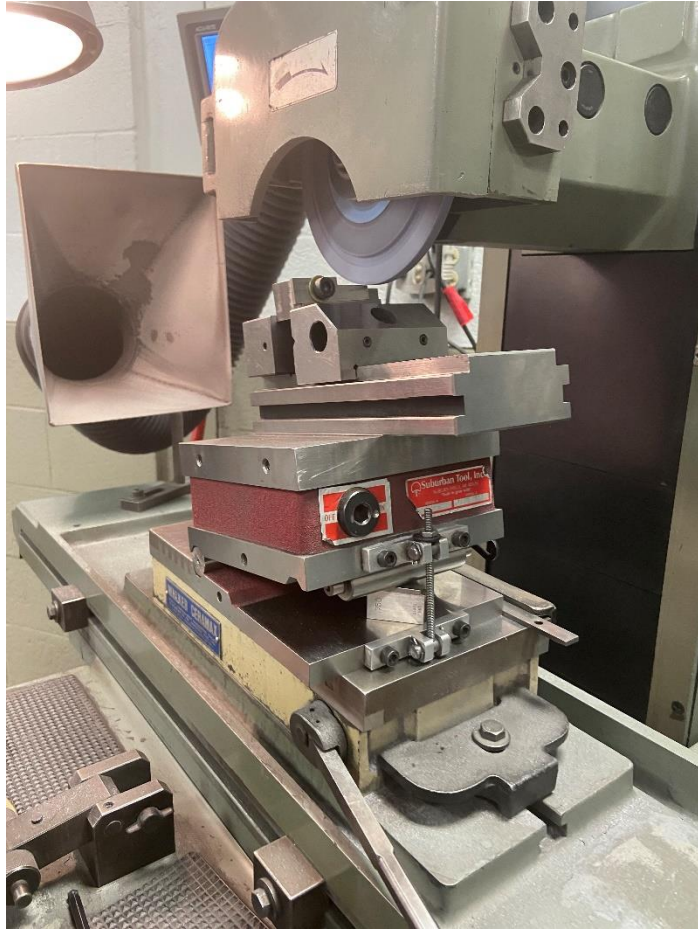
Machines and their capabilities

- **Lathe** - A machine tool that rotates a workpiece about an axis of rotation to perform various operations such as cutting, sanding, knurling, drilling, deformation, facing, and turning, with tools that are applied to the workpiece to create an object with symmetry about that axis.
- **Grinding** - A type of machining using an abrasive wheel as the cutting tool. Grinding is used to finish workpieces that must show high surface quality and high accuracy of shape and dimension.
- **Wire EDM** - Electrical discharge machining (EDM), also known as spark machining, spark eroding, die sinking, wire burning , or wire erosion, is a metal fabrication process whereby a desired shape is obtained by using electrical discharges.

Examples



Examples



Examples



[5 Axis Simultaneous Ball Mill CNC Machining on Doosan DVF 6500](#)

Machine shop customers

Machine shop customers

- Firearm industry
 - Workholding fixtures
 - Inspection fixtures
 - Spare equipment
- Aerospace industry
 - Testing fixtures
 - Workholding fixtures
- Automotive industry
 - Shop tooling
 - Fixtures

Questions?