

AUTOMATED "PREP-BOT" CELL

Reduce overhead

The current manufacturing process of getting a blank tool ready for the cutter grinder involves numerous operations and high employee involvement.

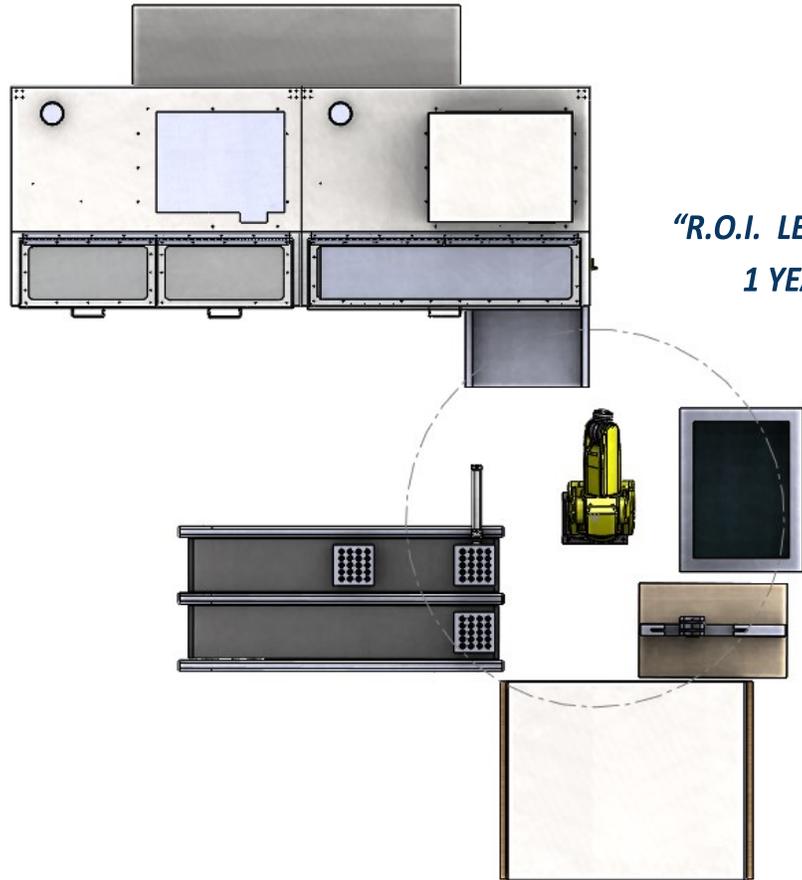
By automating the machines and incorporating a 6 axes robot, it allows for unattended operations and frees up the operator to complete other essential tasks.

The Cell Concept effectively takes the once separated system consisting of numerous people down to one individual with no loss in production.



Chamfered Angles and Rod Lengths

The "BOSS-FA" (Cut-Off Machine) and Chamfer Machine by Wayne Machinery are programmed to accommodate for different cut lengths and chamfer angles within the same run of parts (i.e. let's say you want your first blank to be 102mm (4") long and have a 45° chamfer and your second blank you want it to be 127mm (5") long with a 30° chamfer.) As long as the operator initially inputs the correct parameters into the machines, the cell will work autonomously. We can even have it set up so the robot places the different length blanks into different pallets on the conveyor.



**"R.O.I. LESS THAN
1 YEAR"**

Cell Process

A centrally located robot eliminates the need for individual operators to be present at each machine. The cell functions autonomously with the robot transitioning the blanks to each station on a set schedule.

The robot has 2 independent encompassing grippers to move the blanks to each station. One gripper removes the processed blank and the other gripper inserts a new blank into the station.

Once the system is fully loaded (wet), there will be 4 blanks in process: (1) getting cut to length in the Cut-Off Machine, (1) getting chamfered in the Chamfer Machine, (1) getting measured/verified in the OD Laser Micrometers, (1) getting etched in the Laser Marking System*¹.

The ultimate goal is to have one completely processed tool placed into the outgoing pallet, located on the conveyor system, within the cycle time of the Cut-Off machine. Therefore, the robot has to transition a new

blank into the subsequent stations, those stations are required to process and complete the new blank prior to another blank coming off the Cut-Off Machine.

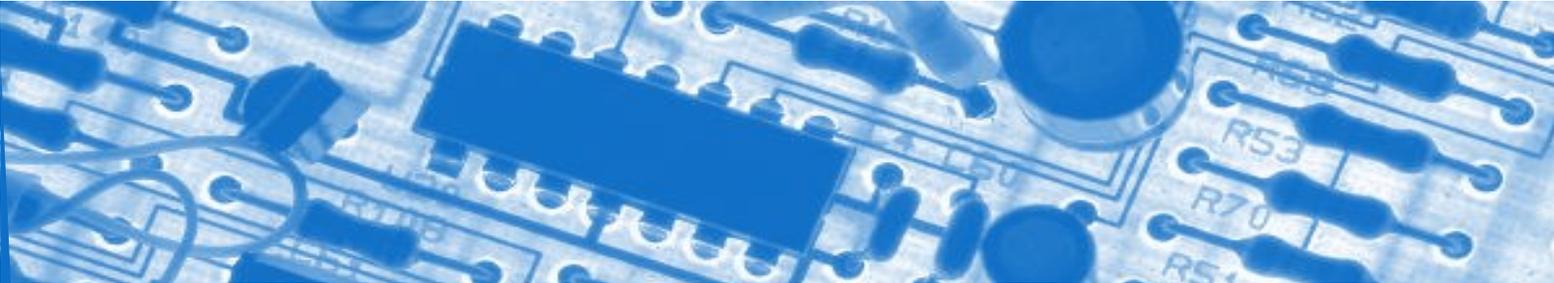
The cycle time of the Cut-Off Machine is dependent on the rod (blank) diameter. A larger rod diameter results in a longer cycle time and a smaller diameter has a shorter cycle time.

Once the outgoing tray/pallet is fully loaded (i.e. a standard batch size) with processed blanks, the conveyor system moves the pallet to a designated area for the cutter grinder and a new empty pallet automatically moves to the robot loading area.

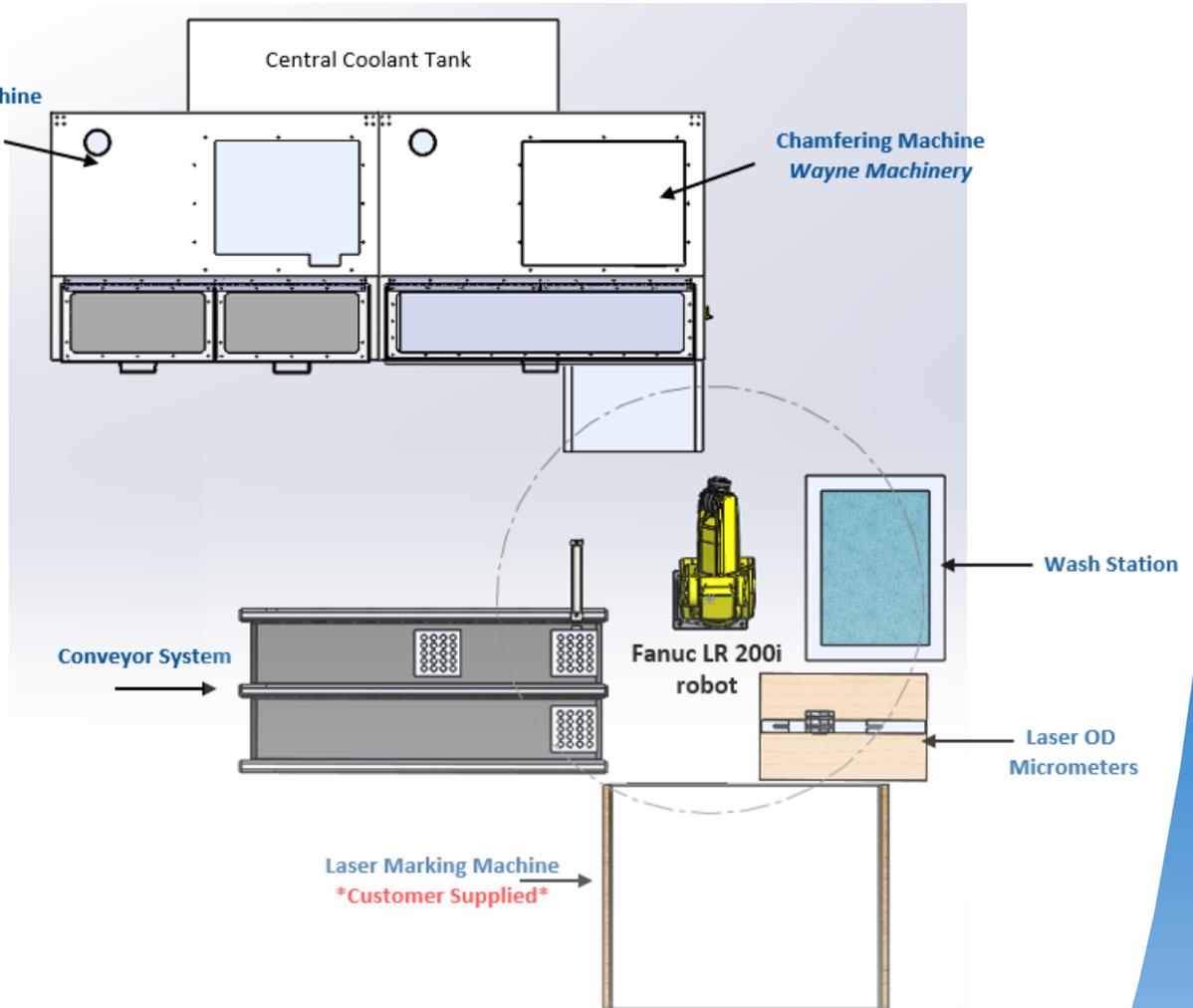
The operator is in total control, but ultimately responsible for initially inputting the parameters into each machine/station, loading the Cut-Off Machine, loading/unloading pallets from the conveyor system and ensuring that the overall cell is working efficiently.

*¹ Laser Marking System must be supplied by the customer at this time





Cell Layout



STATION #1:
Carbide Cut-Off Machine
 ("BOSS-FA" by Wayne Machinery)

Servo Driven Infeed, 1A1R 200mm (8") x 1mm (.040") x 32mm (1-1/4") bore diamond grind wheel (CBN for HSS). Capable of machining rod diameters 3-40mm (.120-1.5") and 25.4-430mm (1-17") long.

STATION #2:
Chamfer Machine
 (Wayne Machinery)

Servo Driven Infeed, 1A1 200mm (8") x 13mm (1/2") x 32mm (1-1/4") bore diamond grind wheel (CBN for HSS). Capable of machining chamfer angles between 0°-90° and conical points.

STATION #3:
Laser OD Micrometers

OD Laser Micrometers to verify rod blank diameter prior to etching part number onto blank.

STATION #4:
Laser Marking System*¹

Laser etch blank shaft towards chamfered end.
**Must be supplied by customer with integration for robotic loading*

STATION #5:
Conveyor System

Conveyor System to move pallets from robotic loading area to prep/staging area for cutter grinder.

Robotics:
Fanuc LR200i

Axis: 6
 Reach: 717mm (≈28")
 Payload: 7kg (≈15lb) at wrist
 2 independent grippers

*¹ Customer Supplied Item



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