

---

## Supplying Critical Components to the Power Generation Sector

2013.07.13 | Hyundai Wia Machine Tools

---

QUEENSBURY, NY — Ed Leonard, shop supervisor, says that Seeley Machine is a small family owned business, which had its beginnings in the Seeley's garage. Barb, Charlie and Craig Seeley are the owners, and in 1986 they built a new splitlevel facility in Queensbury. They thought the building was plenty large enough for their needs, but they have added on several times. The newest addition is on the lower level where most large part machining takes place; smaller parts and machines are on the upper level. Material often moves from one level to the other — roughing on one level, then finishing on the other. The company has 20some employees. Manufacturing space today: 20,000 sq. ft.



Craig Seeley, Ed Leonard and Jeremy Shamp at Seeley Machine, in front of their Hyundai WIA F750 vertical machining center

"We are pretty much the definition of a job shop," Leonard says. "We process a wide gamut of materials — exotics, Inconel, Hastalloy, Waspoly, 300 to 400 series stainless and some aluminum. Over the past 10 years, the energy segment, specifically power generation, has been our bread and butter focus.

"For example, we produce several sizes of labyrinthine bearing seals, which redirect coolant or lubrication around a shaft, and many of these seals are larger than we technically should be doing on our new Hyundai WIA FM Series vertical machining center. Many of the seals coming off the F750B are up to 32" in diameter and 3" to 8" thick. These typically are machined from aluminum, exotics and different grades of stainless and involve significant stock removal, tight tolerances and fine surface finishes."

The typical seal starts as rough aluminum stock, which is placed on a sub plate set up with locating pins. They run "OP1" and machine the part to a certain stage, hitting all the features on the part in one setup. If they have a batch of 40, they will run all 40 parts through OP1. Next, they set up OP2 where they flip the part and come back through and hit the remaining features. In OP1 they locate off rough surfaces and locating pins, and once OP1 is done they have machineknown surfaces for locating during OP2. They continue then with the same sub plate, locating against pins and known surfaces until they get through all the features on the seal.

Part programming is done offline via solid modeling on SolidWorks. The program is loaded to a data card, which is then transferred to the Fanuc control, and it's as simple as touching the part, locating it, and running. SolidWorks displays the sub plate, so they know where the material is at all times.

"The surface finishes on the bearing seals are very critical," says Leonard. "On some we get to a 32 Ra, but the majority of our surface finishes are around 63 Ra. Tolerances are typically +/- 0.0001" — but we can hold much tighter with the Hyundai F750B. The seal is probably 3 ft. in diameter, and while in this case the part is aluminum and not very heavy, we run parts on the same machine that weigh in excess of 2000 lbs. The Hyundai WIA machines are able to handle, on the one hand, light and delicate materials and, on the other, very heavy, tough, rough cutting materials. You need only look at our machining of Stellite, which is as tough and rough cutting as you can get. We take heavy cuts in Stellite, and the Hyundai WIA machines are so rigid, the material doesn't phase them at all."

Part programming is done offline via solid modeling on SolidWorks. The program is loaded to a data card, which is then transferred to the Fanuc control, and it's as simple as touching the part, locating it, and running. SolidWorks displays the sub plate, so they know where the material is at all times.

"The surface finishes on the bearing seals are very critical," says Leonard. "On some we get to a 32 Ra, but the majority of our surface finishes are around 63 Ra. Tolerances are typically  $\pm 0.0001$ " — but we can hold much tighter with the Hyundai F750B. The seal is probably 3 ft. in diameter, and while in this case the part is aluminum and not very heavy, we run parts on the same machine that weigh in excess of 2000 lbs. The Hyundai WIA machines are able to handle, on the one hand, light and delicate materials and, on the other, very heavy, tough, rough cutting materials. You need only look at our machining of Stellite, which is as tough and rough cutting as you can get. We take heavy cuts in Stellite, and the Hyundai WIA machines are so rigid, the material doesn't phase them at all."



An operator at Seeley Machine programs a Hyundai WIA SKT Turning Center for a large diameter part



Making chips on a Hyundai WIA CNC Turning Center