VESSCO INC.

PUMP REPAIR PROCESS

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Submersible Pumps

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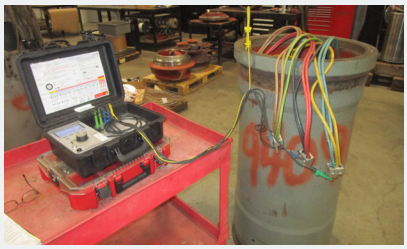
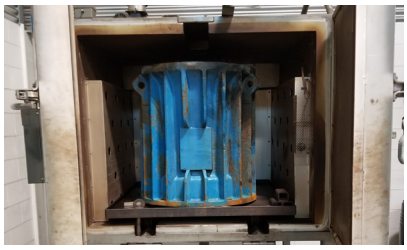
1. After disassembly and cleaning of all components, a complete disassembly report is written detailing all parts required to bring your machine back to OEM specifications. The stator is also tested with our motor analyzer. We perform a surge test, a 2,000 VDC megger, and a winding resistance test in milliohms. EASA guidelines and OEM specs are met. A visual examination is also completed to check for mechanical wear patterns and compromised connections.



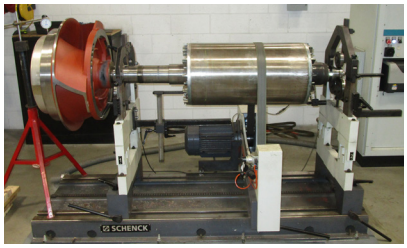
2. The stator is then baked in our dedicated bake out oven for a minimum of two hours at 250°F. This removes all moisture from the windings and insulation. After this process, the stator will be tested to guidelines listed above.



3. All worn parts are replaced with new parts or are restored to OEM specifications by certified welding, hard chrome plating, tungsten carbide coating, machining, precision grinding, seal face lapping, or many of our other in-house processes.

   Prior to assembly, the seal faces are lapped in-house to within two lightbands of flatness. The final product is Opti-flat verified.

4. After the rotating assembly is constructed with all components, total indicator runout is verified at less than .003" on critical faces and diameters. The rotor is then dynamically balanced to 4W/N. Our balance stand has a sensitivity of 20 microinches and a capacity of 10,000 lbs.



5. After assembly, the pump is air tested at 6 PSI for one hour then test run and checked for AMP draw, phase balance, and vibration. The pump is then coated with an epoxy based paint.

6. We also offer state of the art ceramic coatings to increase efficiency and to protect against erosion and cavitation damage. Our technicians are trained by 3M in surface preparation and application. Kennedy Industries, Inc. is also an authorized Flygt Distribution and repair facility.

Horizontal Pumps

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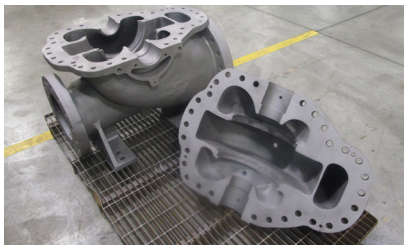
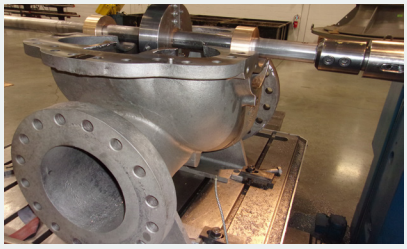
1. Once your pump is checked in at our shop, photos are taken, and external details such as seal flush and coupling position are recorded.

   During disassembly, we will inspect for and note visual wear, foreign objects, and damaged, cracked, or broken components.

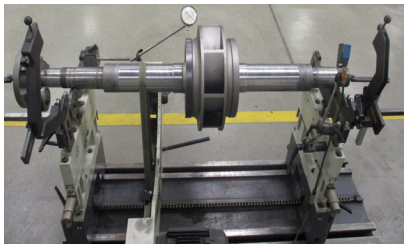
2. Cleaning consists of a spherical crowned glass bead blast on fabricated and cast components in our 30' blast booth. Bearing housings are pressure washed, and shafting is polished with 400 grit emery cloth. This process prepares all surfaces for an accurate inspection, and allows us to easily spot defects.



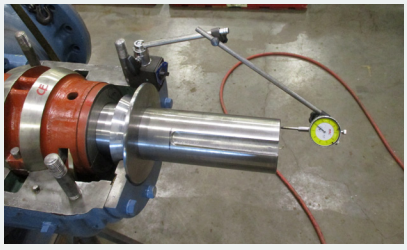
3. After a micrometer and run out inspection, worn parts are replaced with new, or restored by welding, chrome plating, tungsten carbide coating, or precision grinding. Line boring internal casing fits can also reduce vibration amplitudes, and improve sealing of rings, bushings, and packing leak off control. Our three CNC centers manufacture parts up to 36" X 120".



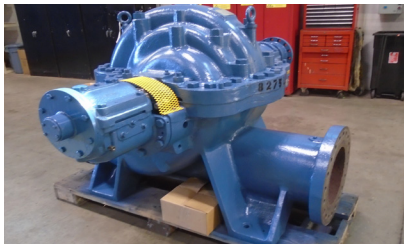
4. The impeller is then assembled to the pump shaft and mounted on roller bearings. Total indicator run out is verified at less than .003" on critical diameters to verify concentricity and trueness. The rotor is then dynamically balanced to 4W/N to ensure smooth performance. Our two computerized balancing stands have a sensitivity of 20 microinches and a capacity of 10,000 lbs.



5. Once our processes are complete, all components undergo a final cleaning and quality control inspection. This process verifies that precision fits, running clearances, and shaft straightness meet or exceed OEM specifications. A careful assembly addresses radial and axial impeller position, thrust, and free rotation.



6. Once assembly is complete, a final check list will be completed to confirm your pump is built properly. We then paint or protect all external surfaces. We also offer ceramic coatings, mechanical seal conversions, and several other upgrades. Our fleet of trucks can deliver up to 52' loads.



Vertical Turbine Pumps

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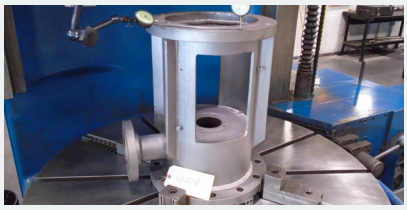
1. Prior to disassembly, dimensions such as length, discharge size, and shaft extension will be measured. Photos are taken, and the rotor end float will be recorded and checked for free rotation. During disassembly, we will inspect for and note visual wear, foreign objects, damaged, cracked, or broken components.

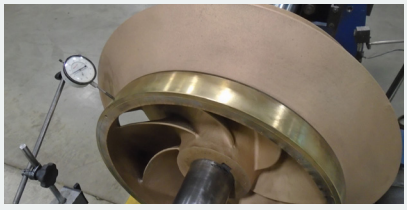
2. Cleaning consists of a spherical crowned glass bead blast on fabricated and cast components in our 30' blast booth. Bearing housings are pressure washed, and shafting is polished with 400 grit emery cloth.

3. After a micrometer and run out inspection, worn parts are replaced with new, or restored by welding, chrome plating, tungsten carbide coating, or precision grinding. Our three CNC turning centers can manufacture parts up to 36" X 120".



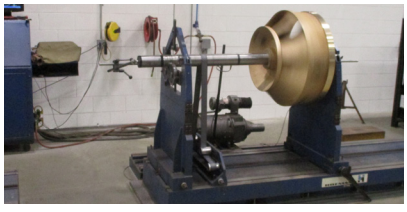
4. Once our processes are complete, all components undergo a final quality control inspection. This process verifies that precision fits, running clearances, and straightness of all shafts meets or exceeds OEM specifications.

5. Each impeller is then assembled to a balance arbor and mounted on roller bearings. Total indicator run out is verified at less than .003" on critical diameters to verify concentricity and trueness. Collets and hardware are match marked for repeatability.



6. The impellers are then dynamically balanced to 4W/N to ensure smooth performance.

   Our two computerized balancing stands have a sensitivity of 20 microinches, and a capacity of 10,000 lbs.



7. Once assembly is complete, a final check list will be completed to confirm your pump is built properly. We then paint or protect all external surfaces. We also offer Tar-Set, and several other special coatings. Our fleet of trucks can deliver up to 52' loads.

Sewage Pumps

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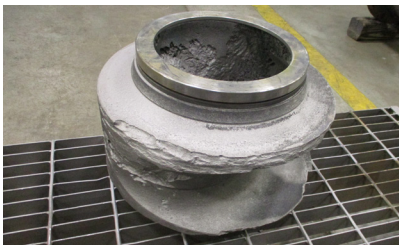
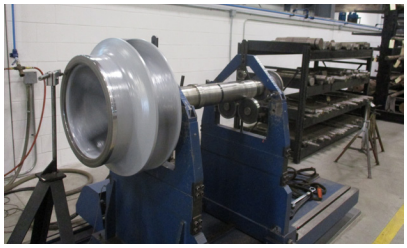
1. Once your pump is checked in at our shop, photos are taken, and external details such as seal flush and coupling run out are recorded. We then begin disassembly, where we will inspect for and note visual wear, foreign objects, damaged, cracked, or broken components.

2. Cleaning consists of a spherical crowned glass bead blast on cast components in our 30' blast booth. Bearing housings are pressure washed and shafting is polished with 400 grit emery cloth. This process allows us to easily spot mechanical wear and erosion in the volute, impeller and shaft.



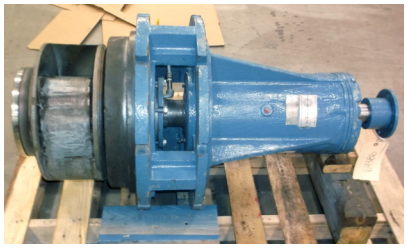
3. After a micrometer and run out inspection, worn components are replaced with new, or restored by welding, chrome plating, tungsten carbide coating, or precision grinding. We also offer protective coatings, such as ceramic overlays that restore surfaces and increase efficiency. Our three CNC centers manufacture parts up to 36" X 120".

4. The impeller is then assembled to the pump shaft and mounted on roller bearings. Total indicator run out is verified at less than .003" on critical diameters to verify concentricity and trueness. The rotor is then dynamically balanced to 4W/N to ensure smooth performance. Our two computerized balancing stands have a sensitivity of 20 microinches and a capacity of 10,000lbs.



5. After our processes are complete, all components undergo a final cleaning, hydro test and quality control inspection. This process verifies that precision fits, running clearances, and shaft straightness meet or exceed OEM specifications. A careful assembly addresses radial and axial impeller position, thrust, and free rotation.

6. Once assembly is complete, a final check list will be completed to confirm your pump has been built properly. We then paint or protect all external surfaces. Kennedy also offers mechanical seal conversions, bearing isolators, special coating and several other upgrades to ensure long service life.



Circulating Pumps

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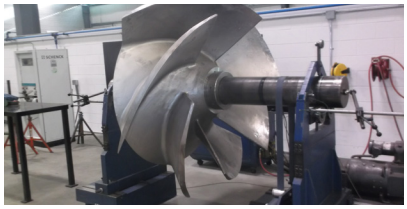
1. Prior to disassembly, details such as length, flush plan, and shaft extension will be documented. Photos are taken, and the rotor end float will be recorded, and checked for free rotation. During disassembly, we will inspect for and note visual wear, foreign objects, damaged, cracked, or broken components.

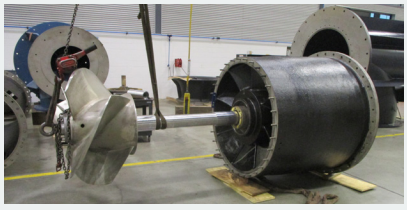
2. Cleaning consists of a steel shot blast on fabricated and cast components or glass bead when warranted in our 30' blast booth. Bearing housings are pressure washed, and shafting is polished with 400 grit emery cloth. This process takes the components to bare metal, which allows an accurate inspection.

3. After a micrometer, NDE, and run out inspection, worn parts are replaced with new or restored. Some of our processes include welding, chrome plating, tungsten carbide and metal spray coatings. Our three CNC turning centers can manufacture parts up to 36" X 120".

4. After run outs are verified at less than .003", the impeller is then dynamically balanced to ISO grade 6.3 to ensure smooth performance. Our two computerized balancing stands have a sensitivity of 20 microinches, and a capacity of 10,000lbs.



5. Prior to assembly, all components undergo a final quality control inspection. This process verifies that precision fits, running clearances, finishes, and straightness of all shafts meets or exceeds OEM specifications.



6. Once assembly is complete, a final check list will be completed to confirm your pump is built properly. We then paint or protect all external surfaces. We also offer bitumastic coal tar epoxy, ceramic, and several other coatings. Our fleet of trucks can deliver up to 52' loads.

7. Kennedy Industries can offer on-site technical assistance. Our friendly and knowledgeable reps can assist with all steps, such as setting lift, alignment, packing, and mechanical seals. We can also assist with start up and baseline performance checks.

End Suction Pumps

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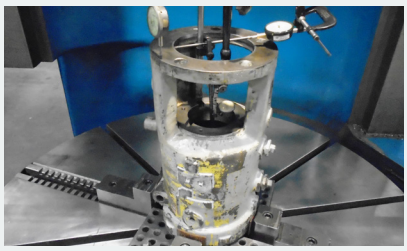
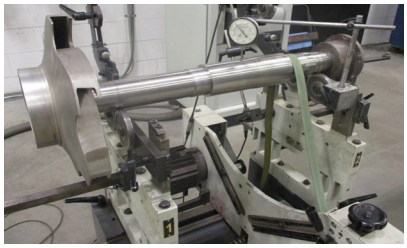
1. Once your pump is checked in at our shop, photos are taken, and external details such as seal flush, coupling position, thrust, and shaft run out are recorded During disassembly, we will inspect for and note visual wear, foreign objects, and damaged, cracked, or broken components.

2. Cleaning consists of a spherical crowned glass bead blast on cast components. Bearing housings are pressure washed, and shafting is polished with 400 grit emery cloth. This process prepares all surfaces for an accurate inspection, and allows us to easily spot defects. We also carefully examine the impeller and volute casings as they are the heart of the pump.

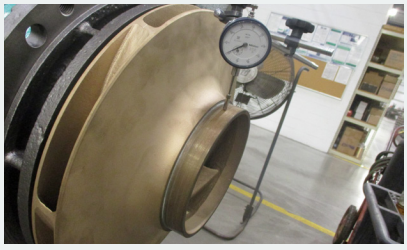
3. After a micrometer, NDE (nondestructive examination), and shaft run out inspection, worn parts are replaced with new, or restored by welding, chrome plating, tungsten carbide coating, or precision grinding. Our three CNC turning centers can accurately machine complex surfaces, and manufacture parts up to 36" X 120".



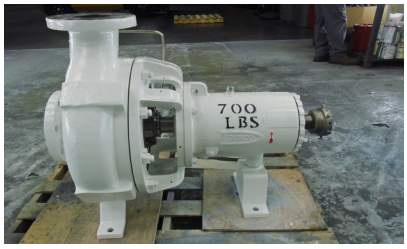
4. The impeller is then assembled to the pump shaft and mounted on roller bearings. Total indicator run out is verified at less than .003" on critical diameters to verify concentricity and trueness. The rotor is then dynamically balanced to 4W/N to ensure smooth performance. Our two computerized balancing stands have a sensitivity of 20 microinches and a capacity of 10,000lbs.



5. Once our processes are complete, all components undergo a final cleaning and quality control inspection. This process verifies that precision fits, running clearances, and shaft straightness meet or exceed OEM specifications. A careful assembly addresses radial and axial impeller position, thrust, and free rotation.



6. Once assembly is complete, we will air test your pump for one hour to ensure it is leak free. A final check list will be completed to confirm your pump is built properly. We then paint or protect all external surfaces. We also offer ceramic coatings, mechanical seal conversions, and several other upgrades to ensure long life.



Boiler Feed Pumps

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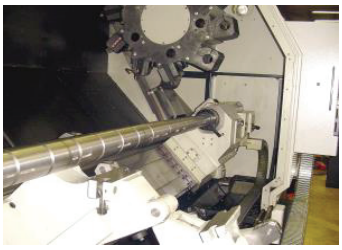
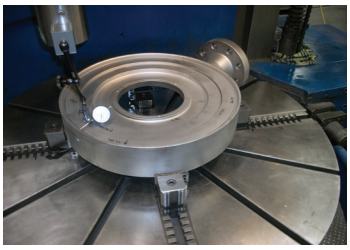
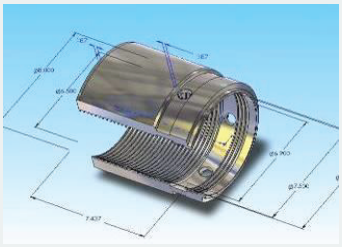
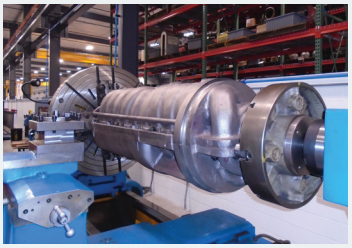
1. Prior to disassembly, photos are taken and we record radial lifts, rotor float, and external dimensions. Impellers and channels are glass bead blasted, followed by a visual, dimensional, A/B Gap, NDE, and T.I.R. inspection.

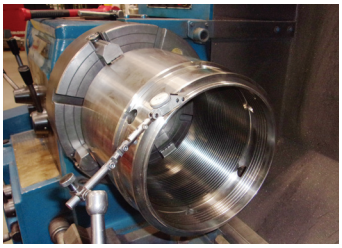
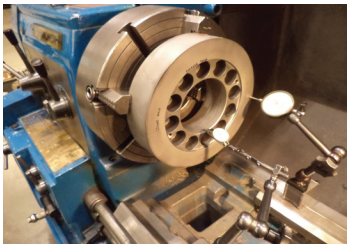

2. Processes include welding, chrome plating, tungsten carbide, CNC, and precision grinding. Careful attention is paid to stack ups, concentricity, perpendicularity, flatness, fits, clearances, and shaft straightness.

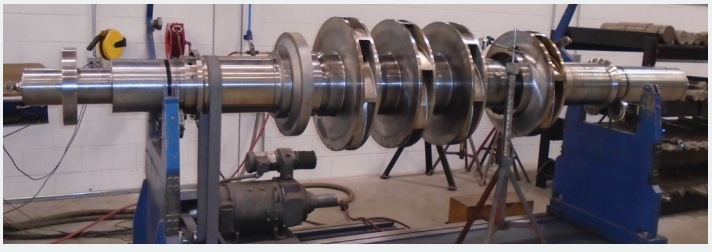
3. Design and layout are completed with state of the art solid modeling to ensure accuracy, and impeller centralization. We can also restore all external components to ensure field assembly and start up are problem free.

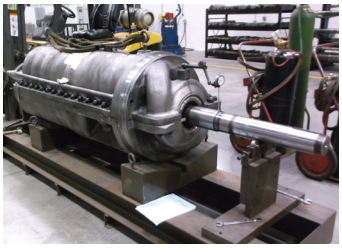
4. Prior to assembly, all components undergo a 3000 psi cleaning to remove machining chips and grit. Each part is put through a triple Q.C. process to ensure OEM specifications are met or exceeded. Quality is our top priority.

5. After an individual balance, the rotor is assembled with all components, and total indicator run out is verified at less than .002" on all critical diameters. We can dynamic balance to 2W/N to ensure a reliable and smooth running pump.



6. A careful assembly verifies precise impeller centralization at each stage. Our test stand confirms free rotation. These projects involve meticulous details. Our skilled technicians can team up with your staff for final assembly.




OUR LOCATIONS

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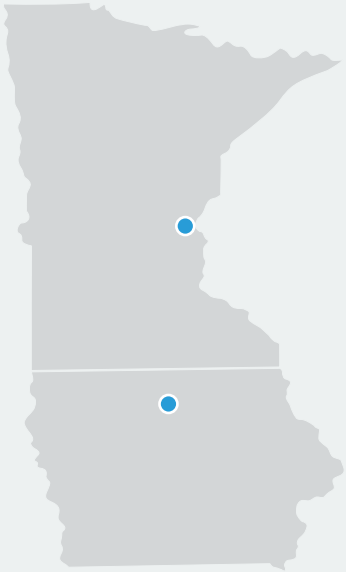

THE TOTAL SOLUTION

Vessco, Inc. has been serving Upper Midwest municipal and industrial customers for over 45 years. During that time, we have built a reputation for representing the best equipment in today's water treatment world. We have also become known for our *Total Solution* approach which includes initial project consultation, design partnering, installation assistance, field service and parts delivery.

At a time when a strong demand for environmental preservation is putting pressure on municipalities and industries to uphold high quality standards for water, wastewater, and process water—Vessco is the proven partner that offers much more than just components. We provide turnkey solutions from conception to ongoing support, well into the future.

Specialty Equipment for Fluid Solutions.