



Second Laureate Innovation

◆ **Project title:** Turbo Molecular Vacuum Pump by Different Capacity Fabrication.

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Abstract:

By means of momentum transferring from high speed rotating rotor, blade supplied turbine in molecular pump converts gas fluid to compressed gas molecules. Free path distance greater than rotor-stator distance (molecular flow), causes more coincidence between particles and rotor and this leads to a higher pumping speed. One of the important features of this kind of pump is the rotor's very high rotating speed and for this, the manufacturing process needs consideration of balancing, noise eliminating, axis sealing and controlling of the high speed rotating blades. All these reasons show that this industry is categorized as high accuracy one, especially when the whole turbine is constructed as a unique part and needs a great attention and accuracy in process.

Turbomolecular pumps are divided into four major kinds:

- Turbo-Molecular Pump
- Molecular-Drag Pump, Hallwek Type (Grooved)
- Molecular-Drag Pump, Saybahen Type (Disc type)
- Hybrid or Compound Molecular Pump

Movement of particles in turbomolecular pump caused by transferring of electric energy to mechanical energy and finally to molecular kinetic energy. Operating pressure ranges from high vacuum to very high vacuum. Therefore, the pump should be compatible with the different conditions of pressure, temperature, speed and flow regime. Through the operation process, flow regime changes to transitional and molecular, respectively, from viscous regime at the start time.

