

**Project Title:** 400 Series Pump Cost Out  
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**Faculty Advisor:** Dr. Donald Mueller  
**Area:** Mechanical Engineering  
**Sponsor:** Tuthill Transfer Systems

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Tuthill Transfer Systems is a leading manufacturer and innovator of chemical and fuel transfer pumps, blowers, and precision meters, with its manufacturing facilities based in Fort Wayne, Indiana, and Lenexa, Kansas. With an annual production rate of 15,000 Sotera chemical transfer pumps, alone, they play a critical role in providing safe and reliable transfer of a variety of industrial and agricultural chemicals and lubricants locally and nationwide. Tuthill has proposed the challenge to reduce the cost of their Sotera 400 Series chemical transfer pump by 50% while maintaining its current performance. Tuthill desires cost reductions to the drive mechanism and planetary drive, which include components such as the yoke, piston retainers, planetary gear system, drive shaft, gear plate, and drive plate. At reduced cost, the redesigned system is required to fit in the existing injection molded housing and support a minimum operational life rating of 50,000 gallons, maximum flow rate of 15 GPM, and 10 ft. of dry suction, while maintaining compatibility with five different motor configurations.

The budget provided for the project is \$3,500. The budget provided will be used to cover prototype and development costs.