Project Title:	Pump Test Station Heat Rejection
Team Members:	Sidney Basham Alex McCrory Taylor Stanton Isaac Wendel
Faculty Advisor:	Dr. Hosni Abu-Mulaweh
Area:	Mechanical Engineering
Sponsor:	Fill-Rite®, A Gorman-Rupp Company

Fill-Rite, located in Southwest Fort Wayne, specializes in fuel management systems and fuel transfer pumps. Their facility includes an in-house fuel pump test station which Fill-Rite currently uses to perform durability testing on fuel transfer pumps. These tests are run continuously for days to weeks at a time. A contained volume of Number 2 diesel fuel is circulated continuously through the hoses and pump and discharged back into a steel drum testing reservoir. This process results in the diesel fuel reaching elevated temperatures (~47 °C). Not only is this a safety concern by exceeding the flash point of Number 2 diesel (38 °C), but the fuel also begins to degrade at these elevated temperatures (> 30 °C). As a result, the diesel fuel must be replaced more often than is desired, and tests do not run to completion due to overheating of the system.

Fill-Rite is seeking assistance in redesigning the existing pump test station so that it is less expensive to maintain, safer to operate, and more reliable for extended durability testing requirements. The project design requires that the temperature of the test fluid does not exceed 30 °C and that the volume of the recirculated test fluid is reduced from 30 gallons to 20 gallons. Any heat should be dissipated outside the testing environment, and the design must be capable of cooling a system running Fill-Rite's most heavy-duty pump. The prototyping and testing budget for this project is $3500.