

Project Title: Hydraulic Power Heat Rejection

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Area: Mechanical Engineering

Sponsor: Trelleborg Sealing Solutions US, Inc.

Trelleborg Sealing Solutions US, Inc. is a leading member of polymer hydraulic seals, O-rings, and gaskets. To ensure durability and quality of their production parts, they perform various tests on their product designs. These tests are performed for varying durations, pressures, and flow rates. This is dependent on the test requirements, type of seal, and type of test. Continuous flow of the hydraulic fluid through the testing unit generates heat and raises the temperature of the fluid and the tested seal. The current system for lowering the temperature of the hydraulic fluid uses a water-glycol solution to remove heat from the hydraulic fluid via heat exchanger. This hot solution is pumped to an outdoor evaporative cooling tower that cools it and returns the solution to the hydraulic fluid heat exchanger in a closed loop. By nature of evaporative cooling, the glycol solution can at best be cooled to a few degrees colder than ambient temperature. In recent years, Trelleborg has been tasked with running tests with hydraulic fluid temperature ranges between 70-85°F. This is impossible to achieve during hot summer months when ambient temperatures may be well above this range. So, Trelleborg would like to be able to reduce and control the temperature of the hydraulic fluid at the inlet of the testing unit so that the test can be performed at a known and set temperature regardless of the ambient temperature. Therefore, the objective of this project is to provide a solution that can cool the hydraulic fluid in their testing units to 80°F±2°F and reject all heat generated outside of the building.