

Thermal Conductivity Lab

The Thermal Conductivity Lab was generated from an AAON sponsored and inspired mechanical engineering technology senior design project. This particular lab serves as a very good beginning lab to introduce the MET 466 students to the data acquisition system and as a refresher on the basics of heat conduction and heat flux. The students' results for this lab include calculating the flux, unit thermal resistance, and the overall heat transfer coefficient for the given insulating material.

Testing Apparatus:

The Thermal Conductivity Lab's testing apparatus consists of three major sections as shown in Figure 1, which are the testing apparatus base, controls, and the data acquisition equipment. The testing apparatus base is manufactured from PVC and provides the platform for the test fixtures. The base houses the sample of insulation being tested, heat flux sensors and thermocouples, side guards and heaters, wiring, and a heat exchanger. The controls consist of the Cole Parmer constant temperature recirculator responsible for maintaining a constant temperature fluid for the heat exchanger and a variac transformer used to adjust the voltage input to the source heater and guard heaters. The data acquisition equipment consists of an Agilent Technologies data recorder coupled to a PC computer running LabView software to record the temperatures and heat flux through the sample.



Figure 1: Thermal Conductivity Testing Apparatus