Temperature Controlled Creep Stand

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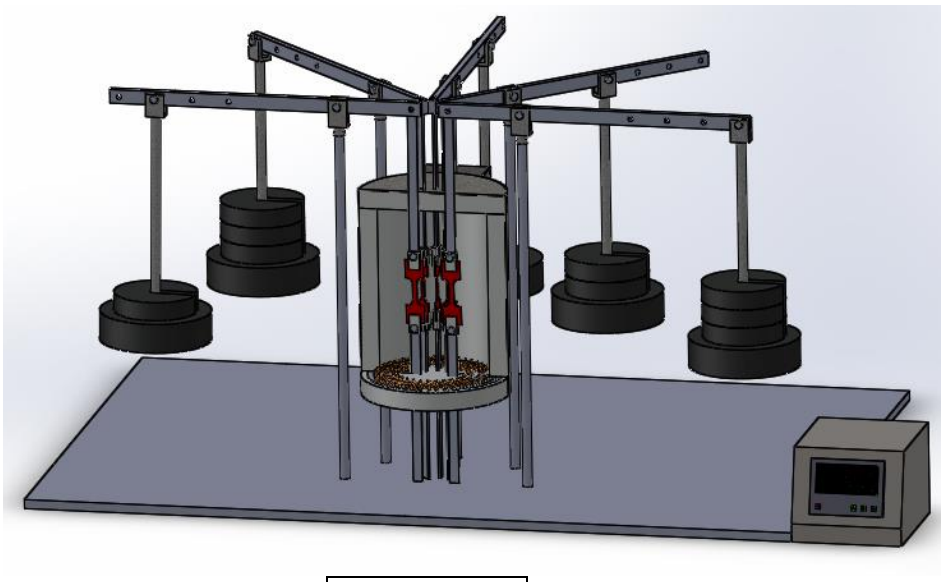
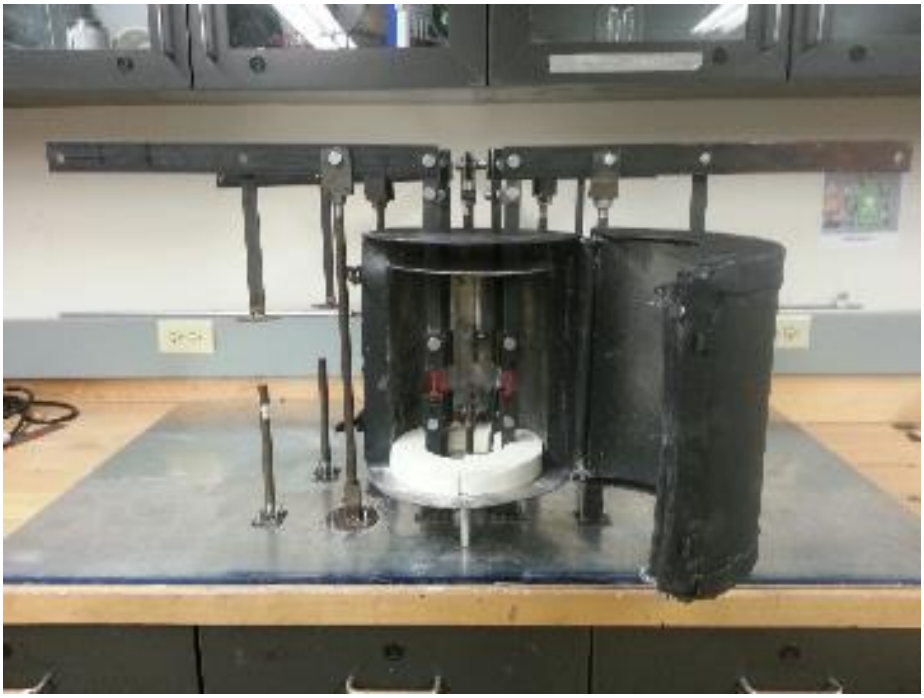
This project aims to design and build a creep testing machine that is capable of testing up to five specimens. Creep is a permanent deformation of a solid at slow, continuous pace that must happen within 40 percent of a materials melting temperature. In order for a design to be considered safe, the deformation due to creep must be much less than the strain at which failure occurs. Creep is an important consideration in any application where a component must support a load at temperatures higher than 40 percent of their melting temperatures. A jet engine is one good example where a material operates at very high temperatures about 1100 K. Because the engine temperatures are so high, the alloys used for the turbine blades operate at temperatures very close to their melting temperatures. In order to demonstrate creep in alloys without using very high temperatures, we can observe creep in low melting point alloys at temperatures near room temperature. There are currently machines out in the market that measure creep that run for long continuous periods of time under prescribed conditions. These machines have also high temperature ranges that range from room temperature to 1200 degree Celsius. The high accuracy in measuring temperature, loads and elongation on these sleek machines make them costly. One aspect that seems common in most creep testing machines includes that most of them only test one specimen at a time. A new concept will be designed to measure multiple specimens under the same temperature conditions. This project will try to tackle the disadvantages the other creep stands are lacking. Research and development will be needed to carefully design a creep machine that will make this particular concept stand out from the rest of the machines. The new design will be benefit new incoming students and will provide research opportunities for students in the upcoming semesters.



Model



Working System