

Abstract for CRADA between Oregon State University-APOLLO and NETL AGMT-0588

Overarching objective of this project is to reduce the size, weight and thermal losses from high temperature solar receivers by the application on microchannel heat transfer technology to solar receiver design. The objective is to design and test on-sun a supercritical CO₂ microchannel receiver commercial module operating at a fluid exit temperature of 720 °C capable absorbing an average flux of 100 W/cm² with a receiver efficiency of 90 percent or higher. More specifically, this project facilitates an investigation of the material and process alternatives available to meet the solar receiver performance requirements (fatigue, creep and corrosion resistance) and use this knowledge to develop a process recipe (lamina patterning, bonding and heat treatment conditions) for making solar receiver test articles. In addition, experiments characterize the fatigue behavior of the material to populate and validate the associated predictive computational models.