

Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Thermal-hydraulic behavior of Sc-CO₂ in a horizontal circular straight tube¹ KATSUYOSHI TANIMIZU, Postdoctoral Research Associate, REZA SADR, DAVESH RANJAN, Assistant Professor — Fluids above critical pressure have been practically utilized for 60 years in many applications and their use and interest is still increasing in many areas, especially power generation industries and chemical industries. Above critical pressure, very rapid changes in thermophysical properties take place near the pseudocritical temperature. In this region, the fluid transforms from liquid-like to gas-like behavior when the fluid temperature rises up and passes through the pseudocritical temperature. This allows enormous potential for energy transfer, but also alters the turbulent flow due to changes in the turbulent shear stress brought about by acceleration and buoyancy effects. However, we have not fully understood their dynamic behaviors such as turbulence yet. A supercritical CO₂ testing loop has been built at Texas A&M University at Qatar to perform heat transfer and pressure drop measurements and investigate the thermo-physical and dynamic characteristics of supercritical carbon dioxide flow. The results of heat transfer measurements in a super critical fluid conducted in a horizontal pipe are reported and discussed here.

¹Supported by QNRF

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Date submitted: 05 Aug 2011

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