

Abstract

The Center for Innovation and Applied Technology (CIAT) at the Cooper Union for the Advancement of Science and Art is researching various apparatus and techniques to improve its heated ground agricultural projects. In 2009, a novel shell-and-coil heat exchanger concept was computer generated based on a theoretical concept developed by Professor Robert Dell in 2006.

There are limited recorded observations on shell-and-coil heat exchangers. This thesis provides a classification system of heat exchangers with different coil designs.

The author created a laboratory work station made of interchangeable commercially available plumbing components that can adequately test coil designs for efficiency. Analysis of a straight tube and two helical coils were completed. The data collected from these designs has lead to preliminary observations on the correlation of coil properties and heat transfer through a coil. These observations also provide suggestions for future research within this subject matter.