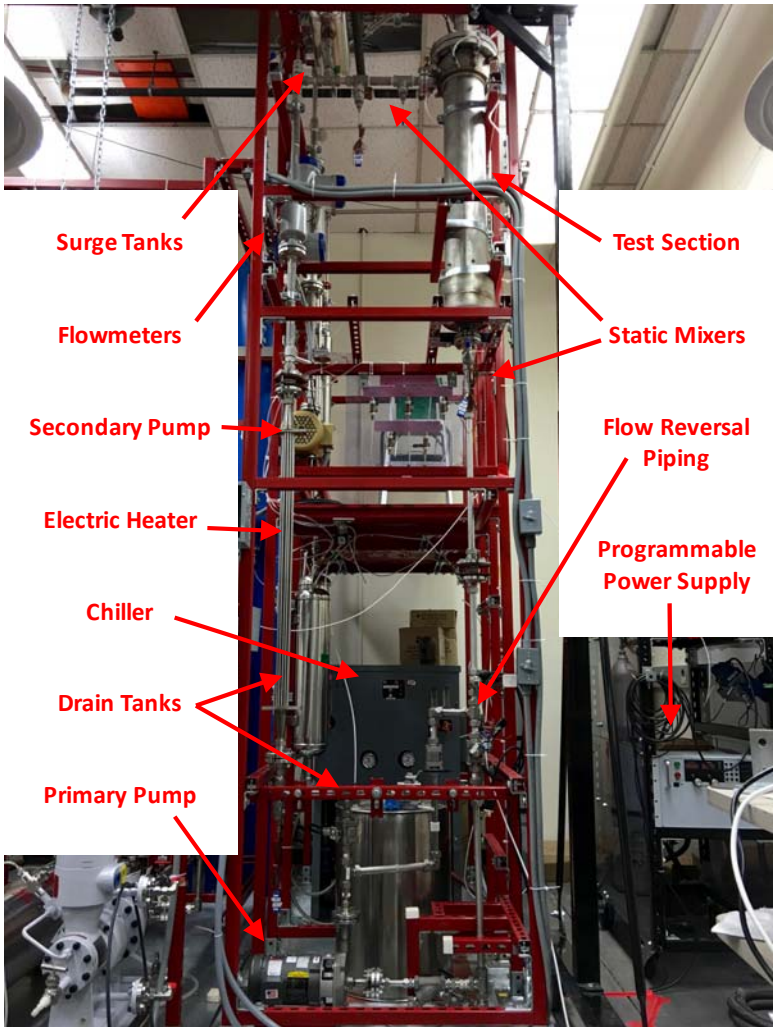
Thermal-Hydraulics SETs
UNM Experimental Overview

Facility

- **Reduced scale heat transfer facility constructed at UNM**
  - **Currently under shakedown testing**
  - **Primary loop**
    - » **Water initially – transition to Dowtherm A**
    - » **Natural + forced circulation flow modes**
    - » **Bi-directional**
    - » **Electrically heated**
    - » **Cooled in test section**
  - **Secondary loop**
    - » **Water initially – transition to Dowtherm A**
    - » **Forced circulation**
    - » **Heated in test section**
    - » **Cooled in secondary heat exchanger by chilled water**



Heat transfer facility at UNM.

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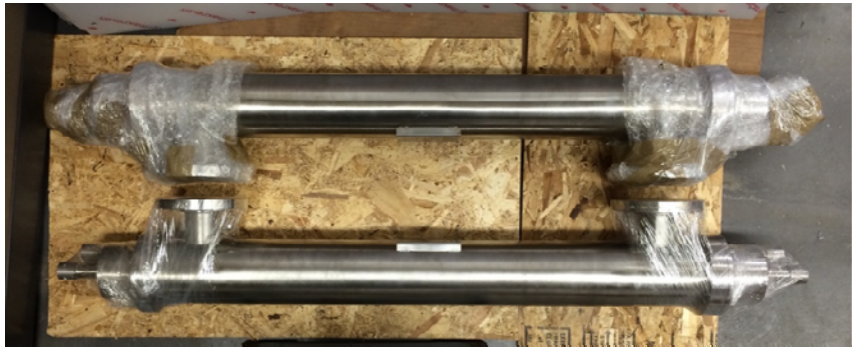
Twisted vs. plain tube heat exchangers provided to UNM, masked for clarity (flange is behind support; photo credit: Hipex).



Twisted outer/plain inner vs. plain outer/plain inner tube heat exchanger.

Planned Tests

- **Enhanced heat transfer**
  - **Single-wall plain tube heat exchanger**
  - **Single-wall twisted tube heat exchanger**
  - **Focus on buoyancy effects**
- **Directional heat exchanger**
  - **Implement hydrodynamic experiment (DirEX^2) insights in designing a heat transfer experiment**
- **Double-wall heat exchanger**
  - **Plain outer/plain inner heat exchanger**
  - **Twisted outer/plain inner heat exchanger**
  - **Focus on double-wall performance**