HiTeC Paratherm NF Thermal-hydraulics Loop

Main Purpose: as a coolant for high temperature solid breeder material system thermomechanics experiments

Alternative use: as a simulant for fluid having high Prandtl numbers

Paratherm NF: A Non-Fouling, Non-Toxic Heat Transfer Fluid
Optimum Use Range 49 to 316 °C
Maximum Recommended Film Temperature 338 °C
Flash point 168 °C
Atmospheric Boiling Point 343 °C
Vapor Pressure psia
  @ 200 °F 0.0005
  300 °F 0.003
Surface Tension
  @ 760 mm Hg/25 °C 28 dynes/cm
Heat transfer coefficient at 2” sched. 40 pipe @ 2.44m/s = 1891 W/m²K

<table>
<thead>
<tr>
<th>°F/°C</th>
<th>μ (Ns/m²)</th>
<th>Cp (J/kgK)</th>
<th>k (W/mK)</th>
<th>Pr</th>
</tr>
</thead>
<tbody>
<tr>
<td>100/37.8</td>
<td>16x10⁻³</td>
<td>1926</td>
<td>0.13156</td>
<td>234</td>
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<tr>
<td>200/93.3</td>
<td>3.5x10⁻³</td>
<td>2135.4</td>
<td>0.128</td>
<td>58.39</td>
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<tr>
<td>300/148.9</td>
<td>1.6x10⁻³</td>
<td>2344.7</td>
<td>0.12378</td>
<td>30.3</td>
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<tr>
<td>400/204.4</td>
<td>0.92x10⁻³</td>
<td>2554</td>
<td>0.1194</td>
<td>19.68</td>
</tr>
</tbody>
</table>
Beryllium Handling and Particulate Materials Thermomechanics Test Stand

Ceramic breeder pebble materials
(Li₄SiO₄, Li₂O, Li₂ZrO₃)
HiTeC Ceramic Breeder Packed Beds Thermal and Mechanics Properties and Material Interactions Facility

Data Acquisition with Internet Remote Viewing and Control

Test Article Assembly

Water Vapor Bake-out and High Vacuum Systems