

Thermosiphon Reboiler with Pillow Plates and Tube Condenser

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Motivation

- Investigation of pillow-plate thermosiphon reboiler
 - Operation behavior, heat transfer and pressure drop
 - Operation limits
 - Evaporation behavior of pure substances and mixtures
- Investigation of tube condenser with inserts
 - Operation behavior, heat transfer and pressure drop
 - Influence of turbulence promotors
 - Influence of inert gas
 - Measurements of temperature profiles with fiber optic sensor

Measuring range

- Operation Pressure: 100 ... 1000 mbar
- Steam Temperature: 65 ... 180 °C
- Heat duty: 5 ... 30 kW
- Static liquid head: 30 ... 120 %
- Cooling water inlet temperature: 20 ... 80 °C
- Cooling water flow: 0 ... 2 m³/h
- Variation of inert mass flow

Experimental setup

- Pillow plate thermosiphon reboiler
 - One double-sided and two single-sided expanded plates
 - Made of 1.4571
 - Length x width = 800 x 220 mm², A = 0.704 m²
- Tube condenser
 - 5 tubes made of 1.4571, L x d_o x t = 1800 x 20 x 2 mm³
 - Tube-side volume 4,4 liter
 - Shell-side volume 6,7 l
 - 31 baffles, baffle spacing 50 mm
- Plate Condenser
 - 40 Plates made of 1.4571, A = 5.3 m²
 - Cooling capacity up to 30 kW
- Liquid-steam separator DN 200, length 800 mm

Results

