

Miniplant thermosiphon reboiler

- Plant under construction -

Technische Universität Braunschweig | Institut für Chemische und Thermische Verfahrenstechnik
ictv@tu-braunschweig.de | Telefon +49 (0) 531 391-2791

Plant design

- Plant height 1500 mm
- Phase separator DN 125; height 1100 mm
- Single steel reboiler tube $d_a \times s \times L = 33.7 \times 2 \times 815$ mm; heat transfer area 0,06 m²
- Thermal oil heating
- Vacuum operation

Operating range

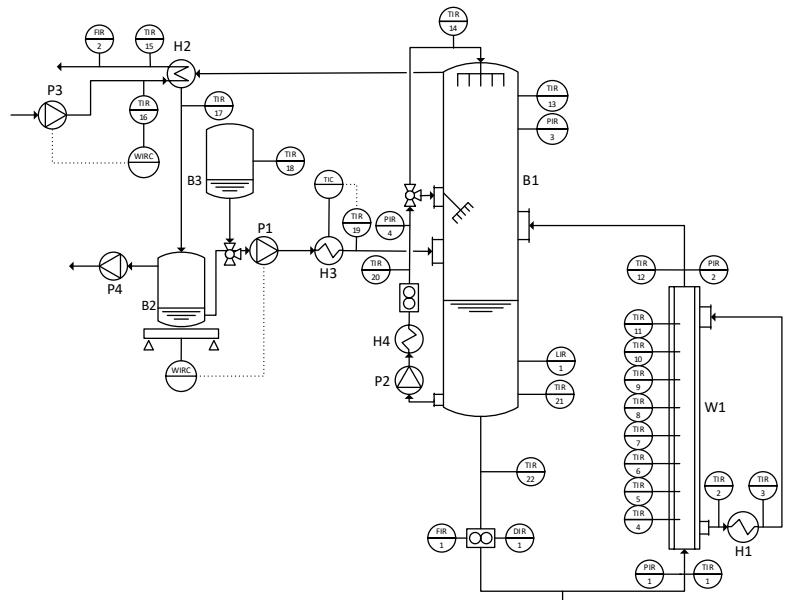
- Operating pressure 200 ... 1000 mbar absolute
- Liquid circulation rate 40 ... 200 kg/h
- Gas loading 0.1 ... 1 Pa^{-0.5}
- Heat duty < 9 kW
- Static liquid head 75 ... 130 %
- Driving temperature difference 15 – 60 K

Foto



- Plant under construction -

Flow chart



Test materials

- Aqueous monoethanolic solutions (MEA)
- 0.1 kg MEA/kg SOL ...
0.3 kg MEA/kg SOL
- Optional CO₂ saturation
- Addition of anionic surfactants

Experimental setup

Objective: prevention, inhibition and destruction of foams

- Liquid circulation driven by pressure difference between liquid in the inlet line and partially evaporated fluid in the reboiler
- Mass and energy balances based on gravimetric determination of product, thermal oil and cooling water flow rates
- Expected foam formation during evaporation in W1 and transfer into B1
- Continuous foam measurement in B1 using guided radar
- Destruction of accumulated foam in B1 using ultrasound and sprinkling