

Stainless steel and steam driven wiped film evaporator

- Residence times, evaporation capacities, wetting rates -

Technical University of Braunschweig | Institute for Chemical und Thermal Process Engineering

Mail: s.jahnke@tu-braunschweig.de | Phone +49 (0) 531 391-2785

Plant design

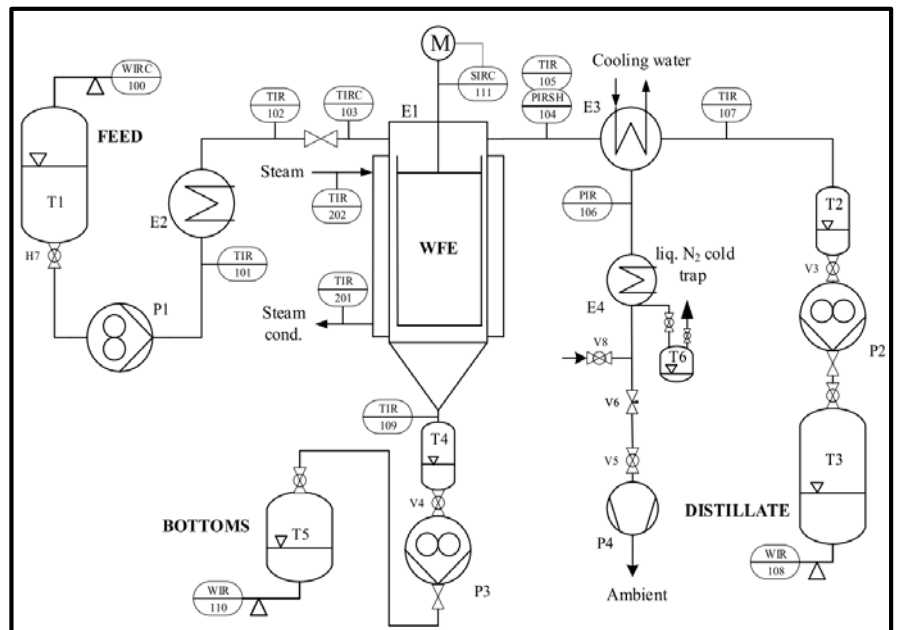
- Type: Wiped film evaporator (WFE)
- Heating side: Steam
- Area: 0.063
- ID x H: 0.08 m x 0.25 m
- Material: 1.4571
- Wiper types: Comb and roll wipers
- Special: RTD¹ under operating conditions

Operating range and analytic

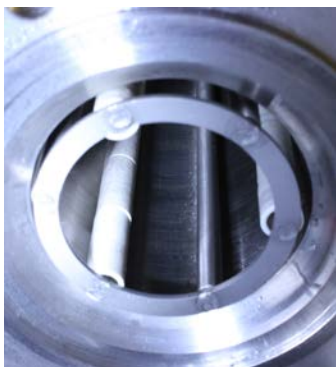
- Operating pressure 0.001...1 bar(a)
- Heating temperature up to 140 °C
- Wiper speeds up to 400 rpm
- Feed rate 6...32 kg/h
- NIR metrology to determine RTD
- External plant control system
- Process medium: MEG



Photo of WFE plant



Flow sheet of WFE plant



Open WFE, roll wiper system

Evaluation capabilities and results

- Feed, distillate and sump tank are installed on scales to determine accurate mass balances (closeable within a range of $\pm 1\%$)
- A steam ejection system allows to quantify the accrued heating steam to specify energy balances (closeable within a range of $\pm 5\%$)
- Assessing distillate rates under varying process conditions allows to distinguish characteristic surface coverage situations
 - Single-phase preheating to boiling conditions
 - Evaporation from a fully covered surface
 - Evaporation from a partly covered surface

¹RTD: residence time distribution