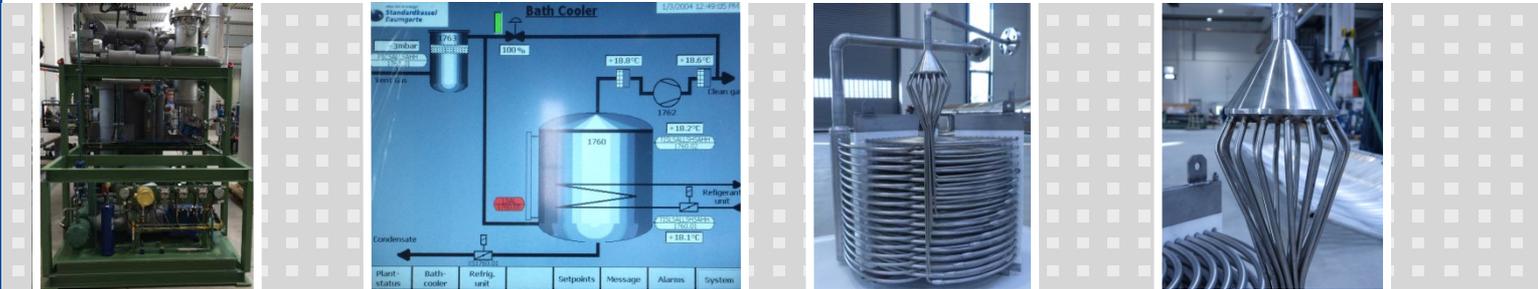


CONDENSATION
CATALYSIS
COMBINED PROCESSES

EVONIK OIL ADDITIVES ASIA PACIFIC PTE LTD SINGAPORE



EVONIK OIL ADDITIVES ASIA PACIFIC PTE LTD, SINGAPORE



Equipment parameters

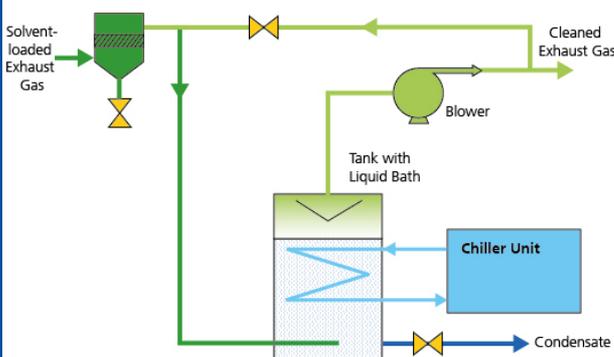
Throughput Rate	10 to 60 Nm ³ /h
Waste Gas Inlet Temperature	10 to 60°C
Condensation Temperature	-30 °C to -40 °C
Service Pressure	0.9 bar abs
Condensation Capacity	up to 10.7 kW
Mode of Operation	Continuous
Solvent Concentration	
- Methanol	60 to 220 g/Nm ³
- Methyl Methacrylat	100 to 280 g/Nm ³
Control Range, Volume Flow	0 to design-volume flow (0 – 100%)
Year of Commissioning	2015

THE TASK

For high solvent concentrations in the waste gas from a production plant a suitable separation process is to be used for the separation of the solvents. As a function of the emitting process the waste gas contains, depending on the production step, different methanol and methyl methacrylate concentrations. The waste gas is to be cleaned to the required emission limit values. The solvents are to be recovered as a valuable resource. The solvents are then to be available in the liquid form for further use.

THE SOLUTION

For recovery and separation of the solvents direct condensation in a liquid storage cooler is provided as a thermal separation process. The means of dissolving is the bath cooler - an item of direct-contact process equipment, in which the waste gas is brought into direct contact with the liquid bath. In this case it is a bubble column in which the evaporator package cools down the liquid to be found in the tank. The liquid corresponds to the composition of the condensate from the waste gas stream. The waste gas stream to be condensed is fed out via a gas distributor as a perforated plate, passed into the tank and conveyed through the liquid storage tank as a bubble column with the help of a fan. The waste gas containing solvent cools down in the bubble column to the temperature set in the storage tank which is below the dew point of the compounds. The condensate forming is collected directly in the liquid. The liquid storage cooler is kept constantly at the selected condensation temperature. The solvent concentration at the outlet from the system corresponds to the saturation concentration of the solvent used.



Direct condensation of solvent in a refrigerated liquid bath

SCOPE OF SUPPLY

- Condensation Process Equipment including Fan for Waste Gas Conveying
- Evaporator Package to Cool the Liquid Storage Tank
- Refrigerating Unit
- Instrumentation and Plant Control System

ENGINEERING SERVICES

- Engineering
- Production and Delivery