

CONTINUOUS AZEOTROPIC DISTILLATION

REFERENCE : MP1012



Non contractual photo

SERVICE : 230 V / 50 HZ / SINGLE PHASE: 6 KW. COLD WATER 20 ° C / 3 BAR: 2 M3 / H. SEWER.
DIMENSIONS : 2,9 M X 0,75 M X 3,45 M

WEIGHT : 200KG

Principle of operation :

Distillation allows the separation of a mixture of compounds having different boiling points. The boiling of the mixture makes it possible to obtain vapors of compositions different from the liquid. Re-condensations and multiple re-evaporations progressively enrich the vapor phase to the most volatile product. The vapors are condensed and then distributed between the distillate (recovered continuously) and the reflux via a column head valve. The residue is also recovered continuously from the bottom of the boiler.

Educational Objectives :

- Study of the hydrodynamics of packed columns and perforated tray columns.
- Continuous distillation.
- Azeotropic continuous distillation.
- Comparison of packed columns and perforated tray columns.
- Influence of the operating conditions on the separation of a binary solution
- Thermal balances.
- Material balance.
- Determination of the number of theoretical plates (McCabe and Thiele, Ponchon and Savart).
- Determination of the number of transfer units

Technical specifications :

Equipment

- Storage can of the polyethylene feed solution.
- Feeder dosing pump, stainless steel 316L - PTFE with manual control.
- Feed preheater with two valves for supply at 33% or 66% of packed column, equipped with minimum level safety and maximum temperature safety.
- Continuous boilers in borosilicate glass, electric heating, each equipped with a minimum level of safety and maximum temperature safety.
- Refrigerants for differential pressure test
- Column made of borosilicate glass in three elements with "multiknit" type 316L stainless steel insulation, insulated.
- Borosilicate glass column in three elements with 3 perforated trays.
- Three 316L stainless steel recentering trays on each column, each equipped with sampling and temperature sampling valve.
- Borosilicate glass column heads with temperature measurement, equipped with a timer valve to control the reflux ratio.
- Vertical 316L stainless steel condensers, borosilicate glass ferrule, single acting with PTFE baffles.

- Hetero-azeotropic decanter with light-phase sampling valve for recycling to the 316L perforated plate column, heavy-phase sampling valve for recycling to the 316L stainless steel packed column with interface level adjustment and 316L stainless steel cooling coil.
- Refrigerant - decanter trap in stainless steel 316L.
- Two refrigerants of distillate and residue in 316L stainless steel.
- Recipe for borosilicate glass distillate for each column.
- Recipe of borosilicate glass residue for each column
- Four cans for receiving distillates and polyethylene residues.
- 316L stainless steel connection pipes for the process and reinforced PVC for the cooling fluid.
- Support frame in 304L stainless steel tubes and aluminum nuts.

Instrumentation

- Cooling water supply for condensers each equipped with a float flowmeter with their control valve and water circulation controller for heating shutdown due to lack of cooling.
- Column pressure drop measurements using differential U-shaped pressure gauges.
- Control and control cabinet, IP55, equipped with emergency stop, operating buttons and the following interfaces:
- Preheater temperature controller.
- Controllers for the temperature of the column heads controlling the sampling or reflux valves of the distillates.
- Boiler heating control regulators.
- Four digital temperature indicators (two per column) of 21 probes type Pt100 ?.

OPTIONS :

Option 1: Touch screen to view temperatures. With data storage and data recovery on USB stick in .txt files.