

GENERAL DESCRIPTION

This equipment demonstrates a process for separation of a mixture (one soluble in another) of two liquids of different boiling points.

The unit consists of boiler, two distillation columns, condenser, reflux tank, top product tank, feed tanks with feed pump, feed preheater, bottom product tanks, measuring instruments, and other accessories.

An initial feed is added to the boiler where the vapor with higher concentration of the lower boiling point component rises in the distillation column. The vapor leaves the top and is condensed in the condenser and collected in the reflux tank. Part of the condensate in the reflux tank is fed back to the top of the column where heat exchange is taken place with the rising vapor. This results in the vapor phase being richer in the lower boiling point component, and the liquid phase being richer in the higher boiling point component. The liquid phase moves down to the boiler.

The feed is pumped from feed tanks, preheated in a heat exchanger, before delivery to the distillation column. The feed is partially evaporated in the column on its way to the bottom where it is heated to boiling.

The hot mixture in the boiler is rich in higher boiling point components is used to preheat the feed and collected in the bottom product tanks.

Two columns, sieve plate column and packed column with Rasching rings, can be interchanged simply by valve control. Lagging is provided for boiler, sieve column, condenser, and preheater.

The unit is installed on a stainless steel frame.

Instruction manual is also included.

EXPERIMENT CAPABILITIES

- Comparison of sieve column and packed column performance in continuous operation.
- Comparison with batch distillation.
- Column efficiency vs boil up rate at total reflux.
- Top product composition vs time at constant reflux ratio.
- Manual control of reflux ratio.
- Plate to plate temperature profiles.
- Mass balance across the system.

TECHNICAL DATA

- Plate column : Stainless steel with a view port
: 8 sieve plates, with a sampling point
- Packed column with Rasching rings : Borosilicate glass
- Reboiler
- Heater : 3000 W
- Maximum temperature : 130°C
- Condenser : Shell and tube, stainless steel, water cooled
- Preheater : Shell and tube, stainless steel
- Feed pump : 400 mL/min
- Vacuum pump : Water jet
- Reagents : Methanol/water solution
- Product tanks
 - Reflux tank : Stainless steel
 - Top product tank : Stainless steel
 - Feed tanks : 2 ea. Stainless steel
 - Bottom products tanks : 2 ea. Stainless steel
- Measuring instruments
 - Water manometer : 1 ea.
 - Rotameter : 1 ea.
 - Reflux ratio control : 0-100%
 - Wattmeter : For reboiler
 - Pressure / vacuum gauge : For system pressure
 - Sensors with digital display : Temperature 16 ea.
- Software for data display and analysis by computer (separately supplied)
- Power supply : 220 V, 1 Ph, 50 Hz. Other power supply is available on request.

OPTIONAL EQUIPMENT

- HM 210-011 Borosilicate glass instead of stainless steel plate column.

Net (unpacked) shipping dimensions WxLxH : 95 x 60 x 250 cm
Net weight : Approx. 80 kg