

# EVAPORATION - CONTINUOUS CRYSTALLIZATION

**REFERENCE : MP1004**



*Non contractual photo*

**SERVICE : 230 V / 50 HZ / SINGLE PHASE: 3  
KW. COLD WATER 10 ° C / 3 BAR: 1 M3 / H.  
EMPTY 100 MBAR: 10NM3 / H DRAIN  
DIMENSIONS : 1,65 M X 0,68 M X 2,2 M**

**WEIGHT : 150KG**

## Principle of operation :

Crystallization allows the separation, from a solution, of one or more solid compounds dissolved in this solution. During the separation, the dissolved compounds pass to the solid state when the operating conditions are required (temperature, concentration). The crystals formed are then separated from the liquid phase by filtration.

The crystallization is obtained by partial evaporation of the solvent and then cooling of the concentrated solution obtained.

The feed of the initial solution is continuous, the evaporation of the solvent is continuous, the crystallization takes place continuously while the collection of the crystals obtained with the saturated stock solution is done semi-continuously; the step of separating the crystals from the stock solution is carried out in a bag filter under reduced pressure.

## Educational Objectives :

### Experimental parameters studies following :

Continuous crystallization of a solution by evaporation and cooling.  
Influence of the operating conditions on the crystallization of a solution.

### Calculations :

Thermal balance.  
Material balance.

## Technical specifications :

- Storage can of the polyethylene feed solution.
- Feeder dosing pump.
- Continuous boiler in borosilicate glass, electric heating, equipped with minimum safety level and maximum temperature safety.
- Inclined condenser in 316L stainless steel.
- Solvent coolant made of 316L stainless steel.
- Borosilicate glass solvent recipe.
- Concentrate refrigerant.
- Cylindrical crystallization reactor made of borosilicate glass.
- 316L stainless steel variable speed stirring unit with inclined tri-blade impeller.
- Cooling exchanger for crystallization in 316L stainless steel.
- 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

- Condenser cooling water supply equipped with a float flowmeter with its control valve and a water circulation controller to stop heating due to lack of cooling.
- Crystallization reactor cooling water supply equipped with a float

flowmeter with its control valve.

- Control and control cabinet, IP55, equipped with emergency stop, operating buttons and the following interfaces:
- Boiler heating control regulator.
- Stirrer speed controller of the crystallization reactor.
- Two digital temperature indicators of 6 probes type Pt100 ?.

### OPTIONS :

Option 1: Bag filter under reduced pressure in 316L stainless steel.

Option 2: Touch screen to view temperatures. With data storage and data recovery on USB stick in .txt files.