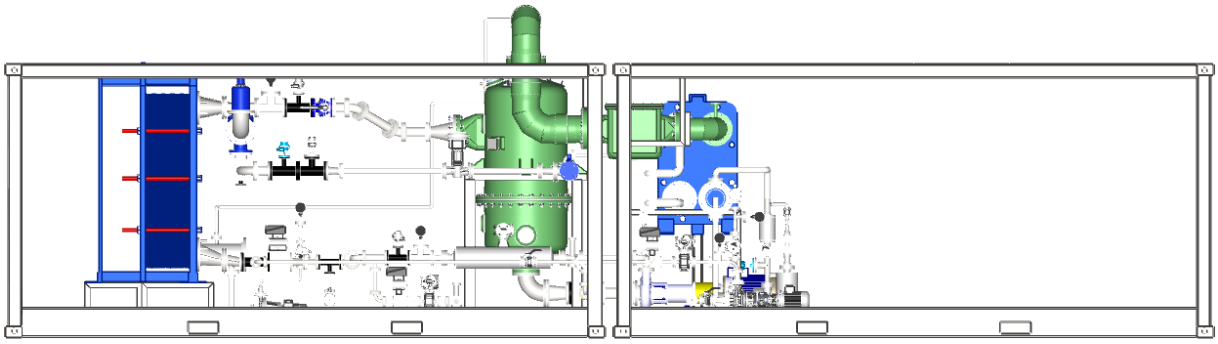
Alfa Laval evaporation test unit

Modular evaporator/crystallizer for industrial trials



Alfa Laval plate-based evaporation test unit for evaporation/crystallization suitable for demanding industries and applications.

The Alfa Laval evaporator/ crystallizer test unit is designed for the needs of industrial applications. Made with high-grade and corrosion resistant materials it can treat different water streams from chemical industry, mining operations, power plant, and oil and gas industry. With the skid-mounted, “plug-and-play” unit on site, a wide range of rapid-response tests, analyses and trials on the actual water to be treated can be carried out. The test results will secure the best selection of operating parameters and process settings for maximum efficiency and lowest-cost operations for a full-scale plant.

Examples of applications
The unit is designed to manage evaporation and crystallization of process water containing both organic and inorganic components, such as:

- RO reject streams
- Cooling tower blow-down
- Frac water and other Produced water streams
- Water from minerals and mining operations
- Landfill leachate and reject from anaerobic digestion
- Different waste water streams from chemical, electrical and textile industries

Immediately ready for service

- The skid-mounted test unit is easy to lift on/off a flatbed truck using a fork lift or other lifting device, and can be moved around as required
- All tie-in connections are in the form of standard ANSI flanges, and are located on the same side for easy access

Main benefits from test work

- Prove concept of evaporation for a specific application at low cost
- Provide understanding of evaporation systems
- Show efficiency of plate-based evaporation technology which results in a compact installation
- Provide design basis for full scale plant, such as temperature/pressure, final concentration, recirculation flow-rate, and heat transfer rates
- Determining the need for specific scaling/ and fouling inhibitors for maximised uptime and define cleaning-in-place (CIP) program

Technical specifications (full tie-in list and location drawing available on request)	
Product feed	up to 2 m³/hour
Product discharge	up to 1.5 m³/hour
Maximum total suspended solids	40–50 %wt
Maximum total dissolved solids	Can handle crystallization
Maximum viscosity	2000 cP
Boiling saturated temperature	55–100 °C
Start-up time*	3 hours
Approximate dimensions per skid (L x W x H)	6.06 x 2.44 x 2.86 m
Approximate weight per skid	6,000 kg
Number of skids for complete test unit	2
Utilities to be provided by customer. Separate tie-in point list available on request	
Cooling water inlet @ max 30 °C	max. 25 m³/hour
Seal water consumption	1.5 m³/hour
Instrument air	1 Nm³/hour
Utility steam consumption** @ min. 1 bar.g max. 3 bar.g	max. 750 kg/hour
Hot water** @ max. 110°C and max. 3 bar g	max. 20000 kg/hour
Power consumption	21.5 kW
Installed motor power (50-60 Hz, 3x460 and 1x100 V)	30.4 kW
System is fully automated for start-up/normal operation/shut down and CIP (Allen Bradley PLC)	
Data logging for key parameters	
IP 65 protection, ANSI flanges	
The test unit must be placed in an environment with a temperature of 5 °C or above	
The product feed must not contain radioactive materials	

* Requires a solid foundation and all utilities prepared

** The evaporation unit can be heated either with steam or with hot water, but not with the two at the same time