GRUPO VENTO

EVAPORATION-CRYSTALLIZATION SYSTEM ZLD (ZERO LIQUID DISCHARGE)

+34 96 134 06 63
P.I. Fuente del Jarro
Ciudad de Elda,11
46988 Paterna | Valencia
www.grupovento.com

The evaporator produces evaporated water with excellent features for reuse in the process, generating a flow much higher than its own consumption needs.

PROCESS SYSTEM

The evaporation-crystallization for ZLD (Zero Liquid Discharge) is mainly a multiple effect evaporation system. The first evaporation effects operate in “falling film” and the last in “forced circulation”. In order to reach a higher degree of concentration an atmospheric evaporator-crystallizer is incorporated. It is provided with a steam jacket and stirring system. An atmospheric evaporation pond for the removal of occluded water may also be planned in the event that the final concentrate of the reactor reaches a high viscosity due to soluble solids (such as water with high silica content). Water vapor evaporated is collected in liquid phase in a multi-tube surface condenser.

This evaporation unit is provided with a final crystallization reactor, allowing an extremely high degree of total concentration in the effluent (about 125: 1). The steam consumption is very low (approx. 0.33 kg steam / kg evaporated water).

ZLD systems are recommended by their energy efficiency and optimization of water resources, providing a true zero discharge system.

The cooling water requirements for the condensing system are 30 m^3 of water / m^3 of evaporated water. Even though, the actual consumption of water in the cooling tower is 1.5% of the cooling flow. The flow of water corresponding to the vacuum pump and cooling of process pumps can be recirculated on the cooling tower itself. It is required to have a line capable of providing 10 m^3/h for the service of washing water, although its use is occasional.

However it should be noticed that consumption of water in the evaporation equipment should not pose any problem. Because the evaporator itself produces evaporated water of excellent features to be reused in the process, generating a flow much higher than the overall consumption needs.

To avoid limescale, we recommend a dosage of HNO_3 in the water to evaporate depending on its analytical characteristics. Estimated consumption of 0.4 liters HNO_3/m^3 of water evaporated.

The installed electrical power for an evaporation unit of this type is approx. 8 kW/m^3 of water evaporated.

PROCESS DIAGRAM

Elfuentes provenientes de planta de O.I.

Relac. Minimización 125 : 1

INSTALLATION EXAMPLES

- Installation ZLD (reverse osmosis waste water) for C.C. in Querétaro (México) with treatment capacity of 10 Tm/h
- Installation ZLD (landfill leachate) for BGRI in Valle de escombreras (Cartagena) with treatment capacity of 2 Tm/h
- Installation ZLD (photographic development waste liquids) for RESER in Sagunto (Valencia) with a treatment capacity of 0.5 Tm/h
- Installation ZLD (almond cropping water) for SIRVENT ALMENDRAS in Xixona (Alicante) with a treatment capacity of 6.5 Tm/h