

CRESCENDO | Gas Liquid Contact System



CRESCENDO can be applied for evaporation (thickening of liquids), scrubbing of (hot) gasses, stripping, cooling and a range of related purposes. The working principle of CRESCENDO is that a liquid that flows down along an inclined plate generates by Venturi action a slightly negative pressure in the downward direction, protruding openings that are present on the upper surface of this plate. The negative pressure causes the gas to pass through the openings into the flow of liquid in a form of long stretched bubbles that stay in contact with the liquid long enough to become saturated with vapor and exchange other components or thermal energy. A low-pressure ventilator will transport the gas and enhance the gas/liquid contact.

This patented method provides a very intensive gas/liquid contact and offers an optimal exchange of components at minimal energy input. Even waste energy from heating, cooling and ventilating may be put to good use.

CRESCENDO has been successfully in operation for several years. When applied to thicken concentrated (waste) streams and to recover valuable resources, using low-grade residual energy saves energy and costs. By combining CRESCENDO with the newly developed AVaR (Active Vapour Recompression) technology, residual heat in the system can be re-used even better, reducing energy consumption up to 80%.



New: corrosion resistant evaporator

CirTec's latest innovation is the synthetic GaLiCos or CRESCENDO. The new design can be applied to thicken liquids with a pH from 1 to 14 at temperatures ranging from 30 to 100°C. The synthetic CRESCENDO is especially suited for corrosive liquids and gasses, with a very high or very low pH and liquids containing a high salt concentration, such as brines.



Evaporation of 3 different concentrated waste streams

At a semi-conductor industrial facility, three individual waste streams (resin, acid and base stream) of each 2.5 m³/d are concentrated using residual heat that comes from an adjacent company. The heat source has an average temperature of 50 °C so that at an operating temperature inside the CRESCENDO of 20 °C can be maintained. The three stand-alone evaporators are operated unmanned, continuously.

The design capacity for each individual evaporator is 1.2 m³/d.

Due to the low investment and operational costs, CRESCENDO was chosen over a vacuum evaporator.

Evaporation of RO-concentrate

The use of membrane technology, both in wastewater treatment and in the production of drinking and process water, has expanded enormously in recent decades. Membrane techniques, however, do not offer a complete solution, because a residual product remains by means of a saline concentrate stream (brine).

The reference treats a brine stream with an incoming TDS of approximately 45 g/l. The design capacity of the installation is 24 m³/day, while the base-temperature of the brine is 25 °C and the operational temperature is 60 °C.



Evaporation of NF-concentrate

As a part of the wastewater treatment plant of a Textile company in the Middle East, a 2-stage nanofiltration system has been installed as final treatment stage, removing salts and color from the water. To thicken the brine, a CRESCENDO evaporator was installed with a design capacity of 5 m³/h to concentrate the water to the limits of saturation. As a part of the process, a side stream is extracted from the process where controlled crystallization can take place and crystals can be removed.

Residual heat from the air-conditioning is re-used for evaporation.

About CirTec B.V.

To maintain a good and healthy environment for future generations, it is crucial that we reduce the disposal of waste and encourage recycling of valuable components. CirTec aims to contribute actively to the sustainability of society, and reuse of (waste) materials in particular.

With both proven and innovative technology, we are able to provide the most appropriate solution for a large number of environmental issues. We focus on the development of alternative raw materials such as recovered cellulose from municipal wastewater and the use of low value residual heat for evaporation of concentrated streams. Cooperation and sharing knowledge are the keys to progress and an integral part of our business model.