APPLICATIONS

SEMICONDUCTOR
SOLAR
PHARMA
POWER GENERATION
FOOD & BEVERAGE
PULP AND PAPER
CHEMICAL
OIL AND GAS
MINING
AEROSPACE AND TRANSPORT

HAGER+ELSÄSSER

ZLD.eco^2

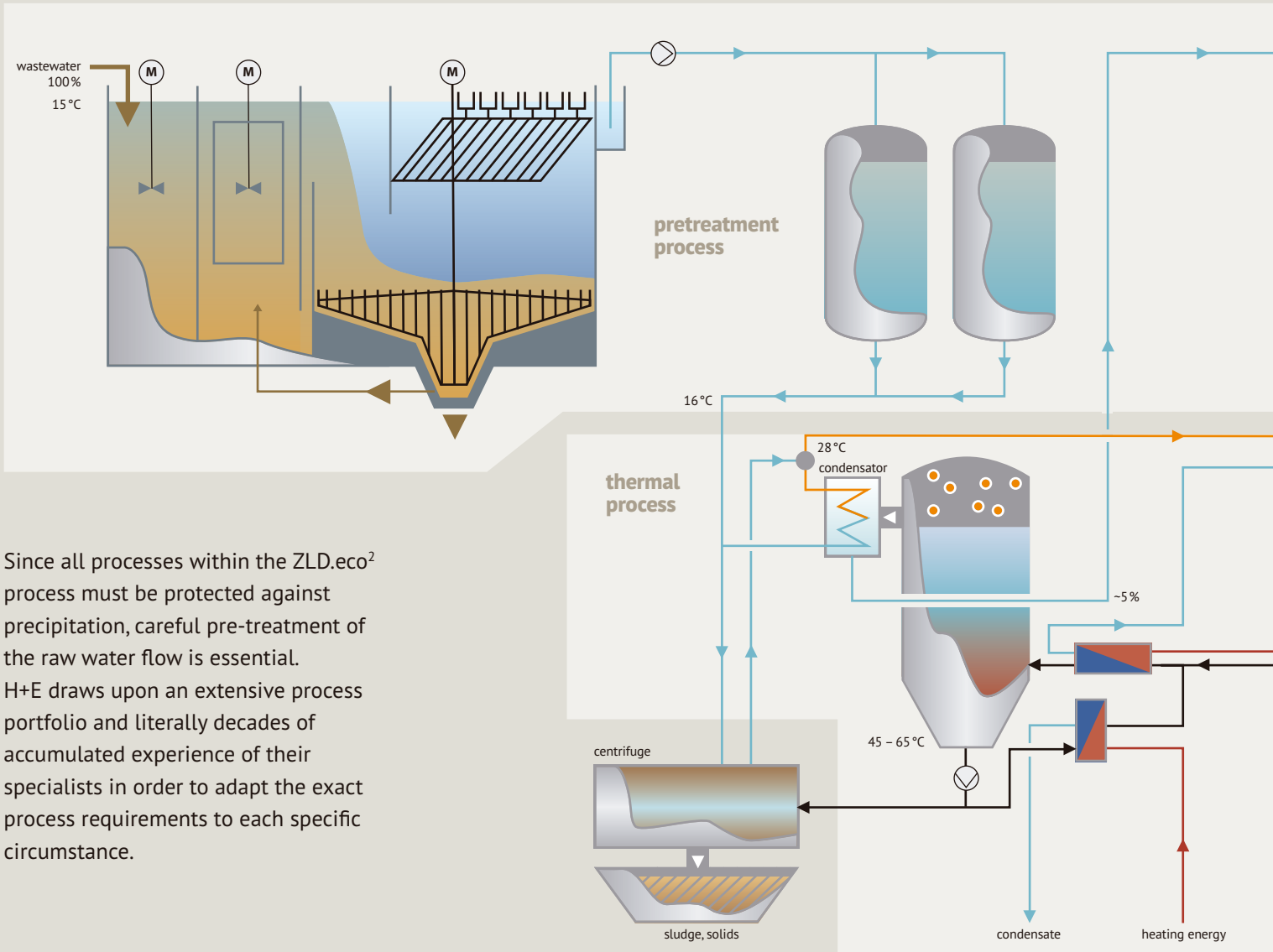
The unique zero liquid discharge hybrid system

ZLD.eco2 - the most economical Zero Liquid Discharge solution on the market

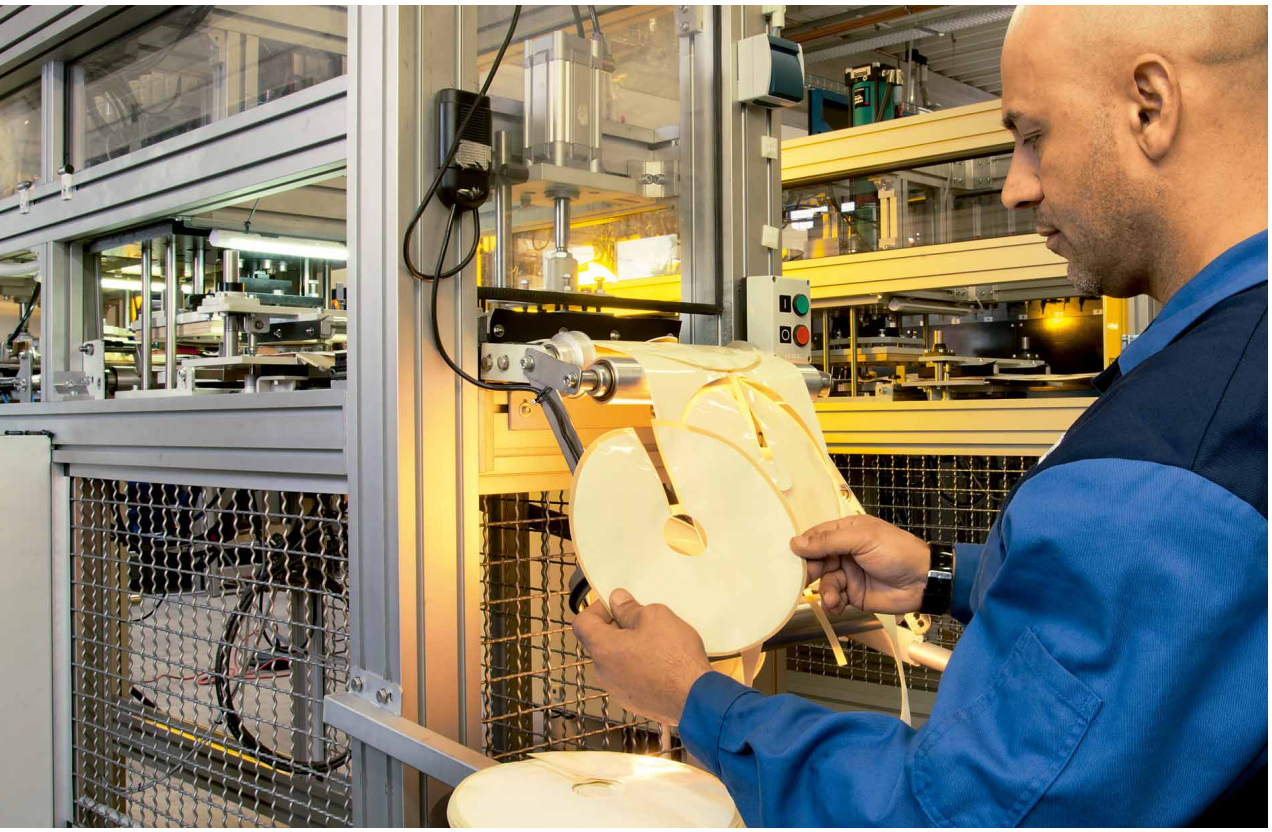
ZLD done right.

Under the brand name ZLD.eco² HAGER + ELSÄSSER has developed an innovative combination of methods to completely eliminate liquid waste, also known as Zero Liquid Discharge, with their cooperation partner MFT GmbH from Cologne.

The particular advantage is the reduction in both the investment and the operating costs compared to standard methods for zero liquid discharge. The main contribution to these savings are created by the high pressure reverse osmosis stage: The resulting parameters allow a size reduction of the eveporator. ZLD.eco² is especially interesting for the oil and gas, mining and chemical industries and, beyond that, for companies and corporations that need full recycling of materials at their production sites due either to legal requirements or specific circumstances.

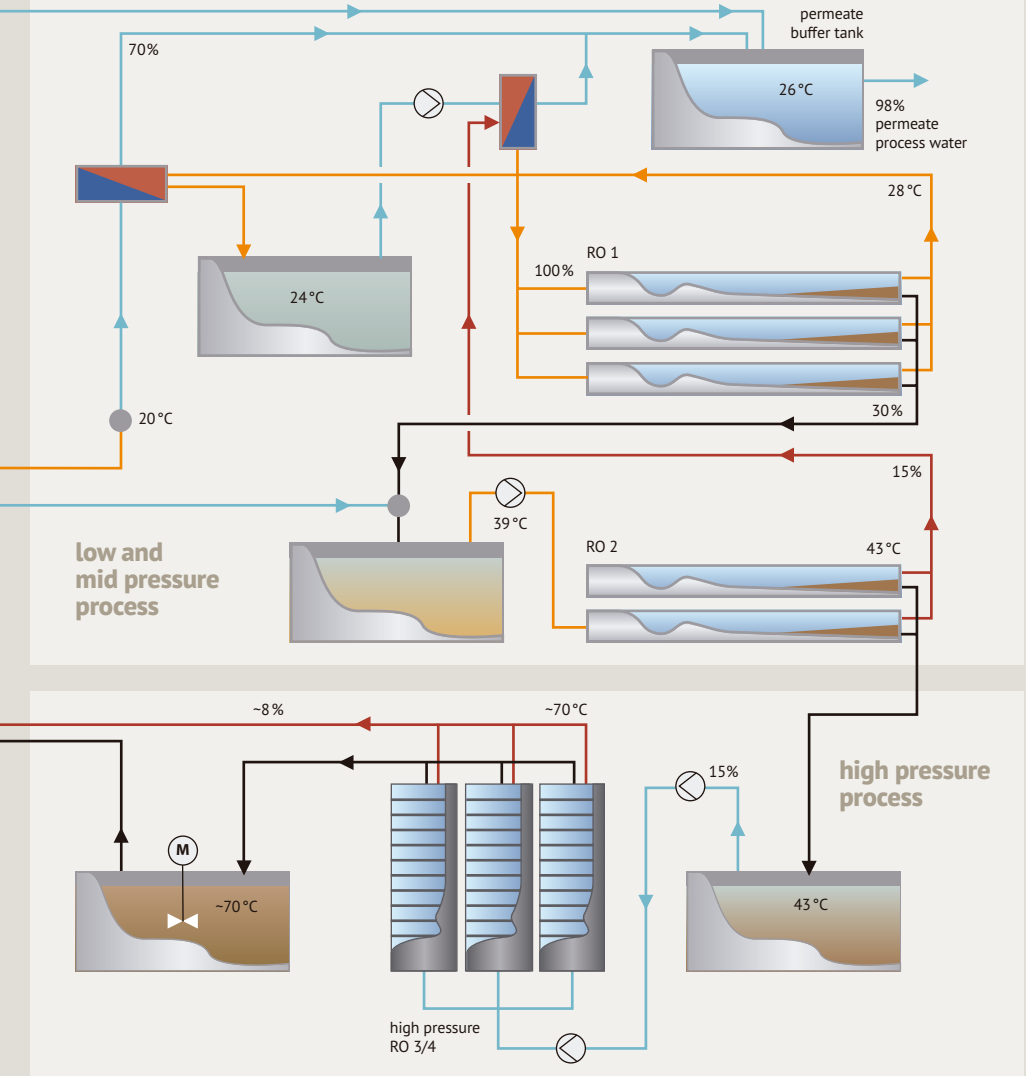


Since all processes within the ZLD.eco² process must be protected against precipitation, careful pre-treatment of the raw water flow is essential.
H+E draws upon an extensive process portfolio and literally decades of accumulated experience of their specialists in order to adapt the exact process requirements to each specific circumstance.



Left side:
High-pressure module as a central element for the high pressure process within ZLD.eco²

Left:
Manufacturing of the membrane elements for the circular disc module for the high pressure reverse osmosis from ZLD.eco²



The prepared waste water then passes through the three steps of the ZLD.eco² process, of which two regular low-pressure reverse osmosis steps are the first. While the resulting permeate flows into a tank for further processing, the intercepted concentrate enters the high-pressure part of the system.

In the second stage the pressure is increased to about 200 bars in a special high-pressure reverse osmosis stage, resulting in further concentration of the pollutants in the remaining waste water. The extreme pressure results in a significant increase in the temperature of the liquid.

This is used to advantage by the third stage of ZLD.eco² technology. The evaporator stage takes the preheated concentrate, further concentrates it under vacuum in a “flasher-like” system and creates a solid product via the docked centrifuge. Optionally, a separate vacuum dryer can be connected downstream.

Benefits

This smaller thermal stage enables ZLD.eco^2 to provide particularly low running costs in comparison with conventional methods.

It is this reduction in the size of the various process components that allows the one-time investment costs to be manageable. Moreover, this applies not only for the thermal stage, but also for the reverse osmosis units that use the energy released in the system to increase efficiency.

Since the fine-tuned process technology results in a further in size of the individual stages, ZLD.eco^2 systems are particularly space saving.

The modular and space-saving design of a ZLD.eco^2 system also ensures low time and cost for its installation.

Integrated recycling within a ZLD.eco^2 system reduces the cost for cooling to a minimum.

Since the already-treated concentrate is re-used in different stages of the process, the overall consumption of chemicals is minimised.

High pressure membrane stack for ZLD.eco^2

Reverese osmosis plant for the low- and mid-pressure part of ZLD.eco^2

Contact