Conductivity measurement in a water reuse plant

Precise measured values even in low measuring ranges

Pasfrost plant in Passendale, Belgium

Pasfrost in Belgium has been producing and distributing high-quality frozen vegetables since 1977. The Lafaut family built their company with their agricultural background and know-how up to a specialist in production of frozen vegetables.

"Endress+Hauser demonstrated again that they are able to provide the suitable product for each application. With the CLS82D we found the optimal sensor to ensure the drinking water quality."

Alexander Wallays
Pasfrost NV.
Passendale, Belgium

The production of frozen vegetables requires a lot of water. In order to save water, Pasfrost has decided to reuse it: the water is purified in a water reuse plant, which includes a reverse osmosis system (RO). The core of the RO system is a membrane through which the water is filtered. A good condition of this membrane is a prerequisite for the proper functioning of the plant. With the help of Memosens conductivity sensors, the membrane condition can be monitored reliably and easily.

Benefits

- Precise measurements - even of very low conductivity values.
- Plug and play, easy exchange of sensors, calibration in the lab - Memosens technology makes sensor handling very convenient.
- No doubts anymore: Reliable conductivity measurements give clear indications about the membrane condition and thus about the functioning of the RO plant.

Customer challenge Pasfrost processes fresh local vegetables to frozen vegetables. Therefore, many water consuming process steps are necessary, eg. washing vegetables and blanching them. As the company is growing continuously, it built a new wastewater treatment plant. In addition, Pasfrost also has a water treatment plant where they purify a large part of the arising wastewater to drinking water, which is then re-used. For purification, Pasfrost relies on technologies like ultrafiltration, UV-disinfection and RO. Currently, multiple RO installations are running to purify a large part of the wastewater.

Water for re-use Reverse osmosis is a water purification process that uses a partially permeable membrane to remove unwanted substances, like ions, molecules or particles, from drinking water. Pressure is applied to overcome osmotic pressure. Unwanted substances are retained on

the pressurized side of the membrane (concentrated wastewater) and the pure water can pass to the other side. The membranes' status needs to be monitored to ensure pureness and to achieve high water quality. Therefore, conductivity is measured at the inlet of the RO and after a membrane.
To fulfill the high hygienic requirements regarding drinking water, CIP is performed regularly at the RO installations. They are cleaned every few weeks with caustic soda or acid at 40°C. The conductivity sensors must withstand this tough cleaning routine.

Our solution The challenge was to select suitable sensors that cover the broad range of conductivity values from incoming and outcoming water in the RO plant. At the RO inlet a CLS21D sensor was installed, whereas at the outlet the choice fell on Memosens CLS82D. With CLS82D even lower conductivity values of purified water after the partially permeable membrane can be measured precisely. Both sensors, CLS82D and CLS21D, need only low maintenance and are easy to use thanks to Memosens.
Via the Liquiline CM44 transmitter, values are transmitted to the PLS, that controls the membrane regeneration and CIP cycles automatically.

Reverse osmosis system at the Pasfrost plant.

Results With the help of the conductivity sensors, Pasfrost is able to monitor the proper functioning of its RO system. Thanks to the water re-use, high quality drinking water can be produced from recycled effluent constantly and reliably. Pasfrost takes only one fourth of the total needed amount of fresh water from a well. The other three fourth of the water demand are covered by the production plant's own recycled water. Thus Pasfrost is virtually independent of the municipal water supply. A good example of a solution that is both sustainable and cost-effective.

Conductivity values in the reverse osmosis installation

- Incoming water from the outlet of the wastewater treatment plant: 3000-5000 µS/cm
- Drinking water outlet: <2000 µS/cm
- Boiler feed water outlet: <50 µS/cm

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