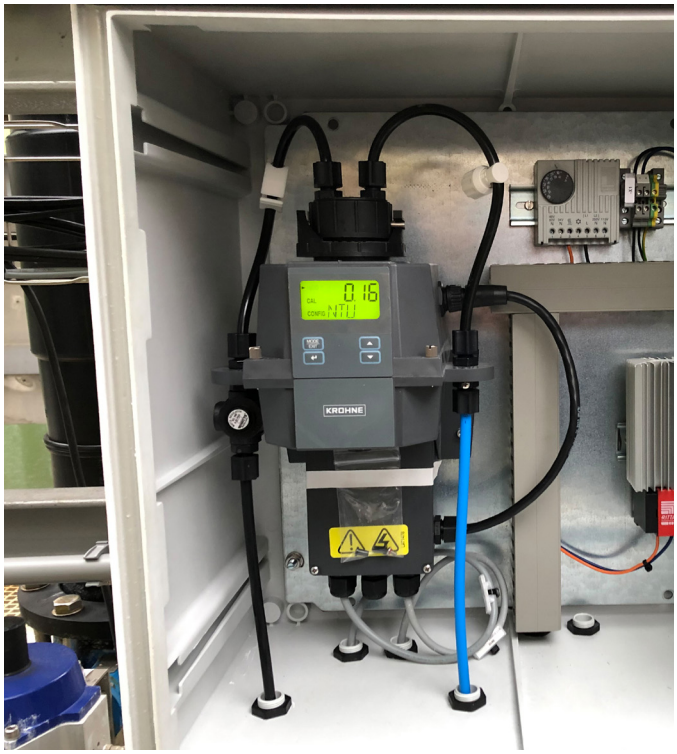
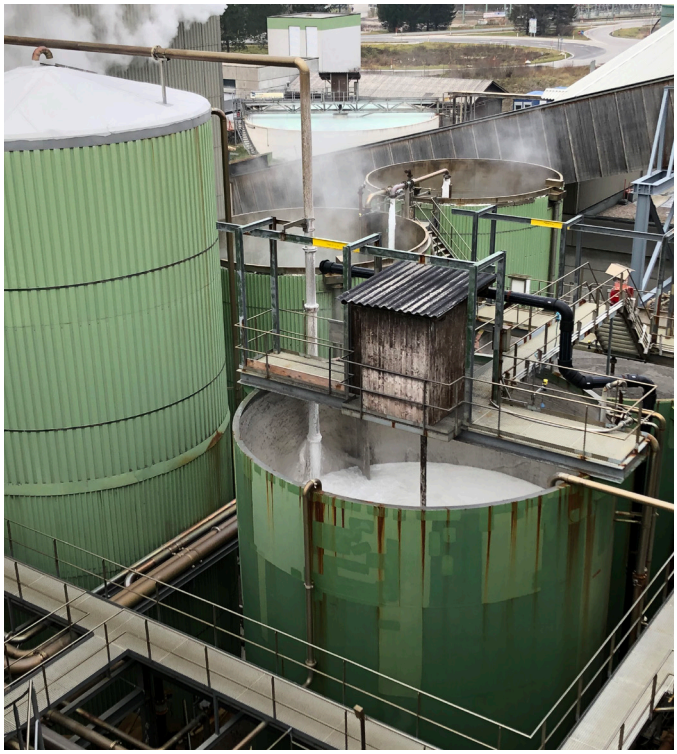




APPLICATION REPORT

Minerals & Mining

Turbidity measurement in the production of evaporated salt

- Determining the purity of liquid brine for consistently high product quality
- Non-contact online measurement with optical measuring system
- Reliable monitoring of filter systems thanks to high measuring dynamics

SALINEN AUSTRIA

1. Background

Salinen Austria AG is one of the leading European salt producers. Located in Ebensee, Austria, the company produces around 1.2 million tonnes of high-quality evaporated salt from the brine of the Alps and natural rock salt. The company's evaporated salt products include table salt, pharmaceutical salt, salt tablets, industrial salt, cattle and pool salt.

2. Measurement requirements

The brine is transported by a pipeline system to the saltworks where the brine is cleaned and processed by means of thermocompression into ultra-pure vacuum salt with up to 99.9% NaCl content. For this purpose, the liquid brine is cleaned, softened (freed from calcium and magnesium salts) and heated in a cylindrical vessel (evaporator) up to +120°C / +248°F. The boiling process continues until only the salt is left over. The salt obtained is dried and is then almost completely drained.

Basin with liquid brine

For the cleaning process, the brine is first treated in a two-stage process. The last fine particles are removed from the brine by a filter system. Since the purity of the brine determines the quality of the end product, the filtering process must be continuously monitored. One of the essential control parameters is turbidity. If the turbidity exceeds a specified maximum value, this indicates inadequate cleaning or even a damaged filter system.

In the past, the customer had used turbidity measurement technology from a competitor. However, these sensors required significant maintenance and did not have the desired measuring dynamics. They were therefore to be replaced successively.

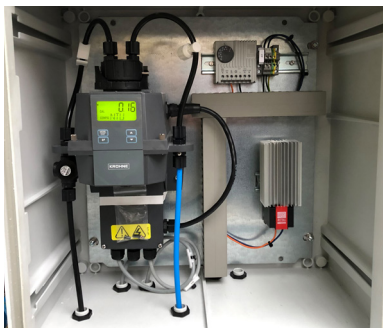
KROHNE

3. KROHNE solution

In a first step, Salinen Austria has equipped four measuring points with the OPTISYS TUR 1060 turbidity measuring system. KROHNE's optical turbidity system measures the liquid brine online in a bypass installed downstream of the filter, which is controlled by way of electric valves. In order to protect the unit from seasonal weather fluctuation in outdoor use, the measuring system was mounted in an air-conditioned control cabinet.

Brine vessel

The turbidity measuring system features a short response time and thus offers the necessary measuring dynamics to monitor the purity of the brine accordingly. The KROHNE system provides the measured values via 4...20 mA output in the client's control room. If a defined threshold is exceeded, the OPTISYS TUR 1060 triggers an alarm in the control room. The built-in data logger allows storage of readings and calibration data. The measuring data can also be downloaded via the USB interface. Additionally, calibration data can be uploaded via USB to change the measuring range.



OPTISYS TUR 1060 for turbidity measurement of brine

The OPTISYS TUR 1060 uses the 90° scattered light method according to ISO 7027. The measurement optics are thus not directly exposed to the sample and require less maintenance. The automatic ultrasonic cleaning of the sensor also prevents deposits, which additionally minimises the maintenance effort and guarantees long service. The turbidity measuring system enables a simple and cost-effective cuvette calibration. This is done using certified test kits supplied by KROHNE.

Air-conditioned control cabinet with KROHNE turbidity measuring system (see arrow)

4. Customer benefits

The salt producer benefits from reliable monitoring of the brine purity. The high measuring dynamics of the OPTISYS TUR 1060 enables the customer to react quickly as soon as the turbidity exceeds a specified limit value. In this way the KROHNE system contributes to meeting the quality requirements in production, allowing the customer to always obtain a consistently high product quality. The turbidity measurement also provides the customer with information on efficiency and condition of the filter systems. The KROHNE system thus also gives an indication for predictive maintenance of the filter technology, which increases plant uptime. The turbidity measuring system is only one of several KROHNE measuring devices on site. It adds to the long-established and successfully used instrumentation for flow and density measurement of brine.

5. Product used

OPTISYS TUR 1060

- Optical turbidity measuring system for water applications
- 4-wire, 4...20 mA, 2 alarm relays or Modbus via RS485; built-in data logger
- 0...100/1000 NTU/FNU; max. +50°C / +122°F
- For online bypass installation

Contact

Would you like further information about these or other applications?
Do you require technical advice for your application?
application@krohne.com

Please visit our website for a current list of all KROHNE contacts and addresses.

www.krohne.com