

Industrial
Wastewater

DesaliTec™ Closed Circuit Reverse Osmosis (CCRO) Helps Carlsberg Create a More Sustainable Water-efficient Brewery

Background

Despite beer primarily consisting of water, the vast majority of the water used during the manufacturing process does not end up in the final product; large volumes of process water are required at every stage of production. With increasing global water scarcity, the need for sustainable industrial water consumption is more prevalent and important than ever. In 2015 Carlsberg Group defined specific water sustainability goals as part of their 'Together Towards Zero' environmental strategy. The brewer announced that by 2022 it intended to reduce water consumption by 25%, and it would achieve a reduction of 50% by 2030 across its global production network. Carlsberg also committed to exploring whether it could reduce water consumption at breweries in water-scarce areas to less than 2 liters per liter of beer.

Challenge

The Carlsberg Group in 2015 identified that it was consuming, on average, 3.4 liters of water for every liter of beer produced across its global network of manufacturing sites. 65% of the 3.4 liters of water was classed as process water, used in the cleaning of the production equipment, bottles, and cans, in addition to boilers, cooling towers, and other processes. The group was determined to rethink its approach to water consumption and implement strategies and technologies to reuse and recycle wastewater to decrease its overall consumption.

Solution

In 2021, a new state-of-the-art water recycling plant, the Total Water Management (TWM) facility, was installed at the Fredericia brewery by Pantarein Water, employing DuPont™ DesaliTec™ CCRO technology. The TWM uses aerobic and anaerobic biological treatment processes to remove most of the pollutants from the waste process water.

The DuPont™ DesaliTec™ CCRO system provides further filtration by extracting the salts that are dissolved in the water. Like conventional reverse osmosis, the CCRO vessel contains membranes; however, the pressurized system ensures the feedwater is recirculated until the desired recovery level is reached. This novel approach means the purification process is automatically tuned to the composition of the feedwater, requiring no intervention from an operator while providing consistently high levels of recovery from feedwater of varying salinity.

Fast Facts

Location: Fredericia, Denmark

End User / OEM: Carlsberg Group /
Pantarein Water

Application: Wastewater Reuse

Product: DesaliTec™ CCRO

Water type: Wastewater

Plant capacity: 83 m³/h

Commissioning: 2021

Benefits

The TWM treatment facility at Carlsberg Fredericia brewery can purify 2,000m³ of process water per day, making it available for reuse. 90% of the source wastewater is treated to drinking water standards and is recycled as process water, and the remaining 10%, consisting of wastewater and sludge concentrate, is sent to a nearby public wastewater treatment plant.

Previous initiatives had allowed Carlsberg to reduce the Fredericia brewery's water consumption by 0.6 liters to 2.8 liters of water per liter of beer produced. The TWM using DuPont™ DesaliTec™ CCRO technology has helped Carlsberg cut overall consumption in half, and only 1.4 liters of water is now required to produce each liter of beer, resulting in the brewery cutting its total water consumption by 560 million liters a year.



Water Solutions
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