



RODI systems

Project Photos

Project Information

Client: Brown Sheep Company

Location: Nebraska, USA

Application: Industrial Waste Treatment

Description: The project entailed the design and construction of a skid-mounted integrated waste treatment system for the treatment of waste water from a woolen yarn dyeing operation. The waste is high in color, suspended solids, organics, and dissolved inorganic salts. It is also treated at an elevated temperature (120° F). Tubular ultrafiltration (UF) is used for the first stage of treatment followed by a primary reverse osmosis (RO) unit. A secondary RO unit is used to further concentrate the reject from the primary RO unit thus increasing overall recovery. The RO permeate is used for boiler makeup thus saving the facility a significant amount of money in energy cost.



The system is mounted on an epoxy coated steel skid. The tubular UF, both RO units, and controls are all contained on the skid. The system also comprises two RO feed tanks and a cone bottom recirculation tank for the UF unit. Treatment capacity of the system is 12,000 gallons per day with recovery approaching 85%.

The system is equipped with a full complement of sensors and instrumentation for flow, pressure, temperature, and conductivity. All functions are controlled by a PLC with a touch screen operator interface. All operating data is logged to removable SanDisk memory. All pumps are equipped with variable frequency drives (VFD's).



Permeate is collected from both RO units and used for boiler makeup. Due to the elevated temperature of the waste water, the use of the permeate for boiler feed provides substantial cost savings in terms of energy usage. A permeate flush system (including the small tank shown here) allows the system to automatically flush with permeate upon shutdown thus reducing the fouling tendency of the waste feed.



Dissolved solids concentration of the feed water can exceed 5,000 ppm with the concentration of the final RO reject approaching 35,000 ppm. Thus the secondary RO unit is equipped with seawater vessels and membrane elements.

These vials illustrate the water as it is processed by the system. From left to right are: UF feed, UF filtrate/RO feed, and RO permeate.

