BVF® reactor helps Ohio cheesemaker reduce sludge, energy, and operational requirements

Client

Since 1956, Rothenbühler Cheesemakers has been producing delicious cheese using all natural ingredients and 100% Grade A milk. Formerly known as Middlefield Cheese, the family-owned company is one of the largest Swiss cheese manufacturers in the United States. Its plant in Middlefield, Ohio, USA, produces five Swiss cheese varieties, as well as high-quality whey ingredient products.

Challenge

Rothenbühler Cheesemakers prides itself on adhering to strict environmental practices, blending the cheese making artistry of the past with modern day innovation. The company's USDA-approved, SQF (Safe Quality Foods) certified facility was already using ecofriendly "green" initiatives to recycle on-site resources. The company wanted an on-site solution to anaerobically pre-treat raw wastewater, thereby remaining environmentally-responsible and reducing its carbon footprint.

Technology
BVF® reactor

Sector
Food & beverage

Location
Ohio, USA



Solution

Xylem was selected to design, install, and commission an anaerobic wastewater treatment system for Rothenbühler Cheesemakers' plant in Middlefield. The system consists of a 230,000 gallon equalization (EQ) tank, which pumps wastewater into an in-ground 6.8 MG ADI-BVF reactor. Anaerobic effluent is discharged by gravity to the existing downstream membrane bioreactor (MBR) system for aerobic polishing. The project also included construction of a control/electrical equipment building.

The large volume of the BVF reactor provides a robust and diverse anaerobic microorganism community, making the system resilient to variations in influent characteristics such as organic load, influent solids concentrations, pH, temperature, and alkalinity. As wastewater passes upward through the sludge blanket, microorganisms digest the majority of the organic load, reducing chemical oxygen demand (COD), total suspended solids (TSS), and fats, oils, grease (FOG). The low-rate system is designed to treat 600,000 gpd of wastewater. The anaerobic digestion process continuously produces biogas, which is collected beneath the reactor cover and delivered to a standard biogas flare and/or utilization system.



Results

The wastewater treatment system that Xylem engineered for Rothenbühler Cheesemakers has simplified and improved process efficiency. The BVF reactor can directly digest raw wastewater (no dissolved air flotation or other FOG or TSS removal is required), and requires very little electrical horsepower, helping lower operational costs. Aeration energy and chemical requirements for the existing aerobic system have also been reduced.

> "We are thrilled to be able to process our wastewater responsibly. The BVF reactor supports our vision of a well-ordered, efficient, and technically advanced system."
>
> Gary Schoenwald, CAO, Rothenbühler Cheesemakers

"The wastewater treatment system reduces our electrical consumption, provides biogas to supplement our existing plant heating, reduces bio-solids production, and ultimately reduces our carbon footprint," says Schoenwald

The BVF reactor at Rothenbühler Cheesemakers is designed to remove approximately 90% of the influent COD. The reactor's long solids retention time (SRT) and hydraulic retention time (HRT) ensure complete biodegradation of the raw organic compounds, thus higher biogas production can be achieved. At design conditions, approximately 320,000 ft^3 (9,000 m^3) of biogas is captured per day. This biogas is utilized at a new dual-fuel boiler in the production plant, further minimizing costs for the cheesemaker.

"This project was a success due to the attention to detail that we experienced from Xylem's staff—everything from the concept drawings through to installation and start-up," says Schoenwald. "We have seen significant savings in our electrical consumption and expect exceptional savings as well from the use of the biogas."

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