Anaerobic Membrane Bioreactor

Innovative Process Helps Food Processor Meet Expansion Goals

Issues

- Needed to expand capacity of WWTP
- Limited footprint available
- Very strong, high-solids wastewater

Features

- Innovative anaerobic technology
- Robust, resilient process
- Small footprint
- Simple, easy to operate
- Highest-quality anaerobic effluent

Benefits

- Easily met expansion goals
- Exceptional anaerobic effluent quality
- Quick installation and start-up

Ken's Foods Inc., a salad dressing and barbeque sauce processor located in Marlborough, MA, recently chose the ADI Anaerobic Membrane Bioreactor (ADI-AnMBR) process to upgrade and expand the capacity of its existing wastewater treatment plant.

The original wastewater treatment plant consisted of a proprietary low-rate anaerobic ADI-BVF® reactor and ADI-SBR (sequencing batch reactor) polishing system. The existing full-scale anaerobic system, a low-rate upflow sludge bed reactor, had worked well for several years treating this high-strength wastewater with its high TSS and FOG concentrations; however, Ken's Foods wanted to expand production, resulting in a 60 percent increase in wastewater flow and loading.

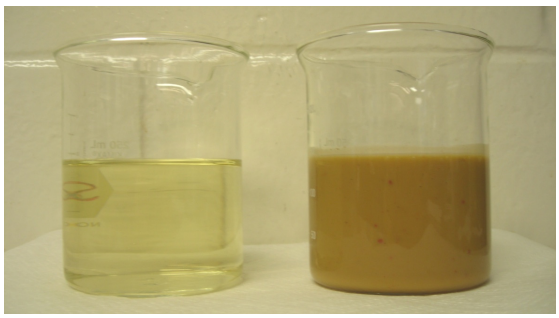
Converting the existing facility to an AnMBR system was very attractive, given the economics and space-saving advantages of the process. In addition to the increased capacity, the AnMBR system produces the highest quality anaerobic effluent, with BOD removals greater than 99 percent and virtually free of suspended solids. This allowed the existing SBR to be utilized as a simple sulfide oxidation tank and the effluent to be discharged to the municipal sewer, simplifying the overall treatment operation.

The innovative ADI-AnMBR system is a compact, high-rate anaerobic treatment process that utilizes submerged membranes for biomass retention and solids-liquid separation. The high biomass concentrations maintained in the reactor(s) provide resiliency against shock loads and changing feed characteristics. The ADI-AnMBR process maximizes biogas production, increases solids digestion, and provides a means to easily handle influent wastewaters with high concentrations of organic matter; solids; and fat, oil, and grease (FOG). Its high-quality effluent also simplifies the design and operation of downstream processes.

Ken's Foods' AnMBR system consists of a Type S ADI-BVF reactor and four AnMBR membrane tanks equipped with Kubota submerged membrane cassettes. A removable geomembrane cover system on each AnMBR membrane tank provides a gastight seal with biogas collection capabilities. Biogas produced at Ken's Foods is used in a process boiler to provide heat for the anaerobic system and hot water for other plant requirements.

The system treats a high-strength wastewater with 39,000 mg/l COD; 18,000 mg/l BOD_5; 850 mg/l FOG; and 12,000 mg/l TSS concentrations, at a flow rate up to 0.14 mgd. The AnMBR produces effluent with COD, BOD_5, and TSS concentrations less than 200, 15, and 1 mg/l, respectively.

The AnMBR expansion of the existing wastewater treatment system began in April 2008, and the new system was fully commissioned in July 2008.



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