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External Circulation Sludge Bed (ECSB)

Ultra high-rate, space-saving wastewater treatment technology



The technology

Xylem's External Circulation Sludge Bed (ECSB) is a next-generation technology that uses granular biomass to anaerobically treat warm, soluble wastewater. Developed by HydroThane and offered under license by Xylem, the design of the ECSB allows for taller reactors, reducing the system's overall footprint and making the technology ideal for facilities with limited space.

The ECSB solves many of the problems with traditional high-rate systems, including having a higher organic loading rate (up to 30 kg COD/ m^3•d). Biogas-liquid solids separators cover 100% of the reactor surface at two levels, providing better biomass retention than systems with one-stage gas separation and/or partial coverage. The technology can be constructed from various materials such as steel, concrete, or fibre/glass-reinforced plastic.



Compact, highly-efficient technology

The ECSB system offers many benefits for industrial processors needing to treat concentrated, biodegradable wastewater.

Cost savings

- Save on energy costs:
  - Low energy consumption design; anaerobic treatment is significantly less energy-intensive than aerobic systems
  - Recover energy from biogas to reduce plant's fossil fuel usage
- Eliminate wastewater surcharges

Process advantages

- High organic loading rates
- Two stages of biogas-liquid-solids separation:
  - Improved process stability
  - Superior biomass retention
- Controlled hydraulic and mixing conditions under any situation
- Specially-developed influent distribution system maximizes wastewater contact with granular sludge

Environmental benefits

- Very compact footprint
- Continuously meet discharge requirements
- Convert organic waste to recoverable green energy (heat and power)
- Improve local and global water security
- Pressurized system design eliminates odor emissions

Operation & maintenance

- No complex internals
- Sealed headspace, eliminating the potential for corrosion
- External circulation controls reactor mixing independently from system operating and loading conditions
- Biogas-liquid solids separators adapt to changes in operating conditions and biogas production
- Data trending for process control



Key industrial markets

- Food & beverage
- Biofuels
- Brewery
- Chemical & pharmaceutical
- Distillery
- Pulp & paper

Project delivery

Xylem customizes each ECSB system to meet the unique needs of the application. Design/build project delivery offers a number of benefits, including a single point of contact and responsibility, and consistency in design and construction quality throughout the entire project. Technology-only packages are also available.



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ADI-ECSB-BR-0426