BIOFerm ™ Anaerobic Digester

FERMITIGO
Dry Fermentation Technology

About BIOFerm Energy Systems

Based in Madison, Wisconsin, BIOFerm Energy Systems is an experienced provider of turnkey renewable energy systems, including anaerobic digestion, gas upgrading, and solar energy. From project conception to commissioning, optimization and training, BIOFerm handles every aspect of the entire process. Our range of biogas solutions allows for seamless integration into a variety of different operations, including landfills, municipalities, wastewater treatment plants, food processors, agricultural operations, and more. BIOFerm is committed to providing successful renewable energy projects to our clients and ensuring that our technologies will produce the results agreed upon by offering the industry's most thorough Performance Guarantee & Warranty.

System Overview

FERMITIGO is a batch-style, high-solids anaerobic digester. The process ideally operates with feedstock at a solids content of >25% and typically requires 30 days per batch cycle. This system has no internal moving parts, which allows for ease of processing:

- Contaminated food waste
- Yard waste
- Solid agricultural waste

Key Advantages

- Ideal for contaminated waste systems
- Batch process and stationary system allows precise control over substrate removal for maximum energy yield
- Liquid from digestion is recirculated
- Virtually no pre-treatment or sorting of feedstock required prior to system loading which saves time and money for system operators
- Low system maintenance and repair costs
- Low parasitic energy consumption

Technical Components

- Gas-tight concrete fermentation chambers with hydronic floor heating
- FERMADOR percolate storage tank with hydronic floor and wall heating
- Percolate distribution system with adjustable spray nozzles, percolate pump, and macerator
- Dual-membrane flexible gas storage container with gas dehumidification and desulfurization
- Enclosed mixing lobby with feedstock storage space
- Biofilter to eliminate pollutants and odors from escaping into the atmosphere

Dry Fermentation Process

Input material is piled into airtight, garage-like fermenters, then feedstock remains stationary while recycled microbial communities are sprayed over the pile to jump-start digestion. After the 30-day batch cycle, the digested material is taken out and replaced with a mix of new and old material. Then the 30-day process begins again.

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FERMITIGO
Dry Fermentation
Case Study

University of Wisconsin - Oshkosh
Oshkosh, Wisconsin

The University of Wisconsin-Oshkosh installed North America's first industrial-scale high solids anaerobic digester in 2011. This FERMITIGO system, dubbed Biodigester I or "BDI," serves as a living, learning laboratory for students and faculty while furthering the University's goals of being a sustainable campus with net zero carbon emissions. Sourced under agreements between the University and its suppliers, BDI diverts approximately 8,000 tons per year of food waste, yard waste, and crop residuals. In addition, an enclosed mixing lobby is ventilated with ~2.6 air exchanges/hour to prevent odors from escaping into the environment.

Plant Dimensions and Process

BDI's total footprint is 19,000 ft^2 with a storage area of 2,000 ft^2 and a mixing area of 7,800 ft^2. The four fermentation vessels, each 70' x 23' x 16.7', undergo a maximum of 13 material exchanges/year with 150 tons of fresh material/exchange. Each cycle is based on a retention time of ~28 days.

Power & Energy Production

- 370 kW biogas engine
  - 370 kW electrical capacity
  - 495 kW thermal capacity
- Average annual energy production
  - 2,479,000 kWh electrical
  - 10,859 MMBTU thermal
- Estimated energy from the CHP could
  - Provide electricity to 220 homes/year
  - Heat 247 homes/year

Environmental Benefits

- The methane produced and used is equal to the avoided release of 9,641 metric tons of CO_2 per year
- Electricity generation from these renewable sources is equivalent to reducing
  - 2,339 metric tons of CO_2 per year from a conventional bituminous coal facility
  - 1,372 metric tons of CO_2 per year from a natural gas facility

Financials

$3.5 million capital investment for the anaerobic digestion portion

- Federal government grant: $500,000
- WI Focus on Energy grant: $232,587

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