BIOFerm ™ Anaerobic Digester

FERMIGMA Small-Scale Technology

About BIOFerm Energy Systems

Based in Madison, Wisconsin, BIOFerm Energy Systems is an experienced turnkey provider of renewable energy systems, including anaerobic digestion, gas upgrading, and solar energy. From project conception to commissioning, opitimization 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 ensures that our technologies will produce the results agreed upon by offering the industry's most thorough Performance Guarantee & Warranty.

System Overview

The small-scale and pre-fabricated FERMIGMA system is simple, flexible and easily integrated into already established operations. These plug flow digesters are pre-manufactured units shipped as complete systems. Modular components can be combined according to specific needs and many combinations of input materials are possible. Depending on availability of organic waste, engine sizes typically range from 50-100 kW.

Key Features

- Easy installation: pre-fabricated, pre-tested for safety, and ready to operate upon delivery
- Small footprint: slightly larger than a shipping container
- Flexible choice of feedstock
- Utilizes well-proven FERMIGMA technology, continuously improved since 1995

System Specifics

The small-scale FERMIGMA's uniquely compact design expands the opportunities for energy generation to operations with limited footprint or smaller waste streams. The digester has a footprint of 112' x 26' x 20', a volume of ~7,000-14,000 ft^3, and typically processes 1,000-6,500 tons of waste/year, including:

- Food waste
- Biosolids
- Manure
- Yard waste
- Brewery waste

Optional Expansions

- Feeder system
- CHP
- Final storage

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FERMIGMA Small-Scale Case Study

Allen Farms
Oshkosh, Wisconsin

Allen Farms' small-scale, plug flow FERMIGMA digester was constructed in 2012 to process industrial food waste mixed with manure and bedding from 136 dairy cows. Herd size and a progressive mindset made Allen Farms an ideal partner of the University of Wisconsin-Oshkosh and their foundation for an installation of BIOFerm's small-scale digester. This FERMIGMA implementation opened a new market for North American facilities that produce smaller amounts of waste or that have limited space. The plant can handle ~6,000 tons per year of the farm's manure and washwater, as well as industrial food waste brought onsite.

Plant Dimensions and Process

Allen Farm's digester consists of two fermentation vessels, each measuring 55.7′ x 11.5′, and a feeding hopper with 13′ x 30′ dimensions. Total footprint is ~2,460 ft^2, and the system averages a retention time between 25-35 days.

Power & Energy Production

- 64 kW continuous power engine
  - 64 kW electrical capacity
  - 90 kW thermal capacity
- Average annual energy production
  - 560,640 kWh electrical
  - 2,680 MMBTU thermal
- Estimated energy from the CHP could
  - Provide electricity to 50 homes/year
  - Heat 61 homes/year

Environmental Benefits

- The methane produced and used is equal to the avoided release of 2,312 metric tons of CO_2 per year
- Electricity generation from these renewable sources equivalent to reducing:
  - 529 metric tons of CO_2 per year from a conventional bituminous coal facility
  - 310 metric tons of CO_2 per year produced from a natural gas facility

Financials

$1.2 million capital investment
- Focus on Energy (WI) grant: $125,000
- Wisconsin State Energy Office grant: $125,000

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