

BIOFerm Dry Fermentation

Anaerobic Digestion System for Solid Input Materials



Plant Systems

The BIOFerm™ system is a batch system that uses dry fermentation anaerobic digestion in the mesophilic temperature range. BIOFerm™ technology is engineered around the concept of holding feedstock stationary while utilizing a liquid percolate to move the methanogenic microorganism throughout the material. Input material is piled into airtight garage-like fermenters where percolate filters through the pile causing digestion to occur. The BIOFerm™ dry fermentation process is well suited for materials with a solids content of 25-35%. This includes food and yard waste, solid waste from agricultural operations like manure with straw bedding, and other solid organic waste materials.

BIOFerm™ System Advantages

- Best option for solid input materials
- Material remains stationary throughout the process, eliminating moving parts
- Batch process and stationary system allow precise control over substrate removal ensuring maximum energy yield
- Closed loop liquid cycle—liquid from digestion is re-circulated
- Virtually no pre-treatment or sorting of feedstock required prior to system loading, saving time and money for system operators
- Low system maintenance and repair costs
- Low parasitic energy consumption of 5-10%

- 1 Biomass Storage
- 2 Mixing Platform
- 3 Fermentation Chamber
- 4 Flexible Gas Storage
- 5 Biogas Boiler
- 6 CHP
- 7 Electric Grid Connection
- 8 To District Heating

Technical Components

- Gastight concrete fermentation chambers with hydronic floor heating
- Percolate storage tank with hydronic floor and wall heating
- Percolate distribution system with individually adjustable spray nozzles, percolate pump and Rota-Cut
- Flexible gas storage container with gas dehumidification and desulfurization
- Enclosed mixing lobby with feedstock storage space (both optional)
- Biofilter to eliminate pollutants and odors from mixing lobby (optional)



Municipal Applications

Dry AD and Composting

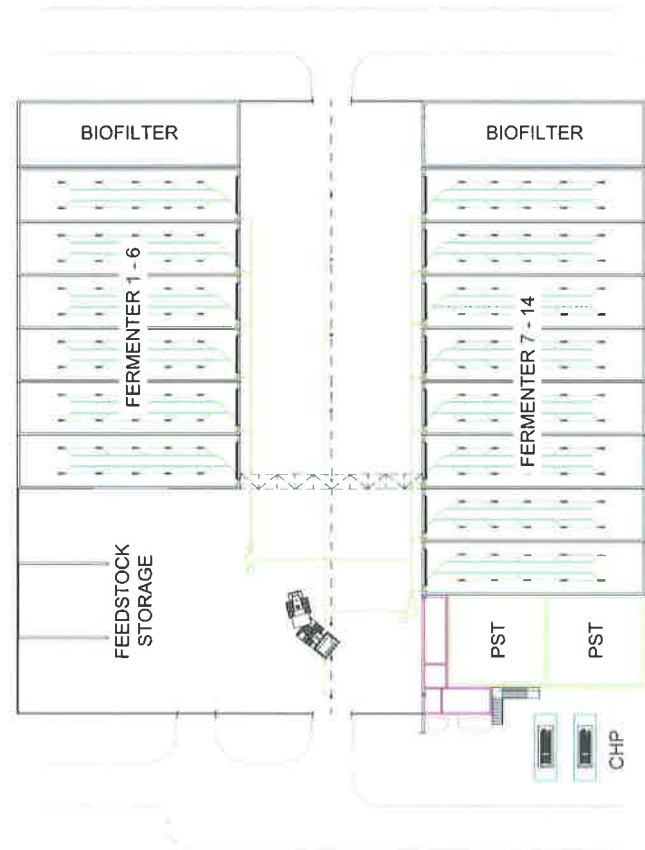
Municipalities can decrease their volume of landfilled waste and generate profits by implementing a BIOFerm™ dry fermentation system to create biogas. By using anaerobic digestion (AD) in a dry fermentation system, municipalities can capture renewable energy in the form of biogas. This energy can be used to generate additional revenue or offset the energy use of an existing composting facility. Utilizing AD provides numerous environmental benefits that serve to further the municipality's sustainability goals.

Waste Treatment and Odor Control

BIOFerm™ dry fermentation can be implemented to treat food and yard waste from municipal collection. The input material does not need to be screened or chopped prior to digestion which keeps operating costs low. It makes residential organics collection possible as contaminants do not pose a significant problem for the plant system. The enclosed building with odor management systems keeps food waste smells from escaping into the environment.

Seamless Integration with Composting

The system integrates seamlessly into a composting facility. After the dry fermentation process, the residual organic material becomes a feedstock for aerobic composting. The material is in an advanced stage of decomposition, requiring less time to complete composting. It also has a significantly reduced volume (up to 40%) which allows the composting facility to process a higher total amount of organic waste. The anaerobic process cuts down the overall processing time and increases the overall process capacity of a plant.



Organic Input (tons)	Number of Fermenters	Biogas Production (million scf)	Installed Electrical Capacity (kW)
8,000	4	24	300
20,000	8	60	760
50,000	16	150	1,900
70,000	24	210	2,600