ANAEROBIC DIGESTION

Wet organic waste to energy

Anaerobic digestion involves the breakdown of organic waste by bacteria in an oxygen-free environment. It is commonly used as a waste treatment process but also produces a methane-rich biogas which can be used to generate heat and/or electricity.

Anaerobic digstion equipment consists, in simple terms, of a heated digester tank, a gas holder to store the biogas, and a gas-burning engine/generator set, if electricity is to be produced. The organic waste is broken down in the tank and up to 60% of this waste is converted into biogas; the rate of breakdown depends on the nature of the waste and the operating temperature. The biogas has a calorific value of typically between 50% and 70% that of natural gas and can be combusted directly in modified natural gas boilers or used to run internal combustion engines.

The Organics anaerobic digestion system has been designed to be both high-rate and with an ability to manage refractory solids.

KEY FEATURES

HIGH-RATE ANAEROBIC DIGESTION EMPLOYING PROPRIETARY TECHNOLOGY

WASTE REDUCTION AND ENERGY RECOVERY

FERTILISER AND COMPOST BY-PRODUCTS

OPTIONS FOR VENDOR FINANCED OWNERSHIP AND OPERATION

ISO 9001
REGISTERED FIRM

ADVANTAGES

- Well proven technology that can be installed and run with confidence
- Production of biogas without creation of issues related to air pollution
- Odour and nuisance control
- Waste minimisation; final repository volume maximisation
- Social net benefit by avoiding greenhouse gas release and production of renewable energy
- Relatively low technology that does not require sophisticated control and management to be operated successfully
- Commercial by-product formation in the form of fertiliser, compost, ammonia and electricity

HOW IT WORKS

The digestion process takes place in a warmed, sealed airless container (the digester) which creates the ideal conditions for the bacteria to ferment the organic material in oxygen-free conditions.

The digestion tank needs to be warmed and mixed thoroughly to create the ideal conditions for the bacteria to convert organic matter into biogas (a mixture of carbon dioxide, methane and small amounts of other gases).

The process of anaerobic digestion (AD) consists of three steps:

The first step is the decomposition (hydrolysis) of plant or animal matter. This step breaks down the organic material to usable-sized molecules such as sugar.

The second step is the conversion of decomposed matter to organic acids.

Finally, the acids are converted to methane gas.

Process temperature affects the rate of digestion and should be maintained in the mesophillic range (30°C to 35°C - 86°F to 95°F). It is possible to operate in the thermophillic range (approx. 55°C - 131°F) but the digestion process at this temperature is subject to upset if not closely monitored.

ATTRIBUTES

Reduce greenhouse gases
Methane is a major greenhouse gas if it escapes to the atmosphere. Current disposal practices for slurry and food residues cause methane to be released through natural processes. AD exploits this process so that the gas can be used as a fuel. A well-managed AD scheme will aim to maximise methane generation, but not release any gas to the atmosphere, thereby reducing overall emissions.

Energy production
AD provides an energy source with no net increase in atmospheric carbon. Using fossil fuels for energy production creates carbon dioxide which causes climate change, resulting in a warming of the planet. By replacing energy from fossil fuels, AD can help reduce overall quantities of carbon dioxide in the atmosphere and reduce dangers of climate change.

Displace use of finite fossil fuels
The feedstock for AD is a renewable resource, and does not deplete finite fossil fuels. Energy generated through this process can help reduce the demand for fossil fuels (if used to replace energy from fossil fuels). The use of the fibre and liquor as a contribution to fertiliser regimes can in turn reduce fossil fuel consumption in the production of synthetic fertiliser.

Recycle nutrients
AD products (liquid fertiliser and fibre), if correctly applied, can reduce the need for synthetic fertilisers within an overall fertiliser programme.

Reduce land and water pollution
Poor disposal of animal slurries can cause land and ground water pollution. AD creates an integrated management system which reduces the likelihood of this happening, and reduces the likelihood of fines being imposed for such pollution.

Reduce odour
AD can reduce the odour from farm slurries and food residues by up to 80%.

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