

Focus on anaerobic digestion



Enpure is a long established process contractor active in the water, wastewater, environment and waste markets. The company employs some 300 people.

Enpure is a leading UK supplier of anaerobic digestion plants. Over the past 15 years, the company has successfully undertaken many installations for the treatment of sludges, slurries and other wastes, with individual contract values of up to £25m.

Enpure has teamed up with BTA to offer the BTA Process® for anaerobic digestion of solid wastes.

What is anaerobic digestion?

Anaerobic digestion is the natural biological conversion of organic materials to methane and carbon dioxide. The process takes place in the absence of oxygen.

Pasteurisation

Sludge hygienisation can be readily coupled with the AD process. Waste heat from the CHP system, together with heat recovered from the digested material, is used to pre-heat the digester feed to 70°C where it is held for 60 minutes for compliance with Animal By-Products regulations. A significant pathogen kill results, allowing the treated material to be applied to farm land.

Product Drying

The dewatered product from the AD process can be safely dried using belt dryers. Enpure is the UK licensee for the Sevar Belt Dryer system from Germany and has installed several digestate systems in recent years.

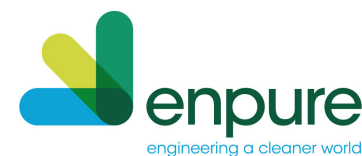
Why do we use it for waste treatment?

Anaerobic digestion is used to breakdown organic materials in wastes. The process takes place in sealed reactors which minimises the environmental impact. The biogas produced can be converted to thermal and electrical energy using a Combined Heat and Power system (CHP). Overall, the process is energy positive.

The stabilised digestate is of high quality and can be applied to land or further processed by thermal drying or composting.

Combined Heat and Power

The biogas from the AD process can be used in a CHP system. The power produced can be exported to the grid, earning ROCs if applicable. The heat produced is used for process heating in the AD and pasteurisation processes.



Enpure Limited
Enpure House
Woodgate Business Park
Kettleswood Drive
Birmingham
B32 3DB

Telephone : +44 (0)121 251 9000
Fax : +44 (0)121 251 9111
Email : sales@enpure.co.uk
Web : www.enpure.co.uk

The Anaerobic Digestion Process

Enpure has a proven anaerobic digestion system with many large installations in the UK, mainly treating sewage sludge. To enhance this digestion capability for the treatment of solid wastes Enpure has teamed up with BTA to offer the BTA Process[®]. This process combines the BTA wet pre-treatment system with anaerobic digestion and dewatering to provide an integrated solution for solid wastes. With many operating BTA Process[®] references around the world, BTA has a wealth of experience to offer and a demonstrable track record. The addition of the Enpure Enhance process for systems provides pasteurisation to meet EU and UK Animal Bi-Products regulations.

- ① Organic materials such as sewage sludge, pulped solid waste, agricultural or industrial waste is pumped into the pasteurisation unit through the inlet heat exchangers.
- ② The first inlet heat exchanger raises the temperature of the feed using heat recovered from cooling the pasteurised feed before it is fed to the digester.
- ③ The second inlet heat exchanger raises the temperature of the feed to the pasteurisation unit to 72°C using waste heat from the CHP system.
- ④ The pasteurisation unit comprises three stirred and insulated tanks that are operated on a batch basis. First a tank is filled over a period of an hour. Next the material is held in the tank for sixty minutes with the stirrer operating to eliminate cold spots, for example near the walls, and the temperature is monitored. Finally once the required temperature has been held for the required time and validated by the control system, the tank contents are fed forward to the next process. If the required time and temperature are not validated for any reason, the pasteurisation tank contents are returned to the feed holding tank and are re-processed.
- ⑤ The pasteurised material passes through a cooling heat exchanger which reduces the temperature to that required for the anaerobic digestion process and recovers the heat which is re-circulated to the first inlet heat exchanger. The cooled material is then fed to the anaerobic digester.

- ⑥ The anaerobic digester is a completely mixed stirred reactor where the biodegradable organic components of the organic material are converted largely to methane gas and carbon dioxide by hydrolytic, acidogenic and methanogenic bacteria. The reactor is insulated to minimise heat loss and continually mixed using biogas recirculation. The reactor is fitted with pressure and vacuum relief systems, temperature monitoring and control and a foam suppression system. The processing time in the anaerobic digester is typically in the range of 15 to 18 days.

- ⑦ The digested material, or digestate, is fed to a centrifuge, which separates the digestate into a high solids cake for further processing or disposal, and a liquid centrate which is recirculated for waste pulping in the case of solid waste digestion, or is treated prior to disposal, according to the application.

- ⑧ Biogas produced in the anaerobic digester is fed via flame traps and condensate drains to a low pressure gas holder for balancing storage prior to use.

- ⑨ The main use for the biogas is to generate electricity and heat in a Combined Heat and Power (CHP) system. The electricity can be exported to the grid and can earn Renewable Obligation Certificates (ROCs) from suitable materials. The heat is used to heat the pasteurisation and digestion processes and any surplus waste heat can be used for space heating.

- ⑩ A safety waste gas destructor is fitted. This is used to safe combust any surplus biogas, for example if the CHP system is being services, etc.



Completed Projects

These images show a few of the successfully completed projects using the Enpure Anaerobic Digestion Process.

- A Cumnock STC for West of Scotland Water
- B Loughborough STC for Severn Trent Water
- C Pyewipe STC for Anglian Water
- D Millbrook STC for Southern Water
- E Lowestoft WwTW for Anglian Water
- F Bromborough WwTW for North West Water

A B C
D E F

