HYDROFLUX epco

BioCap®

Equipment for anaerobic digestion

Over 85 installations since 1961

The Hydroflux Epco Australia name has been synonymous with anaerobic digestion since the early 1960's.

There are over 85 Hydroflux Epco Australia digester installations throughout Australia and South-East Asia and we have accumulated a wealth of expertise in the design of equipment for anaerobic digestion.

Introduction

Anaerobic Digestion of Municipal Biosolids

Digestion of municipal biosolids plays a key role in the stabilisation of the sludge stream, to reduce pathogens with volatile suspended solids destruction and produce a biogas as part of the process. The overall volume of the sludge stream is also reduced.

The biogas is mostly comprised of methane and can be used for electricity generation.

Mesophillic digestion is the most common type of operating process which operates in between 32—35°C.

The digester typically comprises of a concrete reactor and gas holding roof. The roof provides gas storage and the mass of roof allows for uniform pressure.

Key to the process is mixing, and the most common methods include recirculation of the compressed methane gas, mechanical mixers and externally pump systems.

Design Configurations

Hydroflux Epco provides specific expertise in all parts of digestion equipment sizing and selection. We provide a one stop shop for complete systems as follows

- BioCap® Floating Digester Roofs
- BioCap® Fixed Digester Roofs
- BioCap® Roofs inclusive of pressure relief valves, flame arrestors, site ports and sediment traps
- External sludge heat exchanger system
- LanceMix® mixing systems with gas compressor
- External sludge mixing with internal nozzles
- FlareWell® gas flares
- Pre-treatment screening and thickening technology

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Key Features

- Extensive design expertise with over 85 installations
- Proven design with optimum mixing conditions within the digester with LanceMix® Gas Lance Mixing System and sequential operation
- LanceMix® mixing systems can be removed without loss of biogas
- Heavy Duty BioCap® roof construction for reliable operation and long life
- Proprietary range of ancillaries such as site glasses, cover roller system and sediment trap
- Strategic partnerships with key suppliers for the supply of pressure/vacuum relief valve, flame arrestors and sample hatch covers

Two Acid Phase BioCap® Fixed Roofs

References

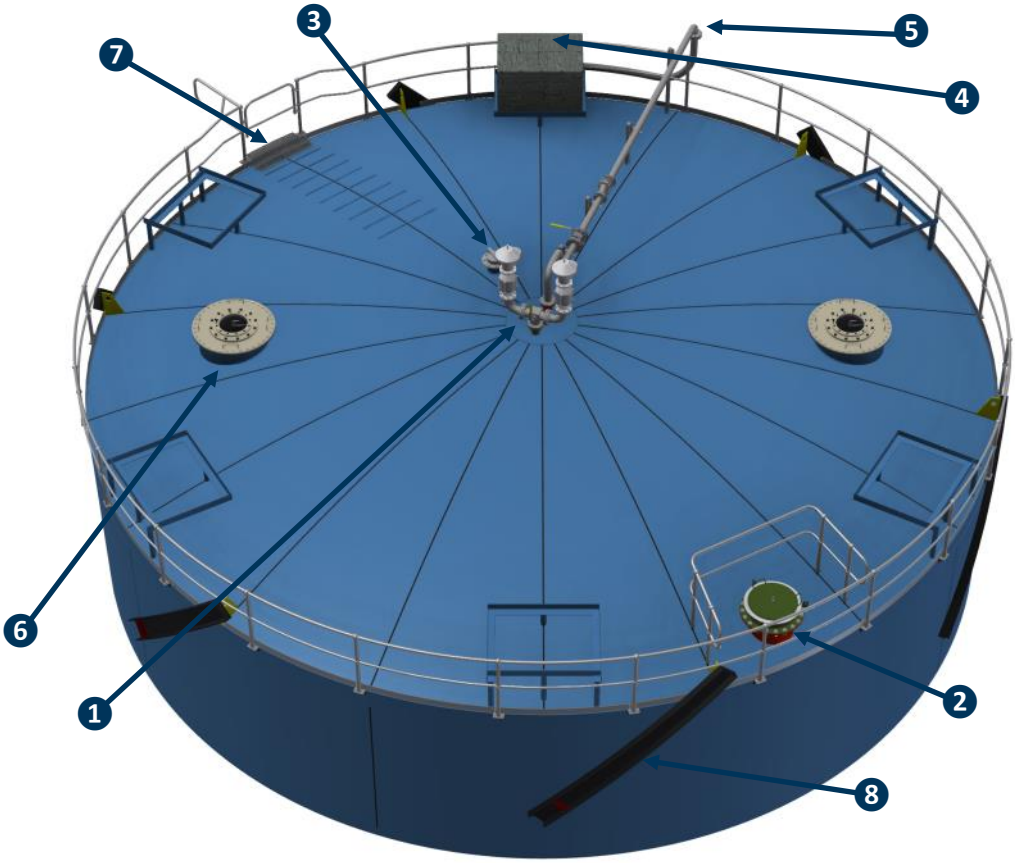
- Cessnock WWTP, NSW
  - 1 x 13M BioCap® Fixed Digester Cover
  - 1 x 150 kW Heater and Heat Exchanger

- Bird in Hand, SA
  - 1 x 9.5M BioCap® Floating Gas Cover
  - 2 x Heaters and Heat Exchangers
  - LanceMix® Gas Lance Mixing System

- West Camden STP, NSW
  - 2 x Fixed 4.5M BioCap® Gas Covers
  - 1 x 13M BioCap® Floating Gas Cover

- Luggage Pt STP, QLD
  - 6 x LanceMix® Gas Mixing Systems
  - 27m diameter Digesters

BioCap® System components



1 Pressure and Vacuum Breaker
Controlled Relief of maximum and minimum gas pressure events

2 Emergency Pressure Relief
Over pressure relief port for emergency management of over pressure events

3 Sampling Hatch
Sludge sampling point via lance into sludge bed

4 Concrete Ballast Blocks
Evenly distributed concrete ballast

5 Gas Outlet Pipe Flame Arrestor
Gas extraction for use in Biogas power generation

6 Manhole with Sight Port/Wiper
Inspection port for viewing internals of digester through cover

7 Access Way
Gated access way across top of cover

8 Roller Guide
Spiral design to prevent cover from jamming as it rises and falls

BioCap® Components

- **Digester Cover Site Glasses:** Doubles as a manhole for internal access and a site glass for regular inspection of the internal digester without entry. complete with a site glass wiper.
- **Emergency Relief Valve:** Its function is to vent in the case of an extreme over pressure event preventing catastrophic failure. Comprises a series of calibrated weights to allow a “reset” if activated.
- **Pressure and Vacuum Relief:** Designed to manage pressure or vacuum events without damaging equipment on the cover. Both are mounted on a common assembly at the highest point of the cover to maximise gas relief.
- **Inspection Hatch:** The sludge inspection hatch is mounted on the top of the sludge sampling lance. The sampling lance is a DN200 tube extending into the sludge bed to enable regular sampling of digesting sludge.

BioCap® Components

- **LanceMix®:** Provides mixing between the active biomass and the incoming feed. The net result is improved sludge digestion increasing gas production.

- **Sludge Heat Exchangers:** Maintains the digester at approximately 35°C. The spiral design reduces the potential of fouling within the tubes, eliminating blockage and is simple to operate.

- **FlareWell®:** Designed to burn excess gas not used. The system is provided with a constant “on” pilot light complete with Flue and automatic gas management fittings and valves.

- **Sediment Trap:** The Hydroflux sediment trap unit is designed to capture excess moisture and debris in the outcoming gas line from the digester.

Build Specification

The BioCap® is designed as a turnkey installation customised to each client's sludge handling needs. The units are made locally by approved fabrication subcontractors and transplanted to site for final fabrication, protective coating and assembly in to reduce site works and transport logistics.

The following table summarises the major components and their materials. Variations on the material specification can be made, please consult Hydroflux Epco for further detail.

SECTION	SPECIFICATION
BioCap®	Epoxy coacted mild steel, double lined skin with
LanceMix® pipe work	GR316 stainless steel
Vents, regulators and relief	Groth Corp or equivalent
Site glass and man hole	Mild steel hot dip galvanised frame, brass fittings and wiper mechanism
Gas compressors	Liquid ring gas compressor
Heat exchanger	GR316 stainless steel
FlareWell® and pipework	GR316 stainless steel

Digester Ancillary Equipment

- **HUBER Strainpress®:** Screens primary and secondary sludge prior to the anaerobic digester. Fine screenings, fibre and cotton bud sticks are removed. Maintains a clean digester for optimum operating conditions.
- **HUBER Rotary Screw Thickeners :** Thickens primary and secondary sludge to 6%dry solids or greater, to enhance the anaerobic digestion process and to produce high gas volumes. Suitable for recuperative thickening.
- **HUBER QPRESS®:** Dewatering of sludge for offsite biosolids reuse. High performance as per centrifuges but with 90% less power. Low maintenance due to 0.6RPM internal speed.
- **AirPrex®:** Removes struvite from the sludge stream post digestion prior to dewatering. Recover struvite as a fertiliser and results in 2 – 4% higher dry solids in dewatering process.

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Hydroflux EPCO is GRS Certified to the following standards

ISO 45001 SAFETY MANAGEMENT SYSTEM

GRS CERTIFIED SYSTEM ISO 45001: 2018

Certificate Number: 4774801610007

ISO 14001 ENVIRONMENTAL MANAGEMENT SYSTEM

GRS CERTIFIED SYSTEM ISO 14001: 2015

Certificate Number: 47714001610007

ISO 9001 QUALITY MANAGEMENT SYSTEM

GRS CERTIFIED SYSTEM ISO 9001: 2015

Certificate Number: 4779001610007

ISO 31000 RISK MANAGEMENT SYSTEMS

GRS CERTIFIED SYSTEM ISO 31000: 2018

Certificate Number: 477310006176001