



Anaerobic Digestion Plant - Case Study



Case Study Information

Customer	Anaerobic Digestion Plant & Processing Facility
Location	UK

Equipment Supplied:

1 x PT-100/15 - Heavy Duty Peristaltic Pump

Application	Organic Waste Sludge Pump w/ Abrasive Solids in Suspension (25-30%)
Capacity	30 m ³ /h @ 3 Bar Max
Required Suction Lift	4-5m
Existing Pipe Size	150mm
Max Viscosity	8000 cPs
Inlet/Outlet Connections	DN100/PN16 Stainless Steel Flanges
Geared Motor	15 kW / 1500 rpm / 400-690V / 3 Phase / 50 Hz / IP55/ Class F
Body, Wheel, Pressing Shoes	Ductile Cast Iron GGG40

PT-100-VAC Air Operated Vacuum System

1 x 15 kW Variable Frequency Drive & Sinusoidal Wave Filter

1 x Customised Automatic Reversing Function

Enquiry:

- ✓ An Anaerobic Digestion Plant and Processing Facility called Castle Pumps to assess the problems they were having with their existing immersible, progressive cavity, digestate transfer pump and installation, and could we recommend a suitable alternative and provide recommendations to optimise the installation to improve their efficiency.

The client was experiencing persistent problems with their existing pump clogging, running dry and failing to deliver the required capacities when at their heaviest solids load. Their pump would run for 3 minutes max before cutting out, drawing air and no fluid upon initial testing and commissioning. Furthermore, as their existing pump was an immersible pump, over 5 meters in length, the client was required to hire a crane to lift the pump out of its chamber to do any inspection, maintenance or repair work on the rotating assembly.

Solution:

- ✓ Further to Castle Pump's initial site visit and report on their existing set-up, we recommended the customer replace their existing pump with a peristaltic pump. These Organic Waste Sludge Pumps have several unique features which were perfect in solving our client's problems.

1. Can run dry indefinitely, eliminating any problems caused by blockages in the suction or delivery pipework.
2. Excellent at handling both water like substances as well as slurries, so they are perfect for digestate transfer.
3. Can perform suction lifts of up to 9.8 m vertically, so we were able to fit the pump to the top of the tank and suck straight out of it, therefore avoiding the need to hire a crane during routine maintenance or repair.
4. Only wearing part is the hose, so maintenance costs and down time are kept to a minimum.
5. The pump can be run in both directions - a feature we cleverly used to our advantage by installing an automatic reversing function, which operates for 30 seconds before every start up to blast any blockages caused by the settlement of the suspended solids in between operating hours, in both the suction and delivery pipework.

By over sizing the pump we were able to reduce the running speed of the pump and therefore the wear on the hose, extending its life and reducing the maintenance costs. Furthermore, another advantage of over sizing the pump meant we could fit a variable frequency driven (VFD) to the unit, so the client could vary the flow rate to cater for both varying solids loads and increased production requirements.



Castle Pumps also provided the customer with:

- ✓ Various 4" Suction & Delivery Hosing and Customised Fittings for PT-100/15 Peristaltic Pump
- ✓ 2 x 4" Expansion Bellows, Carbon Steel Flanges & EPDM Moulded Rubber Belows
- ✓ 2 x Expansion Bellows
- ✓ 1 x Multi-Flanged Wafer Pattern Butterfly Valve - EPDM Liner

Size: 4" to fit PN6/10/16, ANSI 150, Table D & E Flanges

Temperature Range: -10°C to 120°C

Body: Epoxy Coated Ductile Iron

Disc: Stainless Steel 316

Liner: EPDM

Shaft: Stainless Steel

Washer: Galvanised Carbon Steel

Circlip ISO 3075: Steel

O-Ring: Viton

Lever: Aluminium

Bolts: Galvanised Carbon Steel



As well as:

- ✓ 2 x Multi-Flanged Wafer Pattern Butterfly Valve - EPDM Liner

Size: 6" to fit PN6/10/16, ANSI 150, Table D & E Flanges

Temperature Range: -10°C to 120°C

Body: Epoxy Coated Ductile Iron

Disc: Stainless Steel 316

Liner: EPDM

Shaft: Stainless Steel

Washer: Galvanised Carbon Steel

Circlip ISO 3075: Steel

O-Ring: Viton

Lever: Aluminium

Bolts: Galvanised Carbon Steel

