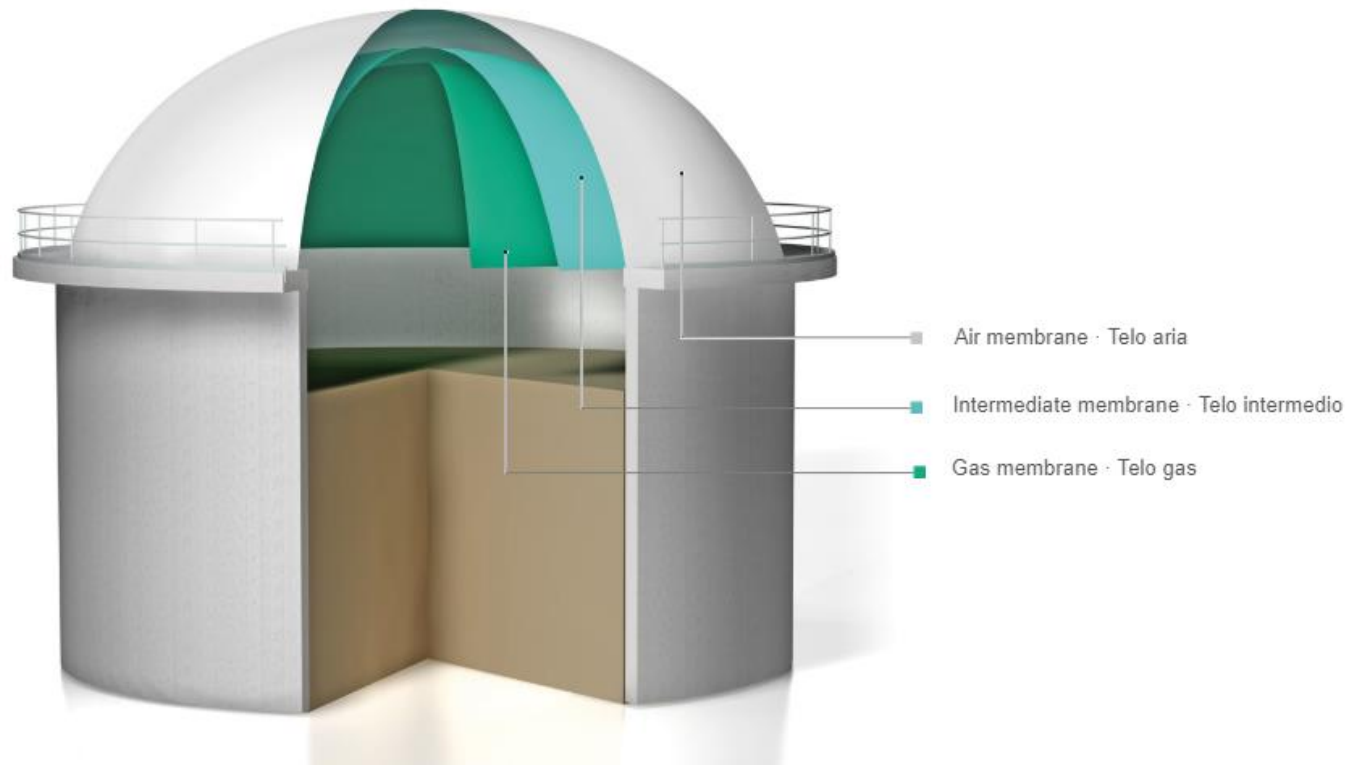




CUPOLA M3 Gasholder Dome



- ▶ The CUPOLA M3 domes are used in industrial and municipal WWTP plants. They install quickly and can be manufactured with different quality of materials and shapes to suit the needs of the customers. Special high pressure covers can be manufactured with reinforced membranes and oversized welding.

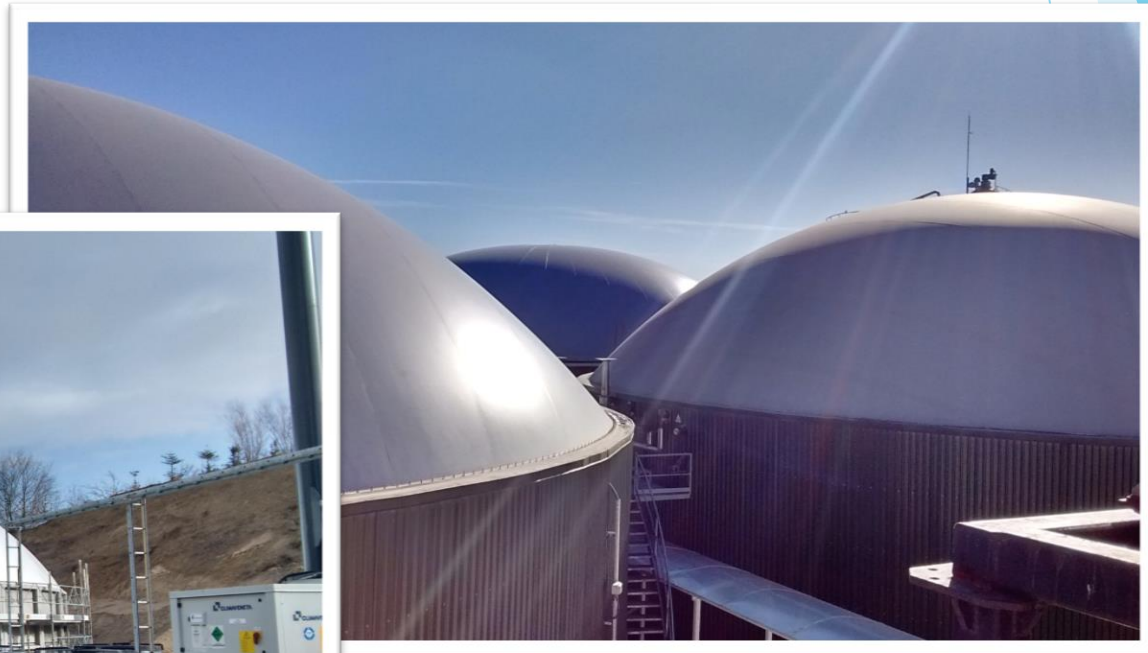
- ▶ Three membrane constant-pressure domes are designed to store biogas coming directly from anaerobic digestion of organic waste and sludge. They are manufactured with biogas resistant polyester reinforced PVC membranes seam welded by high frequency electronic machines. The welding of the internal membrane is made adding an Eco-Safe layer of pure PVC that stops every porosity of the fibres to the biogas.



- ▶ The CUPOLA M3 domes are used to replace old steel gas holder domes, existing in present waste water treatment plants. Storage volumes can be maintained or increased and installation takes approximately one week to complete, while reducing replacement and maintenance costs.



- ▶ The exclusive CUPOLA M3 system is designed to form an upper air chamber that gives a pneumatic push on the biogas chamber, which keeps the biogas chamber at a prefixed and constant positive pressure. The two chambers are divided from each other by a double membrane layer that ensures complete safety against the formation of a dangerous air and gas mixture.



MAIN FEATURES

▶ High Safety Level:

Ecomembrane's PATENTED 3 membrane system negates any possibility of a gas and air explosive mix because the biogas chamber is completely divided from the air compensation chamber. Any possible leakage from the gas membrane will be directly pushed outside through special fitting passages that allow the natural gas discharge.



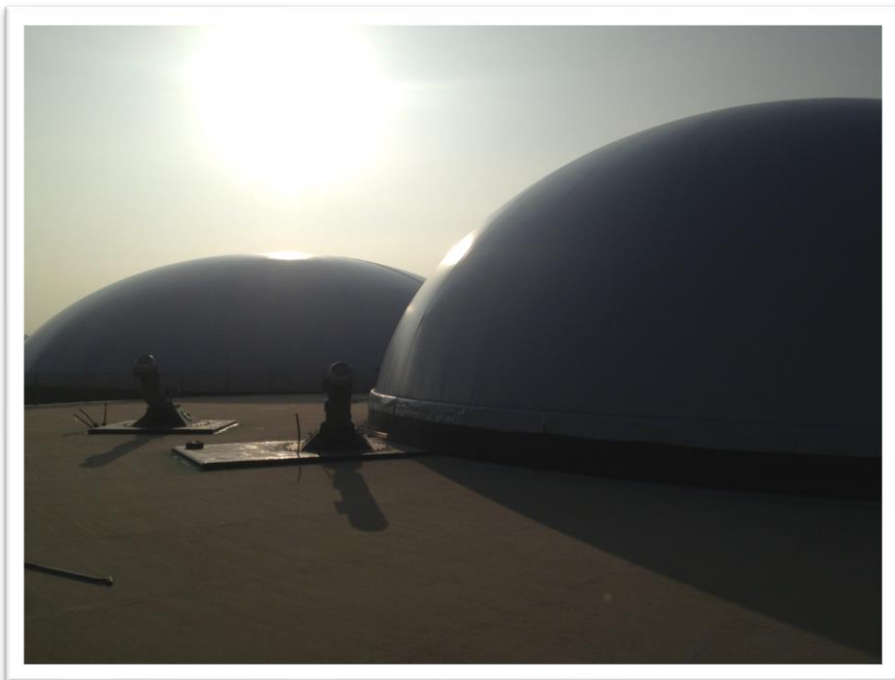
► **Low Energy Consumption:**

The compensation air blower only operates when the biogas is being used from the gasholder and switches off when the gasholder is filling. The air blower is controlled by a pressure sensor and an air valve is fitted to the air chamber and set to limit the maximum operating pressure ensuring constant pressure of the biogas throughout the filling and emptying cycle.



► **Long Life:**

3MASTER gasholder domes are UV resistant and designed to withstand substantial wind and snow loadings. The internal membrane is biogas tight. Three membrane constant-pressure gasholders are designed to store biogas made from anaerobic digestion of organic waste and sludge. They are manufactured with biogas resistant polyester reinforced PVC membranes seam welded by high frequency electronic machines. The welding of the internal membrane is made adding an Eco-Safe layer of pure PVC that stops every porosity of the fibres to the biogas



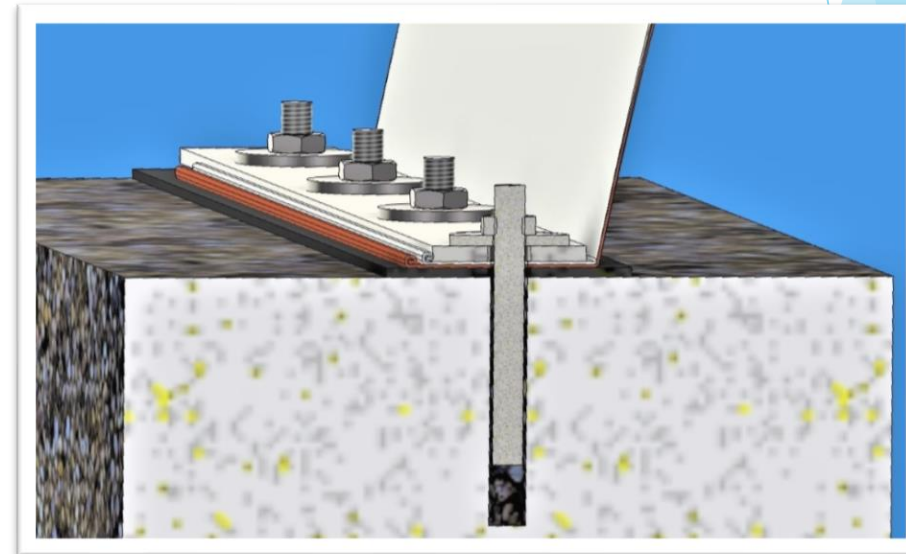
MAIN COMPONENTS

► Anchorage System:

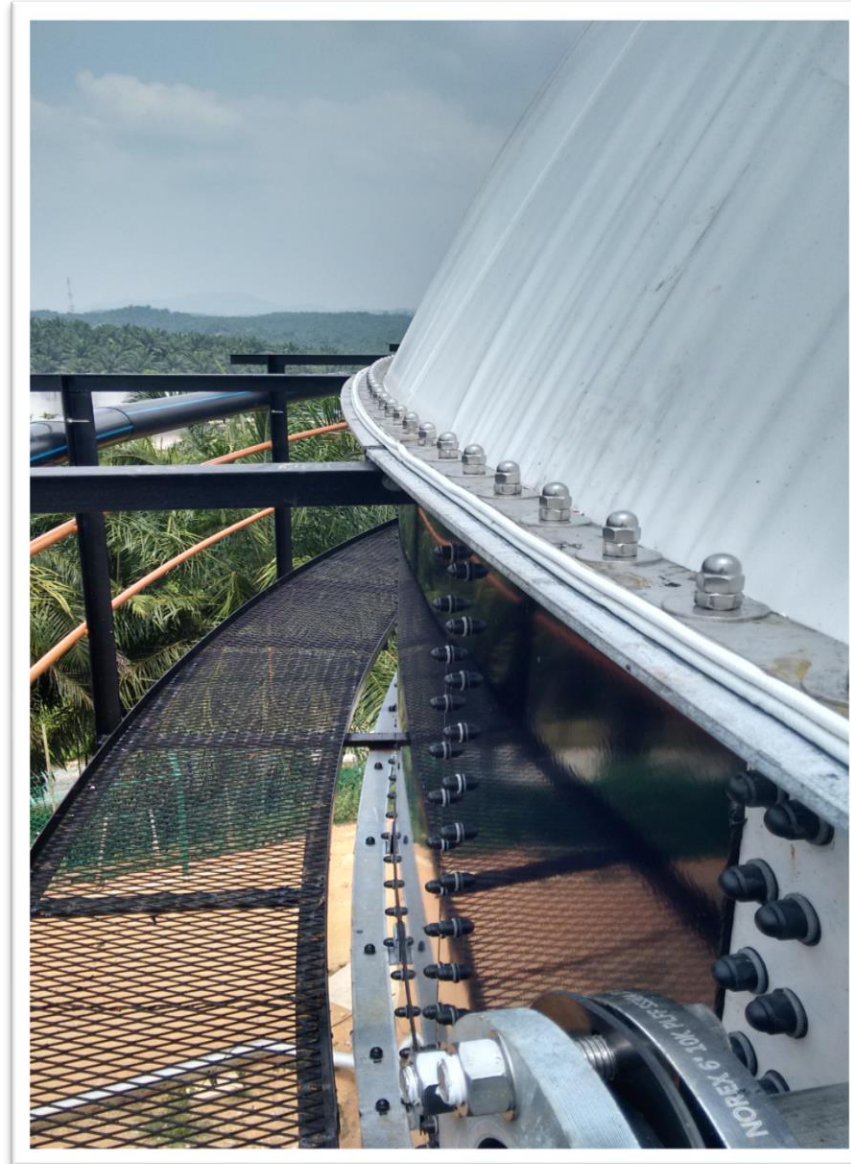
Our anchorage system is made in house with specially designed stainless steel anchoring plates that together with the action of the anchoring bolts manufactured by Hilti keep the membrane fixed on the ground concrete slab.

This well proven system with hundreds of installations done is able to keep the stresses acting from the membrane in any weather and pressure scenario.

To achieve the perfect gas sealing there are special butyl made gaskets and silicon sealant that secure the gas tightness on the perimeter of the gasholder.



- ▶ In case of steel tanks there will be simple anchoring bolts.



► **Centrifugal Air Fans:**

Our air fans are carefully selected only from the best suppliers and only in EX class execution.

The air flow is chosen to secure the perfect gas pressurization while also keeping washed the air volume between the gas and the outer membrane to reduce the risk of minimal gas mixtures.

They are furnished always with stainless steel made check valve that secures the maintenance of the pressure for enough time even during temporary power shut off.



▶ **Air Pressure Control Valves:**

Our air valves have been designed and utilized by Ecomembrane since 20 years to be able to achieve the best performances available for our specific work on the membrane gasholders.

In fact they present the following features and relative advantages compared with the standard weighted clapet-style valves used by our competitors.

They are directly attached to the external air membrane avoiding the use of any flexible pipe that could cause pressure drops and even break after some time.

The valve is totally covered by a aluminum box that protects the air flux from the action of wind, snow and icing that in the other models can change the working pressure of the gasholders.

The system use an Ecomembrane designed unique mechanism that with the use of leverages ensures the increment of the sensibility of the air valve to the pressure changes letting an enhanced control of the flows with the possibility to regulate the working pressure from 3 to 50 mbar without changing the valve.

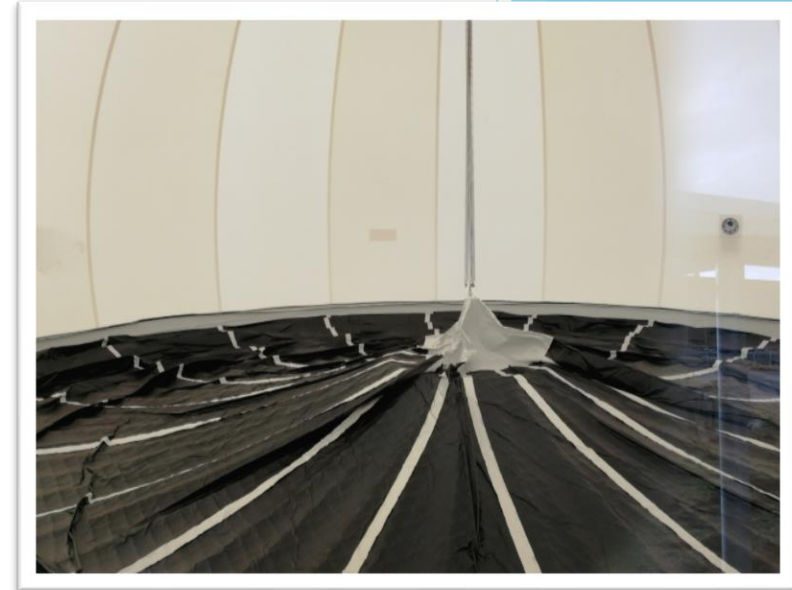


► **Level Sensor 4-20 mA:**

Our patented level sensor system is the only one that ensures the following two main goals:

- 1) achieving a constant and reliable level signal independently from the shape variabilities of the gas membrane during the filling-emptying cycles.
- 2) controlling the shape of the gas membrane to secure the complete usage of the geometrical volume of gas storage.

Our system control and diminish the weight of the top center part of the gas membrane letting it drive the direction of filling. In other terms with the aid of the special Ecomembrane level sensor the center top of the gas membrane will be the first part to rise up during filling time and the last one to go down during depleting time. In this way all the volume stored inside the gas membrane will be usable for the clients. In all the competitor's products the volume usage can reach no more than the 80% of the stored volume due to different level sensors.



► **Overpressure and Anti-Vacuum Valves:**

Ecomembrane produces his own biogas controlling valves. They are available in two working principles:

- 1) Pure hydraulic safety overpressure gas valves
- 2) Water sealed mechanical safety overpressure valves

The anti-vacuum valve is available only in the water sealed mechanical model.

All our valves are made in stainless steel and have an automatic refill system that ensures the reduction of the maintenance time of the end user.



► **Special Shape for Balconies Location:**

Ecomembrane is able to design and realize its own membranes in order to be adapted to any kind of balcony for human access box located on the perimeter of the digester and equipped with mixers and accessories for sewage or gas management.



- ▶ Based on customer requirements, Ecomembrane suggests the most appropriate form for membrane integration in order to not create stress on any of the surfaces. Ecomembrane is also skilled of studying and manufacturing dedicated stainless-steel balconies and supports so as to fully respond to the customer's accessibility requirements.

