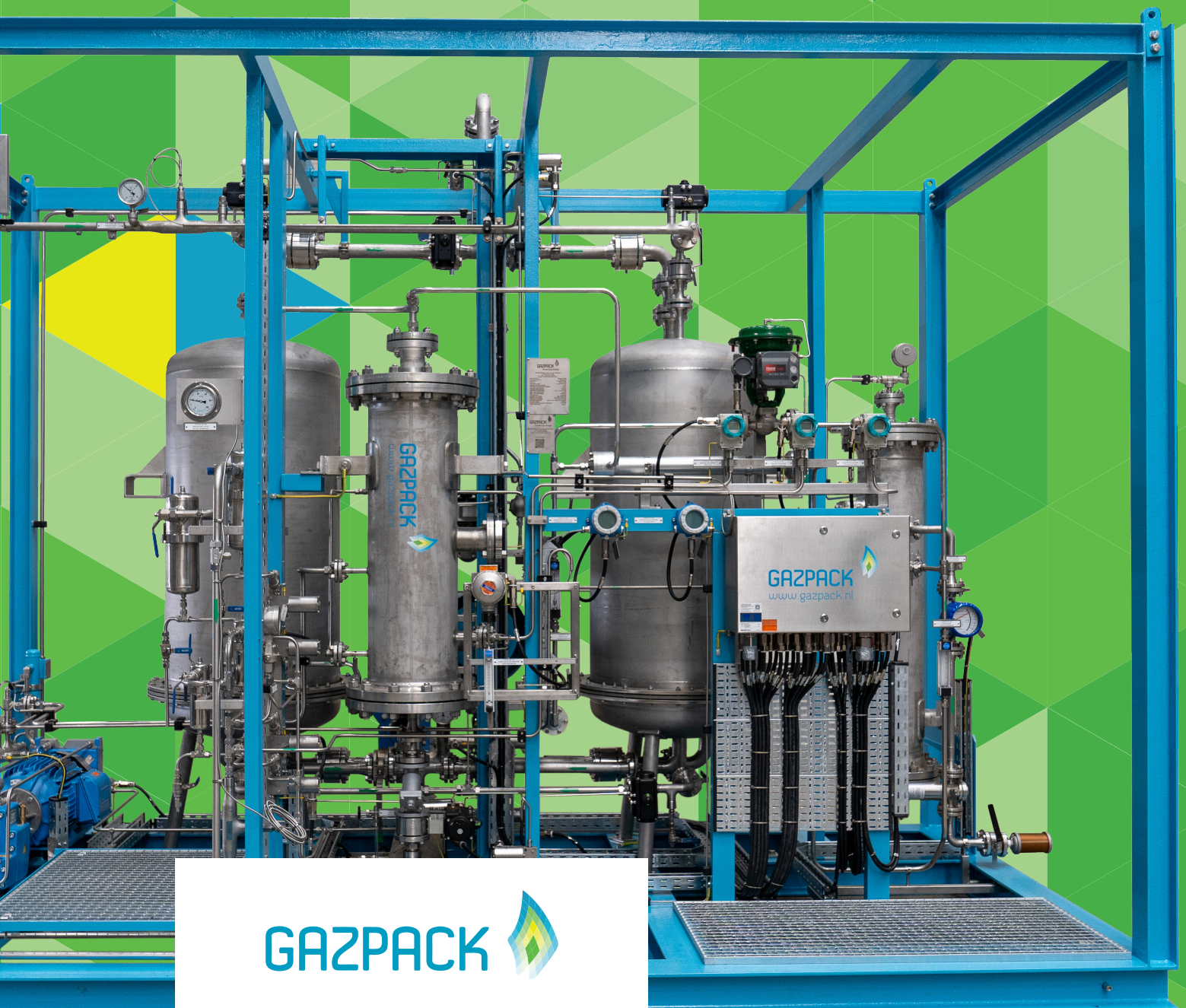
Custom made biogas upgrading solutions



GAZPACK

About and history

The main questions “How to reduce flaring?” and “How to convert oil gas into a usable gas?” led Mr. JP Warnar to found Gazpack in 2006. It started as a research division of Airpack Nederland BV. After years of extensive testing, together with the best universities The Netherlands has to offer, a revolutionary desulphurization method was developed. Biogas turned out to be very similar in composition to oil gas, making it the perfect alternative to pilot-test all of Gazpack’s products. It appeared to be a promising industry in which to market our packages. Our packages are designed entirely according to our client’s specifications and requirements. They are completely interconnected, cabled, programmed, and ready on arrival at the site with minimal start-up time.

Our extensive in-house expertise allows us to engineer and manufacture our packages with a unique customization level to suit the client’s expectations. We support our products with a wide range of after-sales services, such as start-up and commissioning, troubleshooting, spare parts, and overhauling services.

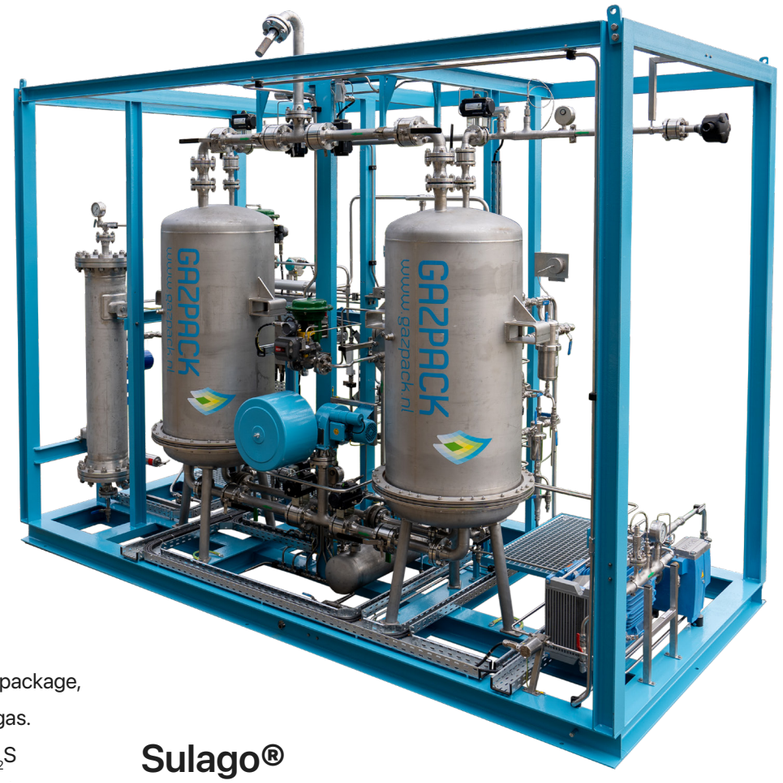
Gazpack systems

Sulago system

The SULAGO® system is specifically engineered to efficiently manage capacities ranging from 20 to 1500 Nm^3/h. The system effectively eliminates H_2S and/or SO_2 by employing SULAFER®

Sulafer, removal H_2S

SULAFER® is a key component of the SULAGO® package, designed to remove H_2S and siloxanes from (bio)gas. SULAFER®, an iron-based absorbent, converts H_2S into elementary sulfur, iron, and water. Once it reaches saturation, this absorption transformation renders a non-hazardous waste. SULAFER® is highly effective in reducing H_2S levels to below 1 ppmV. The SULAFER® regeneration capability enables continuous operation. The system requires two towers in the setup - one tower for absorption and the other for regeneration. Furthermore, SULAFER® generates no unpleasant odors. Repurposed uses include enhancing walkways and fertilizers. Notably, its capacity surpasses that of active carbon by tenfold.



Sulago®

Removal of	Inlet	Outlet
Carbon dioxide (CO_2)	80%	0,2%
Oxygen (O_2)	10%	0%
Sulfur dioxide (SO_2)	-	200 ppmV
Siloxanes	-	200 ppmV
Hydrogen sulfide (H_2S)	2500	< 1 ppmV
Water (H_2O)	saturated	0%

Sulaway system

The SULAWAY® system was originally designed to clean oil gas, yet it can also be applied to the biogas industry. SULAWAY® is capable of cleaning volumes of 1500 Nm^3/h and higher and gases with high H_2S levels.

The system is an innovative technical solution that eliminates chemicals for H_2S removal.

The Sulaway system employs an adsorption process to capture H_2S. It operates with two towers - one tower adsorbs the H_2S while the other undergoes regeneration. The regenerating tower is heated, using a closed-loop system until the H_2S condenses. A vacuum pump then extracts the condensed H_2S and directs it through a U-tube. Here, it is transformed into H_2SO_4, also known as battery acid, with a purity of around 40%.

Sulaway®

Removal of	Inlet	Outlet
Carbon dioxide (CO_2)	80%	0,2%
Oxygen (O_2)	10%	0%
Sulfur dioxide (SO_2)	-	200 ppmV
Siloxanes	-	200 ppmV
Hydrogen sulfide (H_2S)	4%	< 1 ppmV
Water (H_2O)	saturated	0%

Option for both systems

CO_2 seperation:
The clean gas, now free of H_2S, is subsequently sent to the membranes for CO_2 separation. The system utilizes membrane technology sourced from reputable suppliers in the industry, allowing Gazpack to guarantee a methane slip of no more than 0,5%, depending on the client's requirements. Gazpack prioritizes efficiency and cost-effectiveness when selecting brands for its systems, which ensures optimal performance. Additionally, the system can be customized to include full redundancy upon request. Furthermore, the separated CO_2 can also be captured for potential reuse or storage.

Siloxane removal :
Most biogas suppliers prefer a maximum siloxane level of 5 ppmV. Installing a pressure vessel containing SILOXgo downstream of the membranes is an effective method to achieve this.

References

Containerized Sulago system for the production of hydrogen

Sulago system

Location	United Kingdom	
Capacity	Max. 66Nm³/h	
Inlet gas composition	55% CH_4	4% N_2
	40% CO_2	410 ppmV H_2S
	1% H_2O	0,98 bar(a)
Outlet gas composition	92% CH_4	6,92 % N_2
	0% CO_2	<1 ppmV H_2S
	0,61% H_2O	10 bar(a)

Production of biomethane for the community

Sulago system

Location	Kenya	
Capacity	20 Nm³/h biogas	
Inlet gas composition	60% CH_4	40% CO_2
	1200 ppmV H_2S	
Outlet gas composition	95% CH_4	5% CO_2
	3 ppmV H_2S	10 bar(a)

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