

# Biogasclean **MBR** - removal of high H<sub>2</sub>S loads from biogas produced from molasses ethanol wastewater



## Key features of Biogasclean MBR (patent pending):

- The MBR (Moving Bed Reactor) is especially developed for biogas produced from waste waters with high organic loads (>130,000 mg/l COD) where the biogas has high H<sub>2</sub>S loads (10,000-30,000 ppm) in combination with low calorific values (50-55% CH<sub>4</sub>).
- Gas bubbles through liquid with MBR media. The raw biogas is – after injection of air - bubbled through the liquid containing the high-surface MBR media.
- H<sub>2</sub>S oxidized to elemental sulfur. Due to the continuously agitation of the liquid from the gas flow and the spray system the sulfur flakes float in the liquid until they are discharged with the effluent from the MBR tanks.
- Foam control. The foam produced by bubbling the gas through the liquid is controlled by injection of small amounts of palm oil based on online process parameters monitored by the PLC.
- MBR versus biological and chemical scrubbers: Lowest CAPEX and OPEX of any H<sub>2</sub>S removal technologies for biogas with 10-30,000 ppm H<sub>2</sub>S.

Plant: Power Solution Technologies (PSTC) Thailand

Capacity: 3,000 m<sup>3</sup>/h  
15,000 ppm H<sub>2</sub>S





Plant: Thai Roong Ruang Energy, Thailand

Capacity: 2,100 m<sup>3</sup>/h  
15,000 ppm H<sub>2</sub>S

	Biotrickling	MBR
Main process	H <sub>2</sub> S (gas) + 2 O <sub>2</sub> (gas) => H <sub>2</sub> SO <sub>4</sub> (liquid)	H <sub>2</sub> S (gas) + ½ O <sub>2</sub> (gas) => S (solid) + H <sub>2</sub> O (liquid)
Media type	Fixed bed	Moving bed
Tank volume	100%	25-30%
Service per tank	6-9 day/year	1-2 day/year
Initial start-up	48-72 hour	0.5-2 hour
O <sub>2</sub> consumption	100%	25%
O <sub>2</sub> after scrubber	1.5-2%	1%
CH <sub>4</sub> dilution	12-21%	7-8%
pH of effluent	1-3 (org. liquid pH 7)	7 (org. liquid pH 7)
Sulfur recovery	Not possible	Possible by means of sedimentation, cyclones or centrifuges
Gas pressure of outlet	Typically 10-30 mbar	Up to 150 mbar (no further compression needed)

### Biogasclean A/S

*Biogasclean is specialized in biological desulfurization and methanation of biogas without the use, of chemicals. We develop, manufacture and supply fully automated gas cleaning systems for H<sub>2</sub>S removal combining low operating costs with high availability. Our track record comprises more than 300 plants in operation or under construction in 40 countries. Biogasclean supplies clean gas to more than 650 MW gas engines and boilers and removes sulfur from more than 25 biogas upgrading plants for RNG production.*

**BIO**  
GASCLEAN | The key to innovative and  
efficient production of biogas

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