



**BIOthane**

# **Sulfothane™**

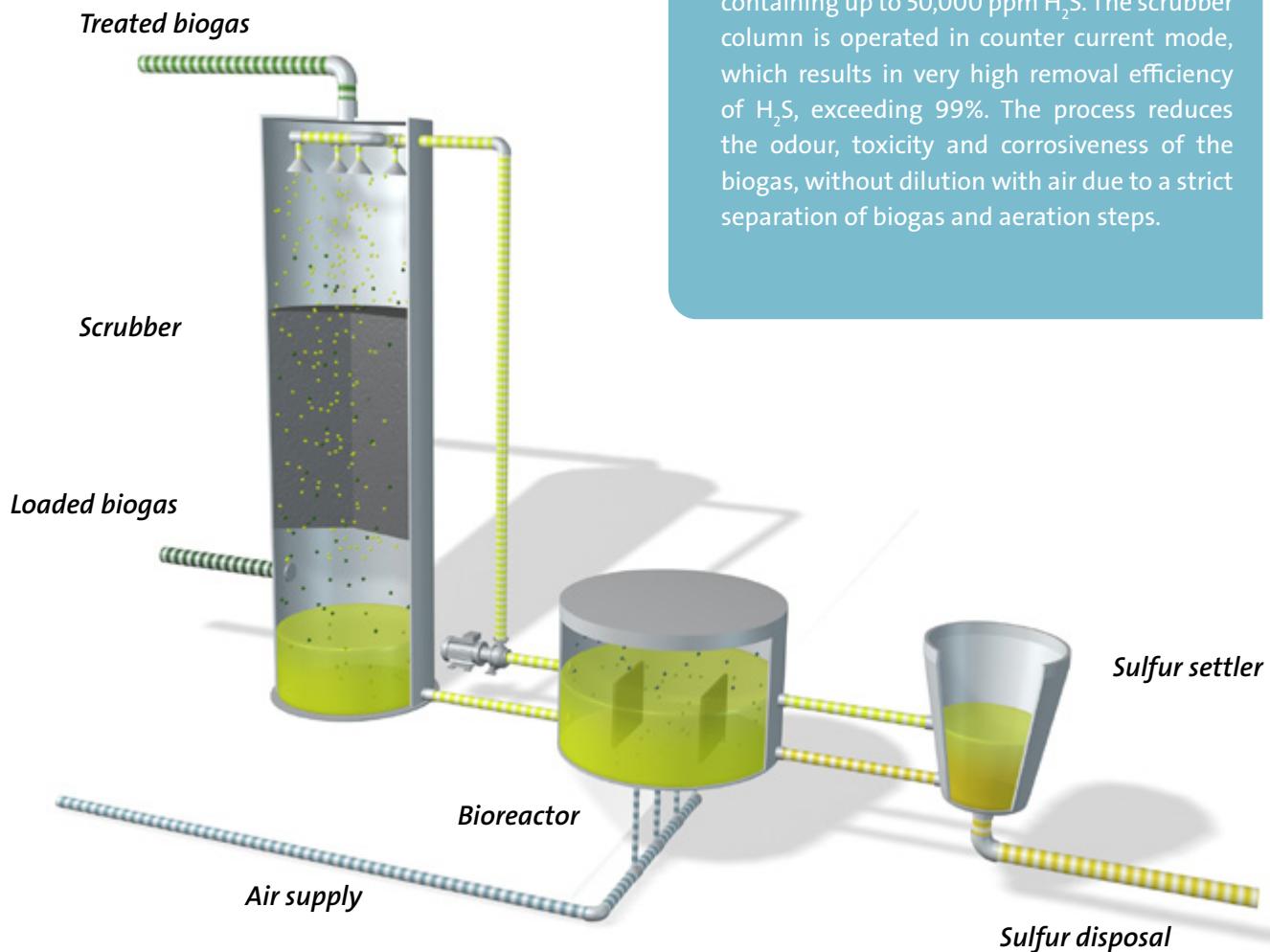
The easy way to utilize Biogas



by **VEOLIA**  
Water Technologies

**Biogas is a valuable renewable energy source receiving ever more attention. Biogas can be generated by the anaerobic treatment of industrial wastewaters, by the digestion of manure and other bio-wastes, and is released as landfill gas from covered landfill sites.**

Before the biogas can be utilized, it is essential to remove the sulphur compounds, which are mainly present in the biogas as sulphide ( $H_2S$ ). Sulphur can cause severe corrosion in boilers and engines utilizing biogas. Sulphur is an essential nutrient for living organisms, and is found for instance in proteins. During the production of biogas, the sulphur is converted biologically to  $H_2S$ . Biological processes can also be used to remove the  $H_2S$  from the biogas.



## Sulfothane™ process

■ The Sulfothane™ process consists of two steps. First it resembles a chemical alkaline scrubber for  $H_2S$ . Second the alkaline solution is continuously regenerated in a biological process using aerobic sulphur bacteria.

■ The first step consists of a scrubber column, in which the  $H_2S$  present in the biogas is transferred to the slightly alkaline (pH 8-9) washing liquid and is dissolved as sodium sulphide (NaHS):



■ In the second step the sodium sulphide is biologically oxidized to elemental sulphur. In this biological process the alkalinity of the washing liquid is regenerated:



■ Sulfothane™ uses a widely applied and well proven technology to treat gas streams containing up to 50,000 ppm  $H_2S$ . The scrubber column is operated in counter current mode, which results in very high removal efficiency of  $H_2S$ , exceeding 99%. The process reduces the odour, toxicity and corrosiveness of the biogas, without dilution with air due to a strict separation of biogas and aeration steps.

## Sulfothane™ standard units

The system is environmentally safe, has minimal power requirements and has a clogging free scrubber which needs almost no maintenance. The process operates at ambient temperature and pressure, and requires almost no chemicals since only the chemicals lost in the small sulphur bleed stream have to be replaced. The recovered sulphur can easily be disposed for sulphuric acid production or as a fertiliser.

Standard design units are offered for biogas flows ranging from 100 to 1500 Nm<sup>3</sup>/h and handling sulphur loads of 10 to 500 kgS/d. The units are factory tested and pre-commissioned and designed for easy transportation, installation and maintenance. All materials are selected in industrial standards for long life time and durability. For larger capacities multiple units can be placed in parallel or a tailor made design can be applied.



## Technical Specification

- > Very high H<sub>2</sub>S removal efficiencies > 99% and < 25 ppm H<sub>2</sub>S can be obtained
- > Removal of odour compounds
- > Ambient temperature and pressure
- > Automatically controlled
- > Robust and highly reliable; uptime > 98%



## Process Features

- > Clogging free scrubber so almost no maintenance (cleaning)
- > Very low operational costs
- > Elemental sulphur recovery
- > Short start-up time
- > No addition of air in biogas stream
- > Robust process, easily handling peak loads and fluctuating flows
- > Design based on various operating experience for industrial and municipal clients
- > Very compact and small footprint
- > No sulphide containing waste streams
- > Little operator time
- > Small requirements of caustic, water and nutrients
- > Units are pre-assembled and tested



