ClimateAdvanced® **Treatment**

Regenerative System for VOC and Siloxane Removal

Advanced Biogas Treatment Systems

In biogas plants, one of the main operational and maintenance challenges arises from high concentrations of volatile organic compounds (VOCs) and siloxanes present in biogas. These compounds can cause clogging or corrosion damage in biogas upgrading or cogeneration equipment. Traditionally, VOCs and siloxanes have been removed through activated carbon adsorption. However, for biogas streams with high concentrations of these impurities, activated carbon consumption is very high, resulting in elevated operational costs.

To provide a better solution, SUEZ AIR & CLIMATE, in collaboration with ANKA, has developed a thermally regenerable adsorption system with much lower operational costs compared to activated carbon.

ADVANTAGES AND BENEFITS OF THE SOLUTION

Lower operational costs compared to traditional activated carbon adsorption technology

No need to manage **the spent adsorbent medium** as hazardous waste

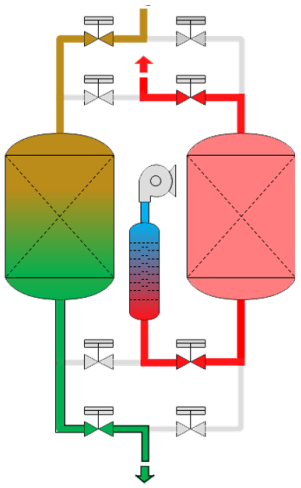
Extremely low-pressure drop, eliminating the need for additional gas compression

Easy **maintenance and operation**

DESCRIPTION OF THE TECHNOLOGY

The Regenerative Adsorption System (SRS) involves adsorption on a hydrophobic polymeric matrix that, at room temperature, is corrugated and capable of adsorbing contaminants. At high temperatures, it expands and can release them.

The system consists of two parallel filters operating sequentially. When one becomes saturated, the system automatically activates the other medium, and the saturated filter is regenerated using hot air. This allows the system to operate continuously during regeneration.



KEY FIGURES

90%
Removal **of volatile organic compounds (VOCs)**

99%
Removal of **siloxanes**

~165kWh
Electricity consumption during medium **regeneration**

<5mbar
Pressure loss

1 replacement
Annual adsorbent medium replacement

DESIGN AND EFFICIENCY DATA

The SRS system can remove up to 90% of VOCs and up to 99% of siloxanes from a biogas stream.

Key advantages of this system include:

- Adaptable to specific VOC subclasses
- Low operating costs as electrical energy is only consumed during the regeneration of the medium
- Low-pressure loss
- Long saturation time: the system is typically designed for annual medium replacement
- In-situ regeneration without interruptions; the design typically allows for daily regeneration
- Guaranteed output performance

INDUSTRIAL APPLICATIONS

Regenerative chemical desulfurization is a widely used system in biogas production plants. The SUEZ AIR & CLIMATE – ANKA technology has over 15 references worldwide.

SRS systems are generally installed to treat biogas produced in waste treatment plants or landfills, where biogas with higher concentrations of VOCs and siloxanes is generated.

This system is versatile and can efficiently treat any biogas, regardless of its source, particularly those containing VOCs and siloxanes.

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