



SULFCAT[®]

Regenerative H₂S
Biogas Treatment System



SULFCAT[®] H₂S Removal

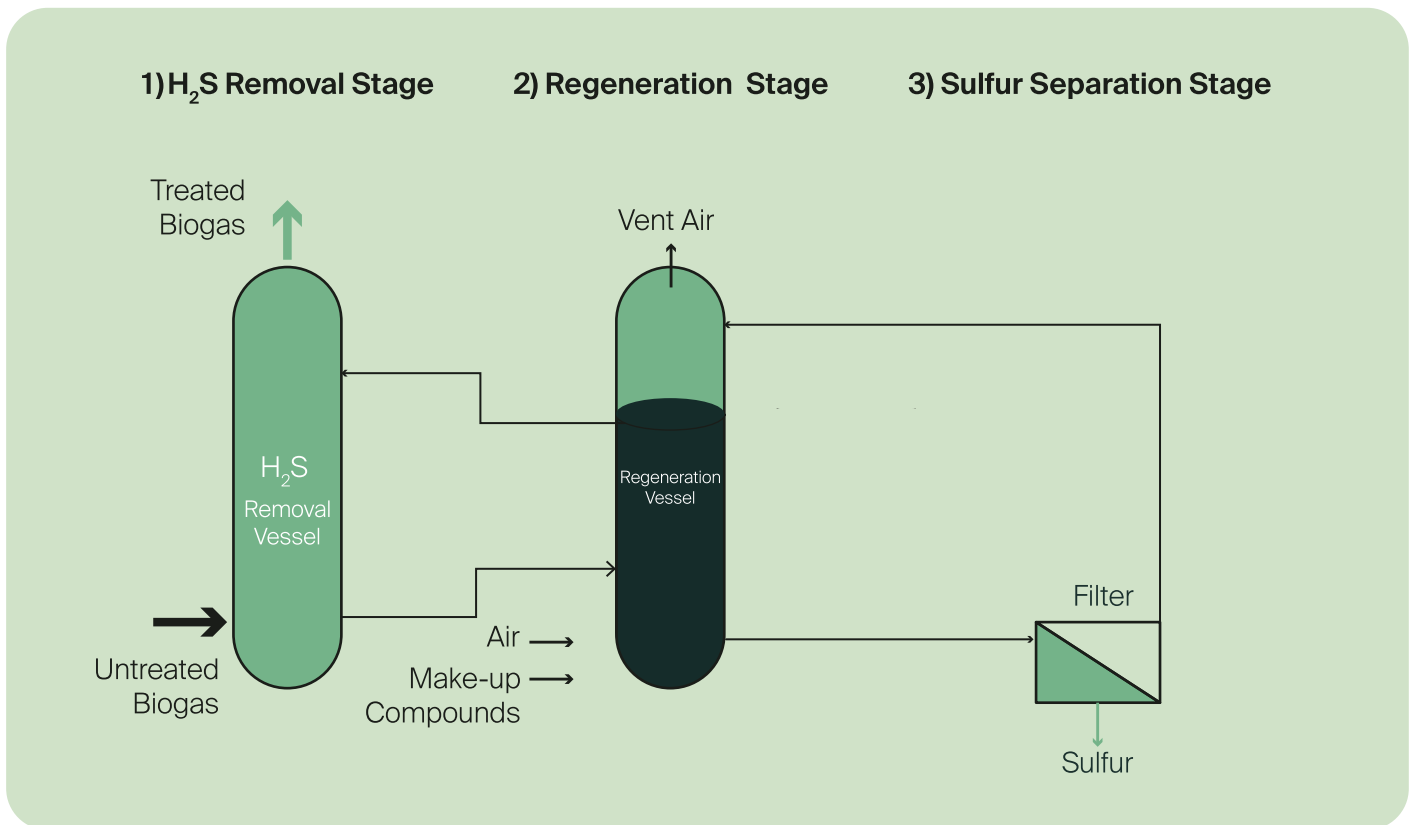
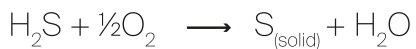
SULFCAT[®] represents a unique advancement in Hydrogen Sulfide (H₂S) treatment, offering a cost reduction of up to 90% for landfill gas and other biogas streams. This state-of-the-art technology is not only a crucial component in renewable natural gas (RNG) development but also a game-changer in environmental stewardship and operational efficiency.

Utilizing its regenerative, non-toxic reagent, FeRedox[™], SULFCAT achieves reliable reduction of H₂S to pipeline quality levels – an essential criterion for RNG projects. This innovative process significantly diminishes the reliance on expensive consumables common in traditional H₂S treatments, simultaneously creating a marketable by-product: elemental sulfur. Engineered to adapt, SULFCAT can achieve H₂S removal efficiencies surpassing 99.9%, catering to the most stringent environmental standards.

How it Works

The SULFCAT process works by first absorbing H₂S from the gas stream with a specially designed absorber system (see diagram). Once absorbed, the H₂S undergoes a series of reactions that convert it to elemental sulfur and water. The reactions are enabled by a suspension of stabilized iron-based molecules. The iron is regenerated directly within the system by the introduction of air within the regeneration vessel. The solid sulfur is filtered out of the solution and the filtrate is recycled back to the process.

A number of reaction pathways occur in the process, however, all reactions can be summarized by the following overall reaction:



1

H₂S is absorbed in Macrotek's advanced absorber tower.

2

A Macrotek Oxidation Vessel regenerates the FeRedox™ reagent and releases the elemental sulfur.

3

The elemental sulfur is filtered out of the solution. The filtrate is then recycled back into the process.



SULFCAT[®] Applications

- Landfill gas
- Biogas and RNG
- Natural Gas
- Mining and roasting
- Pulp and paper industry
- Wastewater treatment plants
- Geothermal steam production
- Gasification and syngas production
- Fertilizer production
- Refineries and flares
- Canola extraction



The SULFCAT® Advantage

SULFCAT technology is not only innovative and unique, but also proven and economical. The process eliminates the generation of wastewater that may need treatment or disposal compared to many conventional technologies. The non-toxic reagent generates a usable by-product without being consumed in the reaction.

Water and other consumable reagents are also minimized compared to alternative technologies.

These combined features as well as many other benefits of SULFCAT result in reduced operating costs while maintaining low capital costs.

Process Features	SULFCAT®	Chelated Iron Processes	Chemical Oxidation	Scavengers	Bio Filters
Minimal waste generation	✓	✓	✗	✗	✓
Regenerative reagent	✓	✓	✗	✗	✓
Low reagent consumption	✓	✓	✗	✗	✓
Non-toxic reagent	✓	✗	✗	✗	✓
Usable by-product generation	✓	✓	✗	✗	✓
Low fresh water requirement	✓	✓	✗	✓	✓
High turndown	✓	✓	✓	✓	✗
Ability to handle process variability	✓	✓	✓	✓	✗
Low operating costs	✓	✓	✗	✗	✓
Low capital costs	✓	✗	✓	✓	✗

Macrotek's Approach

Macrotek Inc. has decades of experience designing and building gas cleanup systems that meet and exceed the most stringent requirements. Using some of the most innovative and effective technologies available in the industry, Macrotek offers cost-efficient applications for industrial air purification and gas cleanup.

Several key objectives are considered in Macrotek's design approach:



Effective and Reliable Performance



Minimize Supply and Installation Cost

Skid mounted pre-assembled packages



Minimize Maintenance

Rugged, reliable, durable design



Reduce and Optimize Operating Cost

Minimal reagent and waste generation



Provide for Maximum Flexibility

High turndown range



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