macrotek

Advanced Clean Air Solutions

SULFCAT™

Regenerative H_2S Gas Scrubbing System

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Innovative Clean Air Solutions

SULFCAT™ H_2S Removal

SULFCAT™ is an innovative technology that efficiently removes Hydrogen Sulphide (H_2S) from a variety of industrial gas streams, including natural gas deposits and anaerobic processes. The extremely hazardous and corrosive nature of H_2S makes it necessary to scrub the gas from these processes.

SULFCAT uses a non-hazardous, regenerative reagent to remove H_2S from industrial gas streams while minimizing operating costs.

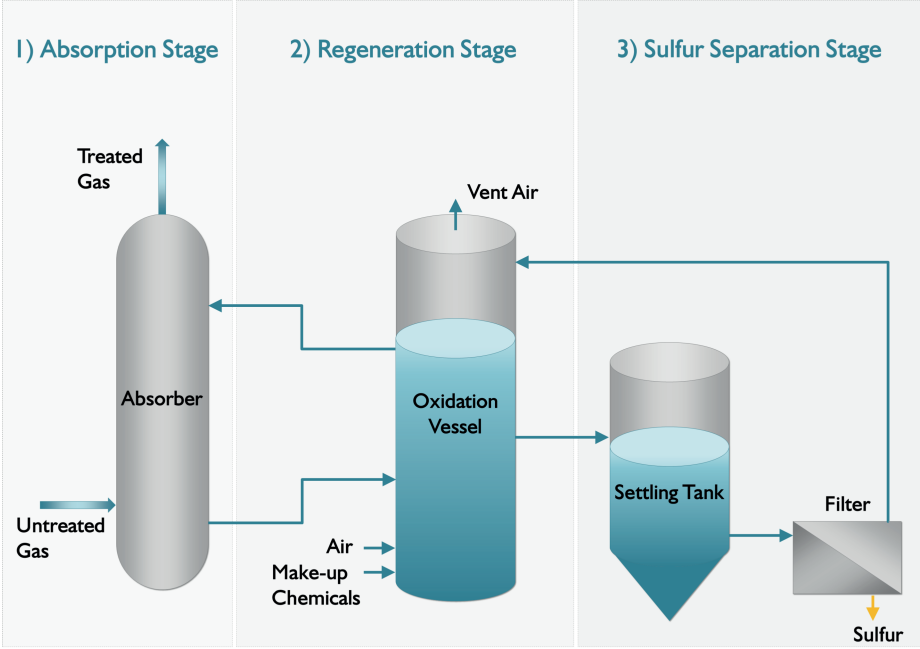
The SULFCAT process dramatically reduces the consumable reagent and water requirements when compared to competing technologies. It also significantly lowers wastewater treatment costs and generates a potentially marketable by-product (elemental sulfur). Emissions of H_2S are removed at levels greater than 99% and the process can be configured to remove H_2S down to < 1 ppm if needed.

How it Works

The SULFCAT process works by first absorbing H_2S from the gas stream with a specially designed absorber system (see diagram). The H_2S then undergoes a series of reactions that convert the absorbed H_2S gas to elemental sulfur and water. The reactions are promoted by a suspension of stabilized, sub-micron-sized iron-based particles. The solid sulfur is filtered out of the solution and the filtrate is recycled back to the process to capture more H_2S.

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

$$H_2S + \tfrac{1}{2}O_2 \longrightarrow S_{(solid)} + H_2O$$

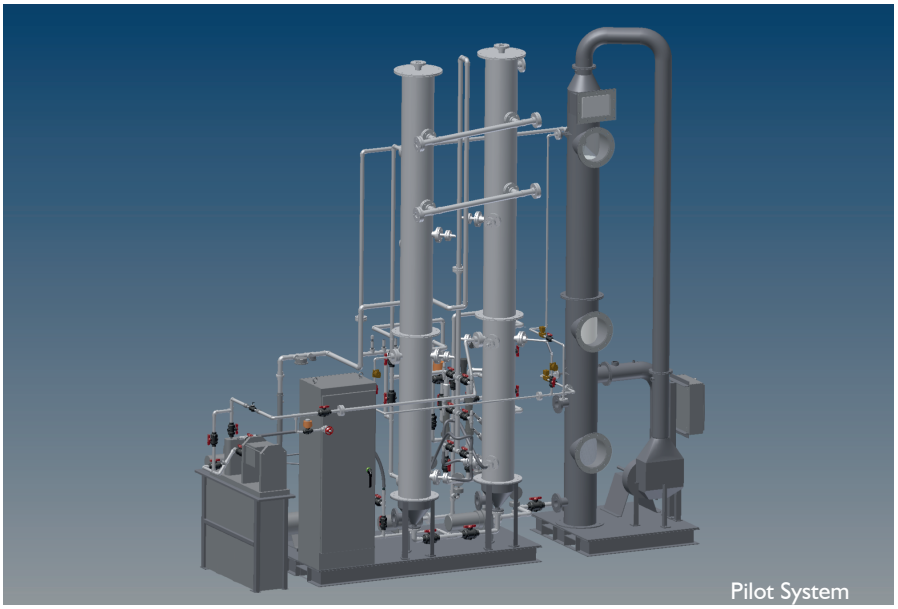


1. H_2S is absorbed in Macrotek's advanced absorber tower.
2. A Macrotek Oxidation Vessel regenerates the SULFCAT™ reagent and releases the elemental sulfur.
3. The elemental sulfur is filtered out of the solution. The filtrate is then recycled back into the process.

SULFCAT™ Applications

- Industrial production processes
- Biogas production systems
- Hydrocarbon processing
- Landfill gas treatment
- Mining and roasting
- Pulp and paper industry
- Municipal wastewater treatment processes
- Geothermal steam production
- Gasification and syngas production
- Oil production
- Fertilizer production
- Natural gas processing
- Refineries and flares

High Removal Efficiency. Low Operating Cost.


Pilot System

Benefits of the SULFCAT™ Process:

- Reagent is continually regenerated and is not consumed by the reaction
- Minimizes wastewater generation
- Minimizes water consumption
- Generates usable by-product
- High removal efficiency
- Low operating cost
- Compact modular design
- Reliable and proven gas cleaning
- Simple, automated operation

The SULFCAT™ Advantage

SULFCAT technology is not only innovative and unique, but also proven and economical. The process reduces the generation of wastewater that may need treatment or disposal compared to many conventional technologies. The non-hazardous reagent generates a usable by-product without being consumed in the reaction. Other consumable reagents, such as water, 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-hazardous reagent	✓	×	×	×	✓
Usable by-product generation	✓	✓	×	×	✓
Low fresh water requirement	✓	✓	×	✓	✓
High turndown	✓	✓	✓	✓	×
Ability to handle process variability	✓	✓	✓	✓	×
Low operating costs	✓	×	×	×	✓
Low capital costs	✓	×	✓	✓	×

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Certified ISO 9001

Macrotek's Approach

Macrotek Inc. has decades of experience designing and building air pollution control 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.

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

Effective and Reliable Performance

√ Meet and exceed removal efficiency

Minimize Supply and Installation Cost

√ Skid mounted pre-assembled packages

Minimize Maintenance

√ Rugged, reliable, durable design

Reduce and Optimize Operating Cost

√ Minimal reagent and wastewater generation

Provide for Maximum Flexibility

√ High turndown range

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