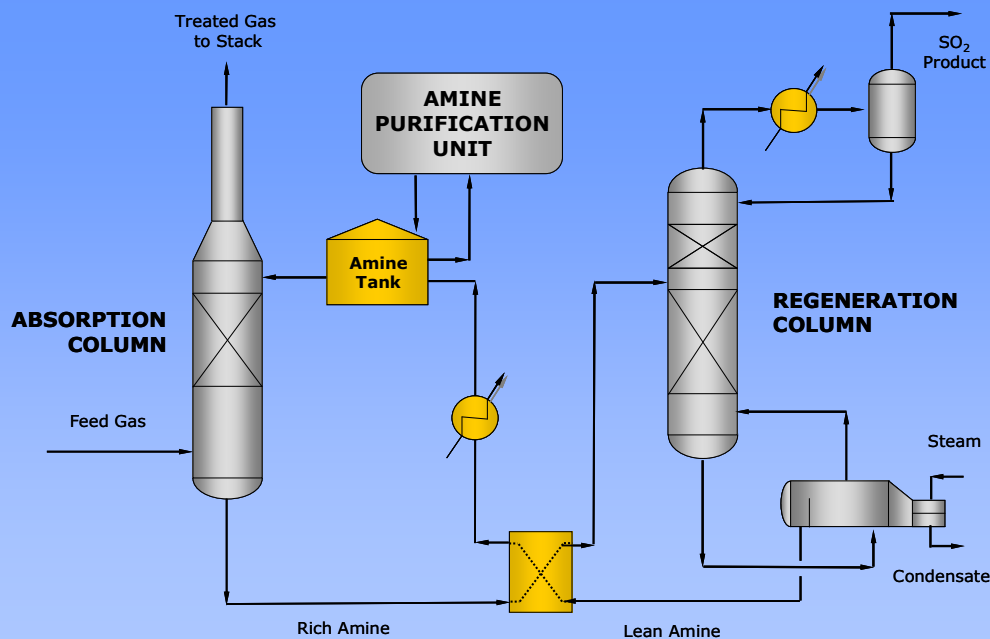


# Cansolv SO<sub>2</sub> Scrubbing System For Sulfuric Acid Plants

## Case Study: Refinery Acid Plant Tail Gas Treatment

The Cansolv SO<sub>2</sub> Scrubbing System is particularly suitable for the treatment of single absorption sulfuric acid plant tail gas and presents numerous advantages over double absorption and/or alkali scrubbing processes:

- Decouples acid plant performance from SO<sub>2</sub> emissions:
  - Remains compliant during cold startup conditions;
  - Eliminates the need for enhanced catalyst.
- Reduces dependence on by-product markets:
  - Pure SO<sub>2</sub> by-product is recycled to the front end of the acid plant.
- Long term strategy on compliance requirements:
  - Achieves SO<sub>2</sub> emissions as low as 0.15lbSO<sub>2</sub>/t acid (~20ppm);
  - Achieves minimal liquid effluent (~0.06USG/k SCF gas treated).



**CANSOLV SO<sub>2</sub> Scrubbing System**

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## Background

An ammonium sulfate process was previously operated to treat the tail gas of a single absorption spent acid recovery plant at a refinery in California. The client faced the challenge of meeting stricter SO<sub>2</sub> regulations and of managing an unwanted by-product. To address these issues, the Cansolv SO<sub>2</sub> Scrubbing System was selected to replace the ammonium sulfate scrubbing process.

## Design Considerations

- Retrofit the design to fit existing alkali scrubbing tower;
- Treat 40,000 Nm<sup>3</sup>/h of gas to reduce SO<sub>2</sub> emissions from 3100ppmv to 50ppmv ;
- Return the recovered SO<sub>2</sub> to the front end of the acid plant for sulfuric acid production.



## Approach

To minimize project costs, the existing FRP ammonium sulfate scrubber was retrofitted for use as a combined quench and SO<sub>2</sub> absorber tower. Furthermore, the regeneration section of the unit was shop assembled and supplied on a modular basis. The pure SO<sub>2</sub> by-product is recycled to the front end of the acid plant, thus increasing acid production and eliminating the production of ammonium sulfate.

## Results

Since the unit's startup in September of 2002, performance has exceeded the targeted design conditions. The client has decoupled the operation of the acid plant from the SO<sub>2</sub> emissions by exploiting the technology's ability to treat a range of inlet SO<sub>2</sub> concentrations. The Cansolv SO<sub>2</sub> Scrubbing System has therefore consistently met SO<sub>2</sub> emissions of 20ppmv or less while treating acid plant tail gas with SO<sub>2</sub> content as high as 6000ppmv.

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