Pall Corporation

# Oil and Gas: Application Focus

## Acid Gas Sweetening

### Ensure your sweetening reliably meets your daily production quotas and environmental protection needs.

### Process Description

Acid gas removal processes utilize amines or specialty solvents to remove acid gases such as $H_2S$ and/or $CO_2$ from sour natural gas in order to meet the gas quality specifications. The sour gas is contacted with lean amine in the contactor tower. An acid-base reaction occurs, binding the acid gases to the amine with a weak bond. The rich amine then flows to a regenerator, where heat breaks the weak bond between the amine and the acid gas, releasing the acid gas and regenerating the amine for re-use. The acid gases exit the top of the regenerator for further treatment while the lean amine is recirculated back to the contactor in a recirculating loop.

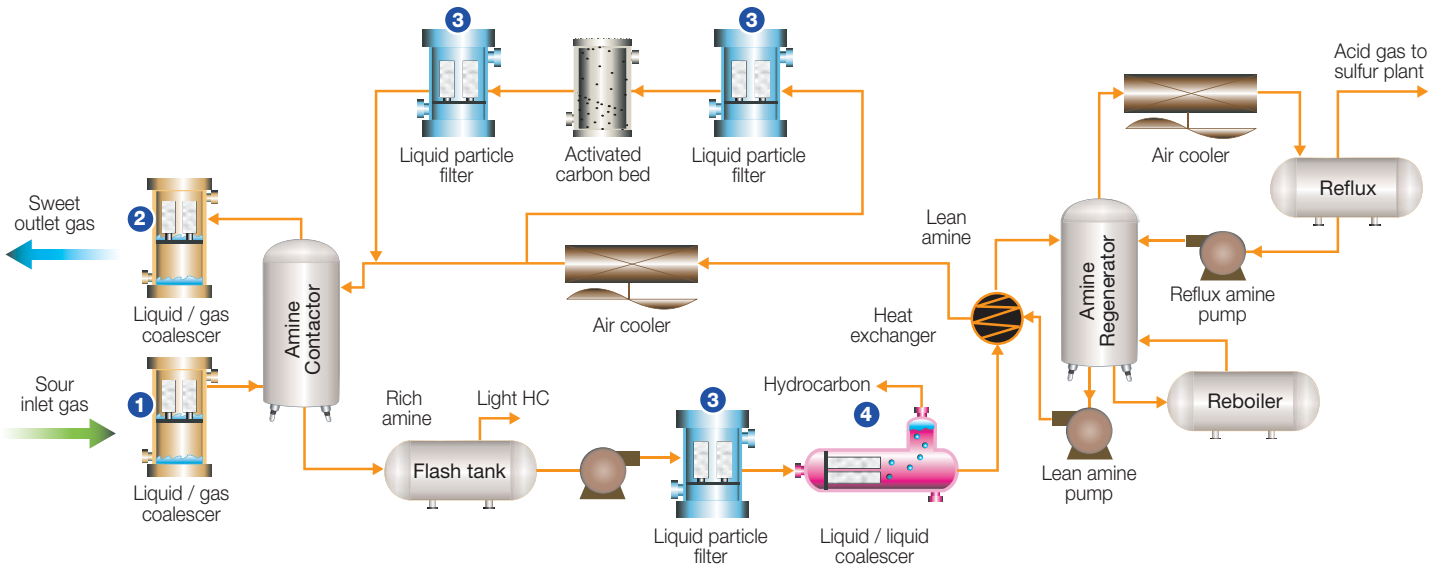
### Gas Plant Needs

- Achieve or exceed natural gas production quotas via reliable treatment of acid gases
- Maintain process reliability for production consistency and minimization of downtime
- Provide consistent sales gas specification quality for $H_2S$ and $CO_2$ levels
- Minimize offgas emissions through effective acid contaminant removal from the sour gas
- Minimize operating and maintenance costs for fouling and corrosion control

### Production Challenge / Pall Solution

| Challenge | Solution |
|---|---|
| **Foaming and reduced production** rates due to hydrocarbon liquid and particulate ingression into the amine loop | **Improve your productivity and reliability** via effective liquid and solid removal **upstream** of the contactor to protect the amine loop.<br>• KO pots, mesh pads, cyclonic devices and conventional filter-separators may not effectively remove aerosol-sized liquid hydrocarbon droplets or fine solids.<br>• High efficiency SepraSol™ Plus liquid/gas coalescers and Medallion™ HP liquid/gas coalescers provide 99.999% removal at 0.3 microns per the DOP test and 1 ppb downstream per the modified ANSI/CAGI-400-1999 test procedure. **Both provide excellent foaming and fouling protection.** |
| **Foaming, process efficiency loss and increased maintenance** due to fouling of the contactor, lean-rich exchanger, regenerator and reboiler due to dirty amine (green, brown, or black in color) | **Reduce the gaps in productivity, reliability and maintenance cost** through effective solids control in the amine loop.<br>• Solid contaminants in amine systems are mostly very fine corrosion products that may not be adequately removed by filters that exhibit unloading, media migration, channeling or poor sealing.<br>• A range of absolute and nominal rated filter elements is available to **reduce suspended solids to <5 ppmw, keep the amine clear or pale yellow in color, and reduce related foaming and fouling issues.**<br>• For enhanced solids control, add filtration to the rich side. Total sour gas worker exposure will typically be lowered due to the reduced system maintenance on the rich side. |

## Process Flow Diagram




## Key Applications / Filter Recommendations *(other applications not shown)*

| | Application | Pall Product | Advantages | Customer Benefits |
|---|---|---|---|---|
| 1 | Contactor inlet coalescer | SepraSol Plus liquid/gas coalescers<br>Medallion HP liquid/gas coalescers | Efficient removal of total hydrocarbon and solids upstream of the loop | Productivity, reliability, freedom from slug upsets |
| 2 | Contactor outlet coalescer | SepraSol Plus liquid/gas coalescers<br>Medallion HP liquid/gas coalescers | Specially formulated B grade coalescer media is compatible with amine | Amine-free sales gas, amine cost control |
| 3 | Amine filter (Add rich side for enhanced performance) | Ultipleat® High Flow filters, Coreless filters, Marksman™ filters, Profile® II filters, Nexis® filters, or a range of Pall FSI bag filters | High filtration efficiency, reproducible performance, easy changeout, and long filter life | Productivity, reliability, maintenance cost control |
| 4 | Liquid hydrocarbon removal from amine | PhaseSep® liquid/liquid coalescers | Proven performance for hydrocarbon liquids removal | Reduce upsets in downstream sulphur plant |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