

Amine Gas Sweetening Systems

Field-proven gas sweetening for complex operations

APPLICATIONS

- Removal of H₂S and CO₂ from natural gas streams

ADVANTAGES

- High versatility
 - Standard and custom designs
 - Stand-alone or integrated processing installation
- Variety of available solvents
 - Monoethanolamine (MEA)
 - Diethanolamine (DEA)
 - Methyldiethanolamine (MDEA)
 - Diglycolamine (DGA)
 - Sulfinol® solvent

Hydrogen sulfide (H₂S), carbon dioxide (CO₂), mercaptans, and other contaminants are often found in natural gas streams. H₂S is a highly toxic gas that is corrosive to carbon steels. CO₂ is also corrosive to equipment and reduces the Btu value of gas.

Gas sweetening processes remove these contaminants so that the gas is suitable for transportation and use.

Schlumberger designs and manufactures a variety of gas sweetening systems, including amine systems. We offer a number of amine solvents that remove the contaminants by chemical reaction. Custom and standard designs are available to meet any gas sweetening challenge, and lease and purchase options are available.

Amine sweetening process

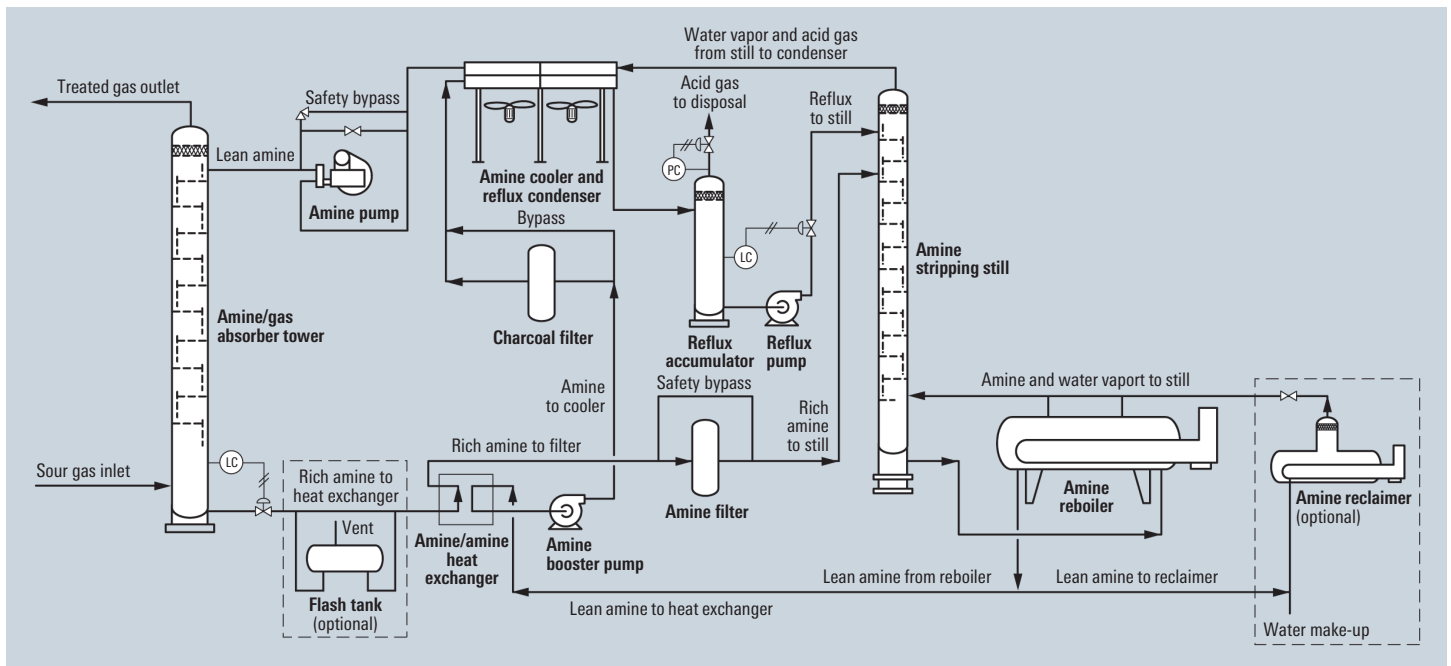
Schlumberger amine sweetening systems are based on proven gas sweetening technology and processes.

1. Sour gas enters the contactor tower and rises through the descending amine solution.
2. Purified gas flows from the top of the tower.
3. The amine solution, carrying absorbed acid gases, leaves the tower for the heat exchanger or optional flash tank.
4. Rich amine is heated by hot regenerated lean amine in the heat exchanger.
5. Rich amine is further heated in the regeneration still column, by heat supplied from the reboiler. The steam rising through the still liberates water and CO₂, regenerating the amine.
6. Steam and acid gases separated from the rich amine are condensed and cooled, respectively, in the reflux condenser.
7. Condensed steam is separated in the reflux accumulator and returned to the still. Acid gases may be vented, incinerated, or directed to a sulfur recovery system.
8. Hot regenerated lean amine is cooled in a solvent aerial cooler and circulated to the contactor tower, completing the cycle.
9. A variety of heat sources can be used for the still reboiler—direct fired, waste heat, hot oil, and steam systems.



Schlumberger amine gas sweetening systems can be customized to meet your needs while maintaining fast delivery.

Amine Gas Sweetening Systems



Efficient, effective Schlumberger amine sweetening systems are based on proven gas sweetening technology.

Custom-designed gas sweetening plants

Schlumberger custom designs and manufactures amine sweetening plants for any particular application. Our specially engineered systems adapt the basic amine process to your gas flow rates, stream composition, desired outlet quality, and more.

The amine plant may stand alone or work as part of an integrated processing installation, either offshore or onshore. Sizes range from 125 galUS/min to 2,000 galUS/min and greater, and contaminants are accommodated at any concentration. Below 125-galUS/min circulation rates, we offer five standardized designs.

Custom performance from a standard design

Schlumberger has put years of gas sweetening expertise into the design and engineering of five standardized gas plants. You receive the kind of performance with these standard plants that you expect from a custom-designed sweetening plant.

Standardized amine plants

By standardizing the gas sweetening design, Schlumberger provides fast delivery and engineering cost savings.

The standard plants are shop-fabricated modular packages. They are skid-mounted and include all piping and controls.

The plants are designed to use a variety of solvents as well as MEA, DEA, MDEA, DGA, and Sulfinol solvent.

Equipment included in each plant:

- amine contactor tower
- reboiler or surge tank
- reflux condenser or solution cooler in a common aerial cooler package
- reflux accumulator
- reflux pump or pumps
- main solvent pump or pumps
- solvent booster pump or pumps
- full-flow filter for rich solvent
- charcoal filter
- control panel or motor starters.

Except for the gas contact tower, the 10-galUS/min and 20-galUS/min plants are complete on one skid. The reboiler and aerial cooler are mounted offskid on the 20- to 40-galUS/min plant. The reboiler, still, and aerial cooler are offskid on the larger plants.

These plants are designed so that they can be customized to meet your unique requirements while maintaining fast delivery. These options include

- outlet scrubber and accessories
- flash tank and accessories
- NACE accessories
- instrument options
- control panel options
- reclaimer and accessories.

Amine Gas Sweetening Systems

Five complete gas sweetening packages

Our standardized plants are available in five sizes for the most frequently required solvent circulation rates.

Sizes	Capacity, galUS/min
Size 1	10
Size 2	20
Size 3	40
Size 4	80
Size 5	120

Technical Specifications

	Standard amine plants, galUS/min				
	10	20	40	80	120
Contacting tower					
OD, in	18	18	18	24	30
Length, ft	52.5	52.5	52.5	52.5	52.5
Trays	20	20	20	20	20
Reboiler					
OD, in	36	60	60	72	96
Length, ft	25	30	30	30	40
Duty, MMbtu/h	0.75	1.25	1.25	2.75	5.5
Still column					
OD, in	14	18	18	24	36
Length, ft	48	50	50	50	50
Trays	20	20	20	20	20
Reflux accumulator					
OD, in	16	18	18	24	36
Length, ft	5	7.5	7.5	7.5	7.5
Circulation pumps					
Maximum rate, galUS/min	10	20	20	40	80
Horsepower	10	20	20	40	75
Reflux pumps					
Maximum rate, galUS/min	0.75	1.5	1.5	3	6
Horsepower	1	1	1	1	1
Booster pump					
Maximum rate, galUS/min	10	20	20	40	80
Horsepower	2	2	2	5	10
Reflux condenser					
Duty, MMbtu/h	0.525	1.05	1.05	2.1	4.2
Heat exchanger					
Duty, MMbtu/h	0.315	0.63	0.63	1.26	2.52
Cooler					
Duty, MMbtu/h	0.325	0.65	0.65	1.3	2.6
Charcoal filter					
Rate, galUS/min	7.5	7.5	7.5	7.5	16

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