

# Proven suite of gas treating technologies and absorbents

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ExxonMobil has developed and commercialized the FLEXSORB™ suite of gas treating technologies and absorbents and has applied them in petroleum refining, natural gas production, and petrochemical operations around the world. The FLEXSORB SE technology is designed for the selective removal of H<sub>2</sub>S in the presence of CO<sub>2</sub> and utilizes proprietary severely sterically hindered amines. This allows FLEXSORB SE solvent to achieve high H<sub>2</sub>S cleanup selectively at low solvent circulation rates.

## Key benefits

### Lower operating costs

- Lower recirculation rates and energy
- Lower corrosion
- Uses conventional equipment and simple to operate

### Lower capital costs

- Reduced regeneration tower diameter due to lower vapor and liquid loads
- Uses standard gas treating equipment

## ExxonMobil offers two grades of solvents depending on the application characteristics needed

- FLEXSORB SE is used for selective removal of H<sub>2</sub>S
- FLEXSORB SE Plus is used for selective removal of H<sub>2</sub>S to less than 10 ppm

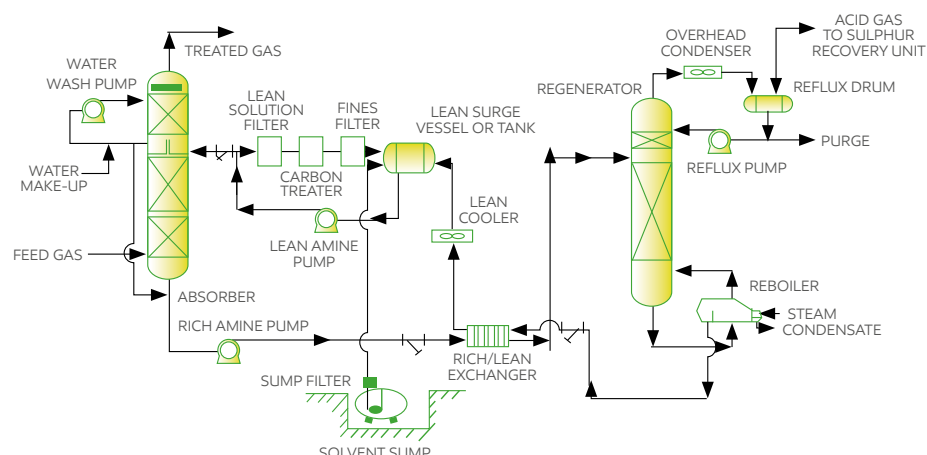
The technology and absorbents have been widely applied in more than 100 commercial applications in petroleum refining, natural gas production, and petrochemical operations. The advantages of FLEXSORB SE and SE Plus over competing solvents has been proven since the first commercial unit was started up in 1983.

## Tail Gas Treating Unit (TGTU)

In sulfur plant TGTU applications, FLEXSORB SE solvents can use about half of the circulation rate and regeneration energy typically required by MDEA-based solvents. CO<sub>2</sub> rejection in TGTU applications is very high, typically above 90%. FLEXSORB SE provides a reduced vapor and liquid load to the regenerator tower, resulting in a smaller tower diameter compared with competing technologies.

The feed gas is contacted counter-currently with lean FLEXSORB SE solution in the absorber tower. With low-pressure applications, it is recommended that the top of this tower include a water wash zone to minimize the loss of FLEXSORB SE amine with the treated gas. The water wash purge is combined with the rich amine to recover the FLEXSORB SE amine.

## FLEXSORB SE Tail Gas Treating Unit (TGTU)



## Natural gas treating

In natural gas treating, selective H<sub>2</sub>S removal from natural gas can be advantageous whenever a portion of the CO<sub>2</sub> can remain in the treated gas. One example is pipeline gas stored in a depleted oil reservoir. The pipeline gas is stored in the summer and withdrawn during the heating season to supplement pipeline gas flow. The unit was originally designed to treat the gas with a conventional hybrid solvent. The need to process at least 25% more gas drove the licensee to change solvents. FLEXSORB™ SE solvent allowed an increase in gas rate from 400 to 510 MSCFD without changing the existing hardware. This was done at a lower solvent circulation, 300 versus 460 gpm, and a higher CO<sub>2</sub> slip. FLEXSORB SE also improved the operability of the unit by reducing the co-absorption of heavy hydrocarbons.

## Acid gas enrichment

ExxonMobil's FLEXSORB SE or SE Plus solvents are in use in a wide variety of Acid Gas Enrichment (AGE) unit designs around the world, with sizes up to over 1,000 tons per day of sulfur capacity and CO<sub>2</sub> slip ranges of 73% to 94%. AGE has become an enabling technology to economically produce natural gas reserves which contain more CO<sub>2</sub> than H<sub>2</sub>S. As the name implies, an AGE unit enriches the H<sub>2</sub>S content of the acid gas stream, making it practical to recover sulfur in a Claus unit. Alternatively, AGE technology can also be used to minimize the volume of acid gas for re-injection or to debottleneck existing facilities if new, sourer fields are developed.

### FLEXSORB™ services include:

- Initial non-confidential consultations
- Development of licensing proposal
- Basic engineering package, including basic design specification and operating guide
- Engineering support during FEED and EPC stages
- Technology transfer, training and start-up support

## About Technology Licensing & Catalysts

ExxonMobil licenses both downstream and chemical technologies and offers proprietary catalysts for fuels, lubricants, plastics and other chemicals. The company's extensive experience can help to provide technology solutions that contribute to cost reduction, environmental compliance, reliability, plant automation, and other other areas.

# ExxonMobil

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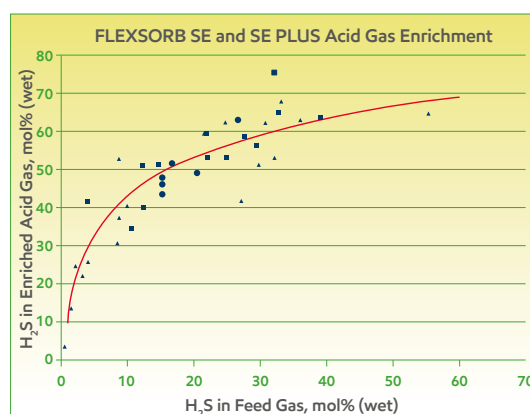
Please contact us at:  
[www.catalysts-licensing.com](http://www.catalysts-licensing.com)

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## Onshore treating facility

	CONVENTIONAL HYBRID	FLEXSORB SE
Sour Gas Rate, MSCFD	400	510
Pressure, psig	935	935
Temperature °F	90	90
<b>Feed Composition, vol %</b>		
H <sub>2</sub> S	0.06	0.06
CO <sub>2</sub>	1.0	1.0
Solvent Rate, gpm	460	<b>300</b>
Reboiler Duty, MBTU/HR	19	<b>14.8</b>
<b>Treated Gas</b>		
H <sub>2</sub> S vppm	4	<b>2</b>
CO <sub>2</sub> mole %	0.7	<b>0.85</b>

## Acid gas enrichment capabilities



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