Gas Treating Solutions

Maximizing Syngas Contaminant Removal Performance with SELEXOL™ MAX Solvent

Reduce Costs and Improve Efficiency

Physical solvents are often used to help remove acid gas from natural gas and synthesis gas streams at high pressures. In these situations, physical absorption processes can provide CAPEX and OPEX advantages over chemical solvents. Many physical solvent systems are successfully operating in industry today.

To maximize value, operators at facilities treating high-pressure gas streams are always looking for ways to increase asset efficiency. In addition to using physical solvents, there are several methods to reduce gas treatment facility economic lifecycle costs, including:

- Reducing capital equipment size
- Reducing energy consumption
- Increasing gas processed throughput
- Maintaining asset integrity and reliability

As more gasification plants are constructed worldwide, there is growing opportunity for operators and engineering companies to reduce gas treatment costs. SELEXOL™ MAX Solvent, an extension of Dow's well-known line of SELEXOL Physical Solvents, can help meet this goal.

SELEXOL MAX Solvent can enhance overall operator value in several ways, including:

- Reducing the capital cost of the syngas purification step by approximately 10 percent
- Increasing acid gas removal per pound of solvent at new facilities by approximately 50 percent
- Reducing the solvent circulation rate of a system by approximately 35 percent
- Enabling the unit to reach a specification based on changing operator needs

In addition, SELEXOL MAX Solvent offers distinct advantages over commodity physical solvents used in gasification, including:

- Enhanced acid gas absorption rate
- Increased gas processing capacity
- Smaller capital equipment size
- Higher revenues
- Maintained asset integrity

Impact of SELEXOL™ MAX Solvent on Plant Performance

Inlet gas composition, site-specific economics and the ability to meet acid gas specifications must all be considered when evaluating optimization of an existing plant. The sample plant scheme below demonstrates the possible benefits of using SELEXOL™ MAX Solvent from Dow. An experienced technical team can perform an on-site analysis to evaluate potential impact at each facility and make site-specific recommendations to help operators maximize value.

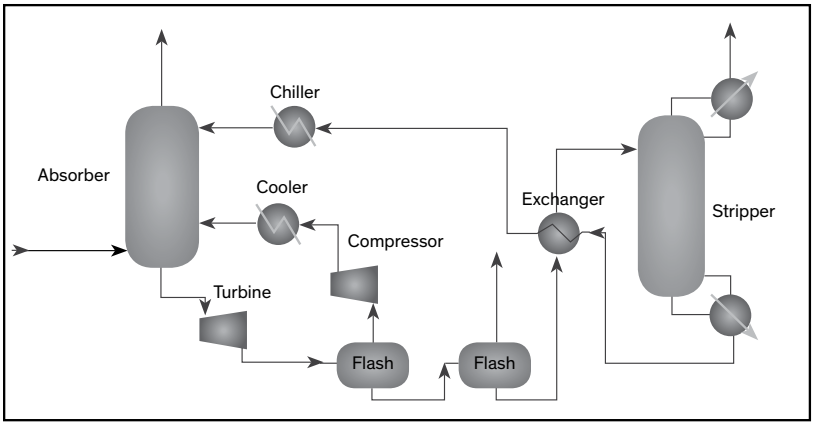
Example: Syngas Treatment, IGCC[1] without Carbon Capture

Inlet Gas Conditions:

- 35 bar, 26°C
- 20% CO_2, 33% H_2, 43% CO, 0.2% N_2, 0.28% H_2S

SELEXOL™ MAX Impact:

- 36% reduction in solvent circulation rate



	DEPG[2] (base case)	SELEXOL™ MAX Example
Total Sulfur Spec	20 ppmv	20 ppmv
Lean Solvent Flow Rate (relative)	1	0.64
Capital Cost (relative)	1	0.90
Operational Cost (relative)	1	0.80
Acid Gas Removal per Pound of Solvent (relative)	1	1.56

[1]Integrated Gasification Combined Cycle
[2]Dimethyl Ether Polyethylene Glycol

Storage and Handling

SELEXOL™ MAX Solvent is usually stored and handled in carbon steel equipment. It is also compatible with stainless steel. Aluminum, zinc or galvanized steel, copper and its alloys should NOT be used for any storage and handling equipment.

This product can become viscous in colder climates and should be stored inside a warm building or in a heated, insulated tank. Pour points for pure solutions are near -50°C (-58°F). A centrifugal pump is suitable for transfer service, assuming the temperature of the product is sufficiently above its pour point. A rotary or gear pump is suggested for lower temperature transfers.

Adequately sized piping should be used to handle the maximum encountered viscosity. Valves, piping, etc. are usually constructed of steel. Type 304 stainless steel, spiral-wound Grafoil gaskets for flanges and Grafoil packing for valves are recommended. Consult the safety data sheet for additional information prior to use.

Experience You Can Trust

Dow has been at the forefront of gas treating technology for more than 65 years. From computer simulations to hands-on operations support and analytical evaluations, our team is with you every step of the way to meet your everyday gas treating challenges. Backed by more than 1,000 global references in gas treating, the Dow technical service team can help to customize a solution based on individual needs. Our advanced simulator is continually and consistently refined through the incorporation of real customer plant data.

Providing Comprehensive Solutions for Market Needs

Dow is committed to the success of our customers through chemistry and continuous innovation. To learn more about our products, innovations, technologies or other Dow services, please speak with your local Dow representative or visit www.dowoilandgas.com.

A Note About Product Safety

When considering the use of any Dow products in a particular application, you should review the latest Material Safety Data Sheets from Dow and ensure that they are intended for safe use. For other products mentioned in the text, you should obtain the current Material Safety Data Sheet and other available product safety information when reviewing and take necessary steps to ensure safety of use before handling.

No chemical should be used as or in a food, drug, medical device or cosmetic, or in a product or process in which it may contact a food, drug, medical device or cosmetic, until the user has determined the suitability and legality of the use. Since government regulations and use conditions are subject to change, it is the user's responsibility to determine that this information is appropriate and suitable under current, applicable laws and regulations.

Dow requests that the customer read, understand and comply with the information contained in this publication and the current Material Safety Data Sheet(s). The customer should furnish the information in this publication to its employees, contractors and customers, or any other users of the product(s), and request that they do the same.

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