Molecular Gate™ Systems

Estimate Request

Guild Associates, Inc. would be pleased to provide a performance and cost estimate for your process conditions. To obtain a budgetary quotation, please complete the information below and return via fax, email or post to:

Michael J. Mitariten
Business Manager
Guild Associates, Inc.
5750 Shier-Rings Road
Dublin, OH 43016 USA
Phone: 908-752-6420
Fax: 614-798-1972
Email: info@moleculargate.com
Website: www.moleculargate.com

Name ___________________________ Company ___________________________
Address ___________________________ ___________________________
City ___________________ State __________ Zip Code ______ Country ______
Phone __________________ Fax ______ E-mail __________________
Well Location ___________________________ ___________________________

Feed Conditions
Feed pressure at wellhead
Feed pressure available
Feed temperature
Feed flowrate

Feed Compositions, Vol. %
Methane
Ethane
Propane
Butane
C5+
Nitrogen
Helium
Carbon dioxide
Hydrogen sulfide
Other

Pipeline Requirements
Pressure
Typical permitted inerts, %
Maximum inerts permitted, %
Is power available? □ Yes □ No
Local use for low BTU □ Yes □ No
If yes, quantity MM BTU / hr
Minimum BTU / ft³ required

Comments

Feed Source (check all that apply)
______ Wet wellhead gas
______ Dehydrated wellhead gas
______ Gas downstream of NGL recovery
______ Coal seam gas
______ Exploratory well / field development
______ Shut-in well
______ Producing well
______ Gas compressed at wellhead

Guild is a licensee of Molecular Gate® adsorbent-related technology and Guild is solely responsible for all representations regarding the technology made herein.

Molecular Gate is a registered trademark of Engelhard Corporation (a BASF Group company).
Unique approach to natural gas processing

Since its commercialization in 2001, the Kirkpatrick Honor Award winning Molecular Gate® systems have achieved growing success with over two dozen projects underway. The systems are noted for ease of operation, ability to produce pipeline quality sales gas regardless of the feed composition and minimal pre-treatment requirements.

Typically the system contains 3 or 4 vessels filled with adsorbent. Contaminated feed flows upward while the adsorbtent traps and removes the nitrogen (N₂) and carbon dioxide (CO₂) with sales quality natural gas produced from the top of the vessel. A small recycle stream is sent back to the feed to improve the methane recovery to typically over 90%. When saturated with N₂ and/or CO₂, the adsorbent is regenerated by pulling a vacuum and applying a small methane purge.

Enabling precise separations

Featuring patented molecular sieve technology, Molecular Gate® adsorbents offer the capability to adjust pore size. During the manufacturing process, the pore size is set so that N₂ and CO₂ are removed from the contaminated feed stream. Methane cannot enter the pore and flows through the feed bed of adsorbent as sales gas at feed pressure and this preservation of pressure is a major advantage of the process. The range of possible separations enabled by the ability to tailor the pore size of the Molecular Gate® adsorbent is substantial.

Proven N₂ and CO₂ removal field experience

Molecular Gate systems have been applied to remove N₂ and CO₂ from natural gas and gases produced before and after coal mining. The units operate unattended and remove either CO₂ alone, or a combination of CO₂ and N₂ in a single step. Since 2003, the units pictured on the right has operated to upgrade a mixture of contaminated natural gas plus coal mine methane with 12% N₂ and 10% CO₂ to a sales gas of 4% N₂ and less than 50 ppm CO₂.

Market interest continues to grow as does the range of applications. To date, feeds as high as 40% N₂ and 38% CO₂, have been upgraded to pipeline requirements. The range of feed stream flow rates also continues to expand with smaller flows treated in several SPEC plants and with larger systems processing flows of up to 10 MM SCFD. Reliability has been excellent and continually improved with the evolution of the design.

SPEC plant option

Since contaminated wells can rarely operate for extended periods without meeting pipeline specifications, a standard plant design is offered to treat a nominal 0.5 MM SCFD for N₂ rejection or over 1 MM SCFD for CO₂ removal.

The ‘spec plant’ option is available for purchase or rent and can allow for the determination of decline curves and production rates from representative wells prior to a larger drilling program. Easily installed, the system can be relocated, as needed.

Reliable design, service & operating features

Molecular Gate® adsorbent based systems are licensed to Guild Associates by Engelhard Corporation. Guild has worked closely with Engelhard (now part of the BASF Group) during the decade-long development period and is the designer and fabricator of the two dozen systems to date. The systems are designed using all carbon steel construction and operate at ambient temperatures and relatively low pressures. The overall system and switching valves have proven to be extremely reliable with only a daily visit by the operator to monitor operation.

Guild also provides associated compression and installation services. Molecular Gate® based systems are offered for sale or in exchange for a share of the project proceeds.

Ready to meet your processing needs

In applications for N₂ rejection and CO₂ removal, Molecular Gate® systems offer a new route for meeting the gas treating needs of the natural gas industry.

With successful field operation and proven market acceptance, it is likely that we are treating a stream similar to yours. If you would like an evaluation of how a Molecular Gate® system can solve your gas treatment needs, simply complete and fax back the form on the last page of this brochure.

You can also contact Michael Mitarriten at 918-752-6420 or info@moleculargate.com, or go on the Internet at www.moleculargate.com to learn more.
Unique approach to natural gas processing

Since its commercialization in 2001, the Kirkpatrick Honor Award winning Molecular Gate® systems have achieved growing success with over two dozen projects underway. The systems are noted for ease of operation, ability to produce pipeline quality sales gas regardless of the feed composition and minimal pre-treatment requirements.

Typically the system contains 3 or 4 vessels filled with adsorbent. Contaminated feed flows upward while the adsorbent traps and removes the nitrogen (N2) and carbon dioxide (CO2) with sales quality natural gas produced from the top of the vessel. A small recycle stream is sent back to the feed to improve the methane recovery to typically over 90%. When saturated with N2 and/or CO2, the adsorbent is regenerated by pulling a vacuum and applying a small methane purge.

Enabling precise separations

Featuring patented molecular sieve technology, Molecular Gate® adsorbents offer the capability to adjust pore size. During the manufacturing process, the pore size is set so that N2 and CO2 are removed from the contaminated feed stream. Methane cannot enter the pore and flows through the feed bed of adsorbent as sales gas at feed pressure and this preservation of pressure is a major advantage of the process. The range of possible separations enabled by the ability to tailor the pore size of the Molecular Gate® adsorbent is substantial.

Proven N2 and CO2 removal field experience

Molecular Gate systems have been applied to remove N2 and CO2 from natural gas and gases produced before and after coal mining. The units operate unattended and remove either CO2 alone, or a combination of CO2 and N2, in a single step. Since 2003, the unit pictured on the right has operated to upgrade a mixture of contaminated natural gas plus coal mine methane with 12% N2 and 10% CO2 to a sales gas of 4% N2 and less than 50 ppm CO2.

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SPEC plant option

Since contaminated wells can rarely operate for extended periods without meeting pipeline specifications, a standard plant design is offered to treat a nominal 0.5 MM SCFD for N2 rejection or over 1 MM SCFD for CO2 removal.

The ‘spec’ plant option is available for purchase or rent and can allow for the determination of decline curves and production rates from representative wells prior to a larger drilling program. Easily installed, the system can be relocated, as needed.

Reliable design, service & operating features

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**Feed Conditions**

- Feed pressure at wellhead
- Feed pressure available
- Feed temperature
- Feed flow rate

**Feed Compositions, Vol. %**

- Methane
- Ethane
- Propane
- Butane
- C5+
- Nitrogen
- Helium
- Carbon dioxide
- Hydrogen sulfide
- Other

**Pipeline Requirements**

- Pressure
- Typical permitted inerts, %
- Maximum inerts permitted, %
- Is power available? □ Yes □ No
- Local use for low BTU □ Yes □ No
- If yes, quantity MM BTU / hr
- Minimum BTU / ft² required

**Feed Source** (check all that apply)

- Wet wellhead gas
- Dehydrated wellhead gas
- Gas downstream of NGL recovery
- Coal seam gas
- Exploratory well / field development
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**Comments**

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