Advanced PRISM® Membranes for Natural Gas Dehydration

Save as much as 30 percent on operating costs vs. glycol or desiccant systems

"Our PRISM Natural Gas Dehydration technology is easy to operate and has worked well since start-up for two years, delivering dewpoints as low as –20˚C. The performance has been completely reliable, causing no downtime of the plant."

Simona Biagi
Research Engineer
ENI – AGIP Division

An Overview

Understanding your specific requirements for cost-effective gas separation, including natural gas dehydration, is one of our strengths at Air Products. As a world leader in the supply of gas separation systems and industrial gases, we manufacture the industry's broadest range of field-proven PRISM membranes for multiple gas processing applications.

Our membranes, including several operating since 1977, have withstood use and abuse in thousands of installations at refineries, petrochemical plants, gas fields, aircraft flight testing, and even military shock and vibration testing.

Applications for PRISM Natural Gas Dehydration Membranes

The membranes are suitable for a variety of offshore and onshore applications:

- Low capacity (retrofits, debottlenecking and fuel gas drying).
- Medium and high capacity (associated gas drying and lift gas drying).
- Ideal for floating production units (FPSOs), platforms, or remote sites in oil and gas service with limited utilities.

Key Benefits of Membrane Technology

In 1996 we introduced our patented PRISM membrane technology for natural gas dehydration following initial evaluations made by major oil companies operating in the North Sea. Our membranes are different from competing brands in that they are more tolerant of particulate dusts as well as contaminants, including liquid water.

- Membranes can be easily packaged in an environmentally closed system with no BETX (aromatics) or glycol emissions.
- Up to a 40 percent reduction on system size and weight compared to traditional drying technologies.
- Lower maintenance costs; no moving parts; less downtime.
- Unattended operation is possible for remote installation.
- Membrane technology easily accommodates changing feed flow conditions and can be easily expanded with its modular design. Multiple assembly options are possible.
- No chemical inventory or makeup required.
- Low pressure drop through the process.
- Easy installation and removal of membrane cartridges for replacement.
- Lower initial capital costs, since membranes can be added as capacity requirements increase.

This PRISM membrane system, started up in 1996, dries 3.2 mmscfd of natural gas for AGIP in Italy.

The Simple Solution

PRISM membrane technology offers a simple solution for natural gas dehydration. Our engineers will assist you in developing the optimal process using our natural gas dehydration membranes on your skid.

Our current PRISM dehydration separator is rated for 1200 psig at 160ºF. Its performance is very stable with time, as shown in Figure 1. Water vapor leaves the separator in a low-pressure permeate gas stream, which is typically 3 to 5 percent of the feed stream. Membranes can achieve 20 to 100 ppmv water pipeline specification (1 to 5 lbs. H_2O/mmscf), and methane losses are as low as 1.5 percent.

The pretreatment requirements for the natural gas dehydration membrane are simple as well. Coalescing filters and a preheater are all that is required for treating the gas prior to feeding the membrane. This simplicity contributes to the low operating cost of the membrane as compared to other technologies.

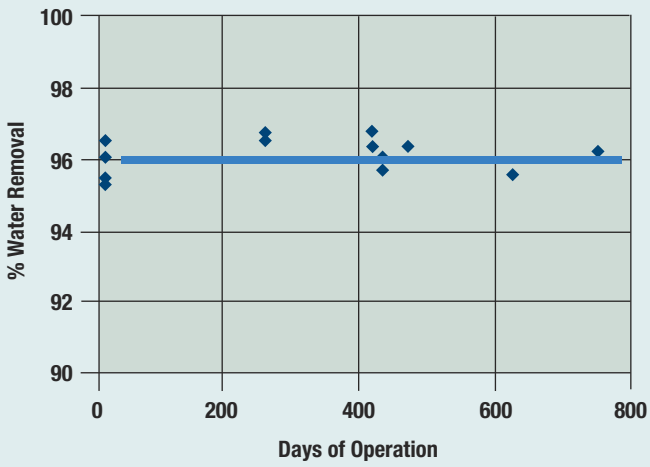
We are fully equipped to meet your other needs for membrane dehydrators for high-pressure gases, including those for shipboard compressed air, compressed natural gas fuel and process gases.

How PRISM Membranes Work

Air Products' PRISM membrane separators operate on the principle of selective gas permeation. Separators use the relative permeation rates of gases to separate the "fast" (i.e., hydrogen) from the "slow" (i.e., methane). The driving force for gas separation is the difference between partial pressure of each stream component on either side of the membrane medium.

Figure 1

Actual performance of a PRISM Natural Gas Dehydration System



This actual performance chart shows the high water removal and operating stability achieved by our membranes in a natural gas dehydration system.

For More Information

For technical information about systems incorporating the PRISM natural gas membrane dryer or to purchase a system, contact our licensed partners listed on our website at the web address shown below. If you are interested in becoming a partner, contact us by phone, fax, mail, or e-mail at the location below.

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