

# LifeCycle Solutions

## Membrane Systems Service



Air Products LifeCycle Solutions is committed to making sure that PRISM Membrane systems are operating at peak efficiency. Even small improvements make a huge difference in plant operating costs.

# Hydrogen in Industrial Applications

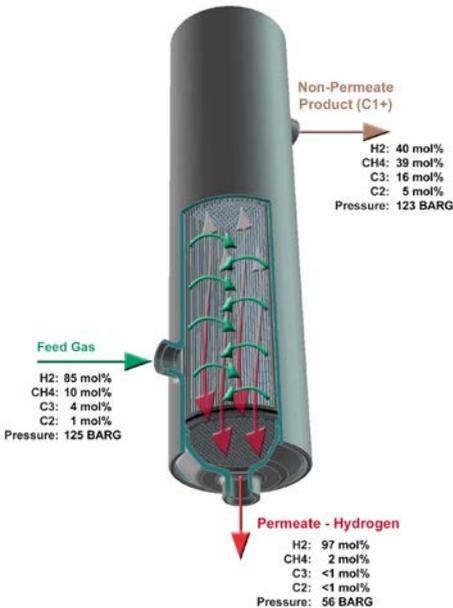
## The enabling technology

Petrochemical plants, oil refineries, methane reformers. Most of their key processes rely on hydrogen as the component that makes complex chemical reactions possible. Hydrogen molecules are a valuable resource that can become expensive if not managed effectively. Air Products introduced the PRISM Membrane technology four decades ago to provide an effective way to separate inert by-products from valuable hydrogen molecules in chemical reaction loops. By removing these inert by-products, the hydrogen molecules are recovered and used to complete the reactions or provide plant fuel. The result: cost savings.



## Optimizing is key

### Efficient membranes equal efficient systems



The PRISM hydrogen separation membranes are efficient and their passive technology and long service life make them a welcome addition to facilities that rely on hydrogen. But, over time plant loading and production demands change, loop dynamics are altered, and pre-treatment upsets can cause the membranes lose some of their original productivity. Efficiency losses, of even a couple percent, will have real impacts on the economics of hydrogen in the plant. Sometimes simple changes, like changing flow dynamics or changing the staging configurations are enough to increase performance.

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Our experts benchmark your membrane system's performance and strategize a game plan that will increase efficiency.

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# What we do.

## A comprehensive approach

The hydrogen separation membranes are tested and evaluated for performance and compared to their original design specifications. A comprehensive report detailing your membrane system's performance is provided to your site engineers with specific recommendations to increase efficiency. Our team of experts will model the changes with cost estimates and project potential payback. This means that your team can calculate the return on investment to make solid business decisions.

## Engineering and Consulting Services

- Modification or upgrades address changes in operating conditions.
- Membrane performance/health evaluation.
- Optimize membrane update and replacement strategies (reduces impact to site operation).
- Feasibility Studies evaluate the best solution for plant-specific needs.
- Technical Assistance – Quick response.

## On site Services

- Confirm alarm and interlock set points.
- Verify interlock logic.
- Reviewing operating set points.
- Adjusting operating conditions for performance optimization.
- Supervision of membrane replacements.
- Comprehensive autopsy service.
- Operations training for operators or process engineers.
- Health Check Report. Comprehensive system evaluation with recommendations.



## Why choose Air Products?

We have the most experience in designing and building spec-compliant systems utilizing hydrogen upgrading membranes. Over 500 PRISM Membrane Systems for Process Gas applications are operating around the world with the very first application commissioned in 1977. These include 230 systems in ammonia purge gas recovery, 90 systems in oil refinery applications, 60 systems for carbon monoxide purification, 50 systems for methanol purge gas recovery and 50 in other petrochemical applications.



When you choose Air products, you are choosing the leader in membrane design, experience, and value.

**For more information,  
please contact us at:**

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