

# *Large Air Separation Experience*

- > Design, engineering and construction of mega air separation units (ASUs) up to 204,000 Nm<sup>3</sup>/hr*
- > Worldwide presence with more than 2,000 ASUs owned or sold*
- > Experience in oil and gas, petroleum refining, chemicals and petrochemicals, power generation, steel, nonferrous, GTL, gasification and other industries*
- > Optimized design based on product requirements and capital evaluation factors*
- > Delivery supply options ranging from ex-works to fully installed units*
- > Comprehensive ASU service and support*

*“In 1997 we raised the bar for mega air separation with a 95,000 Nm<sup>3</sup>/hr single-train ASU in Rozenburg, the Netherlands. Since then, we’ve successfully delivered large-scale projects around the globe to meet customers’ oxygen needs reliably and economically.”*

Todd Newman, Global Business Manager, Large Air Separation Unit Equipment Sales Manager





## ***We think big . . .***

Large-scale air separation units pose unique challenges, from cost/benefit design considerations to construction logistics in remote sites to ensuring reliable operation. With decades of experience and global resources, Air Products takes pride in providing customers with tonnage oxygen, nitrogen and other gases safely, reliably and cost-effectively.

## ***. . . and we can back it up.***

Since 1940, Air Products has built more than 2,000 facilities, and today we have more than 300 ASUs in operation. We have significant experience with large-scale ASUs, single- and double-ended steam turbine drives, and other large equipment. We have built several ASUs that produce more than 2,100 MT/d of oxygen each, including the 3,200 MT/d plant in Rozenburg and a 2,800 MT/d plant for Atlas Methanol in Trinidad. We recently completed construction of a 7,000 MT/d oxygen facility for the world's biggest and most technically advanced GTL plant at Ras Laffan, Qatar, and we are fabricating the 7,000 MT/d ASU for the Escravos GTL project in Nigeria. And we have more operating experience with supplying tonnage oxygen at pressures greater than 1,000 psig than anyone else in the industry.

## ***What we can offer***

### **Equipment**

- Cryogenic air separation units (single-train or multi-train units of more than 204,000 Nm<sup>3</sup>/hr — 7,000 MT/d)
- Turbo expanders, cryogenic vessels and transport equipment, and vaporizers
- Liquid merchant plants integrated with large-scale ASUs for argon recovery

### **Innovation**

- With the U.S. Department of Energy, we are developing Ion Transport Membrane (ITM) technology for high-efficiency oxygen production with lower capital and operating costs
- We were the first company to supply high-reliability tonnage oxygen without oxygen backup

### **Resources**

- Operations in more than 40 countries worldwide
- Engineering offices and cryogenic equipment manufacturing facilities in China, the United Kingdom and the United States

**tell me more**  
**[www.airproducts.com/ASUsales](http://www.airproducts.com/ASUsales)**

## ***What our offerings mean to you:***

### **Minimize technical risk**

- Specifications based on proven technology across a broad range of project types
- Optimized plant design to address product requirements, capital evaluation factors, process cycle, compressor types, vendor options
- Processes and machinery are efficient, reliable, easy to operate/maintain, cost-effective and flexible

### **Minimize field construction risks and delays**

- Extensive experience in several fabrication and construction methods
- Attention to determining factors, including access, shipping limits, availability of skilled workforce and large cranes
- Evaluation of risk vs. cost vs. schedule

### **Confidence to focus on your core business**

- ASU plant reliability >99 % without LOX storage
- Global spare parts availability
- Best safety record in the chemical industry
- Contract operating and maintenance services, from supervision to complete staffing

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## ***For More Information***

To learn more about how Air Products can help supply your needs for tonnage oxygen, contact us at one of the locations listed here.

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