Gas solutions for the biotechnology and life science industries...
tell me more
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Air Products is committed to helping biotech and life science customers in unique ways—from discovery through production. We have a 99.94% on-time delivery record, outstanding safety performance and medical gas compliance, and a total solutions approach to doing business. We provide worry-free supply of products and services that can help reduce your risk of noncompliance or downtime and lower your overall operating costs. So you can focus on making the world healthier.

Compliance to regulatory standards

At Air Products, we know that medical grade gases for biotech and life science applications are not an industrial commodity or utility. Lack of compliance with manufacturing, distribution, storage, and usage requirements could put your company at risk. We have developed a comprehensive program designed to provide reliable, cost-effective, worry-free service to you. We manufacture our medical gases to meet all regulatory standards for production and transport:

- Our purity specifications comply with U.S. Pharmacopeia (USP), National Formulary (NF), and European Pharmacopeia (EP).
- All of our manufacturing sites are fully validated and operated under current Good Manufacturing Practice (cGMP) guidelines (GMP in Canada).
- Our compliance process covers production and storage, trailer loading, distribution, and customer tanks and vaporizers.
- Tankers are dedicated to medical grade service, so we can respond quickly without concern for cross-contamination.

Supply options that work for you

Our teams work around the clock to maintain an outstanding global reliability record of 99.94%—supplying product on time at the flow, purity, and pressure our customers specify.

Specifications for Air Products’ NF, EP, and USP Grade Gases

<table>
<thead>
<tr>
<th></th>
<th>NF Nitrogen</th>
<th>EP Nitrogen</th>
<th>USP Oxygen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total purity</td>
<td>≥ 99.0%</td>
<td>≥ 99.5%</td>
<td>≥ 99.0%</td>
</tr>
<tr>
<td>Oxygen</td>
<td>≤ 1.0%</td>
<td>≤ 50 ppm</td>
<td></td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>≤ 0.001%</td>
<td>≤ 5 ppm</td>
<td>Exempt*</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>≤ 300 ppm</td>
<td>Exempt*</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>≤ 67 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odor</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

*Carbon monoxide and carbon dioxide exempt due to production by air liquefaction.
We supply nitrogen, oxygen, hydrogen, and helium from over 40 production facilities across North America. Deliveries are scheduled from our world-class logistics center, where we forecast deliveries using proprietary software and remote TELALERT® telemetry systems. Ordinarily, there is no need for you to place an order. Our logistics center can help you lower inventory control and reporting costs and minimize delivery truck traffic at your facility. Also, our Customer Service Center is available 24/7/365 to help with any gas and equipment service needs.

Air Products provides a comprehensive range of supply modes, including delivery and storage on-site of CryoEase® microbulk and bulk volumes of gas, as well as generation of gases on-site. The right option for you depends on the type of gas being used, the form it’s in (liquid or gas), and the volume and purity needed.

**Expertise for your many applications**

Staying competitive often involves investing in new or better products, more efficient and safer work processes, or improved environmental compliance. Many biotech and life science processes can be enhanced through our innovative gas technologies that help cut costs, improve quality, increase output, or improve safety.

Our engineers can assist you in evaluating your processes and identifying low-cost solutions to serve you and help optimize your productivity.

**Cryopreservation and storage:**
Liquid nitrogen provides a stable, low-temperature environment to preserve and store biological materials. Typically, lower storage temperatures enable a longer viable storage period. Most cells need to be maintained at temperatures of −130°C or below in order to completely stop the chemical reactions responsible for cellular degradation. Nitrogen’s ultra-cold temperature maintains long-term viability of cells and helps improve reliability, since the systems are not susceptible to electrical outages. Our engineers can help optimize your liquid nitrogen supply system to increase reliability and reduce labor and maintenance.

**Lyophilization:**
Liquid nitrogen cooling for lyophilization/freeze drying is often cost competitive with conventional mechanical refrigeration. The use of liquid nitrogen provides multiple benefits including greater flexibility in operating temperature ranges and rates, higher condenser capacity, and reduced maintenance. Also, it helps improve performance and reliability, and can involve lower capital investment compared to mechanically cooled freeze-drying systems. Our engineers can help you design, fabricate, and supply liquid nitrogen cooling systems including control system software, highly efficient heat exchanger systems, and liquid nitrogen supply.

**CryoEase microbulk supply—small package, big benefits**

For smaller volumes, our CryoEase microbulk option has proven to be an excellent, cost-effective supply solution for many life science and biotech customers where reliable gas supply, temperature control, and traceability are critical components of developmental research and clinical operations. Gas is supplied by filling tanks that remain on-site vs. the traditional method of exchanging full for empty cylinders and dewars.

- Safer—eliminates cylinder handling
- Gas can be piped from central supply to end-use point
- Frees up valuable laboratory floor space
- Tank content is monitored remotely by Air Products
- Pay only for gas you use; no residual product returned to supplier
- More consistent purity—eliminates potential contamination, risk of product mix-up
- Reduces number of deliveries
Our 24/7/365 logistics operation and TELALERT® solar cellular and hard-wired telemetry systems help us maintain an outstanding 99.94% on-time delivery record.

Inerting atmospheres: Controlling the gaseous atmosphere in a bioreactor could be critical for its best performance. Nitrogen gas is commonly used in biotechnology and life science processes to maintain oxygen concentrations at the required levels. Also because nitrogen is inert and nonflammable, it enables safe storage and use of flammables, and improves the quality and shelf life of air-sensitive materials. Our engineers can make sure that your inerting/blanketing applications meet all performance standards, while minimizing gas volume requirements and optimizing supply mode.

Cell culture: CO2 is widely used in incubators for cell culture. Traditionally, large steel cylinders are used for supply. With our CryoEase service, liquid CO2 can be stored in a fixed or mobile tank located outside your laboratory and then piped safely to your incubators.

Fermentation: Increasing demand for biological products from fermentation processes can push bioreactor capacity to the limit. Oxygen enrichment can enhance bioreactor capacity and performance without the need for significant capital equipment. Introducing pure oxygen can restore operating production, while also reducing the overall gas flow and associated foaming and gas flooding. Our engineers can help you optimize your bioreactor process safely and efficiently using computational modeling to predict mixing, mass transfer, and other parameters.

Analytical instrumentation: Air Products can provide several installed or portable microbulk supply options for analytical laboratories, including argon for ICP, nitrogen, helium, or hydrogen for GC-MS, and liquid nitrogen for thermal analysis, cryogenic cooling, and NMR. Also, we supply liquid helium dewars for NMR and high-purity helium paks for GC carrier gas. All provide consistent gas supply and purity that are critical to accurate analysis.

Focus on safety and sustainability

At Air Products, nothing is more important than safety—not sales, not production, not profits. We have one of the best safety records in the industrial gas and chemical manufacturing industries and stand among the top performers of the American Chemistry Council’s Responsible Care® program. We are equally diligent about sustainability. Often, our offerings and applications expertise help our customers’ sustainability by reducing energy use, increasing productivity and product quality, and lowering emissions and waste.

About Air Products

More than 20,000 Air Products employees in over 50 countries serve customers in many markets worldwide with a unique portfolio of atmospheric, process, and specialty gases as well as performance materials, equipment, and technology. For over 70 years, the company has developed innovative solutions that help customers become more productive, energy-efficient, and sustainable.