

Worry-Free Gas Supply and Solutions for the Pharmaceutical Industry



When you're responsible for discovering and producing drugs, you shouldn't have to worry about your supply of medical and industrial grade gases. We understand your commitment to the healthcare professionals and patients who use your products. And we understand many of the issues you face, including tighter budgets, stricter FDA regulations, and intense competition, whether you're producing proprietary drugs, generics, biological materials or specialty chemicals.



With a global on-time delivery record of over 99.9%, outstanding safety performance and medical gas compliance, and a total solutions approach to doing business, Air Products provides 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.

Put your confidence in our commitment to quality—and compliance

At Air Products, we know that medical grade gases 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 United States Pharmacopeia (USP), National Formulary (NF), and European Pharmacopeia (EP).
- All our manufacturing sites are fully validated and operated under current Good Manufacturing Practice (cGMP) guidelines (GMP in Canada).
- Our manufacturing process is ISO 9001:2008 certified.
- 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.

Specifications for Air Products' NF, EP, and USP grade gases

	NF Nitrogen	EP Nitrogen	USP Oxygen
Total purity	≥ 99.0%	≥ 99.5%	≥ 99.0%
Oxygen	≤ 1.0%	≤ 50 ppm	
Carbon monoxide	≤ 0.001%	≤ 5 ppm	Exempt*
Carbon dioxide		≤ 300 ppm	Exempt*
Water		≤ 67 ppm	
Odor	None	None	None

*Carbon monoxide and carbon dioxide exempt due to production by air liquefaction.

Relax knowing we have an excellent delivery record

Whether you require medical or industrial grade gases, you can relax when it comes to dependable product supply. Air Products works around the clock to maintain an outstanding global reliability record of over 99.9%—supplying product on time at the flow, purity, and pressure our customers specify.

How do we do it?

- We supply nitrogen, oxygen, hydrogen, and helium from over 40 production facilities across North America.
- We're the world's largest supplier of hydrogen and helium.

- North American deliveries are scheduled from our world-class logistics center, where we forecast deliveries using our 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.
- A comprehensive range of supply modes, including bulk, microbulk, and on-site generation, enables us to provide the right option to meet your needs.
- APEX Express service is available for fast, flexible temporary gas supply. Many mobile units are NF certified for medical use, reducing downtime.
- Our Customer Service Center is available 24/7 to help you with your gas and equipment service needs.

Tap into our technology

Staying competitive often involves investing in new or better products, more efficient and safer work processes, or improved environmental compliance. Many pharmaceutical processes can be enhanced through gas technologies that help cut costs, improve quality, increase output, or improve safety. We can provide gas systems for applications ranging from aerobic fermentation to wastewater treatment.

In addition, because we manufacture specialty chemicals as well as medical and industrial grade gases, we understand the reaction chemistry, kinetics, mixing, and mass transfer issues that can be applied to your operations. Our engineers can assist you in evaluating your processes and identifying low-cost solutions to serve you and help optimize your productivity.



Our 24/7 logistics operation and TELALERT® forecasting system help us maintain an outstanding delivery record of over 99.9%.

Air Products offerings benefit a number of applications and needs

Applications/Needs	Air Products' Offerings
Combustion	Oxygen enrichment systems and modeling expertise
	<ul style="list-style-type: none"> Enhanced combustion and increased productivity Reduced emissions
Cryopreservation	Liquid nitrogen for cryopreservation and storage of biological materials
	<ul style="list-style-type: none"> Maintains long-term viability of cell structure Reliable long-term storage, not susceptible to electrical outages
Fermentation	Oxygen enrichment and modeling expertise
	<ul style="list-style-type: none"> Reduced foaming and gas flooding Improved yield and productivity
Fluorination	Selectfluor® and Deoxfluor® fluorinating reagents
	<ul style="list-style-type: none"> Safe, mild, effective reagents Increased yields
Hydrogenation	Hydrogen supply and optimization expertise
	<ul style="list-style-type: none"> Reliable supply: largest producer of hydrogen, with multiple supply options Technical expertise in gas/liquid mass transfer and modeling and computational fluid dynamics to increase yields
Inerting and blanketing	Nitrogen inerting
	<ul style="list-style-type: none"> Safe storage and use of flammables or prevention of combustible dust explosions Improved quality and shelf life of air-sensitive materials
Low-temperature reactions	Liquid nitrogen cooling
	<ul style="list-style-type: none"> Safe processing of highly reactive chemistries such as butyllithium or Grignard reactions Easily combined with other refrigeration steps
Lyophilization	Liquid nitrogen refrigeration
	<ul style="list-style-type: none"> Reduced cycle times and improved productivity Improved performance and reliability and lower capital investment compared to mechanically cooled freeze-drying systems Reduced carbon footprint
Particle size reduction	Cryo-Grind® liquid nitrogen grinding or milling
	<ul style="list-style-type: none"> Freezing with liquid nitrogen followed by grinding Gaseous nitrogen for micronization applications Produces high-quality, uniformly sized particles
Solvent/VOC recovery	Cryo-Condap® liquid nitrogen system for solvent condensation
	<ul style="list-style-type: none"> Condensing and recovery of solvents/VOCs Compliance with the most rigid EPA requirements
Sparging/stripping	Nitrogen sparging
	<ul style="list-style-type: none"> Efficient removal of volatile contaminants In-vessel and in-line systems
Wastewater treatment	Halia® oxygen aeration systems
	<ul style="list-style-type: none"> Increased capacity vs. air Improved productivity

Dedicated to safety and sustainability

At Air Products, safety is our number one priority. A commitment to total safety is the commitment to doing things right. Our performance is consistently among the leaders in our industry, thanks to our teams' efforts around the world to prevent injuries and send people home as safely as they arrived at work. We hold all of our people accountable for working safely and protecting the safety of our contractors and customers.

We put our safety expertise to work for you:

- Safety training in using our products safely
- Online Material Safety Data Sheets and Safetygrams
- 24/7 emergency response (800-523-9374)
- Identification of opportunities to upgrade the safety of existing operations
- Gas applications for safety, such as nitrogen inerting and critical oxygen content calculations to help avoid fire and explosion

People thrive on solving tough challenges. Customers in more than 30 industries are more productive, energy-efficient and sustainable with our gases, materials, technology solutions, and the deep understanding and expertise we bring to them.

Our people, offerings and the markets we serve give us unique insight into pressing social and environmental challenges. At the heart of Air Products and its people is a set of real values—values that say we will work to protect our fellow human beings and the environment and will be a positive influence for our communities and our world through our behaviors, offerings and operations.

Joining accountability, customer focus, innovation, integrity, and respect, sustainability is one of six core values at Air Products and is directly tied to our business strategy and our growth. In addition to our focus on safety, we are committed to reducing our environmental impact by consuming fewer resources and lowering our emissions. We've set aggressive reduction goals in energy, greenhouse gases, water, waste, emissions, and fleet emissions.

About Air Products

Air Products serves customers in many markets in over 50 countries with a unique portfolio of products, services, and solutions. For over 70 years, the company has developed innovative solutions that help customers become more productive, energy-efficient, and sustainable.



Air Products' compliance program for NF, EP, and USP grade gases covers every applicable regulatory standard for both production and transport.

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