

Helium Recovery and Recycle System for Fiber Optics Manufacturers

With helium recovery rates exceeding 90 percent and recovery purities greater than 99.99 percent, Air Products' patented¹ Helium Recovery and Recycle System offers many advantages for fiber optics manufacturers worldwide. With this new system, you may lower your helium costs and reduce your vulnerability to product shortages and supply disruptions without risking damage to fiber quality.

In the fiber manufacturing process, helium is essential for cooling fiber as it is being pulled from a furnace and prior to applying protective coatings. Although manufacturing processes vary widely, a typical fiber optic production process uses large quantities of helium, making recovery and recycle an important element in cost control. Conservation has become even more vital, with helium demand projected to exceed worldwide capacity in the immediate future and helium costs projected to continue climbing for several years.

Demonstrate at Your Site

Air Products offers a demonstration Helium Recovery and Recycle System which is modular and portable, allowing you to install and test the system at your manufacturing site, in contrast to other systems that require off-site testing. Our system is designed to blend into your operating system without unnecessary downtime and disruption. With the on-site trial unit, you will be able to determine whether the system will work with your particular draw process before investing in a permanent installation.

The demonstration unit can be connected to multiple draw towers, reducing the amount of hardware required in prime manufacturing space. In addition, you can opt to compare the quality of the fiber, both with and without a Helium Recovery System, by running Air Products' unit in tandem with a draw tower that doesn't use a recovery system.

Additionally, the demonstration system can easily be adapted to support a permanent system installation that meets all your requirements.



Air Products' patented Helium Recovery and Recycle System is designed to improve process efficiency and reduce helium requirements during fiber optics production.

¹ U.S. Patent No. 6,345,451-B1.

Advantages of Air Products' Helium Recovery and Recycle System

Features	Benefits
Patented technology	Doesn't damage fibers or disrupt fiber production process
On-site trial unit	Allows you to be confident that the system is compatible with your manufacturing operation
Recovers helium from draw towers at a recovery rate ranging from 50 to 90+ percent at purity levels ranging from 95 to 99.99 percent	Lowers cost of your helium supply and helps you manage possible supply shortages or disruptions
Retrofits easily to your existing system	Easy to install with little disruption to your staff
Leased terms	Minimal capital investment, reduced risk

Assessing Your Recovery Options

The critical success factors for recovering and/or recycling helium in fiber optic manufacturing include the amenability of your draw towers to recovery. Determining the amenability may require a practical test and development work. A draw tower optimization plan is necessary.

Economic justification is also essential. For example, your overall cost savings can be determined by calculating such factors as the number of towers, their flow and duty cycles, the number of vacuum pumps needed, your inlet purity requirements for helium, piping layout and constraints, and the availability of utilities.

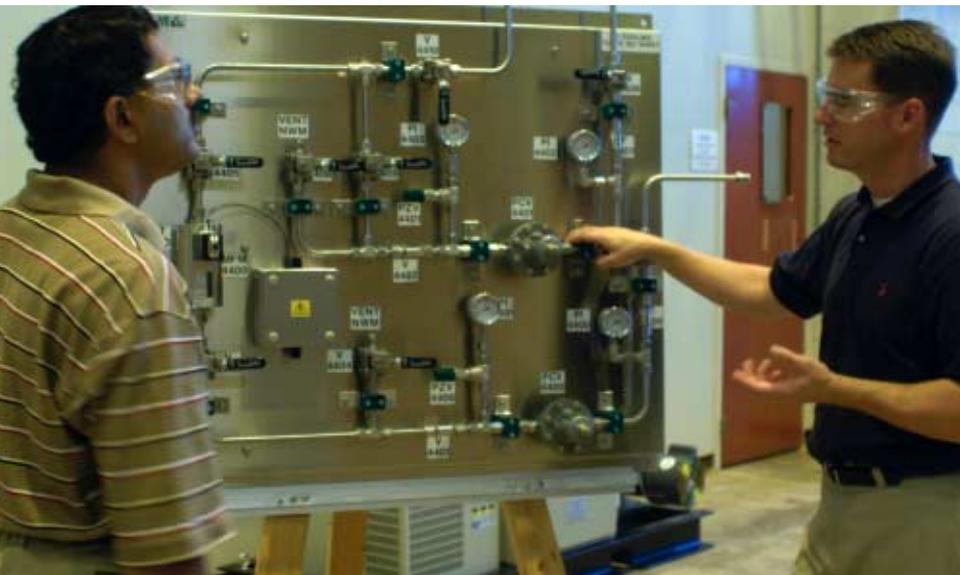
We offer a variety of recovery solutions that are tailored to your needs. Our systems are adaptable to:

- Recover helium from your draw towers and recycle it back to your towers or compress it into tube trailers for resale to Air Products.
- Recover helium from your preform production and recycle it into your draw towers. This may be a simple process and may be worth exploring if your preform area represents a majority of your overall helium use. The viability of this choice also depends upon the amount of impurities present.
- Recover and recycle helium within both your preform and draw tower areas. This may be the most economically beneficial option, provided acceptable purity can be achieved within the preform area at an acceptable cost.

Air Products' helium recovery and recycle experts will help you determine the best option.

Why Air Products?

As the leading producer and supplier of helium, using the most extensive network of helium production facilities in the world, Air Products has become recognized as the expert in helium supply and recovery solutions. In fact, more than four decades ago, Air Products pioneered many of the helium extraction, production, distribution and storage technologies that are still in use today, including cryogenic equipment for most of the world's helium recovery plants. The company began exploring fiber optic helium recovery in the early 1990s and has continued to refine that technology to provide enhanced reliability and operation.



Our novel system has achieved steady-state helium recovery rates in excess of 90 percent and recovery purities greater than 99.99 percent in actual commercial operation and field trials at major fiber optics manufacturers.

System Specifics of Helium Recycle Trial Equipment

Helium recovery for the fiber optics industry is a fine balance between recovering the helium gas without causing defects in the fiber during the drawing process and reducing the influx of ambient air into the recovered helium stream. Our recovery units are engineered specifically for the fiber optics manufacturing operation. Our design helps to reduce control disruptions by using mass flow controllers in conjunction with a vacuum pump to accurately recover helium from chillers with minimum aspiration of air into the recovery system. The benefit to you is a system that can be adapted to “load-follow” your unique draw requirements without causing costly production line delays or disruptions.

Flow Control System

- Inlet mass flow measurement for accurate measurement of incoming helium flow rate.
- Mass flow controller for rapid, precise control of recovered gases.
- Integral electronic control system.

Vacuum Pump System

- Facilitates helium recovery.
- Custom-designed to help meet your process recovery requirements.
- Vacuum vessel can eliminate fluctuations in vacuum as required.

Piping

- Sized to help reduce pressure drops.

Compressor

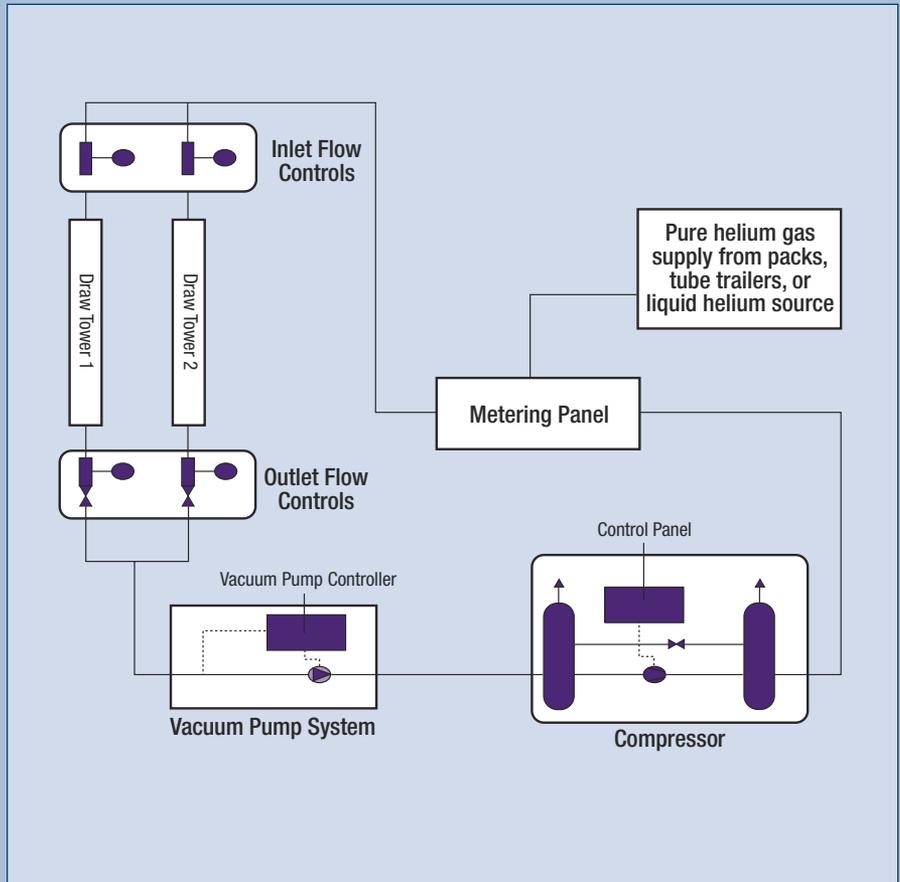
- Increases helium pressure for recycle.

Gas Conditioning (if necessary)

- Normally only water vapor removal is required (no need for costly pressure swing adsorption units).

Metering Panel

- Mixes recycled helium with pure helium makeup.



Special Operational Features

- Completely automatic—helium recovery without operator intervention.
- User-friendly defined set points—user controls desired recovery ratio.
- Highly stable performance—essential to effective fiber optic production.
- Simple and effective purification strategy—no need for costly purification add-ons.
- Smooth ramp-up—critical for stable multitower operation.
- Rapid upset response—minimizes downtime; keeps towers producing fiber.
- Maximum recovery potential—system even recovers analysis stream.

About Air Products

Air Products serves customers in technology, energy, healthcare, and industrial markets worldwide with a unique portfolio of products, services, and solutions, providing atmospheric gases, process and specialty gases, performance materials, and chemical intermediates. The company is the largest global supplier of electronic materials, hydrogen, helium, and select performance chemicals. Founded in 1940, Air Products is recognized for its innovative culture, operational excellence, and commitment to safety and the environment. With annual revenues of \$5.7 billion and operations in 30 countries, the company's 18,000 employees build lasting relationships with their customers and communities based on understanding, integrity, and passion.

For More Information

To learn more about our global helium recovery and recycle capabilities or to tell us more about your needs, contact the office nearest you. Or visit us on the Web at www.airproducts.com/helium.

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