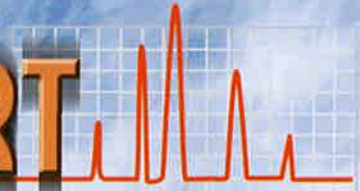


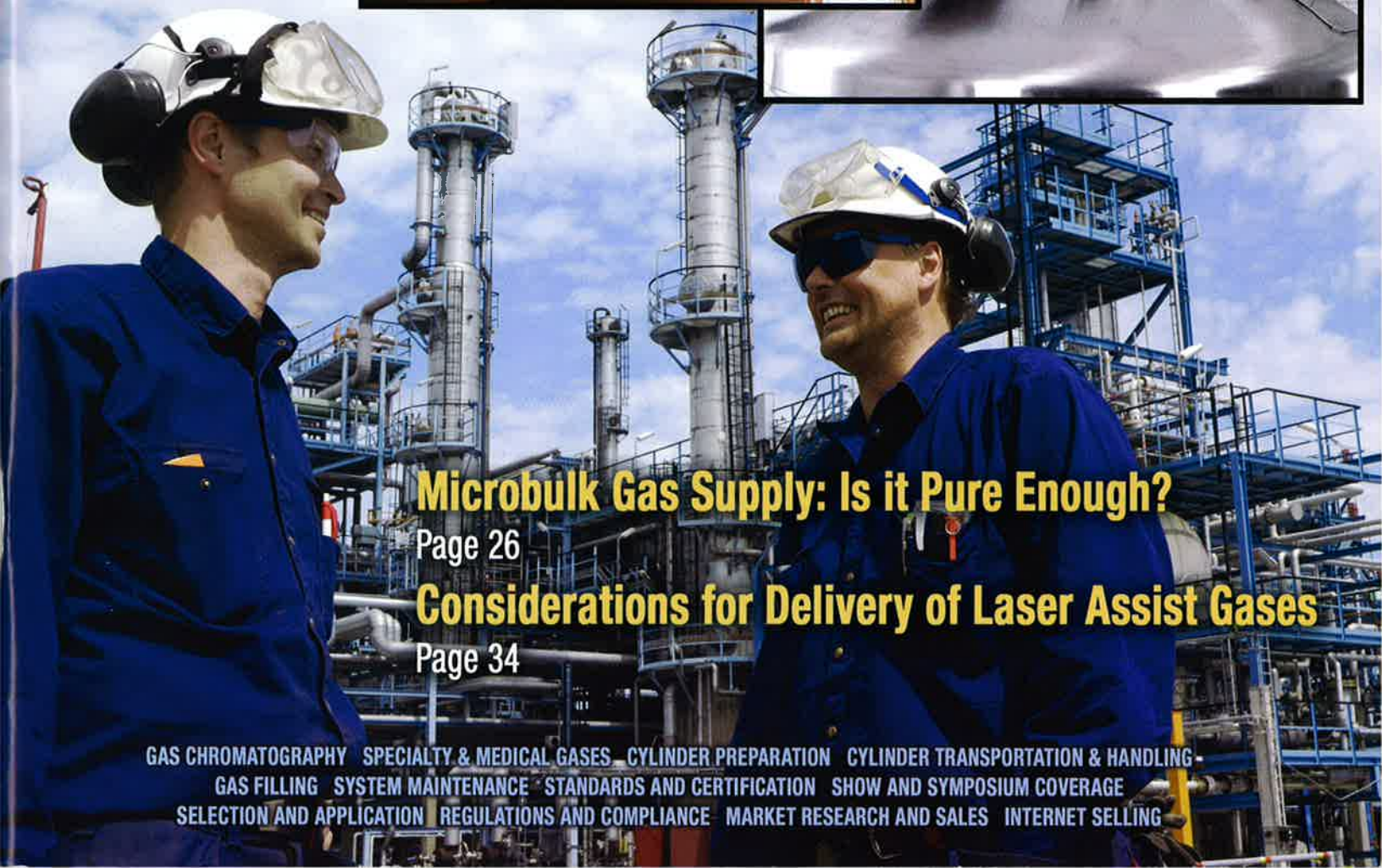
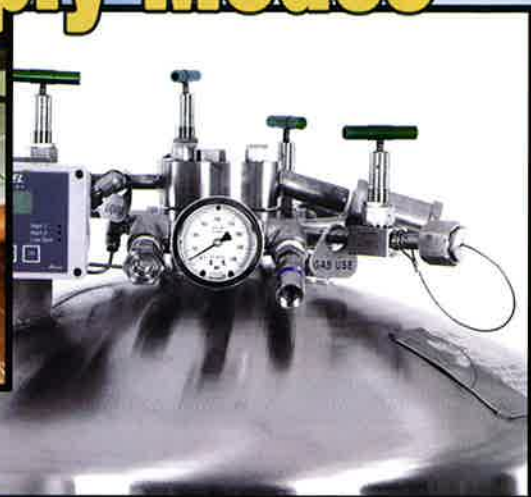
SPECIALTY GAS REPORT



The Magazine for Producers, Distributors, and Users of Specialty and Medical Gases

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Microbulk Gas Supply: Is It Pure Enough to Promote the Mode Change?



by Tim Neeser

Lab and operations managers need to look beyond the convenience, safety, and savings when evaluating microbulk.

The distribution of microbulk gas has evolved over the past 14 years to the point that it has gradually become the standard gas supply today for small- to medium-sized users. Applications from ICP-MS/GC systems in laboratories to laser cutting in metal fabrication have embraced the gas supply mode change from conventional cylinders.



Fig. 1 Laboratories have discovered the benefits of microbulk argon and nitrogen gas for ICP and GCs to be more productive.

Customer buying motives have typically focused on cost savings that result from labor reduction and better gas utilization as justification for this change; however, after installation they quickly realize that their expectations are exceeded. One of the pluses is a continuous, uninterrupted gas supply that eliminates potential contamination and reduces equipment down time to positively affect the quality of their processes.

Also, lab users have discovered that microbulk argon and nitrogen gas for ICP and GCs increases productivity.

Laser metal fabrication shops can now enjoy the true benefits of “Lights Out” operation with a reliable continuous flow of nitrogen assist gas.

The Microbulk Mode Improves Purity at the Application

The improvements in gas quality start with the Perma-Cyl* storage system. The vacuum-insulated Perma-Cyl is located near the application and refilled on site. The inner vessel of the Perma-Cyl is constructed of stainless steel, whereas, high pressure cylinders are carbon or alloy steel construction. These differences in the gas containment materials should not



Figure 2. Laser metal fabrication shops can now enjoy the benefits of “Lights Out” operation with a reliable continuous flow of nitrogen assist gas.

be discounted. Corrosion of the internal surfaces of high pressure cylinders is a known problem, and that is avoided with the Perma-Cyl design. Thus, the risk of corrosive products contaminating the Perma-Cyl is very low.

During the operation of the Perma-Cyl, liquid is converted to the gaseous state automatically as the application demands it. As the cryogenic liquid boils, extremely pure gas is generated, which results from the exact change-of-state temperature. Thus, purity is inherent in the cryogenic storage medium—much like when water boils and the pure water vapor is captured during the distillation process.

The System Design

Chart Industries’ MicroBulk Delivery System (see Figure 3) starts with an ORCA* truck (1) for quick and easy filling directly to or through a Wall Box (2) to the Perma-Cyl storage vessel (3). When the supply of gas reaches a low point, the Cyl-Tel Telemetry System (4, 5) notifies the gas supplier, who returns with the ORCA truck and refills the Perma-Cyl.

To complete the delivery of the pure gas to the application, stainless steel piping and premium controls are permanently installed at the site and connected to the Perma-Cyl. If contamination from this equipment is identified as a potential issue,

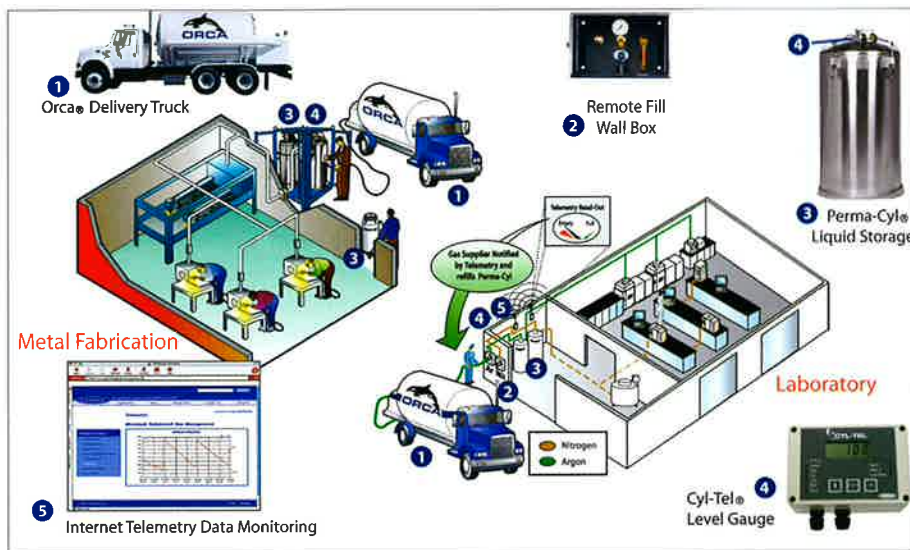


Figure 3. Chart Industries' MicroBulk Delivery System starts with an ORCA truck (1) for quick and easy filling directly to or through a Wall Box (2) to the Perma-Cyl storage vessel (3). When the supply of gas gets low, the Cyl-Tel Telemetry System (4, 5) will notify the gas supplier, who returns with the ORCA truck and refills the Perma-Cyl.

UHP (Ultra-High Purity) components can be specified in advance. These components are typically made from high-quality stainless steel and may even be electro-polished to achieve a clean, smooth surface that prevents the harboring of contaminants. This requirement can also include the piping and controls on the Perma-Cyl.

The Perma-Cyl is available with the UHP option for all stainless steel construction, including the internal piping.

MicroBulk Improves Purity Trough Distribution

The foundation of MicroBulk gas purity is inherent in its distribution model. The improvement of gas quality is simply outlined through a reduction in unnecessary

handling. Since the molecule path from the air separation plant to the Perma-Cyl is typically very short with relation to the ORCA distribution truck, the probability of contamination is greatly reduced.

In comparison, transportable cylinders, either liquid or high-pressure, are subject to the risk of contamination from handling by previous users. Although high-pressure cylinders are evacuated prior to being refilled, the risk of contaminants clinging to the inner surfaces remains. Perma-Cyls, dedicated to one end use, are only at risk of being contaminated by the application in service.

Furthermore, transportable cylinders must be exchanged on a full-for-empty basis. This means constantly disconnecting empties and connecting cylinders at

the point of use. Each of these connections creates a risk of introducing air or contaminants into the piping process. Perma-Cyls are connected one time and remain in place, eliminating this risk.

If the customer requests documentation of proof of the gas purity, MicroBulk is set to deliver. The Orca delivery system is equipped with a special liquid valve that permits a liquid gas sample to be dispensed for testing. This simplifies the task of tracing each load.

Better Quality Gas is Inherent in MicroBulk Distribution From Reduced Handling.

With a dedicated storage gas supply and direct distribution, MicroBulk should be considered as a solid candidate for your customers' pure gas supply requirements. Their processes will run more smoothly and their equipment will last longer, without unnecessary equipment restarts from gas outages.

So evaluate your customers' gas supplies and consider moving them up to a microbulk mode—in which moving molecules instead of metal will significantly improve the quality of their gas supply.

*Perma-Cyl and ORCA are registered trademarks of Chart Industries. **SGR**

Tim Neeser is Director, Marketing and New Product Development, Distribution and Storage Group, Chart Industries.



Figure 4. The Perma-Cyl is available with the UHP option for all stainless steel construction, including the internal piping.

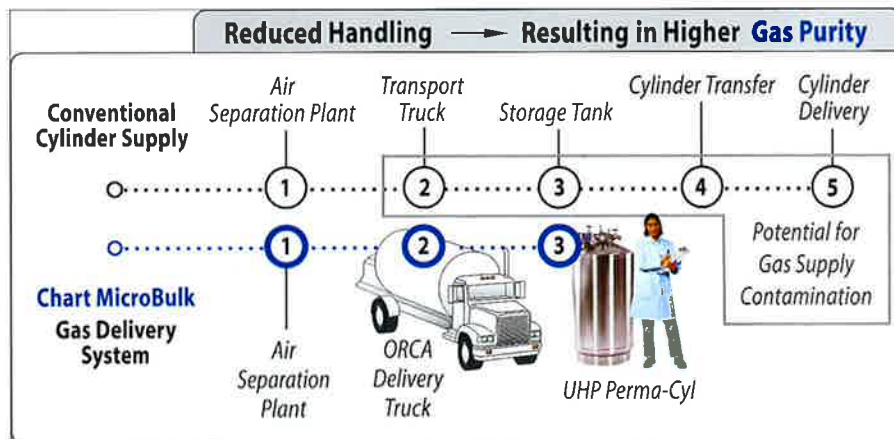


Figure 5. Improved gas quality is achieved as a result of reduced handling with microbulk distribution.

If it doesn't say Perma-Cyl®... it's not MicroBulk.



Perma-Cyl is what users trust!

Chart has over 13,000 built-to-order Perma-Cyl® systems installed worldwide in businesses ranging from metal fabrication to research laboratories. No other company has more experience in MicroBulk gas delivery and storage solutions than Chart.

Chart invented MicroBulk so we know the applications inside and out. We have the proven experience that MicroBulk system users trust.

13,000 Perma-Cyl® Installations



- » Configure-to-order plumbing to match your customers' application
- » Single hose no-loss/low-loss fill for optimum delivery
- » Internal top fill float assures automatic shut-off from the Orca® delivery system
- » Exclusive Cyl-Tel® digital electronic level gauge for accurate readings with telemetry-ready output
- » Capacities from 230 to 2000 liters and up to 500 psig (34.5 barg)

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