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Microbulk Storage for Laser Gases

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Laser Cutting?

Make It Microbulk

Ray Homan, Airgas Inc.

Making the switch to microbulk delivery enabled Cutting Edge Laser to reduce loss time, increase laser cutting production capacity, and improve the bottom line.

By nature, steel cutters are sharp thinkers. But it was an edgy innovation that enabled Cutting Edge Laser to reduce loss time, increase its laser cutting line's production, and improve its bottom line — with no capital investment.

This suburban Atlanta-based sheet metal fabrication company found significant productivity improvements by streamlining its gas supply chain.

Last fall, Cutting Edge Laser switched its liquid nitrogen delivery mode from liquid cylinders to the Airgas MicroBulk gas delivery system, which includes a Chart Perma-Cyl tank at the company's location. The tank is refilled as needed by custom-designed microbulk delivery vehicles.



Laser cutting, fueled by a microbulk delivery system, allows Cutting Edge Laser to use gas more efficiently.

“Since making the switch, we can run our laser overnight when no one is in the shop, essentially getting a third shift without added personnel expense, and we’ve reduced loss time by up to an hour on the days we run our laser non-stop,” said Doug Nielsen, co-owner of Cutting Edge Laser. “Not only did the new system require no capital investment, we are actually saving money on our liquid nitrogen bill by using gas more efficiently.”

Located in a 3,500 ft.² facility in Covington, GA, Cutting Edge Laser manufactures highly engineered metal fabricated components. Its clients use the company to create prototypes and small production runs. The company uses the latest equipment available, including a laser cutter, press brakes, grinding equipment and welders.

Space and Time

Before switching to the microbulk system, Cutting Edge Laser needed as many as 40 liquid cylinders, or dewars, of nitrogen a month to fuel the 2,000 W laser it uses to cut stainless steel. Each dewar lasted between one and three hours, depending on the thickness of the cut steel. Nielsen said his production team constantly changed cylinders throughout the day when the laser cutter was running non-stop. The company kept 10 cylinders onsite at any given time taking up valuable floor space.

Because the laser-cutting line had to be shut down for up to 30 min-

utes each time a cylinder needed changing, Cutting Edge Laser installed a vaporizer. The vaporizer allows the company to switch out one tank while using another. However, the production crew still ran into problems maintaining pressure to keep the laser cutter running while the change out occurred.

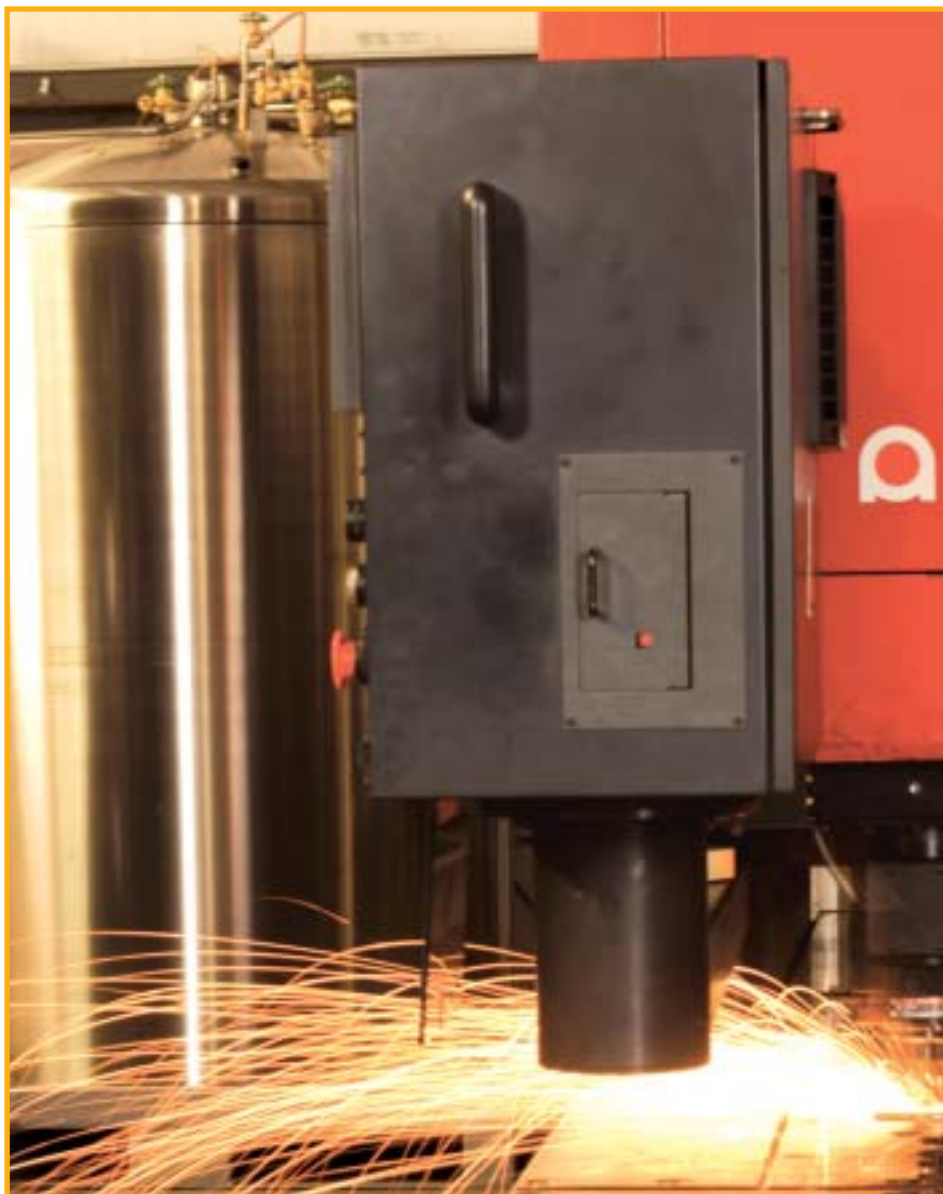
“Switching cylinders required a lot of operator intervention,” Nielsen said. “My production manager says he felt like a mad scientist, con-

stantly adjusting pressures and trying to avoid problems just to switch a cylinder.”

In addition, the variability in the nitrogen pressure sometimes reduced the quality of cutting adding labor costs associated with rework.

Growth Driven

Despite the economic slowdown and manufacturing decline of recent years, Cutting Edge Laser grew by 100 percent from 2002 to 2003.



The firm installed a 1,500 liter VHP Perma-Cyl nitrogen tank on its shop floor near its laser cutter. Installing the microbulk system reduced labor on change outs and minimized product loss.

Nielsen said the costs associated with the laser downtime and lost employee productivity caused by the liquid cylinder gas supply system were becoming more apparent. The company turned to its gas supplier to learn more about microbulk, a relatively new supply option that use a moderate amount of gas.

Small users tend to rely on high-pressure cylinders or low-pressure liquid dewar cylinders while large users turn to full size bulk tanks. Microbulk systems provide medium-sized companies with the advantages of a bulk supply in a smaller package.

For Cutting Edge Laser, Airgas installed a 1,500 liter VHP Perma-Cyl nitrogen tank on the shop floor near the laser steel cutter. Designed



The connection from the delivery truck to the microbulk tank. Tanks can be installed inside or outside a facility, depending on space requirements. Gas is then piped to the point-of-use.

specifically for laser applications, the VHP Perma-Cyl includes automatic pressure builder and economizer systems to deliver optimal pressure up to 475 psig (32.75 bar). In addition, its built-in vaporizer coil supplies gas at continuous flow rates of up to 1,350 SCFH.

Keep the Pressure On

Another key decision factor was the ability for the microbulk delivery trucks to maintain pressure when refilling the VHP Perma-Cyl tank. A 200 liter VHP Perma-Cyl mounted on the delivery vehicle maintains a pressure of 420-450 PSI during refill. This reduced production downtime when bringing the system to operating pressure and nearly eliminated the bad cuts due to unstable gas pressure whenever a dewar was changed out.

“Since we installed the microbulk system, we haven’t had to worry about gas pressure at all,” Nielsen said. “The continuous supply is a big benefit to our business operations.”

Other benefits include: reducing the amount of contaminants that can enter the gas supply, decreasing cylinder rental charges, eliminating residual gas loss, freeing up storage space, and providing a safer, more productive work environment.

Safety Issues Addressed

Altec Industries of Saint Joseph, MO, which makes aerial lifts and derrick diggers, found installing a



Cutting Edge Laser’s shop manager John Cooper adjusts the sheet metal cutter for the next cuts. Production teams eliminated the need to change cylinders throughout the day, freeing more time for other tasks.



Airgas driver, Kenneth Alexander, refills Cutting Edge Laser's microbulk tank (left) and adjusts the VHP Perma-Cyl below. The truck maintains pressures between 420-450 PSI during refills, helping to reduce downtime.



microbulk system helped with safety issues.

The company recently started a new manufacturing process that needed to supply a four-head seam welder. The amount of gas needed for welding operations in the new plant couldn't justify a traditional bulk tank. However, to ensure that enough gas was onsite, nine to 12 cylinders of 90 Ar -10 CO₂ shielding gas had to be delivered every other day.

Altec had two 1,500-liter Perma-Cyl argon tanks installed — one for the seam welder and one to supply all the other welding stations in the plant. It also installed a gas mixer and manifold to mix its shielding gas on site, using liquid cylinders for the CO₂.

"The microbulk system is extremely convenient since the gas is mixed and supplied with safety alarms and can be piped directly to the point of use," Rick Mulvaney of Altec said. "Plus, it significantly re-

duces the safety issues inherent in storing, moving, and switching out cylinders.

"Another added benefit is the flexibility in the microbulk system," Mulvaney continued. "As we adjust the process in our manufacturing facility, we may need to move the Perma-Cyl tank in the future. Because of its relatively small size, we can easily make the move without incurring huge expenses."

Argon and nitrogen are available for microbulk deliveries nationwide. Perma-Cyl MicroBulk tanks are available in sizes ranging from 230 liters to 1,500 liters and can be installed inside or outside a facility, depending on space requirements. Gas or liquid is piped to each point of use within a facility. Portable

tanks can be positioned at point of use, as well.

Telemetry services will allow the gas supplier to help monitor its customer's gas inventory on a daily basis to maximize the efficiency of deliveries and prevent run-outs.

The Final Decision

The final decision to move to a microbulk system might be fueled by one overriding reason, as it was for Cutting Edge Laser — continued rapid growth. Or, it might rest on a number of factors, as it did for Kemlee Manufacturing, which makes custom stainless steel food service, laboratory, and residential equipment in its Galena, KS facility. "We can attribute a number, of cost savings to our microbulk gas delivery system," Rick Roberts of Kemlee said. "Not only did we eliminate a number of safety issues with cylinder handling, we are saving money with reduced cylinder rental charges, residual gas loss, and reduced labor costs."

About the Author

Ray Homan is a market development manager for industrial gases at Airgas, Inc. Prior to taking the lead on developing Airgas' MicroBulk program nationwide, he was a national sales manager for industrial gases and equipment. Homan joined Airgas in 1997.

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