



Modern bulk gas supply chains

Making big strides with MicroBulk and small bulk

By Bob Linton

Twenty years ago, industrial gases were supplied through three methods – packaged gases, including cylinders and dewars; bulk liquid; and onsite gas generation. While bulk fills and onsite gas generation are highly effective for large volume end-users, a precipitous gap existed for packaged gas users whose needs were of a significant volume, but not quite at the levels where bulk deliveries made economic sense. The market was ripe for the introduction of MicroBulk and small bulk as a viable, and much welcomed, delivery method for industrial gases.

MicroBulk is a modern concept where the customer's gas is supplied by filling on-site versus the traditional delivery method for smaller volume users where gas is supplied by swapping full for empty cylinders and dewars, according to Air Products. MicroBulk supply features specially designed tank trucks with integrated controls and flexible storage tank options, built with automatic shut-off devices. End usage can be provided as pure gases, cryogenic liquids, or gaseous mixtures via a blender installed at the customer's site.

Lower distribution costs

"Micro-bulk started off as a way to fill a

void in distribution," said Tim Neeser, Vice-President of Marketing and Applications Development, Chart Industries. "When we started, MicroBulk was in the 500 to 1,000 litre range. Now we're about to launch a 5,000 litre container, which competes in the small bulk arena. The bottom line is that it's a lower cost to deliver the product."

Chart provides the industrial gas market with a variety of products and services, including its Orca™ MicroBulk Delivery System, its Perma-Cyl® MicroBulk Storage Systems, and its Cyl-Tel® Telemetry System that manages customers' gas inventory on a daily basis.

Neeser says that MicroBulk offers flexible solutions. This can include no requirement for a concrete pour pad; no height restrictions, which are defined by code in some states; no need for permits in many areas; and growth flexibility, as the usage patterns of some applications, such as laser, are erratic depending on the changes in business climate. He says its customers generally rent the Perma-Cyl storage tanks at a typical term of about seven years. This allows the gas distributors to move their packaged gas customers to a secure contract, which benefits both parties because the distributor can now invest in adding more value to its customer's gas supply.

Air Products, a Chart customer, has its own branded product and says its CryoEase® Microbulk Solutions offer a cost-effective alternative to cylinder supply – even if using as few as 10 cylinders per month of the same gas. Benefits of CryoEase include the option for various tank sizes, a range of pressures and configurations to meet the customer's needs, a programmable digital liquid level gauge that enables better inventory management and guards against run-outs, remote alarms and telemetry monitoring programmes, outdoor or indoor installation, and an optional wall box for remote fills.

"Our CryoEase micro-bulk customers are seeing the advantages over traditional cylinder supply, which include lower costs, convenience through automation, and improved quality control," said John Tapley, Business Development Manager, Microbulk, Air Products. "Not only are we seeing conversion from cylinders, but also new opportunities in the suitable, smaller volume range are going straight to MicroBulk instead of starting with cylinders and moving up."

According to Neeser, MicroBulk and small bulk offer the benefits of bulk on a smaller scale. The company's entry-level, 230 litre Perma-Cyl tank holds as much gas as 20 high pressure cylinders, at a lower cost and safer pressure. "Delivery once per month is the sweet spot," Neeser said. "We work with our gas distributor customers and help them to size our tanks accordingly to give a 30-day delivery cycle. More deliveries per month raise fuel costs and indicate the need for a bigger tank."

Neeser also highlights Chart's patented float auto shut-off system, which means less training for drivers, and its patented submersible pumps, which eliminate waiting for cool down and allow drivers to make up to 10 deliveries per day.

Growth opportunities

For Middlesex Gases and Technologies, a Praxair distributor based in Everett, Massachusetts, MicroBulk and small bulk have significantly benefited the company's business. Ron Perry, Director of Sales and Marketing, explained, "In the past when ▶

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► a customer's gas usage increased beyond a certain point I'd lose the account to the manufacturer."

"I really disliked telling a customer that we had reached the limit of our supply options. By investing in the MicroBulk programme, we now are able to service the customer as his needs grow. In several cases we have seen our customers starting with either a 1,000 or 1,500 litre cylinder then, in time, moving into a 3,000 litre or bulk opportunity."

In addition to MicroBulk tanks ranging from 1,000 to 3,000 litres, Middlesex Gases and Technologies' business has grown with regard to larger bulk tanks as well. The company started its MicroBulk service with one nitrogen truck and today has three nitrogen trailers, one argon trailer, one CO₂ (carbon dioxide) truck, and one nitrogen transport. "Over the last 10 years we've grown 10-fold," said Perry. "We provide specialty gases to biopharma and life sciences organisations. Boston/New England is a major hub and it's all about space. MicroBulk and small bulk enable us to best utilise the space the customer has and offer the best possible solutions."

As a rule of thumb, Perry encourages his customers to lease tanks, rather than purchase them, in case they outgrow their existing tanks. "Leasing has an upside to them," he explained. "It takes the worry out of it." He also says that monitoring is a big part of the equation, and that Middlesex Gases offers that service to customers. "With telemetry we can precisely monitor their usage and dispatch orders automatically so they can focus on their research," he added. "It's changed the dynamics of the industry – it really has."

"The majors were concerned when they realised independents were getting into this market. However, it's been mutually beneficial for both parties because the majors didn't have the representation for these accounts and we add an extra level of customer service. We all benefit as our customers grow."

Cylinders are right for some customers, but MicroBulk fills gaps for others, according to Memphis-based nexAir, one of the largest distributors of atmospheric gases and welding supplies in the US.

VALUE IN REHABBED EQUIPMENT

As the number of MicroBulk storage vessels continues to grow in both number and age, it has been recognised that there is a need for quality repair and refurbishment of these workhorse vessels, according to Ohio-based Eleet Cryogenics. The industry has widely accepted the fact that large cryogenic bulk tanks can be fully rehabbed to like-new condition at a fraction of the cost of purchasing a new vessel.

"Since 1996, Eleet Cryogenics has been rehabbiting cryogenic bulk tanks and hospital reserve units, which are very similar to MicroBulk containers,"

"MicroBulk is one of the fastest-growing segments of our gases business," said Steve Atkins, Executive Vice-President of Gases at nexAir, which supplies argon, oxygen, nitrogen, and CO₂ in MicroBulk.

"Lower costs, uninterrupted supply of product, and customer inventory management via remote telemetry has led to our MicroBulk volume steadily increasing and our placing of 40 to 50 MicroBulk tanks per year. Ten to 15 years ago MicroBulk was a tough sell. Today, MicroBulk is more widely accepted in the marketplace and recognised by customers as a viable method of supply."

Atkins notes that MicroBulk reduces product usage by 20% due to the elimination of residual product in returned cylinders, and it reduces cylinder handling costs, which are significant due to the labour intensive process of filling cylinders, delivering them, and picking up used ones. Both factors offer savings for the customer.

A gap filled

Trucks that are smaller than the large transport trailers used to fill bulk tanks have been developed to support the MicroBulk business. Trinity Industries, based in Dallas, Texas offers comprehensive product portfolios for mini bulk delivery through its Wesmor Cryogenics and Alloy Custom Products company divisions.

Wesmor Cryogenics and Custom Products have been building mini bulk delivery trucks for multiple customers in the industry for many years. Mini bulk

said Doug Morton, Vice-President of Sales at Eleet Cryogenics. "The next logical step for our company was to add MicroBulk vessel services to meet the developing demand for this type of work."

In addition, there are many unique upgrades that can be added to MicroBulk tanks as part of refurbishment that will both facilitate ease of usage in the field as well as reduce maintenance costs. These include extended stem valves, palletised bases, high flow external vaporization, and multiple selector valves.

trucks can fill MicroBulk tanks as small as 180 litres or as large as 3,000 litres, and are used in the industrial gas, medical, and oilfield services markets. Many of the small bulk oxygen tanks seen at medical facilities are filled by mini bulk trucks, while these are also used to supply nitrogen for fracking in oil fields. Meanwhile, another trend understood to exist in the bulk gases supply chain is increased interest in small refrigerated liquid CO₂ bulk units, when a customer's production demand increases.

It is clear that MicroBulk and small bulk have gained much traction in the US and indeed the world over the past decade, and have fostered overall business growth as these delivery systems have filled the gap that once existed between the packaged gases and on-site bulk filling markets.

Gas companies, distributors, equipment makers, and end-users alike have all realised great benefits from MicroBulk and small bulk programmes, and participants will continue to innovate and optimise these delivery methods going forward. 

ABOUT THE AUTHOR

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