Microbulk is bulking up

Chart Industries on microbulk trends and the success of the Orca™ delivery system

By Nick Parkinson

Chart Industries has been there since the birth of microbulk and expects its baby to keep on growing, with larger tanks and larger Orca™ MicroBulk Delivery Systems.

Since introducing the Orca™ delivery truck in 1996, Chart has sold close to 1,000 units around the world and recently introduced its "next generation" two years ago. Named after the killer whale, with the thinking being "Eat lunch or be lunch", the Orca™ delivery system aims to make on-site distribution for smaller accounts profitable.

The Orca™ offers fast, reliable and accurate on-site delivery of liquefied gases to a customer. Key controls and components allow the driver to safely and quickly deliver the proper amount of liquid accurately to the Perma-Cyl® MicroBulk Storage System or small bulk tanks. An entire fill operation can be completed in three to 30 minutes with no pump cooling or product loss in inert service.

With the aim of driving down the costs of packaged gas distribution, one of the key selling points for Chart is the Orca truck's ease of use and reduced driver training, making faster, more efficient deliveries.

"It's all about safety and efficiency when delivering to small accounts," Chart VP Customer Service & Marketing Tim Neeser told **gas**world.

"The new generation Orca™ system is arguably the most advanced cryogenic transport on the planet."

"It's been a real steady product for us since we introduced the new generation in 2016 – pretty much on the 20th anniversary. Since 1996, I would say worldwide we have sold close to 1,000 Orca delivery systems. And last year, we added the CO_2 series. That's a space where we never really had a delivery product before because the market didn't want to pay for vacuum insulation and other key features we typically supply on a delivery unit. But now the market is starting to change as the value and scarcity of CO_2 has changed and people want better equipment for safety, filling flexibility and reduced transfer losses."

"For those that are really interested in a semi-trailer, we are now offering the Orca ST Series. It's expensive, but we're integrating the Orca™ system to a semi-trailer and they have more economies of scale and complete delivery flexibility, from filling 230 liters to dumping the entire load into a large bulk tank. For the US market, we typically manufacture about 24 to 28 Orca™ units per year, of all models."

"Our Czech Republic facility builds Orca™ units for the European market and we manufacture in China as well. We built a lot of Orca™ units in China for LNG service when LNG was hot three or four years ago. The LNG Orca™ was used as a temporary supply to fuel vehicles before they put in a stationary LNG fueling station. For the US market, the Orca™ units are built in New Prague, Minnesota, along with the 5,500-liter Perma-Cyl storage tanks. Whereas, the smaller, all stainless steel Perma-Cyl models, are built in Ball Ground, Georgia."

"True microbulk actually started with CO_2 with McDonald's restaurants in the mid-1980s for beverage carbonation"

Chart, which claims to have invented microbulk, manufactures highly engineered cryogenic equipment used from beginning to end in the liquid gas supply chain. It is experiencing increasing demand for its microbulk products from the CO_2 market, such as microbreweries, cannabis growing, swimming pools and waste water treatment.

"A good portion of the recent growth in the CO_2 market is driven by cannabis from greenhouse grow houses and botanical extraction from the plant by pulling the oils out using high pressure CO_2 at the supercritical range of around 1,500 psi," Neeser told **gas**world.

"We have a specially designed Perma-Cyl system that delivers up to 725 psi to better assist the CO_2 pumps for this application."

"Microbreweries is another application that is really growing in popularity. For Neeser, it is a return to what helped drive the microbulk market in the early days."

"True microbulk actually started with bulk CO_2 for McDonald's restaurants in the mid-1980s for beverage carbonation, and since then, we have installed bulk CO_2 in about 350,000 bars and restaurants – maybe 400,000 – worldwide systems. And, when we started there was no microbulk delivery businesses! Coca-Cola® and Pepsi® basically delivered their customers' CO_2 in high pressure bottles. So, the distribution has really changed. It

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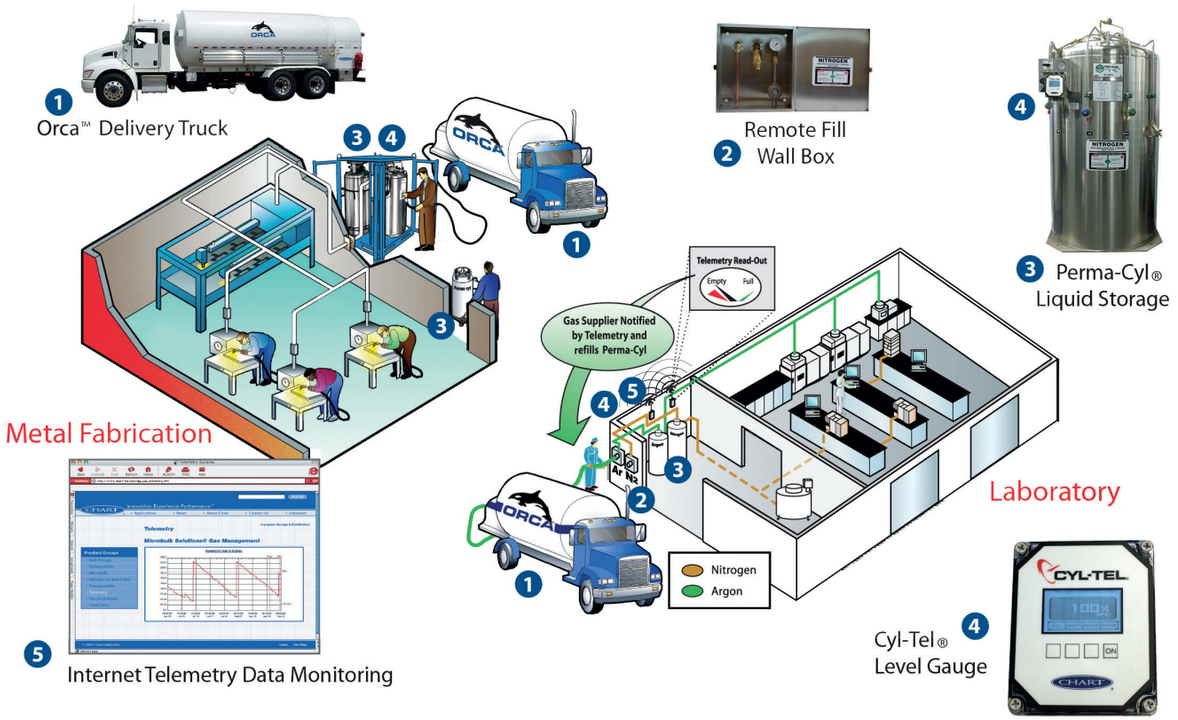
Figure 1. The Orca Delivery Truck is part of a Turnkey Approach
Source: Chart Industries



was the first true microbulk system, but one application and one gas made it easier to develop back then."

The UK industrial gas distributor CryoServices and manufacturer Minnesota Valley Engineering (MVE) Chart Industries got together to develop the Orca™ system with target customers being the small independent gas distributors, who needed a new way to grow their business. Over the years, the user-friendly product has had various upgrades such as telemetry, controls with more automated functionality, larger capacities, greater pump speeds, all while ensuring safety for the operator when transferring cryogenic liquids.

As well as CO_2, Neeser says the trend is now for bigger microbulk.

"The trends we have seen is bigger and bigger," Neeser told **gas**world.

"When I was product manager for microbulk 20 years ago, the biggest tank we had was 1,000 liters. We now offer four larger sizes up to 5,500 liters. The Orca™ delivery units went through the same phases. The Orca™ units first started with 1,500 gallons, and now we offer capacities all the way up to the maximum road limit. The great success story for microbulk in the US is defined by those independent distributors that have really embraced it. They are making good money from microbulk because they are delivering gas at the point of use, just like the big guys are with bulk. To a certain degree, it changed their whole business model as well as the landscape of gas distribution."

"In addition to being more efficient, they get rental on the Perma-Cyl® microbulk tanks. In seven or eight years the tank is paid for and it's going to last another 50. So overall, it's a pretty good business model."

"The Orca™ units first started with 1,500 gallons, and now we offer capacities all the way up to the maximum road limit"

"When the independents started with microbulk delivery, one of their biggest challenges was to start getting contracts like the majors. They had to change their business model to have customers sign up for the contract term. In the past, they were swapping liquid cylinders full for empty and there was no contract required. CeeKay Supply in St Louis, Missouri, was one of the early adaptors and when I did the tour of their facility earlier in 2018, they commented that if they didn't have the microbulk accounts that they have today, they would be doing ten times the number of liquid cylinders – and this just wouldn't be a feasible business model."

"So, the timing of introducing microbulk as a new product turned out to be perfect to meet the gas demands during economic expansion. Chart also makes liquid cylinders but we're promoting the model to replace high pressure cylinders with liquid containers across the board and liquid cylinders still play an important role in distribution. Microbulk fills a great niche that was never there 20+ years ago."

"For the CO_2 market the Perma-Cyl® storage systems were available for this service, but feedback from our CO_2 sales specialist, Tom Chromy, suggested that we changed the name to Perma-Max™ CO_2 storage systems and changed the model number scheme from liters to pounds. I don't know if the industry is totally aware of this marketing change. Because CO_2 is measured in pounds, the 5,500-litre unit is 12,000 pounds or six tons of storage."

"Ironically, we have a six-ton bulk tank, so it is somewhat of a duplicate, but the market has gravitated toward the largest Perma-Max™ system because it allows lower installation costs. It has helped the industry understand it better, especially the customers like the microbreweries that were buying CO_2 in pounds, so it was a good match, a good move, a little painful, but when we got it done and it appears to be working."

Like its Orca™ creation, Chart is getting bigger. Chart, with headquarters in Ball Ground, Georgia, has domestic operations located in eight US states and international engineering and manufacturing in Australia, China, the Czech Republic, Germany and the UK.

It took a significant step last year with the acquisition of Italy-based VRV S.r.l. and its subsidiaries for €125m (approximately $147m based on current exchange rates) in September and divested CAIRE, its oxygen business, to Japanese company NGK Spark Plug Co., Ltd. for $133.5m. VRV, set up in 1956, has a rich history of engineering and design dating back to its beginning in 1956 and the acquisition was part of Chart's strategic realignment of the business to focus on core cryogenic and energy technologies.

Chart wants to convert others to microbulk beyond the US.

Mark McKechnie, Chart Industries South East Asia Industrial Gas Business Manager, based in Sydney, Australia, has 18 years' experience in the cryogenic industry and is confident about the growth of microbulk in the region. Speaking at the **gas**world conference in Kuala Lumpur in December, he told delegates there is an increasing popularity in microbulk worldwide.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"There's a lot of cost associated with the transportation of gases and because of the cost hazards associated with those gases, a lot of companies have outsourced their logistics to third party specialty transportation companies," McKechnie said.

"It pushes some of the liability away, but it moves you further away from the customer. The logistics and work that goes with maintaining the temperature, pressure, look after the cylinders, all adds to the cost of moving the product. The greatest cost is moving the gas from your facility to your customer's site. There's also quite a lot of money that is lost through traffic congestion around the world."

"Microbulk is growing quite considerably. This is the sort of trend with microbulk we are seeing as industrial gas space expands. We define microbulk as a skid-mounted tank sized to bridge the gap between a packaged gas application and a bulk tank. It gives the customer the benefit of a bulk tank system without the huge infrastructure cost that goes into installing a bulk tank system. It's a lot more flexible for your customer and to get around regulations to have these installed at your customer's site."

"If you have a customer that is using two liquid cylinders per month or more than 15 high pressure cylinders per month, they are a perfect customer to move to microbulk. Microbulk is typically sized from 230 liters up to 5,000 liters, which is the current largest defined as microbulk, pressures that microbulk can come in low pressure 22 psi or high pressure 500 psi applications. Microbulk is designed to be moved easily on a truck. It does not require huge infrastructure or concrete bases, so installation fees are a lot less than a standard tank."

"When the 5,000-liter microbulk tank came out it was priced at almost twice the price of a 6,000-liter bulk tank but when the customer looks at associated costs such as a crane, pad, or moving that vessel all a way around, it's actually cheaper than installing a bulk tank."

"Microbulk in its purest form is moving molecules instead of metal. Instead of loading a truck with a lot of metal and liquid cylinders, you will have a delivery truck that has a product inside it and you are moving the molecules from your facility to a customer."

"It fills a gap between high pressure, cluster packs, liquid cylinders and bulk. Twenty high pressure cylinders are the equivalent to one 230-liter vessel."

"The benefits of microbulk are many: it replaces high pressure cylinders, high-pressured packs and liquid dewars. From a customer's point of view, it's a dedicated tank that never leaves the site. It provides your customer with an uninterrupted on-site gas supply. It removes the handling of cylinders, loading from trucks, storage space that you have, it's a lot safer for your drivers, there are fewer injuries to your staff from moving cylinders around. It reduces or eliminates down time totally." gw