

ARROW TANK - A BUSY YEAR BUILDING VESSELS AND BOBTAILS

For Arrow Tank & Engineering Inc. it has been another busy year building vessels and bobtails, endeavors boosted by good material supply that has the workplace buzzing and the team working nonstop to get products out the door and into the hands of customers. The Cambridge, Minn.-based company recently completed two significant plant expansions to help keep up with demand in the industries it serves. Arrow Tank's paint facility has more than doubled in size and now includes a second 28x100-ft spray booth, and another 24,000-sq-ft building has been constructed to house its heavy-plate roll, which is capable of manufacturing shells in excess of four inches thick.

In addition to propane trucks and tanks, its various divisions offer custom industrial fabrication; fire suppression equipment; post-weld treatment; and high-purity equipment distribution for the semiconductor, biomedical, and pharmaceutical markets, among others. With new resources and expanded capacity in place, the focus on prompt turnaround is being prioritized. Tim Schweppe, general manager of the propane division, said in August and September throughput for propane vessels was up 25%, with on-time deliveries hitting 99% —"definitely a step in the right direction."

"Propane marketers continue to ride the wave of building smart bobtails utilizing technology and larger capacities to improve efficiency of their deliveries," he said. "Additionally, a large majority of our complete bobtails tend to be from our MOFLO lineup that are capable of maintaining higher flow rates, with some exceeding 100 gpm. We're also seeing the next generation of safety features becoming more common in the northern climate, such as rear-view camera systems, front and rear disc brakes, differential lock/traction control, and automatic tire chains to overcome dangerous and harsh conditions of the environment."

Schweppe added that companies are focusing more on driver-operator comfort by specifying equipment to make the job less strenuous and difficult. "On the chassis side, air conditioning, tilt/telescoping steering, power windows/locks, power/heated mirrors, and air-ride cab suspensions are the norm. Likewise, RF system options such as PTO, throttle, power reel-out, and meter display are practically standard features these days with approximately 75% of our complete bobtails having a peripheral interface with the meter's electronic register."

Arrow Tank was founded in 1957 to manufacture storage containers, mainly for the oil and gas industry. Its products included above- and below-ground storage tanks, water tanks and trucks, liquid fuel tank trucks, propane tank trucks, propane transports, and large storage tanks. Initially, all operations took place in a modest manufacturing facility in Edina, Minn. However, a surge in demand in the 1960s prompted the construction of a new 80,000-sq-ft facility in Eagan, Minn.

In 1971 Arrow Tank relocated its main fabrication plant to Cambridge, Minn. and added a satellite facility in Coon Rapids, Minn. Today, the company employs a workforce of more than 170, with all cargo tank fabrication, bobtail assembly, and service and parts departments located in Cambridge under about 165,000 square feet of production space. Large-scale shipping is accommodated by rail, truck, or waterway. Coon Rapids is now home to general offices and the technical division.

Schweppe, who oversees production, sales, and service of cargo tank manufacturing and bobtail fabrication, joined Arrow in 1997. His duties have included sales, bobtail design, technical assistance, and field service. "We're seeing significant investments in the smart side of bobtails, in the chassis and on the safety side." He comments a plus is that the investments can lead to longer service intervals. Recent onboard options, he notes, are rear-view camera systems and automatic tire chains, expensive upgrades, but they are increasingly being called for.

For the automatic chain option, one system is manufactured by OnSpot (Stratford, Conn.), providing the traction of a set of conventional snow chains at the flip of a switch without having to stop the vehicle. An electric switch mounted in the cab provides 12 volts to an air solenoid mounted on the truck's frame rail. Compressed air to the solenoid is supplied from either the vehicle's onboard air system or a 12-v compressed-air kit. When the dashboard switch is activated, the solenoid opens, allowing compressed air to enter the air chamber and lower the chain wheel so it contacts the inside of the tire. The friction between the tire and the rubber-covered chain wheel causes the chain wheel to rotate, creating enough centrifugal force to flail the chains out in front of the tire.

The manufacturer explains that the principle of the system is similar to a small generator driven by a bicycle tire to operate a headlight. Six lengths of chain spaced at 60° intervals on the chain wheel ensure there are always two chains between the tire and road surface, whether the truck is accelerating, braking, or is in a wheel lock-up position. The traction from the chain wheel is obtained in either forward or reverse. When the dashboard switch is turned off, the solenoid exhausts the air provided to the chain units and return springs in the air chambers bring the chain wheels back to their resting position. And, of course, drivers shifting between forward and reverse these days are doing so by engaging an automatic transmission, industry standard throughout most of the fleet over several years. "Ten years ago we installed the tire chain systems on a couple trucks, but now they represent 10% to 15% of builds," Schweppe said.



Requirements for higher pump system flow rates have prompted Arrow Tank to include increasing numbers of heat exchangers/stabilizers, upper foreground, and hydraulic pump drives in bobtail builds. Among other options growing in popularity are automatic chain installers that provide the traction of a set of conventional snow chains at the flip of a switch inside the cab.

Regulated safety features such as RF remote internal valve closure and engine kill (E-Stop) to prevent an unintentional release have evolved into convenience features that make the delivery process more efficient while improving equipment longevity. For example, with a remote PTO, the pump doesn't engage unless product is flowing and registered. Additional efficiency upgrades include in-cab interfaces with the register that ultimately make their way to the back office. Such systems operate through wireless networks or transfer data to a disc or thumb drive. "The cool part about it is that the systems save time. Drivers have customer account information at their fingertips, and it is more accurate. In some instances the software includes mapping, which is extremely helpful when a driver travels an unfamiliar route," Schweppe commented.

Like the passenger cars that share the road with bobtails, electronic troubleshooting systems to diagnose maintenance concerns and repair problems are now standard. "Truck builds are definitely becoming more complicated," Arrow Tank's general manager said. "There are now so many electronics on a truck that a typical 3200-gallon bobtail has about 380 feet of wiring harness. Some harnesses may contain up to 27 wires in each harness." He added that while the typical truck 20 years ago had one work light, today's may feature six — four docking lights and halogen stadium lights. "We frequently install LED six-light systems, and there is a super-light option with a wide-angle flood behind the truck that will reach to the end of the delivery hose 150 feet away."

He remarked that the smart aspect of bobtails was being driven by customers, who are increasingly seeking efficiencies such as higher pump system flow rates and consistency in pumping. "Many systems start out fast and fall just as quick," observed Schweppe. "We are installing onboard heat exchangers/stabilizers that provide more consistent flow rates — 60 to 70 gallons a minute — and there's a beauty in maintaining 65 gallons per minute when you're making a 500- to 1500-gallon delivery. In the past flow rate could fade by 10 to 20 gallons per minute, making a significant difference on big drops."

He added that providing faster flow rates is another area Arrow Tank is helping marketers to maximize efficiency, and that solutions involve going back to the drawing board and utilizing mechanics and propane properties to make it happen by incorporating hydraulic pump drives rather than PTOs. Schweppe explains the systems in an online YouTube video at <https://www.youtube.com/watch?v=Jg0O0D1j-EI> titled "Arrow Tank: Benefits of Hydraulic Pump Drives and Heat Exchangers in LPG Pumping Systems."

Further, Arrow tank is building bobtails with up to 6700-gal. capacity on tri-axes and up to 3499 gallons on single axles. In most regions 3200s and 3400s remain the most popular, increasingly fitted to a propane-fueled chassis, but in mountainous regions in the West diesel still rules. The company also builds trucks with 5000-gal. tanks that are 80 inches in diameter. However, most-sought in that range are the 84-in. variety, resulting in a package that is nearly identical in length and yielding a capacity of 5500 or 5600 gallons, Schweppe said.

With cargo tank capacity rising steadily over the years, the company offers tank stretching services, adding volume to existing tanks. In most instances, stretches for 73-in. tanks yield up to 3200 gallons and 5000 gallons or more for 80-in. tanks. As part of the process, cargo tanks are updated to the latest ASME and DOT requirements. Likewise, vessel openings are upgraded or added to increase performance and facilitate a new piping assembly.

Arrow Tank manufactures both Deckline and Fleetline bobtail packages, both incorporating computer-aided design and manufacturing to enhance fit and finish. Among the available chassis are Kenworth, International, Freightliner, Mack, Ford, Peterbilt, and Hino. "What would have been considered unnecessary creature comforts 20 years ago are now standard," Schweppe observed. "There's a lot more thought about driver comfort and truck system efficiency, and marketers are demanding more and more smart bobtail features for their fleet operations." —John Needham