



Proprietary
Gas/Liquid Transfer
Technology



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CASE STUDY

GasTran™ Systems Helps PepsiAmericas Plant Increase Capacity and Boost Profitability

CUSTOMER: PepsiAmericas Inc., Indianapolis, Indiana

SITUATION ANALYSIS

PepsiAmericas Inc. is an anchor bottler and distributor of Pepsi and related beverages with more than \$3 billion in annual revenues. Recently, officials with the company's Indianapolis, Indiana plant sought ways to optimize production and streamline costs within their facility. Like most others in the beverage packaging industry, they were increasingly concerned about the presence of dissolved oxygen in feed water. They also understood the importance of lowering dissolved oxygen (DO) levels and achieving consistent CO₂ injection in order to decrease foaming, gain faster and more consistent

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– **Rob Schlafer**
Director of Engineering
PepsiAmericas East Group

fill rates, prolong shelf life, and produce a higher quality product. They learned of GasTran™ Systems through Rob Schlafer, Director of Engineering, PepsiAmericas East Group, and quickly realized that the company's unique systems offer the promise of increased filling speeds, improved carbonation capability, and a reduction in low fills and flavor degradation.

GASTRAN SYSTEM'S UNIQUE SOLUTION

GasTran Systems use a proprietary design to continuously shear an incoming fluid stream into ultra fine droplets. By dramatically increasing the effective surface area of the fluid, the mass transfer efficiency of removing the dissolved gases from the fluid increases as well. The GasTran System, based on process intensification principles, uses a vacuum to remove DO from water to much

lower levels than other deaeration methods currently in use. This system features an integrated holding tank and water handling system to reduce floor space requirements and allow bottling plants to remove large holding tank systems and transfer pumps, thereby reducing energy requirements, CO₂ usage, and the total cost of operation.

HOW IT WORKS

The GasTran System is constructed in stainless steel with 316 used throughout and 314 used on the rotor for more specific oxidation protection. There are no fibrous materials, and the system can handle pH ranges of 3 – 12 and temperature ranges of 32° – 210° F, making it easy to incorporate existing hot and chemical clean-in-place (CIP) programs.

Unlike other deaeration technologies, this system has no biodegradable membranes or non-stainless steel parts. There are no residual restrictions on oxidizers, temperature, silica or any other dissolved solids. It does not require any stripping gases and can provide consistent performance at varying flow rates and water temperatures. It also does not use CO₂ or nitrogen gas to scrub or sweep out dissolved oxygen, thus eliminating the variation these residual gases cause in final product carbonation. The system will produce deaerated water and transfer via pump to the line selected, and it provides a constant flow of deaerated water to the blend system.

INSTALLATION

Once they recognized the significant advantages of GasTran Systems' unique deaeration system, plant engineers quickly moved to integrate it into their operation, thereby replacing their old CO₂ column deaerator. The footprint of the GasTran System is 4'x4'x13' (LxWxH), which allowed plant officials to easily identify a small space in which to place it. PepsiAmericas' new GasTran System was designed to provide deaerated water to the PET line.

RESULTS: GASTRAN SYSTEMS MEETS THE PEPSI CHALLENGE

Plant officials would agree: The most significant improvements gained from using the GasTran System were lower dissolved oxygen levels and lower CO₂ levels. Without stripping gases, the system reduced these levels in the process water to 0.3 – 0.6 parts per million from 8.1 parts per million (PPM) at 48°F – 42°F water. By comparison, current industry deaeration practice targets a much higher level – between 1.0 to 2.0 PPM. The GasTran System enabled the Indianapolis plant to produce consistent product with existing 1960s-era Mojonnier blending equipment, and it yielded an annual CO₂ savings of more than \$88,000.

The GasTran System replaced an inefficient CO₂ stripping deaerator, resulting in the savings in CO₂ gas. Improved carbonation capabilities on the existing carbo-cooler were realized as well. The old CO₂ column deaerator reduced the DO to 1.9 PPM. The GasTran System reduced the DO to 0.20 PPM from 8.1 PPM. The GasTran System reached its equilibrium in less than one second and produced ultra-low dissolved oxygen on demand.

Specific performance improvements are listed below:

CO₂ Savings – A Sustainable Solution: The GasTran System does not require CO₂ or nitrogen to facilitate deaeration. A typical CO₂ deaerator only absorbs 2 percent of the total CO₂ flow, thereby wasting 98 percent. Even with Reflux units, most CO₂ does not get used. This inefficiency results in very high CO₂ costs per line. By implementing the GasTran System, plant officials realized an average savings of \$7,400 per month or more than \$88,800 per year. They reduced the CO₂ cost on the line by 42 percent – from \$15,580 per month to \$8,180 per month.

CO₂ Capability in Pepsi 20 oz. PET and Mug 2-Liter PET: The data after installation of the GasTran System blends at temperatures 2°F higher, making carbonation levels easier to maintain. Additionally, the data after the installation of the GasTran System blends a Mug 2-liter PET at temperatures 4°F higher, again making carbonation levels easier to maintain. This ability to increase temperature while providing ultra-low deaeration and consistent carbonation lowers total manufacturing costs. Consistent carbonation also allows for longer runs with no start/stop situations to adjust CO₂ settings. These short 30-second stops lowered output by 40 cases per hour.

“The GasTran System delivered ultra-low dissolved oxygen in the process water, which enabled the bottling line to produce consistent carbonation to our fill lines. Ultimately, it helped us increase plant capacity and improve profitability,” said PepsiAmericas’ Schlafer.

CONCLUSION

PepsiAmericas’ incorporation of the GasTran System enabled the company to reduce its total manufacturing costs and improve product quality without having to replace major carbonating and filling equipment. Specific benefits include:

- Uniformity of carbonation content *and* energy savings with higher temperature filling
- Marked improvement in deaeration system flow control and DO uniformity
- More consistent, repeatable and predictable carbo-cooler settings and operation
- Superior performance – *and* the lowest possible life cycle cost for deaeration
- Lower cost compared to total blending/carbonation system replacement
- Reduced CO₂ usage through sustainable design

ABOUT GASTRAN SYSTEMS

GasTran™ Systems is rapidly transforming a variety of industries with its patented process intensification approach to combining and separating gases and liquids. The company designs, builds and installs industrial water treatment systems and equipment to meet the specific needs of its customers and exceed their process improvement goals. For information, call (866) GAS-TRAN or visit www.GasTranSystems.com.

CONTACT:

David Florez, GasTran Systems

Office: (216) 391-7780 • Fax: (216) 391-7004 • E-Mail: David.Florez@gastransfer.com

GasTran Systems

1768 East 25th Street • Cleveland, Ohio 44114 • 866-GASTRAN (phone) • 216-391-7004 (fax)

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