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## CASE STUDY

# GasTran™ Systems Helps PepsiAmericas Plant Boost Production and Improve Quality

**CUSTOMER:** PepsiAmericas Inc., Austin, Indiana

### SITUATION ANALYSIS

PepsiAmericas Inc. is an anchor bottler and distributor of Pepsi and related beverages with more than \$3 billion in annual revenues. The plant manufactures and bottles products that include Aquafina, Dr Pepper and Hawaiian Punch, which it then distributes to supermarkets, restaurants and convenience stores. All told, the plant produces more than 50 million units per year.

As a key step in their expansion planning, plant officials sought ways to optimize production and streamline costs within the revitalized space. 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 CO<sub>2</sub> injection in order to decrease foaming, gain faster and more consistent 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, CO<sub>2</sub> 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 and no 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 CO<sub>2</sub> 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 and pressure of ultra-low 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 CO<sub>2</sub> column deaerator. The footprint of the GasTran System is 4'x4'x13' (LxWxH), which allowed plant personnel to easily identify a small space inside the filling room. PepsiAmericas' new GasTran System was designed to provide deaerated water to a can and bottle line.

## RESULTS: GASTRAN SYSTEMS MEETS THE PEPSI CHALLENGE

The GasTran System yielded faster filling rates and better product quality – *all without having to replace major carbonating and filling equipment*. Specifically, this system enabled the plant to produce more volume with existing blending equipment. The lines have also experienced more consistent content weights on all carbonated soft drink (CSD) products.

PepsiAmericas engineers would agree: The most significant difference in the GasTran System was the dissolved oxygen performance levels. Without stripping gases, the system reduced these levels in the process water from 8.7 parts per million (PPM) to 0.3 – 0.6 parts per million at 48°F – 42°F water. By comparison, current industry deaeration practice targets a much higher level – between 1.0 to 2.0 parts per million. Specific performance improvements are listed below:

**Dissolved Oxygen:** The old CO<sub>2</sub> column deaerator reduced the DO from 8.7 to about 2.75 PPM. The GasTran System reduced the DO from 8.7 to 0.3 PPM. The system also reached its equilibrium in less than one second and produced ultra-low dissolved oxygen on demand.

**Net Contents In Cans:** Two sample tests were performed on a specific PepsiAmericas product. The first test was performed with the traditional CO<sub>2</sub> deaeration column. The second test was performed with the GasTran System. The results showed a 70 percent improvement in net content in cans while producing 30 percent more cans per minute by using the GasTran System.

**CO<sub>2</sub> in PET:** PepsiAmericas' Process Capability Index (Cp) showed a 43 percent improvement with the GasTran System. The results also demonstrated a marked improvement in product consistency and quality. Additionally, studies show that most plants using traditional deaerators to strip with carbon dioxide can immediately reduce their CO<sub>2</sub> usage by more than two million pounds per year by switching to a GasTran System. The cost savings in CO<sub>2</sub> alone will typically provide a quick payback.

**Low Maintenance and No Replacement Costs:** PepsiAmericas engineers appreciated the fact that the GasTran System utilizes skids that are extremely low maintenance and feature redundancy options for 24x7 processing environments. No membranes means better performance with lower operating expenses, no replacement cartridge inventory to manage, no bio-fouling, and no worries for plant officials.

In short, the high-performance GasTran System enabled PepsiAmericas plant engineers to achieve consistent carbonation. No other process enhancements were implemented to achieve these results. As a direct result of integrating the GasTran System, the plant loses less CO<sub>2</sub> and thereby realizes a significant cost savings. Additionally, the GasTran System's ability to prevent over-foam in filling enhances product yield.

## CONCLUSION

PepsiAmericas' incorporation of the GasTran System yielded ultra-low dissolved oxygen levels and provided numerous benefits for CSD production:

- Better 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 CO<sub>2</sub> usage through sustainable design

"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.

## 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](http://www.GasTranSystems.com).

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