

# Micro Motion® Flowmeters Improve Continuous Blending of Fructose

## RESULTS

- Over \$20,000 saved per year
- Meters paid for themselves within seven months
- Improved product concentrations, consistently hitting the target value
- Reduced equipment and maintenance requirements



## APPLICATION

In many blending operations, knowing the composition of each component stream is essential to determining the correct amount of each component required to produce the final product.

## CHALLENGE

A manufacturer of corn syrups had installed a system of refractometers and magmeters to continuously blend 90% and 42% solutions of fructose to produce a 55% fructose solution. For the system to perform properly, it was necessary to measure the °Brix content of each component stream, feed the information into a control system, and then determine the amount of each component required to achieve the desired product. In this continuous blending system, the °Brix measurement was constantly updated and the blending ratios were changed accordingly.

The densities of the component streams varied with temperature, causing difficulties with the existing system. Even if the °Brix measurements were accurate, the volume/mass ratios could vary and result in an inconsistent product. Because the variations were unpredictable, the set point for the final product concentration was 2% higher than the desired target value.

*Two Micro Motion meters replaced two magmeters and two refractometers.*

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**SOLUTION**

This manufacturer had been using Micro Motion® Coriolis flowmeters for several years on its truck loading systems with great success. It decided to install Micro Motion meters to measure mass flow and monitor density of its fructose solution.

The °Brix and flow rate of the 90% fructose solution, measured by a primary Micro Motion meter, is fed into a controller. Simultaneously, a secondary Micro Motion meter monitors the °Brix of the 42% solution and sends the signal to the controller. Based on the °Brix measurement of each fructose stream and the flow rate through the primary meter, the controller determines what flow rate is required through the secondary meter to produce a final product with the desired 55% fructose concentration.

The controller is also wired to level gauges on both the 90% and 42% fructose storage bins. If either tank reaches a low level, the 90% and 42% fructose streams go into a recirculation mode until the tanks are full. During the recirculation mode, mass flow rate totalization is inhibited. The totalizer inhibit prevents inventory total errors. Once the tanks are full, blending and totalization automatically continue.

This company produces 55,000 pounds per day of the 55% fructose solution at a selling price of \$0.65 per pound. With the old magmeter and refractometer system, actual concentration of the final product was on average 2% greater than the target value of 55%. With the new Micro Motion based system, final product concentrations are consistently at the target value of 55% resulting in an \$80 to \$90 raw material cost savings, while maintaining the 55,000 pound per day production level. The Micro Motion mass flowmeters cost \$12,000 and resulted in savings of \$20,800 to \$23,400 per year. These savings represent a return on investment within seven months. Equipment and maintenance requirements were also reduced because two Micro Motion sensors perform the same function as two volumetric flowmeters and two refractometers.

