

# Refining/Petrochemical Complex Saves \$800,000 Using Micro Motion® Meters for Ethylene Transfer

## RESULTS

- Saved up to \$800,000 per year from tighter accounting
- Recovered installed cost of meters in less than one month
- Lowered maintenance costs

## APPLICATION

A major Asian refiner transfers ethylene gas to downstream plastics plants who use the gas in the production of a wide variety of products. Ethylene gas is relatively expensive. Therefore, both the refiner and its customers require accurate measurement of gas transferred for billing purposes. The refiner estimates that a 0.1% metering error in a single transfer line could mean a \$50,000 difference per year in accounting.

Ethylene is bought and sold on a mass basis. Historically, the mass of ethylene transferred has been determined by measuring the volume flow rate of gas with differential pressure meters or turbine meters, and then combining this measurement with values from a density meter or pressure and temperature measurement to calculate inferred mass flow.

## CHALLENGE

The volumetric meters used to measure the ethylene were subject to a high degree of error due to fluctuations in gas pressure and temperature. Ethylene is a highly non-ideal gas, so compensating for temperature and pressure was not easy, and was a major source of error in the inferred mass calculations. In addition, the volumetric meters needed frequent recalibration to keep their accuracy from falling due to drift. The refiner believed the typical error of the final inferred mass calculations to be as high as  $\pm 3\%$ , and desired to improve this to at least  $\pm 1\%$ .



*Measuring the mass flow of ethylene with Micro Motion Coriolis meters dramatically improved the accounting of this valuable gas.*

[www.micromotion.com](http://www.micromotion.com)



*A Micro Motion meter measures the flow of ethylene gas.*



For more information:  
[www.EmersonProcess.com/solutions/refining](http://www.EmersonProcess.com/solutions/refining)  
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### SOLUTION

The refiner replaced the volumetric meters in their transfer lines with Micro Motion® Coriolis meters. Coriolis meters measure mass flow and density directly. This meant it was no longer necessary to have a separate density meter in the line, and it was no longer necessary to perform the inferred mass flow calculations. The meters' measurements could be used as is. Furthermore, Coriolis meters are unaffected by changes in process pressure or temperature. By measuring ethylene flow with Micro Motion meters, the refiner eliminated measurement error due to changes in the properties of the gas.

The accuracy of the flow measurement improved to  $\pm 0.30\%$ , exceeding the refiner's expectations. This level of accuracy translated to as much as \$800,000 per year in savings due to better accounting for the transfer of ethylene. With such a high rate of savings, the Micro Motion meters recovered their installed cost in less than one month.

As an added benefit, the refiner saw a reduction in meter maintenance, on average \$5000 per year per meter – because Micro Motion meters have no intrusive parts, there's nothing to wear out or break down – and meter recalibration is no longer required. These benefits raised the refiner's return on investment even further.

