

# Improved Compressor Efficiency, Reduced Surge Margin, with Micro Motion Specific Gravity Meter

## RESULTS

- Reduced operating costs through improved system efficiency through accurate process control
- Reduced risk of compressor bearing, seal, blade damage or catastrophic failure
- Reduced down time due to maintenance or repair of damaged compressors



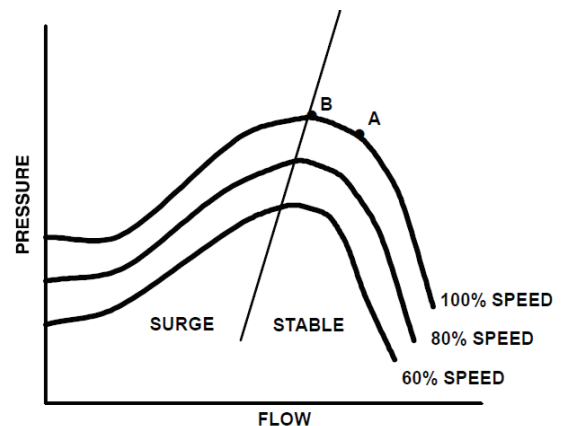
## APPLICATION

A leading chemical producer in Belgium uses the Catofin propane dehydrogenation (PDH) process to produce propylene, which in turn is used to produce polypropylene. Polypropylene is used in a variety of applications, including packaging, textiles, plastic parts and reusable containers of various types, and laboratory equipment to name a few. Axial gas turbine compressors are an integral part of the propylene production process.

## CHALLENGE

It is a common occurrence to experience surge when compressors are operated near their peak-efficiency point. Surge is a sudden reduction in flow combined with a high differential pressure across the compressor that may result in a reversed back flow through the gas compressor. As the system recovers from a surge, the compressor speed may momentarily increase. This unstable behaviour can result in an increase of stresses, damage to the compressor parts, or at the worst, complete catastrophic failure of the compressor. For this reason, gas compressors must be protected from surge.

To avoid surge, the compressor should operate below a given surge limit, or within an operating margin with anti-surge control. Operating within this margin will result in reduced operating efficiency, so it is to the benefit of the customer to operate as close to the surge limit as possible. To determine the surge limit, you must consider a number of factors, such as the gas composition which in turn determines the gas molecular weight. If the gas molecular weight can be accurately determined then anti-surge control can be implemented.



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### SOLUTION

The refinery chose to install a Micro Motion® Gas Specific Gravity meter because of its ability to provide a continuous, fast online molecular weight measurement. Gas Specific Gravity is critical because surge is a volumetric flow phenomena.

As the composition might fluctuate, the volume flow might fluctuate unexpectedly as measured by other devices.

This meter provided the molecular weight and specific gravity measurements, independent of process conditions. The meter enabled them to more accurately determine the surge limit, and operate with increased efficiency and reduced risk of damage due to surge.



Micro Motion Specific Gravity Meter with Sample Conditioning System