

## APPLICATION NOTE

### The Mass ProBar® Flowmeter Measures Both Ethylene and Propylene at a Light Hydrocarbon Plant

In a light hydrocarbon facility, ethane and propane are moved through pipelines to a furnace where they cracked into basic feedstocks for downstream processes. The resultant products of this process are ethylene and propylene.

The two products are pressurized and run through distillation to remove the heavy impurities and then further distilled again to remove the remaining light impurities. When in liquid stage, ethylene and propylene can reach temperatures as cold as  $-150^{\circ}\text{F}$  ( $-101\text{C}$ ). Propylene is used as a refrigerant before being sent to the glycol plant for the processing of propyleneoxide and propylene glycol. Ethylene is used to make several products such as PVC, ethylene oxide, ethylene glycol and polyethylene. A typical installation consists of measurement points before the compressor and in the compressor discharge lines.

Each feedline requires an accurate flow measurement to control the efficiency of the compressor. Since a gas compressor is a mechanical device, it can lose efficiency over time. Due to the high cost of energy, it is important that it is operated for optimum efficiency.

It is also important the compressor efficiency be closely monitored in order to predict and schedule maintenance at a time convenient to plant operations. The efficient conversion of feedstocks into finished products will control costs and maintain a quality product.

<b>Customer:</b>	Light Hydrocarbon Plant
<b>Product Line:</b>	Mass ProBar® Flowmeter
<b>Application:</b>	Mass flow measurement for compressor efficiency

**Details:**

<b>Fluid</b>	Ethylene and Propylene
<b>Temperature</b>	$-159^{\circ}\text{F}$ to $245^{\circ}\text{F}$ ( $-106\text{C}$ to $118\text{C}$ )
<b>Pressure</b>	3 psi to 245 psi (0.2 Bar to 17 Bar)
<b>Line Size</b>	8-inch to 42-inch (204mm to 1067mm)

Mass flow measurement was required to determine what effects changes in density due to pressure and temperature variations had on the compressor efficiency.

Mass ProBar® mass flowmeter was the preferred method when compared with other measurement technologies because of its high accuracy, ease of installation, low permanent pressure loss and ability to dynamically calculate mass flow rate.

The combination of the Dieterich Standard Anubar® primary flow element and the Rosemount, Inc. 3095MV™ Multivariable transmitter provides the lowest total cost of any precision flowmeter. By combining the integrated electronics with insertion flowmeter technology, only one pipe hole and two wires are needed to measure all process variables. The customer realized the significant installation savings with the Mass ProBar® flowmeter when compared to

traditional DP or vortex mass flow measurement. The integrated design eliminates tubing, valves, adapter unions, transmitter mounting, excessive welding and fugitive emission points.

The diamond shape of the sensing element of the Mass ProBar® flowmeter provided additional benefits to the customer. The aerodynamic shape of the Anubar® primary flowelement does not restrict the flow like the bluff body of a vortex shedder or restrictive opening of anorifice plate. The reduced pressure drop, due to limited flow restrictions, converted directly into energy savings for the customer in decreased operating costs for the compressors.

The customer was impressed with the cost reducing benefits and the high accuracy of the Mass ProBar® flowmeter.

