

# Market Watch

## *Exclusive look at* **Vortex Flowmeter Market Penetration**

By Jesse Yoder

**T**he worldwide flowmeter market was not exempt from the effects of September 11, 2001. While many flowmeter suppliers reported strong sales in the first three quarters of 2001, many experienced a downturn in the fourth quarter. In 2002, sales remained down for many companies. While some flow suppliers experienced an upturn in the fourth quarter of 2002, geopolitical fears began kicking in that same quarter. These fears were accentuated in the first quarter of 2003, culminating in the start of conflict in March 2003. However this situation is resolved, it seems clear that geopolitical uncertainties will continue to serve as a drag on the economy.

One important fact that has not changed as a result of the economic downturn is that new-technology flowmeters are replacing traditional technology meters. New-technology flowmeters include Coriolis, magnetic, ultrasonic, vortex, and multivariable DP. While all these meters continued to grow between 2000 and 2002, they did not grow as fast during this period as many people expected in 2000. While ultrasonic and Coriolis flowmeters were the fastest growing flowmeters during that time, revenues from these meters failed to show the

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double-digit growth rates that some had projected.

### **Why Vortex Meters Have Shown Slow Growth**

Vortex flowmeters were the slowest growing of the new-technology flowmeters between 2000 and 2002.

There are fewer vortex flowmeter suppliers than there are for most other new-technology meters. There are more than 50 ultrasonic flowmeter suppliers worldwide and more than 35 worldwide suppliers of magnetic flowmeters. By contrast, there are only between 15 and 20 suppliers of vortex flowmeters worldwide. This means that there are possibly fewer new product introductions and fewer product improvements in vortex flowmeters than for ultrasonic and magnetic flowmeters. This is changing, however, as more vortex suppliers have brought

out new products in the past year.

The Coriolis flowmeter market is an exception to this. While there are no more suppliers of Coriolis meters than of vortex meters, the Coriolis market is substantially larger than the vortex flowmeter market.

Customer loyalty is stronger for other flowmeters among end-users, especially for Coriolis flowmeters. It is not clear why Coriolis flowmeters inspire such loyalty — perhaps it is their high accuracy. What is clear is that vortex flowmeters do not inspire the same degree of loyalty. In Europe, magnetic flowmeters are the meter of choice, while in the United States, differential pressure (DP) meters are still very popular. Ultrasonic flowmeters have found an important niche in the custody transfer of natural gas. Vortex meters have not found a similar niche, except possibly in steam flow measurement.

## Steam Flow Measurement

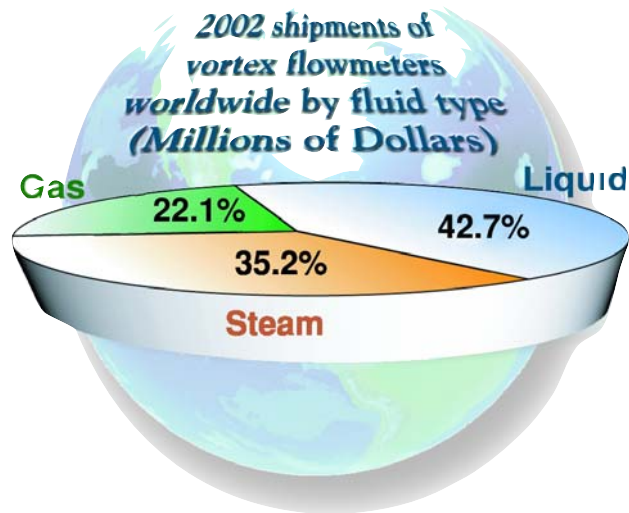
Steam flow is one area in which vortex flowmeters excel. Vortex meters can tolerate the high temperature and pressure that typically accompanies steam applications. The main types of steam include wet, saturated and superheated steam. Steam flow is often measured in power generation and in process plants. Here they mainly compete with DP flowmeters. Vortex meters have no competition from magnetic flowmeters, and very little from Coriolis and ultrasonic meters. Steam is a very new measurement for both these types of meters.

## Multivariable Flowmeters

The use of multivariable vortex flowmeters has been growing since Sierra Instruments first introduced their multivariable vortex flowmeter in 1997. Multivariable flowmeters typically combine a pressure transducer and a temperature sensor with a volumetric flowmeter. Multivariable vortex flowmeters use the temperature and pressure values, along with the volumetric flow rate, to compute mass flow.

Multivariable DP flowmeters use a similar concept to measure mass flow. Instead of a vortex meter, multivariable DP flowmeters use a DP transmitter together with a primary element such as an orifice plate to calculate volumetric flow rate. They then compute mass flow by using the temperature and pressure values provided by temperature and pressure sensors. Some companies have offered multivariable DP transmitters integrated with a primary element to form a multivariable DP flowmeter.

There are other types of multivariable flowmeters available as well, including ultrasonic, magnetic and turbine. One reason why multivariable flowmeters are attractive is that it is often less expensive to buy a multivariable flowmeter than to buy the individual components separately. Multivariable flowmeters also provide mass flow measure-



ment for applications where this is desired for substantially less than the price of Coriolis flowmeters. While vortex flowmeters share in the growth of multivariable flowmeters, they are not the only kind of multivariable flowmeter.

## Vibration an Issue

Vortex flowmeters have traditionally had a problem with vibration. Suppliers have dealt with this issue by using digital signal processing (DSP) techniques. While different suppliers have taken different approaches to



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this problem, these approaches use a variety of DSP techniques. These advances will make vortex meters more reliable and should make them more appealing to users.

### **Prospects for Future Growth**

What vortex meters do have going for them is their versatility. Vortex meters can readily measure liquid, gas and steam. This makes them a candidate for use in a wide range of appli-

cations. Whether they are chosen for a particular application depends on how end-users balance price versus performance, and the importance they attach to high accuracy and high reliability in a particular case.

One encouraging fact is the recent introduction of new vortex flowmeters by several major suppliers. Emerson also has increased the attention paid to these meters since it entered the market in 1994. Product

improvements, such as those involving DSP, will continue to make vortex flowmeters more reliable.

Will something happen to make vortex flowmeters suddenly the meter of choice for some niche or application? This is one way that meters have grown. For example, much of the growth in ultrasonic flowmeters is due to the American Gas Association's approval of their use in the custody transfer of natural gas.

For this to happen, vortex suppliers would have to seek regulatory approvals in some new area. Such a process does not appear to be underway at the present time.

Probably the best area of growth for vortex flowmeters is in steam flow measurement. District heating is an example of one application where vortex flowmeters are used. In district heating, vortex meters also compete with ultrasonic meters. This still may not be a formula for rapid growth, since steam represents less than 10 percent of total flow measurements.

Unless vortex flowmeters find a new niche, gain regulatory approvals, or suddenly become the object of extreme affection by end-users, it is likely that vortex flowmeters will remain the slowest growing new-technology flowmeter. Even so, their reliability, versatility and the presence of new products will continue to make them an important player in the flowmeter market.

### **About the Author**

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