Today's flowmeter market is driven by many factors. The growth in the energy markets, especially oil & gas production, is creating a greater need for accurate and reliable measurement. The increasingly high price of crude oil and natural gas is generating more opportunities for instrumentation suppliers, as oil and gas production companies ramp up their search for new supplies. The same companies are also attempting to gain more petroleum and natural gas from existing sources of supply.

New-technology flowmeters, especially ultrasonic and Coriolis, have been grabbing most of the headlines when looking at growth in the flowmeter markets. This is because many end-users are selecting them due to an increased need for the high accuracy and high reliability that these meters offer. While both Coriolis and ultrasonic flowmeters may have a higher initial purchase price than some competitive meters, the reduced maintenance for these meters often means lower cost of ownership.

Despite the surge in interest in new-technology meters, many end-users are still selecting traditional technology flowmeters for certain applications. This includes positive-displacement, turbine, and variable-area meters. Positive-displacement and turbine meters are used for water utility, gas utility, oil, and industrial liquid applications. These two meter types are more complementary than competing, as positive-displacement meters are often used for low-flow measurement and for line sizes below four inches. Turbine meters perform well on medium- to high-speed flows, and on line sizes of four inches and up. However, turbine meters are also used on lower line sizes.

Positive-Displacement Flowmeters
Positive-displacement meters operate by repeatedly filling and emptying compartments of known volume, and then counting how many times this is done. Flowrate is calculated based on the number of times these compartments are filled and emptied. The main types of positive-displacement meters are oval gear, rotary, nutating disc, piston, diaphragm, and helical.

Positive-displacement meters are widely used to make low-cost mechanical measurements for utility purposes. This includes residential, commercial, and industrial applications. The primary competition for positive-displacement meters in these applications is different types of turbine meters, including single-jet, multi-jet, Woltman, and compound meters. While new-technology meters, including magnetic and Coriolis, are beginning to make their presence known in utility applications, many of these applications require industry approvals, and it is taking time for new-technology meters to acquire the necessary approvals.

Positive-displacement meters also face competition from turbine meters for gas applications. However, positive-displacement meters have an advantage in the smaller line sizes. Most positive-displacement meters for gas applications have line sizes between 1.5 inches and 10 inches. While turbine and ultrasonic meters are also used in line sizes between four and 10 inches, positive-displacement meters still have an advantage in line sizes below four inches. Low flowrates are not a barrier to positive-displacement meters. Diaphragm positive-displacement meters still dominate the utility gas flow measurement market.

Positive-displacement meters do face a serious challenge from new-technology meters in oil flow measurement. Their main competition comes from Coriolis meters. Because oil is a high-value product, end-users are willing to pay the higher prices for Coriolis meters to measure oil flow. Both positive-displacement and Coriolis meters are widely used to measure hydrocarbon flows both upstream and downstream of refineries at custody-transfer points along the process line.

Another area where positive-displacement meters are being challenged is in the measurement of industrial liquids. Coriolis, magnetic and ultrasonic meters are making inroads in these applications. Some end-users are gravitating to Coriolis meters due to their high accuracy, while others are seeking meters with no moving parts.

Turbine Flowmeters
Turbine flowmeters have a spinning rotor with propeller-like blades that is mounted on bearings in a housing. As fluid passes over the rotor, it spins in proportion to flowrate. Flowrate is calculated based on the rotor speed. A variety of methods, including a mechanical shaft and an electronic sensor, are used to detect the speed of the rotor.

Turbine flowmeters differ according to the design of the spinning rotor. Different types of turbine meters include axial, single-jet, multi-jet, paddlewheel, Pelton wheel, propeller and Woltman. Single-jet and multi-jet meters are widely used for municipal water
Like the positive-displacement flowmeter market, turbine meters figure to continue to serve a valuable role in the flow measurement space going forward.

The Future of Flow Measurement

While there is no doubt that new-technology flowmeters are on the rise, traditional meter types still have a place in the flow measurement world. Turbine, positive-displacement, and DP flowmeters still have an advantage in installed base in many applications, and this will help them maintain their presence despite competition from new-technology meters. The extent to which suppliers continue to invest in traditional meters with product improvements will help determine how much these traditional meters can maintain their own. This is an evolving story worth watching.

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