

Vortex flowmeters poised for renewed growth

Flow Research says its latest global study reveals a market on the brink of transformation

Flow Research has tracked vortex technology since 2001, and its latest study, *The World Market for Vortex Flowmeters*, places particular emphasis on multivariable vortex meters and the growing integration of pressure and temperature sensors for mass flow calculation.

As end users expand steam measurement and face rising demand for natural gas and other gases, mass flow capability is becoming increasingly critical.

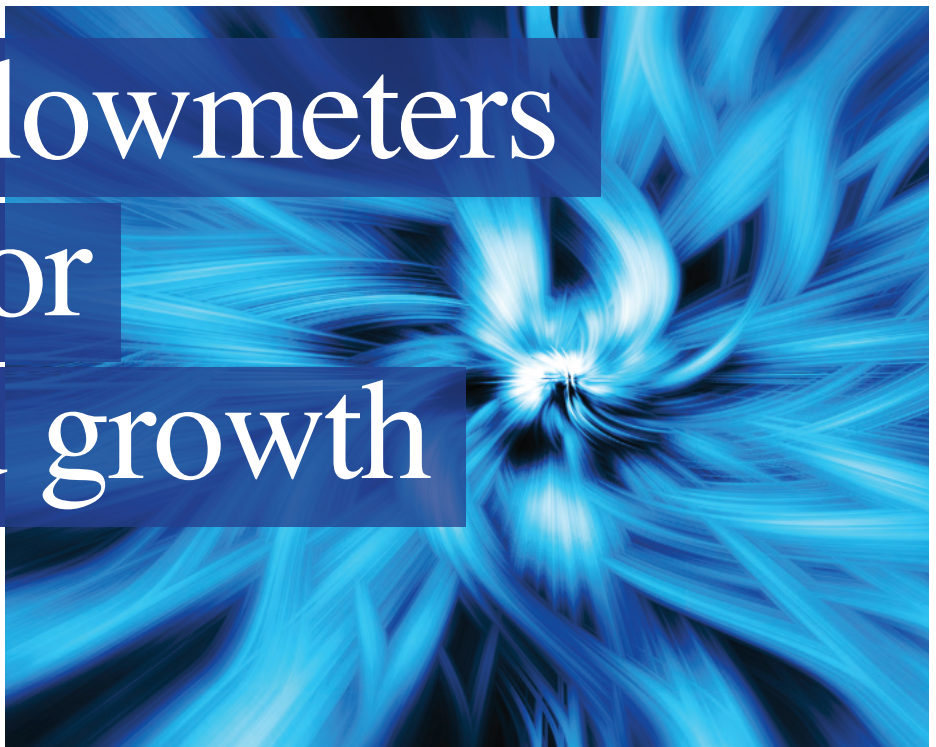
This latest edition places particular emphasis on the rapid evolution of multivariable vortex technology and the increasing integration of pressure and temperature sensors to support mass flow measurement.

A mature technology with enduring strengths

Vortex flowmeters, first commercialised in 1969, have earned a reputation for versatility, reliability and accuracy across liquids, gases and steam.

Their ability to withstand the high temperatures associated with both saturated and superheated steam has made them a mainstay in energy and process industries.

Many modern devices now achieve accuracy better than one per cent, depending on the application, while maintaining favourable costs of acquisition, commissioning and long term ownership.



An oil and gas industrial setting where vortex flow measurement plays a key role in monitoring fluid and energy flows

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These attributes continue to underpin their appeal in a competitive flow measurement landscape.

Market conditions favouring expansion

Although the vortex market has experienced periods of slow growth, Flow Research identifies clear signs of renewed momentum.

More suppliers are entering the field, and global demand for gas measurement is rising steadily.

The American Petroleum Institute's approval of API 14.12, which permits vortex meters for single phase gas and steam custody transfer, has further strengthened market confidence. Suppliers are now developing products that conform to the standard, accelerating innovation and broadening the technology's commercial reach.

Innovation reshapes the competitive landscape

The study highlights a wave of technical advancements that have transformed the market in recent years. These include anti vibration electronics,



Process industry infrastructure illustrating the environments in which modern flow measurement technologies are widely used



An example of equipment found in applications that rely on accurate and reliable flow monitoring across liquids, gases and steam

multivariable designs, reduced bore meters, plastic body instruments and enhanced digital signal processing.

With more than 50 suppliers now active worldwide, customers have a wider range of options than ever before when specifying or purchasing vortex flowmeters.

This diversity has intensified competition and encouraged suppliers to differentiate through performance, reliability and advanced diagnostics.

Reduced bore designs address low flow challenges

Historically, vortex flowmeters have struggled to measure low flowrates due to the weaker vortex signals generated at lower velocities.

Recent developments in reduced bore designs have significantly improved performance in this area. By narrowing the bore, suppliers have created stronger, more stable vortex signals, enabling more accurate low flow measurement.

Both single line size and dual line size reduced bore configurations have gained

traction, reflecting end users' growing need for precision across a wider flow range.

The expanding role of multivariable Vortex flowmeters

Multivariable vortex technology, first introduced commercially in the 1990s, continues to gain prominence. By combining vortex detection with integrated temperature and pressure sensors, these instruments can output volumetric flow, temperature, pressure, fluid density and mass flow.

This capability is particularly valuable in applications where temperature and pressure fluctuate, such as steam and gas systems. Although multivariable devices are more expensive than single variable models, they provide significantly richer data and are contributing to overall market growth. Suppliers offering multivariable designs now include Emerson, ABB, Yokogawa, KROHNE and Endress+Hauser.

As industries place greater emphasis on reliability and measurement certainty, suppliers have introduced redundant

configurations to meet these expectations. These include single shedder bars equipped with dual sensors and paired vortex meters installed in tandem within the flow stream. While traditional single sensor designs remain dominant, Flow Research finds that users increasingly recognise the value of redundancy, particularly in critical applications where uptime and accuracy are paramount.

Vibration issues mitigated through advanced electronics

Vibration interference has long been a challenge for vortex flowmeters, with pipeline vibrations capable of generating false signals or distorting existing vortex patterns. Suppliers have responded with advanced software, digital signal processing and improved electronics that significantly reduce susceptibility to vibration.

These enhancements have strengthened confidence in vortex technology, particularly in environments where mechanical vibration is unavoidable.

Vortex flowmeters operate on the von Kármán effect, a principle describing the alternating vortices that form when a fluid passes an obstacle. In a vortex meter, this obstacle takes the form of a bluff body mounted perpendicular to the flowstream.

The frequency of vortex shedding is proportional to flow velocity, allowing the meter to calculate flowrate by multiplying velocity by pipe area. Most devices use piezoelectric sensors to detect vortices, though capacitive and ultrasonic sensing technologies are also employed. This simple yet robust principle has contributed to the technology's longevity and reliability.

Strong prospects for the decade ahead

Flow Research concludes that vortex flowmeters are well positioned for sustained growth. The combination of expanding supplier participation, rising demand for gas measurement, and ongoing technical innovation is reshaping the market.

With their long standing strengths including accuracy, durability and cost effectiveness, now complemented by multivariable capabilities, reduced bore designs and improved vibration resistance, vortex flowmeters are entering a new phase of relevance across global process industries. ■

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