

Worldflow™ Volume I: Worldwide Coriolis Flowmeter Market



Coriolis flowmeters are a unique phenomenon among flowmeter types. Rather than measuring volumetric flow as most flowmeters do, these twisting meters measure mass flow. While they are known for their high accuracy, their size limits them for most practical purposes to line sizes of six inches or less. While Coriolis flowmeters have a relatively high initial cost, their low maintenance reduces their total cost of ownership.

Operating Principle: The Twist

Coriolis flowmeters rely on a principle according to which inertial force must be taken into account when describing the motion of bodies in a rotating frame of reference. Coriolis meters are named after Gustave Coriolis, a French mathematician who discovered the principle in 1835. The force that acts according to this principle is called the Coriolis force.

Coriolis flowmeters contain one or more vibrating tubes. As the fluid to be measured passes through the tubes, it accelerates as it reaches the point of maximum vibration. It then decelerates as it leaves this point. As a result, there is a twisting motion in the tubes. Mass flow is directly proportional to the degree of twisting motion.

Paradigm Case Applications

Paradigm case applications for Coriolis flowmeters are for clean liquids and gases flowing at medium to high velocity in pipes six inches and under. Coriolis meters become unwieldy at pipe sizes above six inches. It is also important that a mass flow measurement is desired. Their use to measure gas flow is a relatively recent phenomenon.

Some low-pressure gases do not have enough density to operate the Coriolis meter. Coriolis meters have the advantage that they can measure fluids of different densities. While they can measure the flow of dirty liquids and slurries, it is recommended that these fluids be measured at relatively low flowrates to reduce wear on the meter.

Note: See [Flowmeter Shootout Part I: New Technologies](#) in Control magazine, February 2001, for an explanation of the paradigm case theory of flowmeter selection.

Study Highlights

As part of our effort to define the worldwide flowmeter market, Flow Research has contacted every known supplier of Coriolis flowmeters worldwide. We have gathered detailed information about these suppliers and compiled the result into a complete description of the worldwide Coriolis flowmeter market. Highlights of the study include:

- Market size by geographic region
- Market shares by geographic region
- Straight-tube vs. bent-tube models
- Meters used for liquids vs. those used for gas
- Smart vs. conventional Coriolis meters
- Market strategies for Coriolis flowmeter suppliers
- Growth forecasts through 2005
- Distribution channels
- Company profiles of Coriolis flowmeter suppliers



Coriolis flowmeters have been in competition with ultrasonic meters for the past five years for the title of “fastest growing flowmeter.” The most distinctive feature about Coriolis meters is that they measure mass flow. However, our survey of flowmeter users reveals that the primary reason that users choose Coriolis meters is for their accuracy. Even though Coriolis

flowmeters have a relatively high purchase price, compared to other flowmeters, they have low maintenance requirements. Prices are coming down, however, and some meters are now available in the \$3,000 range.

Coriolis meters are widely used in the chemical industry, where mass flows measurement is often required. They are also widely used in the other process industries.

Companies Included

Some companies included in this study:

ABB

Accurate Metering Systems

Brooks Instrument

Danfoss

EMCO

Endress & Hauser

FMC Smith Meter

Foxboro

Krohne

Liquid Controls

Micro Motion

Schlumberger

Contact Flow Research for more details about this exciting new study. **Worldflow™ Volume I: The World Market for Coriolis Flowmeters** is available for purchase in June 2001.

[Worldflow™ Letter and Ordering Information](#)