



Flow Research, Inc.
27 Water Street
Wakefield, MA 01880 USA
+1 781-245-3200
+1 781-224-7552 (fax)
www.flowresearch.com

The World Market for Vortex Flowmeters, 6th Edition

Overview



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www.FlowVortex.com



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The World Market for Vortex Flowmeters, 6th Edition

Flow Research has completed a new study on the worldwide vortex flowmeter market, published in January 2019. One important focus of this study is to determine the size of this market in 2018. Forecasts through 2023 are included.

This study is called **The World Market for Vortex Flowmeters, 6th Edition**.

This study has multiple purposes:

- To determine worldwide market size and market shares for all vortex flowmeters in 2018
- To forecast market growth for all types of vortex flowmeters through 2023
- To identify the industries and the applications where vortex flowmeters are used, and to identify market growth sectors
- To provide a product analysis for the main companies selling into the vortex flowmeter market
- To provide strategies to manufacturers for selling into the vortex flowmeter market
- To provide company profiles of the main suppliers of vortex flowmeters



Rationale for Study

Flow Research published the 5th edition of this worldwide study in December 2014, and has continued following the vortex flowmeter market regularly since then. We provide quarterly updates in our *Market Barometer* publication (www.Worldflow.com). We have also done user interviews that show that interest in vortex flowmeters remains at a very high level. One reason for this interest is that vortex flowmeters are approved for use in custody transfer applications by the American Petroleum Institute, and investment in oil & gas operations are increasing once again. We believe that this is an optimal time to analyze and quantify this measurement technology's market, a market which appears to be expanding.

Background of Study

Vortex flowmeters were first introduced to the industrial markets in the early 1970s. Since that time, growth in the vortex flowmeter market has been relatively slow. Vortex flowmeters have never undergone a period of rapid growth that would enable them to catch up to ultrasonic, Coriolis, or magnetic flowmeters in terms of market size. Even so, the past several years have seen important changes in the vortex flowmeter market.

In conducting this study, we have contacted all known manufacturers of vortex flowmeters worldwide. Flow Research identified more than 30 vortex flowmeter manufacturers around the world. By obtaining detailed information about each company, we have assembled a new picture of the total vortex flowmeter market. We asked suppliers to provide detailed information about geographic segmentation, industries sold into, types of vortex flowmeters sold, and many other product segments. As a result, the study accurately identifies where growth is occurring in the market, as well as the underlying factors for that growth.

Key issues addressed in this study

This study will address the following key issues in the vortex flowmeter market:

- The factors causing the market to grow
- Growth in the use of multivariable flowmeters
- The effects of the API's adoption of a custody transfer standard on vortex sales
- The use of vortex flowmeters in district heating applications
- Line sizes for vortex flowmeter applications
- The use of vortex flowmeters in steam applications
- The importance of reducer vortex flowmeters
- New product and technology developments
- Growth strategies for vortex flowmeter suppliers

Operating Principle

Vortex flowmeters operate on a principle called the von Karman effect. This principle concerns the behavior of fluids when an obstacle is placed in the path of the flow. Under the right conditions, the presence of an obstacle generates a series of alternative vortices called the von Karman street. This phenomenon can be made to occur in liquid, gas, and steam flows. The effect can actually be observed in many everyday contexts such as cloud layers passing over an island or downstream of rocks in whitewater rapids.

In vortex flowmeters, the obstacle takes the form of an object with a broad, flat front called a bluff body. The bluff body is mounted at right angles to the flowstream. Flow velocity is proportional to the frequency of the vortices. The flowrate is calculated by using an algorithm that essentially multiplies the area of the pipe times the velocity of the flow.

In order to compute the flowrate, vortex flowmeters count the number of vortices generated by the bluff body. They use a variety of techniques for sensing the presence of a vortex. The majority of vortex flowmeters use a piezoelectric sensor. However, some use a capacitive sensor, and still others use an ultrasonic sensor to detect vortices.

Segmentation

Geographic Segmentation

- North America (USA and Canada)
- Western Europe
- Eastern Europe/FSU (Former Soviet Union)
- Mideast/Africa
- Japan
- China
- Asia/Pacific (without Japan/China)
- Latin America (Mexico, South/Central America)



Vortex Flowmeters by Mounting Type

All three kinds of vortex flowmeters:

- Wafer
- Flanged
- Insertion

Vortex Flowmeters by Variable Type

- Single Variable
- Multivariable

Multivariable Vortex Flowmeters by Sensor Configuration

- Integrated Temperature Sensor – No Pressure Sensor
- Integrated Temperature and Pressure Sensors
- Integrated Pressure Sensor – No Temperature Sensor

Vortex Flowmeters by Transmitter Configuration

- Integral (Compact)
- Remote

Vortex Flowmeters by Bore Type

- Single-line Size Bore Reduction
- Two-line Size Bore Reduction
- Straight Through (No Reduced Bore)

Single and Multivariable Vortex Flowmeters by Fluid Type

Single and multivariable vortex flowmeters are segmented in this study according to the fluid type measured:

- Gas
- Petroleum Liquids
- Non-petroleum Liquids
- Saturated Steam
- Superheated Steam

Vortex Flowmeters by Single vs. Dual Configuration

- Single shedder bar with single sensor
- Single shedder bar with two sensors downstream
- Dual vortex flowmeters calibrated together

Vortex Flowmeters by Flow Measurement Type

- Volumetric Flow
- Mass Flow



Vortex Flowmeters by Smart/Conventional

- Smart
- Conventional

Smart Vortex Flowmeters by Communication Protocol

Smart vortex flowmeters are segmented by the following protocols:

- Foundation Fieldbus™
- HART
- Profibus DP
- Profibus PA
- Modbus
- Other

Vortex Flowmeters by Accuracy Level

- $\leq 0.50\%$
- $> 0.50\%$ and $\leq 0.75\%$
- $> 0.75\%$ and $\leq 1.00\%$
- $> 1.00\%$ and $\leq 1.50\%$
- $> 1.50\%$

Vortex Flowmeters by Industry

Vortex flowmeters are used mainly in the process industries, although some are used for utility applications. We include the following industries in this study:

- Oil & Gas*
- Refining
- Chemical
- Pharmaceutical
- Food & Beverage
- Pulp & Paper
- Metals & Mining
- Electric Power
- Water/Wastewater
- Semiconductor
- District Energy
- Other

*Oil & Gas includes Production, Transportation, and Distribution

Vortex Flowmeters by Application:

- Custody Transfer of Petroleum Liquids
- Custody Transfer of Natural Gas
- Custody Transfer of Steam
- Non-custody Transfer of Petroleum Liquids
- Non-custody Transfer of Natural Gas
- Non-custody Transfer of Steam
- Non-petroleum Liquids
- Industrial Gases
- Slurries
- Water
- Other

Vortex Flowmeters by Hygienic Application

- Not Offered
- Sanitary/Hygienic

Vortex Flowmeters by Line Size

This study determines line sizes for vortex flowmeters as follows:

- $\frac{1}{2}$ inch or less
- $> \frac{1}{2}$ – 1 inch
- > 1 – 2 inches
- > 2 – 4 inches
- > 4 – 8 inches
- > 8 – 12 inches
- > 12 inches

What's in this for my company?

- See the emerging applications and where the growth is
- Understand world and regional markets
- Get to know your real competition
- Learn what other suppliers manufacture, where, and for whom
- The best information creates the best decisions



Vortex Flowmeters by Distribution Channel

The Vortex flowmeter market is segmented according to the following sales channels:

- Direct Sales
- Independent Representatives
- Distributors
- E-Business

Vortex Flowmeters by Customer Type

The Vortex flowmeter market is segmented according to the following customer types:

- End-Users
- OEM's
- Systems Integrators
- Engineers/Consultants

Market Shares of the Leading Suppliers

This study provides company market share data in multiple categories. Worldwide market share data is provided as well as market share data for the following eight geographic regions:

- North America (USA, Canada)
- Western Europe
- Central/Eastern Europe/FSU
- Mideast/Africa
- Japan
- China
- Asia without Japan/China
- Latin America



Strategies for Success

- Discussion of market forces at work
- Product and technical comparisons
- Company analyses
- Strategic action perspectives
- Action items to compete more successfully

Company Profiles

Complete company profiles on the leading vortex flowmeter suppliers are included.

The following is a partial list of the companies profiled in this study:

- ABB
- Armstrong
- Azbil – Vortek
- Badger Meter
- Bopp & Reuther Messtechnik
- Emerson Process – Rosemount
- Endress+Hauser
- Höntzsch
- Kofloc
- KROHNE
- OVAL Corporation
- Schneider Electric – Foxboro
- Shanghai Yinuo Instrument
- Sibnefteavtomatika (SIBNA)
- Sierra Instruments
- Tancy Instrument
- Yokogawa Corporation
- YuYao Yinhan Flowmeter Instrument

Publication Date

January 2019

Flow Research and Research Team Background

Dr. Jesse Yoder is President of Flow Research Inc., a company he founded in 1998. Dr. Yoder has 32 years of experience as a writer and an analyst in process control and instrumentation. Since 1990, he has written over 220 market research studies, most of them regarding flow and instrumentation. Dr. Yoder has also written more than 300 articles on flow and instrumentation for trade journals. Most can be found at www.FlowArticles.com by topic or by date. Some recent articles that would be of interest vis-à-vis vortex flowmeters and their market:

- Taking on the Big Guns: How small but nimble companies compete against the Coriolis and magnetic flowmeter giants, *Fluid Handling International*, November/December 2018
- Thermal & Vortex Flowmeters Improve Efficiency in Energy Management, *Flow Control*, May 2018
- An Integrated Approach to Energy Metering, *Fluid Handling*, March/April 2018

Belinda Burum, Vice President, joined Flow Research in 2002 having worked in journalism and advertising before entering high tech as a writer, marketing communications manager, and customer references consultant. She has assisted with many projects, studies and publications.

Norm Weeks, Senior Market Analyst, joined Flow Research in November 2004 after 24-years with Verizon specializing in innovative solutions for major enterprises, introducing new products and lifecycle management strategies, and product marketing. He also served as Director of the Urban Fellows Institute in New York. At Flow Research, he is involved in project development, research, analysis and writing. In addition to working on studies, custom projects are a specialty. He also contributes to White Papers, our Worldflow and other publications.

Harry Lund, Sales Director, joined Flow Research in October 2016. He has 45 years experience in the flow measurement industry with several US and international corporations. From beginning as a technical writer, he advanced through communication systems, application engineering, and product management to VP Sales, Service, and Marketing. At Flow Research, his experience and skills with people, products and the flow measurement business world are a valuable resource for our customers and us. Harry also has a forte for formulating strategies to enable companies to compete more effectively in the marketplace.

David Goldstein, Business Analyst, joined Flow Research in September 2016. He has an MBA from Boston University and 30 years of professional experience including various management positions in Sales and Marketing with consumer product companies. David developed products and programs for customers as large as Wal-Mart and as small as independent corner drug stores. At Flow Research, he combines his market research and business analyst skills with his astuteness and organizational abilities to assist with research and writing for studies and projects.

Leslie Buchanan, Research Assistant, and Publication Production Associate, joined Flow Research in March 2010, with skills from a variety of work and life experiences. Early on, she worked with the contacts database, assisted with customer liaison, and took on our publication formats. Since, she has become increasingly involved in many capacities with Flow Research studies, Worldflow and other publications.

Victoria Tuck, Administrative and Research Assistant, joined Flow Research in June 2012 with experience from both law firms and nonprofit organizations. She handles a variety of office functions – essential to keep any business running – as well as assisting in other ways, including outreach, the contacts database, and news research for the Worldflow publications.

Recent and Scheduled Flow Research studies:

The World Market for Coriolis Flowmeters, 6 th Edition	www.flowcoriolis.com
The World Market for Magnetic Flowmeters, 7 th Edition	www.flowmags.com
The World Market for Ultrasonic Flowmeters, 6 th Edition	www.flowultrasonic.com
The World Market for Vortex Flowmeters, 6 th Edition	www.flowvortex.com
The World Market for Thermal Flowmeters, 2 nd Edition	www.flowthermal.com
The World Market for Multiphase Flowmeters, 2 nd Edition	www.flowmultiphase.com
Multiphase: Module A: The World Market for Watercut Meters	www.watercutmeters.com
The World Market for Pressure Transmitters, 5 th Edition	www.pressureresearch.com
The World Market for Pressure Transducers	www.worldpressure.com
The World Market for Primary Elements, 2 nd Edition	www.flowplate.com
The World Market for Mass Flow Controllers, 3rd Edition	www.flowmfc.com
<i>Covering a worldwide market view of all and each of the major flow measurement technologies:</i>	
Volume X: The World Market for Flowmeters, 7 th Edition	www.flowvolumex.com
Volume X: Module A: Strategies, Industries, and Applications	www.flowvolumex.com

Information about all of our studies can be quickly found at www.FlowStudies.com. For more information about Flow Research, you can visit our main website at www.FlowResearch.com. There you will find links to information about all of our studies and publications, articles, our secure online store, plus much more information and resources relating to every flow measurement technology, other process instruments, calibration, and many other related topics.

To go straight to more information related to vortex flowmeters, you're welcome to visit www.FlowVortex.com, a Worldflow™ Knowledge website that is dedicated to vortex flowmeter technology and products, and our vortex flowmeter market studies.

We offer the opportunity for companies to become Founding Sponsors of our studies. Benefits of being a Founding Sponsor include being able to participate in determining study scope and direction, receiving updates on study progress, and a favorable discount pricing package.

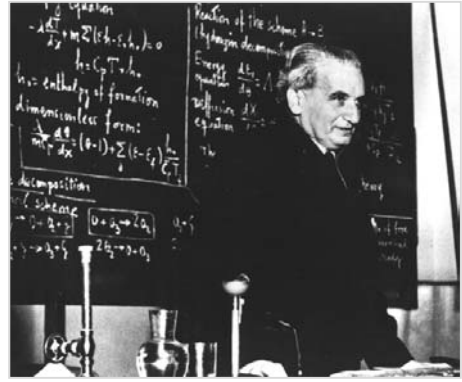
Flow Research is the only market research company whose primary mission is to research flowmeter, calibration, level device, and other process control instrumentation markets.

In addition to off-the-shelf studies, Flow Research specializes in **custom projects** for companies or others who want more detailed information on a specific subject. We can work with companies individually to **formulate strategies** to help them succeed in an increasingly complex world. We conduct **user surveys** that include a detailed analysis of customer perceptions.

Flow Research also offers the **Worldflow Monitoring Service** (www.worldflow.com) that provides subscribers with quarterly updates on the flow and energy industries in the *Market Barometer* and the *Energy Monitor*, plus Flash Reports and access to other information. The *Market Barometer* covers news and analysis for flowmeters, level measurement devices and some other process industries instrumentation, plus calibration. The *Energy Monitor* covers news and analysis for the oil & gas, refining, power, and renewables industries.



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Theodore von Karman

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To produce studies that most closely match our clients' needs, Flow Research instituted the Founding Sponsor Program. This program enables companies who wish to participate at a high level in a study's research to influence its scope and segmentation. In addition, Founding Sponsors can receive updates from Flow Research on study progress, and will receive a significant discount on the regular price of the study.

Procedure: Early in the planning phase of a study, Founding Sponsors receive a proposal that includes the proposed segmentation. Founding Sponsors can propose additional segmentation, and can also suggest changes to the proposed segmentation. While the decision to adopt particular segmentation ultimately lies with Flow Research, and is based on input from all contributors, we will do our best to accommodate the specific needs of each of our clients.

During the research phase of a study, Flow Research can provide updates on the progress of the research. These reports will be sent to the Founding Sponsors, who are then invited to provide any additional input or comments about the study.

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For additional details, or to find out how the Founding Sponsor program applies to any particular study, please contact Flow Research. We look forward to working with you!

If you have any questions about the Founding Sponsor program, please contact Norm Weeks at +1 781 245-3200, or norm@flowresearch.com.

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Why Flow Research?

- We specialize in flowmeter markets and technologies
- We have researched all flowmeter types
- We study suppliers, distributors, and end-users
- Our worldwide network of contacts provides a unique perspective
- Our mission is to supply the data to help your business succeed

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