



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, 7th Edition

Proposal



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www.FlowVortex.com



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The World Market for Vortex Flowmeters, 7th Edition

Flow Research is conducting a new study on the worldwide vortex flowmeter market, called **The World Market for Vortex Flowmeters, 7th Edition**, to be published in Q4 2023. One important focus of this study is to determine the size of this market in 2022. Forecasts through 2027 are included.

This study has multiple purposes:

- To determine 2022 worldwide market size and market shares for all vortex flowmeters
- To forecast market growth for all types of vortex flowmeters through 2027
- 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 6th edition of this comprehensive study in January 2019, and follows the vortex flowmeter market regularly. We provide market updates in our study about the worldwide market for all flowmeters, *Volume X* (www.FlowVolumeX.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 are contacting all known manufacturers of vortex flowmeters worldwide. Flow Research identified over 30 vortex flowmeter manufacturers around the world. By obtaining detailed information about each company, we can assemble a fresh picture of the total vortex flowmeter market. We ask suppliers to provide detailed information about geographic segmentation, industries sold into, types of vortex flowmeters sold, and many other product segments. Flow Research has over 20 years of experience in following the markets for flow measurement and related instruments, markets, industries, and news. We can identify where growth is occurring in the market, as well as the underlying factors for that growth.

Key issues addressed in this study

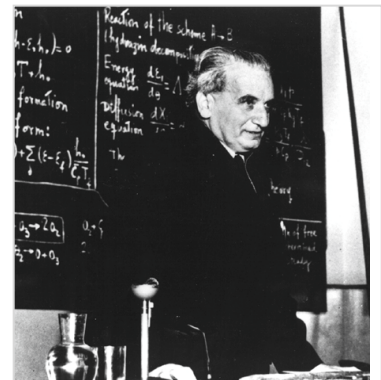
This study will address the following key issues in the vortex flowmeter market:

- Important factors influencing market growth
- The increase in 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

New Chapter Expanding History and Operating Principle

We are expanding coverage of history and operating principle, giving them their own whole chapter.

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



Theodore von Karman

In vortex flowmeters, the obstacle is in the form of an object with a broad, flat front called a bluff body, mounted at right angles to the flowstream. Vortex flowmeters count the number of vortices generated. They use a variety of techniques for sensing the presence of a vortex. The majority of vortex flowmeters use a piezoelectric sensor, some use a capacitive sensor, and others use an ultrasonic sensor. 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.

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 each segmented in this study according to the fluid type measured:

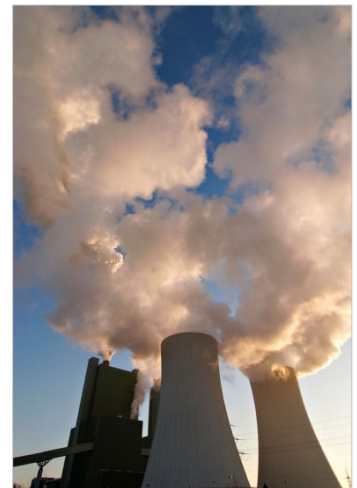
- Gas
- Petroleum Liquids
- Non-petroleum Liquids
- Saturated Steam
- Superheated Steam

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
- Eastern Europe/FSU
- Mideast/Africa
- Japan
- China
- Asia/Pacific (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
- Sierra Instruments
- Tancy Instrument
- Yokogawa Corporation
- Yuyao YinHuan Flowmeter Co.

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Flow Research, Inc.

Flow Research is the only market research company that publishes studies on all nine flowmeter types and whose primary mission is to research process control instrumentation markets. In addition to studies on both new and conventional flowmeter types, we have researched pressure transmitters; temperature sensors and transmitters, infrared thermometers and thermal imagers; level devices; analytical instrumentation; and selected API-certified valves. We also publish studies on oil & gas and other major flowmeter markets. In addition, Flow Research started a working group on flowmeter calibration (FRWG.org) and published two studies on flowmeter calibration facilities, one each for liquids and gas.



Dr. Jesse Yoder, president and founder of Flow Research

Gold Partner Program

We offer companies the opportunity to become “Gold Partners” in advance of our studies. Benefits include being able to participate in determining study scope and direction, receiving updates on study progress, and a favorable discount pricing package. Contact us for more information.

Partnerships and Alliances

Flow Research helps flowmeter companies form alliances and partnerships to provide specific solutions or broaden their customer base and distribution channels. These partnerships can include manufacturers of valves, hoses, transmitters, or other flow-related products, as well as other flowmeter manufacturers.

Distributorships

Are you thinking about expanding your presence in the U.S.? We can help you find distributors for your flowmeters and other instrumentation.

Custom Projects

Companies commission us for custom projects when they want more detailed information on a specific subject than is possible in an off-the-shelf report. They may be evaluating the future or expansion of a product line, determining whether to acquire or merge with another company, or seeking to better understand their customer needs.

Consulting

We also work with companies individually to formulate strategies that help them succeed in an increasingly complex world. Dr. Yoder and his team have studied hundreds of companies and have advised most of the top flowmeter suppliers on market and product strategies.

Research Team Background

Dr. Jesse Yoder, the lead analyst for this study, is President of Flow Research Inc., which he founded in 1998. He has worked as a writer and analyst in process control and instrumentation since 1987 and has created market research studies since 1990. Since then he has written over 280

market research studies, most of them on flow and instrumentation, and over 300 articles on flow and instrumentation for trade journals. (See www.flowarticles.com.)

Dr. Yoder received a PhD in philosophy from the University of Massachusetts Amherst in 1984 and spent 10 years as an adjunct philosophy professor at the University of Massachusetts Lowell and Lafayette College. Dr. Yoder also worked 10 years as a technical writer, including for the process control division of Siemens, and taught technical writing at Northeastern University and UMass Lowell.

Dr. Yoder has received two U.S. patents for the flowtube meter, a new dual tube/dual sensor method of measuring flow, in 2015 and 2017. This meter's two prototypes have been tested at CEESI in Nunn, Colorado.

CRC Press published Dr. Yoder's two-book set, *Advances in Flowmeter Technology*, on the history, operating principles, growth factors, representative companies, and frontiers of research for all 10 types of flowmeters. The first volume, *New-Technology Flowmeters*, published September 6, 2022, was followed by *Conventional Flowmeters* on December 15, 2022.

In 2015, ISA published Dr. Yoder's book, *The Tao of Measurement*, with Richard E. Morley as co-contributor. Topics included temperature, pressure, flow, time, length, and area.



Belinda Burum

Belinda Burum, Vice President, joined Flow Research in 2002. Since then, she has served as senior strategic advisor and been involved with most of our projects and publications. She has also worked as a writer and editor in journalism, advertising, and high tech marketing communications and customer references for 40+ years in the U.S. and Switzerland and is a published author and book editor. She has travelled extensively and enjoyed teaching English in Massachusetts, California, and Ecuador.

Leslie Buchanan, Research and Publication Production Associate, joined Flow Research in 2010 with skills from work and life experiences here and abroad. She assists with research and writing, and handles many publication aspects of Flow Research studies.

Vicki Tuck, Administrative Assistant, joined Flow Research in 2012 with experience in both the fast-paced law firms of Boston and in various nonprofit organizations. She assists with administrative tasks, including database and collecting news for the Worldflow publications.

Kaleigh Flaherty, Director of Marketing, created social media posts for us starting in May 2021 before going back to school to finish her degree in marketing at Coastal Carolina University in Conway, South Carolina. She rejoined us in August 2022 to expand our social media presence and manage other outreach activities.



Kaleigh Flaherty

You can follow us on Facebook, Instagram, Twitter, and LinkedIn (Flow Research, Inc.). We also invite you to join our Flow Research LinkedIn group.

Recent and Currently Scheduled Flow Research Studies

New-Technology Flowmeter Studies

Mass Flowmeter Series	www.massflows.com
The World Market for Mass Flow Measurement (Core Study)	
The World Market for Coriolis Flowmeters, 7 th Edition	www.flowcoriolis.com
The World Market for Thermal Flowmeters, 3 rd Edition	www.flowthermal.com
The World Market for Mass Flow Controllers, 4 th Edition	www.flowmfc.com
The World Market for Magnetic Flowmeters, 7 th Edition	www.flowmags.com
The World Market for Ultrasonic Flowmeters, 7 th Edition	www.flowultrasonic.com
The World Market for Vortex Flowmeters, 7 th Edition	www.flowvortex.com
The World Market Update for Mass Flow Controllers	www.flowmfc.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

Conventional Flowmeter Studies

The World Market for Pressure Transmitters, 5 th Edition	www.worldpressure.com
The World Market for Primary Elements, 2 nd Edition	www.flowplate.com
The World Market for Positive Displacement Flowmeters, 3 rd Edition	www.flowpd.com
The World Market for Turbine Flowmeters, 3 rd Edition	www.flowturbine.com
The World Market for Variable Area Flowmeters	www.flowva.com

Cross-Technology Flowmeter Studies

Volume X: The World Market for Flowmeters, 9 th Edition	www.flowvolumex.com
Volume X: Module A: Strategies, Industries, and Applications	www.flowvolumex.com
The World Market for Gas Flow Measurement, 4 th Edition	www.gasflows.com
Gas Module A: Applications and Strategies for Gas Flow Measurement	www.gasflows.com
Gas Module B: Natural Gas Production, Consumption, and Flow Measurement in the Oil & Gas Industry	www.gasflows.com
Flowmeters in the Oil & Gas Industry	www.oilflows.com

Flow Calibration Studies

Core Study: Worldwide Gas Flow Calibration Facilities and Markets	www.flowcalibration.org
Module A: Worldwide Liquid Flow Calibration Facilities and Markets	www.flowcalibration.org

Temperature

Market for Temperature Sensors in the Americas, 3 rd Edition	www.tempresearch.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

www.FlowVortex.com