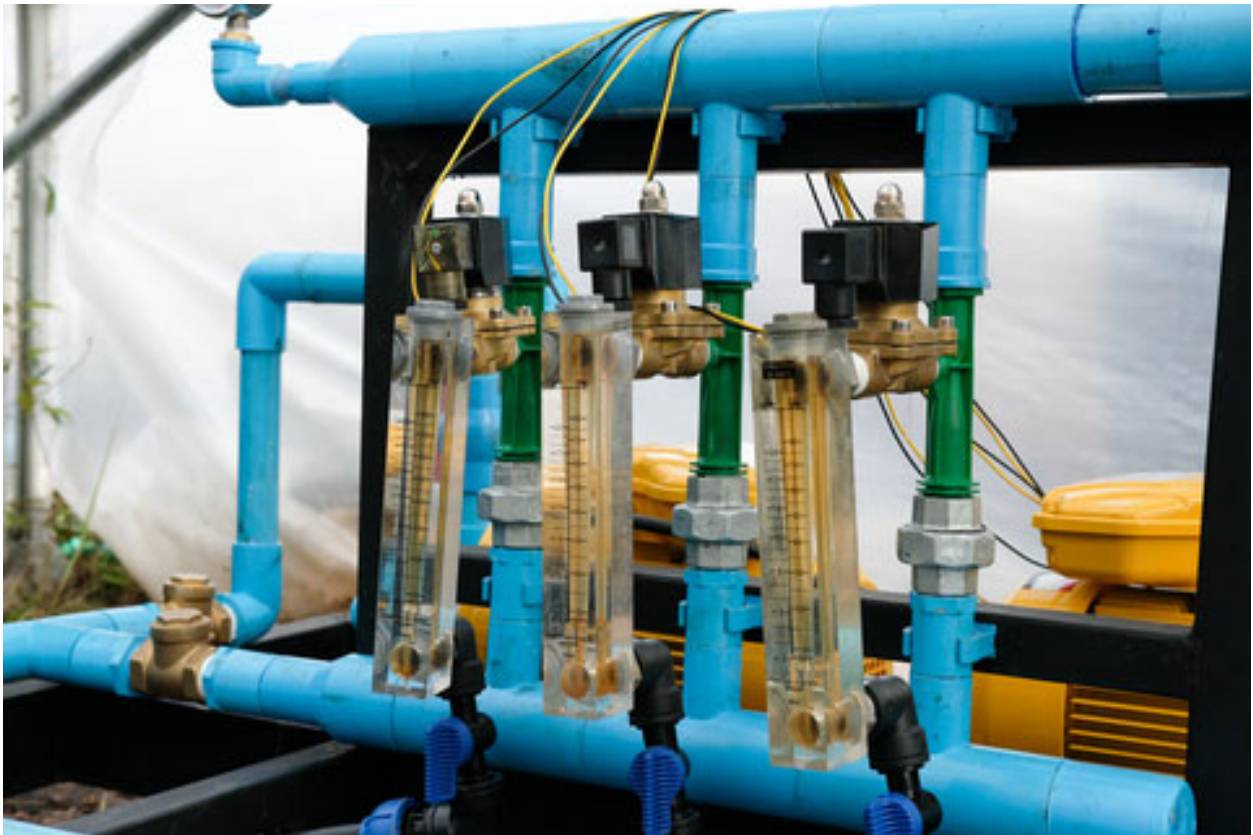


The World Market for Variable Area Flowmeters

— Overview —



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www.FlowVA.com

The World Market for Variable Area Flowmeters

Flow Research is excited to announce a new market study called *The World Market for Variable Area Flowmeters*.

The Variable Area (VA) market has been largely unexplored for many years despite the fact that this technology remains a popular choice for many end-users in a variety of industries. As you know, VA meters have been a good fit whenever users are looking for a simpler, low-cost solution in gas and liquid measurements. Today, they can offer new material types for more difficult applications, new communication protocols for better device management, and other features important to potential buyers.

Rationale for Study

We believe that this is an optimal time to accurately quantify the present size and the growth opportunities within this flowmeter market, and to provide a comprehensive view of the current state of the technology.



A variable area flowmeter with flanges

This Study Has Multiple Objectives:

- To determine worldwide market size and market shares for VA flowmeters in 2019
- To forecast market growth for all types of VA flowmeters through 2024
- To identify industries and applications where VA flowmeters are used today
- To identify and describe those factors contributing to growth in VA flowmeter revenues
- To provide product analyses for the main companies selling into the VA flowmeter market
- To provide strategies to manufacturers for selling into this worldwide flowmeter market
- To provide company profiles of the main suppliers of VA flowmeters

We are using 2019 as the base year for this study for two basic reasons. First, study respondents have solid data to report for the years 2019 and 2020. And second, analysis of the data will be able to fully account for the effects of the pandemic on the VA market. This is important as there is great interest in knowing what effects the pandemic has had on worldwide and regional markets, and where and how quickly the recovery from these is occurring.

Study Methodology

Flow Research has more than two decades worth of experience in the analysis of process control instrumentation markets, industries, technologies, and customer behaviors. We keep our own clientele updated on these interest areas through our regular development of new research on these subjects, as well as our two quarterly publications, *Market Barometer* and *Energy Monitor*.

In conducting this study, we contacted all known manufacturers of Variable Area flowmeters worldwide to assemble a picture of the total VA flowmeter market. We asked these suppliers for information about geographic segmentation, industries sold into, types of VA flowmeters sold,

and many other product segments. As a result, the study identifies where growth is occurring in the market, and the underlying factors driving that growth.

When analyzing target markets, Flow Research uses the perspective of all three segments: manufacturer, distributor/representative, and end-user. We maintain regular communication with all three of these groups in order to be best positioned to note both subtle and significant shifts in technologies or buying patterns.



Operating Principle

The Variable Area flowmeter is an instrument for measuring the flow of liquids and gases in pipes. It includes a vertical tube through which the fluid flows whose diameter increases from the bottom to the top and a float that moves vertically in the tube.

This variable area principle consists of three basic elements: A uniformly tapered flow tube, a float, and a measurement scale. A control valve may be added if flow control is also desired. Variable area flowmeters are also known as rotameters.

Key Issues Addressed in This Study

- How did the COVID-19 pandemic affect the market?
- Growth outlook for Variable Area (VA) flowmeters worldwide and by region
- Usage of VA flowmeters by industries
- Current applications for VA flowmeters
- Market size for the three basic types of VA flowmeters: plastic, glass, and metal
- Meter tube sizes where VA flowmeters are most frequently used
- Accuracy levels for the three VA flowmeter types
- Pressure and temperature ranges for the three types of VA flowmeters
- VA flowmeters configured to perform purge functions
- Adoption rates of communication protocols in smart VA flowmeters
- Features that end-users are looking for in VA flowmeters
- Competitive price pressures on VA flowmeters
- Understanding why and where VA flowmeter usage is growing or declining

Segmentation

Our comprehensive segmentation provides valuable insights into the use of this technology. All study information is provided worldwide *and* by six regions.

Geographic Segmentation

- North America (U.S. and Canada)
- Western Europe
- Eastern Europe/FSU
- Mideast/Africa
- Asia/Pacific (including India, China, and Japan)
- Latin America (Mexico, Central and South America)



Variable Area Flowmeters by Tube Material

- Plastic
- Glass
- Metal

Variable Area Flowmeters by Fluid Type Measurement

- Petroleum/Refined Petroleum Liquid
- Non-petroleum Liquid
- Gas
- Steam
- Other

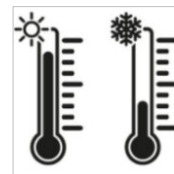


Variable Area Flowmeters by Pressure Ranges

- Plastic
- Glass
- Metal

Variable Area Flowmeters by Temperature Ranges

- Plastic
- Glass
- Metal



Variable Area Flowmeters by Purge Function

A valve placed at the inlet or outlet of a VA flowmeter can be used to regulate pressure and create a self-contained purge flowmeter, a popular design option among end-users.

- % of plastic, glass, or metal VA meters configured as a purgometer
- % of plastic, glass, or metal VA meters not configured as a purgometer

Variable Area Flowmeters by Meter Tube Sizes

- ½ inch or less
- >½ inch to 1 inch
- >1 to 1½ inches
- >1½ to 2 inches
- >2 inches



Variable Area Flowmeters by Power Type

VA flowmeters have stood alone for being the only type which does not require an external source of power. Today, they can provide the end-user other options.

- No Power
- 2-wire
- 4-wire
- Battery

Variable Area Flowmeters by Communications Capability

- Conventional (visual indication only)
- Smart (analog or digital output to a device manager)

Smart Variable Area Flowmeters by Communications Capability

- FOUNDATION Fieldbus™
- HART
- Wireless Hart
- Ethernet
- Profibus DP®
- Profibus PA®
- Other

Variable Area Flowmeters by Accuracy Level by Each of Three Tube Materials for plastic, for glass, and for metal:

- ≤0.5%
- >0.5% to 1.0%
- >1.0% to 2.0%
- >2.0% to 3.0%
- >3.0% to 5.0%
- >5.0%

Variable Area Flowmeters by Industry

- Oil & Gas(Up-, Mid-, and Downstream)
- Refining
- Chemical
- Food & Beverage
- Pharmaceutical
- Pulp & Paper
- Metals & Mining
- Power
- Water & Wastewater
- Agriculture/Irrigation
- Healthcare/Medical
- Heating, Ventilation, & Air Conditioning
- Machine Building
- Other

One of the unique qualities of VA flowmeters is the degree of customization that suppliers routinely provide to their customers. Examples include items such as scales specific to the intended application, inlet/outlet orientation, non-standard threads, and even customer name and logo and special ink colors. These marketing ideas and more are described in this study.

Variable Area Flowmeters by Application

- Industrial Gas Measurement
- Water Flow
- Water-based Chemicals
- Cooling/Heating Circuits
- Industrial Furnaces
- Compressor Monitoring
- Sanitary/Hygienic
- Process Control
- Purge Fluids for Measuring Systems
- Liquids with Particulates
- Other



Variable Area Flowmeters by Distribution Channel

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

Variable Area Flowmeters by Customer Type

- End-users
- Original Equipment Manufacturers (OEM's)
- Systems Integrators
- Engineering and Consulting Firms
- Resellers

Market Shares of Major Suppliers

- Market Shares Worldwide and by the Six Regions

Strategies for Success

- Discussion of market forces at work
- Strategic action perspectives
- Real world success stories



Company Profiles

Company profiles of all of the major VA flowmeter suppliers are provided, including:

- Aalborg Instruments & Controls, Inc.
- Blue-White Industries
- King Instrument Company
- Kytola Instruments Oy
- Tokyo Keiso Co., Ltd.
- Vögtlin Instruments AG
- ABB Automation Products
- Brooks Instrument
- KROHNE Messtechnik GmbH
- Tecfluid
- Universal Flow Monitors, Inc.
- Yokogawa Electric Corporation

Flow Research, Inc.

Flow Research is the only market research company whose primary mission is to research process control instrumentation markets. We create these studies through interviews with suppliers, distributors, and end-users. Topics include all of the flowmeter technologies – both new and conventional – as well as pressure transmitters; temperature sensors; level devices; and studies specifically focused on certain major markets such as the oil and gas markets. Flow Research leads a working group focusing on flowmeter calibration, and has completed two studies on flowmeter calibration facilities. Further information on studies, links for articles and more can be found by visiting the FlowResearch website at www.flowresearch.com or by calling us at +1 781-245-3200.

Dr. Jesse Yoder, President of Flow Research and the lead analyst for this study, has over 32 years of experience writing about and analyzing process control and instrumentation markets, beginning as president and founder of Idea Network. In addition to the years he has spent writing market studies, Dr. Yoder spent 10 years as a technical writer. Almost four years of this were spent writing technical manuals and training guides for the process control division of Siemens. He also taught technical writing at the graduate level at Northeastern University and the University of Massachusetts Lowell. Dr. Yoder spent 10 years as an adjunct philosophy professor at the University of Massachusetts Lowell and Lafayette College.

Dr. Yoder has received two patents for new flowmeter designs. This meter has two prototypes built and is under test at CEESI in Nunn, Colorado. He has led the research of over 280 market studies, published over 300 articles on flow and instrumentation in industry journals, and written two books, with another in progress. His last book, *The Tao of Measurement: A Philosophical View of Flow and Sensors*, with Richard E. Morley as co-contributor, was published in 2015 by the International Society of Automation (ISA). Topics covered include temperature, pressure, flow, time, length, and area. Dr. Yoder is currently writing a two-book set called *Advances in Flowmeter Technology* that will be published in 2021 by CRC Press. The first volume is called *New-technology Flowmeters* and the second volume is called *Conventional Flowmeters*.

Belinda Burum, Vice President, worked in journalism and advertising before entering high tech as a writer, marketing communications manager, and customer references consultant. She joined Flow Research in 2002, and has worked on 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 market management. He also served as Director of the Urban Fellows Institute in New York. At Flow Research, his involvement and contributions in project development, research, analysis and writing are significant. In addition to working on studies, custom projects are a specialty. He also contributes to White Papers, Worldflow and other publications.

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

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

Gabriella DeCologero, Director of Marketing, joined Flow Research in June 2019. She is in charge of our social media outreach, and has brought her graphic design talents to our marketing efforts. Gabriella is also assisting in our customer contacts and outreach.

Flow Research studies contribute to an ongoing view of the flowmeter market

Listed below is a summary of recent and upcoming Flow Research studies in the area of process control instrumentation. These studies are further described at www.FlowStudies.com.

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 Mass Flow Controllers, 3 rd Edition	www.flowmfc.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
The World Market for Pressure Transmitters, 5 th Edition	www.pressureresearch.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
Volume X: The World Market for Flowmeters, 8 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
Core Study: Worldwide Gas Flow Calibration Facilities and Markets	www.flowcalibration.org
Module A: Worldwide Liquid Flow Calibration Facilities and Markets	www.flowcalibration.org
Market for Temperature Sensors in the Americas, 3 rd Edition	www.tempresearch.com

Worldflow Monitoring Service

In addition, Flow Research provides quarterly updates on the flow and energy industries in the *Market Barometer* and *Energy Monitor*. *Market Barometer* provides current information on process control instrumentation and the companies within the industry. *Energy Monitor* analyzes the current state of the Oil & Gas, Refining, Power, and Renewable industries, and the implications for instrumentation suppliers. Both reports are part of the Worldflow Monitoring Service. More details are available at www.worldflow.com.

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Blaise Pascal

The Flow Research Gold Partner Program

To produce studies that most closely match our clients' needs, Flow Research has instituted the Gold Partner 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, Gold Partners receive regular updates from Flow Research on study progress, and receive a significant discount on the regular price of the study.

Procedure: Early in the planning phase of a study, Gold Partners receive a proposal that includes the proposed segmentation. Gold Partners 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 do our best to accommodate the specific needs of each of our clients.

During the research phase of a study, Flow Research will issue regular reports that provide updates on the progress of the research. These reports will be sent to Gold Partners, who are then invited to provide any additional input or comments into the study.

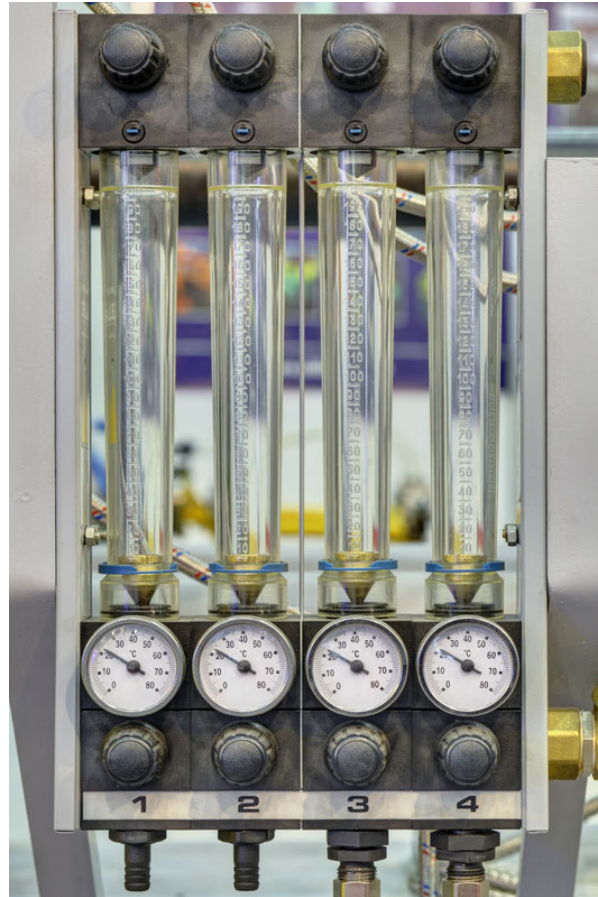
Being a Gold Partner requires making an early commitment to purchase the study. However, in return, Gold Partners receive a significant discount off the regular price of the study. Payment can be made either in one amount at the beginning of the study, or split into two, with the second payment due upon delivery of the study.

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

For answers to any questions you may have regarding the above, 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 research 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.FlowVA.com