FlowTimes – July 2022

Your strategic update on flow, temperature, and pressure measurement from Flow Research

Executive Editor: Dr. Jesse Yoder. Volume 23, Number 1 – ISSN 1350-7204

1. A trip to Europe reveals frontiers in flowmeter development

In mid-May, longtime Flow Research contributor and vice president Belinda Burum and I spent eight days visiting some of the leading flowmeter suppliers in the Netherlands and Switzerland. These countries are host to some of the most innovative and prominent companies in flow. It was very exciting to meet with CEOs and product managers as we expanded our knowledge of flowmeters and the current state of the flowmeter market. We also took some time to enjoy the beauty of Zurich, Lucerne, and Basel. Now we can't wait to return!

Mini cruise on Lake Zurich

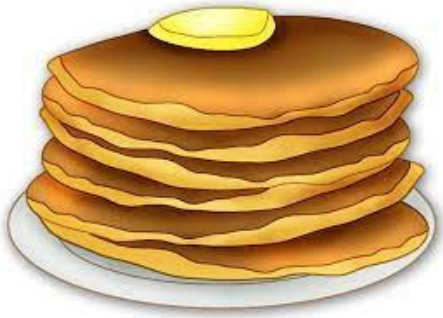
One topic we discussed on our trip is what the leading companies are researching and thinking about for new flowmeter development. Here is a sampling of questions relating to the frontiers in flow research:

- Greater use of wireless technology
- Different bluff bodies for vortex meters and different technologies for sensing vortices
- New types of liners for magnetic flowmeters
- Higher accuracy in thermal flowmeters
- Will accuracy improvements in ultrasonic flowmeters come from new hardware or software? Are Doppler flowmeters making a comeback?
- Will new primary elements emerge by combining two types into one?
- Is it possible to build a 20-inch Coriolis flowmeter? Why or why not?
- Do Coriolis flowmeters use the Coriolis principle?
- What new materials can be used to make flowmeters stronger and lighter?
- How will wireless technology affect instrumentation?
- How can turbine meters be made more reliable
- Can two sensors be built in a meter for redundancy?
- How will mergers & acquisitions impact available products?
- To what extent will the mechanical counters on positive displacement meters be replaced by more modern ones?

Relaxing at Lake Zug

We welcome your thoughts on these and other frontiers of flowmeter research. *Please send any comments or additions to jesse@flowresearch.com.*

2. Get your copy now of *Volume X: The World Market for Flowmeters*



Selling like hotcakes

We don't want to brag, but our latest edition of the comprehensive, ***Volume X: The World Market for Flowmeters, 8th Edition***, is selling like hotcakes, and with good reason. This one-of-a-kind, all-in-one view of the entire flowmeter market gives you the most accurate picture possible of the market, including the impact of the coronavirus pandemic for 12 flowmeter types. *Volume X* publishes detailed data for both 2019 and 2020 plus participating companies' projections for 2021 sales, with forecasts through 2024. A standalone companion volume, ***Module A: Strategies, Industries, & Applications*** provides data about industry trends and how they are impacting the flowmeter market. Then, if you want even more detailed information on a specific flowmeter type, we encourage you to take a look at the rest of our inventory. We've been busy churning out reports this year and have fresh reports on just about every technology.

Volume X draws on 29 years of consistent methodology in research by Dr. Yoder, who authored his first worldwide flowmeter study in 1994 for Find/SVP. Flow Research published its first *Volume X* study in 2003, followed by editions in 2008, 2010, 2013, 2014, 2017, and 2019.

The report is designed for anyone involved in developing strategies and products. It displays in one glance a comparison of the revenues, units sold, and compound annual growth rate for all the main types of flowmeters. Growth factors and limiting factors for each flowmeter type explain the rationale of the market forecasts and what can be expected over the next three years. No other study exists that provides this type of all-in-one view of the flowmeter market. Even companies that sell only one or two types of flowmeters can benefit from learning about the eight or nine other types of flowmeters they are competing against.

To get your copy, click the Order link at www.flowvolumex.com or contact us directly at 781-245-3200 or jesse@flowresearch.com. Make sure to take advantage of our special summer pricing by ordering by July 20.

3. VorTek's confidence in multivariable flowmeters has never varied

VorTek's VorCone™ flowmeter

Multivariable measurement is growing more popular as a way to reduce installation and maintenance costs and enhance process insights, according to Ryan Bennett of VorTek Instruments, whose article, "Utilizing Multivariable Measurement" appeared in the December issue of *P.I. Process Instrumentation*. Bennett maintains – and we agree – that multivariable measurement has been gaining wider acceptance as users grasp the value of having more than one independent process variable in a single

instrument. Bennett sees two main use cases for multivariable measurement: 1) multiple measurements that are useful individually, such as a multivariable vortex flowmeter that also measures temperature and pressure and 2) compensative measurements that improve performance or enhance calculations, such as adding temperature and pressure sensors to a differential pressure transmitter.

The origin of the multivariable vortex flowmeter goes back to the founder of VorTek Instruments, Jim Storer, who came up with the idea for a multivariable vortex meter in 1994 after he left EMCO Flow Systems. At that time, EMCO was selling vortex flowmeters along with pressure and temperature sensors and sending the values to a flow computer to calculate mass flow. Storer later realized it would be more efficient to consolidate all these measurements in a single unit to create a multivariable vortex meter.

In 1995, Storer left EMCO to found VorTek Instruments in Longmont, Colorado, where he began the design of the multivariable vortex flowmeter. The company, now an azbil Group Company, specializes in vortex technology, and during its history has designed and manufactured custom flowmeters to meet its customers' original equipment manufacturer (OEM), private label, or general customer needs and specialized application requirements. The company is known for its innovative hybrid VorCone™ meter, which uses vortex and cone-based differential pressure flow technologies to measure fluid density, volumetric flowrate, and mass flowrate without any fluid density information from an external source. VorTek also offers multivariable insertion turbine flowmeters and ultrasonic flowmeters.

Azbil North America president Gary Johnson (left), Jim Storer (center), and Azbil Corporation President and CEO Hirozumi Sone during 2013 merger

In the early days, Storer lacked a distribution channel and decided to form a joint venture with Sierra Instruments in Monterey, California. VorTek retained the rights to manufacture the insertion multivariable vortex, while Sierra owned and manufactured the inline version. However, Sierra was allowed to market both meters under its brand name. This arrangement lasted for several years until VorTek developed a second-generation multivariable vortex flowmeter that Sierra sold under its brand name. This arrangement continued until about 2014, when Sierra decided to manufacture its own vortex meter. Even after this, Sierra continued to sell VorTek meters under its own name, as is still does today.

Since January 2013, VorTek Instruments has been a subsidiary of Azbil North America, which is a wholly owned subsidiary of the Japan-based azbil Group. In April 2017, Storer retired from VorTek and turned the reins of the company over to Eric Sanford, who still serves as president.

A number of other companies have now come out with their own multivariable vortex flowmeters, including ABB, Yokogawa, KROHNE, and Endress+Hauser. Multivariable vortex flowmeters are also one of a growing number of multivariable flowmeters, including multivariable magnetic flowmeters and multivariable DP flowmeters.

4. Magmeters – still a revenue leader in the flowmeter market

Magmeters, one of the top revenue leaders in the global flowmeter market – running neck and neck with Coriolis meters – are among the most widely used types of meters for measuring the flow of water and other liquids. More than 40 percent of their revenues are from the water & wastewater and chemical industries and more than 15 percent of their market is in food & beverage applications. according to ***The World Market for Magnetic Flowmeters, 7th Edition***, which is now ready for immediate delivery.

Even though they don't measure hydrocarbons, magmeters are used in the oil & gas industry for fracking applications, including measuring water injected into oil and gas wells and water flowing from them for capture, disposal, or recycling. In water & wastewater, magmeters are growing in demand as water shortages and climate change intensify the need to more closely monitor water supplies and usage. In fact, they are now displacing positive displacement and turbine meters in some residential and industrial applications for utility measurement,

The World Market for Magnetic Flowmeters, 7th Edition determines the regional and worldwide market size in 2019 and 2020 and forecasts market growth through 2024. It also provides the market shares of the leading suppliers. The study analyzes products from all the primary magmeter suppliers and profiles the significant worldwide suppliers. We identify the top industries and applications and propose market and product strategies.

For complete details, go to www.flowmags.com. For special pricing, call or email us by July 20 at 781-245-3200 or jesse@flowresearch.com.

5. Dresser and Itron strike a deal

Dresser Utility Solutions, formerly Dresser Natural Gas Solutions (NGS), has acquired Itron's global gas regulator business and its European commercial & industrial (C&I) mechanical gas meter businesses and gas stations meter and pressure regulation business.

In a February press release, Itron's senior vice president of Device Solutions, Justin Patrick, said the two companies' customers and partners will benefit from working with Dresser Utility Solutions, a solutions provider for utility companies that he called "a trusted leader in the gas industry with over a century of experience providing highly engineered infrastructure for critical service applications for natural gas and utility industries."

Dresser Utility Solutions, based in Houston, Texas, includes Dresser Measurement and Dresser Utility Solutions UK, along with six other brands. Dresser Measurement provides rotary positive displacement flowmeters, metering instrumentation, and test equipment for global natural gas distribution, transmission, and production. Dresser Utility Solutions UK offers rotary meters and pulse transmitters as well as complete solutions.

Dresser Utility Solutions traces its history to 1880 when Solomon Dresser started selling products to the petroleum industry near Bradford, Pennsylvania. In 1944, Dresser purchased Roots Blowers and Meters, which was founded in 1854 when two brothers, Francis and Philander Roots, introduced the rotary positive displacement blower and marketed it in Pennsylvania oil fields. In 1920 the brothers introduced the world's first rotary meter for gas measurement. In 1998, Dresser Industries merged with Halliburton, Inc. but in 2001, the Dresser Equipment Group separated from Halliburton to become Dresser, Inc., owned by the First Reserve investor group. In July 2009 Dresser, Inc. acquired the assets of iMeter B.V., a global supplier of natural gas metering equipment, including rotary and turbine gas meters, meter instrumentation, and meter calibration systems for the natural gas industry.

In 2011 GE acquired Dresser and in 2017, when Baker Hughes merged with GE Oil & Gas, Dresser's natural gas solutions business became part of the oilfield services company. In 2018, Baker Hughes, a GE company, sold what became known as Dresser NGS back to First Reserve. On March 23, 2021, Dresser NGS changed its name to Dresser Utility Solutions.

For more analyses of issues involved in company restructuring, see our new Positive Displacement study, which was released in December 2021. Full details are at www.flowPD.com.

6. We're positive you'll like our new PD flowmeter study

We are proud to announce the release of ***The World Market for Positive Displacement Flowmeters, 3rd Edition***, the first study devoted exclusively to PD meters since our last full positive displacement study in 2012. Our research shows that PD meters are holding their own even in today's competitive environment due to their accuracy, reliability, and large installed base. PD meters face stiff competition from new-technology meters in some segments, especially in the oil and gas market. Positive displacement (PD) flowmeters remain the workhorses of today's flowmeter world, performing important flow measurements that many people take for granted. Most notably, they are widely used for water and gas billing in residential, commercial, and industrial applications.

Find out more and order your copy at www.flowpd.com or contact us directly at 781-245-3200 or jesse@flowresearch.com.

7. Feel the pressure? Check out our newest study

Flow Research has just finished a new market study, *The World Market for Pressure Transmitters, 5th Edition*. This new study brings you up to date on the pressure transmitter market, while focusing on the effects on the market of the pandemic in 2020 and the subsequent rebound in 2021 and 2022.

A variety of factors are promoting growth within the pressure transmitter market:

- Feature enhancements adding value to process performance

- Resurgence of the Oil & Gas industry
- Large installed base favoring technology retention and product upgrades
- Plant construction in China, India, and other developing markets
- Greater use of multivariable pressure transmitters and the growth in types of communication protocols

Many important events have occurred since our last pressure study was published in 2015, including the downturn in oil prices that year, the pandemic, supply chain issues, and inflation. These changes make it even more important to track what is happening in the pressure and instrumentation markets. One silver lining is that the increase in oil prices, especially in 2022, will increase the need for more oil and gas exploration and production, even as the world moves towards renewables over time. This is good for both the pressure transmitter and flowmeter markets.

In the study we distinguish the four types of pressure transmitters on the market and what they actually measure:

- Multivariable (MV) pressure transmitters measure two or more process variables – usually volumetric flow and pressure and/or temperature – in a single device.
- Differential pressure (DP) transmitters measure the difference in pressure upstream and downstream of a constriction in a pipe called a primary element.
- Gage pressure transmitters measure an amount of pressure that includes atmospheric pressure.
- Absolute pressure transmitters measure an amount of pressure that does not include atmospheric pressure.

The study covers the pressure transmitter market from 2019 to 2024 and identifies where growth is occurring in the market and the underlying factors driving that growth.

To learn more and order the study, visit www.pressureresearch.com. Contact us directly at 781-245-3200 or jesse@flowresearch.com by July 20 for special pricing.

8. Studies from Flow Research

Upcoming studies:

- ***The World Market for Turbine Flowmeters, 3rd Edition*** (July 2022) www.FlowTurbine.com
- ***The World Market for Variable Area Flowmeters*** (July 2022) www.FlowVA.com

Recently published studies:

- ***The World Market for Pressure Transmitters, 5th Edition*** (June 2022) www.PressureResearch.com

- ***The World Market for Magnetic Flowmeters, 7th Edition*** (May 2022)
  www.FlowMags.com
- Covering all the main flowmeter types: www.FlowVolumeX.com
  Volume X: The World Market for Flowmeters, 8th Edition (January 2022)
  Volume X: Module A: Strategies, Industries, and Applications (April 2022)
- ***The World Market for Positive Displacement Flowmeters, 3rd Edition*** (December 2021)
  www.FlowPD.com
- Ultrasonic flowmeters series,www.FlowUltrasonic.com (May 2021)
  Core Study: The World Market for Ultrasonic Flowmeters, 6th Edition
  Module A: The World Market for Inline Ultrasonic Flowmeters
  Module B: The World Market for Clamp-on and Insertion Ultrasonic Flowmeters
- ***Flowmeters in the Oil & Gas Industry***, www.oilflows.com, published April 2021
- ***The World Market for Coriolis Flowmeters, 6th Edition***, www.FlowCoriolis.com, published September 2020
- World Market for Gas Flow Measurement 4th Edition, www.GasFlows.com, published August 2020
  Core Study: The World Market for Gas Flow Measurement, 4th Edition
  Module A: Applications and Strategies for Gas Flow Measurement
  Module B: Natural Gas Production, Consumption, and Flow Measurement in the Oil & Gas Industry

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9. The *Worldflow Handbook: A Guide to Flowmeter Selection & Suppliers* — now fully updated to 2022

- Which flowmeter do I need for my application?
- Where can I find a supplier?
- What other companies are in the flowmeter market?

The *Worldflow Handbook* is the only complete and independent worldwide guide to flowmeter selection and flowmeter suppliers. Its pages are chock full of valuable information for flowmeter suppliers and end-users alike! The *Worldflow Handbook* gives you the information you need to decide what type of flowmeter to use for your application, find a supplier to order it from, and locate contact information for the supplier. New-technology flowmeters include Coriolis, magnetic, ultrasonic, vortex, and thermal. Conventional technology flowmeters include differential pressure, positive displacement, turbine, open channel, and variable area. The

Handbook also gives flowmeter manufacturers an overall look at who is in the flowmeter market and who you are competing against in every flow technology, including:

- An explanation of the paradigm case method of flowmeter selection
- A listing of the suppliers for all the new-technology and conventional technology flowmeters and what types of meters they manufacture
- A directory of over 250 flowmeter suppliers

To get your copy, click the Order link at www.flowhandbook.com or contact Flow Research at 781-245-3200 or jesse@flowresearch.com.

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