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## ***Go with the Flow*** **» Guide to the CD «**

Flow Research is pleased to present the latest edition of our **Go with the Flow** CD, chock full of informative articles on flow technology, related process instrumentation technologies and topics, and some food for thought and just plain fun stuff.

The **Go with Flow Research – Articles & Studies** section is an extensive collection of articles organized by technologies and topics. It also includes overviews of our related studies, and information about our other publications and services.

The **Shades of Experience** section provides a more philosophical perspective. *Shades of Experience* is a book by Jesse Yoder on philosophy, experience and language. Some of its main purposes are to explain the philosophy of viewpoint pluralism, discuss how people can increase their understanding by becoming more aware of previously unnoticed differences in their experience, and examine some of the dynamics of language and ways it can be used as a more powerful descriptive tool. According to viewpoint pluralism, our knowledge of a subject or object increases as we take additional viewpoints of it. Chapter One describes **viewpoint pluralism**, which is the philosophy that underlies the market research done at Flow Research.

Just for fun, we have included a **Music** section with two toe-tapping, flow-related songs we think you'll enjoy — “Go with the Flow” and “King of Flow” — along with lyrics and artists’ background information.

We hope you’ll like this CD! We had a lot of fun putting it together. We welcome your comments and suggestions.

**The following is a directory of what you’ll find:**

## **Begin Here**

1. Letter from the President of Flow Research
2. Guide to the CD
3. Flow Research Brochure
4. Flow Research Studies EZ Faxback Response Form
5. Flow Research Websites

## **Go With Flow Research—Articles & Studies**

This section contains detailed information on our flow, temperature, and pressure studies, and user surveys. The section is organized by technologies and topics. Most sections also contain published articles by Dr. Jesse Yoder on flow technology.

### **Applications Articles**

**Studies:** For information on our studies focusing on flow measurement Applications, please see:

*Volume X* (all flowmeters) 5<sup>th</sup> Edition: **Module A: Strategies, Industries, & Applications** — [www.FlowVolumeX.com](http://www.FlowVolumeX.com)

and **Module D: Strategies, Industries & Applications** of *The World Market for Natural Gas and Gas Flow Measurement, 3<sup>rd</sup> Edition* — [www.GasFlows.com](http://www.GasFlows.com)

and **Module D: Strategies, Industries & Applications** of *The World Market for Oil and Oil Flow Measurement* — [www.OilFlows.com](http://www.OilFlows.com)

*Article* – “Measuring the World’s Water Supply” – February 2009, *Flow Control*

*Article* – “4 Key Flowmeter Applications to Watch” – December 2010, *Flow Control*

*Article* – “Flowmeter Applications to Watch in 2012” – December 2011, *Flow Control*

### **Columns**

*Article* – “New Realities Bring New Measurements” – July 2008, *Processing*

*Article* – Flow Update: Something to Be Said for Tradition: Legacy Flow Measurement Systems Live On – November 2008, *Flow Control*

*Article* – “New Technology Flowmeters: A Growing Trend” – May 2009, *Processing Magazine*

*Article* – “Measurement Guru Waxes Philosophically Over Flowmeters” – June 2009, *Pipeline & Gas Journal*

*Article* – “Ge F. Fischer Tells It His Way – Reflections from a Pioneer of Flow Measurement” – June 2011, *Flow Control*

*Article* – “Where Flowmeters Matter – A look at leading flow measurement conferences” – March 2012, *Flow Control*

*Article* – Flow Update: Part II: Trend Watch: A look at recent developments in traditional-technology flowmeters – June 2013, *Flow Control Magazine*

*Article* – Flowmeter Outlook: Is the United States Really Set to Surpass Saudi Arabia As Leading Supplier of ‘Oil’? – December 2013, *Flow Control Magazine*

*Article* – Flow Update: Introducing the ‘Multi-Tech’ Flowmeter: When technologies unite in the name of flow measurement – June 2014, *Flow Control Magazine*

*Article* – Oil Flow Outlook: How Hydraulic Fracturing Is Influencing the Price of Oil – December 2014, *Flow Control Magazine*

## Custody Transfer Articles

**Studies:** For information on our studies focusing on custody transfer, please see:

**Module C: The World Market for Custody Transfer of Natural Gas** of *The World Market for Natural Gas and Gas Flow Measurement, 3<sup>rd</sup> Edition* — [www.GasFlows.com](http://www.GasFlows.com)

and **Module C: The World Market for Custody Transfer of Petroleum Liquids** of *The World Market for Oil and Oil Flow Measurement* — [www.OilFlows.com](http://www.OilFlows.com)

1. Gas 3<sup>rd</sup> Ed. Core + Module C: Custody Transfer – Overview: A brochure covering details about *The World Market for Gas Flow Measurement, 3<sup>rd</sup> Edition*, and **Module C: The World Market for Custody Transfer of Natural Gas**. Scheduled for 2017, this new edition of our popular 2011 and 2015 study series will update the core study and custody transfer module.
2. Oil Module C: Custody Transfer – TOC: This table of contents gives you a look at what is covered in **Module C: The World Market for Custody Transfer of Petroleum Liquids** of our series *The World Market for Oil and Oil Flow Measurement*.
  - Article* – “Energy Demand Propels Custody Transfer Flow Measurement” – July 2010, *Pipeline & Gas Journal*
  - Article* – “Flowmeter Battle Royale: The Competition in an Expanding Custody Transfer Market” – July 2010, *Processing*
  - Article* – “Custody Battles: Positioning for Market Share in Custody Transfer of Oil and Gas” – July 2011, *Flow Control*
  - Article* – “Custody Transfer of Oil & Gas – Flow measurement accuracy with money on the line” – October 2012, *Flow Control*
  - Article* – “Custody Transfer of Natural Gas: cooperation leads to success” – July 2013, *Flowmeter Solutions*

## Energy Articles

*Article* – “Innovations Dominate Flow Measurement Market” – November 2011, *Pipeline & Gas Journal*

*Article* – “Energy Applications Drive Flowmeter Technology Improvement” – December 2012, *Flow Control*

*Article* – “Energy Energizes the Technology Marketplace – How oil & gas exploration worldwide will dictate instrumentation investments going forward” – October 2013, *Flow Control Magazine*

## Flowmeter Calibration Articles

1. Flowmeter Calibration Facilities, Markets-Overview: This brochure covers details about our two-study series on *The World Market for Flow Calibration Facilities*. The Core Study covers *Gas Flowmeter Calibration* and Module A covers *Liquid Flowmeter Calibration*. You can also visit [www.flowcalibration.org](http://www.flowcalibration.org).

*Article* – “Calibration Issues Bedevil the Fast-growing Ultrasonic Flowmeter Market” – January 2010, *Processing*

*Article* – “Accuracy Matters: The Why and Where of Flowmeter Calibration” – July 2010, *FlowControlNetwork.com*

*Article* – “Ultrasonic Flowmeters Wow Them at CEESI Workshop” – October 2013, *Processing*

## Gas Flow Studies & Articles

1. Gas 3<sup>rd</sup> Ed. Core + Module C: Custody Transfer – Overview: A brochure covering details about *The World Market for Gas Flow Measurement, 3<sup>rd</sup> Edition*, and *Module C: The World Market for Custody Transfer of Natural Gas*. Scheduled for 2017, this new edition of our popular 2011 and 2015 study series will update the core study and custody transfer module. You can also visit [www.GasFlows.com](http://www.GasFlows.com).

*Article* – “Market Watch Survey: Measurement in the Oil & Gas Industries” – September 2003, *Flow Control*

*Article* – “Gas Measurement Trends” – July 2004, *Flow Control*

*Article* – “The ‘Cleaner’ Fossil Fuel: Considering Natural Gas as Part of the Alternative Energy Future” – August 2009, *Flow Control*

*Article* – “Measuring Gas Flows: Flowmeter Suppliers Jockey for Position in Critical Applications” – June 2010, *Flow Control*

*Article* – “A Golden Age for Gas Flow Measurement” – May 2011, *Processing*

*Article* – “The Future of Oil & Gas: Understanding the Measurement of Two Key Energy Sources” – May 2011, *Flow Control*

*Article* – “Part I: The Pros and Cons of Gas Flowmeters: Considering Technology Advantages & Disadvantages for End-Users” – August 2011, *Flow Control*

*Article* – “Part II: The Pros & Cons of Gas Flowmeters: Traditional Technologies Still a Mainstay of Gas Flow Measurement” – September 2011, *Flow Control*

*Article* – “Innovations Dominate Flow Measurement Market” – November 2011, *Pipeline & Gas Journal*

*Article* – “Oil and Gas Measurement Still Dominate the Energy Markets” – July 2012, *Pipeline & Gas Journal*

*Article* – “Part I: The Role of Oil & Natural Gas: Flow measurement opportunities in the increasingly complicated global energy market” – January 2013, *Flow Control Magazine*

*Article* – “Part II: The Role of Oil & Natural Gas: Digging down on the pros and cons of each and every possible solution” – February 2013, *Flow Control Magazine*

*Article* – “Measuring Hydrocarbon Fluids Using Wet Gas, Watercut, and Multiphase Meters” – July 2015, *Pipeline & Gas Journal*

*Article – Gas Flow Measurement: The oil and gas industry's recent impact on flowmeter technology – August 2016, Flow Control*

## **Geographic Regions Articles**

*Article – “Observing the Middle East” – December 2009, FlowControlNetwork.com*

*Article – “Flow Business in the Middle East” – February 2011, Flow Control*

## **Liquid Analytical Study**

1. Liquid Analytical – Overview: A brochure covering details about our February 2011 study, *The World Market for Liquid Analytical Instruments*, on the worldwide market in liquid analytical instruments used in process control.

## **LNG Articles**

*Article – LNG: Key to supplying Asia-Pacific energy needs — Australia uses about half the natural gas it produces, and exports the rest in the form of LNG – January 2013, Processing*

*Article – LNG’s Role In the Natural Gas Marketplace – March 2015, Flow Control Magazine*

## **New-Technology Flowmeter Studies & Articles**

All New-Technology flowmeters are covered in **Volume X: The World Market for Flowmeters, 6<sup>th</sup> Edition** and **Volume X: Module A: Strategies, Industries, & Applications** — [www.FlowVolumeX.com](http://www.FlowVolumeX.com)

See also some of our in-depth market studies for individual flowmeter technologies in the sections below and at [www.flowresearch.com](http://www.flowresearch.com).

### **Coriolis Flow Study & Articles**

1. Coriolis 5<sup>th</sup> Edition – Overview: A brochure covering details about our January 2013 study, *The World Market for Coriolis Flowmeters, 4<sup>th</sup> Edition*, a new edition of our 2008 study, with all the same previous segmentation plus brand new segmentation for a comprehensive analysis of this important market.

*Article – “Measurement Nuts & Bolts: There Are Three Basic Types of Mass Flowmeters: Coriolis, Thermal, and Multi-variable. How Do They Work and When Should They Be Used?” – January 2003, Flow Control*

*Article – “Coriolis & Thermal: 2 Approaches to Mass Flow Measurement” – March 2005, Flow Control*

*Article – “The Changing Face of Coriolis: Technology Evolves to Meet More Measurement Needs” – July 2008, Flow Control*

*Article – “Addressing Cost and Line Size Limitations” – December 2009, Flow Control*

*Article – “When Performance Matters” – December 2010, Flow Control*

*Article – “The Coriolis Effect: Unquestionable Accuracy, but Are Coriolis Meters Aptly Named?” – November 2011, Flow Control*

*Article* – “Coriolis: The Trend toward Large-Line Coriolis Continues” – December 2011, *Flow Control*

*Article* – “The Good Gets Better: Coriolis Flowmeter Suppliers Continue to Innovate an Already Strong Technology” – March 2013, *Flow Control Magazine*

*Article* – Coriolis Flow Measurement – Past, Present & Future – May 2015, *Flow Control Magazine*

## Magnetic Flow Study & Articles

1. Magnetic 6<sup>th</sup> Edition – Proposal: A brochure covering details about our study, ***The World Market for Magnetic Flowmeters, 6<sup>th</sup> Edition***, underway for 2017. Flow Research has previously published this popular study in 2001, 2003, 2005, 2009, and 2015. The newest edition continues to build on earlier editions. Based on extensive supplier input, we have updated and expanded our segmentation even more! For more information, you can visit [www.flowmags.com](http://www.flowmags.com).

*Article* – “Magnetic Attraction: The Food & Beverage Industry’s Pull to Magmeters” – October 2003, *Flow Control*

*Article* – “Principle of Attraction: The Rise of Magnetic Flowmeter Technology” – January 2005, *Flow Control*

*Article* – “In Magmeters We Trust: Technology Improvements Drive Magnetic Flowmeter Uptake” – November 2005, *Flow Control*

*Article* – “Evolution of Magnetic Flowmeters: Technological Innovation Makes a Proven Meter Type More Useful” – November 2006, *Flow Control*

*Article* – “Magmeter Market Rising: Application Flexibility Drives Demand for Magnetic Flowmeters” – May 2009, *Flow Control*

*Article* – “A Versatile Solution for Most Liquid Flow Applications” – December 2009, *Flow Control*

*Article* – “A Solid Replacement for Mechanical Meter Types” – December 2010, *Flow Control*

*Article* – “Magnetic Flowmeters: A Trusted Solution for the Measurement of Most Liquids” – December 2011, *Flow Control*

*Article* – Magmeters Top the Market in Revenue – December 2014, *Flow Control Magazine*

*Article* – “The Moneymaker: Why are electromagnetic flowmeters so popular?” – February 2014, *Flow Control Magazine*

*Article* – Magnetic Meters Boast Liner Variety & Improved Technology – December 2015, *Flow Control Magazine*

## Ultrasonic Flow Studies & Articles

1. Ultrasonic 5<sup>th</sup> Ed + Mods A & B – Overview: A brochure covering details about ***The World Market for Ultrasonic Flowmeters, 5<sup>th</sup> Edition***, plus ***Modules A*** and ***B***, all coming in 2017. Starting with the 4<sup>th</sup> Edition, Flow Research divided the study of this fast growing market into three: a core study and two modules. The Core study covers the worldwide view. Module A covers Inline, and Module B covers Clamp-On and Insertion, so that these markets are each analyzed separately in more specific depth than ever. This has proved very popular.

- Article* – “Ultrasonic Flowmeters: A Market of Dichotomies” – August 2003, *Flow Control*
- Article* – “Ultrasonic Flowmeters: Many Paths to Successful Flow Measurement” – February 2005, *Flow Control*
- Article* – “Ultrasonic Flowmeters for Custody Transfer: Multipath Systems Offer Accuracy for Critical Measurement Applications” – January 2008, *Flow Control*
- Article* – “The Ultrasonic Boom: New Technology Development Brings Niche Solution to the Mainstream” – February 2008, *Flow Control*
- Article* – “Ultrasonic Flowmeters in the Energy Measurement Spotlight” – July 2009, *Pipeline & Gas Journal*
- Article* – “Technology Evolves to Meet Custody-Transfer Requirements” – December 2009, *Flow Control*
- Article* – “Calibration Issues Bedevil the Fast-growing Ultrasonic Flowmeter Market” – January 2010, *Processing*
- Article* – “An Evolving Technology Expands Its Application Reach” – December 2010, *Flow Control*
- Article* – “Ultrasonic Flowmeters: So Many Paths to Choose From” – December 2011, *Flow Control*
- Article* – “Understanding Ultrasonics: Custody transfer drives the market, but inline and clamp-ons gain popularity” – July 2012, *Flow Control*
- Article* – “The Path to Chordal Harmony: Differentiating a ‘chord’ & a ‘path’ in ultrasonic flow measurement” – September 2012, *Flow Control*
- Article* – “What Ever Happened to Doppler Flowmeters?” – October 2012, *Processing*
- Article* – “Ultrasonic Flowmeters Wow Them at CEESI Workshop” – October 2013, *Processing*
- Article* – Ultrasonic Meter Market Expands with Natural Gas Flow – December 2015, *Flow Control Magazine*

### Vortex Flow Study & Articles

1. Vortex 5<sup>th</sup> Ed. Study – Overview: A brochure covering details about our 2014 study, ***The World Market for Vortex Flowmeters, 5<sup>th</sup> Edition***, which takes a fresh look at what appears to be an expanding market. We have done user interviews that show the interest in vortex flowmeters remains at a very high level.
 

*Article* – “Market Watch: Exclusive Look at Vortex Flowmeter Market Penetration” – May 2003, *Flow Control*

*Article* – “Dramatic Changes Ahead for Vortex Flowmeter Market” – May 2006, *Processing*

*Article* – “Vortex Flowmeters Gaining Traction (Finally): Technology Enhancements, Standardization Efforts Are Reason for Optimism” – August 2006, *Flow Control*

*Article* – “What’s So Great About Vortex Flowmeters?: Proven Technology Struggles to Differentiate in a Competitive Market” – June 2009, *Flow Control*

*Article* – “A Hot Technology for Steam & Gas Flows: Industry Approvals & Innovation Drive Demand for Vortex Flowmeters” – March 2010, *Flow Control*

*Article* – “Versatile Flowmeter to See Growth Due to Industry Approvals” – December 2010, *Flow Control*

*Article* – “A Growing Market in Need of More Research & Development” – December 2011, *Flow Control*

*Article* – “In the Eye of the Vortex: The history and evolution of vortex flow measurement” – May 2014, *Flow Control Magazine*

*Article* – “A Multi-Faceted Flow Measurement Device – Considering the application versatility of vortex flowmeters” – November 2014, *Flowcontrolnetwork.com*

*Article* – “Vortex Flowmeters Prove Their Worth in Steam Flow Measurement” – December 2014, *Flow Control Magazine*

*Article* – Multivariable & Dual-Sensor Technologies Offered in Vortex Meters – December 2015, *Flow Control Magazine*

### Thermal Flow Study & Articles

1. Thermal – Overview: A brochure covering details about our October 2009 study, ***The World Market for Thermal Flowmeters***, in which we find that this relatively younger technology appears to have great potential for future growth, partly due to growth in the need for environmental monitoring, such as rising requirements to measure greenhouse gas emissions.

*Article* – “Measurement Nuts & Bolts: There Are Three Basic Types of Flowmeters: Coriolis, Thermal, and Multivariable. How Do They Work and When Should They Be Used?” – January 2003, *Flow Control*

*Article* – “Thermal Flow Innovators: How the Technology Came to Be” – March 2004, *Flow Control*

*Article* – “Coriolis & Thermal: 2 Approaches to Mass Flow Measurement” – March 2005, *Flow Control*

*Article* – “A Prime Market for Boom: Thermal Flowmeters Positioned to Gain from Environment Push” – March 2009, *Flow Control*

*Article* – “Emissions Control Efforts Figure to Drive Demand” – December 2009, *Flow Control*

*Article* – “Emissions-Monitoring Market to Drive Demand” – December 2010, *Flow Control*

*Article* – “Thermal Flowmeters: An Ideal Solution for Emissions & Certain Gas Flow Applications” – December 2011, *Flow Control*

*Article* – “The History & Evolution of Thermal Flowmeters: Innovation abounds as technology suppliers jockey for competitive advantage” – August 2013, *Flow Control Magazine*

*Article* – “Emissions Monitoring Applications Propel Thermal Flowmeter Market” – December 2014, *Flow Control Magazine*

*Article* – New Thermal Meters Developed for Environmental Markets – December 2015, *Flow Control Magazine*



## Mass Flow Controller Study & Articles

1. MFC 2<sup>nd</sup> Edition – Overview: A brochure covering details about our May 2012 study, *The World Market for Mass Flow Controllers, 2<sup>nd</sup> Edition*. Several suppliers asked us to do this 2<sup>nd</sup> edition because the market had been changing substantially since our first edition study was published in 2008. This study has a great deal of new segmentation, and also has special emphasis on the industrial segments that provide applications for mass flow controllers. Some of these segments are growing rapidly and hold the promise of longterm applications for MFCs.
  2. MFC 2015 Market Update – Overview: A brochure covering details about our July 2015 market update, *The World Market Update for Mass Flow Controllers*. Several suppliers asked us to do this Market Update to our full study 2<sup>nd</sup> edition. This Update covers key segmentation of the world market for mass flow controllers for 2014, forecast to 2019.
- Article* – “Mass Appeal: Market Outlook for Mass Flow Controllers” – August 2008, *FlowControlNetwork.com*
- Article* – “The History & Evolution of Mass Flow Controllers: Considering the development of a popular solution for OEMs & system integrators” – November 2013, *Flow Control Magazine*
- Article* – Mass Flow Controllers Can Replace Manual Systems – December 2015, *Flow Control Magazine*

## Multiphase and Watercut Flow Study & Articles

1. Multiphase & Watercut Meters – Overview: This brochure describes the **Core Study: The World Market for Multiphase Flowmeters, 2nd Edition** and **Module A: The World Market for Watercut Meters**. The multiphase flowmeter market was previously covered as adapted modules of our Gas study series and Oil study series. It has been popular enough that it is now being done as a stand-alone, with a companion module to cover the market for watercut meters.
- Article* – “Multiphase Flow Measurement a Main Focus of Norway’s North Sea Flow Workshop” – January 2012, *Processing*
- Article* – “Multiphase Flowmeters: A Chorus of Instruments” – April 2012, *Processing*
- Article* – “The Many Phases of Multiphase Flow Meters” – July 2013, *Pipeline & Gas Journal*
- Article* – “Measuring Hydrocarbon Fluids Using Wet Gas, Watercut, and Multiphase Meters” – July 2015, *Pipeline & Gas Journal*
- Article* – Multiphase Meter Development Prominent Around the North Sea – December 2015, *Flow Control Magazine*

## Cross-Technology Articles

- Article* – “Measurement Nuts & Bolts: There Are Three Basic Types of Mass Flowmeters: Coriolis, Thermal, and Multi-variable. How Do They Work and When Should They Be Used?” – January 2003, *Flow Control*
- Article* – “Market Outlook for Flowmeters by Technology” – December 2008, *Flow Control*
- Article* – “The Heavyweights of Flow Measurement: Coriolis, magnetic and ultrasonic square off for flow measurement supremacy” – July 2009, *Processing*

- Article* – “Trends in New-Technology Flowmeters: Features & Reliability Drive Demand for Flow Measurement Systems” – October 2010, *Flow Control*
- Article* – “Innovations Dominate Flow Measurement Market” – November 2011, *Pipeline & Gas Journal*
- Article* – “The Exclusive Large Line Size Meter Club” – November 2011, *Processing*
- Article* – “Viewpoint: Flowmeter Applications to Watch in 2012” – December 2011, *Flow Control*
- Article* – “Ultrasonic and Coriolis Flowmeters a Big Hit at Norway’s North Sea Flow Workshop” – February 2012, *Global Processing*
- Article* – “Flow Measurement Trendlines: A Look at Traditional and New-technology Flowmeters” – May 2012, *Flow Control*
- Article* – “Recent Flowmeter Advances Reflect Energy Market Priorities: Bigger Coriolis meters, diagnostic-minded ultrasonics and more reliable thermal flowmeters among advances” – July 2012, *Processing (Flowmeter Solutions)*
- Article* – “Leading the Way: Strong R&D drives Coriolis & ultrasonic flowmeters to new heights” – August 2012, *Flow Control*
- Article* – “A Decade Dominated by the Rise of New-technology Flowmeters” – April 2013, *Processing Magazine*
- Article* – “Part I: Flow Trend Watch: A look at recent developments in new-technology flowmeters” – May 2013, *Flow Control Magazine*
- Article* – “Coriolis vs. Ultrasonic Flowmeters: Comparing and contrasting two popular solutions for flow measurement” – March 2014, *Flow Control Magazine*
- Article* – “Introducing the ‘Multi-Tech’ Flowmeter: When technologies unite in the name of flow measurement” – June 2014, *Flow Control Magazine*
- Article* – “Coriolis and ultrasonic flowmeters: competitive or complementary?” – September/October 2014, *Fluid Handling*

## **Oil Flow Studies & Articles**

### ***The World Market for Oil and Oil Flow Measurement* — [www.OilFlows.com](http://www.OilFlows.com)**

1. Oil Core + A–E Modules – Overview: A brochure covering details about our 2012/2013 oil flow study series, ***The World Market for Oil and Oil Flow Measurement***, which includes a core study and five modules, presenting a comprehensive world view of oil and oil flow measurement.
 

*Article* – “Flow Update: Flow Business in the Middle East” – February 2011, *Flow Control*

*Article* – “The Future of Oil and Gas” – May 2011, *Flow Control*

*Article* – “Innovations Dominate: Flow Measurement Market” – November 2011, *Pipeline & Gas Journal*

*Article* – “Oil and Gas Measurement Still Dominate the Energy Markets” – July 2012, *Pipeline & Gas Journal*

*Article* – “Part I: The Role of Oil & Natural Gas: Flow measurement opportunities in the increasingly complicated global energy market” – January 2013, *Flow Control Magazine*

*Article* – “Part II: The Role of Oil & Natural Gas: Digging down on the pros and cons of each and every possible solution” – February 2013, *Flow Control Magazine*

*Article* – Flowmeter Outlook: Is the United States Really Set to Surpass Saudi Arabia As Leading Supplier of ‘Oil’? – December 2013, *Flow Control Magazine*

*Article* – “Oil Prices Rise as World Walks Supply-Demand Tightrope” – August 2014, *Pipeline & Gas Journal*

*Article* – Oil Flow Outlook: How Hydraulic Fracturing Is Influencing the Price of Oil – December 2014, *Flow Control Magazine*

*Article* – “Measuring Hydrocarbon Fluids Using Wet Gas, Watercut, and Multiphase Meters” – July 2015, *Pipeline & Gas Journal*

*Article* – “What Lies Ahead for Oil Prices” – July 2016, *Pipeline & Gas Journal*

*Article* – “Understanding OPEC, OECD Influence on Crude Oil Markets” – August 2016, *Pipeline & Gas Journal*

*Article* – “2017: The Year of Oil” – November/December 2016, *Fluid Handling International*

*Article* – The flowmeter market in 2016: In Recovery Mode: Exploring oil price volatility and other contributing factors – December 2016, *Flow Control*

## Pressure Transmitter Study & Articles

1. Pressure 4<sup>th</sup> Edition – Overview: A brochure covering details about our 2014 study, ***The World Market for Pressure Transmitters, 4<sup>th</sup> Edition***, which takes a fresh look at the changing factors contributing to this substantial market and why it will continue to hold its own within the instrumentation world.

*Article* – “Pressure Transmitter Market Trends: From Globalization to New Technology” – August 2004, *Flow Control*

*Article* – “The Difference with Differential Pressure: Understanding the True Value of DP Flowmeters” – November/December 2004, *Flow Control*

*Article* – “Future Looks Bright for Pressure Transmitters: Technology Development & Large Installed Base to Drive Uptake” – March 2008, *Flow Control*

*Article* – “From Gauges to Transmitters: A Primer on Pressure Measurement Technology” – March 2011, *Flow Control*

*Article* – “Pressure Transmitter Perspectives: Technology trends, application scenarios & market insights” – August 2014, *Flow Control Magazine*

## Steam Flow Study & Articles

1. Steam Study – Overview: A brochure covering details about our 2008 study, ***The World Market for Steam Flow Measurement***. It examines the steam measurement market, the types of meters used, and factors affecting the market. Steam flow measurement plays an increasingly important role in such areas as energy production, well injection, heating process fluids, and for boiler outlet measurements.

2. Steam Study – Letter: “The World Market for Steam Flow Measurement” – July 2008. Press release discussing the study.

*Article* – “Steamed Up” – May 2005, *Flow Control*

*Article* – “7 Technologies for Steam Flow: Pros & Cons of Leading Measurement Methods” – May 2008, *Flow Control*

## Temperature Sensors Articles

1. Temp. Sensors Americas-Proposal – This brochure covers details about our study, *The Market for Temperature Sensors in the Americas, 3<sup>rd</sup> Edition*, coming in 2017. In response to popular demand, Flow Research is updating our market research study on temperature sensors in the Americas, previously published in 2000 and 2006.  
*Article* – “From the Glass Thermometer to Fiber Optics: An Overview of Leading Sensor Technologies & Applications” – February 2007, *Flow Control*

## Traditional Technology Flowmeter Studies & Articles

All Traditional Technology flowmeters are covered in *Volume X: The World Market for Flowmeters, 6<sup>th</sup> Edition* and *Volume X: Module A: Strategies, Industries, & Applications* — [www.FlowVolumeX.com](http://www.FlowVolumeX.com)

See also some of our in-depth market studies for individual flowmeter technologies in the sections below and at [www.flowresearch.com](http://www.flowresearch.com).

### DP Flow and Primary Elements Articles

- Article* – “Pressure Transmitter Market Trends: From Globalization to New Technology” – August 2004, *Flow Control*
- Article* – “The Difference with Differential Pressure: Understanding the True Value of DP Flowmeters” – November/December 2004, *Flow Control*
- Article* – “The Key to Unlocking the DP Flowmeter Market” – September 2006, *Processing*
- Article* – “A Primer on Primary Elements: Understanding a Key Aspect of DP Flow Measurement” – May 2007, *Flow Control*
- Article* – “DP Flowmeters Ride the Wave of Growth in the Oil & Gas Industry” – May 2007, *Processing*
- Article* – “Not So Element-ary: New Primary Elements Expand the Reach of DP Flow Measurement” – September 2009, *Flow Control*
- Article* – DP Flowmeters: “An Old Technology Gets Some New Looks” – December 2009, *Flow Control*
- Article* – DP Flowmeters: “A Traditional Technology Incorporates Advanced Features” – December 2010, *Flow Control*
- Article* – “DP Flowmeters: Seizing Opportunity from a Rise in Oil & Gas Exploration” – December 2011, *Flow Control*

### Positive Displacement Flow Study & Articles

1. Positive Displacement 2<sup>nd</sup> Ed. – Overview: A brochure covering details about our March 2012 study, *The World Market for Positive Displacement Flowmeters, 2<sup>nd</sup> Edition*. Positive displacement flowmeters are undergoing competitive pressure from more recently invented flowmeter technologies, yet remain a solid choice within several basic applications in today’s modern process control environment, and remain one of the most widely used types of flowmeters for measuring the flow of water and other liquids.

*Article* – “Old Faithful: Traditional PD Meters Offer Reliable Gas Flow Measurement” – July 2005, *Flow Control*

*Article* – “Something to Be Said for Tradition: Legacy Flow Measurement Systems Live On” – November 2008, *Flow Control*

*Article* – Positive Displacement Overview: “Large Installed Base & Competitive Advantage for Certain Applications” – December 2010, *Flow Control*

*Article* – PD Flowmeters: “A Traditional Technology Learns Some New Tricks” – December 2011, *Flow Control*

### Turbine Flow Study & Articles

1. Turbine 2<sup>nd</sup> Ed. Study – Overview: A brochure covering details about our January 2012 study, *The World Market for Turbine Flowmeters, 2<sup>nd</sup> Edition*. The turbine flowmeter market has been essentially flat for the past 10 years, but not declining, as some experts predicted. Turbine flowmeters retain a price advantage over new-technology competitors, suppliers have made technology improvements to make turbine meters more reliable and effective, and the installed base remains large enough to encourage development in the market.

*Article* – “Something to Be Said for Tradition: Legacy Flow Measurement Systems Live On” – November 2008, *Flow Control*

*Article* – “An Industry Standard Faces New Competition” – December 2009, *Flow Control*

*Article* – “A Strong Position in Gas Flow Applications” – December 2010, *Flow Control*

*Article* – “Ge F. Fischer Tells It His Way: Reflections from a Pioneer of Flow Measurement” – June 2011, *Flow Control*

*Article* – Turbine Flowmeters: “A Traditional Technology Learns Some New Tricks” – December 2011, *Flow Control*

*Article* – “Flowmeter Spin: History & evolution of turbine flow measurement” – February 2012, *Flow Control*

*Article* – Turbine Flowmeters Remain Competitive in Turbulent Market – December 2014, *Flow Control Magazine*

*Article* – Turbine Meters Become More Efficient & Reliable – December 2015, *Flow Control Magazine*

*Article* – PD Flowmeters Poised to Gain from Oil & Gas Application Opportunities – December 2014, *Flow Control Magazine*

*Article* – Positive Displacement Meters Hold Their Place in Utility Market – December 2015, *Flow Control Magazine*

### Variable Area Flow Articles

*Article* – “Something to Be Said for Tradition: Legacy Flow Measurement Systems Live On” – November 2008, *Flow Control*

*Article* – Variable-Area Flowmeters: “A Low-Cost Solution for Simple Applications” – December 2010, *Flow Control*

*Article* – “Considering Variable-Area Flowmeters: A Device with a Fascinating Past & Potentially a Bright Future” – January 2012, *Flow Control*

## Cross-Technology Articles

- Article* – “A New Perspective on Traditional Technology Flowmeters” – November/December 2002, *Flow Control*
- Article* – Flow Update: Something to Be Said for Tradition: Legacy Flow Measurement Systems Live On – November 2008, *Flow Control*
- Article* – “Flowmeter Market Watch: Mergers & Acquisitions in the Turbine & Positive-Displacement Segments” – August 2010, *Flow Control*
- Article* – “Something to be Said for Tradition: Old Standards of Flow Measurement Serve Many Applications” – November 2010, *Flow Control*
- Article* – “The Exclusive Large Line Size Meter Club” – November 2011, *Processing*
- Article* – “Viewpoint: Flowmeter Applications to Watch in 2012” – December 2011, *Flow Control*
- Article* – “Flow Measurement Trendlines: A Look at Traditional and New-technology Flowmeters” – May 2012, *Flow Control*
- Article* – “Part II: Trend Watch: A Look at Recent Developments in Traditional-technology Flowmeters” – June 2013, *Flow Control Magazine*
- Article* – Introducing the ‘Multi-Tech’ Flowmeter: When technologies unite in the name of flow measurement – June 2014, *Flow Control Magazine*

## User & Industry Surveys

1. User Survey TOC: The Table of Contents shows what’s covered in our January 2006 ***Worldwide Survey of Flowmeter Users, 2<sup>nd</sup> Edition***. This survey gives you insights from the perspectives of flowmeter users — looking at who buys them, why, for what uses where.
  - Article* – Price Effects on Petroleum Industry: “The Varied Effects of Oil Prices on the Petroleum Industry” – February 2003, *Flow Control*
  - Article* – Spending and the Economy: “How is the Economy Affecting Instrumentation Spending? Interviews from various process industries reveal a mixed bag of approaches in dealing with a limping economy.” – March 2003, *Flow Control*
  - Article* – Water Industry Trends: “Flowmeter Measurement Trends in the Water Industry” – June 2003, *Flow Control*
  - Article* – Oil & Gas Measurement: “Market Watch Survey: Measurement in the Oil & Gas Industries Reveals Consistency in Flowmeter Selection” – September 2003, *Flow Control*
  - Article* – Utility Flowmeter Selection: “Water Works: Flowmeter Selection for Utility Applications” – June 2004, *Flow Control*
  - Article* – Technology & Market Review: “The Difference with Differential Pressure: Understanding the True Value of DP Flowmeters” – November 2004, *Flow Control*
  - Article* – Who Benefits from Oil Demand: “Exploring the Possibilities: Instrumentation to Benefit from High Oil Demand” – August 2005, *Flow Control*
  - Article* – User Survey Results: “2006 Flowmeter User Study Results: DP Remains Dominant, but New Technologies Are Catching On” – September 2006, *Flow Control*

## Volume X on All Flowmeters Studies & Articles

**Volume X: The World Market for Flowmeters, 6<sup>th</sup> Edition** and

**Volume X: Module A: Strategies, Industries, & Applications** — [www.FlowVolumeX.com](http://www.FlowVolumeX.com)

1. Volume X 6<sup>th</sup> Ed. + Module A – Overview: A brochure covering details about the latest editions of our companion studies, **Volume X: The World Market for Flowmeters, 6<sup>th</sup> Edition**, and **Volume X: Module A: Strategies, Industries, & Applications**. Since we published our first edition of Volume X in 2003, it has become immensely popular. The introduction of *Module A* was met with similar interest. This ‘all-in-one’ study provides one of the most comprehensive views ever published of the market for all flowmeters and for each flowmeter type, worldwide and by region, including insights into developments and market influences. This makes it easy to compare market size, market shares, and growth rates for all types of flowmeters.

*Article* – “Measuring a 1% Gain in a \$4.5 Billion Market: Newer Technologies Continue upward Trend in Flowmeter Space” – June 2008, *Flow Control*

*Article* – “Market Outlook by Flowmeter Technology” – December 2008, *Flow Control*

*Article* – “Pioneers of Flow Measurement: Founding the Technologies of Today” – January 2009, *Flow Control*

*Article* – “A Difficult Year: Flowmeter Markets Emerge from the Recession of 2009” – May 2010, *Flow Control*

*Article* – 2017: The Year of Oil: How the oil price crash affected the global flowmeter market – November/December 2016, *Fluid Handling International*

*Article* – The flowmeter market in 2016: In Recovery Mode: Exploring oil price volatility and other contributing factors – December 2016, *Flow Control*

## Worldflow Handbook

Worldflow Handbook Overview: A brochure covering details about our worldwide guide to flowmeter selection and suppliers.

## Worldflow Monitoring Service: Energy Monitor

1. Flow Research Brochure – Worldflow: A brochure covering details about our Worldflow Monitoring Service, which includes the periodical *Energy Monitor*.
2. Energy Monitor – Q4 2013 excerpt (20 pages)
3. Energy Monitor – Q1 2014 excerpt (22 pages)

## Worldflow Monitoring Service: Market Barometer

1. Flow Research Brochure – Worldflow: A brochure covering details about our Worldflow Monitoring Service, which includes the periodical *Market Barometer*.
5. Market Barometer – Q4 2013 excerpt (18 pages)
6. Market Barometer – Q1 2014 excerpt (26 pages)

## **Shades of Experience**

A PhD philosopher, Jesse Yoder believes he's fortunate to have had the opportunity to put his philosophies to the test in his work as a flow market analyst. He feels that although it may not be immediately obvious, philosophy and flow technology have much in common.

The philosophy of **viewpoint pluralism**, described in Chapter One, is the philosophy that underlies the market research done at Flow Research. In this volume – excerpted from a larger book by the same name – Jesse shares his reflections and perspectives on a variety of topics. We hope you find them thought-provoking and entertaining.

0. Table of Contents
1. Viewpoint Pluralism: philosophy about points of view. The more perspectives or points of view we have of something, the better our knowledge and understanding.
2. Experience Rich: “From Conceptpoor to Experience-Rich” – how our language can be broadened to enable us to more adequately describe our experiences.
3. Duonyms: “A Dictionary of English Duonyms” – single words formed by putting two existing words together.
4. Feel Like 20: “Feel Like You’re Twenty Again” – how to reduce fragmentation and achieve personal integration by connecting the dots of your past experiences with your life today
5. Self-Expression: “The Meaning of Life is Self-Expression” – how to achieve a meaningful life by being yourself
6. Poems: “These are the things I remember” and “Shrinkwrap this Day”
7. Flowtime – A Form of Decimal Time – describes a system of time in which minutes have 100 seconds and hours have 100 minutes

Appendix A: “Circular Geometry”

Appendix B: “A Synthetic Proof that God Exists”

Appendix C: “Acknowledgments”

## **Music: Songs, Lyrics and Artists’ Backgrounds**

Artists’ backgrounds

Song Lyrics – “Go with the Flow” by Stretch Harpo and the Blues Axes

Song Lyrics – “King of Flow” by Michael Kirsch

### **Songs**

We think these songs epitomize the fun feeling of flow. Feel free to sing along!

“Go with the Flow” by Stretch Harpo and the Blues Axes

“King of Flow” by Michael Kirsch



## **Flow Research Websites**

Visit our knowledge websites for more information about specific topics.

Here are just a few of the many websites we maintain.

For a complete list, go to [www.FlowResearch.com](http://www.FlowResearch.com)!

<b>New-Technology Flow</b>	<b>Traditional Tech</b>	<b>Fluid Flows</b>	<b>Flow Research</b>	<b>Philosophy</b>
<a href="#">flowcoriolis</a>	<a href="#">flowdp</a>	<a href="#">gasflows</a>	<a href="#">legendsofflow</a>	<a href="#">flowbluejeans</a>
<a href="#">flowmags</a>	<a href="#">flowpd</a>	<a href="#">liquidflows</a>	<a href="#">flowhandbook</a>	<a href="#">jesseyoder</a>
<a href="#">flowultrasonic</a>	<a href="#">flowturbine</a>	<a href="#">massflows</a>	<a href="#">flowanalytical</a>	<a href="#">duonyms</a>
<a href="#">flowvortex</a>	<a href="#">flowopenchannel</a>	<a href="#">oilflows</a>	<a href="#">flowtimes</a>	<a href="#">shades</a>
<a href="#">flowthermal</a>	<a href="#">flowva</a>	<a href="#">pumpflows</a>	<a href="#">tempflows</a>	<a href="#">taoofflow</a>
<a href="#">flowsonar</a>	<a href="#">flowplate</a>	<a href="#">steamflows</a>	<a href="#">worldflow</a>	<a href="#">flowmath</a>
<a href="#">flowoptical</a>	<a href="#">flowvolumex</a>	<a href="#">valveflows</a>	<a href="#">custodytransfer</a>	<a href="#">flowcalendar</a>
<a href="#">flowmfc</a>	<a href="#">worldpressure</a>	<a href="#">flowreport</a>	<a href="#">newtechflow</a>	<a href="#">flowcd</a>