The World Market for Primary Elements, 2nd Edition

Overview

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The World Market for Primary Elements, 2nd Edition

Flow Research is announcing a new market study called ***The World Market for Primary Elements, 2nd Edition***. The study determines the size of the worldwide market in 2018, and the market shares of all major suppliers. Market forecasts through 2023 are included.

This study focuses on several important objectives:

- To provide the 2018 market size in US dollars and unit volume for primary elements worldwide
- To provide 2018 market shares of the leading suppliers of primary elements worldwide
- To provide a forecast of the growth market for primary elements in dollars and unit volumes through 2023
- To provide segmented data both worldwide and for each of eight geographic regions
- To provide a product analysis for the significant suppliers of primary elements
- To identify the industries and applications where primary elements are used, and to identify market growth sectors
- To provide market and product strategies for suppliers of primary elements worldwide
- To provide company profiles for the significant suppliers of primary elements worldwide

Rationale for Study

Flow Research published the 1st edition of our worldwide primary elements study in 2007. We have continued to follow the primary elements market regularly through successive editions of **Volume X: The World Market for Flowmeters** and providing quarterly updates in our **Market Barometer** (www.worldflow.com). We received requests for a more detailed look at the primary elements market. Since our last primary elements study, much has happened in economies and industries, especially those affected by fluctuations in oil prices. Since oil prices began to restabilize, there has been a renewed expansion in oil & gas exploration and production activity and we see a more positive outlook for primary elements and related instrumentation. As a result, this is an optimal time to accurately quantify the size and growth of this technology, and to provide a comprehensive view of its market.

Background of Study

Primary elements have been used for flow measurement since the 18th and 19th centuries. One of the most common types of primary elements is the orifice plate. In 1896, Max Gehre, a German engineer, received a patent on an orifice meter. The first commercial orifice plate meter appeared in 1909 and was used to measure steam flow. Shortly thereafter, the oil and gas industry began using orifice plate meters because of their ease of standardization and low maintenance. The first patent for the use of a Pitot tube to measure velocity in pipes was given

to Henry Fladd of St. Louis, Missouri, in 1889. The Venturi tube was invented by an Italian physicist named Giovanni Battista Venturi in 1797. In 1887, Clemens Herschel used Venturi's work to develop the first commercial flowmeter based on it. His version of the Venturi flowmeter became known as the Herschel Standard Venturi. Herschel published his paper called "The Venturi Water Meter" in 1898. In 1970, a company called BIF introduced the Universal Venturi Tube™.

More than 125 suppliers worldwide now offer primary elements for use in flow measurement.

Key Issues Addressed in This Study

- The growth outlook for primary elements worldwide and by region
- The chief types of primary elements manufactured
- New product developments
- The integration of different types of primary elements into a single unit
- The encroachment of new-technology flowmeters into the primary elements market
- The large number of primary elements suppliers in the market
- Mergers and acquisitions of primary elements suppliers

Primary elements included in this study

- Orifice Measuring Points
- Pitot Tubes (single and multiport)
- Venturi Tubes
- Cone Elements
- Flow Nozzles
- Wedge Elements
- Other (e.g., Dall Tubes, Laminar Flow)

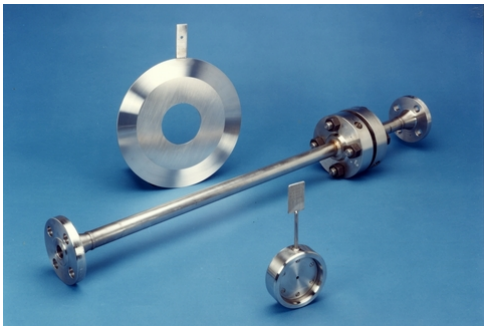
Descriptions of the main primary elements included in this study:

Orifice Measuring Points

Orifice plates are the most common type of primary element. An orifice plate is a flat, usually round piece of metal, often steel, with an opening or "orifice" in it. The orifice plate needs to be positioned at a correct position in the flowstream for it to function as a primary element for the purpose of making a differential pressure flow measurement. For it to be so positioned, it must be held in place. This is typically done by an orifice assembly, an orifice flange, or a holding element.

This study defines an orifice measuring point as having the following three components:

- An orifice plate
- An orifice assembly, flange, or holding element
- A valve manifold



Pitot Tubes

Photo courtesy of Veris

Pitot tubes are of two types: Single port and Multiport averaging.

A **single port Pitot tube** includes an L-shaped tube inserted into the flowstream, with the opening facing directly into the flow measuring impact pressure. Another tube has an opening parallel to the direction of flow measuring static pressure. Flowrate is proportional to the difference between impact pressure and static pressure.

A **multiport averaging Pitot tube** has multiple ports to measure impact pressure and static pressure at different points. The DP transmitter computes flowrate by taking the average of the differences in pressure readings at different points.

Venturi Tube

A **Venturi tube** is a flow tube that has a tapered inlet and a diverging exit. A differential pressure transmitter measures pressure drop and uses this value to calculate flowrate.

Photo courtesy of ABB

Cone Elements

These consist of a specially tapered element positioned within the flowstream through the pipe. The cone element creates a difference in speed and pressure as the flow is forced around it, then allowed to resume unobstructed flow beyond the cone. DP transmitters get measurements via a port in the pipe upstream from the cone (the high side) and also downstream (the low side) via another port either in the pipe wall or in the blunt end of the cone.

Flow Nozzles

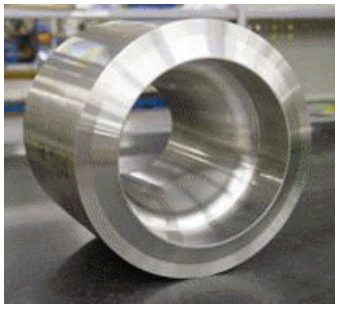


Photo courtesy of ABB

A flow nozzle is a flow tube with a smooth entry and a sharp exit. Flow nozzles are mainly used for high-velocity, erosive, non-viscous flows. Flow nozzles are sometimes used as an alternative to orifice plates when erosion or cavitation would damage an orifice plate. They offer excellent long-term accuracy.

Wedge Elements

A wedge element is a flow tube that has a "V-"shaped flow restriction – the "wedge" – protruding into the flowstream from at least one side of the pipe. They are robust, easy to install and use and there are variations designed to handle air and gases, steam, and all sorts of liquids – clean, dirty, high-solids, slurries, viscous, corrosive or erosive.

Other Primary Elements

Other types of primary elements include combinations, Dall tubes, laminar flow elements, and low loss elements.

Study Segmentation

Geographic Regions

- North America
- Western Europe
- Eastern Europe/FSU
- Mideast/Africa
- Japan
- China
- Asia/Pacific (except for Japan and China)
- Latin America (including Caribbean and Mexico)

Primary elements

- Orifice Measuring Points
- Pitot Tubes (single and multiport)
- Venturi Tubes
- Cone Elements
- Flow Nozzles
- Wedge Elements
- Other (e.g., Dall Tubes, Laminar Flow)

Fluid Types

- Petroleum Liquids
- Non-petroleum Liquids
- Gas
- Steam
- Air

Industries

- Oil & Gas
- Oil Refining
- Gas Processing
- Petrochemicals
- Chemicals
- Food & Beverage
- Pharmaceutical/Life Sciences
- Pulp & Paper
- Metals & Mining
- Electric Power
- Water/Wastewater
- District Energy
- Other

Applications

- Custody Transfer: Oil/Petroleum Liquids
- Custody Transfer: Gas
- Non-custody Transfer of Gas
- Non-custody Transfer of Liquid
- Wet Gas Metering
- Allocation Metering: Oil/Petroleum Liquids
- Allocation Metering: Gas
- Steam
- LNG
- CNG
- Gas Gathering Stations
- Wellhead Monitoring
- In-plant Measurement
- HVAC
- Other

Distribution Channels

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

Customer Types

- End-users
- OEMs
- Systems Integrators
- Engineers / Consultants

The study provides the following information about the primary elements market.

- Shipments of primary elements in revenues and units worldwide and by region in 2018, with forecasts through 2023
- Shipments of primary elements by type worldwide and by region in 2018
- Average selling prices of primary elements by type worldwide and by region
- Shipments of orifice measuring points worldwide and by region
- Shipments of Pitot tubes worldwide and by region
- Shipments of Venturi tubes worldwide and by region
- Shipments of cones worldwide and by region
- Shipments of flow nozzles worldwide and by region
- Shipments of wedge elements worldwide and by region
- Shipments of other primary elements worldwide and by region

Other vital information in this study

- Growth rates worldwide and by region
- Discussion of market forces at work
- Market shares for the leading suppliers of primary elements
- Detailed product descriptions by supplier
- Company profiles
- Strategies for success

Company Profiles

We provide company profiles of the major primary elements suppliers.
The following is a partial list of the companies that are included:

- ABB Ltd.
- Armstrong / Veris
- BIF
- Canalta Controls Ltd.
- Emerson Automation Solutions:
  - Daniel Division
  - Rosemount Division
- McCrometer
- Primary Flow Signal
- SAMIL Industry
- Solartron ISA
- TMCo, The Measurement Company
- WIKA – Euromisure

And more

Flow Research Team

Dr. Jesse Yoder

Dr. Jesse Yoder is President of Flow Research Inc., a company he founded in 1998. Dr. Yoder has 28 years of experience as a writer and an analyst in process control and instrumentation. Since 1990, he has written more than 180 market research studies, most of them regarding flow and instrumentation. Dr. Yoder has also written more than 250 articles on flow and instrumentation for trade journals. Links to many of these articles can be found at www.flowarticles.com. He has also written two books, and holds a patent for a flowmeter.

Belinda Burum, Vice President, worked in journalism and advertising, then in 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. Belinda is currently working on press releases, Worldflow publications, and social media.

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

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

Leslie Buchanan, Publication Production Associate, and Research Assistant, joined Flow Research in March 2010, with skills from a variety of work and life experiences. Early on, she worked on the database, customer contact, and publication formats. She became increasingly involved in many capacities with Flow Research studies, Worldflow and other publications. Leslie does the production of our reports, and has the final say on formatting and graphics issues.

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

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.

Recent and Currently Scheduled Flow Research Studies *Websites*

These studies and others can also be found at www.flowstudies.com

New-Technology Flowmeter Studies

The World Market for Coriolis Flowmeters, 6th Edition	www.flowcoriolis.com
The World Market for Magnetic Flowmeters, 7th Edition	www.flowmags.com
The World Market for Ultrasonic Flowmeters, 6th Edition	www.flowultrasonic.com
The World Market for Vortex Flowmeters, 6th Edition	www.flowvortex.com
The World Market for Thermal Flowmeters, 2nd Edition	www.flowthermal.com
The World Market for Multiphase Flowmeters, 2nd Edition	www.flowmultiphase.com
Multiphase: Module A: The World Market for Watercut Meters	www.watercutmeters.com

Traditional Technology Flowmeter Studies

The World Market for Pressure Transmitters, 5th Edition	www.pressureresearch.com
The World Market for Pressure Transducers	www.worldpressure.com
The World Market for Primary Elements, 2nd Edition	www.flowplate.com
The World Market for Positive Displacement Flowmeters, 2nd Edition	www.flowpd.com
The World Market for Turbine Flowmeters, 2nd Edition	www.flowturbine.comm

Mass Flow Controller Studies

The World Market for Mass Flow Controllers, 3rd Edition	www.flowmfc.com

Cross-Technology Flowmeter Studies

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Volume X: Module A: Strategies, Industries, and Applications	www.flowvolumex.com
The World Market for Natural Gas and Gas Flow Measurement, 3rd Edition	www.gasflows.com
The World Market for Oil and Oil Flow Measurement	www.oilflows.com

Flow Calibration Studies

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

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Level Measurement Devices Studies

The World Market for Level Measurement Devices	www.levelresearch.com

Oil and Gas

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The World Market for Oil Flow Measurement, 3rd Edition	www.oilflows.com

Besides writing and publishing studies of this type, Flow Research specializes in user surveys that include a detailed analysis of customer perceptions. In addition, Flow Research provides quarterly updates on the flow and energy industries in the **Market Barometer** and the **Energy Monitor**. The **Energy Monitor** analyzes the current state of the oil & gas, refining, power, and renewables industries, and the implications for instrumentation suppliers. Both publications are part of the Worldflow Monitoring Service. More details are available at www.worldflow.com.

For more information on Flow Research, please visit our website at www.flowresearch.com.

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For additional details, or to learn how the Founding Sponsor Program might benefit you, please contact Norm Weeks at [1] 781-245-3200, or at norm@flowresearch.com.

We look forward to working with you!

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Updated to 2018!

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