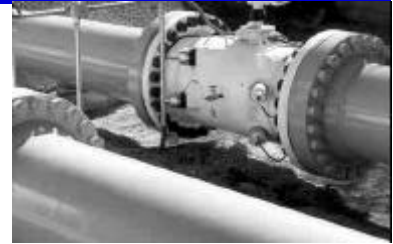


We have the data the world is standardizing on

new-technology flowmeter studies



michael faraday

- Volume I:* The World Market for Coriolis Flowmeters
- Volume II:* The World Market for Magnetic Flowmeters
- Volume III:* The World Market for Ultrasonic Flowmeters
- Volume IV:* The World Market for Vortex Flowmeters
- Volume V:* The World Market for New Technology Flowmeters
- Volume VI:* Worldwide Survey of Flowmeter Users



FLOW RESEARCH

AN IDEA NETWORK COMPANY

A new era has dawned in market research with the publication of this comprehensive and integrated six-volume set of studies on new-technology flowmeters. Flow Research and Ducker Worldwide have scrutinized the market from every point of view and in every location to bring you the most complete analysis ever made of the worldwide flowmeter market. Each study is complete in itself but also a vital part of the whole picture, to give you the information you need to make informed and intelligent decisions about the future of your business.

Worldflow new-technology studies — an unprecedented look at the industry

We spent a year — and thousands of hours — gathering and analyzing data for this comprehensive look at the worldwide flowmeter markets for New Technology. We interviewed more than 200 suppliers and 300 endusers, visited 34 companies, and sent out thousands of faxes and emails to uncover every possible flowmeter supplier. The result: six volumes, more than 3000 pages, and a complete definition and analysis of the worldwide flowmeter market. Don't miss your chance to benefit from our extensive and exhaustive research.



Flowmeter studies

The complete Worldflow™ series includes:

Volume I: **The World Market for Coriolis Flowmeters** (434-page analysis of this fast-growing market)

Volume II: **The World Market for Magnetic Flowmeters** (555-page study on this market, which is more mature than ultrasonic, but still growing)

Volume III: **The World Market for Ultrasonic Flowmeters** (572-page study on the fastest-growing flowmeter market)

Volume IV: **The World Market for Vortex Flowmeters** (good potential for future growth; 444 pages)

Volume V: **The World Market for New Technology Flowmeters** (high-level comparison and analysis of all four technologies, plus data on single and multivariable differential pressure (DP) flowmeters; 651-pages)

Volume VI: **Worldwide Survey of Flowmeter Users** (total worldwide and regional analysis of what users value; 569 pages — an amazing accomplishment)

Comprehensive **traditional technology flowmeter studies** are now underway and will be available beginning in May. The six studies will cover the world market for traditional technology in general and five types of flowmeters: **positive displacement, turbine, open channel, thermal, and variable area.**

Tap the most comprehensive and meaningful data available today

Our studies are simply the best research available today on the worldwide flowmeter market — and the most comprehensive look ever taken.

No stone unturned

Instead of just talking to suppliers, we also interviewed users — users in the US, Canada, France, Germany, the UK, Japan, China, and Singapore. We took our 14-page questionnaire and did 300 interviews by phone in the native language to find out what users in every region of the world are thinking and planning when it comes to flowmeters.

We also interviewed and profiled every supplier we could find, not just the leaders. We identified 53 suppliers of ultrasonic flowmeters and 33 magnetic flowmeter suppliers and talked to them all. We believe smaller companies are just as important as the major influencers because they develop new technology, serve niche markets that make up important segments, and are important in determining true market size as well as an accurate picture of products, perspective, and distribution channels.

A complete and consistent picture

Because we researched all of the studies together, rather than one at a time, our data is consistent and uses the same definitions and terminology across all technologies. Cross-technology research results in

- A complete snapshot of the market over the same time period
- Meaningful forecasts and comparisons of market shares and size across technologies
- A better handle on the strengths and weaknesses of each technology and the geographic regions receptive to certain technologies
- A clear understanding of supplier strengths
- A complete and systematic intellectual framework
- Unique insights — analogies and parallels among different technologies that a "one study at a time" approach would miss

Objective and original research

Our studies are brand new, not updates. This means our market sizing is based on current supplier interviews, not projections from past forecasts. Although we've been tracking the flowmeter market for a decade, we drew comparisons with that data only after we completed the current studies. We started each study with a completely open mind about the results, determined to provide an honest and unbiased assessment.

What's in these studies?

These extensive studies have parallel content for volumes I through IV, the individual studies covering Coriolis, magnetic, ultrasonic, and vortex flowmeters worldwide. Volume V, the overview new-technology study, also includes a chapter on multivariable differential pressure meters. Volume VI features analysis of user questions for worldwide and geographical areas.

Chapter One — Executive Summary: Concisely presents the main conclusions of the study.

Chapter Two — Introduction: Presents the methodology and key definitions of terms used in the study. Defines the countries included in the five geographic regions: North America, Europe, Japan, Asia without Japan, and rest of world.

Chapter Three — Product and Technology Analysis: Presents the theory of operation of the flowmeter in question (Coriolis, magnetic, ultrasonic, or vortex). Provides a detailed analysis of the products by model name. Specs listed include applications, diameter range, connection type, flow range, temperature range, approvals, pressure range, and flowtube material. *This is a new feature in these studies, and provides a complete overview of the available products on the market worldwide from virtually every supplier.*

Chapter Four — Market Size and Forecast Through 2005: By compiling together the sales data from the individual companies contacted, we have been able to determine actual market size. Market is forecast by geographic region, and in terms of various market segments specific to each type of meter. This chapter tells you the dollar amount of each type of flowmeter sold in each geographic region, and the number of units sold. Includes: macroeconomic factors, economic growth of countries, population growth, standard of living, new plant construction, retrofits and renovations, the recovering Asian economies, growth in environmental regulations, and the inherently conservative nature of users in the process industries.

Chapter Five — Market Shares by Region and by Industry: Provides market share analysis for each type of flowmeter by geographic region and by industry. Industries covered include oil & gas, refining, chemical, food & beverage, pulp & paper, pharmaceutical, metals & mining, power, water & wastewater, and other.

Chapter Six — Strategies for Success: Contains strategies flowmeter suppliers can use to gain market share, and expand their presence.

Chapter Seven — Company Profiles: Contains detailed information on the suppliers of the type of flowmeter in question as well as detailed information on company history and products.

What are new-technology flowmeters?

New-technology flowmeters include Coriolis, magnetic, ultrasonic, vortex, and multivariable differential pressure (DP) meters. They have four features in common.

1. They have been introduced in the last 50 years.
2. They incorporate technological advances that avoid some of the problems inherent in earlier flowmeters.
3. They are more the focus of new product development efforts by the major flowmeter suppliers than traditional technology meters.
4. Their performance, including criteria such as accuracy, is better than that of Traditional Technology meters.

Many new-technology meters have enhanced features, including self-diagnostics, and also have up-to-date communication protocols, like HART, Foundation Fieldbus, and Profibus. New-technology meters have other advantages, including few or no moving parts, and reduced pressure drop.

Traditional technology flowmeters include single-variable DP, open channel, positive displacement, thermal, turbine, and variable area meters.



Dr. Jesse Yoder

Capitalize on our experience

Massachusetts-based Flow Research, founded in 1999, is the only market research company whose primary mission is researching flowmeter markets. It is a division of Idea Network, a market research and publishing company producing market research, technical reports, and newsletters for the process control industry since 1986.

Both were founded by president **Dr. Jesse Yoder**, who in his 15 years of experience in the process control and instrumentation markets has written more than 40 market research studies and published numerous articles on instrumentation in industry journals, including *Control*, *Pipeline and Gas Journal*, *Control Engineering*, *InTech*, *Plant Services*, and *Control Solutions*.

Michael Kirsch, senior analyst, has more than 30 years of industrial and consulting experience, in the areas of

R&D, market research and strategic planning. He holds an MBA and a bachelor's degree in chemical engineering.

Flow Research is partnering with **Ducker Research**. Ducker has 40 years of experience in researching industrial and business markets and a staff of more than 60 in its Michigan and Paris offices. **Nick Limb**, partner and overall manager of this project, has overseen the publication of many reports. He has a master's degree in economics.

Profit from the trend toward new-tech

A major shift is occurring in the world of flow measurement — away from traditional technology flowmeters and towards new-technology flowmeters.

The goal of this comprehensive series is to provide a complete definition and analysis of the worldwide New Technology flowmeter market. We wanted to answer critical questions:

Which flowmeters are replacing others and which flowmeters are being replaced?

How fast is each type of flowmeter growing?

What does the future hold for all four technologies?

How do users decide what flowmeter to use?

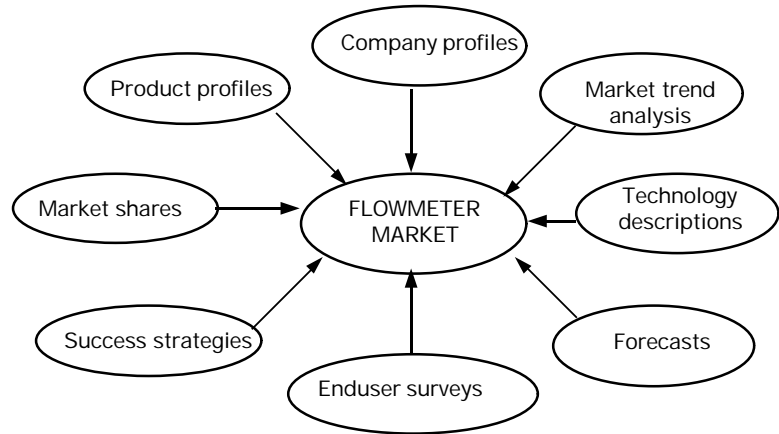
What are the prospects for Foundation Fieldbus and Profibus in the US, Europe, and Asia?

What differences are there in flowmeter use by geographical location?

The studies create a comprehensive New Technology flowmeter database by providing:

- A technology and product analysis
- Market size in US dollars and unit volume
- Market shares of the leading suppliers
- A detailed forecast of the market in dollars and unit volume through 2005
- A detailed analysis of OEMs and endusers
- Market and product strategies for suppliers
- Company profiles of suppliers

Worldflow market research studies look at flow from many points of view



... so you get the complete picture

Data you can trust to make powerful decisions

We pride ourselves on our rigorous and thorough research methodology.

Supplier input: At the beginning of the study, we contacted suppliers to find out what they would like to know.

Market size and market shares: We interview suppliers, then cross check revenue numbers with a variety of other sources, including business directories and Dun & Bradstreet reports.

Forecasts: We draw on interviews with suppliers, OEM and end-user survey data, reports on industry and economic growth.

Company profiles: We compile these from interviews, websites, product brochures, and Dun & Bradstreet reports.

Why is market research vital to your company?

Don't drive blind. Use market research as a map to help you get where you want to go.

- The success of your company depends in part on the quality of the market research you rely on
- Market research looks at underlying causes and driving forces, not just surface features
- Market research provides a guide to the future, not just a description of the present
- Market research is a powerful tool for predicting economic trends and buying behavior

Volume I: The World Market for Coriolis Flowmeters

Coriolis flowmeters are the most accurate flowmeter made. They are also highly reliable. In a time when the desire for accuracy and reliability are the strongest drivers of the flowmeter market, Coriolis meters have been one of the fastest growing types of meter, exceeded in revenue only by magnetic flowmeters. Coriolis meters are widely used in the chemical industry, where mass flow measurement is often

required. They are also widely used in the other process industries. Coriolis meters are currently being tested for use in natural gas custody transfer applications. With new products being introduced into the marketplace, and Coriolis meters continuing to show impressive growth, the Coriolis flowmeter market promises to be an exciting one over the next several years.

Study highlights

As part of our effort to define the worldwide flowmeter market, Flow Research has contacted every known supplier of Coriolis flowmeters worldwide. We have gathered detailed information about these suppliers and compiled the result into a complete description of the worldwide Coriolis flowmeter market. Highlights of the study include:

- The most distinctive feature about Coriolis meters is that they measure mass flow. However, the primary reason users choose Coriolis meters is for their accuracy.
- Even though Coriolis flowmeters have a relatively high purchase price, compared to other flowmeters, they have low maintenance requirements. Prices are coming down, however, and some meters are now available in the \$3,000 range.
- Complete market size and share by geographic region
- Straight-tube vs. bent-tube models — *straight-tube meters address the problem of pressure drop, and make Coriolis meters more suitable for sanitary applications*
- Liquid vs. gas vs. steam ; Smart vs. conventional
- Technological Improvements in Coriolis flowmeters
- Custody transfer of natural gas as a potential boom market
- Growth factors for the Coriolis flowmeter market, including larger line sizes
- More suppliers now in the market
- The advent of Foundation Fieldbus and Profibus, increased use of HART; Danfoss' USM II Module
- Macroeconomic factors
- New plant construction; retrofits and renovations
- The recovering Asian economies
- Growth in environmental regulations
- Factors limiting the growth of Coriolis flowmeters
- The inherently conservative nature of users in the process industries
- Competition from other new-technology flowmeters
- Users are looking for low maintenance

Strategies for success

- Emphasize the high accuracy of Coriolis flowmeters
- Offer both straight tube and bent tube models
- Participate in the fast-growing market for gas and steam applications
- Offer Coriolis flowmeters designed for specific industries and applications
- Find ways to address the question of large line sizes
- Become a broad-line supplier
- Educate your customers about Coriolis technology
- Invest in smart flowmeters and in communication protocols
- Offer many models and types of Coriolis flowmeters

Companies profiled

ABB
Bopp & Reuther
Brooks Instrument
Danfoss
Endress & Hauser
FMC Energy Systems
Foxboro
Krohne
Liquid Controls
Micro Motion
Oval
Rheonik
Schlumberger
Yokogawa

Volume II: The World Market for Magnetic Flowmeters

The magnetic flowmeter market has the distinction of being the largest flowmeter market, in terms of revenues. Even though more differential pressure flowmeters are still sold today than any other type, revenues from magnetic flowmeters are greater, due to their higher price. Water and wastewater is the most popular industry for magnetic meters.

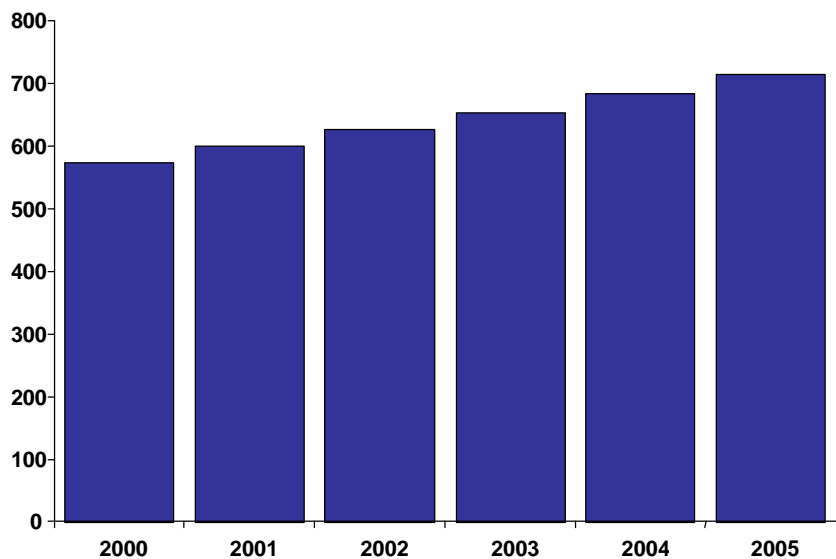
While ultrasonic and Coriolis flowmeters are growing at a faster rate, the installed base of magnetic flowmeters gives magnetic flowmeters the edge in terms of total revenues generated. Many companies have invested very heavily in magnetic flowmeter technology, and are not likely to abandon this investment for another type of meter.

Although the magnetic flowmeter market is not growing as fast as the Coriolis or ultrasonic flowmeter market, it is still experiencing solid growth worldwide. Magnetic flowmeters are very widely used in Europe, especially in the food processing and water and wastewater industries. Magnetic flowmeters are well known for their accuracy, and they are well liked because of their nonintrusive nature. Magmeters today are more capable than before of

handling low conductivity applications. Insertion mags are sometimes used for larger pipes.

The most severe limitation on the use of magmeters is their inability to meter nonconductive fluids. Apart from this, they will remain the king of the flowmeter hill, in terms of revenues, for at least the next few years.

**Total Shipments of Magnetic Flowmeters Worldwide
(Millions of Dollars)**



Companies profiled

ABB Automation	Isco
Advanced Flow Technology	Istec
Badger Meter	Krohne
Bopp & Reuther	Liquid Controls
Brinck	Marsh McBirney
Brooks Instrument	McCrometer
Brunata	Oval
Burkert	Proces-Data
Danfoss	Rosemount
Datam Flutec	Siemens-Turbo
Diessel	Sparling Instruments
Dynasonics	Tec Fluid
Elis Plzen	Toshiba
Endress & Hauser	Venture Measurement
Enko	Yokogawa
Euromag	
Foxboro	
Hangzhu Zhenhua Meter Factory	

Strategies for success

- Offer magnetic flowmeters designed for specific industries and applications
- Become a broad-line supplier
- Be aware of the benefits of both AC and DC technologies
- Form alliances with other companies
- Offer two-wire as well as four-wire magnetic flowmeters
- Emphasize the advantages of magnetic flowmeters
- Create a coherent and understandable product naming system
- Offer both remote and compact magnetic flowmeters
- Address difficult applications
- Consider multivariable magnetic flowmeters
- Invest in smart flowmeters, and in communication protocols
- Offer many models and types of magnetic flowmeters

Study highlights

As part of our effort to define the worldwide flowmeter market, Flow Research has contacted and interviewed every known supplier of magnetic flowmeters worldwide. We have gathered detailed information about these suppliers and compiled the result into a complete description of the worldwide magnetic flowmeter (magmeter) market. Highlights of the study include:

- Worldwide sales of magnetic flowmeters totaled \$574 million in 2000, and are projected to grow to \$716 million in 2005. This represents a compound annual growth rate of 4.5 percent.
- Market size and shares by geographic region, growth forecasts
- AC vs. DC magmeters
- Two-wire vs. four-wire magmeters
- Inline vs. insertion magmeters
- Multivariable vs. smart vs. conventional magmeters
- Market strategies for magmeter suppliers
- Growth forecasts through 2005
- Distribution channels
- Company profiles of magmeter suppliers
- Magnetic flowmeters remain the revenue leader
- Growth factors for the magnetic flowmeter market
- Installed base
- High accuracy continues to be a factor
- Popularity of magnetic flowmeters in Europe
- Technological improvements in magnetic flowmeters
- The advent of Foundation Fieldbus and Profibus
- New product types available
- Prospects for more multivariable magnetic flowmeters
- The large number of magnetic flowmeter suppliers
- Competitive pricing and average selling price for magnetic flowmeters
- Factors limiting the growth of magnetic flowmeters
- The cost of magnetic flowmeters
- Competition from other new-technology flowmeters
- Inability to measure nonconductive liquids
- Shipments of magnetic flowmeters worldwide by type
- Shipments of smart, conventional, multivariable magnetic flowmeters by type and by region
- Shipments of magnetic flowmeters by mounting type worldwide and by region, by coil power type, by configuration, by wiring type, by communication protocol, worldwide by industry, worldwide by distribution channels, worldwide by customer type

Advantages of magnetic flowmeters

Magnetic flowmeters also have some very important advantages. Most introduce little or no pressure drop. Insertion meters are an exception to this, but even these introduce only a limited amount of pressure drop. Magnetic flowmeters are highly accurate at a time when many flowmeter users are looking for high accuracy. Published accuracies for many magmeters are in the 0.5 percent range. Many different types of liners are available that are specific to different applications. Newer DC type magmeters have eliminated problems related to zero-calibration that occurred earlier with AC type meters.

Magnetic flowmeters have a good reputation for reliability and accuracy in a market that is driven

by both of those factors. Magnetic flowmeters have significant advantages over traditional technology flowmeters. Unlike differential pressure (DP) meters, especially orifice plate, magnetic meters do not have a primary element that can wear and significantly degrade measurement accuracy. Unlike turbine and positive displacement meters, they have no moving parts. This eliminates a potential source of wear that these flowmeters are subject to.

Magnetic flowmeters also have advantages over other new-technology meters. Unlike vortex flowmeters, magnetic flowmeters do not place an obstruction into the flowstream. Insertion magnetic meters are an exception to this, of course. Magnetic flowmeters may be preferred to Coriolis flowmeters when pressure drop is a consideration. They also do not

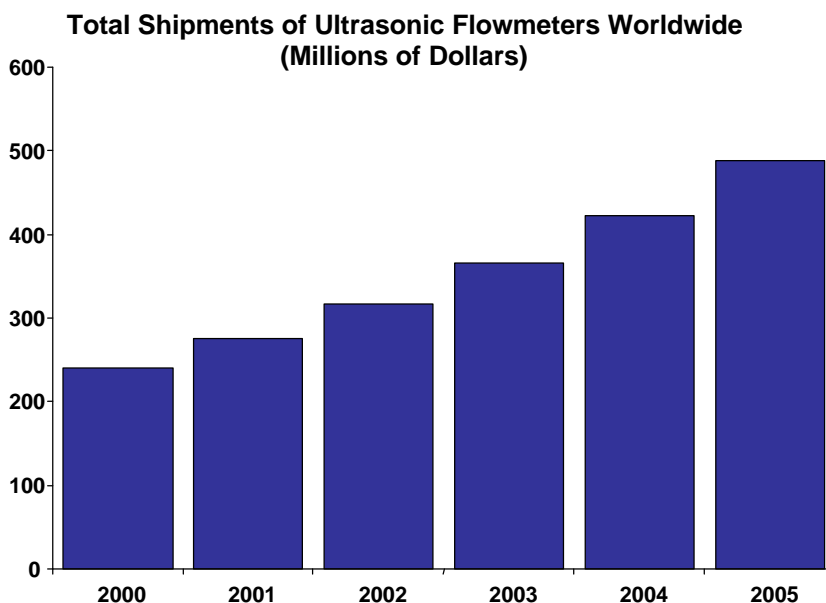


have the same type of line size constraints that Coriolis meters have, since they can be placed in lines of almost any size. Coriolis meters become unwieldy and expensive to use in pipe sizes over four inches, and the majority are used on pipes of two inches or less. Magnetic flowmeters have a price advantage over Coriolis meters. They also have an accuracy advantage over multivariable DP flowmeters.

Volume III: The World Market for Ultrasonic Flowmeters

The ultrasonic flowmeter market has been growing very rapidly over the past several years, and is now poised for explosive growth.

For the past three years, ultrasonic flowmeter have been the fastest growing type of flowmeter, even exceeding the growth rate of Coriolis flowmeters. This is still true today, fueled in part by dramatic growth in the use of ultrasonic meters for custody transfer of natural gas. The fast-growing use of ultrasonic flowmeters to measure natural gas flow receives special attention in this study. The approval of the American Gas Association report (AGA-9) in 1998 on the use of ultrasonic flowmeters to measure natural gas flow gave a major boost to this market. Since that time, new suppliers have entered the field and new products have been introduced. This is one of the most exciting and dynamic segments of the entire flowmeter market. Probably the single most important factor in the recent growth of ultrasonic flowmeters has been the explosive growth in the market of multipath ultrasonic meters for custody transfer of natural gas.



Companies profiled

Alphasonics	Laaser
American Sigma	Matelco
Automated Sonix Corp.	Mesa Labs
Brinck	Micronics
Caldon	Monitor Labs
Controlotron	Panametrics
Danfoss	Polysonics
Daniel	Quality Control Equipment
D-Flow	Rittmeyer
Datam Flutec	Sick
Durag Group	Siemens
Dynasonics	Solartron Mobrey
Eastech Flow Controls	Sparling
Eastern Energy Service	Teksco
Elis Plzen	Thermo MeasureTech
EMCO	Tokimec
Endress & Hauser	Tokyo Keiso
Flexim	Ultraflux
Flotec UK	Ultrasound Research Center
Fluenta	Venture Measurement
FMC Energy Systems	Yokogawa
Fuji Electric	
Greyline	
Honda Electronics	
Instromet	
Kaijo	
Kamstrup	
Krohne	

Strategies for success

- Become a broad-line supplier
- The ultrasonic flowmeter is not a universal flowmeter
- Form alliances with other companies
- Prepare for market consolidation
- Move beyond clamp — on to spoolpiece meters
- Emphasize the advantages of ultrasonic flowmeters
- Invest in smart flowmeters, and in communication protocols
- Offer ultrasonic meters for measuring gas flow
- Offer multipath ultrasonic flowmeters for custody transfer applications
- Work with industry associations to obtain approvals for ultrasonic flowmeters

Study highlights

As part of our effort to define the worldwide flowmeter market, Flow Research has contacted every known supplier of ultrasonic flowmeters worldwide. We have gathered detailed information about these suppliers and compiled the result into a complete description of the worldwide ultrasonic flowmeter market.

We found that one reason for the explosive growth in the ultrasonic market is the number of new companies entering the market. There are more ultrasonic flowmeter manufacturers than for any other new-technology flowmeter. While the leading suppliers are enjoying significant growth, the new companies in the market are a major force in expanding total market size. Other factors include increasing awareness of this technology by users. As users become more aware of the advantages of ultrasonic meters, and more familiar with the technology, they are more likely to replace their traditional meters with ultrasonic meters.

Other highlights include:

- Market size and shares by geographic region
- Growth factors for the ultrasonic market
- Use of ultrasonic flowmeters for liquid vs. gas flow

- Transit time vs. Doppler vs. Hybrid meters
- Clamp-on vs. spoolpiece meters
- Multipath vs. single path meters
- Smart vs. conventional ultrasonic meters
- Market strategies for ultrasonic suppliers
- Growth forecasts through 2005
- Technology improvements in ultrasonic meters
- The development of multipath flowmeters
- More calibration facilities available
- Industry approvals of ultrasonic meters
- Wider use of spoolpiece ultrasonic meters
- Increased use of ultrasonic flowmeters in the process industries
- Factors limiting the growth of ultrasonic flowmeters
- The cost of ultrasonic flowmeters
- Shipments of ultrasonic flowmeters worldwide by region, technology, type, mounting, fluid type, communication, industry, distribution, customer type, and industrial district heating

Operating principle: the silent wave

Ultrasonic flowmeters use ultrasonic waves to measure flowrate in closed pipes and open channels. Ultrasonic waves are beyond the frequencies that humans can hear. Most people can hear sound waves between 20 and 20,000 cycles per second. Ultrasonic waves are above 20,000 cycles per second, making them inaudible to human beings. Ultrasonic flowmeters contain transducers that send and receive these ultrasonic waves.

Ultrasonic flowmeters rely on the fact that ultrasonic waves travel more quickly when they travel with the flowstream than when they travel against it. Ultrasonic flowmeters send ultrasonic waves across the flowstream and measure the time it takes for the wave to cross from one side of the pipe to the other. Using this information, the flowmeter can calculate flowrate. Ultrasonic flowmeters are used to measure both liquid and gas flow.

Ultrasonic meters are nonintrusive, and they have no pressure drop. Clamp-on meters offer the ability to measure flow in various locations without interfering in any way with the process. While clamp-on meters have mainly been used for liquids, they are also beginning to be used to measure gas flow



Paradigm case applications

The paradigm case application for ultrasonic flowmeters is for clean, swirl-free liquids and gases of known profile. Operating on clean fluids is the most important constraint on ultrasonic meters, although today's transit time meters can handle some impurities. Doppler meters are made to measure dirty liquids, since they bounce their signals off the impurities in the flowstream. Multipath meters are more accurate, since they use more than one ultrasonic signal to calculate flowrate.

Volume IV: The World Market for Vortex Flowmeters

Since vortex flowmeters were first introduced into industrial markets in the early 1970s, they have undergone significant growth. Vortex meters are considered an alternative to differential pressure flowmeters, since they offer reduced pressure drop at a reasonable price. Steam flow measurement has emerged as the best-known application for vortex meters.

meter market including findings such as the increased popularity of multivariable flowmeters and greater use of vortex meters to measure the flow of gases and steams. While vortex meters are not growing as fast as ultrasonic or Coriolis meters, they have good potential for future growth, especially as more users become familiar with the technology.

This study takes a complete look at the vortex flow-

Study highlights

Much of the growth in the vortex flowmeter market comes from their use in steam flow measurement. Our research found that Rosemount's entrance into the vortex flowmeter market in 1994 has had a substantial impact. Another significant event is Sierra Instruments' introduction of a multivariable vortex meter in 1997. Other highlights of the study include:

- Vortex flowmeters provide accurate and reliable flow measurement at a competitive price and are the lowest cost new-technology meter
- Suppliers in recent products have adequately addressed many earlier issues relating to vibration
- Market size, growth factors, and forecasts through 2005
- Smart vs. conventional vortex meters
- Liquid vs. steam vs. gas flow measurement
- Wafer vs. flanged vs. other (Insertion)
- Multivariable vortex meters — their prospects for growth compared to growth prospects for other multivariable meters (multivariable differential pressure flowmeters and multivariable magnetic flowmeters).
- Communication protocols (HART, Foundation Fieldbus, Profibus, Serial, Other)
- District heating applications use vortex flowmeters
- More suppliers now in the market
- Technological improvements in vortex flowmeters
- Users are looking for low maintenance
- Custody transfer of natural gas a potential market for vortex meters
- The advent of Foundation Fieldbus and Profibus
- Increased use of Hart; Danfoss' USMII module
- Factors limiting the growth of vortex flowmeters, including their limited ability to handle low flowrates.
- Competition from other new-technology flowmeters
- Average selling prices of vortex flowmeters:
- Shipments of conventional, multivariable vortex flowmeters, single-variable smart vortex flowmeters worldwide and by region
- Shipments of vortex flowmeters by mounting type, fluid type, industry, distribution channels, and customer type

Strategies for success

- Vortex meters: a reliable and versatile meter at an economical price
- Tap into the fast-growing market for gas applications
- Pursue the market for steam applications
- Offer vortex flowmeters designed for specific industries and applications
- Become a broad-line supplier
- Offer a variety of models, including wafer, flanged, and insertion
- Form alliances with other companies
- Emphasize the advantages of vortex flowmeters
- Consider multivariable vortex flowmeters
- Invest in smart flowmeters and in communication protocols

Companies profiled

ABB
Asahi America
Eastech
EMCO
Endress & Hauser
Foxboro
Hangzhu Zhenhua Meter Factory
J-Tec Associates
Krohne
Oval
Rosemount
Sierra Instruments
Tokyo Keiso
Venture Measurement
Yokogawa

Volume V: The World Market for New-Technology Flowmeters

This exciting and comprehensive study incorporates the data from the ultrasonic, magnetic, Coriolis, and vortex studies into a high-level analysis of the new-technology flowmeter market. For the first time, you can see how ultrasonic, Coriolis, magnetic, and vortex flowmeters compare to each other, which meters are growing at what rate, and what the future holds for all four technologies.

Study highlights

A major shift is occurring in the flowmeter market. Users are moving away from traditional technologies towards new-technology flowmeters, and we predict strong growth for new-technology flowmeters over the next several years. Revenues from new-technology flowmeters are projected to increase at an average annual rate of 8.8 percent through 2005.

- The overall New Technology flowmeter market was nearly \$1.4 billion in 2000, and is projected to grow to over \$2.1 billion in 2005
- Ultrasonic, Coriolis, and multivariable DP flowmeters are growing faster than the average growth rate
- Magnetic will remain the largest market, but is the slowest growing technology
- The market for custody transfer of natural gas is the fastest growing demand segment
- Half of all endusers switching from DP flowmeters cite "High Accuracy" as the reason for their switch

Topics covered include:

- For multiple reasons, more users are selecting new-technology flowmeters
- Growth factors for the new-technology flowmeter market
- High accuracy continues to be a factor in the shift to new technologies
- Users looking for reliability
- Nonintrusiveness and lack of pressure drop are major factors
- New-technology flowmeters turned their negatives into positives
- Custody transfer of natural gas is a boom market for new-technology meters
- Technology improvements in new-technology flowmeters
- Growth in multivariable flowmeters
- More new-technology suppliers now in the market
- Increased capability to measure gas and steam flow
- The 1990's: the decade of smart
- The advent of Foundation Fieldbus and Profibus
- Increased use of Hart; Danfoss' USMII module
- Factors limiting the growth of new-technology flowmeters
- The cost of new-technology flowmeters
- Regional and geographic preferences
- Market size and growth forecasts

Multivariable DP flowmeters

This volume also includes data on single- and multivariable differential pressure (DP) flowmeters. It tells you the current market size for each technology, and projects growth through 2005, including DP and multivariable DP flowmeters. In fact, Chapter Four of this study is devoted to DP and multivariable DP flowmeters. (This data on DP flowmeters only appears in this study.)

Companies profiled

ABB
Badger Meter
Bopp & Reuther
Bristol Babcock
Brooks Instrument
Controlotron
Danfoss
Daniel
Endress & Hauser
FMC Energy Systems
Foxboro
Fuji Electric
Honeywell
Instromet
Krohne
Micro Motion
Oval
Panametrics
Rosemount
Siemens
Tokimec
Tokyo Keiso
Toshiba
Venture Measurement
Yamatake
Yokogawa

Volume VI: Worldwide Survey of Flowmeter Users

If you're looking for data about what flowmeter users from around the world say about their current and projected use of flowmeters, then this groundbreaking study is for you. **This is the definitive analysis of the perspectives of flowmeter users worldwide and by geographic region.** No other market research company has undertaken such an ambitious analysis of flowmeter users – there is no other study like it available anywhere.

The fundamental reason for doing this extensive worldwide survey was to understand why users are selecting the flowmeters they have, and to better understand how users perceive the differences among all types of flowmeters. This study includes all types of flowmeters, including new-technology and traditional technology meters.

Study highlights

According to the study, one of the main reasons users are switching to new-technology meters is that they are looking for higher accuracy and greater reliability. The study also reveals compelling regional and geographic differences in the flowmeter market that would never be apparent to someone who does a survey of U.S. users and then generalizes to the world.

Our analysis of flowmeter users includes:

- Installed flowmeter base by region and type
- User criteria for selecting flowmeters
- User projected spending plans
- Flowmeters for liquid/steam/gas
- Use of multivariable flowmeters
- Foundation Fieldbus/Profibus
- Safety approvals required

The bulk of the report is four chapters on the survey results — worldwide, in North America, Europe, and Asia. Each chapter includes the following topics:

- Analysis of the segment
- Profile of users surveyed
- Installed base of flowmeters by type
- Use of primary elements

To create this volume, we translated our 14-page questionnaire into French, German, Chinese, and Japanese. We then interviewed users by phone in North America, Europe, and Asia: 100 from each region. In Europe, we interviewed users in Germany, France, and the UK. In Asia, we interviewed users in China, Japan, and Singapore. This volume includes a total worldwide analysis, as well as an analysis by region. You'll find answers to the following questions and more:

- How quickly are Foundation Fieldbus and Profibus being adopted in North America, Europe, and Asia?
- Which geographic region reports the highest percent of flowmeters for measuring water?

- Which type of flowmeter makes up the largest percentage of the installed base of flowmeters in North America? In Europe? In Asia?
- What percent of flowmeters by type are used to measure gas vs. steam vs. liquid in each geographic region?
- What criteria do users consider most important when selecting each type of flowmeter?
- What new-technology meters are replacing traditional technology meters and why?
- What do users project by region in terms of flowmeter purchases by type of meter?

- Applications by flowmeter type
- Type of fluid measured by flowmeter type
- Reasons for using flowmeters
- Importance of factors when purchasing flowmeters
- Flowmeter purchasing expectations
- New versus retrofit flowmeter purchases
- Reasons for expected change in flowmeter usage
- Flowmeter purchasing channels
- Who specifies flowmeter purchases
- What medium flowmeters are measuring
- Safety approvals required on flowmeters
- User experience with flowmeters, importance of accuracy
- User satisfaction with supplier services
- Use of multivariable flowmeters
- Substitution of one flowmeter type for another
- Substitution of one flow type for another in the future
- Use of communication protocols with flowmeters
- Use of the Internet for making purchase decisions
- Information sources used other than the internet
- Frequency with which users calibrate their flowmeters