

THE MARKET FOR CORIOLIS FLOWMETERS WORLDWIDE

Researched by:

**Flow Research
27 Water Street
Wakefield, MA 01880
781-245-3200
www.flowresearch.com
Project team: Jesse Yoder PhD.,
Michael Kirsch, Kelly Deppen**

**Ducker Research Company, Inc.
6905 Telegraph Road Suite 300
Bloomfield Hills, MI 48301
248-644-0086
www.ducker.com
Project team: Nick Limb, Scott Shober
Josiah Waxman, Lorena Ferrari**

Published by



***Ducker Research Company, Inc.
A Division of Ducker Worldwide***

July, 2001

TABLE OF CONTENTS

<u>Chapter</u>	<u>Description</u>	<u>Page Number</u>
One	Executive Summary	1-1
	Coriolis Flowmeters Lead the Way in Accuracy.....	1-1
	Overview	1-2
	Worldflow™	1-3
	The Role of Viewpoint Pluralism in Worldflow™	1-5
	The Importance of Cross-Technology Research.....	1-7
	Study Objectives	1-8
	Methodology	1-9
	Supplier Input	1-9
	Supplier Analysis	1-10
	OEM and End-User Analysis.....	1-11
	Forecasts.....	1-12
	Definitions	1-12
	New Technology Flowmeters	1-14
	Paradigm Case Selection Method	1-15
	Growth Factors for the Coriolis Flowmeter Market	1-17
	Shipments of Coriolis Flowmeters Worldwide by Region.....	1-18
	Shipments of Coriolis Flowmeters Worldwide by Type	1-18
	Market Shares for Coriolis Flowmeters by Geographic Region.....	1-19
	Strategies	1-19
	Emphasize the High Accuracy of Coriolis Flowmeters.....	1-19
	Offer Both Straight Tube and Bent Tube Models.....	1-20
	Participate in the Fast-Growing Market for Gas and Steam Applications	1-20

TABLE OF CONTENTS

(continued)

<u>Chapter</u>	<u>Description</u>	<u>Page Number</u>
Two	Introduction.....	2-1
	Overview	2-1
	Worldflow™	2-2
	The Role of Viewpoint Pluralism in Worldflow™	2-4
	The Importance of Cross-Technology Research.....	2-6
	New Studies vs. Updates.....	2-7
	Leading Suppliers vs. All Suppliers.....	2-8
	Building a Mystery.....	2-9
	Study Objectives	2-10
	Methodology	2-10
	Supplier Input	2-11
	Supplier Analysis	2-11
	OEM and End-User Analysis.....	2-12
	Forecasts.....	2-13
	Definitions	2-13
	Smart Flowmeters	2-15
	Communication Protocols.....	2-16
	Geographic Regions	2-20
	Geographic Regions of the World	2-22
	End-User Industries.....	2-29
	Coriolis Flowmeter Industry Structure	2-29
	Team History and Experience.....	2-29
	Flow Research.....	2-30
	Ducker Research.....	2-35
	Custom Projects	2-35
Three	Coriolis Flowmeter Product and Technology Analysis	3-1
	New Technology Flowmeters	3-2
	Coriolis Flowmeters	3-2
	Magnetic Flowmeters.....	3-5
	Ultrasonic Flowmeters	3-6
	Vortex Flowmeters.....	3-7
	Paradigm Case Selection Method	3-12
	Coriolis Flowmeter Product Analysis	3-15
	ABB	3-16
	Bopp & Reuther	3-18

TABLE OF CONTENTS

(continued)

<u>Chapter</u>	<u>Description</u>	<u>Page Number</u>
3 <i>(continued)</i>		
	Brooks Instrument.....	3-20
	Danfoss.....	3-22
	Endress & Hauser.....	3-24
	FMC Energy Systems	3-28
	Foxboro	3-31
	Krohne.....	3-33
	Liquid Controls	3-37
	Micro Motion.....	3-39
	Oval.....	3-43
	Rheonik	3-45
	Schlumberger	3-47
	Yokogawa	3-49
Four	Coriolis Flowmeter Market Size and Forecast.....	4-1
	Overview	4-1
	Coriolis Flowmeters Lead the Way in Accuracy.....	4-2
	Growth Factors for the Coriolis Flowmeter Market	4-4
	Flowmeter Factors.....	4-4
	High Accuracy Continues to Be a Factor	4-5
	Users are Moving Towards New Technology Meters	4-5
	Technological Improvements in Coriolis Flowmeters.....	4-6
	Users are Looking for Low Maintenance	4-6
	Straight-tube Meters are Addressing Some Issues with Bent-tube Meters.....	4-7
	Custody Transfer of Natural Gas is a Potential Boom Market for Coriolis Meters.....	4-8
	Introduction of Low Cost Coriolis Meters	4-9
	More Suppliers Now in the Market	4-10
	Growth in Coriolis Meters for Larger Line Sizes	4-11
	The Advent of Foundation Fieldbus and Profibus	4-12
	Increased Use of HART	4-16
	Danfoss' USM II Module	4-17
	Macroeconomic Factors	4-17
	Economic Growth of Countries	4-18
	Population Growth.....	4-21
	Standard of Living Increases.....	4-21

TABLE OF CONTENTS

(continued)

<u>Chapter</u>	<u>Description</u>	<u>Page Number</u>
4 <i>(continued)</i>	New Plant Construction.....	4-22
	Retrofits and Renovations	4-23
	The Recovering Asian Economies	4-23
	Growth in Environmental Regulations	4-24
	Factors Limiting the Growth of Coriolis Flowmeters.....	4-25
	The Inherently Conservative Nature of Users in the Process Industries	4-25
	The Cost of Coriolis Flowmeters	4-25
	Competition From Other New Technology Flowmeters	4-26
	Market Size and Growth Forecasts	4-26
	Shipments of Coriolis Flowmeters Worldwide by Region: Figures 4-1 to 4-5.....	4-28
	Shipments of Coriolis Flowmeters Worldwide by Type: Figures 4-6 to 4-13.....	4-28
	Average Selling Prices of Coriolis Flowmeters: Figure 4-14 to 4-16	4-29
	Shipments of Smart Coriolis Flowmeters Worldwide and by Region: Figures 4-17 to 4-21	4-29
	Shipments of Conventional Coriolis Flowmeters Worldwide and by Region: Figures 4-22 to 4-26	4-30
	Shipments of Coriolis Flowmeters by Flowtube Type Worldwide and by Region: Figures 4-27 to 4-33	4-30
	Shipments of Coriolis Flowmeters by Fluid Type Worldwide and by Region: Figures 4-34 to 4-40	4-31
	Shipments of Smart Coriolis Flowmeters by Communication Protocol: Figures 4-41 to 4-47	4-31
	Shipments of Coriolis Flowmeters Worldwide by Line Size: Figures 4-48 to 4-49.....	4-33
	Shipments of Coriolis Flowmeters Worldwide by Industry: Figures 4-50 to 4-55.....	4-34
	Shipments of Coriolis Flowmeters Worldwide by Distribution Channels: Figures 4-55 to 4-58.....	4-34
	Shipments of Coriolis Flowmeters Worldwide by Region by Customer Type: Figures 4-59 to 4-61	4-35
Five	Coriolis Flowmeter Supplier Market Shares	5-1
	Overview	5-1
	Market Shares for Coriolis Flowmeters by Geographic Region.....	5-1

TABLE OF CONTENTS

(continued)

<u>Chapter</u>	<u>Description</u>	<u>Page Number</u>
5 <i>(continued)</i>	Market Shares for Smart Flowmeters by Geographic Region.....	5-5
	Market Shares for Conventional Flowmeters by Region.....	5-5
	Market Shares for Bent Tube Coriolis Flowmeters	5-7
	Market Shares for Straight Tube Coriolis Flowmeters	5-8
	Market Shares for Coriolis Flowmeters for Liquid Applications	5-8
	Market Shares for Coriolis Flowmeters for Gas Applications	5-9
	Market Shares for Coriolis Flowmeters by Industry.....	5-10
Six	Strategies for Success.....	6-1
	Overview	6-1
	Emphasize the High Accuracy of Coriolis Flowmeters.....	6-1
	Offer Both Straight Tube and Bent Tube Models.....	6-1
	Participate in the Fast-Growing Market for Gas and Steam Applications	6-2
	Offer Coriolis Flowmeters Designed for Specific Industries and Applications	6-3
	Find Ways to Address the Question of Large Line Sizes	6-3
	Become a Broad-line Supplier	6-3
	Form Alliances with Other Companies.....	6-4
	Emphasize the Advantages of Coriolis Flowmeters	6-5
	Create a Coherent and Understandable Product Naming System.....	6-6
	Build a Great Website	6-8
	Educate Your Customers About Coriolis Technology	6-10
	Invest in Smart Flowmeters, and in Communication Protocols	6-11
	Offer Many Models and Types of Coriolis Flowmeters	6-11
Seven	Coriolis Flowmeter Supplier Profiles.....	7-1
	ABB Automation	7-2
	Bopp & Reuther Heinrichs Messtechnik	7-6
	Brooks Instrument Division.....	7-8
	Danfoss A/S Flow Division	7-10
	Endress & Hauser AG.....	7-12
	FMC Measurement Solutions.. ..	7-16
	Foxboro	7-19
	Krohne Messtechnik Gmbh & Co. KG.	7-22

TABLE OF CONTENTS

(continued)

<u>Chapter</u>	<u>Description</u>	<u>Page Number</u>
7 <i>(continued)</i>	Liquid Controls LLC	7-26
	Micro Motion	7-28
	Oval Corporation.....	7-30
	Rheonik Messgeraete GmbH.....	7-33
	Schlumberger Measurement Division.....	7-35
	Yokogawa Electric Company	7-37

TABLE OF CONTENTS

(continued)

<u>Appendix</u>	<u>Description</u>	<u>Page Number</u>
Appendix A	Worldwide Flowmeter Study: Phase One and Phase Two	A-1
Appendix B	Input Questionnaire	B-1
Appendix C	Enduser Survey	C-1
Appendix D	Directory of Flowmeter Suppliers	D-1

