The World Market for Turbine Flowmeters, 2nd Edition

Flow Research, Inc.

Wakefield, Massachusetts

January 2012

Researched by:

Flow Research, Inc. 27 Water Street – Suite B7 Wakefield, MA 01880 United States

+1 781-245-3200 +1 781-7552 (fax) info@flowresearch.com www.flowresearch.com www.gasflows.com

Project Team
Jesse Yoder, PhD – Publisher and Executive Director

Belinda Burum Norman Weeks Leslie Buchanan Christina Glaser Nicole Riordan Jessica Weldy

Published by



January 2012

Copyright © 2012

Flow Research, Inc.

All data and information in this study is proprietary and copyrighted by Flow Research, Inc. No part of this study may be reproduced orally or in written form to anyone outside the internal organization of the client for five years from the date of this study without the prior written consent of Flow Research, Inc.

Disclaimer

While every effort has been made to insure that this study is accurate and complete, Flow Research, Inc. accepts no liability for consequences of any actions that are based on the findings in this study.

TABLE OF CONTENTS

One	Executive Summary	1-1
	Study Objectives	1-1
	Overview	1-2
	Methodology	1-3
	Turbine Flowmeter Product and Technology Analysis	1-5
	Growth Factors for the Turbine Flowmeter Market	1-5
	Factors Limiting the Growth of Turbine Flowmeters	1-5
	Shipments of Turbine Flowmeters Worldwide by Region: Figures 1-1 to 1-3	1-5
	Shipments of Turbine Flowmeters Worldwide by Type: Figures 1-4 to 1-5	1-6
	Market Shares for the Leading Turbine Flowmeter Suppliers Worldwide: Figure 1-6	1-6
	Research and Develop New Features and Products	1-6
	Develop Improvements to the Basic Technology	1-7
IWO	Scope and Method Overview	
Two	Scope and Method	2-1
	Study Objectives	
	A Complete Analysis of the Flowmeter Market	
	The Role of Viewpoint Pluralism	
	The Importance of Multi-Technology Research	
	Leading Suppliers vs. All Suppliers	
	Methodology	2-6
	Geographic Regions of the World	2-9
	Definitions	2-20
	End-User Industries	2-24
	Applications	2-25
	Fluid Types	2-25
	Mounting Types	2-26
	Line Sizes	2-26
	Bearing Materials	2-26
	Sales Channels and Customer Types	2-26

	Flow Research, Inc	2-27
	Flow Research Instrumentation Articles	2-29
	Flow Research Studies	2-38
	Custom Projects	2-38
	Worldflow Monitoring Service	2-39
Three	Turbine Flowmeter Product and Technology Analysis	3-1
	Overview	3-1
	New-Technology Flowmeters	
	Coriolis Flowmeters	
	Magnetic Flowmeters	3-5
	Ultrasonic Flowmeters	
	Vortex Flowmeters	3-7
	Thermal Flowmeters	3-8
	Paradigm Case Selection Method	3-14
	Traditional Technology Flowmeters	3-17
	Familiarity Breeds Respect	3-18
	Switching Technologies Has a Cost	3-19
	Differential Pressure	3-19
	Positive Displacement	3-21
	Turbine	3-21
	Open Channel	3-21
	Variable Area	3-22
	Selecting a Flowmeter	3-23
	Recent Developments among Positive Displacement and	
	Turbine Flowmeter Suppliers	3-24
	Positive Displacement Flowmeters	3-24
	Turbine Flowmeters	3-25
	Mergers and Acquisitions in the PD and Turbine Markets	3-25
	Turbine Flowmeter Product Analysis	3-34
	Aichi Tokei Denki Co., Ltd.	3-40
	The Arad Group	3-41
	Badger Meter, Inc.	3-44
	Bopp & Reuther Messtechnik GmbH	3-46
	Cameron	3-47
	Danaher Corporation	3-48

Anderson Instrument Company, Inc.	3-48
Venture Measurement Company LLC	3-49
Diehl Stiftung & Co. KG	3-50
Elster	3-51
Emerson Process Management	3-53
Daniel Measurement and Control	3-53
FMC Technologies	3-55
GE Measurement and Control Solutions	3-57
Dresser, Inc.	3-57
Great Plains Industries	3-58
Hoffer Flow Controls, Inc.	3-59
IDEX Corporation, Liquid Controls Group (LCG)	3-61
Liquid Controls Sponsler	3-61
Faure Herman	3-62
Itron	3-62
Manu Electronics Pty Ltd	3-63
Mueller Systems.	3-64
Ningbo Donghai Group Corporation	3-65
Ningbo Huangtai Industrial Co., Ltd.	3-66
Nitto Seiko Co., Ltd.	3-67
Oval Corporation	3-68
Racine Federated	3-68
Honeywell International, Inc.	3-70
RMG Group	3-70
Roper Industries, Inc.	3-70
Neptune Technology Group Inc	3-70
FTI Flow Technology, Inc.	3-71
SATAM sas	3-72
Sensus	3-73
Spirax Sarco Engineering plc Group (EMCO)	3-74
TASI Group	3-75
AW-Lake Company	3-75
KEM Küppers Elektromechanik GmbH	3-76
Litre Meter	3-76
Thermo Fisher Scientific	3-77
Tokyo Keiso Co., Ltd	3-78
Trimec Industries	3_70

Four	Market Size and Growth Forecast	4-1
	Overview	4-1
	Growth Factors for the Turbine Flowmeter Market	4-4
	Turbine Flowmeters Are Well-Established	4-4
	Installed Base of Turbine Flowmeters	4-5
	Approval Organizations Specify Turbine Meters	4-5
	Turbine Flowmeters Remain a Viable Choice for Steady, Medium to High-Speed Flows	
	Turbine Suppliers Making Technology Improvements	4-7
	Factors Limiting the Growth of Turbine Flowmeters	4-7
	Competition from New-Technology Flowmeters	4-8
	Competition from Traditional Technology Meters	4-9
	Perception of Turbine Meters as 'Old Tech' and Unreliable 4	-10
	Companies Not Investing in Turbine Meters4	-10
	Market Size and Growth Forecasts4	-11
	Shipments of Turbine Flowmeters Worldwide by Region: Figures 4-1 to 4-54	-11
	Shipments of Turbine Flowmeters Worldwide by Type: Figures 4-6 to 4-224	-11
	Average Selling Prices of Turbine Flowmeters by Region and by Type: Figure 4-23 to 4-304	-12
	Shipments of Axial Turbine Flowmeters Worldwide by Region: Figures 4-31 to 4-35	-12
	Shipments of Single Jet Turbine Flowmeters Worldwide by Region: Figures 4-36 to 4-404	-12
	Shipments of Multi-Jet Turbine Flowmeters Worldwide by Region: Figures 4-41 to 4-454	-12
	Shipments of Paddlewheel Turbine Flowmeters Worldwide by Region: Figures 4-46 to 4-504	-13
	Shipments of Pelton Wheel Turbine Flowmeters Worldwide by Region: Figures 4-51 to 4-554	-13
	Shipments of Propeller Turbine Flowmeters Worldwide by Region: Figures 4-56 to 4-604	-13
	Shipments of Woltman Turbine Flowmeters Worldwide by Region: Figures 4-61 to 4-654	-13

Shipments of Compound Turbine Flowmeters Worldwide by Region: Figures 4-66 to 4-70	.4-13
Shipments of Fire Service Turbine Flowmeters Worldwide by Region: Figures 4-71 to 4-75	.4-14
Shipments of Other Turbine Flowmeters Worldwide by Region: Figures 4-76 to 4-80	.4-14
Shipments of Other Turbine Flowmeters Worldwide by Region: Figures 4-76 to 4-80	.4-14
Shipments of Turbine Flowmeters Worldwide by Region by Application: Figures 4-81 to 4-88	.4-14
Shipments of Turbine Flowmeters Worldwide by Region by Fluid Type: Figures 4-89 to 4-96	.4-15
Shipments of Turbine Flowmeters Worldwide by Region by Mounting Type: Figures 4-97 to 4-104	.4-15
Shipments of Turbine Flowmeters Worldwide by Region by Bearing Material: Figures 4-105 to 4-111	.4-16
Shipments of Turbine Flowmeters Worldwide by Region by Line Size: Figures 4-112 to 4-118	4-
Shipments of Turbine Flowmeters Worldwide by Region by Industry: Figures 4-119 to 4-125	4-
Shipments of Turbine Flowmeters Worldwide by Region by Distribution Channel: Figures 4-126 to 4-130	4-
Shipments of Turbine Flowmeters Worldwide by Region by Customer Type: Figures 4-119 to 4-125	4-

Five	Turbine Flowmeter Supplier Market Shares	5-1
	Overview	5-1
	Market Shares for the Leading Suppliers of Turbine Flowmeters Worldwide: Figures 5-1 to 5-7	5-1
	Market Shares for the Leading Suppliers of Turbine Flowmeters for Water/Wastewater Applications Worldwide: Figure 5-8	5-5
	Market Shares for the Leading Suppliers of Turbine Meters for Municipal/Industrial Gas Applications Worldwide: Figure 5-9	5-5
	Market Shares for the Leading Suppliers of Turbine Meters for Oil Applications: Figure 5-10	5-6
	Market Shares for the Leading Suppliers of Turbine Flowmeters for Industrial Liquid Applications Worldwide: Figure 5-11	

Six	Strategies for Success	6-1
	Research and Develop New Features and Products	6-1
	Develop Improvements to the Basic Technology	6-2
	Make Customers' Potential Ancillary Costs a Part of Your	
	Retention Strategy	6-3
	Reinforce the Price Advatage of Turbine Flowmeters	6-4
	Become a Broadline Supplier	6-4
	Form Alliances with Other Companies	6-6
	Provide a Migration Path for End-Users to More Current Technology	6-7
	Create and Maintain a Coherent and Understandable Production Naming System	
	Build a Great Website, and Keep it Up-to-Date	6-10
	Educate Your Customers about Flow Technology	6-11
	Invest in Smart Flowmeters, and in Communication Protoco	ols 6-12
	Prospects are Good for Turbine Flowmeters	6-13
Seven	Supplier Profiles	7-1
Seven	Supplier Profiles Aichi Tokei Denki Co., Ltd	
Seven	• •	7-1
Seven	Aichi Tokei Denki Co., Ltd.	7-1 7-7
Seven	Aichi Tokei Denki Co., Ltd. Arad Group	7-1 7-7
Seven	Aichi Tokei Denki Co., Ltd. Arad Group Badger Meter, Inc.; Cox Flow Measurement division	7-1 7-7 7-14 7-24
Seven	Aichi Tokei Denki Co., Ltd. Arad Group Badger Meter, Inc.; Cox Flow Measurement division Bopp & Reuther Messtechnik GmbH	7-1 7-7 7-14 7-24
Seven	Aichi Tokei Denki Co., Ltd. Arad Group Badger Meter, Inc.; Cox Flow Measurement division Bopp & Reuther Messtechnik GmbH Cameron Measurement Systems	7-1 7-7 7-14 7-24 7-27
Seven	Aichi Tokei Denki Co., Ltd. Arad Group Badger Meter, Inc.; Cox Flow Measurement division Bopp & Reuther Messtechnik GmbH Cameron Measurement Systems Danaher Corporation.	7-1 7-7 7-14 7-24 7-27 7-34
Seven	Aichi Tokei Denki Co., Ltd. Arad Group Badger Meter, Inc.; Cox Flow Measurement division Bopp & Reuther Messtechnik GmbH Cameron Measurement Systems Danaher Corporation Anderson Instrument Company, Inc.	7-1 7-7 7-14 7-24 7-27 7-36 7-38
Seven	Aichi Tokei Denki Co., Ltd. Arad Group Badger Meter, Inc.; Cox Flow Measurement division Bopp & Reuther Messtechnik GmbH Cameron Measurement Systems Danaher Corporation Anderson Instrument Company, Inc. McCrometer, Inc.	7-17-77-147-247-277-347-367-38
Seven	Aichi Tokei Denki Co., Ltd. Arad Group Badger Meter, Inc.; Cox Flow Measurement division Bopp & Reuther Messtechnik GmbH Cameron Measurement Systems Danaher Corporation Anderson Instrument Company, Inc. McCrometer, Inc. Venture Measurement Company LLC	7-17-77-147-247-277-367-387-41
Seven	Aichi Tokei Denki Co., Ltd. Arad Group Badger Meter, Inc.; Cox Flow Measurement division Bopp & Reuther Messtechnik GmbH Cameron Measurement Systems Danaher Corporation Anderson Instrument Company, Inc. McCrometer, Inc. Venture Measurement Company LLC Diehl Stiftung & Co., KG	7-17-77-147-247-277-367-387-417-457-50
Seven	Aichi Tokei Denki Co., Ltd. Arad Group Badger Meter, Inc.; Cox Flow Measurement division Bopp & Reuther Messtechnik GmbH Cameron Measurement Systems Danaher Corporation Anderson Instrument Company, Inc. McCrometer, Inc. Venture Measurement Company LLC Diehl Stiftung & Co., KG Elster Group SE	7-17-77-147-247-277-367-367-367-417-457-507-57
Seven	Aichi Tokei Denki Co., Ltd. Arad Group Badger Meter, Inc.; Cox Flow Measurement division. Bopp & Reuther Messtechnik GmbH Cameron Measurement Systems Danaher Corporation. Anderson Instrument Company, Inc. McCrometer, Inc. Venture Measurement Company LLC. Diehl Stiftung & Co., KG Elster Group SE. Emerson Process Management	7-17-77-147-247-277-367-367-367-507-57
Seven	Aichi Tokei Denki Co., Ltd. Arad Group Badger Meter, Inc.; Cox Flow Measurement division Bopp & Reuther Messtechnik GmbH Cameron Measurement Systems Danaher Corporation Anderson Instrument Company, Inc. McCrometer, Inc. Venture Measurement Company LLC Diehl Stiftung & Co., KG Elster Group SE Emerson Process Management Daniel Measurement and Control	7-17-77-147-247-277-347-367-367-457-507-577-587-63

Dresser, Inc.	7-71
GL Flow Limited	7-77
Great Plains Industries	7-79
Hoffer Flow controls, Inc	7-83
Honeywell International, Inc.	7-87
RMG Group	7-88
IDEX Corporation (Liquid Controls Group)	7-92
Itron	7-99
ManuFlo® Flow Measurement Products	7-104
Mueller Systems	7-108
Ningbo Donghai Group Corporation	7-111
Ningbo Huangtai Industrial Co., Ltd	7-113
Nitto Seiko Co., Ltd.	7-115
OVAL Corporation	7-120
Racine Federated Inc	7-127
Roper Industries, Inc.	7-133
Neptune Technology Group Inc	7-134
FTI Flow Technology, Inc.	7-136
SATAM sas	7-140
Sensus	7-142
Spirax Sarco Engineering plc Group (EMCO)	7-146
TASI Group	7-153
AW-Lake Company	7-154
KEM Küppers Elektromechanik GmbH	7-158
Litre Meter Limited	7-162
Thermo Fisher Scientific	7-165
Tokyo Keiso Co., Ltd	7-169
Trimec Industries	7-173

LIST OF FIGURES

F	ia	u	re
•	ıy	u	

1-1	Total Shipments of Turbine Meters Worldwide	1-9
1-2	Total Shipments of Turbine Meters Worldwide	1-10
1-3	Shipments of Turbine Flowmeters by Region	1-11
1-4	Shipments of Turbine Flowmeters Worldwide by Type	1-12
1-5	Shipments of Turbine Flowmeters Worldwide by Type	1-13
1-6	Market Shares for the Leading Suppliers of Turbine Flowmeters Worldwide	1-14
2-1	New-Technology and Traditional Technology Flowmeters	2-40
2-2	Emerging Technology Flowmeters	
2-3	New-Technology Flowmeters Approved by the Fieldbus Foundation	2-41
3-1	Advantages and Disadvantages of DP and New-Technology Flowmeters.	3-11
3-2	New-Technology and DP Flowmeter Principles of Operation	3-13
3-3	Paradigm Case Conditions for New-Technology Flowmeters	3-16
3-4	Where Traditional Technology Flowmeters Excel	3-24
3-5	Mergers and Acquisitions in Traditional Technology Flowmeter Suppliers	3-32
3-6	Types of Turbine Flowmeters by Supplier	
4-1	Total Shipments of Turbine Flowmeters Worldwide	4-19
4-2	Total Shipments of Turbine Flowmeters Worldwide	
4-3	Shipments of Turbine Flowmeters by Region	
4-4	Shipments of Turbine Flowmeters by Region	
4-5	Shipments of Turbine Flowmeters by Region	
4-6	Shipments of Turbine Flowmeters Worldwide by Type	
4-7	Shipments of Turbine Flowmeters Worldwide by Type	
4-8	Shipments of Turbine Flowmeters Worldwide by Type	4-26
4-9	Shipments of Turbine Flowmeters Worldwide by Type	4-27
4-10	Shipments of Turbine Flowmeters Worldwide by Type	
4-11	Shipments of Turbine Flowmeters in North America by Type	
4-12	Shipments of Turbine Flowmeters in North America by Type	4-30
4-13	Shipments of Turbine Flowmeters in Europe by Type	4-31

4-14	Shipments of Turbine Flowmeters in Europe by Type	.4-32
4-15	Shipments of Turbine Flowmeters in Japan by Type	.4-33
4-16	Shipments of Turbine Flowmeters in Japan by Type	.4-34
4-17	Shipments of Turbine Flowmeters in China by Type	.4-35
4-18	Shipments of Turbine Flowmeters in China by Type	.4-36
4-19	Shipments of Turbine Flowmeters in Rest of Asia by Type	.4-37
4-20	Shipments of Turbine Flowmeters in Rest of Asia by Type	.4-38
4-21	Shipments of Turbine Flowmeters in Rest of World by Type	.4-39
4-22	Shipments of Turbine Flowmeters in Rest of World by Type	. 4-40
4-23	Average Selling Price of Turbine Flowmeters by Region	.4-41
4-24	Average Selling Price of Turbine Flowmeters Worldwide by Type	. 4-42
4-25	Average Selling Price of Turbine Flowmeters in North America by Type	.4-43
4-26	Average Selling Price of Turbine Flowmeters in Europe by Type	. 4-44
4-27	Average Selling Price of Turbine Flowmeters in Japan by Type	. 4-45
4-28	Average Selling Price of Turbine Flowmeters in China by Type	.4-46
4-29	Average Selling Price of Turbine Flowmeters in Rest of Asia by Type	. 4-47
4-30	Average Selling Price of Turbine Flowmeters in Rest of World by Type	. 4-48
4-31	Shipments of Axial Turbine Flowmeters Worldwide	. 4-49
4-32	Shipments of Axial Turbine Flowmeters Worldwide	.4-50
4-33	Shipments of Axial Turbine Flowmeters by Region	.4-51
4-34	Shipments of Axial Turbine Flowmeters by Region	. 4-52
4-35	Shipments of Axial Turbine Flowmeters by Region	.4-53
4-36	Shipments of Single Jet Turbine Flowmeters by Region	. 4-54
4-37	Shipments of Single Jet Turbine Flowmeters by Region	. 4-55
4-38	Shipments of Single Jet Turbine Flowmeters by Region	. 4-56
4-39	Shipments of Single Jet Turbine Flowmeters by Region	. 4-57
4-40	Shipments of Single Jet Turbine Flowmeters by Region	. 4-58
4-41	Shipments of Multi-Jet Turbine Flowmeters by Region	. 4-59
4-42	Shipments of Multi-Jet Turbine Flowmeters by Region	. 4-60
4-43	Shipments of Multi-Jet Turbine Flowmeters by Region	.4-61
4-44	Shipments of Multi-Jet Turbine Flowmeters by Region	. 4-62
4-45	Shipments of Multi-Jet Turbine Flowmeters by Region	. 4-63
4-46	Shipments of Paddlewheel Turbine Flowmeters by Region	. 4-64
4-47	Shipments of Paddlewheel Turbine Flowmeters by Region	.4-65
4-48	Shipments of Paddlewheel Turbine Flowmeters by Region	. 4-66
4-49	Shipments of Paddlewheel Turbine Flowmeters by Region	. 4-67
4-50	Shipments of Paddlewheel Turbine Flowmeters by Region	. 4-68

4-51	Shipments of Pelton Wheel Turbine Flowmeters by Region	4-69
4-52	Shipments of Pelton Wheel Turbine Flowmeters by Region	4-70
4-53	Shipments of Pelton Wheel Turbine Flowmeters by Region	4-71
4-54	Shipments of Pelton Wheel Turbine Flowmeters by Region	4-72
4-55	Shipments of Pelton Wheel Turbine Flowmeters by Region	4-73
4-56	Shipments of Propeller Turbine Flowmeters by Region	4-74
4-57	Shipments of Propeller Turbine Flowmeters by Region	4-75
4-58	Shipments of Propeller Turbine Flowmeters by Region	4-76
4-59	Shipments of Propeller Turbine Flowmeters by Region	4-77
4-60	Shipments of Propeller Turbine Flowmeters by Region	4-78
4-61	Shipments of Woltman Turbine Flowmeters by Region	4-79
4-62	Shipments of Woltman Turbine Flowmeters by Region	4-80
4-63	Shipments of Woltman Turbine Flowmeters by Region	4-81
4-64	Shipments of Woltman Turbine Flowmeters by Region	4-82
4-65	Shipments of Woltman Turbine Flowmeters by Region	4-83
4-66	Shipments of Compound Turbine Flowmeters by Region	4-84
4-67	Shipments of Compound Turbine Flowmeters by Region	4-85
4-68	Shipments of Compound Turbine Flowmeters by Region	4-86
4-70	Shipments of Compound Turbine Flowmeters by Region	4-87
4-70	Shipments of Compound Turbine Flowmeters by Region	4-88
4-71	Shipments of Fire Service Turbine Flowmeters Worldwide	4-89
4-72	Shipments of Fire Service Turbine Flowmeters Worldwide	4-90
4-73	Shipments of Fire Service Turbine Flowmeters Worldwide	4-91
4-74	Shipments of Fire Service Turbine Flowmeters Worldwide	4-92
4-75	Shipments of Fire Service Turbine Flowmeters Worldwide	4-93
4-76	Shipments of Other Turbine Flowmeters Worldwide	4-94
4-77	Shipments of Other Turbine Flowmeters Worldwide	4-95
4-78	Shipments of Other Turbine Flowmeters Worldwide	4-96
4-79	Shipments of Other Turbine Flowmeters Worldwide	4-97
4-80	Shipments of Other Turbine Flowmeters Worldwide	4-98
4-81	Shipments of Turbine Flowmeters Worldwide by Application	4-99
4-82	Shipments of Turbine Flowmeters Worldwide by Application	4-100
4-83	Shipments of Turbine Flowmeters in North America by Application	4-101
4-84	Shipments of Turbine Flowmeters in Europe by Application	4-102
4-85	Shipments of Turbine Flowmeters in Japan by Application	4-103
4-86	Shipments of Turbine Flowmeters in China by Application	4-104
4-87	Shipments of Turbine Flowmeters in Rest of Asia by Application	4-105

4-88	Shipments of Turbine Flowmeters in Rest of World by Application	.4-106
4-89	Shipments of Turbine Flowmeters Worldwide by Fluid Type	.4-107
4-90	Shipments of Turbine Flowmeters Worldwide by Fluid Type	. 4-108
4-91	Shipments of Turbine Flowmeters in North America by Fluid Type	.4-109
4-92	Shipments of Turbine Flowmeters in Europe by Fluid Type	.4-110
4-93	Shipments of Turbine Flowmeters in Japan by Fluid Type	.4-111
4-94	Shipments of Turbine Flowmeters in China by Fluid Type	.4-112
4-95	Shipments of Turbine Flowmeters in Rest of Asia by Fluid Type	. 4-113
4-96	Shipments of Turbine Flowmeters in Rest of World by Fluid Type	.4-114
4-97	Shipments of Turbine Flowmeters Worldwide by Mounting Type	. 4-115
4-98	Shipments of Turbine Flowmeters Worldwide by Mounting Type	.4-116
4-99	Shipments of Turbine Flowmeters in North America by Mounting Type .	.4-117
4-100	Shipments of Turbine Flowmeters in Europe by Mounting Type	.4-118
4-101	Shipments of Turbine Flowmeters in Japan by Mounting Type	.4-119
4-102	Shipments of Turbine Flowmeters in China by Mounting Type	.4-120
4-103	Shipments of Turbine Flowmeters in Rest of Asia by Mounting Type	.4-121
4-104	Shipments of Turbine Flowmeters in Rest of World by Mounting Type	. 4-122
4-105	Shipments of Turbine Flowmeters Worldwide by Bearing Material	. 4-123
4-106	Shipments of Turbine Flowmeters in North America by	
	Bearing Material	. 4-124
4-107	Shipments of Turbine Flowmeters in Europe by Bearing Material	. 4-125
4-108	Shipments of Turbine Flowmeters in Japan by Bearing Material	.4-126
4-109	Shipments of Turbine Flowmeters in China by Bearing Material	.4-127
4-110	Shipments of Turbine Flowmeters in Rest of Asia by Bearing Material	. 4-128
4-111	Shipments of Turbine Flowmeters in Rest of World by Bearing Material.	.4-129
4-112	Shipments of Turbine Flowmeters Worldwide by Line Size	.4-130
4-113	Shipments of Turbine Flowmeters in North America by Line Size	.4-131
4-114	Shipments of Turbine Flowmeters in Europe by Line Size	.4-131
4-115	Shipments of Turbine Flowmeters in Japan by Line Size	.4-132
4-116	Shipments of Turbine Flowmeters in China by Line Size	.4-132
4-117	Shipments of Turbine Flowmeters in Rest of Asia by Line Size	.4-133
4-118	Shipments of Turbine Flowmeters in Rest of World by Line Size	.4-133
4-119	Shipments of Turbine Flowmeters Worldwide by Industry	.4-134
4-120	Shipments of Turbine Flowmeters in North America by Industry	.4-135
4-121	Shipments of Turbine Flowmeters in Europe by Industry	. 4-136
4-122	Shipments of Turbine Flowmeters in Japan by Industry	.4-137
4-123	Shipments of Turbine Flowmeters in China by Industry	.4-138
4-124	Shipments of Turbine Flowmeters in Rest of Asia by Industry	.4-139

4-125	Shipments of Turbine Flowmeters in Rest of World by Industry4-140
4-126	Shipments of Turbine Flowmeters Worldwide by Distribution Channel 4-141
4-127	Shipments of Turbine Flowmeters by Region by Distribution Channel 4-142
4-128	Shipments of Turbine Flowmeters by Region by Distribution Channel 4-143
4-129	Shipments of Turbine Flowmeters by Region by Distribution Channel 4-144
4-130	Shipments of Turbine Flowmeters by Region by Distribution Channel 4-145
4-131	Shipments of Turbine Flowmeters Worldwide by Customer Type4-146
4-132	Shipments of Turbine Flowmeters by Region by Customer Type4-147
4-133	Shipments of Turbine Flowmeters by Region by Customer Type4-148
4-134	Shipments of Turbine Flowmeters by Region by Customer Type4-149
5-1	Market Shares for the Leading Suppliers of Turbine Flowmeters
<i>5</i> 2	Worldwide
5-2	Market Shares for the Leading Suppliers of Turbine Flowmeters in North America
5-3	Market Shares for the Leading Suppliers of Turbine Flowmeters in Europe
5-4	Market Shares for the Leading Suppliers of Turbine Flowmeters in Japan
5-5	Market Shares for the Leading Suppliers of Turbine Flowmeters in China
5-6	Market Shares for the Leading Suppliers of Turbine Flowmeters in Rest of Asia
5-7	Market Shares for the Leading Suppliers of Turbine Flowmeters in Rest of World
5-8	Market Shares for the Leading Suppliers of Turbine Flowmeters for Water/Wastewater Applications Worldwide
5-9	Market Shares for the Leading Suppliers of Turbine Flowmeters for Municipal/Industrial Gas Applications Worldwide5-15
5-10	Market Shares for the Leading Suppliers of Turbine Flowmeters for Oil Applications Worldwide
5-11	Market Shares for the Leading Suppliers of Turbine Flowmeters for Industrial Liquid Applications Worldwide

xvii

LIST OF MAPS

2-1	World	2-11
2-2	World by Region	2-12
2-3	Asia	2-12
2-4	Europe and Russia	2-13
2-5	The Russian Federation	2-13
2-6	China	2-14
2-7	Japan	2-14
2-8	India	2-15
2-9	Indonesia	2-15
2-10	Europe, Mideast, and Africa (EMEA)	2-16
2-11	The Mideast	2-17
2-12	Commonwealth of Independent States and Asia	2-17
2-13	South America	2-18
2-14	Central America	2-18
2-15	The United States	2-19
2-16	Canada	2-19
	x A: Overview of <i>The World Market for Turbine Flowme</i>	