

Gas Separation Membrane Market by Module, Material Type, Application (Nitrogen Generation & Oxygen Enrichment, Hydrogen Recovery, CDR, Vapor/Gas Separation, Vapor/Vapor Separation, Air Dehydration, H2S Removal), and Region - Global Forecast to 2030

Market Report | 2025-10-27 | 258 pages | MarketsandMarkets

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Report description:

The gas separation membrane market is estimated to be worth USD 1.16 billion in 2025 and is projected to reach USD 1.67 billion by 2030, growing at a CAGR of 7.4% from 2025 to 2030. Spiral-wound modules combine a number of attributes that make them very appealing in many gas separation applications, acting as a strong middle ground between cost, performance, and operational practicality. Their compact design with high packing density allows for a large membrane area in a relatively small volume, meaning more separation area per module footprint. Also, spiral-wound modules are often less expensive to manufacture per unit of membrane area compared to many more complex module types, giving them cost-benefits especially in large-scale or energy-sensitive applications.

"Polysulfone type accounted for the second-largest market share during the forecast period."

Polysulfone types are expected to account for the second-highest market share in the gas separation membrane type segment, driven by their excellent balance of mechanical strength, thermal stability, and chemical resistance at a relatively lower cost compared to advanced polymers. Their robust structure makes them suitable for a wide range of industrial applications, including air separation, hydrogen recovery, and biogas upgrading, where moderate selectivity and durability are sufficient. Polysulfone is also highly processable, allowing manufacturers to fabricate membranes in different module configurations, such as hollow fiber and spiral wound, to meet diverse operational needs.

"Nitrogen generation & oxygen enrichment application is projected to account for the second-largest market share during the

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forecast period.

The nitrogen generation & oxygen enrichment segment is expected to hold the second highest market share in the gas separation membrane market due to their wide industrial and commercial demand. Nitrogen generation membranes are extensively used in food packaging, electronics, pharmaceuticals, and chemical industries to create inert atmospheres that enhance product safety and shelf life. Similarly, oxygen enrichment applications are gaining traction in healthcare, metal cutting, and wastewater treatment, where a reliable and cost-effective oxygen supply is critical. Membranes offer significant advantages in these applications by providing on-site gas generation with lower energy consumption, compact systems, and reduced dependence on bulk gas deliveries. The scalability and operational simplicity of membrane-based systems make them highly attractive across both large-scale industries and small to medium enterprises. While carbon dioxide removal leads in adoption, the versatility and growing demand for nitrogen and oxygen in essential industries ensure this segment secures the second-largest share in the market.

"North America is expected to account for the second-largest market share during the forecast period.

North America is expected to hold the second-highest market share in the gas separation membrane market, driven by its strong industrial base, advanced technological adoption, and supportive regulatory framework. The region has a high demand for gas separation membranes in natural gas processing, hydrogen recovery, and carbon capture, driven by the presence of abundant shale gas reserves and growing clean energy initiatives. In addition, industries such as petrochemicals, chemicals, and healthcare are increasingly adopting membrane technologies for nitrogen generation and oxygen enrichment, benefiting from their cost-effectiveness and energy efficiency. Continuous investments in R&D, coupled with the presence of leading global players and government policies encouraging emission reduction, further strengthen the region's market position. While Asia Pacific dominates due to large-scale industrialization, North America's mature energy sector, innovation-driven ecosystem, and emphasis on sustainability ensure it remains the second-largest regional market for gas separation membranes. North America has numerous manufacturers, including Air Products and Chemicals, Inc. (US), Honeywell International Inc. (US), GENERON (US), Membrane Technology and Research, Inc. (US), Parker Hannifin Corporation (US), and others.

This study has been validated through primary interviews with industry experts globally. These primary sources have been divided into the following three categories:

-□By Company Type- Tier 1- 60%, Tier 2- 20%, and Tier 3- 20%

-□By Designation- C Level- 33%, Director Level- 33%, and Managers- 34%

-□By Region- North America- 20%, Europe- 25%, Asia Pacific- 25%, Middle East & Africa- 15%, and Latin America- 15%

The report provides a comprehensive analysis of company profiles:

Prominent companies Air Liquide (France), Air Products and Chemicals, Inc. (US), Honeywell International Inc. (US), UBE Corporation (Japan), FUJIFILM RUS LLC (Japan), Linde plc (Ireland), DIC Corporation (Japan), GENERON (US), Membrane Technology and Research, Inc. (US), Parker Hannifin Corporation (US).

Study Coverage

This research report categorizes the gas separation membrane market by module (Plate & Frame, Spiral Wound, Hollow Fiber and Other Modules), Material Type (Polyimide & Polyaramide, Polysulfone, Cellulose Acetate and Other Types), Application (Nitrogen Generation & Oxygen Enrichment, Hydrogen Recovery, Carbon Dioxide Removal, Vapor/Gas Separation, Vapor/Vapor Separation, Air Dehydration, H₂S and Other Applications), Region (North America, Europe, Asia Pacific, Middle East & Africa, and South America). The scope of the report includes detailed information about the major factors influencing the growth of the gas separation membrane market, such as drivers, restraints, challenges, and opportunities. A thorough examination of the key industry players has been conducted in order to provide insights into their business overview, solutions, and services, key strategies, contracts, partnerships, and agreements. Product launches, mergers and acquisitions, and recent developments in the gas separation membrane market are all covered. This report includes a competitive analysis of upcoming startups in the gas separation membrane market ecosystem.

Reasons to buy this report:

The report will help the market leaders/new entrants in this market with information on the closest approximations of the revenue

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numbers for the overall gas separation membrane market and the subsegments. This report will help stakeholders understand the competitive landscape and gain more insights to position their businesses better and plan suitable go-to-market strategies. The report also helps stakeholders understand the pulse of the market and provides them with information on key market drivers, restraints, challenges, and opportunities.

The report provides insights on the following pointers:

-□Analysis of key drivers (Growing need for membranes in carbon dioxide separation processes, rising demand for membranes in nitrogen generation and syngas cleaning), restraints (Technical disadvantages compared to alternative gas separation technologies, plasticization of polymeric membranes in high temperature applications), opportunities (Rising demand for clean energy, development of mixed matrix membranes) and challenges (Upscaling and commercializing new membranes, requirement for high initial investment for development and installation of polymeric membranes for separation).

-□Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and service launches in the gas separation membrane market.

-□Market Development: Comprehensive information about lucrative markets - the report analyses the gas separation membrane market across varied regions.

-□Market Diversification: Exhaustive information about services, untapped geographies, recent developments, and investments in the gas separation membrane market

-□Competitive Assessment: In-depth assessment of market shares, growth strategies and service offerings of leading players like Air Liquide (France), Air Products and Chemicals, Inc. (US), Honeywell International Inc. (US), UBE Corporation (Japan), FUJIFILM RUS LLC (Japan), Linde plc (Ireland), DIC Corporation (Japan), GENERON (US), Membrane Technology and Research, Inc. (US), Parker Hannifin Corporation (US) among others in the gas separation membrane market.

Table of Contents:

1	INTRODUCTION	24
1.1	STUDY OBJECTIVES	24
1.2	MARKET DEFINITION	24
1.3	STUDY SCOPE	25
1.3.1	MARKETS COVERED AND REGIONAL SCOPE	25
1.3.2	INCLUSIONS AND EXCLUSIONS	26
1.3.3	YEARS CONSIDERED	26
1.3.4	CURRENCY CONSIDERED	27
1.3.5	UNITS CONSIDERED	27
1.4	STAKEHOLDERS	27
2	RESEARCH METHODOLOGY	28
2.1	RESEARCH DATA	28
2.1.1	SECONDARY DATA	29
2.1.1.1	List of key secondary sources	29
2.1.1.2	Key data from secondary sources	29
2.1.2	PRIMARY DATA	30
2.1.2.1	Key data from primary sources	30
2.1.2.2	List of primary interview participants-demand and supply side	30
2.1.2.3	Key industry insights	31
2.1.2.4	Breakdown of interviews with experts	31
2.2	MARKET SIZE ESTIMATION	31

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2.2.1	BOTTOM-UP APPROACH	32
2.2.2	TOP-DOWN APPROACH	32
2.3	FORECAST NUMBER CALCULATION	33
2.4	DATA TRIANGULATION	34
2.5	FACTOR ANALYSIS	35
2.6	ASSUMPTIONS	35
2.7	LIMITATIONS AND RISKS	36
3	EXECUTIVE SUMMARY	37
4	PREMIUM INSIGHTS	41
4.1	ATTRACTIVE OPPORTUNITIES FOR PLAYERS IN GAS SEPARATION MEMBRANES	41
4.2	GAS SEPARATION MEMBRANE MARKET, BY MODULE	41
4.3	GAS SEPARATION MEMBRANE MARKET, BY MATERIAL TYPE	42
4.4	GAS SEPARATION MEMBRANE MARKET, BY APPLICATION	42
4.5	GAS SEPARATION MEMBRANE MARKET, BY KEY COUNTRY	43
5	MARKET OVERVIEW	44
5.1	INTRODUCTION	44
5.2	MARKET DYNAMICS	44
5.2.1	DRIVERS	45
5.2.1.1	Growing need for membranes in carbon dioxide separation processes	45
5.2.1.2	Rising demand for membranes in nitrogen generation and syngas cleaning	45
5.2.1.3	Increasing implementation of environmental regulations and stringent emission standards	45
5.2.2	RESTRAINTS	46
5.2.2.1	Technical disadvantages compared to alternative gas separation technologies	46
5.2.2.2	Plasticization of polymeric membranes in high-temperature applications	47
5.2.3	OPPORTUNITIES	47
5.2.3.1	Rising demand for clean energy	47
5.2.3.2	Development of mixed matrix membranes	48
5.2.4	CHALLENGES	48
5.2.4.1	Upscaling and commercializing new membranes	48
5.2.4.2	Requirement for high initial investment for development and installation of polymeric membranes for separation	49
5.3	VALUE CHAIN ANALYSIS	49
5.4	PORTER'S FIVE FORCE ANALYSIS	50
5.4.1	BARGAINING POWER OF BUYERS	51
5.4.2	BARGAINING POWER OF SUPPLIERS	51
5.4.3	THREAT OF NEW ENTRANTS	52
5.4.4	THREAT OF SUBSTITUTES	52
5.4.5	INTENSITY OF COMPETITIVE RIVALRY	52
5.5	MACROECONOMIC OUTLOOK	53
5.5.1	INTRODUCTION	53
5.5.2	GDP TRENDS AND FORECASTS	53
5.6	REGULATORY LANDSCAPE	54
5.6.1	REGULATIONS	54
5.6.1.1	North America	54
5.6.1.2	Europe	54

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5.6.1.3	Asia Pacific	54
5.6.2	STANDARDS	54
5.6.2.1	ISO 21873-1	54
5.6.2.2	ASTM D1434	55
5.6.2.3	ISO 10156	55
5.6.2.4	ISO 10715	55
5.6.3	REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS	55
5.7	TECHNOLOGY ANALYSIS	57
5.7.1	KEY TECHNOLOGIES	57
5.7.1.1	Polymeric Membrane Technology	57
5.7.1.2	Inorganic Membrane Technology	58
5.7.2	COMPLEMENTARY TECHNOLOGIES	58
5.7.2.1	Mixed Matrix Membrane (MMM) Technology	58
5.7.2.2	Facilitated Transport Membranes (FTM)	58
5.7.3	ADJACENT TECHNOLOGIES	58
5.7.3.1	Nanocomposite & Hybrid Membranes	58
5.7.3.2	Bio-Based and Sustainable Membrane Materials	58
5.8	TRADE ANALYSIS	59
5.8.1	IMPORT SCENARIO (HS CODE 842199)	59
5.8.2	EXPORT SCENARIO (HS CODE 842199)	60
5.9	PRICING ANALYSIS	61
5.9.1	AVERAGE SELLING PRICE TREND OF KEY PLAYERS, BY APPLICATION, 2024	62
5.9.2	AVERAGE SELLING PRICE TREND, BY REGION, 2022-2024	62
5.10	ECOSYSTEM ANALYSIS	63
5.11	TRENDS/DISRUPTIONS IMPACTING CUSTOMER BUSINESS	65
5.12	KEY CONFERENCES AND EVENTS	66
5.13	KEY STAKEHOLDERS AND BUYING CRITERIA	67
5.13.1	KEY STAKEHOLDERS IN BUYING PROCESS	67
5.13.2	BUYING CRITERIA	68
5.14	CASE STUDY ANALYSIS	68
5.14.1	AIR PRODUCTS PROVIDED GAS SEPARATION MEMBRANE TECHNOLOGY TO OIL FIELD FOR METHANE EXTRACTION	68
5.14.2	HONEYWELL UOP'S SEPREX MEMBRANE TECHNOLOGY USED FOR NATURAL GAS PROCESSING TO ADHERE TO STRINGENT PURITY STANDARDS AND TRANSPORTATION REGULATIONS	69
5.14.3	FUJIFILM CORPORATION'S FUJIFILM APURA GAS SEPARATION MEMBRANES OFFER EFFICIENT AND LONG-LASTING NATURAL GAS TREATMENT	69
5.15	PATENT ANALYSIS	70
5.15.1	METHODOLOGY	70
5.15.2	DOCUMENT TYPES	70
5.15.3	PUBLICATION TRENDS IN LAST 10 YEARS	71
5.15.4	INSIGHTS	71
5.15.5	LEGAL STATUS OF PATENTS	71
5.15.6	JURISDICTION ANALYSIS	72
5.15.7	TOP APPLICANTS	73
5.16	INVESTMENT AND FUNDING SCENARIO	74
5.17	IMPACT OF GEN AI/AI ON GAS SEPARATION MEMBRANE MARKET	74
5.17.1	INTRODUCTION	74
5.17.2	AI-DRIVEN PRODUCTION OPTIMIZATION	74

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5.17.3	AI-DRIVEN QUALITY CONTROL AND MONITORING	75
5.17.4	GENAI FOR MEMBRANE DESIGN AND R&D ACCELERATION	75
5.18	MACROECONOMIC ANALYSIS	76
5.18.1	INTRODUCTION	76
5.18.2	GDP TRENDS AND FORECASTS	76
5.19	IMPACT OF 2025 US TARIFF - GAS SEPARATION MEMBRANE MARKET	77
5.19.1	INTRODUCTION	77
5.19.2	KEY TARIFF RATES	77
5.19.3	PRICE IMPACT ANALYSIS	78
5.19.4	IMPACT ON COUNTRY/REGION	78
5.19.4.1	US	78
5.19.4.2	China/South Korea/Taiwan	79
5.19.4.3	Europe	79
5.19.4.4	Mexico and Canada	79
5.19.5	IMPACT ON END-USE SECTOR	79
5.19.5.1	Nitrogen Generation & Oxygen Enrichment	79
5.19.5.2	Hydrogen Recovery	79
5.19.5.3	Carbon Dioxide Removal	80
5.19.5.4	Vapor/Gas & Vapor/Vapor Separation	80
5.19.5.5	Air Dehydration & H ₂ S Removal	80
6	GAS SEPARATION MEMBRANE MARKET, BY MATERIAL TYPE	81
6.1	INTRODUCTION	82
6.2	POLYIMIDE & POLYARAMIDE	83
6.2.1	NEED FOR MEMBRANES WITH ROBUST PERFORMANCE IN HARSH ENVIRONMENTS TO DRIVE SEGMENT	83
6.3	POLYSULFONE	84
6.3.1	RISING DEMAND FROM AUTOMOTIVE AND ELECTRONIC INDUSTRIES TO PROPEL SEGMENTAL GROWTH	84
6.4	CELLULOSE ACETATE	84
6.4.1	INCREASING USE IN APPLICATIONS REQUIRING LOW TEMPERATURE AND PRESSURE RESISTANCE TO CONTRIBUTE TO SEGMENTAL GROWTH	84
6.5	OTHER MATERIAL TYPES	85
7	GAS SEPARATION MEMBRANE MARKET, BY MODULE	86
7.1	INTRODUCTION	87
7.2	PLATE AND FRAME	89
7.2.1	INCREASING FOCUS ON REDUCING FOULING TO BOOST DEMAND	89
7.3	SPIRAL WOUND	89
7.3.1	DEMAND FROM WATER TREATMENT AND FOOD INDUSTRIES TO CONTRIBUTE TO SEGMENTAL GROWTH	89
7.4	HOLLOW FIBER	90
7.4.1	SUITABILITY FOR APPLICATIONS WITH SPACE CONSTRAINTS TO FUEL SEGMENTAL GROWTH	90
7.5	OTHER MODULES	90
8	GAS SEPARATION MEMBRANE MARKET, BY APPLICATION	91
8.1	INTRODUCTION	92
8.2	NITROGEN GENERATION & OXYGEN ENRICHMENT	94
8.2.1	GROWING DEMAND FROM FOOD & BEVERAGE AND AEROSPACE COMPANIES TO DRIVE MARKET	94
8.2.2	PACKAGING AND STORAGE	94
8.2.3	METAL MANUFACTURING AND FABRICATION	95

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- 8.2.4 ELECTRONICS 95
- 8.2.5 OIL & GAS 95
- 8.2.6 OTHER NITROGEN GENERATION & OXYGEN ENRICHMENT APPLICATIONS 95
- 8.3 HYDROGEN RECOVERY 96
- 8.3.1 INCREASING NEED FOR HYDROGEN AT INDUSTRIAL SCALE TO FUEL MARKET GROWTH 96
- 8.3.2 HYDROGEN PURIFICATION IN REFINERIES 96
- 8.3.3 HYDROGEN RECOVERY FROM SYNGAS PROCESSES 96
- 8.3.4 HYDROGEN RECOVERY FROM PURGE GAS 96
- 8.4 CARBON DIOXIDE REMOVAL 97
- 8.4.1 GROWING DEMAND FOR SHALE GAS TO CONTRIBUTE TO MARKET GROWTH 97
- 8.4.2 NATURAL GAS 97
- 8.4.3 BIOGAS 97
- 8.5 VAPOR/GAS SEPARATION 98
- 8.5.1 INCREASING NEED FOR HIGH-TEMPERATURE AND PRESSURE-RESISTANT MEMBRANES IN INDUSTRIAL PROCESSES TO DRIVE MARKET 98
- 8.6 VAPOR/VAPOR SEPARATION 98
- 8.6.1 VARIOUS ADVANTAGES OVER ALTERNATIVE TECHNOLOGIES TO FUEL MARKET GROWTH 98
- 8.7 AIR DEHYDRATION 98
- 8.7.1 DURABILITY AND COST-EFFECTIVENESS TO DRIVE MARKET 98
- 8.8 H₂S REMOVAL 99
- 8.8.1 RISING AWARENESS ABOUT COMPLIANCE WITH ENVIRONMENTAL REGULATIONS TO SUPPORT MARKET GROWTH 99
- 8.9 OTHER APPLICATIONS 99
- 9 GAS SEPARATION MEMBRANE MARKET, BY REGION 100
- 9.1 INTRODUCTION 101
- 9.2 NORTH AMERICA 106
- 9.2.1 US 111
- 9.2.1.1 Rising shale gas exploration activities to drive market 111
- 9.2.2 CANADA 113
- 9.2.2.1 Growing natural gas production to contribute to market growth 113
- 9.2.3 MEXICO 115
- 9.2.3.1 Growing construction and domestic plastic industries to drive market 115
- ?
- 9.3 EUROPE 117
- 9.3.1 GERMANY 122
- 9.3.1.1 High consumption of natural gas to fuel market growth 122
- 9.3.2 FRANCE 124
- 9.3.2.1 Growing demand for electric vehicles and variable renewable electricity to boost market growth 124
- 9.3.3 ITALY 126
- 9.3.3.1 Dependence on imported gas to drive demand for gas separation membranes 126
- 9.3.4 SPAIN 128
- 9.3.4.1 Increasing demand for natural gas in residential and industrial applications to fuel market growth 128
- 9.3.5 NETHERLANDS 130
- 9.3.5.1 Presence of large natural gas reserves to drive market 130
- 9.3.6 RUSSIA 132
- 9.3.6.1 Increasing oil & gas exports to drive market 132

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9.3.7	REST OF EUROPE	135
9.4	SOUTH AMERICA	137
9.4.1	BRAZIL	141
9.4.1.1	Rising renewable energy consumption to foster market growth	141
9.4.2	ARGENTINA	142
9.4.2.1	Growing dependence on natural gas to drive demand	142
9.4.3	REST OF SOUTH AMERICA	144
9.5	ASIA PACIFIC	147
9.5.1	CHINA	152
9.5.1.1	Growing use of nitrogen and oxygen gas in packaging, chemical, and other manufacturing applications to boost market	152
9.5.2	JAPAN	154
9.5.2.1	Natural gas consumption for domestic and industrial purposes to drive demand	154
9.5.3	INDIA	156
9.5.3.1	Government investments in domestic oil and natural gas exploration to contribute to market growth	156
9.5.4	SOUTH KOREA	158
9.5.4.1	High demand across various industries to drive market	158
9.5.5	REST OF ASIA PACIFIC	160
9.6	MIDDLE EAST & AFRICA	163
9.6.1	GCC COUNTRIES	167
9.6.1.1	Saudi Arabia	169
9.6.1.1.1	Expansion of oil & gas industry to support market growth	169
9.6.1.2	UAE	172
9.6.1.2.1	Government initiatives to drive market	172
9.6.1.3	Rest of GCC countries	173
9.6.2	REST OF MIDDLE EAST & AFRICA	175
10	COMPETITIVE LANDSCAPE	178
10.1	OVERVIEW	178
10.2	KEY PLAYER STRATEGIES	178
10.3	MARKET SHARE ANALYSIS	180
10.4	REVENUE ANALYSIS	183
10.5	COMPANY VALUATION AND FINANCIAL METRICS	184
10.6	PRODUCT/BRAND COMPARISON	185
10.7	COMPANY EVALUATION MATRIX: KEY PLAYERS, 2024	187
10.7.1	STARS	187
10.7.2	EMERGING LEADERS	187
10.7.3	PERVASIVE PLAYERS	187
10.7.4	PARTICIPANTS	187
10.7.5	COMPANY FOOTPRINT: KEY PLAYERS, 2024	189
10.7.5.1	Company footprint	189
10.7.5.2	Regional footprint	189
10.7.5.3	Company module footprint	190
10.7.5.4	Application footprint	190
10.8	COMPANY EVALUATION MATRIX: STARTUPS/SMES, 2024	191
10.8.1	PROGRESSIVE COMPANIES	191
10.8.2	RESPONSIVE COMPANIES	191
10.8.3	DYNAMIC COMPANIES	191
10.8.4	STARTING BLOCKS	191

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10.8.5	COMPETITIVE BENCHMARKING: STARTUPS/SMES, 2024	193
10.8.5.1	Detailed list of key startups/SMEs	193
10.8.5.2	Competitive benchmarking of key startups/SMEs	194
10.9	COMPETITIVE SCENARIO	196
10.9.1	PRODUCT LAUNCHES	196
10.9.2	DEALS	196
10.9.3	EXPANSIONS	197
11	COMPANY PROFILES	201
11.1	KEY COMPANIES	201
11.1.1	AIR LIQUIDE	201
11.1.1.1	Business overview	201
11.1.1.2	Products/Solutions/Services offered	202
11.1.1.3	Recent developments	203
11.1.1.3.1	Deals	203
11.1.1.3.2	Expansions	203
11.1.1.4	MnM view	204
11.1.1.4.1	Key strengths	204
11.1.1.4.2	Strategic choices	205
11.1.1.4.3	Weaknesses and competitive threats	205
11.1.2	AIR PRODUCTS AND CHEMICALS, INC.	206
11.1.2.1	Business overview	206
11.1.2.2	Products/Solutions/Services offered	207
11.1.2.3	Recent developments	208
11.1.2.3.1	Product launches	208
11.1.2.3.2	Deals	208
11.1.2.4	Expansions	208
11.1.2.5	MnM view	209
11.1.2.5.1	Key strategies	209
11.1.2.5.2	Strategic choices	209
11.1.2.5.3	Weaknesses and competitive threats	210
11.1.3	HONEYWELL INTERNATIONAL INC.	211
11.1.3.1	Business overview	211
11.1.3.2	Products/Solutions/Services offered	212
11.1.3.3	Recent developments	213
11.1.3.3.1	Deals	213
11.1.3.4	MnM view	213
11.1.3.4.1	Key strategies	213
11.1.3.4.2	Strategic choices	213
11.1.3.4.3	Weaknesses and competitive threats	213
11.1.4	UBE CORPORATION	214
11.1.4.1	Business overview	214
11.1.4.2	Products/Solutions/Services offered	215
11.1.4.3	MnM view	216
11.1.4.3.1	Key strategies	216
11.1.4.3.2	Strategic choices	216
11.1.4.3.3	Weaknesses and competitive threats	216
11.1.5	FUJIFILM RUS LLC	217

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11.1.5.1	Business overview	217
11.1.5.2	Products/Solutions/Services offered	218
11.1.5.3	Recent developments	219
11.1.5.3.1	Expansions	219
11.1.5.4	MnM view	219
11.1.5.4.1	Key strategies	219
11.1.5.4.2	Strategic choices	219
11.1.5.4.3	Weaknesses and competitive threats	220
11.1.6	LINDE PLC	221
11.1.6.1	Business overview	221
11.1.6.2	Products/Solutions/Services offered	222
11.1.6.3	MnM view	223
11.1.7	DIC CORPORATION	224
11.1.7.1	Business overview	224
11.1.7.2	Products/Solutions/Services offered	225
11.1.7.3	MnM view	226
11.1.8	GENERON	227
11.1.8.1	Business overview	227
11.1.8.2	Products/Solutions/Services offered	227
11.1.8.3	MnM view	228
11.1.9	MEMBRANE TECHNOLOGY AND RESEARCH, INC.	229
11.1.9.1	Business overview	229
11.1.9.2	Products/Solutions/Services offered	229
11.1.9.3	Recent developments	230
11.1.9.3.1	Expansions	230
11.1.9.4	MnM view	230
11.1.10	PARKER HANNIFIN CORP	231
11.1.10.1	Business overview	231
11.1.10.2	Products/Solutions/Services offered	232
11.1.10.3	MnM view	233
11.1.11	SCHLUMBERGER LIMITED	234
11.1.11.1	Business overview	234
11.1.11.2	Products/Solutions/Services offered	235
11.1.11.3	MnM view	236
11.2	OTHER KEY COMPANIES	237
11.2.1	AIRRANE	237
11.2.2	ATLAS COPCO GROUP	238
11.2.3	EVONIK INDUSTRIES AG	239
11.2.4	BORSIG MEMBRANE TECHNOLOGY GMBH	240
11.2.5	ARDENT PROCESS TECHNOLOGIES	241
11.2.6	COBETTER FILTRATION EQUIPMENT CO., LTD.	242
11.2.7	GENRICH MEMBRANES PVT. LTD.	243
11.2.8	GRASYS JSC.	244
11.2.9	MEGAVISION	245
11.2.10	NOVAMEM LTD.	245
11.2.11	PERMSELECT	246
11.2.12	PERVATECH	247

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11.2.13 SEPRATEC 248

11.2.14 THEWAY MEMBRANES 249

12 APPENDIX 250

12.1 DISCUSSION GUIDE 250

12.2 KNOWLEDGESTORE: MARKETSandMARKETS' SUBSCRIPTION PORTAL 254

12.3 CUSTOMIZATION OPTIONS 256

12.4 RELATED REPORTS 256

12.5 AUTHOR DETAILS 257

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