



Nonwoven Filter Media:

Global Markets to 2023

August 2018

Adrian Wilson

Report Code: AVM043G

Table of Contents

Chapter 1: Introduction	1
Study Goals and Objectives.....	1
Reasons for Doing This Study.....	1
Scope of Report.....	2
Information Sources.....	2
Methodology.....	3
Geographic Breakdown.....	3
Analyst's Credentials.....	6
Related BCC Research Reports.....	6
Chapter 2: Summary and Highlights	8
Chapter 3: Filtration Overview	13
Filtration Mechanisms	13
Straining or Sieving.....	13
Interception.....	13
Diffusion	13
Inertial Impaction.....	13
Electrostatic Attraction	14
Categories of Filtration	14
ISO 16890	16
Filtration Types	18
Surface Filtration.....	18
Deep-Bed or Depth Filtration.....	18
Chapter 4: Nonwoven Materials Overview	20
Nonwoven Materials Development.....	20
Nonwoven Definitions.....	20
Nonwoven Functionality	21
Nonwoven Products.....	22
Chapter 5: Raw Materials and Properties of Nonwoven Filter Media	24
Raw Materials: Fibers and Polymers.....	24
Global Fibers Market.....	24
Fiber Types.....	25
Natural Fibers	25
Cellulosics.....	25
Rayon, Tencel and Viscose	25
Wool	26
Other Natural Fibers.....	26
Synthetic Fibers	26
Acrylic Fibers	26
Aramids	27
Glass	27
Polyester.....	28
Polyimide.....	28
Polyolefins and Polypropylene	29
Polyphenylene Sulfide	30
Polytetrafluorethylene (PTFE).....	30

Bicomponent Fibers	30
Biofibers	31
Key Physical Properties of Commercial Fibers.....	31
Key Physical Properties and Testing of Filter Media.....	33
Pressure Drop.....	34
Triboelectric Effects in Filter Media	36
Comparison of Nonwoven Filter Media and Membranes	37
Nonwovens Approaching Membrane Efficiency.....	39
Ahlstrom-Munksjö Disruptor	39
DuPont HMT.....	40
Chapter 6: Manufacturing of Nonwovens Filtering Media	43
Drylaid Nonwovens.....	43
Carding	43
Airlaying.....	44
Wetlaid Nonwovens.....	44
Process Equipment.....	45
Spunbond Process.....	46
Polymer Melt Preparation.....	46
Filament Extrusion, Spinning and Drawing	47
Web Forming.....	47
Bonding	48
Product Characteristics	48
Commercial Spunbonding Processes	49
Reicofil 5.....	49
Meltblown Process.....	50
Meltblowing Operation	50
Process and Property Relationships.....	51
Limitations of Meltblown Technology.....	52
Borealis Finer Meltblown	53
Apertured Films Process	54
Hybrids and Combination Composites	54
Composite Material Formation	55
Technology Trends	55
Bonding Methods and Downstream Operations.....	56
Bonding Processes.....	56
Needlepunching	56
Chemical Bonding.....	57
Stitch Bonding	58
Thermal Bonding	58
Spunlacing	58
Norafin Spunlaced Media.....	58
Layering and Crosslapping.....	59
Finishing	59
Nanofiber Nonwovens Production	60
Nozzleless Electrospinning	60
Alternative Technologies.....	61
Summary of the Nonwoven Filter Media Manufacturing Processes.....	63
Product Forms of Nonwoven Filter Media.....	64
Air and Gas Filtration.....	64
Water and Liquid Filtration Products	65

Chapter 7: Commercial Applications and Nonwoven Filter Media Production and Pricing Overview	68
Commercial Applications	68
Nonwoven Filter Media Prices	71
Raw Materials Prices	72
Filter Media Manufacturing Margins	73
Chapter 8: Transportation Applications	75
Applications for Filter Media in Transport	75
Fuel and Oil Filters	76
Air Induction Filters	76
ISO 19713 for Engine Air Intake Filtration	77
Diesel Engine Demands	77
Euro VI Standard	78
Mann+Hummel’s Micrograde A-NF	79
Mann+Hummel’s Three-Stage Micrograde F	79
Clarcor’s Hybrid Media	80
Donaldson’s Synteq XP	80
Johns Manville’s Bicomponent Hybrids	80
Ahlstrom-Munksjö’s Captimax	81
Sandler’s Sawascreen Pleat	81
Cummins’ Fleetguard and StrataPore	81
Cummins’ NanoNet	82
Cummins’ NanoForce	82
Donaldson’s Ultra-Web	82
Donaldson’s PowerCore	83
Donaldson’s TopSpin	83
Volkswagen Controversy	84
Tougher Standards Anticipated	84
Pedestrian Protection	85
Automotive Cabin Air Filtration	85
Demands on Cabin Air Filters	85
Freudenberg’s micronAir	86
Hollingsworth & Vose’s Technostat	86
3M’s Filtrete	86
Mann+Hummel’s Precious Plus	87
Humidity’s Effect	87
Electric Vehicle Requirements	87
Fine Dust Eater	87
Aircraft Filtration	88
Engine Lube and Fuel Filtration	89
Hydraulic Systems	89
Ground Support Equipment	90
Cabin Air Systems	90
Avionics Cooling Electronic Equipment (E/E) Systems	91
Advanced Engine Bleed Air	91
Parker-Hannifin and Clarcor Case	91
Transportation Filter Media Market Value	92
Chapter 9: Water Filtration Applications	95
Supplying Clean Water	95

Types of Water Treatment.....	96
Drinking Water.....	96
AquaSure.....	97
Membrane-Based Separation Applications.....	97
Flat Membranes.....	98
Tubular Membranes.....	98
Pleated Membranes.....	99
Reemay Synergex.....	99
Viledon Hydrotexx ECO.....	99
Process Industry Applications.....	99
Boiler Feed Water Filtrations.....	99
Process Filtration Applications.....	100
Wastewater Treatment Applications.....	100
Domestic Wastewater.....	100
Industrial Wastewater.....	102
Freudenberg and Aquabio.....	102
Industrial Treatment Applications.....	103
Municipal Treatment Applications.....	103
Swimming Pool Applications.....	104
Reemay Spa and Pool Filter Media.....	105
Johns Manville's C-Clear.....	105
3M Ultra-PES.....	105
Seawater Desalination.....	106
WQA Product Sustainability Standards.....	107
Nonwoven Filter Media Growth in the Water Filtration Industry.....	107
Chapter 10: HVAC Applications.....	110
Air Quality Outside and Indoors.....	110
Nonwoven Filter Media for HVAC.....	111
Ventilation Filters.....	111
Commercial HVAC Filters.....	111
ISO 16890 test standard.....	112
Data Centers.....	113
Air Filtration in Commercial Buildings.....	113
Camfil Hi-Flo II.....	114
Ahlstrom-Munksjö Pleat 2Save.....	114
Sandler enAirsave.....	115
Johns Manville Three-layer Hybrids.....	115
H&V Nanowave LM.....	115
Adsorbent-Impregnated Filter Media for Odor Removal.....	115
3M Filtrete Retail Media.....	116
Vacuum Cleaner Bags.....	117
Sandler's PLA Vacuum Filter.....	118
Nonwoven Filter Media Growth in the HVAC Industry.....	118
Chapter 11: Healthcare Applications.....	121
Commercial Applications.....	121
Pharmaceutical Industry.....	122
Membrane Support Applications in Biopharma.....	123
Biopharma.....	124
MilliporeSigma.....	124

Cost of Product Separation and Purification	125
FibroSelect Nanofiber Filtration	125
Puridify Collaboration with GlaxoSmithKline	126
Puridify Acquisition by GE Healthcare.....	126
3M Emphaze AEX Hybrid Purifier	126
Air Filtration in Healthcare Facilities.....	127
HEPA and ULPA Filtration.....	129
Biofluid Filtration Applications	130
Blood and Serum Filtration Applications.....	130
Separation of Red and White Blood Cells by Filtration	131
Asahi’s Sepacell	131
Hemodialysis	132
Universal Plasma Filter	132
Miscellaneous Other Applications in the Healthcare Sector	133
Nonwoven Filter Media Growth in the Healthcare Industry	134
Chapter 12: Food Processing Applications	138
Food and Beverage Processing	138
Seitz Sheets and Pall SUPRAPak Filter Modules.....	139
Food Ingredients	140
Dairy Applications	141
Brewing Industry Applications	142
Additives Elimination Opportunity.....	142
More Nonwovens Substitution	143
Bottled Water Industry Applications	143
Threat from Membranes.....	144
Coffee Filters and Pods	144
3M Adds Wi-Fi to Coffee Filters	145
Teabags	145
Nonwoven Filter Media Growth in the Food Processing Industry.....	146
Chapter 13: Industrial Manufacturing Applications.....	149
Commercial Applications	149
Metal Processing Industry	149
Gravity Filters	150
Vacuum and Pressure Filters.....	150
Dust Collection Applications	151
Process and Energy Industries	151
Baghouses	152
Tougher Emissions Standards	153
Cement and Asphalt Manufacturing.....	154
Power Generation.....	154
Turbomachinery Applications	154
Hot Gas Filtration Applications	155
Water Filters for Generators	156
Clarcor Air Inlet Filtration System for GE H Turbines.....	157
Protection against Humidity.....	157
Trinitex Advance W3000	158
Filter Media for Water Jet Cutting Machines	158
Chemical Process Industry	159
Textile Mills.....	160

Paints and Coatings Industry Applications.....	160
Filler Particle Removal from Effluents.....	161
Ink Filtration Applications	161
Gels Removal.....	161
Perfumes and Cosmetics Industry Applications.....	162
Personal Protection Equipment.....	162
Electrostatic Nonwoven Filter Media for Removal of Microbial Spores and Bacteria.....	163
Biofiltration Applications	163
Nonwoven Filter Media Growth in the Industrial Manufacturing.....	163
Chapter 14: Oil and Gas Industry Applications	166
Oil Refining.....	166
3M DF Filter System	167
Commercial Applications	167
Hydrocarbon Processing Industry	167
Petrochemicals Industry.....	168
Coalescers.....	168
Mining Industry Applications	169
Hydraulic Fluid Filtration	169
Mine Air Filtration	169
Nonwoven Filter Media Growth in the Oil and Gas Industry	170
Chapter 15: Electronics Industry Applications.....	173
High Technology and Clean Rooms.....	173
Electronics Manufacturing.....	173
Clean Room Manufacturing Environment.....	174
Removal of Foul Gases by Adsorbent-Loaded Filter Media	174
Solvent Filtration in Printed Circuit Board Manufacturing.....	175
Ultrapure Water Usage	175
Meltblown Polypropylene for CMP Slurry Applications.....	176
Air Filtration for Electronic Components	176
Electronics and Disk Drives.....	176
Nonwoven Filter Media Growth in the Electronics Industry	177
Semiconductor Sales in 2016	177
Chapter 16: Industry Structure	180
Customer Base	180
Commodity and Specialized Markets	180
Global Market Summary Tables.....	180
SWOT Analysis of the Nonwoven Filter Media Industry.....	188
Strengths	188
Weaknesses.....	189
Opportunities	189
Threats.....	189
Driving Force Analysis	190
Regulatory Forces.....	190
Air and Water Quality Concerns.....	191
Environmental Protection and Pollution Control.....	191
Economic Forces.....	191
Raw Material Inflation and Product Pricing	192
Industry Structure Forces.....	192

Competition.....	192
New Entrants.....	193
Substitute Products	193
Buyers' Influence.....	194
Suppliers' Influence.....	194
Competitive Strategies in the Nonwoven Filter Media Industry	195
New Market Development.....	195
Strategic Alliances and Mergers.....	195
Customization.....	195
Focus on Niche Markets.....	196
Standardization	196

Chapter 17: Company Profiles: Major Customers and Users of Nonwoven Filter Media 198

End-Use Market	198
The Filter Media Converting Industry and Supply Chain	198
Filter Systems and Related Equipment Manufacturers.....	199
Other Key Players.....	201

Chapter 18: Company Profiles: Major Manufacturers of Nonwoven Filter Media 226

Chapter 19: Global Markets for Nonwoven Filter Media 249

Overview	249
Asia-Pacific.....	250
North America	250
EMEA	251

Chapter 20: North American Market Overview..... 254

Economic Trends.....	254
U.S.	254
Canada.....	255
Mexico	255
Regional Market Size and Growth.....	256
Nonwoven Capacity Expansions in North America	256
Mogul, Sandler and Tenowo	257
Filter Media Application Areas.....	259
Transportation.....	259
Water Filtration	260
Drinking Water, U.S.....	260
Drinking Water, Canada	261
Drinking Water, Mexico	261
Industrial Process Water/Wastewater.....	262
HVAC.....	262
Food Processing.....	263
Healthcare	264
Pharmaceuticals, U.S.....	264
Pharmaceuticals, Canada	265
Pharmaceuticals, Mexico	265
Air Treatment in Healthcare.....	265
Industrial Manufacturing.....	266

Oil and Gas Industry	267
Produced Water Treatment	267
Electronics	268
North American Market Value	269
Chapter 21: Europe, Middle East and Africa (EMEA) Market Overview.....	272
Economic Trends	272
Market Size and Growth	273
Application Areas	275
Transportation.....	275
Water Filtration	276
Drinking Water	276
Wastewater	277
Desalination.....	277
HVAC.....	277
Industrial Manufacturing.....	278
Food Processing.....	278
Healthcare	279
Oil and Gas	280
Electronics	280
Chapter 22: Asia-Pacific Market Overview	284
Economic Trends.....	284
China	285
India	287
Value of the Asia-Pacific Market.....	288
Application Markets.....	288
Water Filtration	288
Municipal Water/Wastewater	289
Industrial Process Water/Wastewater	290
Transportation.....	290
HVAC.....	291
Healthcare	292
Food Processing.....	293
Industrial Manufacturing.....	293
Electronics	294
Oil and Gas	295
Produced Water	295
Chapter 23: South American Market Overview.....	299
Economic Trends.....	299
Water Filtration	301
Transportation.....	301
Industrial Manufacturing.....	302
Oil and Gas	302
Chapter 24: Technological Developments and Trends	305
Patent Analysis.....	305
Trends.....	306
Nanofibers	307
Pleating.....	308
Bicomponent Fibers	309

Spunbonded Polyester and Hybrids	310
Environmentally Sustainable Media.....	310
Recycled Fibers.....	311
Plasma Coating	311
Surface-Modified Fibers	312
Pleated Ceramic Materials	312
Patents in China.....	312
About BCC Research.....	313
About BCC Research.....	314
BCC Membership	314
BCC Custom Research	314

List of Tables

Summary Table Global Market for Nonwoven Filter Media, by Application, Through 2023 (\$ Millions) ..	10
Table 1 Basic EN Air Filter Media Grades.....	15
Table 2 MERV Basic Filter Media Grades	16
Table 3 New ISO 16890 Categories.....	16
Table 4 Health Dangers Related to Particle Size	17
Table 5 Raw Materials Employed by the Nonwoven Filter Media Industry	24
Table 6 Key Physical Properties of Commercial Fibers for the Nonwoven Filter Media Industry	31
Table 7 Operating Parameters for Common Fibers Employed in Nonwoven Filter Media in Water Filtration.....	32
Table 8 Operating Parameters for Fibers Employed in Nonwoven Filter Media for Gas Filtration.....	32
Table 9 Physical Properties of Fibers That Influence Filtration Performance.....	33
Table 10 Standard Test Methods for Nonwoven Filter Media	35
Table 11 Classification of Nonwoven Filter Media Properties.....	36
Table 12 Triboelectric Nature of Fibers Used in Nonwoven Filter Media	36
Table 13 Comparison of Membrane and Nonwoven Filter Media	38
Table 14 Characteristics of Spunbond Nonwoven Filter Media	48
Table 15 Characteristics of Meltblown Filter Media.....	52
Table 16 Comparison of Spunbonding and Meltblown Technologies for Nonwoven Filter Media.....	53
Table 17 In-House Technologies of the Leading Filter Media Manufacturers.....	63
Table 18 Comparison of Basic Nonwoven Technologies Used in Nonwoven Filter Media Manufacturing	64
Table 19 Product Forms of Nonwoven Filter Media	66
Table 20 Global Market for Nonwoven Filter Media, by Application, Through 2023 (\$ Millions)	69
Table 21 Global Market Shares of Nonwoven Filter Media, by Application, 2017 (%).....	69
Table 22 Global Market Shares of Nonwoven Filter Media, by Type, 2017 (%)	70
Table 23 Global Market Shares by Value of Nonwoven Filter Media, by Type, 2017 (\$ Millions/%).....	70
Table 24 Global Market Shares, by Volume of Nonwoven Filter Media, by Type, 2017 (Metric Tons/%) .	71
Table 25 Global Market Size and Growth for Nonwoven Filter Media in the Transportation Application, Through 2023 (\$ Millions).....	92
Table 26 Global Market Shares of Nonwoven Filter Media in Transportation Applications, by Type, 2017 (\$ Millions/%)	93
Table 27 Global Market for Nonwoven Filter Media in Water Filtration, Through 2023 (\$ Millions).....	108
Table 28 Global Market Share of Nonwoven Filter Media in Water Treatment, by Type, 2017 (\$ Millions/%)	108
Table 29 Cost Comparison of Retail HVAC Filters (\$).....	116
Table 30 Effectiveness and Annual Cost of Six HVAC Filters (%/\$)	117
Table 31 Global Market Size and Growth for Nonwoven Filter Media in the HVAC Industry, Through 2023 (\$ Millions)	119
Table 32 Global Market Shares of Nonwoven Filter Media in the HVAC Industry, by Type, 2017 (\$ Millions/%)	119
Table 33 Ten Leading Pharmaceutical Companies, 2016 (\$ Billions).....	121
Table 34 Average Size of Common Contaminants in Hospital Air (Microns).....	127
Table 35 Characteristics of Nonwoven Filter Media in Hospital Air Filtration Applications.....	128
Table 36 HEPA and ULPA Filter Classes as per EN 1822:2009 Standard (%).....	129
Table 37 Global Market Size and Growth for Nonwoven Filter Media in the Healthcare Industry, Through 2023 (\$ Millions)	136

Table 38 Global Market Shares of Nonwoven Filter Media in Healthcare Applications, by Type, 2017 (\$ Millions/%)	136
Table 39 Typical Filtering Operations within a Food Processing Plant	138
Table 40 Global Market Size and Growth for Nonwoven Filter Media in Food and Beverage Processing, Through 2023 (\$ Millions).....	147
Table 41 Global Market Shares of Nonwoven Filter Media in Food and Beverage Processing, by Type, 2017 (\$ Millions/%)	147
Table 42 Typical Maximum Operating Temperatures and Weights of Fibers Employed in Media for High-Temperature Applications (°C/gsm)	152
Table 43 Survey of Common Airborne Contaminant Concentration and Sizes (mg/m ³ /micron).....	155
Table 44 Global Market Size and Growth for Nonwoven Filter Media in Industrial Manufacturing, Through 2023 (\$ Millions).....	164
Table 45 Global Market Shares of Nonwoven Filter Media in Industrial Manufacturing, by Type, 2017 (\$ Millions/%)	164
Table 46 Key Filtration Operations in Oil refining.....	166
Table 47 Global Market Size and Growth for Nonwoven Filter Media in the Oil and Gas Industry, Through 2023 (\$ Millions)	171
Table 48 Global Market Shares of Nonwoven Filter Media in the Oil and Gas Industry, by Type, 2017 (\$ Millions/%)	171
Table 49 Global Market Size and Growth in the Electronics Industry, Through 2023 (\$ Millions).....	178
Table 50 Global Market Shares of Nonwoven Filter Media in the Electronics Industry, by Type, 2017 (\$ Millions/%)	178
Table 51 Global Meltblown Sales, by Application, 2017 (\$ Millions).....	181
Table 52 Global Spunbond Sales, by Application, 2017 (\$ Millions).....	181
Table 53 Global Wetlaid Sales, by Application, 2017 (\$ Millions).....	182
Table 54 Global Drylaid Sales, by Application, 2017 (\$ Millions).....	182
Table 55 Global Apertured Film Sales, by Application, 2017 (\$ Millions).....	183
Table 56 Global Meltblown Sales, by Application, 2018 (\$ Millions).....	183
Table 57 Global Spunbond Sales, by Application, 2018 (\$ Millions).....	184
Table 58 Global Wetlaid Sales, by Application, 2018 (\$ Millions).....	184
Table 59 Global Drylaid Sales, by Application, 2018 (\$ Millions).....	185
Table 60 Global Apertured Film Sales, by Application, 2018 (\$ Millions).....	185
Table 61 Global Meltblown Sales, by Application, 2023 (\$ Millions).....	186
Table 62 Global Spunbond Sales, by Application, 2023 (\$ Millions).....	186
Table 63 Global Wetlaid Sales, by Application, 2023 (\$ Millions).....	187
Table 64 Global Drylaid Sales, by Application, 2023 (\$ Millions).....	187
Table 65 Global Apertured Film Sales, by Application, 2023 (\$ Millions).....	188
Table 66 SWOT Analysis of the Nonwoven Filter Media Summary	190
Table 67 Key Finishing Treatments for Nonwoven Filter Media	199
Table 68 Thirteen Leading Global Manufacturers of Filter Systems, by Filter Industry Turnover, 2017.....	199
Table 69 Pall’s Specific Filter Media Advantages, by Manufacturing Process	200
Table 70 Customized Filter Solutions from Pall	208
Table 71 Donaldson’s Recent Acquisitions, 2014-2017	211
Table 72 Filtration Group Acquisitions, 2009–2017	212
Table 73 Filtration Group Companies, by Business Unit.....	213
Table 74 Significant Recent Mann + Hummel Acquisitions, 2010-2018	215
Table 75 Clarcor’s Recent Acquisitions, 2011-2016.....	218
Table 76 Pentair’s Recent Acquisitions, 2004-2017.....	221
Table 77 Recent Sartorius Acquisitions, 2011-2016	223
Table 78 Top 15 Nonwoven Companies with Filter Media Businesses, by Global Nonwoven Revenue, 2017	226

Table 79 Notable Filter-Media Related Ahlstrom Acquisitions, 2001-2012	227
Table 80 Significant Filter-Media Related Expansion by Ahlstrom, 2004-2017.....	228
Table 81 Avintiv’s Key Acquisitions, 1992-2015.....	229
Table 82 Freudenberg Filtration Technologies Notable Developments, 2005–2016.....	232
Table 83 Notable Fibertex Acquisitions, 2004–2018	235
Table 84 Other Notable North-America-Headquartered Nonwoven Manufacturers and Converters with Filter Media Activities	246
Table 85 Other Notable EMEA-Headquartered Nonwoven Manufacturers with Filter Media Activities	247
Table 86 Notable Asia-Pacific-Headquartered Nonwoven Manufacturers with Filter Media Activities .	247
Table 87 Global Market Size and Growth for Nonwoven Filter Media, by Region, Through 2023 (\$ Millions)	251
Table 88 Global Market Shares of Nonwoven Filter Media, by Region, 2017 (%).....	252
Table 89 Recent Nonwoven Technology Expansions in North America, 2015-2018.....	258
Table 90 North American Market Nonwoven Filter Media, by Application, Through 2023 (\$ millions)..	269
Table 91 North American Market Shares of Nonwoven Filter Media, by Application, 2017 (%)	270
Table 92 Recent Nonwoven Technology Expansions in EMEA, 2015-2018.....	274
Table 93 EMEA Market for Nonwoven Filter Media, by Application, Through 2023 (\$ millions)	281
Table 94 EMEA Market Shares of Nonwoven Filter Media, by Application, 2017 (%)	282
Table 95 Recent Nonwoven Technology Expansions in Asia-Pacific, 2015-2019	284
Table 96 Asia-Pacific Market for Nonwoven Filter Media, by Application, Through 2023 (\$ Millions)....	297
Table 97 Asia-Pacific Market Shares of Nonwoven Filter Media, by Application, 2017 (%).....	297
Table 98 Recent Nonwoven Technology Expansions in South America, 2015 and 2016	299
Table 99 South America Market for Nonwoven Filter Media, by Application, Through 2023 (\$ Millions)	300
Table 100 South America Market Shares of Nonwoven Filter Media, by Application, 2017 (%)	300
Table 101 Key Holders of Filter Media Patents.....	305
Table 102 Recent Examples of Nanofiber Filter Media Patents, 2016-2018.....	307
Table 103 Examples of Recent Patents Relating to Pleating	308
Table 104 Recent Patents Relating to Bicomponent Filter Media, 2014-2017	309

List of Figures

Summary Figure Global Market of Nonwoven Filter Media, by Application, 2018–2023 (\$ Millions)..... 11



About BCC Research

About BCC Research

With our unparalleled 45-year history, BCC Research provides comprehensive analysis of global market sizing, forecasting and industry intelligence, covering markets where advances in science and technology are improving the quality, standard and sustainability of businesses, economies and lives.

BCC Membership

From market sizing and forecasts, to opportunity assessments and competitive analyses, our ever-expanding library gives you the data, insights and intelligence required to ensure your project is a success. Members benefit from ongoing, unlimited access to the category or collections of their choice, and most membership packages pay for themselves within two to three reports being accessed.

Did you buy this report? You may qualify to apply your purchase price toward a full membership. Call 866/285-7215 or e-mail info@bccresearch.com to request a demo.

BCC Custom Research

Our experts provide custom research projects to those working to identify new markets, introduce new products, validate existing market share, analyze competition and assess the potential for products to impact existing markets. With impressive academic credentials and broad and deep knowledge of global industrial markets, our independent analysts and consultants develop the facts, figures, analysis and assessments to inform the decisions that will move your company ahead. Confidential inquiries to: custom@bccresearch.com or 781/205-2429.

DISCLAIMER

The information developed in this report is intended to be as reliable as possible at the time of publication and is of a professional nature. This information does not constitute managerial, legal or accounting advice, nor should it be considered as a corporate policy guide, laboratory manual or an endorsement of any product, as much of the information is speculative in nature. BCC Research and the author assume no responsibility for any loss or damage that might result from reliance on the reported information or from its use.

ISBN: 978-1-62296-800-8
August 2018