



Tire Reinforcement Materials:

Global Markets to 2023

September 2018

Jason Chen

Report Code: AVM077D

Table of Contents

- Chapter 1: Introduction 1**
 - Study Goals and Objectives..... 1
 - Reasons for Doing This Study..... 2
 - Scope of Report..... 2
 - Intended Audience..... 2
 - Information Sources..... 2
 - Methodology..... 3
 - Geographic Breakdown..... 3
 - Analyst’s Credentials..... 9
 - Related BCC Research Reports..... 9

- Chapter 2: Summary 11**
 - Largest and Fastest-growing Markets..... 12
 - Significant Trends..... 13

- Chapter 3: Overview 15**
 - Definition of the Industry..... 15
 - Future Developments 15
 - International Targets and Regulations..... 16
 - Carbon Dioxide Emission Reduction..... 16
 - Global Tariffs 18
 - Recycling..... 18
 - Tire Labeling 18
 - Registration, Evaluation, Authorization and Restriction of Chemicals 19

- Chapter 4: Tire Output and Forecast by Product..... 21**
 - Automotive Tires..... 21
 - Automotive Tires in Detail 22
 - Subproducts 23
 - Cycle Tires..... 25
 - Bicycle Tire Output 25
 - Motorcycle Tires..... 26
 - Other Cycle Tires 26

- Chapter 5: Tire Output by Region 28**
 - Automotive Tires..... 29
 - Radial Light-Duty Tire Output by Region..... 30
 - Radial Heavy-Duty Tire Output by Region..... 31
 - Light-Duty Bias Tire Output by Region 31
 - Bias Heavy-Duty Tire Output by Region..... 32
 - Cycle Tires 33
 - Bicycle Tire Output by Region 33
 - Motorcycle Tire Output by Region..... 34
 - Other Cycle Tire Output by Region..... 35

- Chapter 6: Global Tire Reinforcement Market by Material Type..... 38**
 - Steel Tire Cord Fabric..... 39
 - History 39

Manufacturing Process.....	39
Growth Drivers and Inhibitors.....	40
Subproducts	41
Steel Bead Wire.....	44
Manufacturing Process.....	44
Growth Drivers and Inhibitors.....	44
Subproducts	45
Polyester Tire Cord Fabric.....	47
History	47
Manufacturing Process.....	47
Growth Drivers and Inhibitors.....	48
Subproducts	48
Nylon Tire Cord Fabric	50
Manufacturing Process.....	50
Growth Drivers and Inhibitors.....	50
Subproducts	51
Rayon Tire Cord Fabric.....	54
Manufacturing Process.....	54
Growth Drivers and Inhibitors.....	55
Subproducts	55
Aramid Tire Cord Fabric	56
Manufacturing Process.....	56
Growth Drivers and Inhibitors.....	57
Subproducts	57
Polyethylene Naphthalate Tire Cord Fabric.....	59
Manufacturing Process.....	59
Growth Drivers and Inhibitors.....	60
Subproducts	60
Other Tire Reinforcement Materials.....	62
Chapter 7: Global Market for Tire Reinforcement Materials by Technology	65
Drawing.....	65
Melt Spinning.....	66
Solution Spinning	66
Chapter 8: Global Market for Tire Reinforcement Materials by Region	68
Steel Tire Cord Fabric Market by Region	69
Chinese Steel Tire Cord Fabric Market.....	70
North American Steel Tire Cord Fabric Market.....	72
Western European: Steel Tire Cord Fabric Market	74
Eastern European Steel Tire Cord Fabric Market.....	75
South American Steel Tire Cord Fabric Market.....	77
East Asia and ASEAN Steel Tire Cord Fabric Market	79
Indian Steel Tire Cord Fabric Market.....	80
ROW Market for Steel Tire Cord Fabric.....	82
Steel Bead Wire Market by Region	83
Chinese Steel Bead Wire Market.....	84
North American Steel Bead Wire Market	86
Western European Steel Bead Wire Market.....	87
Eastern European Steel Bead Wire Market.....	88
South American Steel Bead Wire Market.....	90

East Asia and ASEAN Steel Bead Wire Market	91
Indian Steel Bead Wire Market	93
ROW Market for Steel Bead Wire	94
Polyester Tire Cord Fabric Market by Region	95
Chinese Polyester Tire Cord Fabric Market	96
North American Polyester Tire Cord Fabric Market.....	98
Western European Market for Polyester Tire Cord Fabric.....	100
Eastern European Polyester Tire Cord Fabric Market.....	102
South American Market for Polyester Tire Cord Fabric	103
East Asian and ASEAN Market for Polyester Tire Cord Fabric.....	104
Indian Market for Polyester Tire Cord Fabric.....	106
ROW market for Polyester Tire Cord Fabric.....	107
Nylon Tire Cord Fabric Market by Region	108
Chinese Nylon Tire Cord Fabric Market	108
North American Market for Nylon Tire Cord Fabric Market	110
Western European Market for Nylon Tire Cord Fabric	111
Eastern European Market for Nylon Tire Cord Fabric.....	113
South American Market for Nylon Tire Cord Fabric.....	114
East Asia and ASEAN Market for Nylon Tire Cord Fabric	116
Indian Market for Nylon Tire Cord Fabric.....	118
ROW Market for Nylon Tire Cord Fabric	119
Market for Rayon Tire Cord Fabric, by Region.....	120
Chinese Market for Rayon Tire Cord Fabric	121
North American Market for Rayon Tire Cord Fabric	122
Western European Rayon Tire Cord Fabric Market	123
Eastern European Market for Rayon Tire Cord Fabric	124
South American Market for Rayon Tire Cord Fabric	125
East Asia and ASEAN Market for Rayon Tire Cord Fabric.....	126
Indian Market for Rayon Tire Cord Fabric.....	128
ROW Market for Rayon Tire Cord Fabric.....	128
Market for Aramid Tire Cord Fabric, by Region	129
Chinese Market for Aramid Tire Cord Fabric.....	130
North American Market for Aramid Tire Cord Fabric	131
Western European Market for Aramid Tire Cord Fabric.....	133
Eastern European Market for Aramid Tire Cord Fabric.....	134
South American Market for Aramid Tire Cord Fabric	135
East Asia and ASEAN Market for Aramid Tire Cord Fabric	136
Indian Market for Aramid Tire Cord Fabric	137
ROW Market for Aramid Tire Cord Fabric.....	138
Market for Polyethylene Naphthalate Tire Cord Fabric, by Region.....	139
Chinese Market for PEN Tire Cord Fabric.....	140
North American Market for PEN Tire Cord Fabric.....	141
Western European Market for PEN Tire Cord Fabric Market	141
East Asia and ASEAN Market for PEN Tire Cord Fabric	142
Market for Other Tire Reinforcement Materials, by Region	143
Chapter 9: Global Market for Tire Cord Fabric by Application.....	145
Automobile Carcasses.....	145
Significant Trends in Carcass Applications	146
Belt Ply	147
Trends in Belt Ply Applications	148

Cap Ply.....	148
Chapter 10: Tire Reinforcement Technology.....	150
Technology Development	150
Drawing.....	151
Steel Tire Cord Fabric	151
Drawing for Steel Bead Wire	155
Melt Spinning	156
Melt Spinning Process Economics	156
Melt Spinning Methods.....	157
Post-Melt Spinning.....	157
Technological Innovation	158
Solution Spinning	158
Solution Spinning Process Economics	158
Solution Spinning for Rayon	159
Solution Spinning for Aramid	160
Technological Innovation	160
Performance Comparison	160
U.S. Patent Analysis	161
Patents by Company.....	161
Patents by Year.....	162
Patents by Major Country	162
Patents by Technology Type.....	162
Chapter 11: Industry Structure and Competitive Analysis.....	165
Steel Tire Cord Fabric Industry.....	165
Market Players	165
Strategies for Staying Competitive.....	166
Competitive Analysis	166
Impact On/Of Other Industries	167
Industry Leaders.....	168
Criteria for Success.....	168
Steel Bead Wire Industry	169
Market Players	169
Strategies for Staying Competitive.....	169
Competitive Analysis	169
Impact of other Industries.....	169
Industry Leaders.....	170
Polyester Tire Cord Fabric Industry.....	170
Strategies for Staying Competitive.....	170
Competitive Analysis	171
Impact of Other Industries	171
Industry Leaders.....	172
Nylon Tire Cord Fabric Industry	172
Strategies for Staying Competitive.....	172
Impact of Other Industries	172
Industry Leaders.....	172
Aramid Tire Cord Fabric Industry.....	173
Strategies for Staying Competitive.....	173
Strategies for Staying Competitive.....	173
Impact of Other Industries	173

Industry Leaders	174
Chapter 12: Company Profiles	176
Steel Tire Cord/Fabric Manufacturers	176
Polyester Tire Cord Fabric Manufacturers	178
Nylon Tire Cord Fabric Manufacturers.....	182
Rayon Tire Cord Fabric Manufacturers	185
Aramid Tire Cord Fabric Makers	186
About BCC Research.....	188
About BCC Research.....	189
BCC Membership	189
BCC Custom Research	189

List of Tables

Summary Table: Global Market for Tire Reinforcement Materials, by Major Product Segment, Through 2023 (\$ Millions)	11
Table 1 Global Tire Reinforcement Materials Output, by Application, Through 2023 (Million Units)	21
Table 2 Global Automotive Tire Reinforcement Materials Output, by Product Type, Through 2023 (Million Units)	23
Table 3 Global Cycle Tire Reinforcement Materials Output, by Product Type, Through 2023 (Million Units).....	25
Table 4 Global Tire Reinforcement Materials Output, by Region, Through 2023 (Million Units)	28
Table 5 Global Automotive Tire Reinforcement Materials Output, by Region, Through 2023 (Million Units).....	29
Table 6 Global Radial Light-Duty Tire Reinforcement Materials Output, by Region, Through 2023 (Million Units).....	30
Table 7 Global Radial Heavy-Duty Tire Reinforcement Materials Output, by Region, Through 2023 (Million Units)	31
Table 8 Global Bias Light-Duty Tire Reinforcement Materials Output, by Region, Through 2023 (Million Units).....	32
Table 9 Global Bias Heavy-Duty Tire Reinforcement Materials Output, by Region, Through 2023 (Million Units).....	32
Table 10 Global Cycle Tire Reinforcement Materials Output, by Region, Through 2023 (Million Units)...	33
Table 11 Global Bicycle Tire Reinforcement Materials Output, by Region, Through 2023 (Million Units)	34
Table 12 Global Motorcycle Tire Reinforcement Materials Output, by Region, Through 2023 (Million Units).....	35
Table 13 Global Other Cycle Tires Reinforcement Materials Output, by Region, Through 2023 (Million Units).....	36
Table 14 Global Market for Tire Reinforcement Materials, by Product Type, Through 2023 (\$ Millions)	38
Table 15 Global Market for Steel Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	41
Table 16 Global Market for Steel Bead Wire, by Segment, Through 2023 (\$ Millions).....	45
Table 17 Global Market for Polyester Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	49
Table 18 Global Market for Nylon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions).....	52
Table 19 Global Market for Rayon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	56
Table 20 Global Market for Aramid Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	58
Table 21 Global Market for Polyethylene Naphthalate Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	61
Table 22 Global Market for Other Tire Reinforcement Materials, Through 2023 (\$ Millions).....	62
Table 23 Global Market for Tire Reinforcement Materials, by Technology, Through 2023 (\$ Millions)....	65
Table 24 Global Market for Tire Reinforcement Materials, by Region, Through 2023 (\$ Millions)	68
Table 25 Global Market for Steel Tire Cord Fabric, by Region, Through 2023 (\$ Millions)	69
Table 26 Chinese Market for Steel Tire Cord Fabric, by Segment, Through 2023 (\$ Millions).....	70
Table 27 North American Market for Steel Tire Cord Fabric, by Segment, Through 2023 (\$ Millions).....	72
Table 28 Western European Market for Steel Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	74
Table 29 Eastern European Market for Steel Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)...	76
Table 30 South American Market for Steel Tire Cord Fabric, by Segment, Through 2023 (\$ Millions).....	77
Table 31 East Asia and ASEAN Market for Steel Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	79
Table 32 Indian Market for Steel Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	81
Table 33 ROW Market for Steel Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	82
Table 34 Global Market for Steel Bead Wire, by Region, Through 2023 (\$ Millions).....	84

Table 35 Chinese Market for Steel Bead Wire, by Segment, Through 2023 (\$ Millions)	84
Table 36 North American Market for Steel Bead Wire, by Segment, Through 2023 (\$ Millions)	86
Table 37 Western European Market for Steel Bead Wire, by Segment, Through 2023 (\$ Millions).....	87
Table 38 Eastern European Market for Steel Bead Wire, by Segment, Through 2023 (\$ Millions)	89
Table 39 South American Market for Steel Bead Wire, by Segment, Through 2023 (\$ Millions)	90
Table 40 East Asia and ASEAN Market for Steel Bead Wire, by Segment, Through 2023 (\$ Millions).....	92
Table 41 Indian Market for Steel Bead Wire, by Segment, Through 2023 (\$ Millions)	93
Table 42 ROW Market for Steel Bead Wire, by Segment, Through 2023 (\$ Millions).....	94
Table 43 Global Market for Polyester Tire Cord Fabric, by Region, Through 2023 (\$ Millions)	96
Table 44 Chinese Market for Polyester Tire Cord Fabrics, by Segment, Through 2023 (\$ Millions)	96
Table 45 North American Market for Polyester Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	98
Table 46 Western European Market for Polyester Tire Cord Fabrics, by Segment, Through 2023 (\$ Millions)	100
Table 47 Eastern European Market for Polyester Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	102
Table 48 South American Market for Polyester Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	103
Table 49 East Asia and ASEAN Market for Polyester Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	105
Table 50 Indian Market for Polyester Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	106
Table 51 ROW Market for Polyester Tire Cord Fabrics, by Segment, Through 2023 (\$ Millions)	107
Table 52 Global Market for Nylon Tire Cord Fabric, by Region, Through 2023 (\$ Millions).....	108
Table 53 Chinese Market for Nylon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	108
Table 54 North American Market for Nylon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions) ..	110
Table 55 Western European Market for Nylon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	112
Table 56 Eastern European Market for Nylon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	113
Table 57 South American Market for Nylon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions) ..	115
Table 58 East Asia and ASEAN Market for Nylon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	116
Table 59 Indian Market for Nylon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions).....	118
Table 60 ROW Market for Nylon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions).....	120
Table 61 Global Market for Rayon Tire Cord Fabric, by Region, Through 2023 (\$ Millions)	120
Table 62 Chinese Market for Rayon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions).....	121
Table 63 North American Market for Rayon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions) ..	122
Table 64 Western European Market for Rayon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	123
Table 65 Eastern European Market for Rayon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	124
Table 66 South American Market for Rayon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions) ..	125
Table 67 East Asia and ASEAN Market for Rayon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	127
Table 68 Indian Market for Rayon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	128
Table 69 ROW Market for Rayon Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	129
Table 70 Global Market for Aramid Tire Cord Fabric, by Region, Through 2023 (\$ Millions)	130
Table 71 Chinese Market for Aramid Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	130
Table 72 North American Market for Aramid Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	132
Table 73 Western European Market for Aramid Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	133

Table 74 Eastern European Market for Aramid Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	134
Table 75 South American Market for Aramid Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	135
Table 76 East Asia and ASEAN Market for Aramid Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	136
Table 77 Indian Market for Aramid Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	138
Table 78 ROW Market for Aramid Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	139
Table 79 Global Market for Polyethylene Naphthalate Tire Cord Fabric, by Region, Through 2023 (\$ Millions)	140
Table 80 Chinese Market for PEN Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	140
Table 81 North American Market for PEN Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	141
Table 82 Western European Market for PEN Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	142
Table 83 East Asia and ASEAN Market for PEN Tire Cord Fabric, by Segment, Through 2023 (\$ Millions)	142
Table 84 Global Market for Other Tire Reinforcement Materials, by Region, Through 2023 (\$ Millions)	143
Table 85 Global Market for Tire Reinforcement Materials, by Application, Through 2023 (\$ Millions)	145
Table 86 Global Market for Automobile Carcass Applications, by Material, Through 2023 (\$ Millions)	146
Table 87 Global Market for Belt Ply Applications, by Material, Through 2023 (\$ Millions)	147
Table 88 Global Market for Cap Ply Applications, by Material, Through 2023 (\$ Millions)	148
Table 89 Significant Technology Developments and Manufacturing Technologies, 1974-2017	150
Table 90 Process Economic Comparisons of Steel Tire Cord and Steel Bead Wire (\$ per Metric Ton)	151
Table 91 Process Economic Comparisons of Polyester, Nylon 66 and PEN Tire Cord Fabric (\$ per Metric Ton)	157
Table 92 Process Economic Comparisons of Rayon and Aramid Tire Cord Fabric (\$ per Metric Ton)	159
Table 93 Performance of Tire Reinforcement Materials after Dipping or Calendering	160
Table 94 Tire Reinforcement Patents, by Company, 2007-2016 (Number)	161
Table 95 Tire Reinforcement Patents, by Year, 2007-2016 (Number)	162
Table 96 Tire Reinforcement Patents, by Country, 2007-2016 (Number)	162
Table 97 Tire Reinforcement Patents, by Technology Type, 2007-2016 (Number)	163

List of Figures

Summary Figure: Global Market for Tire Reinforcement Materials, by Major Product Segment, 2016-2023 (\$ Millions)	12
Figure 1 Manufacturing Flow for Steel Tire Cord Fabric.....	152
Figure 2 Drawing Flow for Steel Tire Cord Fabric	152
Figure 3 Manufacturing Flow for Steel Bead Wire.....	155
Figure 4 Drawing Flow for Steel Bead Wire	155
Figure 5 Manufacturing Flow for Polyester/Nylon Tire Cord Fabric.....	156
Figure 6 Manufacturing Flow for Rayon/Aramid Tire Cord Fabric.....	159



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 towards 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: 978-1-62296-837-4
September 2018