

The Global Market for Carbon Nanotubes 2020

https://marketpublishers.com/r/GFC5A17860BEN.html

Date: April 2020

Pages: 376

Price: US\$ 1,250.00 (Single User License)

ID: GFC5A17860BEN

Abstracts

Multi-walled carbon nanotubes (MWCNTs)-enhanced products are commercially available in vartiety of markets. MWCNT arrays, sheets, flakes, films and yarns have found applications in consumer electronics, power cables, batteries, polymer composites, coatings, aerospace, sensors, heaters, filters and biomedicine.

The market for MWCNTs has witnessed a decline in large-scale production; however there still remains global demand of >2000 tons per annum with increased demand over the past 12 months in composites, automotive and aerospace applications and especially as battery additives in Asia. MWCNTs are used as conductive agents in lithium ion secondary batteries, with demand increasing greatly in markets for EVs and PHEVs.

Large-scale industrial production of single-walled carbon nanotubes (SWCNTs) has been initiated, promising new market opportunities in transparent conductive films, transistors, sensors and memory devices. Market volume for SWCNTs will increase in the coming years due to multi-volume production methods coming on stream and reduction in price. This will allow for penetration in high volume markets such as polymer composites, conductive coatings, antistatic coatings, rubber and tires, batteries, construction materials, asphalt, power cables and plastics.

Report contents:

Global production capacities for MWCNTS and SWCNTs, historical and forecast to 2030.

Unique market assessment tools to assess the viability of graphene, by market, and application.



Assessment of carbon nanotubes by market including applications, key benefits, market megatrends, market drivers for carbon nanotubes, technology drawbacks, competing materials, potential consumption of nanotubes to 2030 and main players.

Market drivers, trends and challenges, by target markets.

In-depth market assessment of opportunities for carbon nanotubes including potential revenues, pricing, most likely applications and market challenges.

Market analysis-Carbon nanotubes in:		
3D printing.		
Adhesives.		
Aerospace and aviation.		
Automotive.		
Coatings.		
Composites.		
Electronics (Flexible electronics, conductive films and displays; conductive inks; transistors, integrated circuites; memory devices; photonics)		
Energy storage, conversion and exploration (Batteries, supercapacitors, photovoltaics, fuel cells and hydrogen storage)		
Filtration and separation.		
Life sciences and medical.		
Power cables.		
Lubricants.		



Oil and gas.

Rubber and tires.
Sensors.
Smart textiles and apparel.
Thermal interface materials (TIM)
Analysis of opportunities, by applications.
Full list of technology collaborations, strategic partnerships, and M&As in the global carbon nanotubes market.
In-depth company profiles of over 100 producers and product developers.
Predictions for key growth areas and opportunities.
Analysis of the market for boron nitride nantotubes.
In death profiles of earlier population products production

In-depth profiles of carbon nanotubes producers including products, production capacities, manufacturing methods, collaborations, licensing, customers and target markets. Companies profiled include Arkema, BNNT LLC, C2CNT LLC, Carbonics, Inc., DexMat, Inc., OCSIAL, Fuji Pigment Co., Ltd., GSI Creos Corporation, Koatsu Gas Kogyo Co. Ltd., Korea Kumho Petrochemical Co., Ltd., Murata Machinery Ltd., Toray Industries, Inc., Zeon Corporation and many more.

Detailed forecasts for key growth areas, opportunities and demand.



Contents

1 EXECUTIVE SUMMARY

- 1.1 Exceptional properties
- 1.2 Products and applications
- 1.3 MWCNTs
 - 1.3.1 Applications
 - 1.3.2 Producers
 - 1.3.3 Production
 - 1.3.4 Market demand, tons
- 1.4 SWCNTs
 - 1.4.1 Applications
 - 1.4.2 Production
 - 1.4.3 Market demand, tons
- 1.5 Carbon nanotubes market challenges

2 OVERVIEW OF CARBON NANOTUBES

- 2.1 Properties
- 2.2 Multi-walled nanotubes (MWCNT)
 - 2.2.1 Properties
 - 2.2.2 Applications
- 2.3 Single-wall carbon nanotubes (SWCNT)
 - 2.3.1 Properties
 - 2.3.2 Applications
 - 2.3.3 Comparison between MWCNTs and SWCNTs
 - 2.3.4 Double-walled carbon nanotubes (DWNTs)
 - 2.3.4.1 Properties
 - 2.3.4.2 Applications
 - 2.3.5 Few-walled carbon nanotubes (FWNTs)
 - 2.3.5.1 Properties
 - 2.3.5.2 Applications
- 2.4 Carbon Nanohorns (CNHs)
 - 2.4.1 Properties
 - 2.4.2 Applications
- 2.5 Carbon Onions
 - 2.5.1 Properties
 - 2.5.2 Applications



- 2.6 Boron Nitride nanotubes (BNNTs)
 - 2.6.1 Properties
 - 2.6.2 Applications
- **3 CARBON NANOTUBE PRODUCTION**
- **4 CARBON NANOTUBES PATENTS**
- **5 CARBON NANOTUBES PRICING**
- **6 CARBON NANOTUBES IN 3D PRINTING**
- 6.1 Market overview
- 6.2 Applications
- 6.3 Market assessment
- 6.4 Global market in tons, historical and forecast to 2030
- 6.5 Product developers

7 CARBON NANOTUBES IN ADHESIVES

- 7.1 Market overview
- 7.2 Applications
- 7.3 Market prospects
- 7.4 Market assessment
- 7.5 Global market in tons, historical and forecast to 2030
- 7.6 Product developers

8 CARBON NANOTUBES IN AEROSPACE

- 8.1 Market overview
- 8.2 Applications
- 8.3 Market prospects
- 8.4 Market assessment
- 8.5 Global market in tons, historical and forecast to 2030
- 8.6 Product developers

9 CARBON NANOTUBES IN AUTOMOTIVE

9.1 Market overview



- 9.2 Applications
- 9.3 Market prospects
- 9.4 Market assessment
- 9.5 Global market in tons, historical and forecast to 2030
- 9.6 Product developers

10 CARBON NANOTUBES IN BATTERIES

- 10.1 Market overview
- 10.2 Applications
- 10.3 Market prospects
- 10.4 Market assessment
- 10.5 Global market in tons, historical and forecast to 2030
- 10.6 Product developers

11 CARBON NANOTUBES IN COMPOSITES

- 11.1 Market overview
- 11.2 Fiber-based polymer composite parts
 - 11.2.1 Market prospects
 - 11.2.2 Applications
 - 11.2.3 Market assessment
- 11.3 Metal-matrix composites
 - 11.3.1 Market assessment
- 11.4 Global market in tons, historical and forecast to 2030
- 11.5 Product developers

12 CARBON NANOTUBES IN CONDUCTIVE INKS

- 12.1 Market overview
- 12.2 Applications
- 12.3 Market prospects
- 12.4 Market assessment
- 12.5 Global market in tons, historical and forecast to 2030
- 12.6 Product developers

13 CARBON NANOTUBES IN CONSTRUCTION

13.1 Market overview



- 13.2 Market prospects
- 13.3 Market assessment
 - 13.3.1 Cement
 - 13.3.2 Asphalt bitumen
- 13.4 Global market in tons, historical and forecast to 2030
- 13.5 Product developers

14 CARBON NANOTUBES IN ELECTRONICS

- 14.1 WEARABLE ELECTRONICS AND DISPLAYS
 - 14.1.1 Market overview
 - 14.1.2 Market prospects
- 14.1.3 Applications
- 14.1.4 Market assessment
- 14.1.5 Global market, historical and forecast to 2030
- 14.1.6 Product developers
- 14.2 CARBON NANOTUBES IN TRANSISTORS AND INTEGRATED CIRCUITS
 - 14.2.1 Market overview
 - 14.2.2 Applications
 - 14.2.3 Market prospects
- 14.2.4 Market assessment
- 14.2.5 Global market, historical and forecast to 2030
- 14.2.6 Product developers
- 14.3 CARBON NANOTUBES IN MEMORY DEVICES
 - 14.3.1 Market overview
 - 14.3.2 Market prospects
 - 14.3.3 Market assessment
 - 14.3.4 Global market in tons, historical and forecast to 2030
 - 14.3.5 Product developers

15 CARBON NANOTUBES IN FILTRATION

- 15.1 Market overview
- 15.2 Applications
- 15.3 Market prospects
- 15.4 Market assessment
- 15.5 Global market in tons, historical and forecast to 2030
- 15.6 Product developers



16 CARBON NANOTUBES IN FUEL CELLS

- 16.1 Market overview
- 16.2 Applications
- 16.3 Market prospects
- 16.4 Market assessment
- 16.5 Global market in tons, historical and forecast to 2030
- 16.6 Product developers

17 CARBON NANOTUBES IN LIFE SCIENCES AND MEDICINE

- 17.1 Market overview
- 17.2 Applications
- 17.3 Market prospects
 - 17.3.1 Drug delivery
 - 17.3.2 Imaging and diagnostics
 - 17.3.3 Implants
 - 17.3.4 Medical biosensors
 - 17.3.5 Woundcare
- 17.4 Market assessment
- 17.5 Global market in tons, historical and forecast to 2030
- 17.6 Product developers

18 CARBON NANOTUBES IN LUBRICANTS

- 18.1 Market overview
- 18.2 Applications
- 18.3 Market prospects
- 18.4 Market assessment
- 18.5 Global market in tons, historical and forecast to 2030
- 18.6 Product developers

19 CARBON NANOTUBES IN OIL AND GAS

- 19.1 Market overview
- 19.2 Applications
- 19.3 Market prospects
- 19.4 Market assessment
- 19.5 Global market in tons, historical and forecast to 2030



19.6 Product developers

20 CARBON NANOTUBES IN PAINTS AND COATINGS

- 20.1 Market overview
- 20.2 Applications
- 20.3 Market prospects
- 20.4 Market assessment
- 20.5 Global market in tons, historical and forecast to 2030
- 20.6 Product developers

21 CARBON NANOTUBES IN PHOTONICS

- 21.1 Market overview
- 21.2 Applications
- 21.3 Market prospects
- 21.4 Market assessment
- 21.5 Global market in tons, historical and forecast to 2030
- 21.6 Product developers

22 CARBON NANOTUBES IN PHOTOVOLTAICS

- 22.1 Market overview
- 22.2 Applications
- 22.3 Market prospects
- 22.4 Market assessment
- 22.5 Global market in tons, historical and forecast to 2030
- 22.6 Product developers

23 CARBON NANOTUBES IN RUBBER AND TIRES

- 23.1 Market overview
- 23.2 Applications
- 23.3 Market prospects
- 23.4 Market assessment
- 23.5 Global market in tons, historical and forecast to 2030
- 23.6 Product developers

24 CARBON NANOTUBES IN SENSORS



- 24.1 Market overview
- 24.2 Applications
- 24.3 Market prospects
- 24.4 Market assessment
- 24.5 Global market in tons, historical and forecast to 2030
- 24.6 Product developers

25 CARBON NANOTUBES IN SMART TEXTILES AND APPAREL

- 25.1 Market overview
- 25.2 Applications
- 25.3 Market prospects
- 25.4 Market assessment
- 25.5 Global market in tons, historical and forecast to 2030
- 25.6 Product developers

26 CARBON NANOTUBES IN SUPERCAPACITORS

- 26.1 Market overview
- 26.2 Applications
- 26.3 Market prospects
- 26.4 Market assessment
- 26.5 Global market in tons, historical and forecast to 2030
- 26.6 Product developers

27 OTHER MARKETS

- 27.1 THERMAL INTERFACE MATERIALS
 - 27.1.1 Market assessment
- 27.2 POWER CABLES
 - 27.2.1 Market assessment

28 MULTI-WALLED CARBON NANOTUBES COMPANY PROFILES (99 COMPANY PROFILES)

29 SINGLE-WALLED CARBON NANOTUBES COMPANY PROFILES (12 COMPANY PROFILES)



30 RESEARCH METHODOLOGY

31 REFERENCES



Tables

TABLES

- Table 1. Market summary for carbon nanotubes-Selling grade particle diameter, usage, advantages, average price/ton, high volume applications, low volume applications and novel applications
- Table 2. Typical properties of SWCNT and MWCNT
- Table 3: Properties of CNTs and comparable materials
- Table 4. Applications of MWCNTs
- Table 5. Key MWCNT producers
- Table 6. Annual production capacity of the key MWCNT producers in 2018
- Table 7. MWCNT market demand forecast (tons), 2018-2030
- Table 8. Comparative properties of MWCNT and SWCNT
- Table 9. Annual production capacity of the key SWCNT producers in 2018
- Table 10. SWCNT market demand forecast (tons), 2018-2030. *
- Table 11. Carbon nanotubes market challenges
- Table 12: Properties of carbon nanotubes
- Table 13: Markets, benefits and applications of Single-Walled Carbon Nanotubes
- Table 14: Comparison between single-walled carbon nanotubes and multi-walled carbon nanotubes
- Table 15. Comparative properties of BNNTs and CNTs
- Table 16: SWCNT synthesis methods
- Table 17. Location of SWCNT patent filings 2008-2018
- Table 18. Main SWCNT patent assignees
- Table 19. Carbon nanotubes pricing (MWCNTS, SWCNT etc.) by producer
- Table 20. Market overview for carbon nanotubes in 3D printing
- Table 21. Applications of carbon nanotubes in 3D printing
- Table 22. Market and applications for carbon nanotubesin 3D printing
- Table 23: Demand for carbon nanotubes in 3-D printing (tons), 2018-2030
- Table 24: Product developers in carbon nanotubes in 3D printing
- Table 25. Market overview for carbon nanotubes in adhesives
- Table 26. Applications of carbon nanotubes in adhesives
- Table 27. Scorecard for carbon nanotubes in adhesives
- Table 28. Market and applications for carbon nanotubes in adhesives
- Table 29: Demand for carbon nanotubes in adhesives (tons), 2018-2030
- Table 30: Product developers in carbon nanotubes for adhesives
- Table 31. Market overview for carbon nanotubes in aerospace
- Table 32. Applications of carbon nanotubes in aerospace



- Table 33. Scorecard for carbon nanotubes in aerospace
- Table 34. Market and applications for carbon nanotubes in aerospace
- Table 35: Demand for carbon nanotubes in aerospace (tons), 2018-2030
- Table 36: Product developers in carbon nanotubes for aerospace
- Table 37. Market overview for carbon nanotubes in automotive
- Table 38. Applications of carbon nanotubes in automotive
- Table 39. Scorecard for carbon nanotubes in automotive
- Table 40. Market and applications for carbon nanotubes in automotive
- Table 41: Demand for carbon nanotubes in automotive (tons), 2018-2030
- Table 42: Product developers in carbon nanotubes in the automotive market
- Table 43. Market overview for carbon nanotubes in batteries
- Table 44. Applications of carbon nanotubes in batteries
- Table 45. Scorecard for carbon nanotubes in batteries
- Table 46. Market and applications for carbon nanotubes in batteries
- Table 47: Estimated demand for carbon nanotubes in batteries (tons), 2018-2030
- Table 48: Product developers in carbon nanotubes for batteries
- Table 49. Market overview for carbon nanotubes in composites
- Table 50. Scorecard for carbon nanotubes in fiber-based polymer composite parts
- Table 51. Applications of carbon nanotubes in fiber-based polymer composite parts
- Table 52. Market and applications for carbon nanotubes in fiber-based composite parts
- Table 53. Market and applications for carbon nanotubes in metal matrix composites
- Table 54. Global market for carbon nanotubes in composites 2018-2030, tons
- Table 55: Product developers in carbon nanotubes in composites
- Table 56. Market overview for carbon nanotubes in conductive inks
- Table 57. Applications of carbon nanotubes in conductive ink
- Table 58. Scorecard for carbon nanotubes in conductive inks
- Table 59. Market and applications for carbon nanotubes in conductive inks
- Table 60. Comparative properties of conductive inks
- Table 61: Demand for carbon nanotubes in conductive ink (tons), 2018-2027
- Table 62: Product developers in carbon nanotubes for conductive inks
- Table 63. Market overview for carbon nanotubes in construction
- Table 64. Scorecard for carbon nanotubes in construction
- Table 65. Carbon nanotubes for cement
- Table 66. Carbon nanotubes for asphalt bitumen
- Table 67: Demand for carbon nanotubes in construction (tons), 2018-2030
- Table 68: Carbon nanotubes product developers in construction
- Table 69. Market overview for carbon nanotubes in wearable electronics and displays
- Table 70. Scorecard for carbon nanotubes in wearable electronics and displays
- Table 71. Applications of carbon nanotubes in wearable electronics and displays



- Table 72. Market and applications for carbon nanotubes in wearable electronics and displays
- Table 73: Comparison of ITO replacements
- Table 74: Demand for carbon nanotubes in wearable electronics and displays, 2018-2030
- Table 75: Product developers in carbon nanotubes for electronics
- Table 76. Market overview for carbon nanotubes in transistors and integrated circuits
- Table 77. Applications of carbon nanotubes in transistors and integrated circuits
- Table 78. Scorecard for carbon nanotubes in transistors and integrated circuits
- Table 79. Market and applications for carbon nanotubes in transistors and integrated circuits
- Table 80: Demand for carbon nanotubes in transistors and integrated circuits, 2018-2030
- Table 81: Product developers in carbon nanotubes in transistors and integrated circuits
- Table 82. Market overview for carbon nanotubes in memory devices
- Table 83. Scorecard for carbon nanotubes in memory devices
- Table 84. Market and applications for carbon nanotubes in memory devices
- Table 85: Demand for carbon nanotubes in memory devices, 2018-2030
- Table 86: Product developers in carbon nanotubes for memory devices
- Table 87: Comparison of CNT membranes with other membrane technologies
- Table 88. Market overview for carbon nanotubes in filtration
- Table 89. Applications of carbon nanotubes in filtration
- Table 90. Scorecard for carbon nanotubes in filtration
- Table 91. Market and applications for carbon nanotubes in filtration
- Table 92: Demand for carbon nanotubes in filtration (tons), 2018-2030
- Table 93: Carbon nanotubes companies in filtration
- Table 94. Electrical conductivity of different catalyst supports compared to carbon nanotubes
- Table 95. Market overview for carbon nanotubes in fuel cells
- Table 96. Applications of carbon nanotubes in fuel cells
- Table 97. Scorecard for carbon nanotubes in fuel cells
- Table 98. Market and applications for carbon nanotubes in fuel cells
- Table 99: Demand for carbon nanotubes in fuel cells (tons), 2018-2030
- Table 100: Product developers in carbon nanotubes for fuel cells
- Table 101. Market overview for carbon nanotubes in life sciences and medicine
- Table 102. Applications of carbon nanotubes in life sciences and biomedicine
- Table 103. Scorecard for carbon nanotubes in drug delivery
- Table 104. Scorecard for carbon nanotubes in imaging and diagnostics
- Table 105. Scorecard for carbon nanotubes in medical implants



- Table 106. Scorecard for carbon nanotubes in medical biosensors
- Table 107. Scorecard for carbon nanotubes in woundcare
- Table 108. Market and applications for carbon nanotubes in life sciences and medicine
- Table 109: Demand for carbon nanotubes in life sciences and medical (tons),
- 2018-2030
- Table 110: Product developers in carbon nanotubes for life sciences and biomedicine
- Table 117. Market overview for carbon nanotubes in lubricants
- Table 118. Nanomaterial lubricant products
- Table 119. Applications of carbon nanotubes in lubricants
- Table 120. Scorecard for carbon nanotubes in lubricants
- Table 121. Market and applications for carbon nanotubes in lubricants
- Table 122: Demand for carbon nanotubes in lubricants (tons), 2018-2030
- Table 123: Product developers in carbon nanotubes for lubricants
- Table 124. Market overview for carbon nanotubes in oil and gas
- Table 125. Applications of carbon nanotubes in oil and gas
- Table 126. Scorecard for carbon nanotubes in oil and gas
- Table 127. Market and applications for carbon nanotubes in oil and gas
- Table 128: Demand for carbon nanotubes in oil and gas (tons), 2018-2030
- Table 129: Product developers in carbon nanotubes for oil and gas
- Table 130. Markets for nanocoatings
- Table 131. Market overview for carbon nanotubes in paints and coatings
- Table 132. Applications of carbon nanotubes in paints and coatings
- Table 133. Scorecard for carbon nanotubes in paints and coatings
- Table 134. Market and applications for carbon nanotubes in paints and coatings
- Table 135: Demand for carbon nanotubes in paints and coatings (tons), 2018-2030
- Table 136: Product developers in carbon nanotubes for paints and coatings
- Table 137. Market overview for carbon nanotubes in photonics
- Table 138. Applications of carbon nanotubes in photonics
- Table 139. Scorecard for carbon nanotubes in photonics
- Table 140. Market and applications for carbon nanotubes in photonics
- Table 141: Demand for carbon nanotubes in photonics, 2018-2030
- Table 142: Product developers in carbon nanotubes in photonics
- Table 143. Market overview for carbon nanotubes in photovoltaics
- Table 144. Applications of carbon nanotubes in photovoltaics
- Table 145. Scorecard for carbon nanotubes in photovoltaics
- Table 146. Market and applications for carbon nanotubes in photovoltaics
- Table 147: Demand for carbon nanotubes in photovoltaics (tons), 2018-2030
- Table 148: Product developers in carbon nanotubes for solar
- Table 149. Market overview for carbon nanotubes in rubber and tires



- Table 150. Applications of carbon nanotubes in rubber and tires
- Table 151. Scorecard for carbon nanotubes in rubber and tires
- Table 152. Market and applications for carbon nanotubes in rubber and tires
- Table 153: Demand for carbon nanotubes in rubber and tires (tons), 2018-2030
- Table 154: Product developers in carbon nanotubes in rubber and tires
- Table 155. Market overview for carbon nanotubes in sensors
- Table 156. Applications of carbon nanotubes in sensors
- Table 157. Scorecard for carbon nanotubes in sensors
- Table 158. Market and applications for carbon nanotubes in sensors
- Table 159: Demand for carbon nanotubes in sensors (tons), 2018-2030
- Table 160: Product developers in carbon nanotubes for sensors
- Table 161: Desirable functional properties for the textiles industry afforded by the use of nanomaterials
- Table 162. Market overview for carbon nanotubes in smart textiles and apparel
- Table 163. Applications of carbon nanotubes in smart textiles and apparel
- Table 164. Scorecard for carbon nanotubes in smart textiles and apparel
- Table 165. Market and applications for carbon nanotubes in smart textiles and apparel
- Table 166: Demand for carbon nanotubes in textiles (tons), 2018-2030
- Table 167: Carbon nanotubes product developers in smart textiles and apparel
- Table 168. Market overview for carbon nanotubes in supercapacitors
- Table 169. Applications of carbon nanotubes in supercapacitors
- Table 170. Scorecard for carbon nanotubes in supercapacitors
- Table 171. Market and applications for carbon nanotubes in supercapacitors
- Table 172: Demand for carbon nanotubes in supercapacitors (tons), 2018-2030
- Table 173: Product developers in carbon nanotubes for supercapacitors
- Table 174. Market and applications for carbon nanotubes in thermal interface materials
- Table 175. Market and applications for carbon nanotubes in power cables
- Table 176: CNT producers and companies they supply/licence to
- Table 177. Properties of carbon nanotube paper
- Table 178. Ex-producers of SWCNTs
- Table 179. SWCNTs distributors



Figures

FIGURES

- Figure 1. Demand for MWCNT by application in 2019
- Figure 2. SWCNT production capacity by producer in 2018 (tons)
- Figure 3. Calculated SWCNT sales volume by producer in 2018 (kg)
- Figure 4: Schematic of single-walled carbon nanotube
- Figure 5: TIM sheet developed by Zeon Corporation
- Figure 6: Double-walled carbon nanotube bundle cross-section micrograph and model
- Figure 7. TEM image of FWNTs
- Figure 8: Schematic representation of carbon nanohorns
- Figure 9: TEM image of carbon onion
- Figure 10: Schematic of Boron Nitride nanotubes (BNNTs). Alternating B and N atoms are shown in blue and red
- Figure 11: Schematic representation of methods used for carbon nanotube synthesis (a)
- Arc discharge (b) Chemical vapor deposition (c) Laser ablation (d) hydrocarbon flames
- Figure 12: Arc discharge process for CNTs
- Figure 13: Schematic of thermal-CVD method
- Figure 14: Schematic of plasma-CVD method
- Figure 15: CoMoCAT® process
- Figure 16: Schematic for flame synthesis of carbon nanotubes (a) premixed flame (b)
- counter-flow diffusion flame (c) co-flow diffusion flame (d) inverse diffusion flame
- Figure 17: Schematic of laser ablation synthesis
- Figure 18: MWCNT patents filed 2007-2019
- Figure 19. SWCNT patent applications 2001-2018
- Figure 20: Demand for carbon nanotubes in 3-D printing (tons), 2018-2030
- Figure 21: Demand for carbon nanotubes in adhesives (tons), 2018-2030
- Figure 22. Carbon nanotube Composite Overwrap Pressure Vessel (COPV) developed by NASA
- Figure 23: Demand for carbon nanomaterials in aerospace (tons), 2018-2030
- Figure 24. HeatCoat technology schematic
- Figure 25: Veelo carbon fiber nanotube sheet
- Figure 26: Demand for carbon nanotubes in automotive (tons), 2018-2030
- Figure 27: Schematic of CNTs as heat-dissipation sheets
- Figure 28: Demand for carbon nanomaterials in batteries (tons), 2018-2030
- Figure 29: Nano Lithium X Battery
- Figure 30. Demand for carbon nanotubes in composites (tons), 2018-2030
- Figure 31. CSCNT Reinforced Prepreg



- Figure 32: Demand for carbon nanotubes in conductive ink (tons), 2018-2030
- Figure 33: Nanotube inks
- Figure 34. Comparison of nanofillers with supplementary cementitious materials and aggregates in concrete
- Figure 35: Demand for carbon nanotubes in construction (tons), 2018-2030
- Figure 36: Demand for carbon nanotubes in wearable electronics and displays, 2018-2030
- Figure 37: Demand for carbon nanomaterials in transistors and integrated circuits, 2018-2030
- Figure 38: Thin film transistor incorporating CNTs
- Figure 39: Demand for carbon nanotubes in memory devices, 2018-2030
- Figure 40: Carbon nanotubes NRAM chip
- Figure 41. Strategic Elements' transparent glass demonstrator
- Figure 42: Demand for carbon nanotubes in filtration (tons), 2018-2030
- Figure 43: Demand for carbon nanotubes in fuel cells (tons), 2018-2030
- Figure 44: Demand for carbon nanotubes in life sciences and medical (tons), 2018-2030
- Figure 45: CARESTREAM DRX-Revolution Nano Mobile X-ray System
- Figure 46. Graphene medical biosensors for wound healing
- Figure 47: Graphene Frontiers' Six chemical sensors consists of a field effect transistor
- (FET) with a graphene channel. Receptor molecules, such as DNA, are attached directly to the graphene channel.
- Figure 48: GraphWear wearable sweat sensor
- Figure 49: Demand for carbon nanotubes in lubricants (tons), 2018-2030
- Figure 50: Demand for carbon nanotubes in oil and gas (tons), 2018-2030
- Figure 51: Demand for carbon nanotubes in paints and coatings (tons), 2018-2030
- Figure 52. CSCNT Reinforced Prepreg
- Figure 53: Demand for carbon nanotubes in photonics, 2018-2030
- Figure 54. All-graphene optical communication link demonstrator operating at a data
- rate of 25 Gb/s per channel
- Figure 55: Demand for carbon nanotubes in photovoltaics (tons), 2018-2030
- Figure 56: Suntech/TCNT nanotube frame module
- Figure 57: Demand for carbon nanotubes in rubber and tires (tons), 2018-2030
- Figure 58: Demand for carbon nanotubes in sensors (tons), 2018-2030
- Figure 59: Demand for carbon nanotubes in textiles (tons), 2018-2030
- Figure 60: Demand for carbon nanotubes in supercapacitors (tons), 2018-2030
- Figure 61. Nawa's ultracapacitors
- Figure 62. AWN Nanotech water harvesting prototype
- Figure 63. Carbonics, Inc.'s carbon nanotube technology
- Figure 64. Fuji carbon nanotube products



- Figure 65. Cup Stacked Type Carbon Nano Tubes schematic
- Figure 66. CSCNT composite dispersion
- Figure 67. Flexible CNT CMOS integrated circuits with sub-10 nanoseconds stage delays
- Figure 68. Koatsu Gas Kogyo Co. Ltd CNT product
- Figure 69. Hybrid battery powered electrica motorbike concept
- Figure 70. Schematic illustration of three-chamber system for SWCNH production
- Figure 71. TEM images of carbon nanobrush
- Figure 72: Carbon nanotube paint product
- Figure 73. HiPCO® Reactor



I would like to order

Product name: The Global Market for Carbon Nanotubes 2020

Product link: https://marketpublishers.com/r/GFC5A17860BEN.html

Price: US\$ 1,250.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer

Service:

info@marketpublishers.com

Payment

First name: Last name:

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page https://marketpublishers.com/r/GFC5A17860BEN.html

To pay by Wire Transfer, please, fill in your contact details in the form below:

Email:	
Company:	
Address:	
City:	
Zip code:	
Country:	
Tel:	
Fax:	
Your message:	
	**All fields are required
	Custumer signature

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at https://marketpublishers.com/docs/terms.html

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970