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Carbon Nanotubes (CNT) Market by Type (Single Walled & Multi Walled), End-use Industry (Electronics & Semiconductors, Chemical Materials & Polymers, Structural Composites, Energy & Storage, Medical), Method, and Region - Global Forecast to 2026

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Abstracts

The carbon nanotubes market is projected to grow from USD 876 million in 2021 to USD 1,714 million by 2026, at a CAGR of 14.4% between 2021 and 2026. The demand and use of CNTs are rapidly increasing in medical, aerospace & defense, coatings, and other applications, especially in the APAC region.

The driving factor for the CNTs market is the intrinsic mechanical properties of CNTs, which make them the ultimate nanomaterial. CNTs have a unique combination of stiffness, strength, and tenacity compared to other fiber materials that usually lack one or more of these properties. The restraining factors of the market are very high prices, limited knowledge, and easy availability of substitutes. The growth of the CNTs market is affected by its cost structure, processing difficulties, and the availability of substitutes, such as silicon carbide nanotubes (SiCNTs). CNT manufacturing methods, such as arc-discharge and laser ablation methods, are expensive, hazardous to the environment, and uneconomical for large-scale production.

“Energy & Storage is projected to be the largest end-use industry of carbon nanotubes market.”

Energy & Storage is the largest end-use industry segment, in terms of both volume, in 2020. Energy & storage segment is sub segmented into lithium-ion batteries, fuel cells, solar PV cells, hydrogen storage, electrochemical supercapacitors, propellants, and others. The lithium-ion batteries sub-segment is expected to account for the larger

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share of the CNTs market in the energy & storage segment during the forecast period. The demand for lithium-ion batteries is rapidly increasing in vehicles that require lightweight and high-energy density solutions. These batteries provide the highest energy density per weight and are used in cellular phones, notebook computers, and hybrid automobiles.

“Single-walled carbon nanotubes is the fastest-growing resin segment of the carbon nanotubes market.”

Single-walled carbon nanotubes (SWCNT) is the fastest-growing resin segment, in terms of volume, between 2020 and 2025. SWCNT are used in electrical conductive transparent electrodes, conductive heating films, conductive nano inks, nanodevices, displays, chemical sensors, super batteries, supercapacitors, energy storage, solar cells, and thermal interface material among other applications. The high demand from various applications, including drug delivery, field emission, interconnects, sensors, and biomedical applications, is also driving the growth of the SWCNT market.

“APAC is the fastest market for carbon nanotubes during the forecast period.”

APAC is projected to be the largest and the fastest-growing market for carbon nanotubes during the forecast period. Easy availability of raw materials at competitive prices and cheap labor force have made APAC the biggest market for CNTs. Global manufacturers are increasingly setting up their production plants in the region in a bid to ramp up production and increase sales. The major end-use industries of CNTs are electronics & semiconductor, energy & storage, structural composites application, chemical materials & polymers, medical, and others.

Extensive primary interviews have been conducted, and information has been gathered from secondary research to determine and verify the market size of several segments and sub-segments.

Breakdown of Primary Interviews:

By Company Type: Tier 3 – 46%, Tier 2 – 36%, and Tier 1 – 18%

By Designation: D Level – 27%, C Level – 18%, and Others – 55%

By Region: APAC – 55%, North America – 18%, Europe – 9%, South America – 9%, and Middle East & Africa – 9%

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The key companies profiled in this report are LG Chemical Limited (South Korea), Cabot Corporation (US), Showa Denko K.K. (Japan), Jiangsu Cnano Technology Co., Ltd. (China), and Chengdu Organic Chemicals Co. Ltd. (China).

Research Coverage:

The carbon nanotubes market has been segmented based on type (single-walled carbon nanotubes and multi-walled carbon nanotubes), method (chemical vapor deposition, catalytic chemical vapor deposition, high-pressure carbon monoxide reaction, and others), end-use industry (electronics & semiconductor, energy & storage, chemical material & polymers, medical, structural composites application, others), and region (APAC, Europe, North America, South America, and Middle East & Africa).

Reasons to Buy the Report

From an insight perspective, this research report focuses on various levels of analyses — industry analysis (industry trends), market share analysis of top players, and company profiles, which together comprise and discuss the basic views on the competitive landscape; emerging and high-growth segments of the market; high growth regions; and market drivers, restraints, opportunities, and challenges.

The report provides insights on the following pointers:

Market Penetration: Comprehensive information on carbon nanotubes offered by top players in the market

Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product launches in the market

Market Development: Comprehensive information about lucrative emerging markets – the report analyzes the market for carbon nanotubes across regions

Market Diversification: Exhaustive information about new products, untapped geographies, recent developments, and investments in the market

Competitive Assessment: In-depth assessment of market shares, strategies, products, and manufacturing capabilities of leading players in the market.

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About

The report "Carbon Nanotubes (CNT) Market by Type (Single, Multi Walled), Method (Chemical Vapor Deposition, Catalytic Chemical Vapor Deposition, High Pressure Carbon Monoxide), Application (Electronics, Chemical, Batteries, Energy, Medical) - Global Forecast to 2023" The carbon nanotubes market is estimated to be USD 4.55 billion in 2018 and is projected to reach USD 9.84 billion by 2023, at a CAGR of 16.70%.

Major companies profiled in this report include:

Arkema S.A. (France), Arry International Group LTD. (China), Carbon Solutions Inc. (US), Cheap Tubes Inc. (US), CNT Co., Ltd. (Korea), Ocsial Llc (US), Hanwha Chemical Corp. (South Korea), Nano-C Inc. (US), Cnano Technology Ltd (US), Toray International Group Limited (Japan), Showa Denko K.K. (Japan), and Continental Carbon Company (US) among others.

This report provides a detailed segmentation of the carbon nanotubes market on the basis of type, method, application, and region. With respect to type, the market has been segmented into multi-walled carbon nanotube and single-walled carbon nanotube. Based on method, the market has been segmented into chemical vapor deposition, catalytic chemical vapor deposition, high pressure carbon monoxide reaction, and others. Based on application, the market has been segmented into advanced materials, electronics & semiconductors, chemical & polymers, batteries & capacitors, energy, aerospace & defense, and medical. Based on region, the market has been segmented into Asia Pacific, Europe, North America, South America, and Middle East & Africa.

Breakup of primary interviews:

By Company Type: Tier 1 – 60%, Tier 2 – 30%, and Tier 3 – 10%

By Designation: C-level – 50%, D-level – 40%, and Others – 10%

By Region: North America – 35%, Europe – 30%, Asia Pacific – 16%, South America – 12%, and Middle East & Africa – 7%

Among type, the multi-walled carbon nanotube (MWCNT) segment is expected to

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grow at the highest CAGR during the forecast period.

MWNT find applications in electrical conductive transparent electrodes, conductive heating films, conductive nano inks, nanodevices, displays, chemical sensors, super batteries, supercapacitors, energy storage, solar industries, thermal interface material, and so on. The high demand from various applications, including drug delivery, field emission, interconnects, sensors, biomedical applications, and others, is also driving the global single-walled carbon nanotubes market.

By method, the chemical vapor deposition (CVD) segment of the carbon nanotubes market is expected to grow at the highest CAGR during the forecast period.

The CVD segment of the carbon nanotubes market is expected to grow at the highest CAGR during the forecast period. CVD was also the largest method segment globally in 2017. It is the cheapest among all. The prices for CVD are assumed to decrease incrementally with the improving technologies and increased production & commercialization. This decrease in price is expected to keep the CAGR for CVD on a higher side for both volume and value markets.

The Asia Pacific carbon nanotubes market is expected to grow at the highest CAGR during the forecast period.

The Asia Pacific carbon nanotubes market is expected to grow at the highest CAGR during the forecast period, which can be attributed to the rising demand for carbon nanotubes from emerging economies of the region, including India, China, South Korea, Vietnam, Taiwan, and Singapore, among others. In addition, factors such as the improving standards of living and rising per capita incomes in the countries of the APAC region are fueling the growth of the market.

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