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Carbon Nanotubes Market by Type ((Single-Walled Carbon Nanotubes (SWCNTs) and Multi-Walled Carbon Nanotubes (MWCNTs)), Application (Structural Polymer Composites, Conductive Polymer Composites, Conductive Adhesives, Fire Retardant Plastics, Metal Matrix Composites, Li-ion Battery Electrodes, and Others), and End User (Electricals & Electronics, Aerospace & Defense, Energy, Sporting Goods, Automotive, Industrial, and Others): Opportunity Analysis and Industry Forecast, 2020–2027

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Abstracts

The global carbon nanotubes market was valued at $2.6 billion in 2019, and is projected to reach $5.8 billion by 2027, growing at a CAGR of 10.7% from 2020 to 2027.

Carbon nanotubes (CNTs) are advanced carbon materials exhibiting different physio-chemical properties than other carbon materials. CNT is an allotrope of carbon with a cylindrical nanostructure. It exhibits remarkable characteristics, such as electrical, optical, and thermal conductivity; tensile strength; and chemical reactivity, which increase its applicability in aerospace & defense, automotive, construction, electricals & electronics, life science & healthcare, personal care, and other industries. These properties and applications of CNTs depend on the type and quality of materials used for manufacturing them. The characteristic properties of CNTs, such as high tensile strength, electrical conductivity, current carrying capacity, gas & energy storage capacity, are the major factors that drive their adoption for various applications.

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The global carbon nanotubes market is presently driven by end-users such as electricals & electronics, automotive, and energy sectors. Carbon nanotubes are used to make transistors, displays, touch screens, and various sensors. Transistors made from carbon nanotubes are better than silicon transistors with respect to their efficiency and processing speeds. Being among the strongest materials, CNTs are ideal for use in high-performance automotive components. Structural nanocomposites based on carbon nanotubes play a critical role in the safety and long life of aircraft and space equipment. Therefore, rise in adoption of renewable sources of energy, such as wind and tidal, increases the use of wind mills that utilize carbon nanotubes as structural composites.

However, high manufacturing cost and low commercial penetration in various applications are the major restricting factors for the industry. CNT is a core R&D-based industry. Market players have taken significant efforts to reduce cost and improve performance to expand the product penetration across various industry verticals. The global carbon nanotubes market is expected to grow at a high CAGR during the forecast period, owing to its increase in use by its present end-users. However, carbon nanotechnology is a futuristic technology that receives global R&D attention. New applications for carbon nanotubes are projected to provide lucrative opportunities for market growth. For instance, biomedical application of carbon nanotubes is one such potential field. Moreover, carbon nanotubes have proved to be better drug carriers than presently available carriers. Therefore, the toxicity of CNT has presently limited its application.

The global carbon nanotubes market is segmented into type, application, and end-user. Based on type, the market is classified into single-walled carbon nanotubes (SWCNTs) and multi-walled carbon nanotubes (MWCNTs). On the basis of application, the market is segmented into structural polymer composites, conductive polymer composites, conductive adhesives, fire retardant plastics, metal matrix composites, Li-ion battery electrodes, and others including rubber tire reinforcement. Based on end-user, the market is fragmented into electricals & electronics, aerospace & defense, energy, sporting goods, automotive, industrial, and others. Industrial end-users include printing & packaging, rubber, and construction. Region-wise, the market is studied across North America, Europe, Asia-Pacific, and LAMEA. Presently, Asia-Pacific accounts for the largest share of the market, followed by Europe and North America.

The major companies profiled in this report include Arkema Group, Chasm Advanced Materials Inc., Cheap Tubes Inc., Cnano Technology Limited, Futurecarbon GmbH, Hyperion Catalysis International, Klean Industries Inc., LG Chem, Nano-C Inc., Nanocyl

SA, OCSiAl, and Toray Industries, Inc.

The global carbon nanotubes market report provides in-depth competitive analysis as well as profiles of these major players.

1.1. Key benefits for stakeholders

Porter’s five forces analysis helps analyze the potential of buyers & suppliers and the competitive scenario of the industry for strategy building.

It outlines the current trends and future estimations of the market from 2019 to 2027 to understand the prevailing opportunities and potential investment pockets.

The major countries in the region have been mapped according to their individual revenue contribution to the regional market.

The key drivers, restraints, and opportunities and their detailed impact analysis are explained in the study.

The profiles of key players and their key strategic developments are enlisted in the report.

IMPACT OF COVID-19 ON THE GLOBAL CARBON NANOTUBES MARKET

The COVID-19 pandemic has negatively affected the global economy by subsequently shrinking the GDPs of numerous economies, thereby changing consumer spending patterns globally.

The global automotive supply chain got disrupted due to lack of workforce and restrictions on manufacturing operations that led to a shortage in key components required in automotive manufacturing.

Further, uncertainty over the economic conditions during the forecast period has led to a decline in consumer confidence, thereby affecting consumer spending. This is expected to decrease vehicle sales during the forecast period. A similar trend is observed in the global demand for electronic goods, thereby impacting

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the semiconductor industry.

A decline in manufacturing output as a result of partial operations is expected to decrease the demand for CNTs during the forecast period.

Financial turbulence in leading economies may delay commissioning of new renewable electricity projects, wind mills & tidal energy farms, biofuel facilities, and renewable heat investments.

In addition, the renewable sector in most of the countries is largely dependent on imports from other countries, notably from China. China, the known source of this pandemic, has been the most affected one in terms of material supply and material transport due to COVID-19.

However, to secure constant supply of critical components, countries are expected to focus on uplifting their regional and local manufacturing networks.

The above factors are expected to impact the global carbon nanotubes market growth during the forecast period.

1.2. Key market segments

By Type

Single-Walled Carbon Nanotubes (SWCNTs)

Multi-Walled Carbon Nanotubes (MWCNTs)

By Application

Structural Polymer Composites

Conductive Polymer Composites

Conductive Adhesives

Fire Retardant Plastics

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- Spain
- Italy
- Rest of Europe

Asia-Pacific

- India
- China
- Japan
- Korea
- Australia
- Rest of Asia-Pacific

LAMEA

- Brazil
- Saudi Arabia
- South Africa
- Rest of LAMEA

Key players in the global carbon nanotubes market are:

1. Arkema Group
2. Chasm Advanced Materials, Inc.
3. Cheap Tubes Inc.
4. Cnano Technology Limited
5. Futurecarbon GmbH

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6. Hyperion Catalysis International
7. Klean Industries Inc.
8. LG Chem
9. Nano-C Inc.
10. Nanocyl SA
11. OCSiAl
12. Toray Industries, Inc.

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