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Advanced Carbon Materials: Global Market 2027-2037

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Abstracts

The global advanced carbon materials market encompasses one of the most structurally diverse product families in modern industrial chemistry. Though united by their elemental composition, advanced carbon materials range from the macroscopic — continuous carbon fibers woven into aerospace composite structures — to the atomic, with single-layer graphene sheets just one carbon atom thick. Each allotrope exploits carbon's extraordinary versatility differently, producing materials that can be simultaneously the hardest known substance and one of the softest, the best electrical conductor or an insulator, ultra-lightweight or structurally superior to steel.

The market has undergone a fundamental shift over the past decade, moving advanced carbon materials from predominantly laboratory and niche industrial settings into mainstream production at scale. This transition has been driven by the convergence of several structural megatrends that show no sign of abating. The global electrification of transport has placed carbon nanotubes at the heart of lithium-ion battery electrode formulations, where they form conductive networks that improve cell performance and longevity. The expansion of renewable energy — particularly offshore wind — continues to pull demand for large-tow carbon fiber, as turbine blade engineers push ever-greater lengths to capture more energy per installation. Aerospace recovery and growth from both commercial aviation and the rapidly expanding defence and space sectors sustain demand for high-modulus carbon fiber grades. Meanwhile, the exponential growth of artificial intelligence and data centre infrastructure has made thermal management a critical engineering challenge, opening substantial markets for graphene and carbon nanotube-based heat dissipation solutions.

Beyond these established drivers, several emerging forces are reshaping the market's long-term trajectory. The hydrogen economy is creating new demand for carbon fiber in composite overwrapped pressure vessels for fuel cell vehicles and industrial hydrogen storage. The voluntary carbon market has elevated biochar from an agricultural soil

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amendment to a certified carbon removal tool, attracting corporate sustainability investment and creating a dual-revenue model for producers. Perhaps most significantly, the ability to synthesise advanced carbon materials directly from captured carbon dioxide is beginning to transform waste emissions into feedstock — a development with potentially profound implications for both the economics of carbon capture and the supply chains of nanomaterials including carbon nanotubes and graphene.

The regulatory environment has also become a meaningful tailwind. Carbon pricing mechanisms, automotive emissions standards, renewable energy mandates, and supply chain localisation policies in North America and Europe are collectively creating durable structural demand across the materials family. The result is a market that spans commodity volumes — carbon black measured in millions of tonnes annually — through to research-scale quantities of graphene quantum dots sold by the milligram, with an increasingly interconnected set of growth drivers binding the entire category together.

This report examines sixteen advanced carbon material categories across a ten-year forecast horizon: carbon fibers, carbon black, graphite, biochar, graphene, carbon nanotubes, carbon nanofibers, fullerenes, nanodiamonds, graphene quantum dots, carbon foam, diamond-like carbon coatings, activated carbon, carbon aerogels and xerogels, carbon nano-onions, and CO?-derived carbon materials. Together these categories span an unusually wide spectrum of commercial maturity — from carbon black and activated carbon, which are mature, high-volume commodity industries, through to carbon nano-onions and CO?-derived nanomaterials, which remain in early-stage commercialisation with limited but growing validated applications.

The report provides pricing, demand volume, revenue and growth forecasts for all sixteen materials, supported by detailed company profiles, supply chain analysis, regulatory overviews, and application roadmaps.

Key coverage areas include:

Pricing trends, cost structures and 2037 price forecasts for all sixteen materials and their principal commercial grade variantsDemand volume forecasts by application and region through 2037Revenue forecasts by end-use market and material typePurity grade classifications and application-specific purity requirements for all sixteen materialsCarbon nanotube market segmentation by wall number, purity tier and end-use applicationGraphite battery anode market analysis, including natural versus synthetic anode dynamics, Chinese market structure and ex-China supply chain

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developmentBiochar market by feedstock, production technology, application and carbon credit market integrationGraphene market by form type, including GNP, GO, rGO, CVD film and battery-grade variantsRecovered carbon black, plasma carbon black and bio-based carbon black as emerging segments within the broader carbon black marketCO?-derived carbon materials as an emerging category covering electrolytic CNT synthesis, plasma carbon black, flash-Joule graphene and CO?-derived activated carbonDiamond-like carbon coating classification by sp? content and market segmentation by deposition technology and application sectorActivated carbon by form, feedstock and application grade including electrode-grade and pharmaceutical gradesCompany profiles covering carbon fiber producers, composite manufacturers and recyclers; carbon black producers and recovered CB specialists; natural and synthetic graphite producers and anode material processors; biochar producers across all major feedstock categories; graphene producers across all commercial forms; carbon nanotube producers covering MWCNT and SWCNT; carbon nanofiber producers; fullerene suppliers; nanodiamond producers; graphene quantum dot developers; carbon foam manufacturers; DLC coating service providers; activated carbon producers; carbon aerogel and xerogel manufacturers; and CO?-derived carbon materials developers

The following companies are profiled in this report: 4M Carbon Fiber Corporation, 9T Labs AG, A Healthier Earth, Aben Resources, ACG Composites Co. Ltd., Acros Organics, ADA Carbon Solutions, Adamas Nanotechnologies Inc., Adeka Corporation, Advanced Material Development (AMD), AdvEn Inc., AerNos Inc., Aerogel Core Ltd, Agar Scientific, AirMembrane Corporation, Airex Energy, Akkolab, Aksa Carbon, Alba Mineral Resources plc, Albany Engineered Composites Inc., Aldila Inc., Alfa Aesar, Aligned Carbon Inc., AlterBiota, Amalyst, Amata Green SL, American Boronite Corporation, American Dye Source Inc., AMO GmbH, Anaphite Limited, Anson Resources, Aperam BioEnergia, ApNano Materials Inc., Appear Inc., Applied Nanolayers BV, ApplyNanosolutions S.L., APS Tech Solutions, AquaGreen Holding ApS, AR Brown Co. Ltd, arbitex, ArborX, Archer Materials Ltd., AREVO, Argo Graphene Solutions, Arkema France SA, Armadale Capital, Arq Inc., Arris Composites, Art Beam Co. Ltd., Asahi Carbon Co Ltd, Aspen Aerogels Inc., Atlas Carbon LLC, Atomic Mechanics Ltd., Atrago, Attis Innovations LLC, Australian Advanced Materials, Avadain Inc., AVANCO GmbH, Avanzare Innovacion Tecnologica S.L., Awn Nanotech Inc., Aztrong Inc., Balkrishna Industries Limited, Baotailong New Materials Co. Ltd., BASF AG, BASF SE, Bass Metals Limited, Battelle Memorial Institute, BC Biocarbon, Bcircular, Bedimensional S.p.A, Bee Graphene, Beijing Grish Hitech Co. Ltd., Bella Biochar Corporation, Bergen Carbon Solutions AS, BestGraphene, Betterial,

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3 CARBON BLACK

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16 CARBON MATERIALS FROM CARBON CAPTURE AND UTILIZATION

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List Of Tables

LIST OF TABLES

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List Of Figures

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