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Nanocomposites Market Report - Global Forecast till 2030

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Description:

Nanocomposites Market Synopsis

The nanocomposites market was valued at over USD 4 billion in 2019 and is projected to register a CAGR of around 15.5% during the forecast period, 2019–2025. Nanocomposites are materials that incorporate nanosized particles dispersed in a matrix into a matrix of standard material, such as polymer/carbon nanotube or Si/Ge nanocomposites to optimize the performance of the traditional materials. The structure is a matrix-filler combination, where the filler-like particles, fibers, or fragments are surrounded and bound together as discrete units by the matrix. The different types of matrix are polymer matrix nanocomposites+ (PMNC), metal matrix nanocomposites (MMNC), and ceramic matrix nanocomposites (CMNC). The majorly used nanoparticles are carbon nanofibers (CNFs), carbon nanotubes [multiwall (MWNTs), small-diameter (SDNTs), and single-wall (SWNTs)], nano-silica (N-silica), nano-aluminum oxide (Al2O3), nano titanium oxide (TiO2), and montmorillonite organoclays (MMT). Carbon nanotube is one of the most promising materials in nanocomposites on account of its superior properties such as rigidity, elasticity, strength, electric conductivity, and field emission. Nanocomposites exhibit structural, flame resistance, and thermal properties without significant loss in impact or clarity owing to which they are widely used in various applications in the packaging, aerospace, automotive, and medical industries.

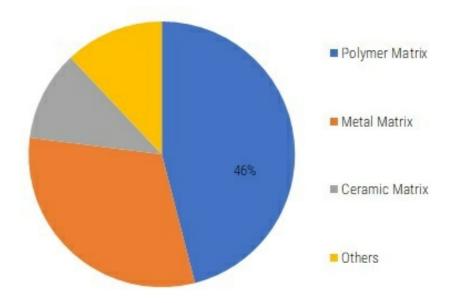
The prominent demand-side market driver for the global nanocomposites is the increasing demand for the product in the food packaging applications. The preliminary functions of food packaging are to extend the shelf life of packaged food materials by preventing unfavorable changes caused by chemical contaminants, microbial spoilage, oxygen, temperature change, moisture, light, and maintaining the quality and safety of food products from production to consumption. Packaging acts as a barrier for gases, water vapor, light, and microorganisms and creates a physicochemical conditions/environment for the packaged products. Moreover, the demand for innovative packaging materials is increasing to meet the need for higher quality food with safety, sustainability, and convenience, making the food packaging industry a dynamic industry. Polymer/clay nanocomposites with improved barrier properties are being increasingly used as a barrier layer in a multilayer packaging material with other structural layers. In addition, the growing demand for antimicrobial nanocomposite films and bio-nano composites (green nanocomposites) as food packaging materials is further expected to favor the market growth in the years to follow.

The automotive industry is the other major consumer of nanocomposites, wherein the demand for nanocomposites is increasing in the manufacturing of various automobile components such as power trains, headlamp covers, interior & exterior components, engine cover, and tires. Nanocomposites can be used as a blend against plastics for strengthening the portions of the automobiles where higher efficiency is desired along with the weight reduction. The growing need to reduce the weight of vehicles to increase fuel economy and thereby enhance vehicle performance and reduce emissions is further expected to boost demand for nanocomposites in the coming years.

With rapid advancements in nanotechnology and related fields, nanocomposites coatings are becoming cheaper, smatter, and more functional. The scope of application for nanocomposite coatings is thus expected to increase in the near future, with applications extending from anticorrosion barrier coatings, drug delivery systems, antibacterial coatings, self-cleaning or "easy-to-clean" coatings reflective coatings, to fire-retardant coatings and screen effect coatings. Also, the widening scope of applications of graphene-based nanocomposites is expected to boost the product demand in the near future and create lucrative opportunities for the players operating in the global market.

However, the high cost of manufacturing of nanocomposites is projected to be a major challenge for the market players during the review period.

Global Nanocomposites Market Share, by Type of Matrix Material, 2018 (%)



Source: MRFR Analysis

Regional Analysis

The global nanocomposites market, by region, has been segmented into five key regions—Asia-Pacific, North America, Europe, Latin America, and the Middle East & Africa. In 2018, Asia-Pacific held the largest share of the global market on account of expanding food & beverage and automotive industries in the region. The packaging industry in the region is one of the fastest-growing and the demand for packaging in the food industry is expected to increase at a significant rate in the coming years. Additionally, the other major consumer of nanocomposites is the automotive industry in the emerging economies of China, India, and Thailand. The expanding automotive industry in these economies is likely to boost the demand for the product in the years to follow.

The European market is the second-largest and projected to register healthy growth during the forecast period owing to the increasing use of nanocomposites in the biomedical applications. North America is expected to follow the European market, in terms of market value, wherein the aerospace and energy industries are likely to be the prominent drivers of the regional market growth.

Market Segmentation

The global nanocomposites market has been segmented on the basis of type of matrix material, end-use industry, and region.

Based on type of matrix material, the global nanocomposites market has been classified intopolymer matrix, metal matrix, ceramic matrix, and others. The polymer matrix segmented is further sub-segmented into polymer/CNT, polyester/TiO2, and thermoplastic/thermoset polymer/layered silicates. The metal matrix segment is further divided into Fe-Cr/Al2O3, Ni/Al2O3 Al/CNT, and others. The ceramic matrix segment is further categorized into Al2O3/SiO2, SiO2/Ni, Al2O3/SiC, and others. The polymer matrix segment accounted for the largest market share in 2018 and is expected to be the fastest-growing segment during the forecast period. This is mainly attributed to the increasing demand for polymer matrix nanocomposites in the packaging and automotive industries.

By end-use industry, the global nanocomposites market has been divided intopackaging, automotive, aerospace & defense, medical, electrical & electronics, energy, and others. The packaging industry is projected to be leading segment during the forecast period owing to the increasing demand for nanocomposites in the food packaging applications.

The global nanocomposites market has been studied with respect to five key regions—Asia-Pacific, North America, Europe, Latin America, and the Middle East & Africa.

Key Players

Nanocyl SA (BELGIUM), Evonik Industries AG (Germany), ZYVEX TECHNOLOGIES (US), Arkema (France), NanoSonic, Inc. (US), UNITIKA LTD (Japan), Pixelligent (US), Industrial Nanotech, Inc. (US), Integran Technologies (Canada), and SHOWA DENKO K.K. (Japan), are some of the key players operating in the global nanocomposites market.

Intended Audience

- · Nanocomposites manufacturers
- Traders and distributors of Nanocomposites
- Research and development institutes
- Potential investors
- Raw material suppliers
- Nationalized laboratories

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