Global Graphene Market

PUNE, INDIA, February 23, 2023 /EINPresswire.com/ -- The global Graphene Market was valued at US$125.84 million in 2021, and is predicted to grow to US$493.10 million in 2027. Graphene is the world's thinnest and strongest material, with outstanding thermal and electrical conductivity. Graphene is a two-dimensional material composed of a single layer of carbon atoms arranged in a honeycomb lattice pattern.

There are three types of graphene: 1) pure graphene (monolayer), which is a single atom thick, over 40 times stronger than diamond, and over 200 times stronger than steel; 2) bi-layer graphene, which is similar to pure graphene in properties; and 3) few-layer graphene. The applications of graphene are widely acknowledged to be endless due to its exceptional thermal conductivity, electrical conductivity, mechanical strength, and high surface area. These properties can transform the properties of other materials, including composites, concrete, elastomers, and plastics. The market is expected to grow at a CAGR of 25.56% over the projected period of 2022-2027.

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Market Segmentation Analysis:

By Material: The report identifies four segments on the basis of material: Graphene Oxide, Reduced Graphene Oxide, Graphene Nanoplatelets, and Others. Reduced graphene oxide segment is expected to be the fastest growing segment in the forecasted period. The product is widely used when a big amount is needed for commercial uses like energy storage. The use of reduced graphene oxide is expanding in fields like research, batteries, biomedicine, supercapacitors, and printable graphene electronics. The product is also utilized in field effect transistors (FETs), which are chemical and biological sensors. Consequently, it is anticipated that the product's availability in a variety of applications would foster the growth during the anticipated period.

By Application: The report identifies four segments on the basis of application: Composites,

Electronics, Energy and Others. Graphene composites dominated the market in 2021, owing to their diverse applications in aerospace, automotive, coatings, metals, and plastics. By combining the potential of graphene with already-existing products, composite materials are created. In order to improve the quality and performance of sporting equipment for cycling, skiing, and other sports, graphene-based composites are used. Furthermore, due to its qualities like UV resistance, lightweight, and flexibility, the product's demand is growing in the composites application segment.

By Region: In the report, the global graphene market is divided into four regions: North America, Asia Pacific, Europe, and ROW. North America accounted for the maximum share of the global market in 2021. The production of graphene in North America is growing, as the material is increasingly being used in a variety of industries and applications. North America is home to several companies that are involved in the production of graphene and graphene-based products, including those in the US and Canada. The production of graphene in North America is driven by factors such as the increasing demand for materials with unique properties, the growing awareness of the environmental benefits of using graphene, and advances in manufacturing techniques.

The Asia Pacific market is expected to expand significantly during the forecast period. Favorable government policies, funding, and research will all contribute to the growth of the local market during this time. Additionally, the region's market is anticipated to be driven by the presence of large manufacturers and consumers as well as the increase in production across a number of sectors, including the automotive, defense, marine, and aerospace industries.

Market Dynamics:

Growth Drivers: One of the key drivers of the market's expansion is the supportive government initiatives and policies. The unique properties of graphene and its potential applications in a wide range of industries has sparked a great deal of interest among researchers and industry players, which has led to a significant increase in investment in research and development activities related to graphene. Governments around the world have recognized the potential of graphene and are providing support in the form of funding and other initiatives to help advance the development of graphene-based technologies. Other significant growth factors of the market include, surging demand from construction activities, growing electronics industry, increasing use in painting and coating, use of graphene in sports equipment and clothes, increasing use of graphene membranes, and growing applications of graphene in medical sector.

Challenges: However, some challenges are impeding the growth of the market such as lack of standardization, limited availability of high-quality graphene and lack of infrastructure and expertise. The lack of standardization in the graphene market refers to the fact that there is

currently no agreed-upon set of standards for the production and characterization of graphene. This lack of standardization makes it difficult to compare the quality and performance of different graphene products, which can create confusion among customers and hinder the growth of the market. For example, there is currently no standard method for measuring the thickness of graphene, which makes it difficult to compare the thickness of different graphene samples.

Trends: The market is projected to grow at a fast pace during the forecast period, due to increasing use in electric vehicles, growing graphene applications in the aerospace industry, increasing role of graphene in the decarbonisation and new production methods and increasing number of filed patents. The incorporation of graphene into composite load-bearing structures to increase strength and toughness while reducing weight is the primary potential application in the automotive industry. Graphene is extremely beneficial in extending the life of lithium-ion batteries while also reducing the overall weight of the battery assembly. As a result, the demand for graphene in the production of electric vehicles is increasing, which is expected to boost market demand in the near future.

Impact Analysis of COVID-19 and Way Forward:

The COVID-19 pandemic has had a profound impact on the graphene market. The pandemic has caused many businesses to shut down or reduce their operations, which has led to a decrease in demand for many products, including those made with graphene. Additionally, the supply chain disruptions caused by the pandemic have made it more difficult for manufacturers to obtain the raw materials and other inputs needed to produce graphene-based products.

Despite the short-term challenges posed by the pandemic, the post COVID outlook for the graphene market looks positive. The increasing demand for high-tech products and the growing need for sustainable and renewable energy solutions are expected to drive the growth of the graphene market in the coming years. Governments around the world are also investing in research and development of graphene-based technologies, which is expected to further support the growth of the market.

Competitive Landscape:

Global grapheme market is moderately concentrated, with many companies and research institutions working on developing graphene-based technologies and products. Graphene was regarded as a newly discovered substance between 2010 and 2015. Numerous graphene-focused businesses have been established as a result of its seemingly limitless applications. The industry is now at a phase where commercialization and scalable production are key. Globally, there are more than 300 graphene producers. The players are likely to compete on factors such as the quality and price of their graphene products, as well as their ability to innovate and bring new graphene-based products to market.

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The key players in the global graphene market are:

Applied Graphene Materials
Directa Plus SpA
NanoXplore Inc
Haydale Graphene Industries Plc.
G6 Materials Corp
Global Graphene Group
Thomas Swan & Co. Ltd.
ACS Material, LLC
Graphenea Inc.
Grolltex, Inc.
BGT Materials

Due to the concentration of key players in developed regions, regional partnerships and distribution agreements have become major strategic initiatives for a number of key players. For instance, Graphene Manufacturing Group Ltd and Amec Foster Wheeler PLC signed a non-binding Letter of Intent in March 2022 to collaborate on GMG's major graphene manufacturing expansion projects.

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