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Composites in Passenger Rail Market By Type (Carbon Fiber, Glass Fiber, Others) , By Resin Type (Epoxy Resin, Polyester, Phenolic, Vinyl Ester, Others) By Application (Interior, Exterior) : Global Opportunity Analysis and Industry Forecast, 2024-2033

https://marketpublishers.com/r/C00334DEE62CEN.html
Date: September 2024
Pages: 340
Price: US$ 2,655.00 (Single User License)
ID: C00334DEE62CEN

Abstracts

The composites in passenger rail market was valued at $1.9 billion in 2023, and is projected to reach $4.0 billion by 2033, growing at a CAGR of 7.6% from 2024 to 2033.

Composites are advanced materials created by combining two or more distinct substances to achieve properties that are superior to those of the individual components. In the passenger rail sector, composites—typically comprising materials like fiber-reinforced plastics and resin matrices—are increasingly replacing traditional materials such as steel and aluminum. The drive for composite usage in passenger rail is fueled by their exceptional strength-to-weight ratio, corrosion resistance, and ability to enhance fuel efficiency and operational sustainability.

The growth of the global composites in passenger rail market is driven by surge in demand for composites to reduce weight of railcars and achieve higher energy efficiency, increased fuel efficiency, and reduced operational costs. Furthermore, rise in need for durable railcars is fueling the demand for composites. This is attributed to the fact that composites are resistant to corrosion, fatigue, and harsh environmental conditions, extending the lifespan of rail components and reducing maintenance costs. This durability is particularly advantageous in regions with extreme weather conditions or high humidity levels. Moreover, as countries invest in high-speed rail systems, lightweight and high-strength materials like composites are witnessing significant demand, which is augmenting the market growth. In addition, implementation of stringent regulations to lower greenhouse gas emissions and adopt more sustainable

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practices acts as a key driving force of the market. This is attributed to the fact that composites contribute to meeting regulatory requirements due to their low environmental impact and potential for recyclability, supporting greener transportation initiatives. According to EU-funded RECOTRANS project—aims to develop efficient, sustainable manufacturing methods for lightweight composite materials in the transport sectors, including automotive, rail, and maritime industries—rails are estimated to witness 57% weight reduction with the use of lightweight composites, which, in turn, will help to reduce greenhouse gas emissions. However, high cost of composite materials restrains the market growth. Moreover, while many composites are durable and lightweight, achieving fire resistance that meets rail safety standards is challenging, thus hampering the market growth. On the contrary, innovations in manufacturing techniques, such as automated production and advanced molding technologies, have made composite materials more accessible and cost-effective. Such developments are expected to offer lucrative opportunities for the market growth during the forecast period.

The global composites in passenger rail market is segmented into type, resin type, application, and region. By type, the market is classified into carbon fiber, glass fiber, and others. On the basis of resin type, it is classified into epoxy resin, polyester, phenolic, vinyl ester, and others. Depending on application, it is divided into exterior and interior. Region wise, the market is analyzed across North America, Europe, Asia-Pacific, and LAMEA.

Key Findings

By type, the glass fiber segment held the highest market share in 2023, and is expected to maintain its leadership status from 2024 to 2033.

On the basis of resin type, the epoxy resin segment was the major shareholder in 2023, and is anticipated to continue the same trend throughout the forecast period

Depending on application, the interior segment garnered the largest share in 2023, and is projected to dominate the market during the forecast period.

Region wise, Asia-Pacific exhibited the highest growth, in terms of revenue, in 2023.

Competition Analysis

Competitive analysis and profiles of the major players in the global composites in

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passenger rail market include Hexcel Corporation, Solvay S.A., Toray Industries, Inc., Kawasaki Heavy Industries Ltd., TEIJIN LIMITED, Owens Corning, BASF SE, Mitsubishi Rayon Co., Ltd., SGL Carbon, and ZOLTEK Corporation. These major players have adopted various key development strategies such as business expansion, new product launches, and partnerships to sustain the intense competition and gain a strong foothold in the global market.

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Analysis of raw material in a product (by %)

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Manufacturing Capacity

Upcoming/New Entrant by Regions

Technology Trend Analysis

Go To Market Strategy

Regulatory Guidelines

Additional company profiles with specific to client's interest

Additional country or region analysis- market size and forecast

Historic market data

SWOT Analysis

Key Market Segments

By Type

Carbon Fiber

Glass Fiber

Others

By Resin Type

Epoxy Resin

Polyester

Phenolic

Vinyl Ester

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Others

By Application

Interior

Exterior

By Region

North America

U.S.

Canada

Mexico

Europe

France

Germany

Italy

Spain

UK

Rest of Europe

Asia-Pacific

China

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Japan

India

South Korea

Australia

Rest of Asia-Pacific

LAMEA

Brazil

South Africa

Saudi Arabia

UAE

Rest of LAMEA

Key Market Players

Hexcel Corporation

Solvay S.A.

Toray Industries, Inc.

Kawasaki Heavy Industries Ltd

TEIJIN LIMITED

Owens Corning

BASF SE

Mitsubishi Rayon Co., Ltd.

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SGL Carbon

ZOLTEK Corporation

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