

Carbon Fiber Reinforced Thermoplastic Composites Market to Hit \$7.6 Bn by 2031, Driven by Aerospace & Automotive Demand

The CF RTP market to grow from \$3.4Bn in 2022 to \$7.6Bn by 2031 at 10.6% CAGR, driven by aerospace, automotive, and engineering demand for lightweight materials.

CALIFORNIA, CA, UNITED STATES,
September 4, 2025 /EINPresswire.com/

-- The global [carbon fiber reinforced thermoplastic composites \(CF RTP\)](#) market is expanding rapidly, growing from US\$ 3.4 billion in 2022 to an expected US\$ 7.6 billion by 2031 at a CAGR of 10.6% (2024-2031). Demand is surging as industries seek lightweight, high-strength, and durable materials for advanced manufacturing, with aerospace, automotive, and key engineering sectors leading the charge.



Carbon Fiber Reinforced Thermoplastic Composites Market

CF RTP composites combine carbon fibers with advanced thermoplastic resins (e.g., PEEK, polyurethane, polyethersulfone) to form strong, lightweight, and versatile materials. Their exceptional strength-to-weight ratio, impact resistance, and processability make them ideal for aerospace, automotive, and industrial applications. CF RTP is favored for structural components, enclosures, and even complex 3D-printed parts, facilitating innovations in design, fuel efficiency, and sustainability.

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United States: Recent Industry Developments

□ In July 2025, Hexcel Corporation launched a new line of CF RTP materials for aerospace

applications. The composites offer lightweight strength and faster processing. They target next-gen aircraft and space vehicles.

□ In June 2025, General Motors partnered with a U.S.-based composites startup to integrate CF RTP in EV structures. The initiative reduces vehicle weight by 20%. It improves battery efficiency and overall driving range.

□ In May 2025, Boeing invested \$120 million in CF RTP R&D at its Seattle innovation center. The research focuses on high-volume manufacturing. It aims to scale CF RTP adoption across commercial aviation platforms.

Japan: Recent Industry Developments

□ In July 2025, Toray Industries unveiled advanced CF RTP sheets with enhanced recyclability. The products are designed for automotive mass production. They align with Japan's push for sustainable mobility solutions.

□ In June 2025, Mitsubishi Chemical invested in expanding CF RTP production capacity in Hiroshima. The expansion supports demand from aerospace and defense sectors. It also boosts supply for international markets.

□ In May 2025, Teijin collaborated with Toyota to develop CF RTP components for next-gen EVs. The materials enable lightweight, durable, and high-performance structures. Pilot production has already started in Japan.

Market Dynamics

Drivers

- **Hybrid Technologies:** The combination of CF RTP with metals and other materials enables hybrid structures possessing enhanced strength, durability, and design flexibility. Companies like 9T Labs deploy hybrid manufacturing systems to enable fast, high repeatability production of structural CF RTP parts.
- **Technological Advancements:** Advances in recycling, molding, and automation like Asahi Kasei's continuous carbon fiber recycling and 3D printing with matched-die compression enable sustainable, scalable, and cost-competitive CF RTP manufacturing.
- **Rising Demand in Aerospace and Automotive:** Companies such as Boeing and Lockheed Martin utilize CF RTP in aviation to lower weight, enhance strength, and improve fuel efficiency, directly contributing to market growth. Automotive manufacturers use CF RTP for lightweight body panels, structural modules, and interiors to meet emissions regulations and performance goals.
- **Growing Composites Industry:** As global composites output rises, CF RTP's share increases thanks to its superior mechanical properties and process efficiencies.

Restraints

- **High Production Costs:** Advanced raw materials, specialized equipment, and complex processing methods result in higher costs restricting widespread commercial adoption, especially in cost-sensitive markets.

- Raw Material Availability: Disruptions or shortages in carbon fiber or specialty resins can impact CFRTP supply and pricing.
- Process Complexity: Stringent quality control, property variability, and production scaling are challenges, particularly for highly regulated sectors like aerospace and automotive.

Market Segmentation

- Material: PAN-based CFRTP dominates for its high performance and wide applicability; pitch-based CFRTP is used in niche, high-demand applications.
- Resin: Polyether ether ketone (PEEK) and other high-temperature resins are favored in aerospace and automotive for thermal stability and chemical resistance.
- Product: Short carbon fiber CFRTP (injection molded) captures the largest market segment due to its suitability for mass production and complex part geometries.
- End-User: Aerospace & defense, automotive, industrial, and energy lead, with medical, entertainment, and law enforcement as emerging sectors.

Regional Analysis

- Asia-Pacific is both the largest and fastest-growing region, accounting for nearly half the global market share. Rapid localization of production, expansion of aerospace and automotive industries, and competitive cost structures drive growth. Companies like Mitsubishi Chemical are scaling operations and pilot plants, supporting this surge.
- North America and Europe retain strong positions due to established aerospace/automotive industries and ongoing investments in sustainable composites manufacturing.

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Competitive Landscape

Major players include:

- BASF SE
- Celanese Corporation
- Dupont
- Hexcel Corporation
- Mitsubishi Chemical Corporation
- PolyOne Corporation
- SABIC
- Solvay
- SGL Carbon
- Teijin Limited

Market leaders are investing in expanded manufacturing, recycling technologies, and partnerships to capture emerging opportunities and drive down costs.

Conclusion

CFRTP composites are reshaping engineering in the 21st century, enabling lightweight, high-performance solutions for critical industries. Advances in manufacturing, recycling, and hybridization coupled with surging demand from Asia-Pacific ensure the CFRTP market's strong trajectory through 2031. Continued innovation and investment will further broaden CFRTP's application spectrum and market accessibility.

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[Thermoplastic Composites Market](#) is expected to grow at a promising CAGR during the forecast period.

[Composites Market](#) size was worth US\$ 108.64 billion in 2023 and is estimated to reach US\$ 204.50 million by 2031, growing at a CAGR of 8.23% during the forecast period (2024-2031).

Sai Kumar

DataM Intelligence 4market Research LLP

+1 877-441-4866

sai.k@datamintelligence.com

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