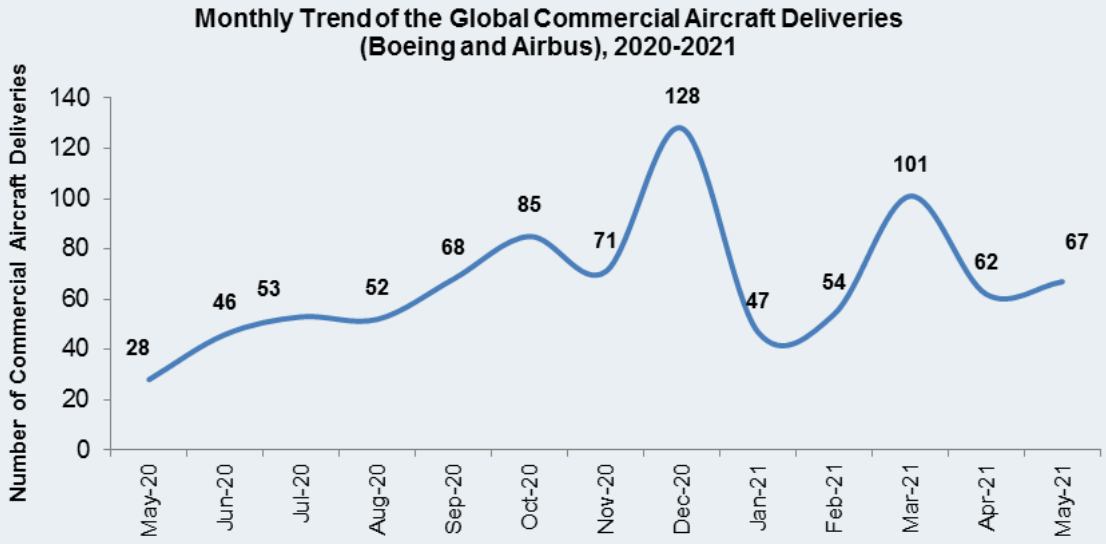
US Composites Market Monthly Insights May 2021

Composites Market Update for May 2021

The US Composites Market in May remained robust from a demand standpoint, with demand roughly equal to May of 2019. However, continued challenges meeting this demand have resulted in a slight decline of roughly 1-2% when compared to 2019 numbers. The demand forecast for June is roughly equal to 2019 and consistent with the trend in May 2021, but supply shortages are expected to be a limiting factor, particularly in maleic, epoxy, vinyl ester and other resins, which are in high demand. International freight, as well as regional freight continues to be significant challenges in the market, and there is a shortage of drivers. This has impacted delivery schedules and continues to be problematic. Steel drums and containers are also in short supply, which adds to these logistics challenges. Labor shortages also have an impact on production, as companies struggle to fill open positions with qualified employees. Despite these conditions, the demand for composites continues to remain robust, and is holding steady or growing modestly across all major sectors. Marine, sports and leisure and building products performed particularly well in May and no industries declined significantly. However, these lingering challenges are likely to remain problematic for the next several months before the supply-demand dynamics come back into balance.

Aerospace

Commercial aircraft (Boeing and Airbus) deliveries increased from 62 aircraft deliveries in April, 2021, to 67 aircraft deliveries in May, 2021.



Some highlights of May, 2021, are as follows:

- **Continuous Composites, Saint-Gobain Collaboration Advances CF3D Technology.** The strategic collaboration was formed to advance and certify Continuous Composites' patented Continuous Fiber 3D Printing (CF3D) technology for commercial aerospace applications. CF3D is an automated manufacturing solution for additively manufacturing strong, lightweight, aerospace-grade composite components. This innovative technology will help to customers solve weight and structural challenges that are inherent in aerospace applications.
- **Honda Aircraft Co. Unveils The HondaJet Elite S.** The new upgraded composite aircraft, the HondaJet Elite S, at its first virtual product launch event themed. The new aircraft represents its continued commitment to research and development of leading-edge technology to realize new possibilities and propose new value for business aviation.
- **Braided Preforms and Resin Infusion for Next-Generation Aerocomposites.** Spintech Holdings Inc. and its fabrication division Hawthorn Composites are using demonstrator components like this subscale tactical UAV wing to test and validate the use of infusion and preform technologies for more cost-effective aerospace and defense components. Spintech shows significant cost and labor savings using its Smart Tooling, dry fiber preforms and RTM/VARTM technology on aircraft wing and inlet duct demonstrators.
- **Virgin Galactic SpaceShipTwo Completes Third Crewed Spaceflight.** This flight showcased the inherent elegance and safety of our spaceflight system, while marking a major step forward for both Virgin Galactic and human spaceflight in New Mexico. All-composite VSS Unity reached suborbital space at a speed of Mach 3, marking the first human spaceflight from its New Mexico home port, and another step toward commercial operations.

Automotive

The U.S. new vehicle sales of 1,577,941 units in May, 2021, represented an increase of 41% as compared to 1,119,089 in May, 2020.

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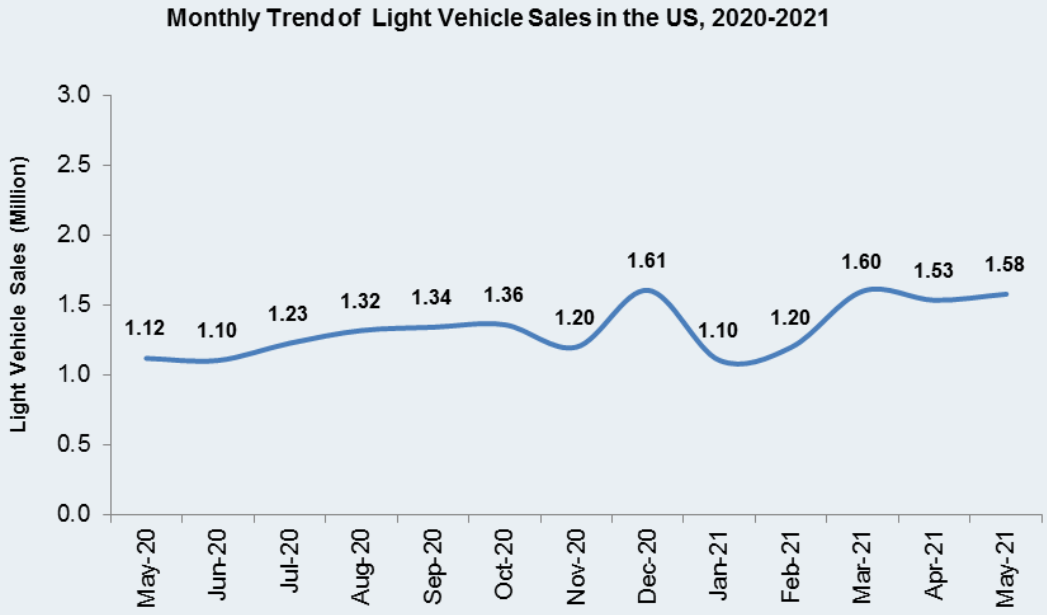

Some highlights of May, 2021, are as follows:

- **Designing a Versatile, Multi-Material EV Battery Enclosure.** Continental Structural Plastics has developed one-piece, compression-molded composite covers, an innovative fastening system and a range of material options to meet OEM needs. Battery boxes are definitely one of our main focuses now, since we have more than 30 different covers in production currently.
- **Borealis Borcycle Material Grades Enhance Sustainability Opportunities for Automotive.** The Borcycle family of products has been conceived for interior, exterior and under-the-bonnet automotive applications and incorporates post-consumer recycled (PCR) content for a lower environmental impact. They are safe to use and are said to provide a material performance and cost-efficiency equal to the performance and cost-efficiency of virgin materials.
- **Bercella, Formula Seven Target Motorsport Innovation with Natural Fiber Composite Developments.** AmpliTex flax fiber used to develop Formula SAE single-seater racing seat for better resistance, vibration absorption and reduced environmental impact. The material absorbs vibrations and isolates from electricity and heat, all of which make it ideal for something like seating applications for Formula SAE race cars.
- **Evonik-Led Group Targets Epoxy SMC for EV Battery Housings.** Epoxy modified with an amine-based hardener is applied in a demonstrator EV battery housing. The result is a thermally and mechanically robust structure that offers scalability in a variety of e-mobility applications. The holistic battery system concept is designed to offer the automotive industry a safer and more energy efficient alternative to metals or higher priced carbon fiber-reinforced plastics.
- **Plastic Omnium Signs Technological Partnership with McPhy for Hydrogen Solution Boost.** Collaboration to improve the performance and connectivity of composite high-pressure vessels with hydrogen stations, speed up transition to carbon-free mobility. This technological collaboration will aim to improve the performance and connectivity of high-pressure vessels, by analyzing and mining the data generated by the interface at the filling station.

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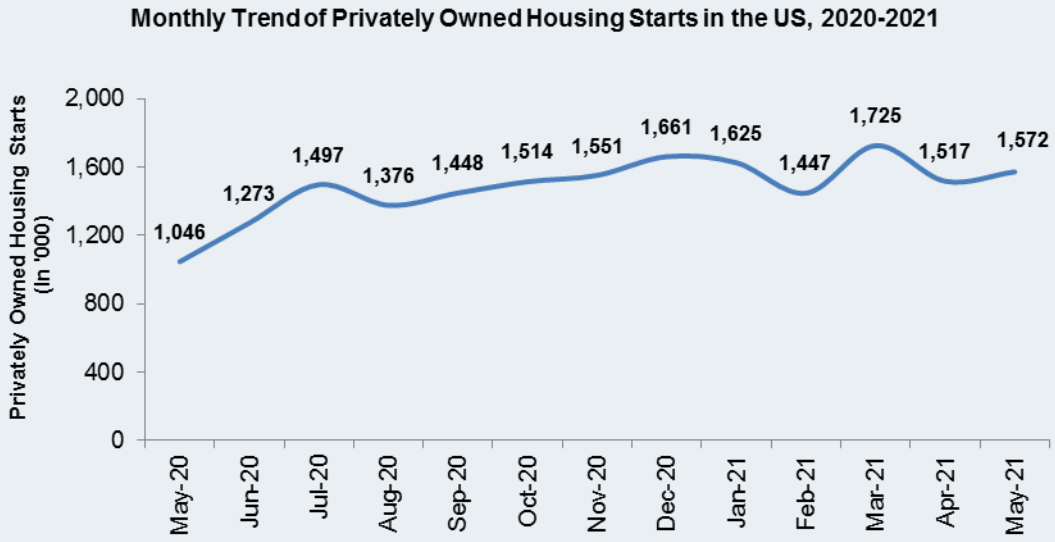
Construction

Privately-owned housing starts in May were at a seasonally adjusted annual rate of 1,572,000. This is 3.6% above the revised April estimate of 1,517,000, and is 50.3% above the May 2020 rate of 1,046,000. Single-family housing starts in May were at a rate of 1,098,000; this is 4.2% above the revised April figure of 1,054,000. The May rate for units in buildings with five units or more was 465,000.



One of the highlights of May, 2021, is as follows:

- **Structural Composites Launches High-Strength Composite Bridge.** Composites bridge deck technology can provide both rural and urban communities with a low-cost, lightweight, durable bridge structure that requires less equipment, making a shorter period for onsite preparation and a vastly shorter period for onsite installation.

Wind Energy

According to the latest "Energy Infrastructure Update" report from the Federal Energy Regulatory Commission's Office of Energy Projects, the cumulative installed capacity of 18 units during January-April 2021 was 3,802 MW as compared to 3,302 MW of 33 units during January-April, 2020. With a total installed generating capacity of 125.68 (GW), wind constituted 10.24% of the total installed generating capacity of 1,226.83 (GW) among all energy sources.

Some highlights of May, 2021, are as follows:

- **CETEC Initiative Established to Commercialize Technology for Full Composite Wind Turbine Blade Recyclability.** A coalition of industry and academic leaders have developed a new technology which will deliver the final technological step toward enabling circularity for thermoset composites used to make wind turbine blades.
- **Optimizing a Wind Turbine Nacelle Cover to Meet LCOE Demand.** Suzlon Group redesigned a composite nacelle cover with in-situ molded stiffeners to reduce manufacturing and material costs while maximizing part performance. Optimized three-part design reduces foam core usage with strategically placed foam core stiffeners.

Marine

The US marine industry is expected to recover in 2021 as compared to the declines of 2020.

Some highlights of May, 2021, are as follows:

- **Solico, Structor Engineering Develop Composite Superyacht Cinema Screen.** Twenty-five square-meter superyacht cinema screen supported by carbon fiber support structure which can hold the screen stable in 14 knots of wind and can be deployed in less than four minutes.
- **MAMBO Tests the Waters for 3D Printing Large Marine Structures.** MAMBO is a 6.5-meter demonstrator boat developed by Moi Composites to show the capabilities of the company's Continuous Fiber Manufacturing (CFM) additive manufacturing process for large marine structures. With its MAMBO boat, Moi Composites demonstrates use of its continuous fiber 3D printing technology for customized, automated production for the boating industry.

Consumer Goods

New orders for manufactured durable goods in May increased $5.7 billion or 2.3% to $253.3 billion, the U.S. Census Bureau announced today. This increase, up twelve of the last thirteen months, followed a 0.8% April decrease. Excluding transportation, new orders increased 0.3%. Excluding defense, new orders increased 1.7%. Transportation equipment, up following two consecutive monthly decreases, led the increase, $5.2 billion or 7.6% to $74.2 billion.

Some highlights of May, 2021, are as follows:

- **Arevo Debuts Custom, 3D-Printed Composite Scooter.** Scotsman is a direct-to-consumer, tailor-made electric kickscooter with continuous carbon fiber/thermoplastic unibody frame, handlebars, stem and baseboard. Scotsman has many features for consumers in terms of connectivity and different customization options, but from a materials perspective, it's really quite an innovation.
- **Sigmatex Renews Partnership with CCM Hockey.** This collaboration developed new innovative forms of SigmaST Spread Tow carbon fiber fabrics that will enable CCM to bring to market the most advanced hockey sticks available. Long-term partnership delivers high-

performance carbon fiber hockey sticks for the elite sport market. These new material solutions epitomize the outcome of working closely with customers to design, develop and manufacture industry leading advanced material products for the most demanding applications.

- **Bedford Reinforced Plastics Introduces FRP Pedestrian and Trial Bridge Line.** ReadySpan trail, park and golf bridges are made of Bedford's high-quality FRP and will reportedly last for decades virtually maintenance-free. The bridge systems are fabricated from high-strength E-glass and isophthalic polyester resin for strength and durability. The FRP bridges are lightweight, making it easy to transport to out-of-the-way locations.

Recent Developments in Materials

- **Trelleborg Unveils High-Temperature Castable Epoxy Tooling Material.** Trelleborg's applied technologies operation unveils its new TC350 castable epoxy tooling solution. TC350 is a specialized high-temperature, low-density syntactic epoxy tooling board, supporting the creation of parts for use in a range of industries, such as aerospace, automotive and marine. The tooling board is compatible with carbon fiber, polypropylene (PP) and glass fiber-reinforced plastics (GFRP) used in the manufacturing of electric vehicles (EVs).
- **New Thermoset Matrix Resin Offers Fast, Low-Temp, Tunable Cure.** Trimer Technologies LLC has introduced HARP Rapid, a new thermoset resin chemistry for liquid molding processes that offers a fast, tunable cure profile, and a Tg that exceeds the material's cure temperature. This laminate molded with Trimer's new HARP Rapid resin shows the thickness capabilities with this fast-cure, high-performance matrix resin. Trimer has also developed the technology to tune the gel time, allowing the heated resin to maintain a low viscosity and thus enabling pre-cured resin flow into larger or multi-cavity molds prior to snap curing. HARP Rapid also offers a long gel time at ambient temperature, enabling its use in vacuum-assisted RTM (VARTM) or in filament winding and pultrusion processes using resin bath systems.
- **Henkel Develops Industry's First Bio-Based PUR Hot Melt Adhesive for Consumer Electronics Assembly.** Henkel informed the development and commercial availability of LOCTITE HHD 3544F, the industry's first bio-based polyurethane reactive (PUR) hot melt designed for consumer electronics assembly. This is the company's inaugural consumer electronics-specific, bio-based PUR hot melt adhesive; approximately two-thirds of its content is sourced from renewable, plant-based feedstocks. Replacing conventional fossil fuel-based raw materials with renewable substitutes is a challenging endeavor. Nearly two years in development, LOCTITE HHD 3544F is a notable structural adhesive innovation and the first product in an expanding Henkel portfolio of bio and renewable material solutions for the consumer electronics sector.
- **Covestro Introduces 3D Printing Material Made From Recycled PET.** Materials manufacturer Covestro introduces its first material developed by the additive manufacturing business recently acquired from DSM: a glass-fiber filled recycled polyethylene terephthalate (rPET) for 3D pellet printing. Made from post-consumer PET waste, Arnite AM2001 GF (G) rPET perfectly fits Covestro's vision for a Circular Economy and illustrates how complementary the two organizations are in their approach to adding more value to additive manufacturing and industrial production overall. The recycled PET has been optimized for 3D pellet printing. This technology, also known as fused granulate fabrication (FGF), allows for fast and economically

viable additive manufacturing of large-size parts. Direct printing of applications lowers cost by reducing product development time. Plus 3D printing allows design flexibility, which can help reduce material cost.

Recent Product Launches in the Composites Market

The following table represents new product launch in the composites market in May, 2021.

Product	Company Name	Description
Tenax carbon fiber/PPS UD tape	Teijin Carbon Europe	Teijin says the new Tenax TPUD with PPS matrix allows entry into new cost-sensitive markets while offering the typical TPUD advantages like resistance to chemicals and solvents, low flammability, storage or shipping at room temperature and recyclability. Due to its flame-retardant properties and low smoke emission, this new Tenax tape can be used in interior applications of aircraft or rail vehicles, among other applications. The maximum continuous operating temperature is up to 220°C. Features of the material include very low water absorption, good creep resistance at elevated temperatures and high dimensional stability.

The US Economic Overview – May, 2021

The US Consumer Confidence Index decreased to 82.9 in May, 2021, as compared to 88.3 in April 2021. The GDP at current price of the US increased from US $22.5 trillion in March, 2021, to US $22.6 trillion in April 2021.

Real gross domestic product (GDP) increased at an annual rate of 6.4% in the first quarter of 2021, according to the "third" estimate. The increase in real GDP in the first quarter reflected increases in personal consumption expenditures (PCE), nonresidential fixed investment, federal government spending, residential fixed investment, and state and local government spending that were partly offset by decreases in private inventory investment and exports.

The increase in first quarter GDP reflected the continued economic recovery, reopening of establishments, and continued government response related to the COVID-19 pandemic. In the first quarter, government assistance payments, such as direct economic impact payments, expanded unemployment benefits, and Paycheck Protection Program loans, were distributed to households and businesses through the Coronavirus Response and Relief Supplemental Appropriations Act and the American Rescue Plan Act. The full economic effects of the COVID-19 pandemic cannot be quantified in the GDP estimate for the first quarter of 2021 because the impacts are generally embedded in source data and cannot be separately identified.

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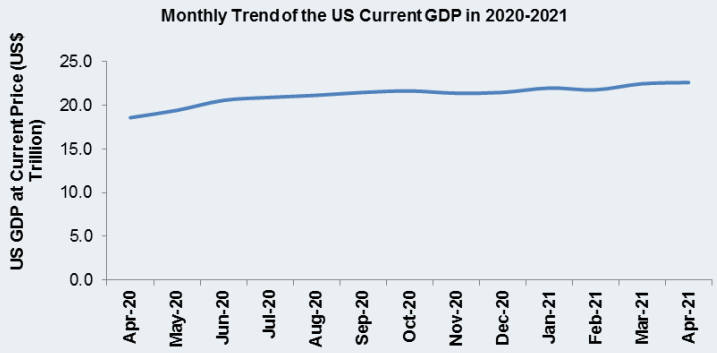
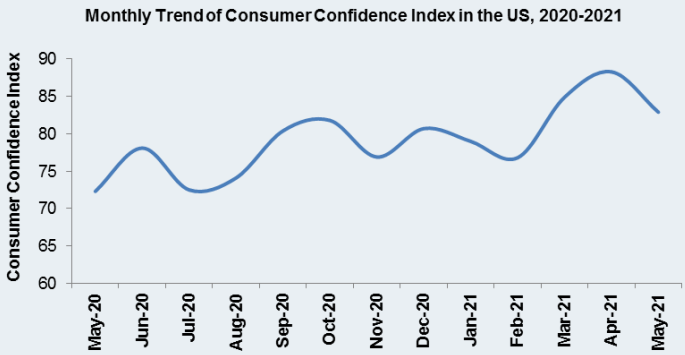
The price index for gross domestic purchases increased 4.0% in the first quarter, compared with an increase of 1.7% in the fourth quarter. The PCE price index increased 3.7%, compared with an increase of 1.5%. Excluding food and energy prices, the PCE price index increased 2.5%, compared with an increase of 1.3%.





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