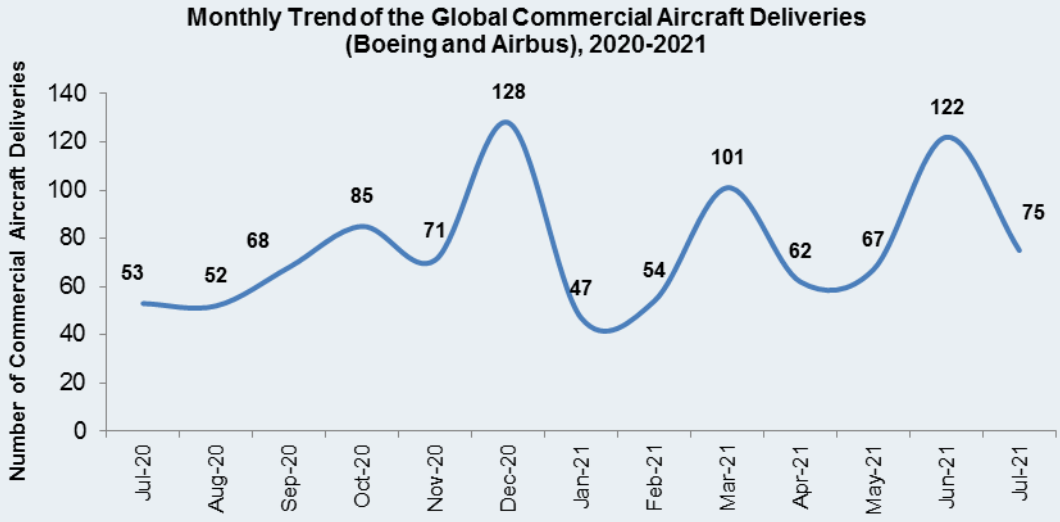
US Composites Market Monthly Insights July 2021

Composites Market Update for July 2021

Demand in the US Composites Market in July remained strong, and roughly flat when compared to July 2019. The trend was overall flat from June to July, but certain lingering constraints on raw materials and freight limited the ability of market players to meet the full demand, which has been a trend over the past several months. August is expected to be slightly ahead of July in terms of daily sales. Construction (particularly residential), RVs, and Marine were particularly strong sectors, while automotive has flattened a bit, as a result of supply challenges. Access to epoxy remains a challenge as the domestic supply is not able to keep up with the current demand, and UPR is in a similar situation, although not quite to the same extent as epoxy. Prices of raw materials have stabilized overall, but the price of epoxy is particularly expensive at the moment. Labor and transportation remain challenges for the Composites Market, but demand is expected to remain strong through the foreseeable future.

Aerospace

Commercial aircraft (Boeing and Airbus) deliveries decreased from 122 aircraft deliveries in June, 2021, to 75 aircraft deliveries in July, 2021.



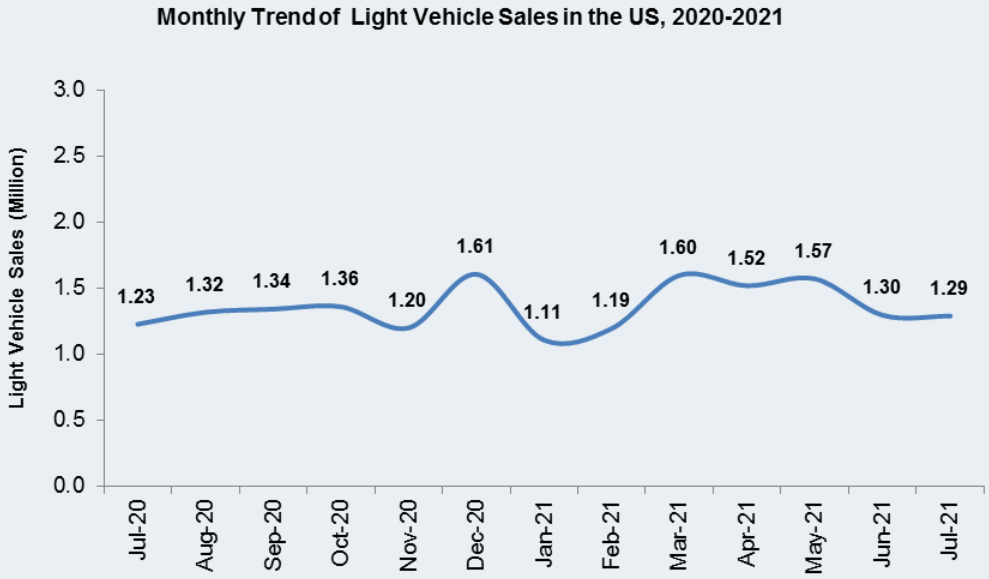
Some highlights of July, 2021, are as follows:

- **Qarbon Aerospace Launches Composite Aircraft Icing Protection System.** The thermoplastic composite Helios system will be distributed by AIR Group for use on the leading edges of turboprop aircraft wings and other components. Together, Qarbon Aerospace and AIR Group will target airlines operating turboprop aircraft where there would be value in reducing the maintenance costs, replacement expenses and operational limits imposed by pneumatic boots.

- **ÉireComposites, Manna and NUIG to Develop Carbon Fiber Composite Drone Airframe.** The MI-DRONE project helps to address consumer demand for fast, reliable, last-mile delivery using a drone with delivery times being reduced to three minutes. The aim to develop additive manufacturing and automation technologies for high-volume manufacturing of drones for 36% reduction in cost per drone.
- **Virgin Galactic Completes First Fully Crewed Spaceflight.** The vehicle reached space, at an altitude of 53.5 miles, before gliding smoothly to a runway landing at Spaceport America, located in Las Cruces, New Mexico. The crew fulfilled a number of test objectives related to the cabin and customer experience.
- **Spirit AeroSystems, Albany Engineered Composites Collaborate to Expand Hypersonic Capabilities.** Combination of high-temperature composite, structure capabilities and experience in 3D-woven near-net shape composites to help rapidly scale affordable hypersonic thermal protection systems. This collaboration enables elegant technical solutions while reducing the risk in accelerating program timelines and scaling to production.
- **Airbus Delivers First A350 Completed in China.** This is a new milestone in the long-term cooperation between China and Airbus, which further demonstrates Airbus' commitment to the country. The A350 features an aerodynamic design, a carbon fiber fuselage and wings, plus new fuel-efficient Rolls-Royce (London, U.K.) engines. These features translate into unrivaled levels of operational efficiency with a 25% reduction in fuel burn and CO2 emissions.

Automotive

The U.S. new vehicle sales of 1,288,494 units in July, 2021, represented an increase of 5% as compared to 1,227,091 in June, 2020.



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Some highlights of July, 2021, are as follows:

- **Coats Joins GM-led U.S. DOE Project to Develop Composite EV Battery Enclosures.** This is an exciting opportunity to innovate with a group of companies led by a global automotive leader to develop a composites solution at scale. Lighter, stronger and cost-effective composites solutions form part of the journey towards a zero-emissions future in automotive. Combined company developed a tailored fiber-reinforced composites solution for volume manufacturing of structural battery enclosures in electric vehicles (EV).
- **McMurtry Automotive Reveals Composites-Intensive, fully Electric Spéirling Demonstrator Vehicle.** It's fast, and there are plenty of composites involved. This is a full carbon fiber monocoque with carbon fiber crash structures and bodywork. The battery capacity is 60 kilowatt-hours and the voltage is >800 volts. The one-seat vehicle is also powered by an e-axle developed by McMurtry Automotive. And while the output of the motor has not been revealed, according to the company there is a power to weight ratio of 1 horsepower: 1 kilogram. So, if the car weighs approximately one tonne, that's ~1,000 kilograms — that's a lot of horsepower to move this vehicle.
- **NCC Develops Composite Structural Systems for Bus Fuel Cell Retrofits.** Glass fiber storage structure increases energy storage density by 28%, meets cost and weight targets and ultimately enables a rapid retrofit of U.K. commercial buses, with potential for larger vehicles.
- **McLaren Racing Accelerates F1 Car Development.** E-Xstream Engineering, part of Hexagon's manufacturing intelligence division, has been selected by McLaren Racing to provide materials data management for its Formula 1 cars. MaterialCenter captures data from material testing and the many tools and processes the team employs to ensure full traceability throughout each component's lifecycle. It also enables design innovation using materials such as alloys, elastomers, plastics, metals and composites.
- **Cevotec Fiber Patch Placement Improves Storage Efficiency of Composite Tanks.** Cevotec's solution is to apply carbon fiber patches to the dome areas of Type IV pressure vessels, which reportedly yields 15% in material, weight and cost savings.
- **Thermoplastic composites: Structural bumper bracket**. A new structural application for composites in a hidden but very effective location: on the left and right front sides behind the steel bumper. The hybrid thermoplastic composite/metal bracket reduces mass, achieves equivalent or better performance in modal, stress, fatigue and crash testing in limited package space, reduces corrosion and warranty risks and permits significant parts consolidation.

Construction

Privately-owned housing starts in July were at a seasonally adjusted annual rate of 1,534,000. This is 7.0% below the revised June estimate of 1,650,000, but is 2.5% above the July 2020 rate of 1,497,000. Single-family housing starts in July were at a rate of 1,111,000; this is 4.5% below the revised June figure of 1,163,000. The July rate for units in buildings with five units or more was 412,000.

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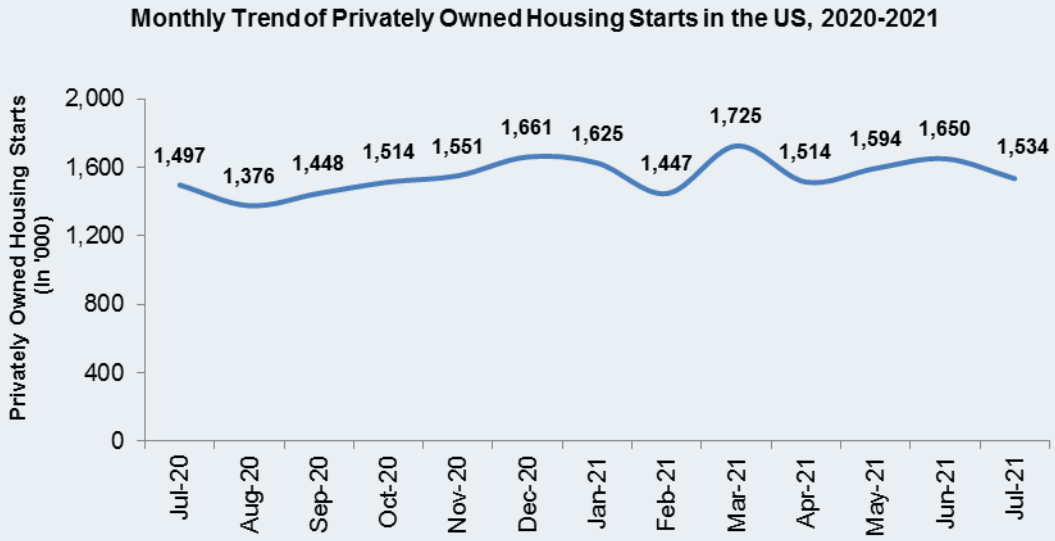

Some highlights of July, 2021, are as follows:

- **Continuous fiber-reinforced, 3D printed houses on the horizon.** 3D-printed modular building manufacturer Mighty Buildings moves toward certification of higher-strength, more sustainable glass fiber-reinforced housing panels. Its 3D-printed, prefabricated modular accessory dwelling units (ADU), which are manufactured via a combination of additively manufactured thermoset resin panels and steel frames.
- **Kordsa launches new structural reinforcement products.** Kordsa held a digital launch for new products in its Kratos structural reinforcements product line, including Kratos C-fabric unidirectional (UD) carbon fiber fabric and Kratos C-plate pultruded carbon fiber strips. Kratos structural reinforcement products are designed to retrofit reinforced concrete structures. In seismic retrofitting applications, these products are said to increase a structure's load-bearing capacity and improve structural performance.

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 34 units during January-June 2021 was 5,617 MW as compared to 4,271 MW of 41 units during January-June, 2020. With a total installed generating capacity of 127.89 (GW), wind constituted 10.40% of the total installed generating capacity of 1,230.09 (GW) among all energy sources.

Some highlights of July, 2021, are as follows:

- **Composites AM Research Targets Wind Energy.** The U.S. DOE, universities and industry leaders ramp up new efforts and funding to develop 3D-printed composite wind blade molds and end-use blade components. Additive manufacturing (AM) technologies, either for faster and less costly tooling development or for tool-less manufacture of blade components themselves, could be an enabling solution for next-generation wind blade innovations.

- **Partnership Integrates Recycled Turbine Blade Materials into Energy Storage System.** Enel Green Power and Energy Vault aim to use decommissioned carbon and glass fiber wind turbine blades to produce composite blocks for the EVx renewable energy storage system. This partnership aims to integrate Energy Vault's energy storage technology, EVx, which relies on the power of gravity and the movement of water to store and discharge electricity, with recycled composite materials from wind turbine plants.

Marine

The US marine industry is anticipated to experience good growth in 2021.

Some highlights of July, 2021, are as follows:

- **ÉireComposites, Wavefoil to Produce Retractable Composite Bow Foils.** Retractable composite bow foils for passenger ferries, fishing trawlers and yachts will lead to a more sustainable marine industry through a reduction in fuel consumption and reduced emissions. Composite materials underpin the overall structure of the foils and they enable the doubled-curved surfaces necessary to obtain smooth and efficient foil geometry.
- **Additive Manufacturing Adds Versatility to Large Marine Structures.** Dive Technologies and Moi Composites are among those extending composite 3D printing's design flexibility past prototyping and into customizable end-use parts. Composite 3D printing is often used for tooling and prototypes, but companies like Dive Technologies and Moi Composites are demonstrating that additive manufacturing (AM) can help solve challenges in short-run and one-off end-use part production within the marine industry.

Consumer Goods

New orders for manufactured durable goods in July decreased $0.4 billion or 0.1% to $257.2 billion, the U.S. Census Bureau announced today. This decrease, down following two consecutive monthly increases, followed a 0.8% June increase. Excluding transportation, new orders increased 0.7%. Excluding defense, new orders decreased 1.2%. Transportation equipment, also down following two consecutive monthly increases, drove the decrease, $1.7 billion or 2.2% to $75.3 billion.

Some highlights of July, 2021, are as follows:

- **NTU Singapore, Arkema Manufacture Carbon Fiber Helmets using Elium Resin.** Carbon fiber reinforcement increases stiffness, toughness of the helmet's outer shell and allows it to absorb more impact energy over a longer period, while also dissipating it evenly throughout the helmet. This results in less overall force reaching the head, thereby reducing the chances of critical injury.
- **Mar-Bal Fire-Resistant Composite Wastebasket Promotes Fire Safety.** Made from thermoset composites reinforced with glass fiber, Waste-Safe is able to contain a fire without burning, melting or collapsing. Mar-Bal says its wastebaskets can also help reduce these preventative maintenance costs, are easy to clean and are corrosion- and rust-proof.

- **CNT-Enhanced Carbon Fiber Strengthens Mountain Bike Team's Race Wheels.** NAWA's vertically aligned carbon nanotube technology enhances shock resistance, increases strength for Santa Cruz team's mountain bike wheels. NAWASTICH also improves strike damage resistance by eliminating the probability that a crack will occur in the interface. In addition, in its own tests, NAWA has found that NAWAStitch-reinforced carbon fiber composites have shear strength increased by a factor of 100 and shock resistance by a factor of 10.

Recent Developments in Materials

- **Film Supplier Covestro Develops Solutions for Wound Dressings with a New Rigid Liner.** Covestro has developed several material solutions, which facilitate a cost-efficient and simple production of wound dressings and wearables. The combination of a polypropylene (PP) liner with thermoplastic polyurethane (TPU) blown films, in particular, proved to be well suited to meet today's high demands for functionality and freedom of design. It also greatly reduces the generation of dust that can interfere with the clean manufacture of medical products at the customer's site.
- **Composite Decorative Fabrics.** Cristex Composite Materials offers a range of Decorative Fabrics for composite applications. The range is primarily composed of Alutex, Dynanotex, Carbon and Coloured Polyester Fabrics, Innovative Tex and Premium Decorative Weaves. Each fabric has a wide variety of finishes available to provide a visually aesthetic finish for a large range of applications across the Aerospace, Automotive and Sporting industries. Alutex is a range of Woven Glass fabrics, typically 200g to 300g of varied weave patterns. These fabrics are finished with an aluminum powder coating to create the final look. Dynanotex is composed of a range of Woven Carbon Fibre fabrics based on spread tow technology which provides both lightweight unidirectional and woven products. Dynanotex fabrics are used in wind surfing, kite boarding, skis, hockey sticks and sports goods in general, automotive, and marine applications.
- **Avient Launches Moisture-Resistant Nylon 6 and 6/6 Complet Long Fiber Composites with Enhanced Appearance.** Avient informed the availability of a new series of nylon-based Complet long fiber reinforced thermoplastic composites with enhanced moisture resistance and smooth surface aesthetics. These formulations feature nylon 6 and 6/6 with delayed moisture absorption, which prolongs the effectiveness of their structural performance in moisture-rich environments. These new materials also take aim at inconsistent surface appearance issues with long fiber polyamides, which have affected quality perceptions in the past. Long glass fiber reinforced grades of Complet moisture-resistant nylon feature surfaces that are smooth and virtually free of visible fiber, making it suitable for a wide range of consumer applications. Complet moisture-resistant nylon 6 and 6/6 grades are globally available in several fiber loading levels (weight percentages) using long glass fiber, long carbon fiber, or hybrid combinations. This allows the materials to retain structural properties that fall between those of standard and specialty nylons when exposed to moisture. As a result, the materials are ideal for metal replacement and light weighting initiatives in automotive and power sports applications that encounter varying climates or intermittent exposure to water.

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Recent Product Launches in the Composites Market

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

Product	Company Name	Description
Linerless liquid hydrogen tank	Lockheed Martin Australia and Omni Tanker	The collaboration will result in the development of two new operational scale propellant tanks for storing cryogenic liquid fuels for commercial and civil satellite programs: a "Type IV" fluoropolymer-lined carbon fiber composite tank and a "Type V" linerless carbon fiber composite tank, both of which are suitable for high pressures, the extreme cryogenic temperatures required for liquid hydrogen as well as oxygen, hydrogen peroxide and hydrazine.

The US Economic Overview – July, 2021

The US Consumer Confidence Index decreased to 81.2 in July, 2021, as compared to 85.5 in June 2021. The GDP at current price of the US increased from US $22.72 trillion in May, 2021, to US $22.83 trillion in June 2021.

Real gross domestic product (GDP) increased at an annual rate of 6.6% in the second quarter of 2021, according to the "second" estimate. The increase in real GDP in the second quarter reflected increases in personal consumption expenditures (PCE), nonresidential fixed investment, exports, and state and local government spending that were partly offset by decreases in private inventory investment, residential fixed investment, and federal government spending.

The increase in second quarter GDP reflected the continued economic recovery, reopening of establishments, and continued government response related to the COVID-19 pandemic. In the second quarter, government assistance payments in the form of loans to businesses and grants to state and local governments increased, while social benefits to households, such as the direct economic impact payments, declined. The full economic effects of the COVID-19 pandemic cannot be quantified in the GDP estimate for the second quarter because the impacts are generally embedded in source data and cannot be separately identified.

The price index for gross domestic purchases increased 5.8% in the second quarter, an upward revision of 0.1% point. The PCE price index increased 6.5%, an upward revision of 0.1% point. Excluding food and energy prices, the PCE price index increased 6.1%, unrevised from the advance estimate.

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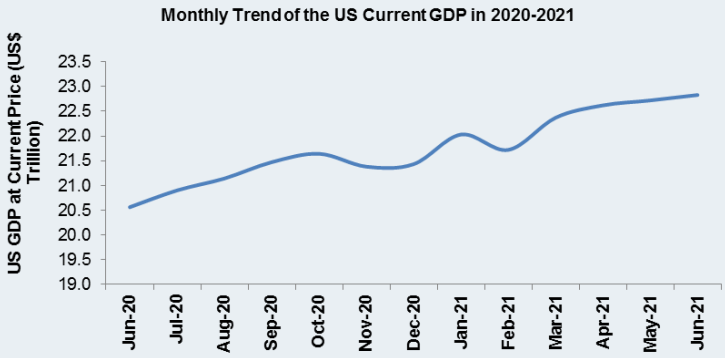

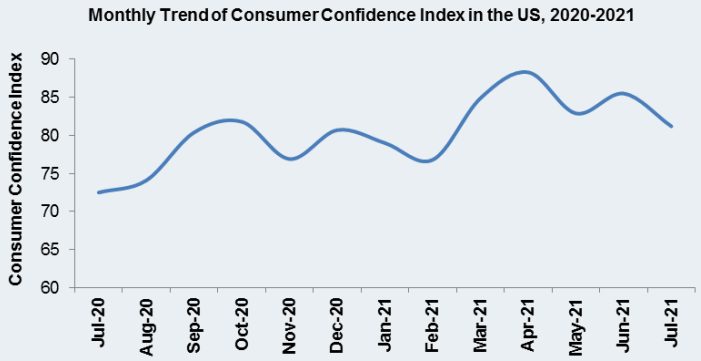

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