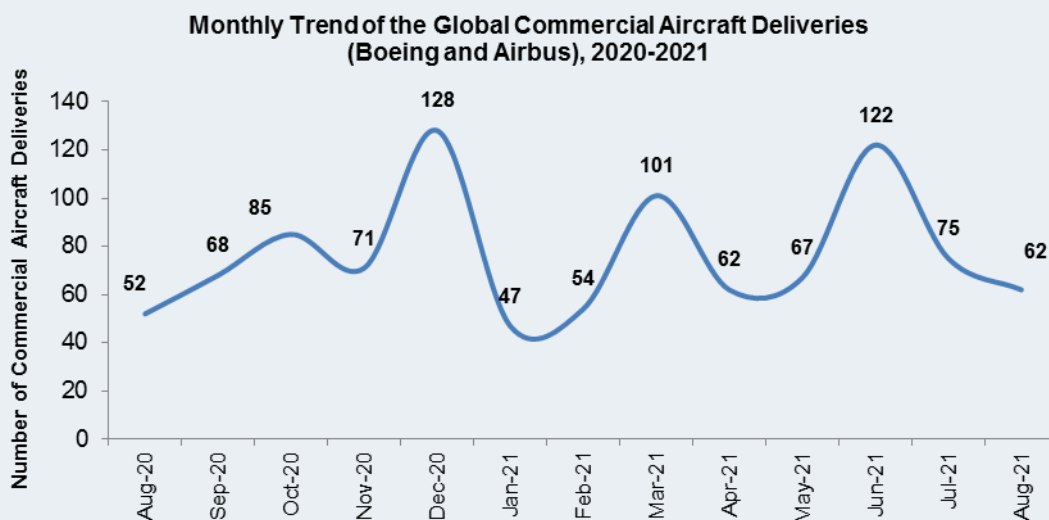


Composites Market Update for August 2021

Demand in the US Composites Market in August remained strong, performing at roughly 8% higher than August 2020, when the market was starting its recovery after lockdown. While the demand and outlook remain strong for September, supply challenges remain a bottleneck to meeting the full demand. Building & construction, marine, and transportation were all robust. YTD trends suggest that composite business in 2021 will exceed 2019. Increasing prices of raw materials as well as freight and logistics challenges have all led to steadily increasing costs in the value chain, which will boost revenue. However, critical challenges attracting skilled labor, maintaining delivery timelines, and addressing supply shortages in key products like epoxy and propylene oxide are all preventing the industry from meeting the full demand. These challenges are expected to persist, which leaves the industry more vulnerable to disruption from hurricanes, international trade disputes, and other external factors.

Aerospace

Commercial aircraft (Boeing and Airbus) deliveries decreased from 75 aircraft deliveries in July, 2021, to 62 aircraft deliveries in August, 2021.



Some highlights of August, 2021, are as follows:

- COBRA Supports HG Robotics with New Production Concept for the Carbon Fiber Composite VETAL Tail Sitter VTOL Drone.** Cobra International (COBRA) informed about the expansion of its development and manufacturing partnership with leading Thai UAV producer HG Robotics. In their latest collaboration, COBRA has supported HG Robotics with the development of an entirely new production concept for the new “VETAL” tail sitter VTOL drone. Building upon earlier experience as a component manufacturer for HG Robotics, COBRA has strengthened

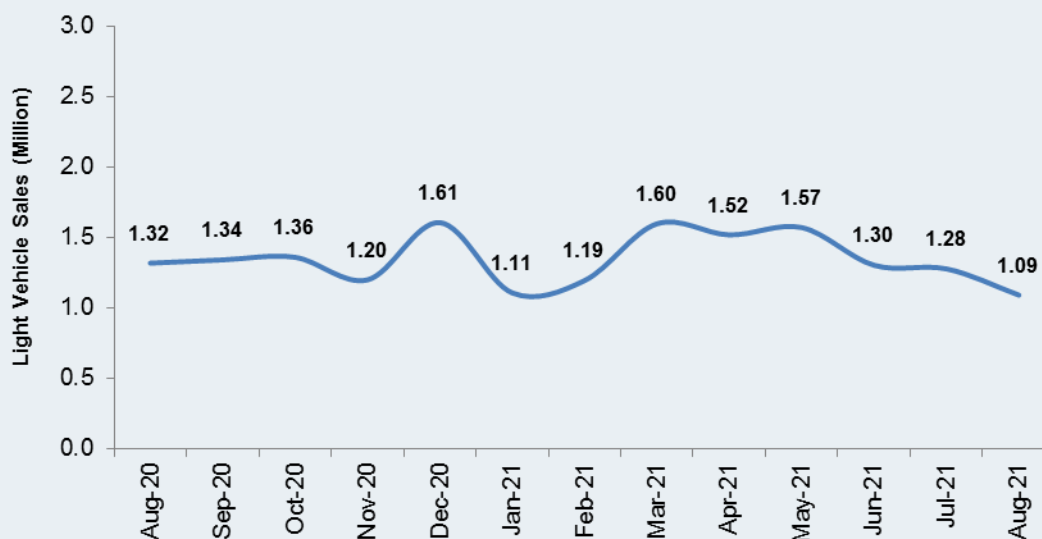
the partnership with the new VETAL drone, supporting HG with the development of an entirely new production concept for the carbon fiber composite flying wing. Having developed the initial flying shape of the VETAL platform, HG Robotics had produced the first flying prototypes using a more traditional UAV construction technique of thin composite skins, with ribs and frames supporting the hollow structure.

- **Kaneka Aerospace Collaborates with Shanghai Huazheng Composites Co., Ltd.** Kaneka Aerospace LLC, a wholly-owned subsidiary of Kaneka Americas Holding, Inc., is pleased to declare its collaboration with Shanghai Huazheng Composites Co., Ltd to extend its footprint at the growing composites market in China. Kaneka Aerospace LLC manufactures specialty high performance composite materials serving a great variety of diverse markets.
- **Spirit AeroSystems Europe Delivers First Set of A320 Family RTM Spoilers.** Spirit AeroSystems Limited, a subsidiary of Spirit AeroSystems Holdings, Inc. has successfully delivered the first set of new advanced composite spoilers to Airbus for the A320 Family. The spoilers are produced using Spirit's pioneering Resin Transfer Moulding (RTM) technology and are the first to feature on a flying aircraft. The redesigned spoiler is produced using a highly-automated advanced manufacturing, out-of-autoclave process, resulting in significantly improved manufacturing efficiencies, and reduced energy and costs compared to the original, more traditional design. Spirit is the first to industrialize this innovative composite technology in the UK aerospace sector.
- **GE Aviation Reaches New Milestones in Advanced Manufacturing for More Fuel-Efficient Jet Engines.** Two GE Aviation facilities producing advanced jet engine components recently passed major manufacturing milestones. GE Aviation's Asheville, North Carolina, facility recently shipped its 100,000th turbine shroud made from Ceramic Matrix Composite (CMC) materials, while the Auburn, Alabama, facility recently shipped its 100,000th additively manufactured fuel nozzle tip. The Asheville facility, which began producing CMCs in 2014, is the aviation industry's first mass manufacturing site for jet engine components made from CMCs. The Auburn site began producing fuel nozzles in 2015 and was the industry's first mass manufacturing site for producing aircraft engine parts using additive manufacturing.

Automotive

The U.S. new vehicle sales of 1,090,446 units in August, 2021, represented a decrease of 17% as compared to 1,317,620 in August, 2020.

Monthly Trend of Light Vehicle Sales in the US, 2020-2021



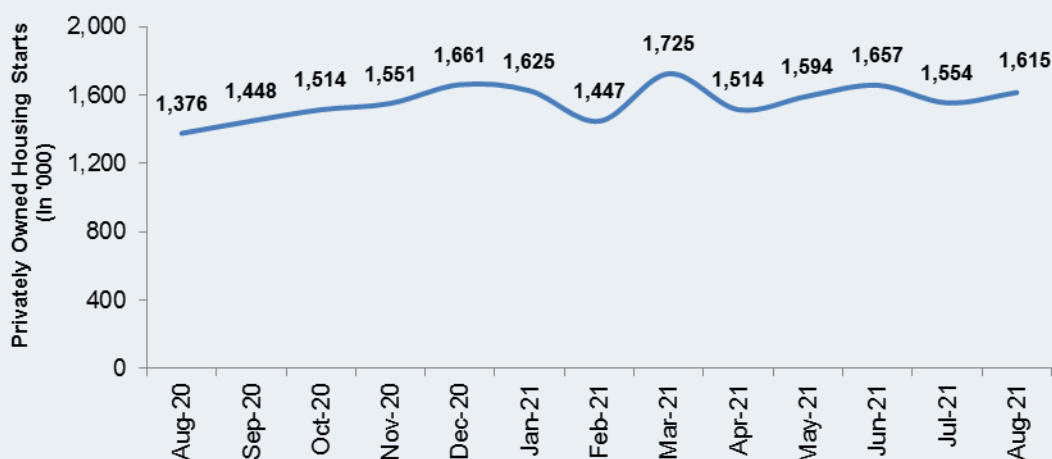
Some highlights of August, 2021, are as follows:

- LANXESS: High Performance Plastics Grade for Production of Battery Housings.** LANXESS and Korean auto parts specialist INFAC have together developed battery module housing for electric vehicles (EVs). The battery housing has been adapted to series production of EV models launched by a Korean OEM. Specialty chemicals company LANXESS and Korean auto parts specialist INFAC have together developed battery module housing for electric vehicles (EVs). The battery housing uses Durethan BKV30FN04 from LANXESS to satisfy stringent mechanical and chemical property requirements for latest EV components. The halogen-free, flame-retardant and glass-fiber-reinforced polyamide 6 (PA6) is characterized by its excellent flame-retardant and electrical properties. The material is highly processable and enables the integration of complex functions required for housing components, resulting in a smaller number of parts and a simplified assembly process as well as lighter weight.
- YCOM Composite Lightweight All-Electric Race Scooter Selected by Eskootr Championship.** YCOM, a company that specializes in motorsports engineering and lightweight composite design, has completed the official delivery and testing of its high-performance composite S1-X eSkootr for the eSkootr Championship (eSC), a new racing series that highlights e-mobility and frontier innovation. It utilizes two compact, state-of-the-art 6kW electric motors in combination with a 1.5kWh battery supplied by Williams Advanced Engineering. The S1-X's carbon fiber chassis is clad with aerodynamic and environmentally friendly bodywork, with adjustable front and rear suspension elements made from CNC-machined aluminum.
- Bucci Composites: 22" Carbon Fiber Wheels for Bentley Revealed.** The 22" carbon wheel, the largest ever made in carbon, guarantees an innovative design and excellent performance, as well as a weight saving of 6 kg per wheel. All the benefits of using the ultralight carbon fiber wheel are directly linked to the reduced weight of the wheel: a lighter component design means less rotational inertia, which translates into greater acceleration, shorter braking distance and better vehicle handling.

Construction

Privately-owned housing starts in August were at a seasonally adjusted annual rate of 1,615,000. This is 3.9% above the revised July estimate of 1,554,000 and is 17.4% above the August 2020 rate of 1,376,000. Single-family housing starts in August were at a rate of 1,076,000; this is 2.8% below the revised July figure of 1,107,000. The August rate for units in buildings with five units or more was 530,000.

Monthly Trend of Privately Owned Housing Starts in the US, 2020-2021



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

- ST Bungalow to Demonstrate Fiberglass Roofing Solution from Recycled Wind Blades.** The New York-based startup recently partnered with a wind blade recycling company and plans to produce its first full-scale prototypes this year. This solution is intended to serve as a more sustainable, lower-concrete alternative to corrugated steel roofs or concrete roofs reinforced with steel or fiber-reinforced polymer (FRP) rebar. The basic idea is that the shape and the form of the fiberglass allows for the tensile strength needed to push the concrete to maximum compression.

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 39 units during January-July 2021 was 6,818 MW as compared to 4,709 MW of 50 units during January-July, 2020. With a total installed generating capacity of 129.09 (GW), wind constituted 10.45% of the total installed generating capacity of 1,235.23 (GW) among all energy sources.

One of the highlights of August, 2021, are as follows:

- **Nordex SE: Nordex Group Announces New Strategic Collaboration with TPI Composites in Mexico.** With this innovative collaboration model, the Nordex Group will transfer the operation of its Mexican rotor blade production in Matamoros to TPI for a period of three years. Both partners will further increase the efficiency and output of the rotor blade production, which mainly serves the American markets, by leveraging the unique expertise of TPI as a leading expert in rotor blade process technology.

Marine

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

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

- **Fire-resistant and bio-based fiber-reinforced composites for structural lightweight design in ships.** As lightweight construction materials, fiber-reinforced polymers have the potential to improve the ecological footprint of ships. These concepts will have to regard strict safety regulations and fire protection requirements applying to passenger ships. The aim of the "GreenLight" project is to develop bio-based composites with intrinsic fire safety for use in load-bearing structures. The project will also cover manufacturing and recycling concepts.

Consumer Goods

New orders for manufactured durable goods in August increased \$4.6 billion or 1.8% to \$263.5 billion. This increase, up fifteen of the last sixteen months, followed a 0.5% July increase. Excluding transportation, new orders increased 0.2%. Excluding defence, new orders increased 2.4%. Transportation equipment, up three of the last four months, led the increase, \$4.2 billion or 5.5% to \$80.8 billion.

Recent Developments in Materials

- **Tough Bicycle Helmet Made from New Composite Materials by French specialty materials leader Arkema.** A team of researchers from NTU's School of Mechanical and Aerospace Engineering, in collaboration with the French specialty materials leader Arkema, have developed a safer bicycle helmet using a combination of materials. The helmet's outer shell developed by Arkema is made from a new thermoplastic resin named Elium, and is reinforced with carbon fiber. This reinforcement makes the outer shell tougher, stiffer, and less brittle than a polycarbonate shell. It also increases the helmet's contact time, which is the total time of impact in which the helmet experiences impact load. These properties allow the outer shell 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.
- **Owens Corning Launches PINK Next Gen Fiberglass Insulation.** Owens Corning, the company that invented fiberglass insulation, informed about its latest advancement: PINK Next Gen

Fiberglas insulation. Featuring advanced fiber technology, this superior insulation solution enables up to 23% faster installation compared to its existing products. The advanced fiber technology of PINK Next Gen Fiberglas creates a tightly woven network of soft, fine fibers to form a super-resilient blanket of insulating micro-pockets. Leveraging several new technology innovations, the new product is safe for installers and residents and faster to install than competitive insulation products and spray foam insulation. Because no hazardous chemicals are required to be mixed on the install site, there is less potential for human error, increasing peace of mind for installers and residents. The product is designed to meet building codes and help professionals manage through tight labor timelines and budgets by reducing install time.

- Markforged Launches Aerospace-Ready Traceable Composite Materials.** Onyx FR-A and Carbon Fiber FR-A materials meet FST requirements, come with traceability and adhere to specifications approved by the National Center for Advanced Materials Performance (NCAMP). Onyx FR-A and Carbon Fiber FR-A materials are designed to meet flame, smoke and toxicity (FST) requirements for many parts in aircraft interiors. They are specifically developed for end-use applications in demanding industries like aerospace and defense because of their high strength-to-weight ratio, exceptional surface finish and high consistency. With Onyx FR-A and Carbon Fiber FR-A materials, aerospace manufacturers and others in highly-regulated industries.
- CAMX 2021 exhibit preview: Toray.** Toray Industries and its North American carbon fiber divisions present its specialized product portfolio, including Toray Cetex TC1225, Toray AmberTool HX56, the 2700 prepreg system and Torayca T1100. Toray Advanced Composites highlights the latest advances in advanced thermoplastic composite materials with Toray Cetex TC1225, an LMPAEK-based composite material which exhibits high-quality and cost-effective processing characteristics together with outstanding mechanical performance properties. Toray Advanced Composites also presents Toray AmberTool HX56 composite tooling prepreg. Now available through an extended dedicated supply base in the U.S., this high-performance tooling prepreg is reported to have robust handling characteristics that provide excellent drape for complex shapes like those needed in the motorsport market.

Recent Product Launches in the Composites Market

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

Product	Company Name	Description
VITA (value in tank assembly) System	Eaton Aerospace	The efficient design of the VITA feed system requires less space on the satellite bus, plus it saves integrators significant procurement, assembly, testing, troubleshooting and rework effort. According to the company, VITA will play a critical role in helping propel satellites to final orbit and in station-keeping to maintain orbital position. By enabling additional payload flexibility and control over which type of fuel can be included on a satellite mission, the VITA design supports the growing satellite industry, especially in the highly competitive area of small satellite providers.

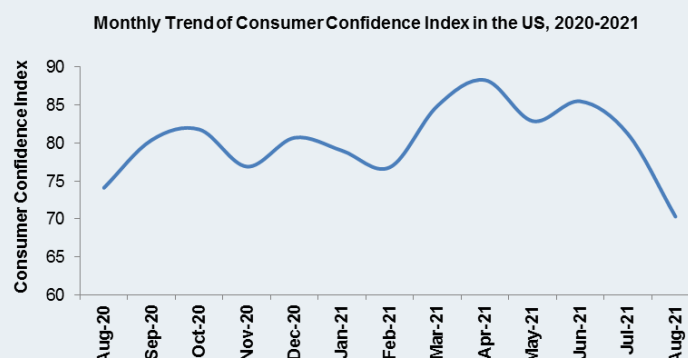
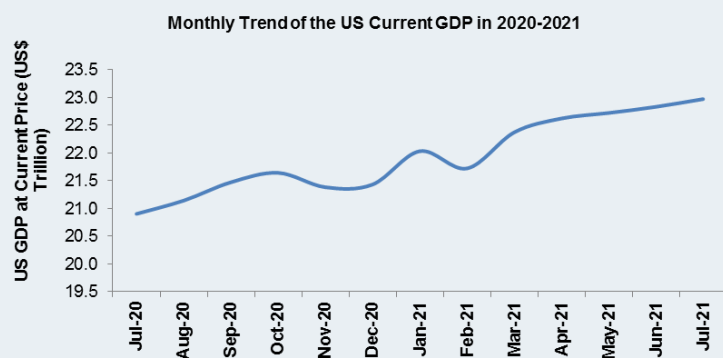
The US Economic Overview – August, 2021

The US Consumer Confidence Index decreased to 70.3 in August, 2021, as compared to 81.2 in July 2021. The GDP at current price of the US increased from US \$22.83 trillion in June, 2021, to US \$22.97 trillion in July 2021.

Real gross domestic product (GDP) increased at an annual rate of 6.7% in the second quarter of 2021, according to the "third" 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, unrevised from the second estimate. The PCE price index increased 6.5%, unrevised from the second estimate. Excluding food and energy prices, the PCE price index increased 6.1%, unrevised from the second estimate.



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