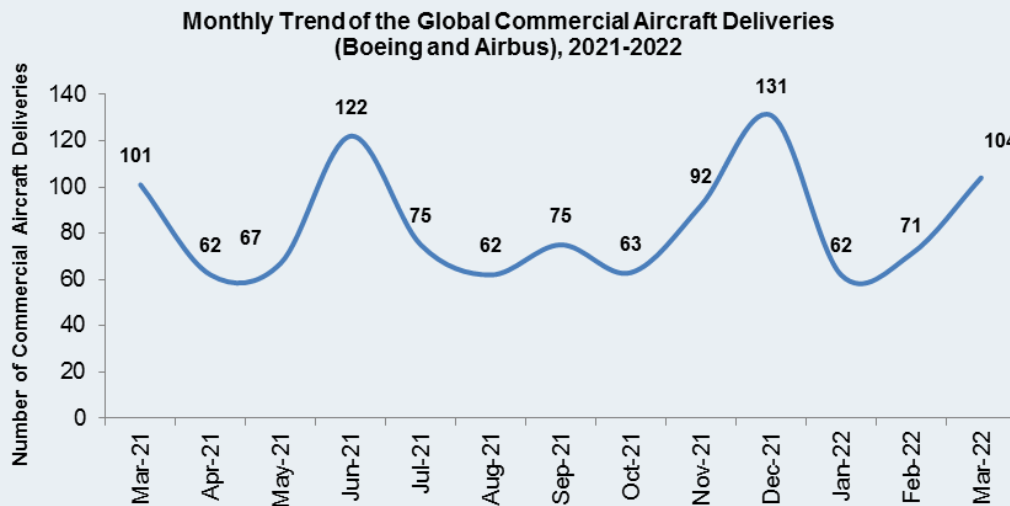


### Composites Market Update for March 2022

The composites market in March remained strong, and slightly (1%) higher than the previous year. For perspective, March of '21 was particularly strong, as the industry was pushing hard to catch up from the severe winter storm in the southern US, which created major challenges in Feb of '21. From a month-to-month perspective, daily sales remained roughly even, although March had fewer business days, and was therefore down slightly from February, although demand remained high. All industries remained strong. Freight remained the biggest constraint to meeting the full potential, as the demand still marginally exceeded the ability to supply materials and finished products. Raw materials cost continued to increase due to increased fuel expenses and strong demand. Prices are expected to continue to creep upward in April and May. Concerns regarding COVID-19 continue to lessen, but the conflict in Ukraine creates the potential for disruption.

### Aerospace

Commercial aircraft (Boeing and Airbus) deliveries increased from 71 aircraft deliveries in February 2022 to 104 aircraft deliveries in March 2022.



Some highlights of March 2022 are as follows:

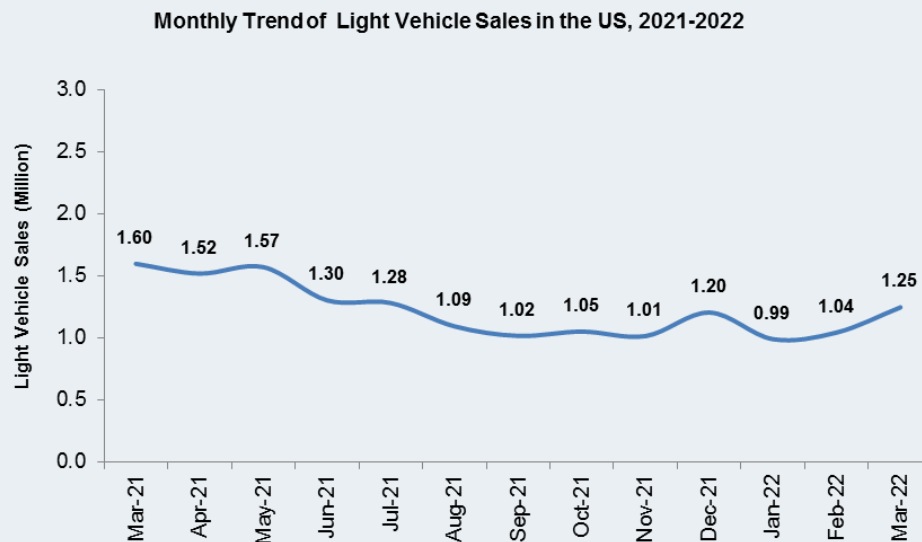
- HyPoint Dramatically Extends Zero-Emission Hydrogen Flight Range With New Ultralight Liquid Hydrogen Fuel Tanks.** HyPoint, the company developing zero carbon-emission turbo air-cooled hydrogen fuel cell systems for aviation and urban air mobility, announced a partnership with Gloyer-Taylor Laboratories (GTL), an aerospace engineering research and development company, to integrate GTL's advanced carbon composite "BHL™ Cryotank" liquid hydrogen fuel tanks with HyPoint's fuel cell system. As a result, aircraft can travel longer distances without refueling. This partnership with GTL goes even further by offering aircraft

and eVTOL makers a liquid hydrogen tank that is stronger and lighter than anything else on the market, thereby significantly increasing fuel capacity.

- **GA-ASI Installs FIRST V-TAIL from GKN Aerospace onto MQ-9B RPA.** The first of the advanced composite V-tails was shipped from the GKN Aerospace facility in Cowes, England to GA-ASI in Poway, Calif. and fitted onto an MQ-9B RPA, which will ultimately be delivered to the RAF as a Protector RPA. This partnership is an important development for Defense business and paves the way for continued growth of advanced aerospace manufacturing in the U.K.
- **Cecence Develops Sustainable Airplane Seatback in Collaboration with NCC and Gen 2 Carbon.** Cecence, in collaboration with the National Composites Centre (NCC) and Gen 2 Carbon, have developed an airplane seatback that could reduce CO2 emissions by over 320 tons during the aircraft's service life, paving the way for more environmentally friendly air travel.

### Automotive

The U.S. new vehicle sales of 1,246,336 units in March 2022 represented a decrease of 22% as compared to 1,597,152 in March 2021.



Some highlights of March 2022 are as follows:

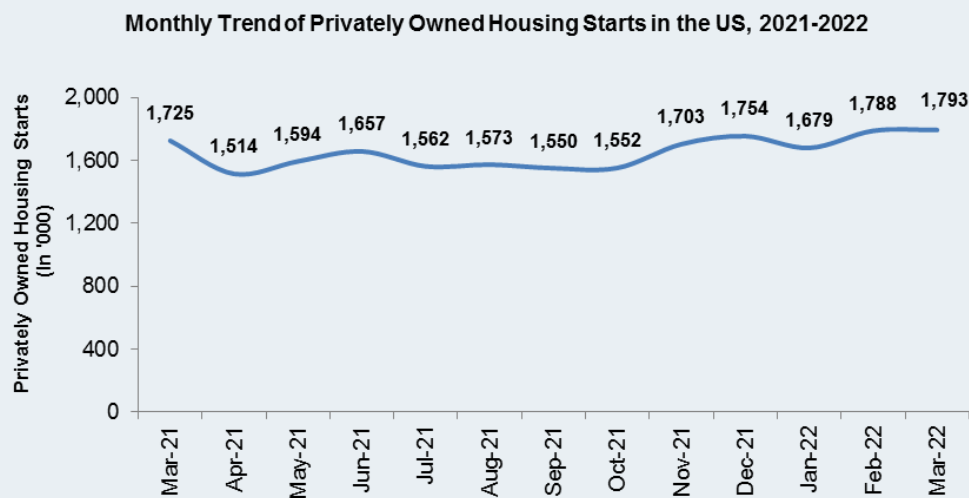
- **LANXESS Tepex Flowcore Composite Range Expanded.** Focusing on lightweight components for cars, sports equipment, and consumer goods, the long fiber-reinforced thermoplastic enhances ductility, recyclability and processability. With Tepex, LANXESS is one of the leading manufacturers of fiber-reinforced thermoplastic composites for lightweight and highly mechanically resilient structural components. The company offers a composite range called Tepex flowcore for numerous variations of the compression molding process. This product line has now been expanded and optimized. The new composites are designed as alternatives to thermoset sheet molding compounds (SMCs). Offering similar mechanical performance,

they are much more ductile and, as thermoplastic systems, much easier to recycle than SMCs. They are easy to process because they are molded and shaped by thermal means only.

- AIMPLAS to Develop New Sustainable Materials and Processes to Reduce Vehicle Emissions through Weight Reduction.** The automotive industry is facing the challenge of environmental sustainability by reducing CO2 emissions in response to legislation and the demands of society, which call for heightened environmental awareness from companies. Weight reduction in electric vehicles is one of the keys to making emission reductions a reality. Lighter vehicles require less energy to run so their range is increased as compared to heavier vehicles with the same batteries. The industry, therefore, aims to replace metal parts with new composite materials that help reduce battery weight by 50%-70%.
- Vestaro Consortium Develops New Generation of EV Battery Packs.** The Vestaro consortium of companies, working to produce lighter and more cost-effective solutions for battery electric vehicles (BEVs), has developed a new generation of battery packs, the Pure Performance Battery. Based on sheet molding compound (SMC) technology made using curing agents from Evonik, the new holistic battery system concept provides the automotive industry with a safe, lightweight, and, most importantly, cost-effective alternative to the traditional heavier metal-based solutions.

### Construction

Privately-owned housing starts in March were at a seasonally adjusted annual rate of 1,793,000. This is 0.3% above the revised February estimate of 1,788,000 and is 3.9% above the March 2021 rate of 1,725,000. Single-family housing starts in March were at a rate of 1,200,000; this is 1.7% below the revised February figure of 1,221,000. The March rate for units in buildings with five units or more was 574,000.



**One of the highlights of March 2022 is as follows:**

- Pultron Composites Implements Flexible Composite Rebar for Skate Park Construction.** The composites company supplied its Mateenbar glass fiber-reinforced (GFRP) rebar for the

project from its Gisborne facility, replacing traditional steel rebar. The materials, which reportedly provided an advantage in terms of light weight and flexural bending for concrete reinforcement, resulted in a park suitable for high-performance athletes. Composite rebar is used in a range of projects, including bridges, roads, and industrial projects.

### 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 13 units during January - February 2022 was 2,695 MW as compared to 2,570 MW of 11 units during January – February 2021. With a total installed generating capacity of 137.74 (GW), wind constituted 10.99% of the total installed generating capacity of 1,252.92 (GW) among all energy sources.

#### One of the highlights of March 2022 is as follows:

- **The World's Largest 100% Recyclable Wind Turbine Blade Made from Elium Thermoplastic Resin.** The ZEBRA (Zero wastE Blade ReseArch) project is led by IRT [Technological Research Institute]-Jules Verne and brings together leading industrial players and technical centers with its ambitious project to demonstrate the technical, economic and environmental relevance of thermoplastic wind turbine blades on a full scale, with an eco-design approach to facilitate recycling. Following a year of material development and testing, as well as process trials, the world's largest thermoplastic blade at 62 meters, made from Arkema's Elium liquid resin and 100% recyclable, was designed and built at the LM Wind Power plant in Ponferrada, Spain. The Elium liquid thermoplastic resin is perfectly suited to the manufacture of large parts by resin infusion. The composite parts made from Arkema's resin deliver the same performances as those made from thermoset resins with an added unique benefit: recyclability. Elium-based composite components can be recycled using an advanced chemical recycling method.

### Marine

The US marine industry is anticipated to experience good growth in 2022.

#### One of the highlights of March 2022 is as follows:

- **Hexcel Unveils G-Vent Technology into Marine Composites.** Hexcel Corporation has developed a new technology for out-of-autoclave (OoA) processing that delivers a game-changing reduction in process time and cost for marine manufacturers without compromising mechanical performance. Hexcel has leveraged its experience in aerospace and wind energy to develop its new G-Vent technology for OoA processing of highly loaded, thick section marine structures such as masts, foils, and wind-assisted ship propulsion (WASP) components. Hexcel's full range of marine prepregs are now available with integrated G-Vent technology, reducing the requirement for debulking steps and ensuring extremely low porosity (<1%) irrespective of the laminate thickness.

### Consumer Goods

New orders for manufactured durable goods in March increased \$2.3 billion or 0.8% to \$275.0 billion, the U.S. Census Bureau announced today. This increase, up five of the last six months, followed a 1.7% February decrease. Excluding transportation, new orders increased 1.1%. Excluding defense, new orders increased 1.2%. Computers and electronic products, up two of the last three months, led the increase, \$0.7 billion or 2.6% to \$26.3 billion.

### Some highlights of March 2022 are as follows:

- **Hypetex and Philip Morris International Collaborate.** Hypetex and Philip Morris International (PMI), owners of the heated tobacco devices brand IQOS, have collaborated on a development program to create colored carbon composite covers for IQOS tobacco heating devices. PMI approached Hypetex with the objective to identify a viable composite material solution to create the IQOS accessories in colored visual carbon, as well as defining an easily scalable production process and manufacturing supply chain using Hypetex's unique in-mold, colored composite technology. Thermoset and thermoplastic materials were considered for the IQOS cosmetic covers, but early-stage trials showed improved results with thermoplastics. As a result, Hypetex colored 3K twill weave carbon fiber fabrics with polycarbonate (PC) organo sheets were chosen for the final parts, with Hypetex turning to Formaplex for manufacturing capacity and technical support as the compression molding, machining and then overmolding processes were finalized.
- **Decathlon Selects Sicomin's GreenPoxy Bio-Resins for Latest Sustainable Wakeboards.** Sicomin informed about its new collaboration with sports equipment giant Decathlon. Sicomin will supply its GreenPoxy 33 resin to produce Decathlon's new JIB and BLOCK wakeboards that will be manufactured at Meditec, the specialist composite board manufacturer based in Tunisia. GreenPoxy 33 resins will contribute to Decathlon's environmental mission, deriving 28% of its carbon content from plant sources, whilst also providing high mechanical properties and exceptional clarity in the finished laminates. Formulated with rapid processing in mind, GreenPoxy 33 has been seamlessly integrated into Meditec's manufacturing process, allowing it to match Decathlon's production demand and keep cure cycles as short as 10 minutes at 100°C. Meditec combines GreenPoxy 33 with Forest Stewardship Council (FSC) accredited wood cores, further increasing the percentage of responsibly sourced materials in the new JIB and BLOCK boards.
- **cultsport's Latest Shoe Collection Uses BASF's Elastopan.** cultsport, India's premium sportswear brand, has launched a collection of running and training shoes with insoles made of BASF's Elastopan PU system. When made with Elastopan, the insole is 25% lighter than similar materials yet delivers better shock absorption and up to 50% higher rebound, so consumers experience greater comfort and more power with each stride when wearing the cultsport running and training shoes.

### Recent Development in Materials

- **Polyplastics Group Unveils New PLASTRON (R) LFT.** The Polyplastics Group has introduced PLASTRON (R) LFT (long fiber reinforced thermoplastic resins) which are made of specially formulated regenerated cellulose fibers. The eco-friendly PLASTRON (R) LFT provides weight

reduction plus mechanical strength, enabling manufacturers to reduce their carbon footprint and meet today's sustainability needs. Cellulose is a promising material to help reduce CO2 emissions but its insufficient strength is a limiting factor. Polyplastics has addressed this problem by using regenerated cellulose in the development of LFT resins with an excellent balance of physical properties. Regenerated cellulose is natural cellulose spun into continuous fibers through wet spinning.

- PPG Launches PPG AMERLOCK 600.** PPG has launched PPG AMERLOCK 600 multipurpose epoxy coating for applicators looking for maximum versatility in the shop or field. The high-build, polyamide-cured coating combines a broad application thickness range with fast dry times and a one-year recoat window. PPG Amerlock 600 works with a wide range of steel substrates, including carbon steel, stainless steel and galvanized surfaces, as well as marginally prepared surfaces. This versatility can help reduce coating inventory and complexity for fabrication shops.
- Trelleborg Launches Orkot C620 for Aerospace Landing Gear.** Trelleborg Sealing Solutions launched its Orkot C620 composite material, specifically developed to meet the needs of the aerospace industry, in particular the requirement for a strong and light material to withstand the high loads and stresses landing gear are subject to. It is a unique high-load material that is an alternative to metal bearings. It gives the benefit of smaller and lighter components that provide a reduction in maximum takeoff weight and extend flying hours before maintenance. Orkot C620 is a high-specification hybrid material that features a strong fiberglass backing, combined with a low-friction TX Orkot lining to provide outstanding, long-lasting durability with no delamination.

### Recent Product Launches in the Composites Market

The following table represents a new product launch in the composites market in March 2022.

Product	Company Name	Description
Amplify Veil	Ilium Composites	The thermobonded veil is offered in 30 and 60gsm formats, and in full rolls up to 2540mm wide, for use as a stand-alone product or mechanically bonded for integration with Ilium's extensive range of composite reinforcements for open and closed mold and pultrusion processes. It works to create an aesthetic finish to boat hulls and surfaces by reducing the appearance of glass fibers on the gelcoat, making it ideal for Class A skin coat and automotive applications.

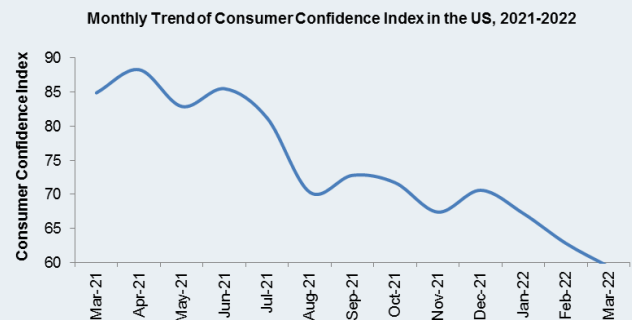
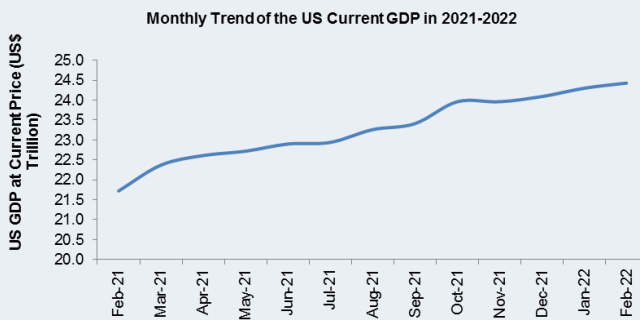
### The US Economic Overview – March 2022

The US Consumer Confidence Index decreased to 59.4 in March 2022 as compared to 62.8 in February 2022. The GDP at current price of the US increased from US \$24.30 trillion in January 2022 to US \$24.43 trillion in February 2022.

**Real gross domestic product (GDP)** decreased at an annual rate of 1.4% in the first quarter of 2022, according to the "advance" estimate. The decrease in real GDP reflected decreases in private inventory investment, exports, federal government spending, and state and local government spending, while imports, which are a subtraction in the calculation of GDP, increased. Personal consumption expenditures (PCE), nonresidential fixed investment, and residential fixed investment increased

In the first quarter, an increase in COVID-19 cases related to the Omicron variant resulted in continued restrictions and disruptions in the operations of establishments in some parts of the country. Government assistance payments in the form of forgivable loans to businesses, grants to state and local governments, and social benefits to households all decreased as provisions of several federal programs expired or tapered off. The full economic effects of the COVID-19 pandemic cannot be quantified in the GDP estimate for the first quarter because the impacts are generally embedded in source data and cannot be separately identified.

The price index for gross domestic purchases increased 7.8% in the first quarter, as compared with an increase of 7.0% in the fourth quarter. The PCE price index increased 7.0%, as compared with an increase of 6.4%. Excluding food and energy prices, the PCE price index increased 5.2%, as compared with an increase of 5.0%.



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