High Strength and Light Weight of Carbon Fiber Driving Strong Demand Growth in Aircraft and Automotive Manufacturing, IHS Markit Says

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Carbon fibers found in industrial applications including pressure vessels, wind turbines, automotive and aircraft manufacturing and sporting goods

HOUSTON (Dec. 20, 2016) – Led by industrial applications such as the manufacturing of aircraft, automobiles, pressure vessels, wind turbines and sporting goods, the global market for carbon fibers is growing dramatically—more than 8 percent per year through 2020, according to new research from IHS Markit (Nasdaq: INFO), a world leader in critical information, analytics and solutions.

IHS Markit expects global consumption of carbon fibers to grow from over 60 thousand metric tons (TMT) in 2015, to approximately 90 TMT by 2020. Carbon fibers are lightweight, high-strength materials that serve as reinforcing agents in high-performance composites made from specialty epoxy resins and high performance engineering thermoplastics.

“Major advances in technology and processing have dramatically expanded the demand for high-performance carbon fibers,” said Michael Malveda, director at IHS Markit, and lead analyst of the report entitled: Carbon Fibers: Chemical Economics Handbook. “And the introduction of higher-volume and lower-cost fibers, coupled with gains in productivity, has reduced the manufacturing costs of carbon fibers. Cost is a major factor affecting demand, and as costs come down, we are seeing demand growing significantly.”

Malveda said aircraft and automotive manufacturers, who face environmental and regulatory pressures to reduce weight, improve energy efficiency and reduce carbon emissions, are helping drive demand growth for carbon fibers. Automotive and industrial/wind applications currently consume more than 60 percent of global carbon fiber demand, according to the IHS Markit study, and carbon fiber demand in this sector will grow at an average annual rate of nearly 9 percent during 2015 to 2020. World demand in aircraft and aerospace applications surpassed sporting goods/recreation to become the second-largest market for carbon fibers in 2011 to 2012, Malveda said.

“Carbon fibers are increasingly being used in commercial and military aircraft manufacturing,” he said. “They are used in the construction of the main body, the wings, engines, etc., and can result in less aircraft weight and lower fuel consumption. In addition, carbon fiber enables higher aircraft speeds and longer distance ranges.”

IHS Markit expects the commercial aircraft market to grow because of increases in airline passenger traffic, as well as the need to replace aging fleets. It is in the long-haul sector where the advantages of carbon fiber use are most pronounced. IHS Markit expects growth in carbon fiber consumption for the aircraft market to reach 9 percent per year through the 2020 study period, or more than 20 TMT by 2020, as compared to less than half that in 2012, Malveda said.

Despite strong growth of carbon fibers usage, limitations do exist, according to the IHS Markit study. For example, use in mass-produced automobiles will need to overcome higher production costs and/or processing technologies that can present certain challenges, and the quality and consistency of carbon
fiber supply is very important.

“Automotive manufacturers are working with carbon fiber producers to help address production costs and quality standards, and lower costs will help manufacturers expand use of these materials to more of their models, beyond just the sports and specialty vehicle markets,” Malveda said.

North America (the U.S.) and Western Europe are the largest markets for carbon fibers, accounting for more than 58 percent of world consumption in 2015. These two regions are the largest-volume consumers of carbon fibers in both aircraft/aerospace and industrial applications. China is expected to experience strong growth of 10 to 11 percent annually for carbon fiber consumption due to increasing government plans to use carbon fibers and composites, such as in wind turbine blades. However, China still faces challenges in developing domestic carbon fiber manufacturing capability, Malveda said.

Sporting goods and recreational manufacturing will consume more than 17 percent of carbon fiber demand by 2020. Asia accounted for 76 percent of world consumption of carbon fibers in sporting goods/recreation manufacturing in 2015, and the region will drive 80 percent of consumption for that use by 2020, according to the IHS Markit report.

There is a trend for carbon fiber production to be fully integrated from precursor raw materials into finished goods, IHS Markit said. For example, in Western Europe, producers have been investing into back integration such as polyacrylonitrile (PAN) precursor facilities, or expanding downstream with composite manufacturing plants.

Likewise, Toray, the world’s largest carbon fiber producer, has vertical production channels from precursor, through carbon fibers to carbon fiber-reinforced plastics (CFRP) on a global scale. In late 2015, the company signed a long-term agreement with Boeing to supply carbon fiber Torayca™ pre-pregs for the new Boeing 777X aircraft.

Malveda said several large auto manufacturers and carbon fiber producers formed partnerships in recent years that may lead to more mainstream use of the material in the future. For example, in 2015, Ford and DowAkisa formed a joint-development agreement to further research high-volume production of automotive-grade carbon fiber. In 2009, SGL Automotive Carbon Fibers was formed as a joint venture between the BMW Group and the SGL Group. It is the exclusive supplier of carbon-fiber materials to the BMW Group for use in BMW’s i-series of electric/hybrid vehicles. In recent years, SGL Automotive has expanded its carbon fiber production capacity to meet increasing automotive demand.

To speak with Mike Malveda, please contact Melissa Manning at melissa.manning@ihsmarkit.com. For more information about the IHS Markit report, entitled: Carbon Fibers: Chemical Economics Handbook, please contact nisha.keskar@ihsmarkit.com.

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