Dream Materials, Carbon Fibers

With the growing potential of carbon fibers recognized worldwide, Korean businesses are investing in carbon fiber production.

In 1958, Roger Bacon, working at Union Carbide (USA), first developed carbon fibers based on rayon. In the early 1970s, Japan’s Toray carpeted out mass production of polycrystalline (PAC)-based carbon fibers to be used for fishing rods, golf clubs, tennis rackets and so on. In 1976, when oil prices soared, Boeing used carbon fibers in airplanes for the first time. Today, the materials reduce the weight of airplanes currently being produced by 50 percent. Demand for carbon fibers for airplanes is expected to continue growing.

Carbon fibers are a type of fiber with more than 90 percent carbon content that are made by heating precursors of organic fibers such as rayon, PAN and pitch. They’re one-fifth the weight of steel but ten times stronger, so carbon fibers are appropriate for use in extreme environments. Therefore, the aerospace, defense, and many other industries are interested in them. Carbon fibers are basic composite materials that are strong and light and can play an important role in raising the competitiveness of Korea’s key industries.

Demand for the fibers is expanding now, 40 years after the first commercialization in the early 1970s. Today the fibers are used in various industries, such as wind power generation and automobiles. However, the market will be centered around supply rather than demand for a while, thanks to entry barriers caused by technological limitations.

Since the late 1970s, several carbon fiber companies in Europe, the United States and Japan have gone bankrupt or been acquired by their rivals. As a result, there are few survivors. But with the growing potential of carbon fibers globally recognized recently, an increasing number of companies from emerging countries are attempting to enter the market.

In Korea, Taekwang Industries started commercial production in March of 2012 for the first time. Taekwang Industries is the only local business equipped with vertical integration connecting propylene (main raw material for AN) → AN (main raw materials for precursors) → precursor processing (core technology of carbon fibers) → carbon fibers. The company has production facilities in Ulsan with an annual production capacity of 3,000 tons of precursors and 1,500 tons of carbon fibers and has a plan to increase the capacity two to three fold. Toray Advanced Materials Korea, an affiliate of a Japanese company, plans to produce 2,200 tons of carbon fibers in January in its factories in Gumi and export them to the United States and China. The company also has a plan to build a second factory with a production capacity of 2,500 tons, with the goal of beginning production in March of 2014. As a result, Toray will be the largest carbon fiber producer in Korea, with its capacity amounting to a total of 4,700 tons.

Market Trends of Carbon Fiber Use in Wind Power Generation & Automobiles

Market prospects for hydrogen fuel cell vehicles & hydrogen pressure vessels

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