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Japan's Frontier Carbon Corporation to Manufacture in U.S. -- Will Accelerate Production of Fullerenes for Nanomanufacturing

NEW YORK -- To meet the growing commercial demand for nano-scale products in the United States and Europe, Frontier Carbon Corporation (FCC) of Tokyo, Japan, has established Frontier Carbon Corporation America (FCCA) in December 2004 to begin production of fullerene materials in the U.S. in March 2005 in co-operation with TDA Research, Inc. for serving present and potential customers.

Fullerenes are large carbon molecules with unique properties that are particularly well suited to nanotechnology-based applications and have led to prototyping a large number of promising cutting-edge products. Fullerenes are extraordinarily stable and heat-resistant, joining diamonds and graphite as the third form of pure carbon, yet are the only form of carbon that is soluble, leading to easy processing and a variety of chemical modifications for usable nanotechnology materials.

By far the most common fullerene is C60, also known as "buckyballs," which look like soccer balls - round, hollow molecular cages of carbon atoms about a billionth of an inch in diameter. Other relatively common fullerenes are C70, C76, and C84. The architectural structure of fullerene molecules resembles the geodesic domes created by architect and philosopher R. Buckminster Fuller. Their discovery was recognized with the 1996 Nobel Prize in chemistry.

The new U.S. corporation will market fullerene products under the brand name "Nanom." Frontier Carbon Corporation America will offer a range of products: Nanom Mix (mixed fullerenes, including C60 and C70); Nanom Purple (pure C60); Nanom Spectra (tailor-made, chemically functionalized fullerenes); and mixtures of fullerene materials with unique properties. In addition, FCCA will pursue exclusive business agreements with select customers for the expeditious development of nanotechnology-based products, offering to the customers its years of experience in the development of such products for the U.S. market.

The Frontier Carbon Corporation was established in Japan in December 2001 as a joint venture of the Mitsubishi Chemical Corporation and Mitsubishi Corporation with the goal of becoming the world leader in the commercial production of nano-scale carbon products.

With world-class production technologies, unique intellectual property and the highly effective global sales forces of its parent companies, Frontier Carbon Corporation in 2003 began operating a 40 tons per year commercial-scale, low-cost plant producing fullerenes, which had been difficult to achieve by previous methods. FCC started delivering Fullerene samples at prices 10 times lower than those prevailing in the market in February 2002.

To date more than 400 Japanese companies have purchased sample lots and are developing commercial products with unique characteristics. Some products using fullerene materials are already commercialized in Japan, for example coatings for bowling balls, fiber reinforced composites for badminton rackets, tennis rackets, and golf club shafts, lubricants for car air conditioners and coatings for glass.

A wave of research and development activities all over the world has led to almost 2,000 application-oriented patents, spanning a very broad range spectrum of potential commercial applications, including: anticancer drug delivery systems using photodynamic therapy, HIV drugs,

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To serve the potential U.S. customers of fullerene products, FCCA has established an effective network of business agreements with various corporations, including:

1. TDA Research, Inc., a U.S. corporation licensed by Massachusetts Institute of Technology to use combustion-based technology for the production of fullerene products.
2. Honjo Chemical Corporation, a Japanese company producing fullerene materials through the arc-based method.
3. Mitsubishi Chemical Corporation, which owns worldwide patent rights on advanced technologies for the purification of fullerene products, and production of a large variety of chemically functionalized fullerenes.
4. Mitsubishi Corporation and Mitsubishi International Corp., which offer a large network for the worldwide marketing and sales of fullerene materials, and the development of novel nanotechnology products based on fullerenes. Mitsubishi Corporation also has an exclusive license of a fullerene material patent in certain countries from Fullerene International Corporation, a U.S. corporation.

Source: *Frontier Carbon Corporation America*

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