



**Developing Efficient Production Technology for High-performance Carbon Fiber  
Reinforced Thermoplastic (CFRTP) Components and  
Winning of Award for Composites Excellence**

 **MITSUBISHI GAS CHEMICAL COMPANY, INC.**

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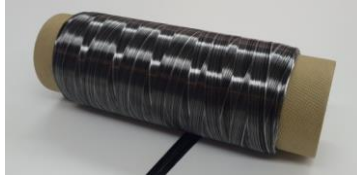
Mitsubishi Gas Chemical Company, Inc. (MGC; Head Office: Chiyoda-ku, Tokyo; President: Toshikiyo Kurai) worked with six companies and universities and completed developing efficient production technology for high-performance carbon fiber reinforced thermoplastic (CFRTP) components.

This technology uses a fiber placement machine, which is dedicated to sewing composite fiber, to stitch combined filament yarn (commingled yarn in which resin and carbon fibers are dispersed) onto resin film to prepare an intermediate (prepreg), before heating the prepreg to produce a high-performance carbon fiber reinforced thermoplastic (CFRTP). The new production method enables molding CFRTP, which can offer enhanced strength in any orientation direction, into complex shapes with less wasting material. Its superior efficiency in producing high-performance products makes it a promising technology to apply to automotive parts, in which lightweight design is now a key requirement to make them appropriate for future electric vehicles. In addition, the new technology will likely find use in a broad range of fields such as aircraft, space and shipbuilding as well as sports equipment, toys, apparel and welfare equipment.

The Nylon-MXD6 and LEXTER polyamide resin products from MGC are used as resin fiber materials for the new CFRTP production technology. Both MGC materials are easy to process and exhibit low water absorption, which translates into low reductions in their physical properties even under high humidity. These features make both materials ideal for producing the commingled yarn used by this technology.

With the development of the innovative production technology, MGC and its partners — Professor Asami Nakai at the Faculty of Engineering of Gifu University, Associate Professor Akio Otani at the Kyoto Institute of Technology, Mitsubishi Engineering-Plastics Corporation, Kajirene Inc., Tajima Industries Ltd. and D-MEC Ltd. — won the Material and Process Innovation Award in the manufacturing category of the Awards for Composites and Excellence during CAMX 2017, the academic conference and Expo on composite materials held in the USA in December 2017.

MGC will promote open innovation initiatives including the above research project, thereby developing its business even further in mobility, which the company defines as a key future business domain.



Commingled yarn made of carbon fiber and Nylon-MXD6 and LEXTER

<Inquiries>

Planning & Development Division, Aromatic Chemicals Company

TEL : +81-3-3283-4714