News Release

AGC Develops Technology to Enhance the Performance of Carbon Fiber Reinforced Thermoplastic (CFRTP)

Tokyo, December 14, 2017–AGC Asahi Glass (AGC), a world-leading manufacturer of glass, chemicals and high-tech materials, has announced a newly developed technology that enhances the performance of carbon fiber reinforced thermoplastic (CFRTP). By using its fluoropolymer to improve existing CFRTP, AGC' new technology greatly improves the material's impact resistance, reduces the product defects that occur under high temperature molding, and also improves yields. The enhanced CFRTP allows for a wide range of applications such as automobiles, aircraft, and sport products that require lighter-weight materials. In addition to CFRTP, this technology can also be applied to improving engineering plastics which superior tolerance against high load and high temperature is required.

These days, weight reductions in automobiles, aircraft and other transportation equipment is in an increasing demand to address both environmental and economical impacts. This has drawn significant attention to carbon fiber reinforced plastic as a "light and strong" alternative to metals. The mainstream alternative material to metals is currently carbon fiber reinforced plastic (CFRP). However, it has been considered unfit for mass production due to long molding times and the inability to recycle leftover material generated in the manufacturing process. CFRTP, in contrast, offers short molding time and excellent recyclability, but has challenges that limit its practical application. Specifically, it is difficult to impregnate CFRTP with resin during molding and to ensure sufficient mechanical strength.

In an aim to further expand CFRTP applications, AGC has developed a new "CFRTP improvement technology" that utilizes the company's fluoropolymer. Using AGC's fluoropolymer to improve polyamide 6, a thermoplastic resin, has successfully boosted impact resistance by 30% compared with conventional CFRTP. It has also succeeded in reducing the water absorption rate, a cause of polyamide 6 thermal decomposition, by 30%. This achievement has made it possible to not only reduce product defects that occur under high temperature molding, but also improve yields. AGC intends to help expand the applications for CFRTP by proposing its new technology to various manufacturers in the transportation equipment field.

CFRTP after fluoropolymer reforming

Under its management policy ***AGC plus***, the AGC Group is committed to leveraging the technical strengths of fluorochemicals it has built up and refined through years of experience to contribute to technological development in a wide range of industrial fields.

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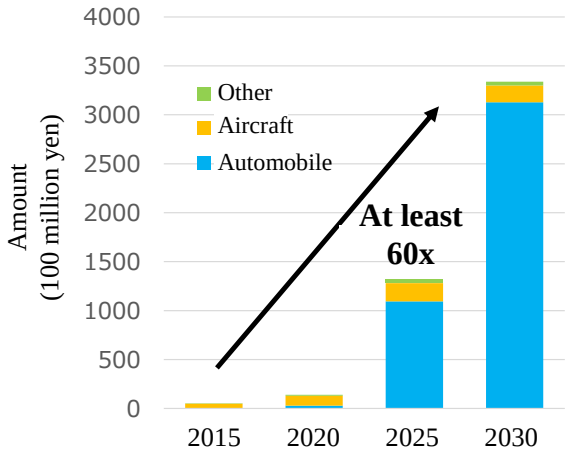
■ CFRTP Future Market Forecast ■

The future CFRTP market size is expected to expand rapidly in automotive applications with an estimated increase of at least 60-times today's monetary value by the year 2030.



Source: Carbon Fiber Composite Material (CFRP/CFRTP) Technical Application Market Outlook 2017 (Fuji Keizai)

■ Comparison of CFRTP Properties ■

	Comparison of CFRTP Physical Properties --- (Using 100 to represent Polyamide 6 CFRTP)		
	Polyamide 6	Polyamide 6 Improved product	Improvement rate
Impact strength	100	130	30% increase
Water absorption (As matrix resin*)	100	70	30% decrease

* Matrix resin means all resin components except carbon fiber.

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