

JOINT JAPANESE-GERMAN NEWSLETTER

Connecting the German and Japanese Composite Industry

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Joint Japanese-German Newsletter

Connecting the Japanese and German Composite Industry

Dear CU Members

Here is the sixth issue of Joint Japanese-German Newsletter, highlighting the exciting news in Japanese composites industry as well as the events in the latter half of FY2025.

Hoping you will enjoy reading!

from ICC Team

High-Rate Manufacturing of Thermoplastic CFRP Structures for Next-Generation Aircraft

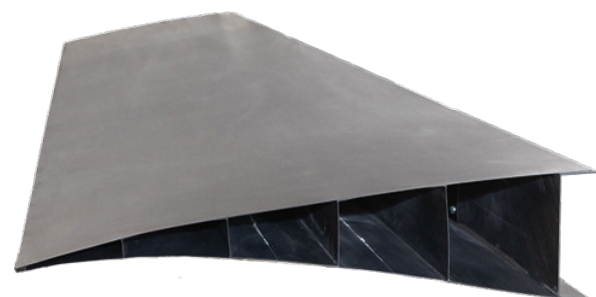
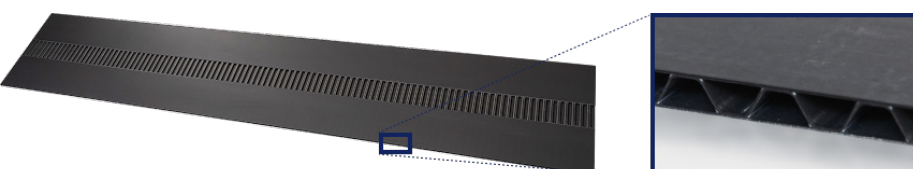
[ShinMaywa Industries, Ltd., Aircraft Division](#), (Kobe, Japan) is developing high-rate manufacturing technologies for next-generation aircraft structures using thermoplastic CFRP. This work focuses on aileron and floor panel applications and utilizes Toray Cetex® TC1225 (LMPAEK/UD tape) to enable lightweight, weldable, and recyclable composite components.

A heat-and-cool cycle press-molding process has been established using dedicated metal molds and a hydraulic press. This process enables rapid consolidation and direct welding of thermoplastic parts, eliminating the need for mechanical fasteners or adhesives. Relative to conventional autoclave-cured thermoset CFRP processes or metal fastening processes, the proposed approach is expected to reduce manufacturing time by approximately 80% and achieve weight reductions of about 30% for the aileron and 10% for the floor panel, accompanied by significant cost savings.

To validate manufacturability and structural performance, full-scale demonstrators were successfully produced, including a 2.5-meter aileron and a 2.8-meter floor panel. Both components feature a sandwich architecture with welded corrugated cores and upper and lower skins. Dimensional inspections, NDI, and structural tests confirmed that the demonstrators satisfied all design requirements.

By advancing thermoplastic composite technologies and enabling high-rate, sustainable manufacturing, this work supports the development of next-generation aircraft structures and contributes to a more environmentally responsible aviation industry.

This paper is based on results obtained from a project subsidized by the [New Energy and Industrial Technology Development Organization \(NEDO\)](#).



Composite Highway Award 2025

The Composite Highway Convention 2025, an annual event hosted by the [Composite Highway Consortium](#), was held on November 20 at Gifu University. At the event, the announcement and award ceremony for the 9th [Composite Highway Award 2025](#) also took place. This year, four projects—two Grand Prix and two Secondary Grand Prix—were selected from six finalists that advanced through the initial screening process.

Composite Highway Award recognizes outstanding research, technologies, and products in the field of composite materials developed by SMEs. These awards highlight innovations that have earned high evaluations from user companies and contribute to the development of domestic and global supply chains.

In this issue, we introduce the two Grand Prix-winning projects and one of the Secondary Grand Prix recipients.



Composite Highway Award 2025 Winners

[Grand Prix]

- 100% rCF Spun Yarn (Tatsuta Spinning Co., Ltd.)
- Robotic AFP for Thermoplastic CFRP (TSUDAKOMA Corp.)

[Secondary Grand Prix]

- Overcoming The Weaknesses of rCF/PP With Interface Technology (Sobueclay Co., Ltd.)
- Automated Mass Production System For Thermoplastic Prepreg & Laminate (Maruhachi Corporation)

[Grand Prix] 100% rCF Spun Yarn ~ Leveraging 120 Years of Spinning Technology

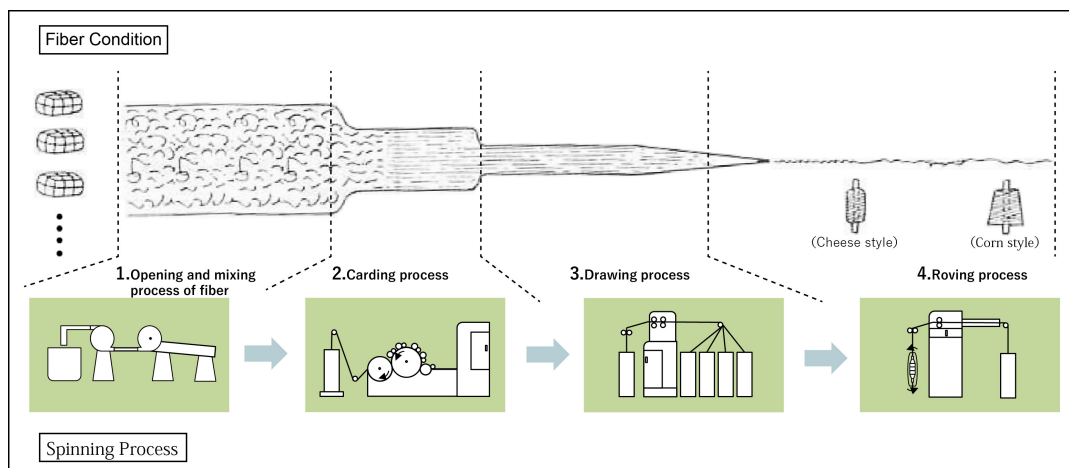
Tatsuta Spinning Co., Ltd.

Spinning carbon fibers into stable yarns has been challenging because it is difficult to impart crimp to carbon fibers, which is necessary to provide cohesion in conventional spinning processes. However, [Tatsuta Spinning Co., Ltd.](#) (Himeji, Hyogo) has successfully produced spun yarn made from 100% recycled carbon fiber (rCF), leveraging its unique expertise cultivated over many years. This innovative technology was highly acclaimed, winning the Grand Prix at the Composite Highway Award 2025.

For the company, which has been engaged in cotton spinning for 120 years since its founding, the 2016 Kumamoto earthquake marked a major turning point. The devastating damage suffered by its factory prompted the decision to shift away from its traditional cotton spinning business. While exploring new fields centered on its core spinning expertise, they focused on carbon fiber.



While carbon fiber possesses excellent properties, being both lightweight and high-rigidity, it also presents challenges: its manufacture requires substantial energy, and methods for its disposal and recycling are not yet fully established. Against this backdrop, they commenced development of spinning technology for recycled carbon fiber (rCF) in 2019. Initially, chemical fibers were blended with rCF to improve spinnability. However, in pursuit of 100% rCF yarn, extensive research was conducted to develop a spinning process that enables sufficient cohesion and strength for weaving and pull-out molding. As a result, spinning of 100% rCF yarn was successfully achieved.



The 100% rCF spun yarn can be used in combination with thermosetting resins, with applications anticipated in horizontal recycling. It has already demonstrated success in the verification stage, and received the SAMPE Japan Technical Award.

The establishment of this new yarn form broadens the application for rCF and represents a significant step towards realizing a circular economy.

Contact: Takeshi Koto (Mr.)
Email: [takeshi@e-tatsubo.com]

[Grand Prix] Robotic AFP System For Thermoplastic CFRP

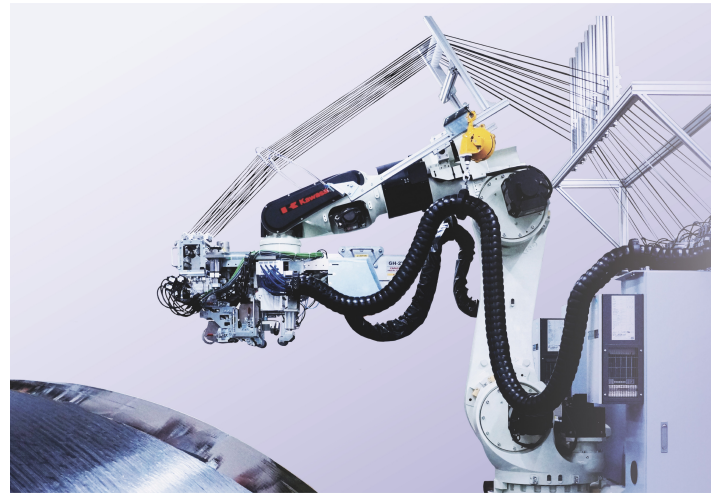
TSUDAKOMA Corp.

Following the robotic AFP system for thermoset UD tape commercialised in 2020, [TSUDAKOMA](#) (Kanazawa, Ishikawa) has announced a 'Robotic AFP system for thermoplastic CFRP'.

This compact robotic system enables high-precision, high-speed lay-up onto complex shapes. While automated equipment including AFP is widely adopted overseas, this represents a valuable technology as the sole commercialised product within Japan's composite sector. Sales commenced at the JEC World 2025, and this technology received the Grand Prix at the Composite Highway Awards 2025.

It garnered high acclaim for its sophisticated proprietary technologies, developed by leveraging expertise in fibre handling and automation cultivated through loom manufacturing. These include tension control per tow, coordinated control of multiple robots, and fusion technology using top-surface laser irradiation. As a valuable Japanese domestic technology, it is expected to make a significant contribution to future product manufacturing.

• [Read the Press release \(Japanese\)](#)



This information is based on results obtained from a project, JPNP20010, subsidized by the New Energy and Industrial Technology Development Organization (NEDO).

[Secondary Grand Prix] Overcoming The Weaknesses of rCF/PP With Interface Technology

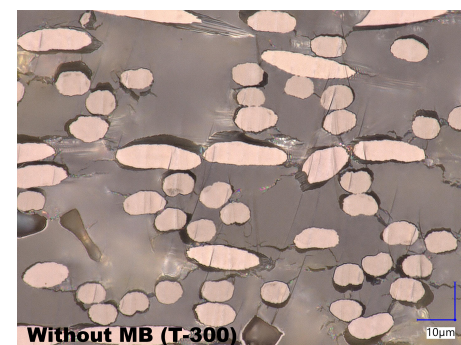
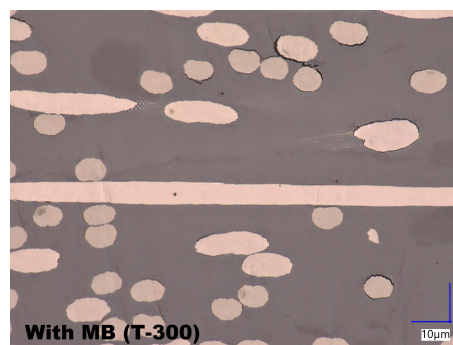
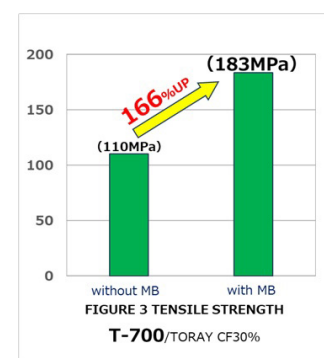
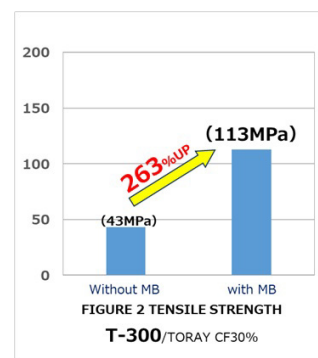
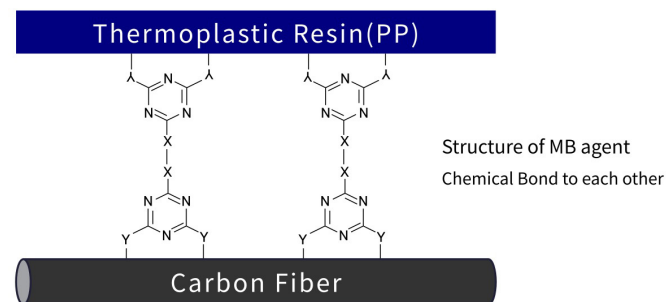
Sobueclay. Co.,Ltd

[Sobueclay Co., Ltd.](#) (Nagoya, Aichi) has developed a technology that increases the tensile and flexural strengths of 'composite materials using rCF and PP as matrices'—which have undergone molecular bonding (MB) treatment—to several times that of conventional products. The technology was recognised for significantly improving the mechanical strength of the composite material by chemically bonding rCF and PP via a molecular coupling agent, and was awarded the Secondary Grand Prix at the Composite Highway Award 2025.

Recycled carbon fiber (rCF) is highly expected as a filler for composite of thermoplastic resins. On the other hand improving strength of interfacial adhesion still remains as a challenge. In particular, the interfacial adhesion between CF and polypropylene (PP) is extremely poor, and it is common to use maleic acid-modified PP to compensate for this. However this solution causes an undesirable side effects such as a decrease in physical properties. In this study, we considered it would be possible to compensate interfacial strength by applying a molecular bonding agent which bridges both surface of CF and PP molecular level, unless using ordinal modifiers. Based on this assumption, we prepared test sample from nonwoven fabric from 12 mm carbon fiber (Toray T-300) treated with molecular bonding agent and PP fibers and then applied heat pressing. Obtained sample showed a tensile strength 2.6 times higher than conventional methods, without using any modifiers. When these broken surfaces were observed using SEM, almost no delamination was observed at the interface between CF and PP, confirming the improvement in physical properties. Furthermore, a notable feature is that molecular bonding treatment allowed T-300 to achieve physical properties equivalent to T-700 (untreated). Given that over 90% of CF discharged from some process waste is T-300, this opens up possibilities for expanding its applications.

If similar effects can be obtained with pellets, it would significantly expand the applications for rCF, which is currently facing challenges. Therefore, research and development is underway towards mass production.

For further information, please contact:
Sobueclay. Co.,Ltd.
Kazuki Nomura (Mr.)
Email: [nomura@sobueclay.co.jp]



19th Japan International SAMPE Symposium & Exhibition (JISSE-19) [Dec.2-4,2025]

The 19th Japan International SAMPE Symposium & Exhibition ([JISSE-19](#)) was held at Ariake Central Tower Hall & Conference in Tokyo. Professors and researchers from ICC presented national project initiatives and their latest research outcomes.

JISSE is an international symposium held by SAMPE Japan in conjunction with the SAMPE Japan Exhibition, bringing together leading experts in advanced materials and composite technologies.

[Learn more](#)



SAMPE Japan Exhibition [Dec.3-5,2025]

[SAMPE Japan Exhibition 2025](#) was held at Tokyo Big Sight from 3 to 5 December, 2025. As in previous years, the exhibition was co-located with related shows such as the Cleaning Expo, Vacuum Expo, and Surface Modification Expo, and was once again held alongside the International Robot Exhibition, resulting in a total of six concurrent exhibitions.

The six co-located shows attracted approximately 44,000 visitors over the three-day period, drawing strong interest from both industry professionals and the wider business community. Under the theme "Advanced Materials Challenge the Realization of a Prosperous Future," the event brought together 129 companies and organizations across 159 booths, showcasing the latest technologies and initiatives in the advanced materials field.



The 4th Hokuriku Composite Conference [Feb.25,2026]

The 4th Hokuriku Composite Conference was held on February 25, 2026 at the KKR Hotel Kanazawa.

This conference is held biennially, co-organised by the Kanazawa Institute of Technology Centre for Innovative Composite Materials Research and Development and the Hokuriku Advanced Composite Materials Research Group (HACM). Its purpose is to share and discuss the latest research trends in the field of composite materials and to strengthen the network of researchers and engineers both domestically and internationally.

[Read more](#)



JCCM-17 [Mar.3-5,2026]

[The Japan Conference on Composite Materials \(JCCM\)](#) was held from 3 to 5 March at Ritsumeikan University's Osaka Ibaraki Campus.

JCCM is an academic conference established with the aim of creating Japan's leading conference on composite materials, building upon and continuing the legacy of JCOM, a symposium focusing on the integration and functionalisation of materials and structures. The first JCCM was held in Kyoto in 2010, and this year marked its 17th edition.

Researchers from ICC, including the Director, participated in the conference, where lively presentations and discussions were held on the latest research trends in the integration and functionalisation of materials, moulding, and structural systems.

[Programme for the conference](#)



JEC World 2026 [Mar.10-12,2026]

ICC participated in the Japan Pavilion at JEC World 2026, held in Paris, France, from 10 to 12 March. Organized by SAMPE Japan in collaboration with ICC, this year's Japan Pavilion featured a joint exhibition showcasing the technologies and innovations of leading Japanese companies and organizations. Following an open call for participation, a total of 12 exhibitors took part, including Maruhachi Corporation, TSUDAKOMA, Mizuno Technics Co., Ltd., the National Institute of Advanced Industrial Science and Technology (AIST), Tatsuta Spinning Co., Ltd., Mirai Kasei Inc., Sobueclay Co., Ltd., Nakashima Propeller Co., Ltd., Tosoh Corporation, the New Energy and Industrial Technology Development Organization (NEDO), the University of Tokyo, and ICC of Kanazawa Institute of Technology.

[Learn more](#)



FIMATEST system has been installed at ICC, marking its first introduction in Japan

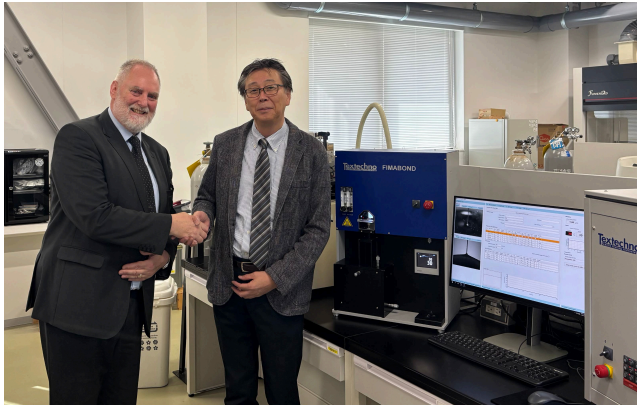
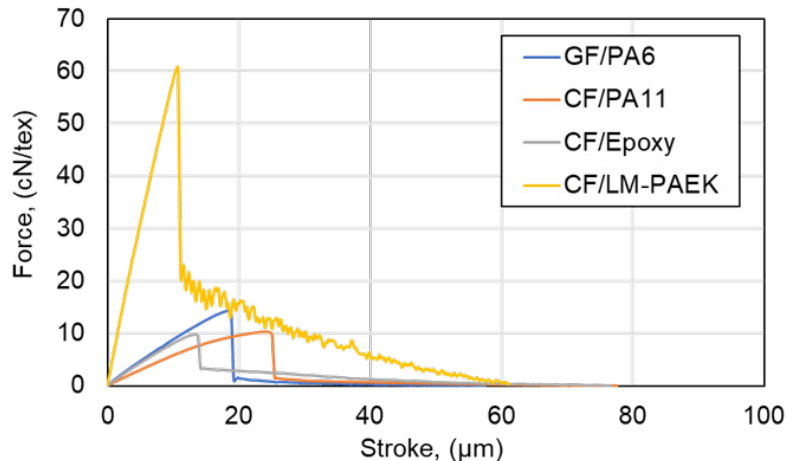
FIMATEST system of [Textechno Herbert Stein GmbH & Co. KG](#), was installed at ICC in November 2025, marking the first time the system has been provided in Japan

At ICC, we have evaluated the interfacial adhesion between fibers and resins using microdroplet and fragmentation tests. With the introduction of the FIMATEST system, kindly provided by Textechno, we are now able to conduct pull-out tests as well, further expanding our range of evaluation methods.

The FIMATEST system enables pull-out testing not only for polypropylene and polyamide, but also for high-melting engineering plastics. In addition, it is compatible with thermosetting resins, allowing for the evaluation of interfacial adhesion across a wide variety of fiber-resin combinations. An example of pull-out test results using various resins and fibers is shown in the figure below.

A summary of the test results is available in the PDF [here](#).

[Learn more](#)



Left: Mr. Erich Ingelsberger (Textechno)
Right: Prof. Kiyoshi Uzawa (Director of ICC)

ICC was established in 2014 at Kanazawa Institute of Technology as an independent research institute specializing in composite materials, where we conduct not only fundamental research on material development but also applied and practical research aimed at implementing these technologies in society and ultimately leading to industrialization.

ICC has introduced state-of-the-art manufacturing equipment and established a comprehensive system capable of carrying out everything from the verification of production lines under real-world conditions to the assembly, evaluation and verification of large structural components using continuous moulding.



We are dedicated to daily research and development with the aim of widely promoting lightweight, high-strength and highly corrosion-resistant composite materials throughout Japanese society and industry.

• [Learn more about ICC Facilities](#)

Innovative Composite Center
2-2 Yatsukaho Hakusan Ishikawa
icc-info@mlist.kanazawa-it.ac.jp



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