May 16, 2025
Nagase & Co., Ltd

**NAGASE, Chiyoda, Fuji-Design and UCHIDA**
**Successful Development of a Sustainable Technology to Extract Carbon Fibers from Damaged Formula E Car Parts and Reform Them into Usable Components**

Nagase & Co., Ltd. (Head office: Chiyoda-ku, Tokyo; President and CEO: Hiroyuki Ueshima; hereinafter referred to as “NAGASE”), Chiyoda Holdings Co., Ltd., Fuji Design Co., Ltd., and UCHIDA Co., Ltd. are proud to announce the successful development of an innovative technology for removing resin from racing car parts made of CFRP (Carbon Fiber Reinforced Plastics)—widely used in aircraft and automobiles—while preserving the length and shape of the carbon fibers. The extracted fibers are then re-impregnated with resin to restore damaged or scratched parts into functional components.

CFRP are composite materials made by solidifying carbon fiber with thermosetting resin, known for being lightweight and highly durable material. While it offers excellent strength-to-weight performance, since its structure makes it difficult to repair once damaged and its incineration requires large amounts of energy, most CFRP waste is landfilled. As CFRP is widely used in racing car body parts, it is recognized that challenge of sustainably disposing of damaged parts generated through race competition are growing.

The four companies recently acquired damaged CFRP front wing parts from the U.S.-based motorsport team Andretti Formula E, made available through NAGASE's sponsorship of the team. Combining Fuji-Design’s patented carbonization technology, which removes the resin while preserving the carbon fiber shape (Note 1), and UCHIDA’s resin re-impregnation technology developed for motorsports parts, they have succeeded for the first time in reforming the original shape of a CFRP part. (This result demonstrates technical feasibility only; the regenerated parts do not yet meet the strength requirements for racing use, and further research and development, including on the resin component, is needed for practical application.)

Conventional recycling methods for used CFRP involve crushing it into thread-like or sheet-like forms. However, this attempt to extract carbon fibers in their original part form and regenerate components offers a new and promising sustainable solution.

[Left: Damaged part provided by Andretti]
[Right: Reformed part using extracted carbon fibers]

This collaboration was initiated by Chiyoda after discussions facilitated with Andretti Formula E at the 2024 Tokyo E-Prix, to explore potential reuse of CFRP parts used in Formula E vehicles. Andretti Formula E supported this initiative as part of its wider commitment to sustainability and its use of Formula E as a platform for testing innovative technologies, advancing both the team's environmental objectives and Formula E's "Net Zero Since Day Zero (Note 2)" mission. Roger Griffiths, The Principal of Andretti Formula E commented, "this breakthrough offers a sustainable solution for repurposing damaged carbon fiber components which is a major step forward for industries where lightweight, durable materials are essential."

(Note 1) Pyrolysis technology that selectively carbonizes only the matrix resin binding the carbon fibers, enabling fiber extraction in its original shape through temperature control. The company has started promoting this technology to the European automotive industry.
(Note 2) Since its inception in 2014, Formula E has aimed to achieve net zero carbon by measuring, reducing, and offsetting all greenhouse gas emissions associated with racing activities.


[Formula E Car]

**■Roles of Each Company**

- NAGASE: Collaboration with Andretti Formula E

- Chiyoda: Proposal to Formula E, Proposal of the four-company partnership
- Fuji-Design: Extraction of carbon fibers from CFRP (via dry distillation)
(Pyrolysis: Dry distillation: selectively carbonizes only the resin while preserving the shape of the part)
- UCHIDA: Resin re-impregnation and molding of extracted carbon fibers
(The carbon fiber bundles after pyrolysis are set into molds to retain shape and then re-impregnated and molded)

**■Company profiles**

Nagase & Co., Ltd.
Company Name: Nagase & Co., Ltd.
Head Office: Tokiwabashi Tower, 2-6-4 Otemachi, Chiyoda-ku, Tokyo 100-8142, Japan
President & CEO: Hiroyuki Uejima
Founded: June 18, 1832
Established: December 9, 1917
Business Description: Import/export and domestic sales of chemicals, synthetic resins, electronic materials, cosmetics, health foods, etc.
Number of Employees: 975 (Consolidated: 7,528)
Website: https://www.nagase.co.jp/english/

Chiyoda Holdings Co., Ltd.
Company Name: Chiyoda Holdings Co., Ltd.
Head Office: 126-2 Nishishinmachi, Ota City, Gunma Prefecture, Japan
President: Michihiro Oe
Established: September 1, 2020
Business Description: Development and design of automotive parts
Number of Employees: 74
Website: https://www.chiyodahd.co.jp/

Fuji Design Co., Ltd.
Company Name: Fuji Design Co., Ltd.
Head Office: 358-25 Manshoji-cho, Ono City, Hyogo Prefecture, Japan
President: Morihiko Sugino
Established: December 1, 2011
Business Description: Specialized manufacturer for CFRP/FRP recycling and composite development

Number of Employees: 6
Website: https://fuji-d.jp/en/

UCHIDA Co., Ltd.
Company Name: UCHIDA Co., Ltd.
Head Office: 2048-1 Kamitomi, Miyoshi-machi, Iruma-gun, Saitama Prefecture, Japan
President & CEO: Toshikazu Uchida
Founded: 1968
Business Description: Manufacturing and prototyping of CFRP products and parts
Number of Employees: 45
Website: https://uchida-k.co.jp/

Related Press Release
November 22, 2024
Partnering with Andretti Formula E for a Third Season:Taking on the Challenge of Achieving "Delivering next sustainability"

**◆Inquiries**

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