

October 16, 2025
Yazaki Corporation

Yazaki Corporation Develops a New Composite from "Bamboo" with Half the Carbon Footprint and Improved Performance for Use in Automotive Parts

–Contributing to Decarbonization and a Circular Economy, and Accelerating Sustainability through the Power of "Monozukuri"–

YTC America Inc., a wholly owned U.S. subsidiary of Yazaki Corporation (Head Office: Minato-ku, Tokyo; President: Riku Yazaki), has developed a composite made from a plant-based filler. Compared to conventional composites made from mineral resources, using bamboo-derived materials reduces the carbon footprint (CFP) of the composite by approximately 50%, while offering an impact strength, heat resistance, and many other properties that are equal or superior to those of conventional composites. Aiming to achieve commercializing within the year, we expect to see the new composite used in automotive parts, among others, where its performance is equivalent to that of existing materials and where it is anticipated to reduce carbon emissions.

Background and History of the New Composite's Research and Development

Conventional fossil fuel-derived resin materials, such as composites made from polypropylene (PP) and talc or glass fiber, offer high reliability and performance, but face issues in terms of the increased carbon emissions associated with their use. To achieve carbon neutrality by 2050 and to promote a circular economy in the automotive sector, we developed a polypropylene-bamboo composite made from a plant-based filler (bamboo) as an alternative to conventional polypropylene-talc composites. In addition to the resin-reducing effect of using plant-based fillers, this newly developed composite can also retain the carbon dioxide absorbed by the bamboo inside like a "canned" product, thereby reducing its carbon footprint by approximately 50% and providing a mechanical performance equal or superior to conventional composites.

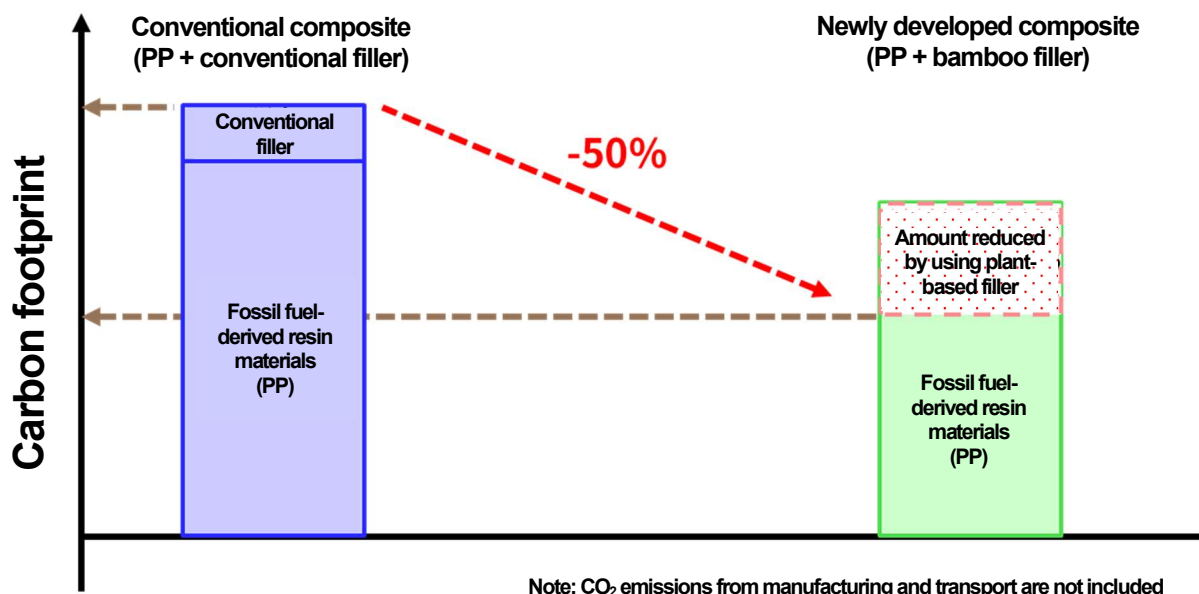


Figure 1: Carbon footprint comparison of a polypropylene-bamboo composite and a conventional composite

Research and Development Details

Found throughout the world, bamboo grows rapidly while absorbing more than four times as much carbon as common trees. These features make it possible to build a supply chain that is safe and cost-effective, as well as that has a lower impact on carbon emissions. Approximately 1,700 species of bamboo are known throughout the world, which we analyzed in each region to select the best candidates for composites, including moso bamboo from Japan and guadua from Colombia. In the past, Japan used bamboo as a common, every-day material, yet the country has experienced an increasing number of "abandoned bamboo forests" in recent years due to poor management. The impact of these on neighboring forests and landscapes has therefore become an issue. Against this backdrop, we believe that developing composites from bamboo will both reduce environmental impact and help solve social issues.

The development of polypropylene-bamboo composites presented several technical challenges, such as difficulties in bonding due to the hygroscopic and hydrophilic properties unique to natural fibers. Through ongoing research and development, however, we succeeded in selecting naturally derived additives and optimizing resin-bamboo bonding to develop a composite with excellent mechanical properties. In addition, this composite meets the stringent standards regarding use of natural fiber composites in automobiles in terms of the common issues they face, such as odor and flammability.

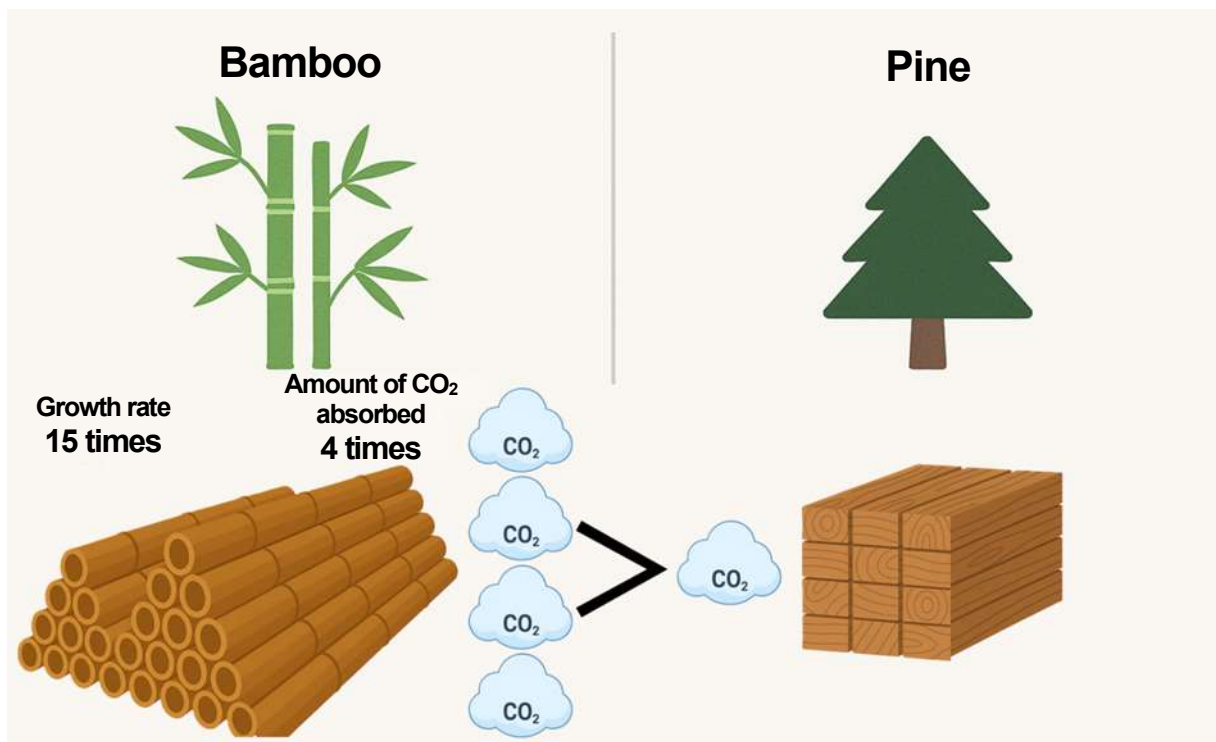


Figure 2: Growth comparison of bamboo and trees (pine) obtained using the same surface area and growth period

Unique Features of YTC America's Polypropylene-Bamboo Composite

- Availability of ideal bamboo species
- Improved hygroscopic properties
- Improved mechanical properties
- Improved odor and flame resistance

The tensile and flexural strengths of the polypropylene-bamboo composite are similar to those of comparable polypropylene-talc composites. Meanwhile, its impact strength, elongation, flexural modulus, heat deflection temperature (HDT), and other properties outperform those of polypropylene-talc composites.

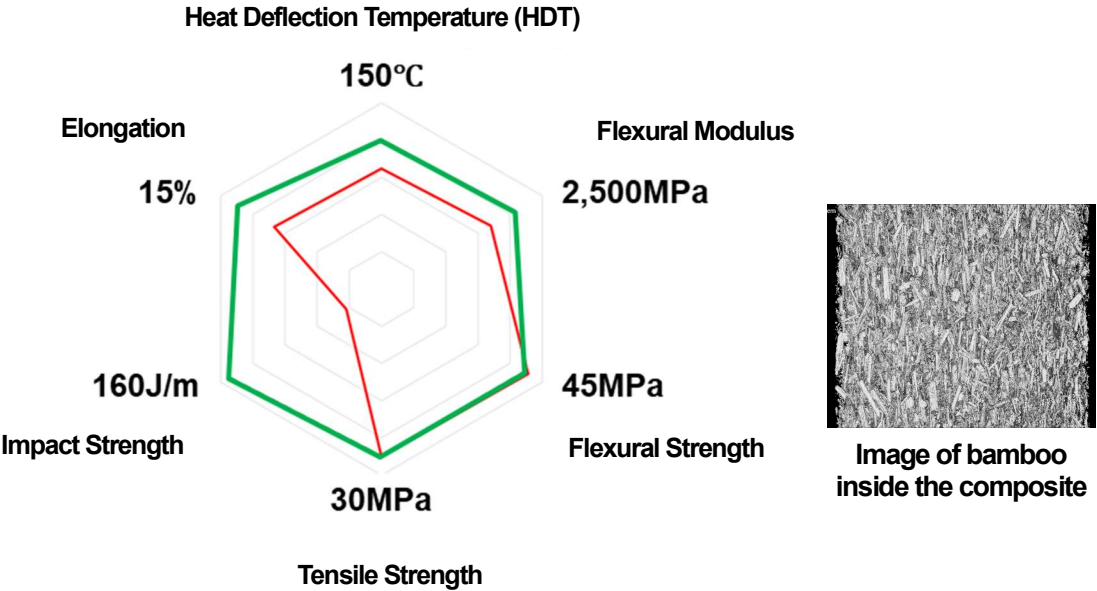
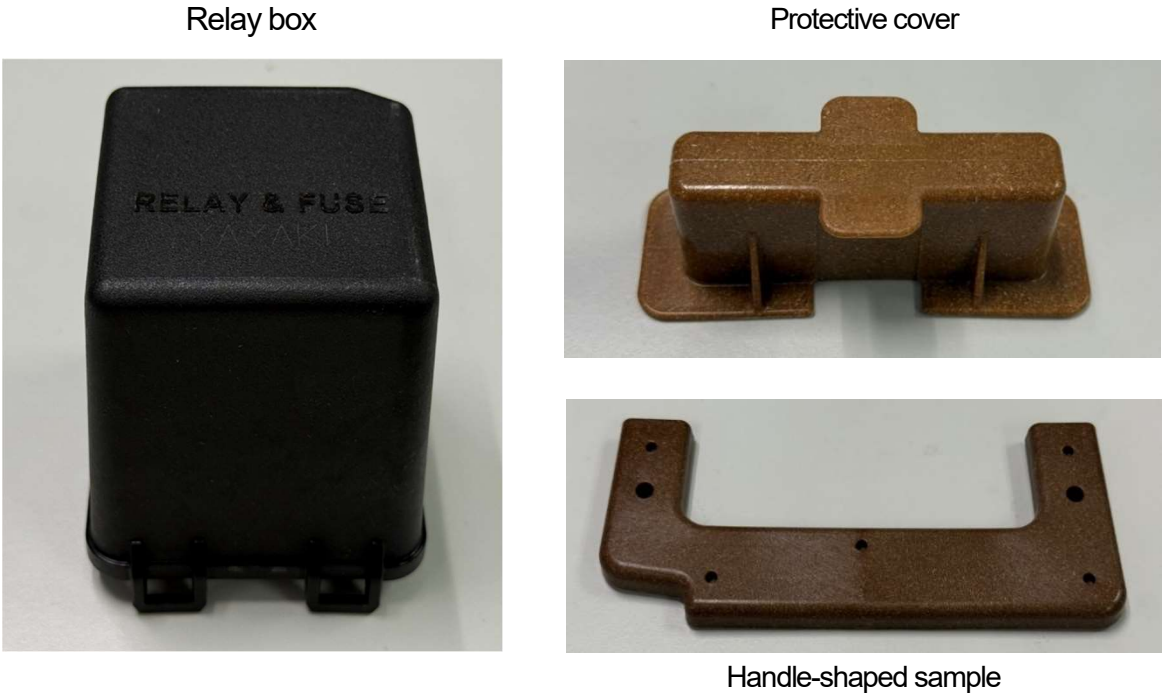


Figure 3: Property comparison of the polypropylene-bamboo composite (green) and a polypropylene-talc composite (red)

Application to Automotive Parts and Other Products

We are considering replacing existing polypropylene or polypropylene-talc composites with the polypropylene-bamboo composite for use in various automotive parts and protective components for which doing so is expected to effectively reduce the carbon footprint. (The photos below show samples of products made from the polypropylene-bamboo composite)



Glossary

Carbon Footprint (CFP)	The greenhouse gas emissions throughout the life cycle of a product or service, from raw material procurement to disposal and recycling, when converted to CO2 emissions.
Plant-based Filler	Plant-derived powders and fibrous solids that are added to resins
Composite	A material made from different components to enhance performance
Circular Economy (Circular Economy)	An economic system that generates added value by making the most of resource circulation
Polypropylene (PP)	A lightweight, highly chemical-resistant thermoplastic resin
Talc	The finely powdered form of a natural mineral called talcum
Supply Chain	The series of steps from raw material procurement to product distribution
Abandoned Bamboo Forest	A bamboo forest that is no longer managed and that has been left to grow unchecked naturally
Flame Resistance	A property that indicates how difficult it is for a material to catch fire or burn
Tensile Strength	The maximum stress a material can withstand before fracturing (rupturing) when pulled
Flexural Strength	A material property that indicates the degree to which a material can withstand bending stress
Impact Strength	An indicator of how well a material can withstand impact without breaking
Flexural Modulus	An indicator of how resistant a material is to deformation when bent
Heat Deflection Temperature (HDT)	The temperature at which a predetermined amount of deflection occurs when the temperature is increased while a constant load is applied to the material

■ About Yazaki Corporation

Yazaki Corporation was founded in 1941. Under the company mottoes of "a corporation in step with the world" and "a corporation needed by society," we engage in the wire harness business, for which we boast the world's leading market share, and in the development, manufacture, and sale of automotive parts and energy equipment. Currently, we have offices in 46 countries and regions around the world. In recent years, we have also contributed to the growth of the electric vehicle market.

Our goal is to improve the mobility of society by connecting automobiles, society, and the future.

[Inquiries]

Public Relations SR Division, Yazaki Corporation

TEL :055-965-3002

E-mail:kouhou@jp.yazaki.com