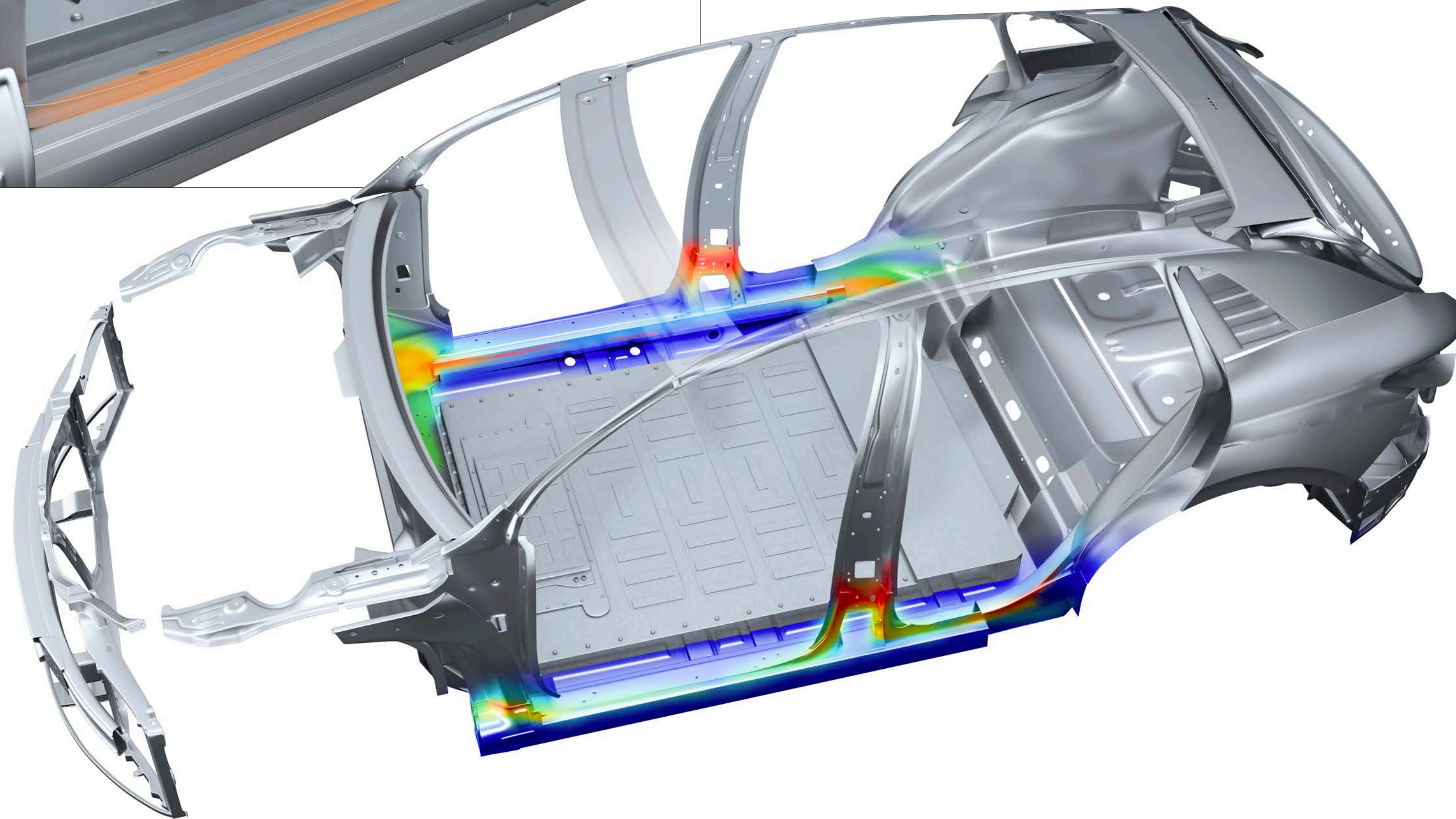


▶ THE ALTAIR ENLIGHTEN AWARD  
**2024 WINNERS**







▶ DuPont

2024 WINNER  
SUSTAINABLE PRODUCT

### DuPont™ BETAMATE™ Broad Bake Adhesive Technology

DuPont™ BETAMATE™ broad bake adhesive technology helps reduce energy use and greenhouse gas emissions during vehicle body manufacturing by allowing adhesives to cure at lower temperatures, thus saving energy via reduced e-coat oven temperatures and shorter oven cycle times. The technology also eliminates the need for cold storage thanks to a special formulation that extends shelf life.





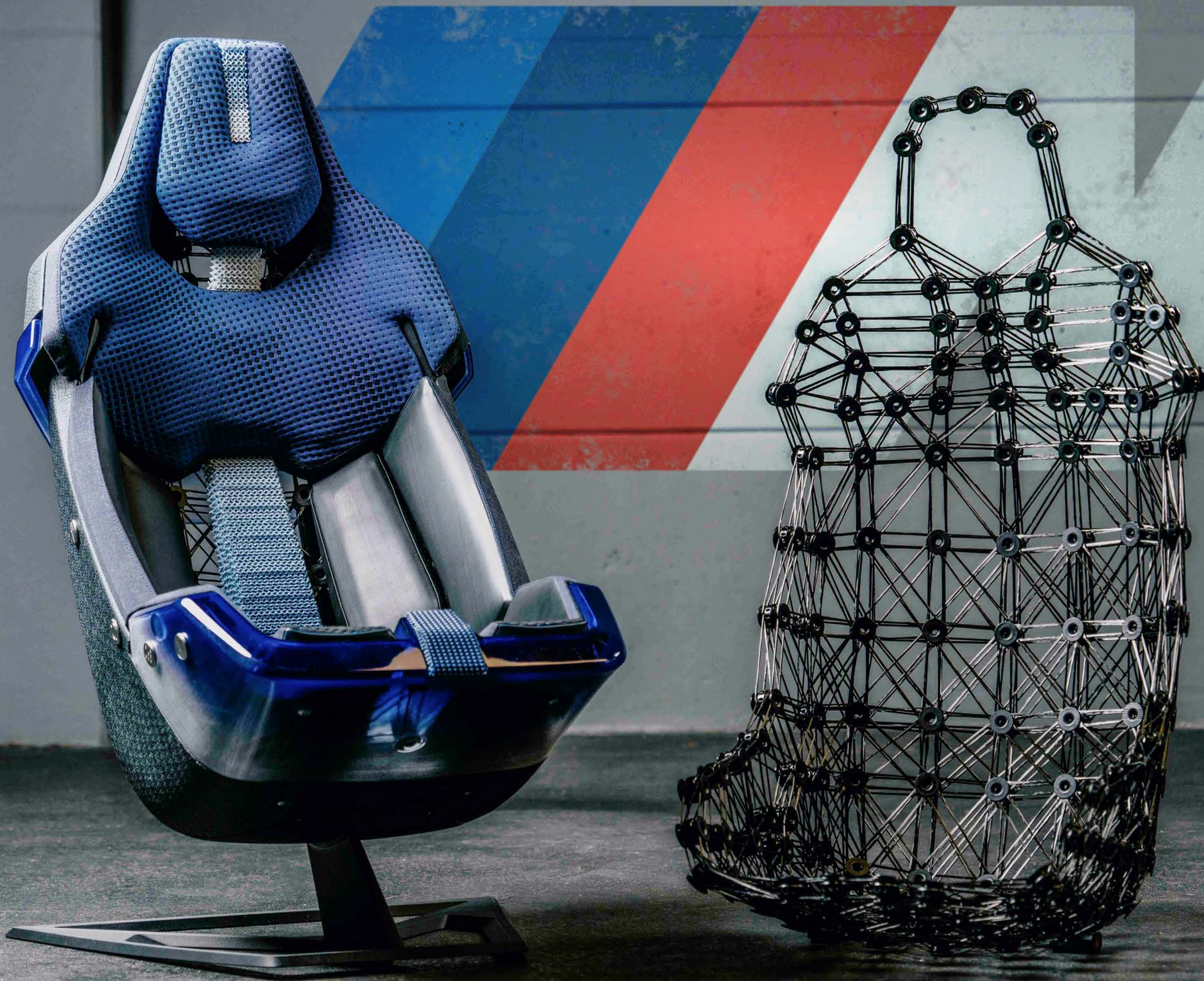
## ▶ BRIDGESTONE AMERICAS

### 2024 RUNNER-UP SUSTAINABLE PRODUCT

#### Turanza EV Tire

The Turanza EV grand touring tire is manufactured with 50% renewable and recycled materials – one of the highest percentages among commercially available replacement tires – and features Bridgestone ENLITEN™ technology to optimize performance and improve tire life span. By 2050, Bridgestone is aiming for all their tires to be composed of 100% renewable and recycled materials.





▶ **BMW GMBH, AMC GMBH,  
BCOMP LTD., GRADEL  
LIGHTWEIGHT SÀRL, & LASSO  
INGENIEURGESELLSCHAFT**

**2024 WINNER  
SUSTAINABLE PROCESS**

### **BMW M Visionary Materials Seat**

The BMW M Visionary Materials Seat focuses on circular design principles and sustainable materials. The seat features a monomaterial lightweight design that emphasizes using sustainable, renewable materials such as recycled polyester textile, flaxfiber BioComposite, and biogene leather alternatives. Where possible, petrol-based raw materials through bio-based materials were made from algae and plant-based fillers – such as chalk and cork. The composite can be made from carbon, basalt, glass fiber, or natural fibers as needed.





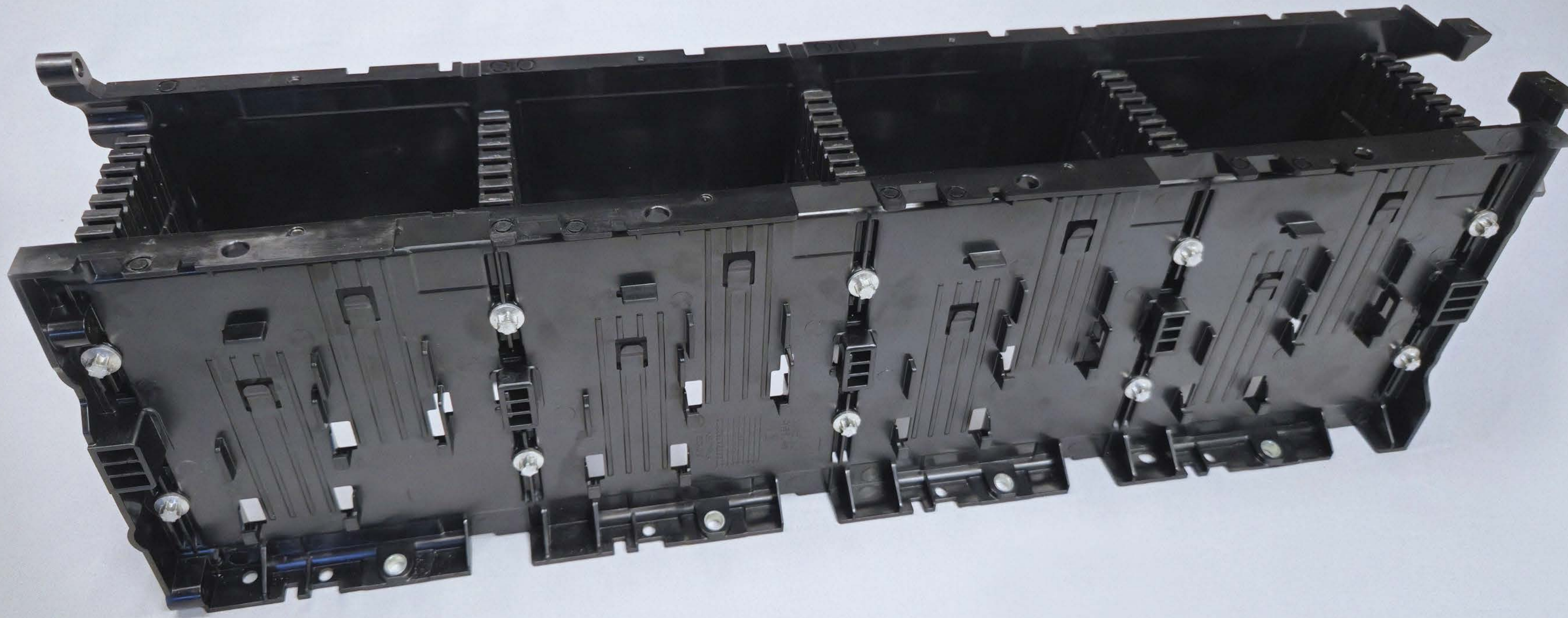
## TOYOTA MOTOR MANUFACTURING CANADA AND PPG INDUSTRIES

### 2024 RUNNER-UP SUSTAINABLE PROCESS

#### EPIC200X Electrocoat

The EPIC200X electrocoat enhances corrosion protection for automotive bodies while significantly reducing environmental impact. At the Toyota facility, the new product and application process enables a total reduction of 3,500 metric tons of CO2 emissions per year. More specifically, the new product reduces the amount of applied product by vehicle by 0.6 kg, while the new application process saves 5,626,000 kWh of energy and 1,843,000 gallons of water per year.





## ▶ SYENSQO AND GENERAL MOTORS

**2024 WINNER  
MODULE LIGHTWEIGHTING**

### **High-Performance Thermoplastic Battery Module Structure**

Syensqo and General Motors have collaboratively designed an innovative high-performance thermoplastic battery module structure that delivers a remarkable 37% weight reduction and a 25% cost savings compared to traditional aluminum. Key features include enhanced vehicle performance through precision injection molding, streamlined component consolidation for simplified assembly, and a unique cell-lock feature that stabilizes battery cells. Additionally, the design eliminates multiple components and processes, further optimizing efficiency.

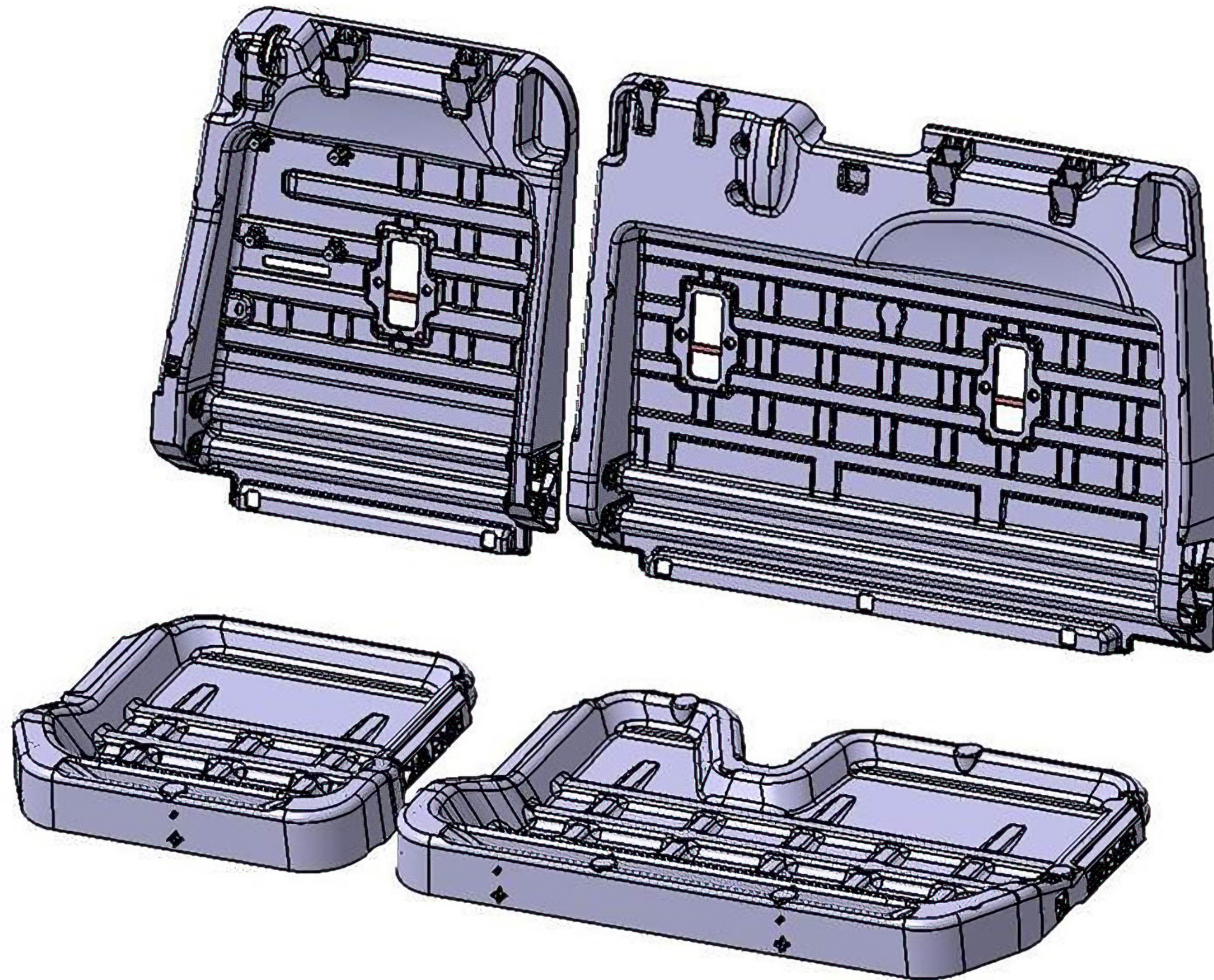


▶ **TOYOTA MOTOR COMPANY,  
US FARATHANE, AND  
BASF CORPORATION**

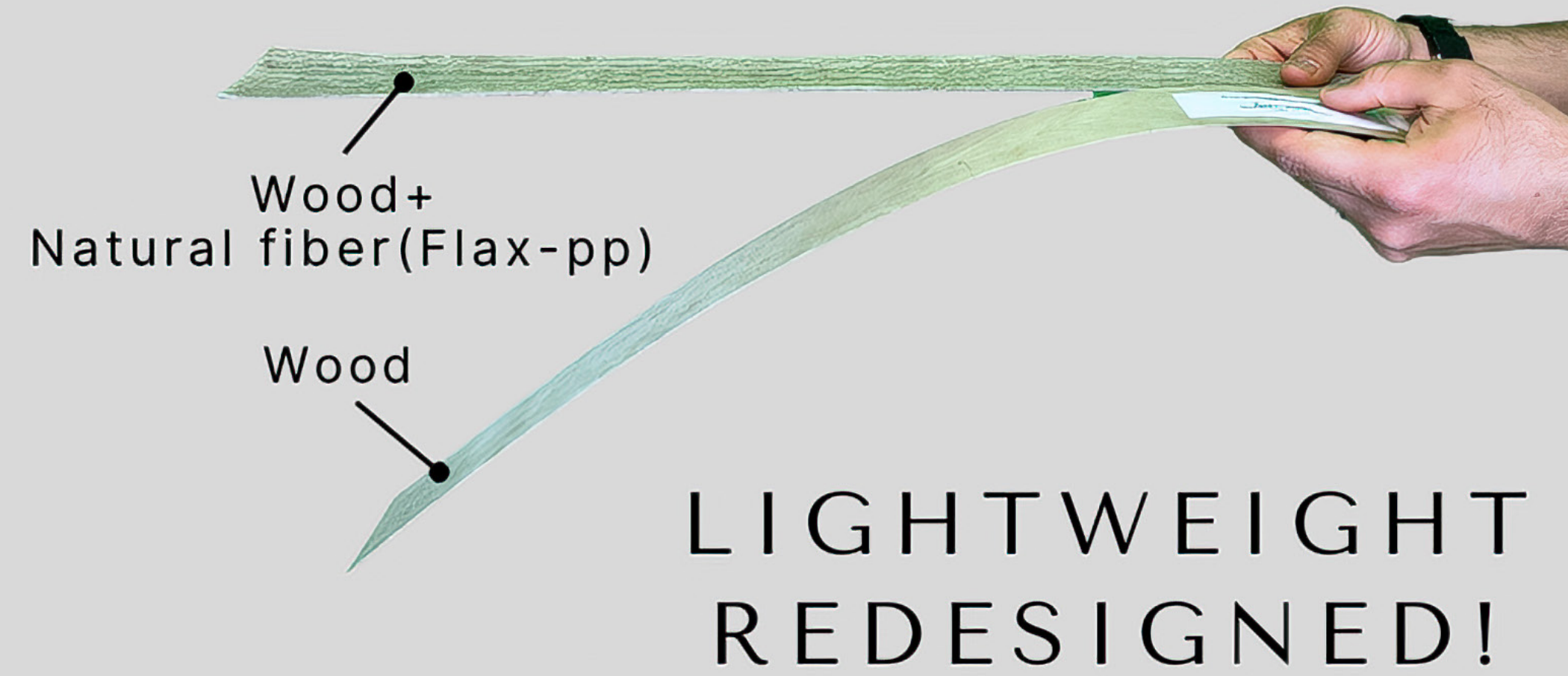
**2024 RUNNER-UP  
MODULE LIGHTWEIGHTING**

**Toyota Tacoma Second-Row  
Composite Seat Structure**

The Toyota Tacoma Second Row Composite Seat Structure features 30% less mass than the previous generation of steel seats and 20% less mass than the current resin seats seen in the 2022 Toyota Tundra. In addition, the new seat structure consolidated more than 55 parts into just four parts that take little time to be injection molded and shipped.







## ▶ CompositeEdge GMBH

**2024 WINNER  
ENABLING TECHNOLOGY**

### **Next-Gen Sustainable High-Performance Structures**

Aiming to minimize overall material usage, CompositeEdge GmbH utilized natural fiber composites – such as flax and hemp fiber – blended with plastic to form high-performance structures that can support the automated manufacture of car body panels, interior trims, chassis parts, suspension elements, and more without additional adhesives. The use of natural fiber composites significantly reduces carbon emissions and energy consumption compared to synthetic materials. Overall, the technology enables the production of sustainable, lightweight automotive components.





## ▶ TEIJIN AUTOMOTIVE TECHNOLOGIES

### 2024 RUNNER-UP ENABLING TECHNOLOGY

#### Fully Automated Preforming Process Enabling Complex CFRP Part

Teijin Automotive Technologies' fully automated preforming process enables the mass production of carbon fiber preforms to be used in automotive components – in this case a vehicle door. The precision of the automated process optimizes the amount of material used and recycles a small amount of offal (waste). The previous labor-intensive process was unsuitable for mass production and often resulted in avoidable waste due to human error. The new process is much more efficient, reducing required labor by 20%.



▶ **BEMIS MANUFACTURING  
COMPANY AND  
BASF CORPORATION**

**2024 HONORABLE MENTION  
ENABLING TECHNOLOGY**

**Large Hydraulic Tanks for  
Compact Excavators via  
BASF's Ultramid Polyamide**

Bemis Manufacturing Company and BASF Corporation developed large hydraulic tanks for compact excavators using BASF's polyamide, which provided an eco-efficient solution that delivered both environmental savings (reductions in life cycle CO2 emissions) and reduced life cycle cost. In addition, by combining injection molding and vibration welding, the approach resulted in 5% mass savings and 20% lower costs compared to traditional roto-molding.







## WEAV3D, BRASKEM, AND CLEMSON COMPOSITES CENTER

### 2024 WINNER FUTURE OF LIGHTWEIGHTING

#### Cost-Effective Lightweight Vehicle Body Structures

WEAV3D, Braskem, and the Clemson Composites Center developed a composite lattice-reinforced polypropylene sheet tailorable to match the performance of any vehicle body structure on the market. Manufactured with a high rate, highly automated forming cycle that produces more parts using less energy, the new sheet cost 50% less and weighed 23% less than CFP6 organosheet (nylon 6) and weighed between 60-70% less than steel. The material also boasted a 62% reduction in trim scrap by weight. Lastly, compared to steel, the polypropylene sheet featured superior energy absorption and shape recovery.





## ▶ CARSOLIA COMPOSITES CORPORATION

2024 RUNNER-UP  
FUTURE OF LIGHTWEIGHTING

### Composite Suspension Coil Spring by Carsolia

Carsolia Composites Corporation introduced a patent-pending composite coil spring that's 50% lighter than steel. The carbon fiber composite material also has 50% less CO2 equivalent per kilogram vs. steel, resulting in a 75% overall reduction of CO2 emissions. Manufactured with an efficient production process that supports high volume vehicle production, the spring also enables unique appearance design possibilities that were previously impossible. Ideally suited for battery electric vehicle (BEV) platforms, it's a direct replacement for current vehicles as a "bolt-on solution" – no redesign needed.





## ▶ DOW INC.

**2024 WINNER  
RESPONSIBLE AI**

### **Sustainable SPECFLEX™ Polyurethane Solutions**

Dow Inc.'s sustainable SPECFLEX™ polyurethane solutions focus on developing and using cleaner raw materials and unique design principles to optimize performance. Achieving equivalent mechanical and ageing properties compared to traditional formulations, these solutions are significantly safer and more sustainable – with over 50% lower total volatile organic compounds (VOCs), 60% lower formaldehyde, and 80% lower acetaldehyde. Moreover, an AI aldehyde predictive model accelerates market response by capturing the factors contributing to odor and translating complicated non-linear features into real-world related performance features – enabling outcome prediction.