

### **A Collection of Racing Products Infused with the Latest Technology Advanced Racing Technology**

- **Symbol to be used on Astemo's high-performance products in the world's most prestigious racing categories.**
- **The latest technology of the SHOWA and NISSIN brands mounted on a skeleton chassis to be displayed.**
- **Equipped with an evolved version of the "Harmonized Function Design" concept model presented at the 2024 EICMA, in which the front fork axle and brake calipers are designed in an integrated shape.**
- **Equipped with the latest suspension and brake systems that have been used or are being developed for use in FIM Superbike World Championship (WSBK), FIM Endurance World Championship/Suzuka 8 Hours Endurance Road Race, All Japan Road Race Championship/JSB1000 Class, and other races.**
- **Mounted with Astemo's first racing parts/brake lever using recycled carbon material, thus extending contributions to CO2 emissions reduction and resource recycling to the racing field as well.**



Astemo is a global mega-supplier that develops and manufactures powertrain systems, chassis systems, and advanced driver assistance systems to provide mobility solutions to automobile and motorcycle manufacturers worldwide. As part of this development, we have actively participated in motorcycle and four-wheel races and have evolved various technologies for use in finished vehicles.

For EICMA 2025, we will present an evolved version of the "Harmonized Function Design" concept model presented at the 2024 EICMA, in which the front fork axle and brake calipers are designed in an integrated shape. We will show the latest suspension and brake systems that have been used or are being developed for use in FIM Superbike World Championship (WSBK), FIM Endurance World Championship/Suzuka 8 Hours Endurance Road Race, All Japan Road Race Championship/JSB1000 Class, and other races. These products will be mounted on a skeleton chassis to be displayed.

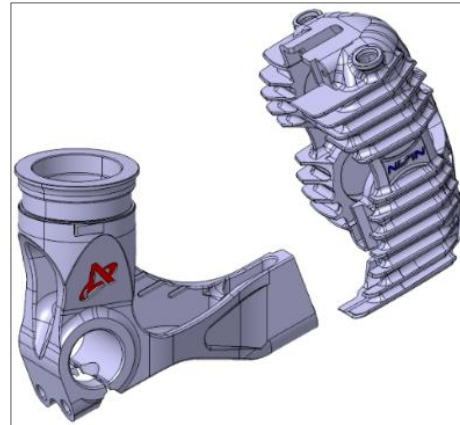
The exhibit will give a hands-on experience showing how Astemo's racing products, the SHOWA suspension brand and the NISSIN brake brand, are directly connected to the performance of racing bikes competing in the world's most prestigious events and how they support performance.

The new symbol mark, which will be adopted for high-value-added SHOWA and NISSIN high-performance products, will continue to be used in the world's most prestigious racing categories, regardless of whether they are on-road or off-road.

## **Products and Descriptions**

### **■ "Harmonized Function Design" Second Generation**

Designers involved in development for both the SHOWA and NISSIN brands jointly analyzed and designed the optimal shape of the front fork axle holders and brake calipers while also ensuring the necessary rigidity. The first generation of the "Harmonized Function Design" concept model with a two-piece axle holder/brake caliper structure was presented at the 2024 EICMA. It is approximately 100 g lighter than the conventional product (approximately 200 g lighter for vehicles with double discs). The contact area between the axle holder and brake caliper has been increased by 30% to enhance the heat sink effect, which dissipates heat generated by the brakes to the front fork side. At the same time, the surface area has been enlarged by designing cooling fins on the brake caliper body. In this way, the unit has been designed to enhance cooling effects.



The second generation of "Harmonized Function Design" to be exhibited at EICMA 2025 has been further updated based on the knowledge gained from circuit testing by professional riders of vehicles equipped with the first generation. The new model is lighter in weight, more effective in cooling, and has been improved to be more field-ready.

Further improvements will be made with the aim of introducing it to the All Japan Road Race Championship/JSB1000 Class in 2026.



In the second generation of Harmonized Function Design, the cooling fins on the brake caliper body have been designed deeper to enhance cooling effectiveness. The surface area of the caliper body has been increased to improve cooling performance by up to 6% compared to the first generation. To increase the rigidity of the fastening area between the caliper body and the axle holder, the area of the fastening area is enlarged using a concave-convex shape. By optimizing the concave-convex surface shape, the caliper's rigidity in the torsional direction has also been increased. Furthermore, while reducing the weight of the axle holders and fastening arms, the rigidity of the arms has been optimized through the fine-tuning of wall thickness and reinforcement. As a result, the second generation weighs 36 g less than the first generation, and approximately 136 g less than conventional products.

When the brakes are applied, the axle holders deflect in the direction of wheel rotation due to the braking force. The first generation had a single arm supporting the axle holder, which increased deflection compared to conventional products. However, in the second generation,

in which the rigidity of the axle holders was optimized, the amount of deflection has been reduced.

### **■ Front Fork with Carbon Fiber CFRP Outer Tube**

Front forks using CFRP (Carbon Fiber Reinforced Plastics) material for the front fork outer tube have been entered in the All Japan Road Race Championship/JSB1000 class from 2024. In 2025, we are also putting the product into races in FIM Superbike World Championship (WSBK) and the FIM Endurance World Championship/Suzuka 8 Hours Endurance Road Race.

Front forks with carbon fiber outer tubes have been under development since 2008, when SHOWA developed them for MotoGP and introduced them into actual races. The front forks with a carbon fiber CFRP outer tube, which are currently in production, have performance specifications that can be used in MotoGP.

The greatest feature of CFRP is its light weight and high rigidity. Weight has been reduced by approximately 20% compared to conventional aluminum alloy front fork outer tubes.

The front fork with a carbon fiber CFRP outer tube, which is currently in production, is attached to the chassis by directly clamping it to the top bracket and under bracket. By using the appropriate CFRP material, distortion and deformation of the CFRP outer tube due to clamping can be kept to the same level as that of an aluminum outer tube.

### **■ Front Brake Lever Molded from Recycled Carbon Material**

In recent years, measures have been taken to reduce environmental impact even at the forefront of motorcycle racing. Astemo is also working to reduce its environmental impact. As part of this effort, we developed recycled CFRTTP (Carbon Fiber Reinforced Thermo Plastics) in collaboration with our materials development department. Brake levers made of this material have been mounted on the skeleton chassis. This product is also Astemo's first racing product using recycled carbon.

CFRTTP is a composite material of recycled carbon fiber and thermoplastic resin, which is not only lightweight but also contributes to cost reduction by significantly eliminating the manufacturing process compared to conventional aluminum levers that require machining. Currently, development is continuing to examine the amount of recycled carbon content and

consider the balance between strength required for brake operation and the amount of recycled material. In-house vehicle testing has shown that the feel is comparable to that of conventional aluminum levers. Under current specifications, CO2 emissions are reduced by 75% and weight is reduced by 44% compared to aluminum levers.

### **■ Versatile Rear Brake System**

In recent years, the requirements for rear brakes in motorcycle racing have increased. Astemo has developed a variety of rear brake systems to meet the diverse needs of riders and teams, including a foot-operated rear brake master cylinder, a scooter-like left-hand-operated rear brake master cylinder, and a thumb brake, which is operated with the left thumb.

The skeleton chassis that we will have on display this time is equipped with a rear brake that is controlled by the left hand, which we call a scooter type. At the same time, it will also be set up so that a foot brake can be used. Honda's factory team, Team HRC, which competes in FIM Superbike World Championship (WSBK), uses this system.

### **■ Rear Shock Unit for WSBK Currently Under Development**

Rear suspension under development is fitted with the latest rear shock unit being developed for FIM Superbike World Championship (WSBK).

### **■ The Carbon Brake Disc Inner Rotor Rear Suspension Under Development**

In order to reduce the weight of the brake area, the inner rotor of the front brake disc was converted to a carbon disc in cooperation with the company's material development department.

\*Information contained in this Technical Information is current as of November 3, 2025, but may be subject to change without prior notice.