

High-performance Frames Developed from our Expertise and Advanced Simulation Technology

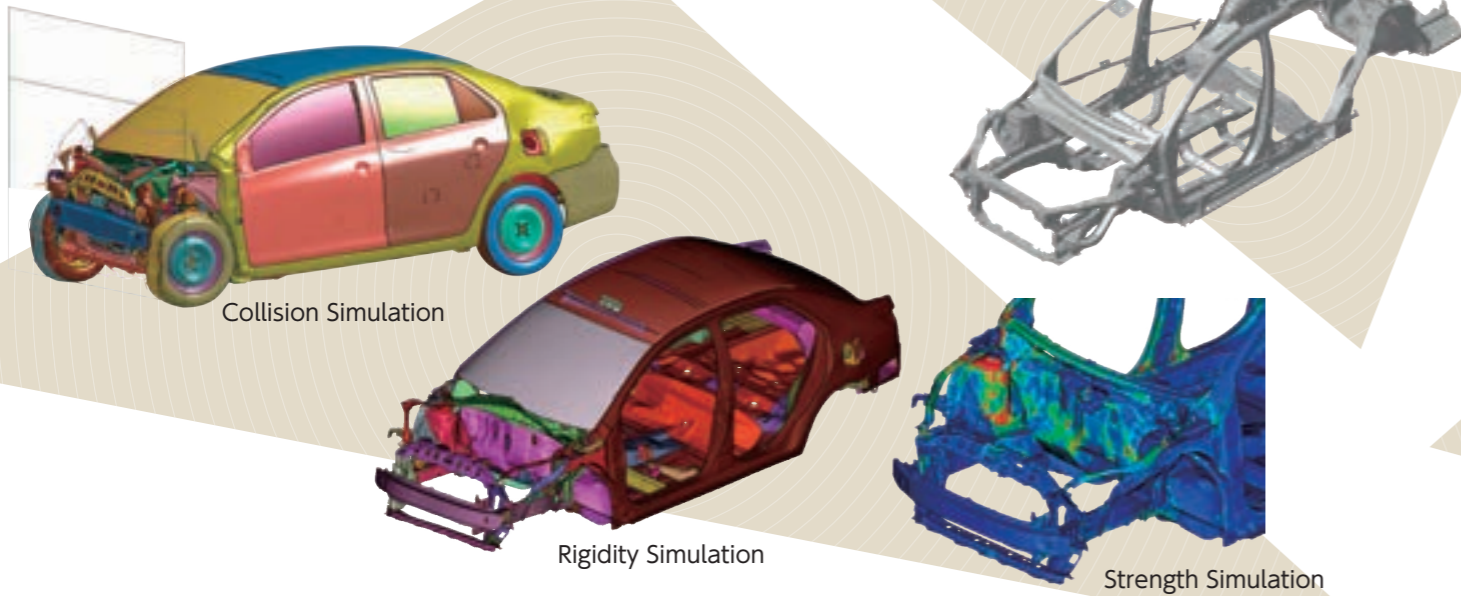
H-one automobile frames support the safety, comfort, and environmental performance of automobiles. With advanced metal forming and welding technologies which fully apply our cutting-edge research and development as well as our unique expertise, we are able to produce high-quality automobile body frames with world-class performance.

We are comprehensively involved in all stages from initial research and development to product design, manufacturing technology development, and mass production.

1 Research and Development

In order to achieve reduced weight and greater safety for our frames, we carry out independent simulations on collisions, strength, and rigidity for a whole automobile body. Our research and development are not limited to frames, but cover a wide range of material engineering fields.

Frame Performance Simulation



2 Frame Design

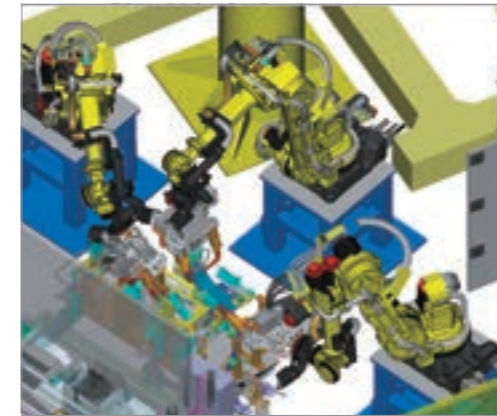
We participate in designing of new vehicle models carried out by automakers from the earliest stages of planning. In addition to simulations on collisions, strength, and rigidity, we use forming and welding simulations to propose optimal frames for each vehicle type which combine excellent performance, high quality, and cost competitiveness.

3 Manufacturing Equipment

from the inside.

By sharing and coordinating product design data between processes ranging from die design to automated processing, and processes ranging from welding line simulation to robot programming, we are able to shorten all lead times required until completion. We also use the latest measuring instruments to make comparisons of actual parts against product design data, ensuring high-precision quality.

Welding Line Simulation



Welding Line Installation



Die Design



Cutting Process



Finishing Process



4 Mass Production of Frames

Mass production can realize inventive ideas which are proposed in upstream processes, with our various manufacturing sites around the world effectively utilizing large-scale press machines and various robots. The combination of such equipment with our proprietary manufacturing technologies and production management expertise allows us to efficiently manufacture superior-quality products.

Stamping Process



Welding Process



Product Delivery



Unique Products Created through Research and Development

3DQ Body Frames

H-one is the world's first company to successfully mass-produce body frames using 3DQ (Three-Dimensional Hot Bending and Direct Quench) technology, in which quenching is performed on steel tubes to enhance their material strength. Body frames produced with this method have outstanding strength at the level of 1,500 MPa, which can both increase passenger safety and reduce part weights, and also have excellent accuracy of form. Since it enables high-efficiency manufacturing without the need for dies by using ultra-strength steel tubes with complex shapes, 3DQ technology can be applied to produce a wide range of frame types.

(Joint development with NIPPON STEEL & SUMITOMO METAL CORPORATION, and NIPPON STEEL & SUMIKIN PIPE CO., LTD.)



Dies

In addition to the manufacturing of dies, we are involved through our Group companies in the production of blocks of cast metal which serve as raw materials for those dies. Our die production technology and expertise in high-strength material processing cultivated over the course of more than 30 years has allowed us to gain a tremendous degree of trust from both domestic and overseas customers.



Metal Separators for Fuel Cells

Metal Separators are a component of the fuel cell stacks which serve as the source of power for fuel-cell vehicles. They are produced from extremely thin stainless steel materials, finely processed to circulate hydrogen, air, and coolant by applying our precision punching and precision die production technologies.

Fuel Cell Stack Component Diagram

