



Forming Technology

Forming Technology Research Department is developing new technologies of forming and performance evaluation to apply our advanced steels to automotive bodies effectively. We support automotive customers with the developed technologies through EVI (Early Vendor Involvement) activities.

New Forming Technology

New forming technologies are being developed to improve formability of high strength steels especially by applying state-of-the-art techniques like press-motion control of a servo press machine. Prototyping is ongoing on difficult parts such as complex shape panels and UHSS structural parts. JFE can support customers by the development of not only advanced steel sheets but also forming technologies.



3,000kN servo press machine



Complex shape panel (Back door with spoiler)



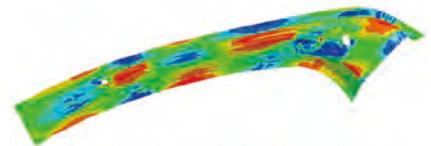
UHSS structural part (Center pillar: 1180MPa steel)

CAE Technology

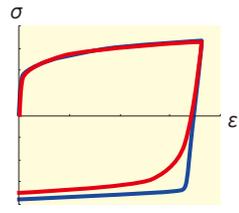
CAE technologies are being developed, for example with more sophisticated models of Bauschinger effect and elastic/plastic anisotropies. The accuracy of CAE prediction is improving in various issues in press forming such as fractures, wrinkles, stretch-flange-fractures, springback, and surface distortion. With our advanced CAE technologies, we can offer our customers solutions to various forming issues.



Springback analysis of center pillar



Press forming analysis of front pillar



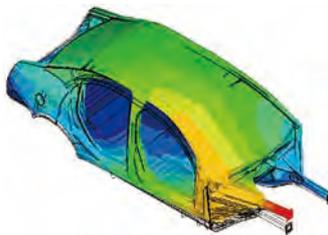
Bauschinger effect of steel in tension-compression test

Performance Evaluation of Automobile Body/Part

Strength, rigidity and durability of automotive bodies and parts are evaluated by numerical and experimental analysis. Based on the data, we propose suitable materials, shapes, and joining conditions to our customers for the development of bodies and parts.



Vehicle crash simulation Model: FSV



Body rigidity (torsion) analysis Model: ULSAB-AVC



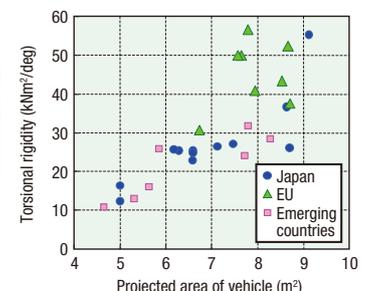
Tri-axial fatigue testing machine

Analysis of Automotive Body Structures

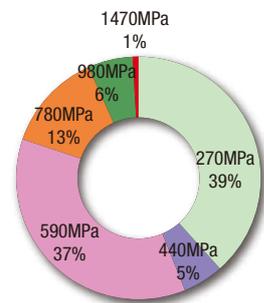
Our database of automotive body structures and materials is being updated through performance evaluation and disassembly investigation. Based on the database, suitable materials, structures, and fabrication processes are proposed to our customers considering weight and cost reduction, and structural optimization.



Disassembled half body



Torsional rigidity of auto-bodies



Weight percentages of various strength steels in automobile body