TP-STRUCT

TP-STRUCT is a comprehensive finite-element-based elasto-plastic simulation software that is empowered by "R-min method", our original static-explicit algorithm. It allows you to accurately predict your product's behavior before manufacturing expensive physical prototypes, and ensure the realization of high quality, low cost and short delivery periods.

Benefits

Accurate and Reliable Solver

Our original method "r-min" in conjunction with an efficient force cancelling algorithm can prevent large nonequilibrated forces arising from an explicit time integration and a sudden change in stiffness due to wrinkle or fracture,etc.It allows you to realistically simulate the springback phenomena on your product.
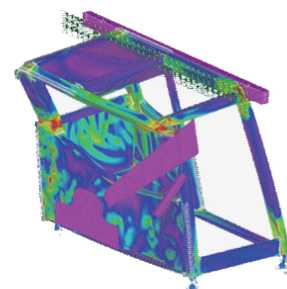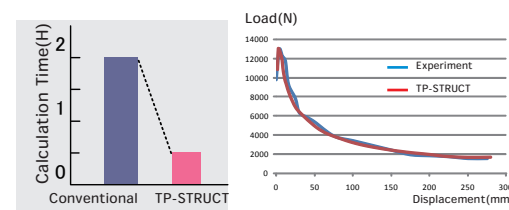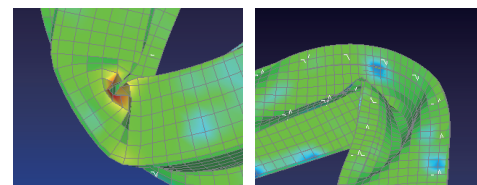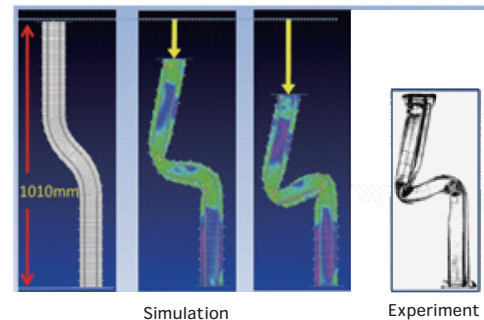
Complete Solution

This solver employs the updated Lagrangian rate formulation and the explicit time integration scheme.
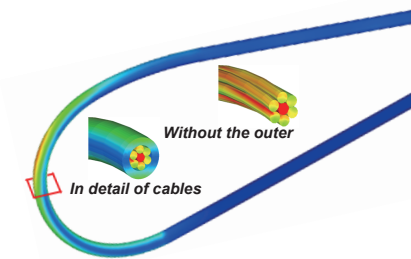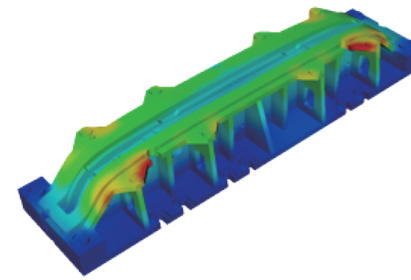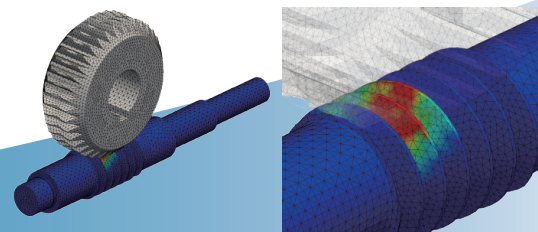It can offer a complete solution without any convergence problems for the simulation process of large deformations and multiple contact conditions.
It allows users to quickly predict deformation behavior on your product without any parameter optimization.

Easy to Use

TP-STRUCT provides the original user interface, which consists of the pre- and post-processor, to handle the multi process in the manufacturing. The conventional user interface with "Femap" or "Nastran" input data can be offered to make it easy-to-use for the experienced engineers.

Simulation   Experiment

Calculation Time(H) / Load(N)
Conventional   TP-STRUCT
Experiment — TP-STRUCT
Displacement(mm)

Structure analysis for protection when a hydraulic excavator falls

Without the outer
In detail of cables

Bending analysis for the helical twisted cables covered with the outer jacket, which requires the contact between elastic-plastic models during the deformation.
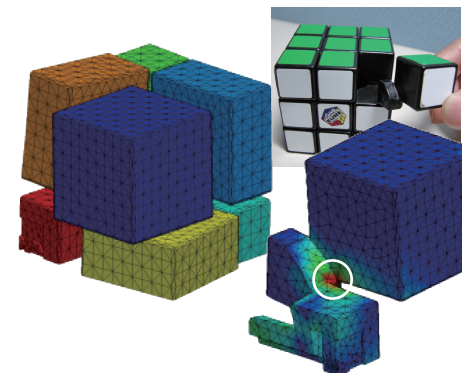
Capabilities

Nonlinear Explicit

• Perform nonlinear static analysis preventing large nonequilibrated forces
• Perform analyses that include large strains, large and rotations
• Represent scenarios that include nonlinear materials, geometric nonlinearities and constraint changes
• Predict springback phenomena after the plastic deformation
• Take advantages of local adaptive mesh refinement for automated alternation

Nonliner Contact

• Take advantages of contact surface description to minimize the gap between CAD and CAE models
• Simulate multi-body 3D contact
• Model contact between deformable bodies or a combination of a deformable and rigid bodies
• Include friction for each body
• Visualize contact condition of contact status and contact force

Assembly

• Utilize connector elements to efficiently model spot welds, bolts and other similar structural connections
• Define numerous contact interactions through the use of contact pairs

Advanced Structures

• Study the creep behavior of structural materials
• Efficiently perform analyses of symmetric geometries
• Utilize plane strain and plane stress elements
• Work with adaptive meshing in oreder to maintain the quality of elements during an analysis

Characteristics

TRIALPARK was awarded the contract from RIKEN to commercialize their own world-class scientific achievements. We are committed to the continued development of TP-STRUCT,which is built on work done by RIKEN researchers for many years.

ABOUT RIKEN   (http://www.riken.jp/, http://vcad-hpsv.riken.jp/)

RIKEN is Japan's largest and most comprehensive research organization for basic and applied science and a world leader in a diverse array of scientific disciplines. For nearly a century since its foundation in 1917, RIKEN has fostered pioneering, innovative research in fields spanning the entire range of the natural sciences, from developmental biology and neuroscience to quantum physics and computer science.