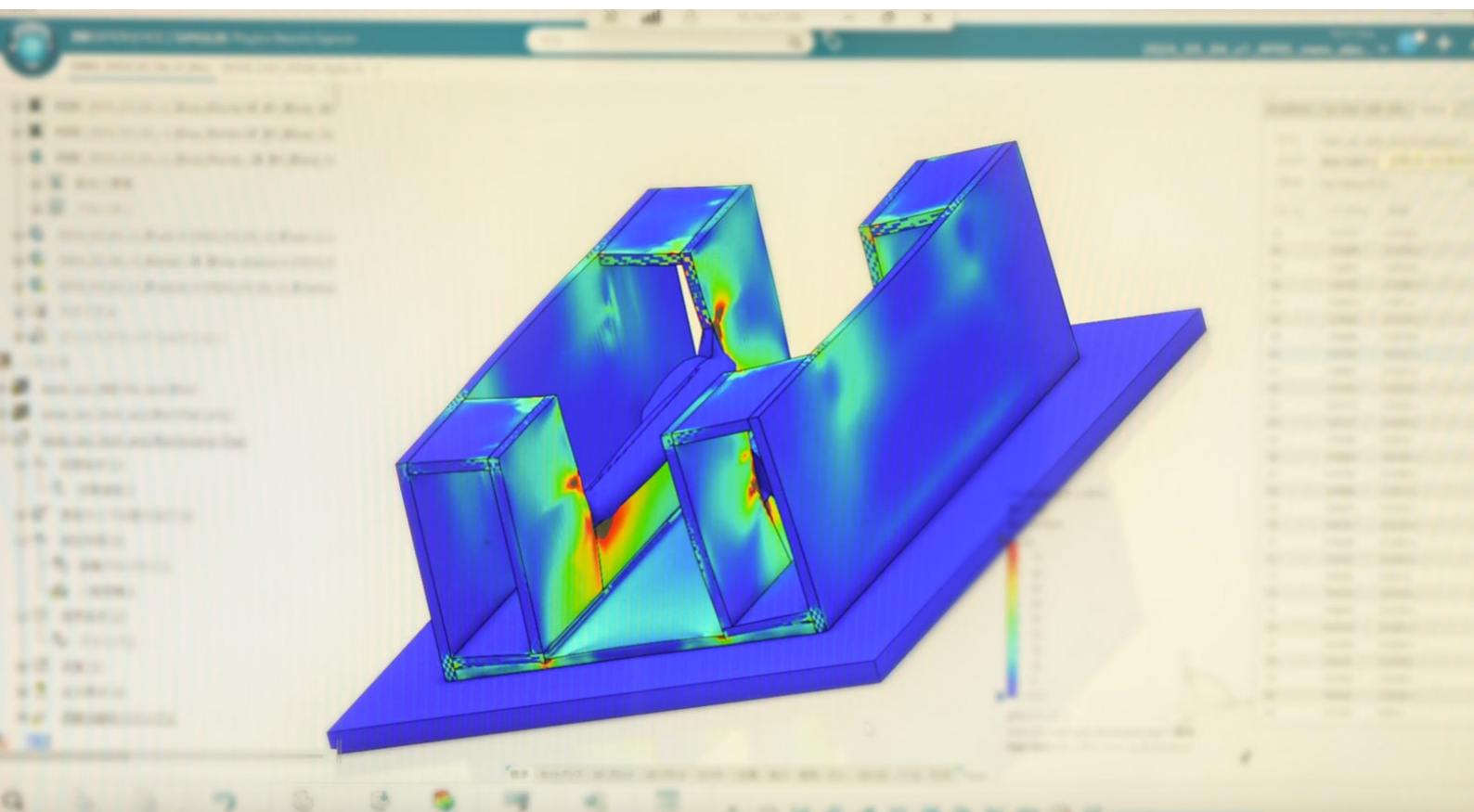


# SBS TOSHIBA LOGISTICS CORPORATION

MINIMIZING PROTOTYPING AND INNOVATING PACKAGING MATERIALS WITH CLOUD-BASED SIMULATION SOLUTIONS

## Case Study



SBS Toshiba Logistics added the cloud-enabled Structural Mechanics Engineer simulation solution, powered by the Abaqus solver, to its existing SOLIDWORKS installation in order to perform advanced nonlinear structural analyses — such as drop tests, contact, and dynamic vibration analyses — in the cloud, reducing prototyping cycles and costs while innovating with unique packaging materials.

### Challenge:

Minimize lengthy, costly rounds of prototype testing to shorten time to market while ensuring quality and reducing the use of plastics in logistics packaging products.

### Solution:

Add the **3DEXPERIENCE** Structural Mechanics Engineer simulation solution and **SOLIDWORKS** Cloud Services for accessing the cloud-based **3DEXPERIENCE** platform to its existing **SOLIDWORKS** installation in order to perform advanced structural analyses in the cloud.

### Results:

- Minimized lengthy, costly rounds of prototype testing
- Shortened lead times and reduced unnecessary costs
- Innovated use of unique packaging materials
- Improved quality through optimized designs

SBS Toshiba Logistics was established with the mission of reducing logistics costs for the Toshiba Group, and has functioned as the group's "logistics department" for many years. Utilizing its extensive manufacturing experience and knowledge — including in fields such as home appliances, energy, infrastructure, buildings, and semiconductors — the company now provides logistics support to many companies outside the Toshiba Group. The firm's Logistics Innovation Division has the knowledge and experience for planning, designing, and operating the supply chain systems that are essential to the smooth operation of any business, and provides comprehensive logistics solutions, including logistics design, procurement, storage, transportation, and operations.

As the only company in Japan accredited under ISO/IEC 17025 for vibration and free-fall testing of packaged cargo, SBS Toshiba Logistics provides testing services backed by impartiality, reliability, and technical expertise. This know-how enables the logistics provider to deliver high-quality products at low cost to a wide variety of businesses, working with customers to develop optimal logistics solutions.



"While we initially used Structural Mechanics Engineer simulation to conduct structural analysis of corrugated cardboard and foam materials, we have plans to also simulate the use of wood. This is an area that few competitors have yet to explore. By accumulating our own proprietary know-how and providing it to our customers, we are differentiating our company and believe we have reached a level at which this technology can be applied to our design work."

– Taichi Toda, Specialist

Rather than merely providing partial support for logistics functions such as transportation, delivery, and warehouse management, the Logistics Innovation Division optimizes the entire supply chain by providing a comprehensive range of services. These services range from procurement logistics for raw materials and components and production logistics related to the assembly line and transportation within the factory, to the sale of logistics and packaging products to a range of businesses and consumers. The Packaging & Equipment Technology Group is a key contributor to the division's work, designing, engineering, and innovating logistics- and packaging-related products.

While the group has relied on **SOLIDWORKS**® product development solutions since 2020, several factors prompted the company to replace its traditional design-prototype-test development cycles with advanced nonlinear structural analysis tools for assessing the effects of vibration, drops, and impacts on packaging and related products. More companies are moving away from the use of plastics in logistics products. Some products, such as expensive made-to-order or one-of-a-kind items cannot be tested. And, the cost of the conventional design-prototype-test cycle was becoming burdensome, often costing millions of yen and taking several months to complete.

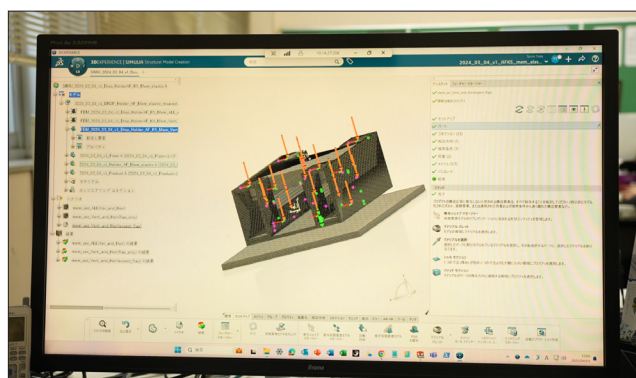
In 2024, SBS Toshiba Logistics chose to add the cloud-enabled Structural Mechanics Engineer simulation solution, powered by the Abaqus® solver, to its existing SOLIDWORKS installation in order to perform advanced nonlinear structural analyses — such as drop tests, contact, and dynamic vibration analyses — in the cloud. “In the process of providing products to our customers, we often need to create prototypes to verify the validity of packaging materials,” explains Chief Specialist Yuki Yoshi Uchida.

“However, if prototypes need to be made two or three times, it inevitably increases costs,” Uchida continues. “Furthermore, for high-value items or those that must not break, we cannot perform destructive testing, which inevitably lengthens the design lead time. This had been a major issue for us. We chose to adopt cloud-enabled simulation to shorten lead times and reduce unnecessary costs. We chose the cloud-based solution because its data is linked to and operates with SOLIDWORKS, it provides nonlinear dynamic analysis for simulating impacts, and it allows us to create material data using the material calibration function.”

## MINIMIZING PROTOTYPING CYCLES WITH STRUCTURAL SIMULATION

Using Structural Mechanics Engineer, SBS Toshiba Logistics is minimizing rounds of prototyping and their attendant costs and delays by validating packaging designs prior to testing. Because designs are validated and optimized, repetitive rounds of prototype testing are no longer necessary. “Over the year since we introduced cloud-enabled simulation, our design process has changed dramatically,” says Specialist Taichi Toda. “Previously, we repeated the process of designing, prototyping, and testing to verify the validity of the design, which increased costs and time, which was a problem.

“Since introducing cloud-based simulation, we can verify the validity of our designs through structural analysis and make improvements without waiting for testing, so we can dramatically reduce the number of design-prototype-test cycles,” Toda adds. “In addition, in design reviews with customers, we can check the validity of the design using analysis animations and plots, leading to highly reliable designs from the customer’s perspective.”



Using the cloud-enabled Structural Mechanics Engineer simulation solution, SBS Toshiba Logistics has not only shortened development lead times and reduced development costs but has also differentiated the company from competitors through the innovative use of packaging materials, such as corrugated cardboard, foam, and wood.

## SHORTENING LEAD TIMES, REDUCING COSTS, EXPANDING KNOWLEDGE

With fewer rounds of prototype testing required to validate and optimize designs, which is now done using cloud-based simulation, SBS Toshiba Logistics has shortened its development lead times and reduced development costs while simultaneously expanding its knowledge of the physical behaviors of new packaging materials. For example, because many of the company’s customers can no longer utilize plastic materials in packaging, SBS Toshiba Logistics is researching, analyzing, and innovating the use of alternative materials for cushioning, including corrugated cardboard and foam.

“When we introduced Structural Mechanics Engineer simulation, the first thing we did was perform impact analysis of cardboard materials, for which I created material properties using the material calibration function,” Toda points out. “Cardboard materials are gaining attention as an eco-friendly packaging

material that can replace plastic materials, so there is demand for their use more than ever before. The structural analysis has enabled us to understand phenomena and behaviors that were not visible to the naked eye.

"For example, we were impressed by the fact that we could see movements that were not visible in actual testing," Toda recalls. "The impact time in the drop test was only 0.01 to 0.02 seconds, and it's impossible to see the movement of the contents of the box with the naked eye in this short time. However, in structural analysis using Structural Mechanics Engineer simulation, we were able to see the 0.01-second impact frame by frame, providing insights into movements that were previously unseen."

## INNOVATING MATERIALS TO CREATE A KEY DIFFERENTIATOR

The addition of the Structural Mechanics Engineer simulation solutions has not only enabled SBS Toshiba Logistics to shorten development lead times and reduce development costs but also is helping the company differentiate itself from competitors through the innovative use of packaging materials. "While we initially used Structural Mechanics Engineer simulation to conduct structural analysis of corrugated cardboard and foam materials, we have plans to also simulate the use of wood," Toda notes.

"This is an area that few competitors have yet to explore," Toda says. "By accumulating our own proprietary know-how and providing it to our customers, we are differentiating our company and believe we have reached a level at which this technology can be applied to our design work."

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"We aim to establish new technology as the engine for our company's growth and to increase added value from the customer's perspective," General Manager Noriyuki Kagami concurs.

### Products:

- SOLIDWORKS Premium with Cloud Services
- SOLIDWORKS Standard
- 3DEXPERIENCE® Platform Extended Storage
- 3DEXPERIENCE SIMULIA Structural Mechanics Engineer
- Collaborative Designer for SOLIDWORKS
- Collaborative Industry Innovator
- 3DSwymer

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