



EFFICIENT MODULAR BUILDING DESIGN

FASTER RESULTS WITH MESHLESS SIMULATION DIRECT FROM FULLY DETAILED CAD ASSEMBLIES

About the Customer

Setting new standards for building methods, [TWH](#) is a leading Chilean company and a DITEC-certified industrial specialist in advanced modular and prefabricated construction solutions, serving both the residential and industrial sectors. With its extensive portfolio of panel-based systems, prefabricated roofs and stairs, and innovative fully equipped bathroom pods, TWH is revolutionizing traditional construction by delivering high-quality, factory-built units that improve steel frame construction efficiency, quality, and project timelines across the region.

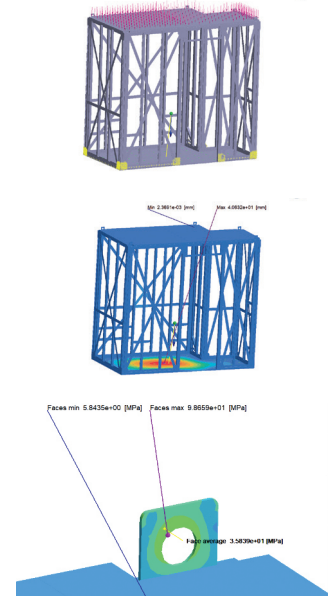


With Altair SimSolid, we import our complex CAD model, and it automatically understands every component and its structural function. This allows us to move from design to validated results in a fraction of the time. It has fundamentally changed our workflow, allowing us to innovate faster while ensuring the highest level of safety and quality.

Martín Epelman, R&D Manager, TWH



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Their Challenge

As TWH expanded its innovative bathroom pod system, the company faced a significant engineering bottleneck. Each building project could require up to ten unique pod typologies, and traditional structural analysis methods were too slow to keep pace with demanding production schedules.

To ensure product integrity and on-site safety, TWH needed to quickly and accurately validate each pod design for critical load cases, including the heavy compressive loads from on-site concrete pouring, the dynamic stresses during vertical crane lifting, and the potential for local buckling. This validation process was critical and hindered their ability to innovate rapidly.

Our Solution

To remove bottlenecks in analysis and accelerate their design validation process, TWH turned to the revolutionary technology of Altair® SimSolid® to completely bypass the most time-consuming, expertise intensive, and error-prone tasks in conventional structural simulation - the need for traditional geometry preparation and meshing. Delivering rapid results with solution times measured in seconds to minutes, Altair SimSolid is proven to provide quick and accurate results, enabling comparisons between multiple design scenarios.

Designed for analysis of complex parts and large assemblies that are impractical to handle with traditional finite element analysis (FEA), Altair SimSolid allowed TWH's engineers to directly import their complete, fully detailed bathroom pod CAD assemblies into the software. Altair SimSolid automatically identified every part, bolt, and connection, allowing the team to set up and run multiple complex structural analyses in minutes instead of days or weeks. They simulated heavy roof loads of up to 1800 kg, analyzed the complex stresses of a multi-point vertical lift, and investigated buckling modes, all within a single, easy-to-use environment.

Results

By integrating Altair SimSolid into the design workflow, TWH dramatically reduced its product development cycle and gained deep engineering insight into their products' real-world performance. The team successfully validated its BP-01 pod, confirming a maximum roof load capacity of 1800 kg, establishing guidelines for safe lifting, and limiting additional internal weight to under 3000 kg to maintain a safety factor greater than two. Altair SimSolid delivered a new, rapid validation process and the confidence to proceed with manufacturing and on-site operations. With this new-found agility, TWH is empowered to develop new, innovative modular solutions for its clients, knowing the designs are optimized and structurally sound.

To learn more, please visit altair.com/simsolid

LEFT: Example of TWH advanced modular prefabricated construction solutions **TOP:** Loads being applied in SimSolid on TWH's bathroom pod design. **MIDDLE:** Results from a lifting load analysis in SimSolid. **BOTTOM:** Lifting lug capacity analysis in SimSolid.



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