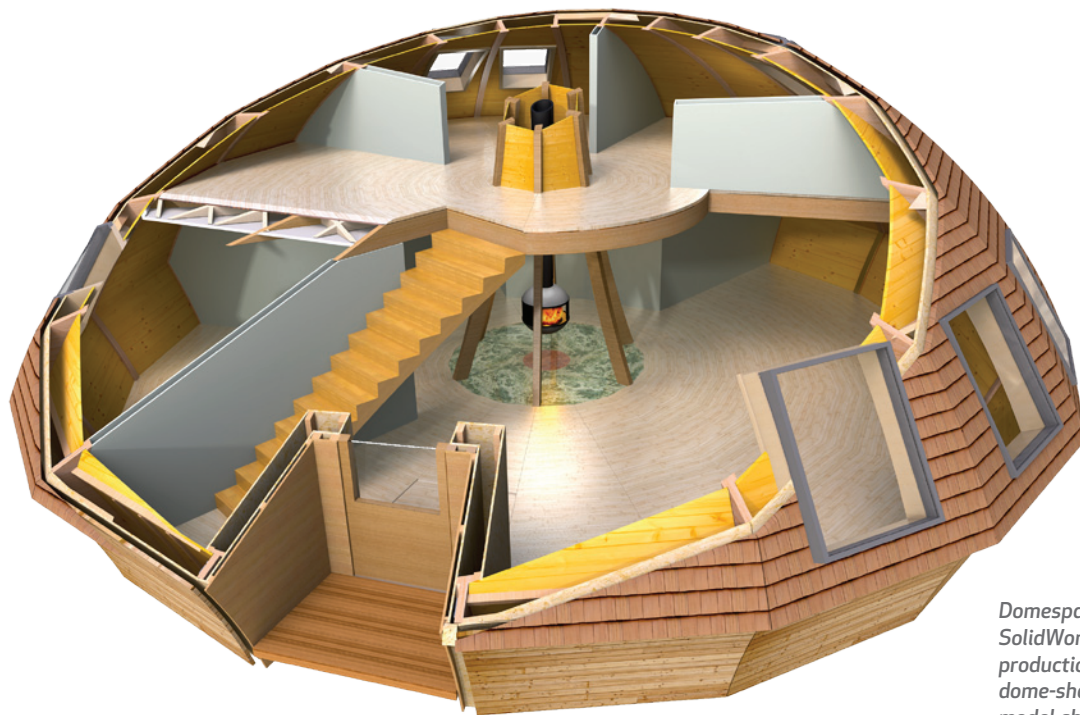


# DOMESPACE INTERNATIONAL

Designing a new generation of eco-friendly homes with SolidWorks software



*Domespace International implemented SolidWorks solutions to accelerate production of its world-class, eco-friendly, dome-shaped homes, like the ELEVATION model shown here.*

Harmony is in a curve.

That's the philosophy behind Domespace International, a leading innovator in the construction of eco-friendly homes. Based in Quimper, France, Domespace has transformed Principal Designer Patrick Marsilli's spherical home designs into world-class rotating, dome-shaped homes.

Domespace homes are designed to be more in harmony with nature, the environment, and the way people live. Constructed primarily of wood and recyclable materials, Domespace designs integrate home automation, account for solar radiation, and are less susceptible to seismic and cyclonic forces than traditional, angular designs. The home's exterior actually rotates, following the sun in winter to take advantage of its warming rays, and the shade in summer for cooling.

Ramping up production to meet global demand presented the company with distinct challenges, according to Benjamin Thoby, computational and R&D head. "To respond to worldwide demand for ecologically sensitive houses, we had to increase our production capacity considerably," Thoby explains. "We also needed to incorporate input from customers, who want to contribute to the design of their own unique, eco-friendly house. Taking our company to greater production levels required us to enhance our design and manufacturing technologies."

Domespace originally used ZOOM 3D modeling software, but determined that it needed a solution that would enable the company to maximize the use of design configurations, leverage the benefits of simulation tools, and automate its approach to manufacturing.

After evaluating Autodesk Inventor® and SolidWorks® software, Domespace chose SolidWorks, implementing SolidWorks Professional design, SolidWorks Premium design and analysis, and SolidWorks Flow Simulation computational fluid dynamics (CFD) analysis software. The company selected SolidWorks because it is easy to use and satisfied all of its requirements. Domespace also values the expertise and services of Cadware, its SolidWorks reseller.

## Challenge:

Visualizing eco-friendly house designs in 3D, assessing the viability of innovative home concepts, and ramping up production to meet increasing demand.

## Solution:

Implement SolidWorks Professional design software for concept development, SolidWorks Premium design and analysis software for structural design, and SolidWorks Flow Simulation computational fluid dynamics (CFD) analysis software for studying airflow and environmental conditions.

## Results:

- Shortened time-to-market by 50 percent
- Cut development costs by 50 percent
- Increased design reuse by 50 percent
- Reduced design errors by 30 percent

"The challenge to building ecological homes is to optimize each part to meet two requirements: building standards and respect for the environment," Thoby notes. "SolidWorks helps us achieve this optimization through a combination of design, visualization, simulation, and manufacturing automation."

### Faster development, lower costs, better quality

SolidWorks helps Domespace optimize its designs and development processes. By creating 3D solid models, the company's designers can effectively communicate concepts, quickly simulate performance, easily make modifications, and more efficiently drive production, saving time and money while improving quality. Since implementing SolidWorks software, Domespace has shortened time-to-market by 50 percent, cut development costs by 50 percent, and reduced design errors by 30 percent.

One of the ways that SolidWorks benefits Domespace is with design configurations of available home options, such as a span that contains a window, a door, or an open space. "All of the possible options are available as configurations in a design table," Thoby points out. "This capability provides an invaluable timesaver to our designers, who can use this tool to quickly create a highly personalized design for our customers. With SolidWorks, we have increased design reuse by 50 percent, which contributes to our improved productivity."

### Simulating innovative building concepts

Using SolidWorks structural and fluid-flow simulation tools allows Domespace to control its costs and develop innovative concepts. The primary feature of the company's homes—their spherical shape—provides a higher level of protection during an earthquake or a storm. Domespace designers use SolidWorks simulation tools not only to simulate these types of environmental forces, but also to study stresses and airflow within the structure.

"The advantage of SolidWorks design and simulation tools is that we can experiment with our concepts without incurring costs," Thoby stresses. "For example, we can check for weak areas in our structural beams. That process led to our patent-pending laminated beams concept, which produces strong structural members without the use of any adhesives. The ecological nature of our homes compels us to try new approaches and reduce material, while maintaining strength and safety. SolidWorks simulation tools enable us to do just that."

### Streamlining production

In addition to shortening its design phase, SolidWorks supports Domespace's efforts to streamline its production processes. With more accurate models and dimensioned drawings, the company plans to install an automated, robotic production unit, which Thoby anticipates will reduce the time between design and assembly by 70 percent.

"Our challenges in the months and years to come are to reduce the overall cost related to the building of a Domespace home through further optimization, new robotic production methods, and additional technological innovations," Thoby explains. "SolidWorks will enable us to successfully meet these challenges quickly and with great reliability."

*"THE ADVANTAGE OF SOLIDWORKS DESIGN AND SIMULATION TOOLS IS THAT WE CAN EXPERIMENT WITH OUR CONCEPTS WITHOUT INCURRING COSTS."*

Benjamin Thoby  
Computational and R&D Head



With SolidWorks design configuration tools, Domespace can take advantage of existing designs to more efficiently address owner requests for customization.

Domespace International - Conception: P. Marsilli;  
Photo: B. Thoby



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