

COMPANY

nanoICE, Inc.
nanoiceglobal.com

LOCATION

Seattle, Washington

SOFTWARE

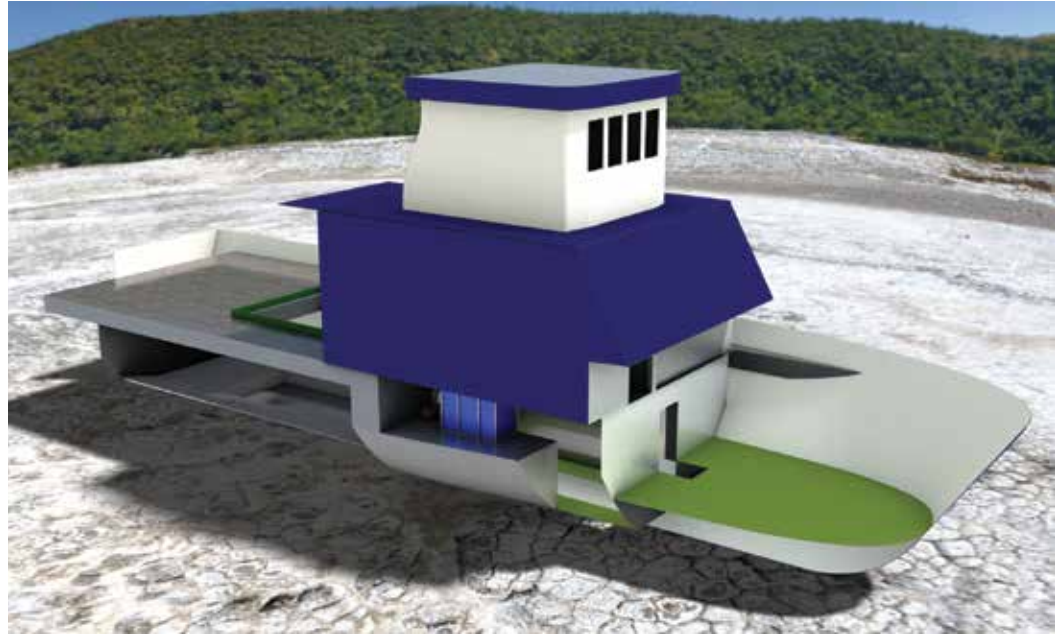
Autodesk® Product Design Suite Ultimate
Autodesk® Sim 360®

Because the nanoICE system contains many complex components, we used Autodesk Inventor to create and compare digital prototypes of multiple configurations. Using Inventor, we did it all digitally.

—**Peyton McCann**
 Design Engineer
 nanoICE, Inc.

Revolutionize food preservation

Startup designs innovative molecular ice technology



nanoICE used Autodesk Inventor to model possible installation locations for its technology. Image courtesy of nanoICE, Inc.

Introduction

nanoICE is an all-natural Molecular Ice Technology™ that keeps food fresher longer by covering the entire surface of seafood, vegetables, poultry, and other products with a viscous solution of micron-sized ice particles. This approach dramatically reduces product cooling times, thereby inhibiting bacterial growth and extending shelf life in every way—appearance, nutritional value, and taste—without freezing or chemicals.

“In many parts of the world, the amount of wasted product in agriculture and fishing is tremendous,” says Bjørn Hermann, CEO of nanoICE, Inc. The main cause of most of this waste is the difficulty in quickly chilling produce or seafood and then keeping it cool during transport and storage. “nanoICE could help prevent much of that waste and allow people across the developing world to have greater access to fresh, nutritious food.”

The challenge

Originally developed as a custom made device in Iceland, the nanoICE system was brought to the United States in 2010 for further development. “Our goal was to redesign homemade machines to make them bigger, more efficient, and more environmentally friendly,” says Peyton McCann, design engineer at nanoICE, Inc. “Our main challenge was taking a proven concept and building a machine around it that would continuously produce exactly what we wanted at high yields, while reducing the environmental impact.”

The Icelandic prototype was designed in Autodesk® Inventor® software. After reviewing the original Inventor design files, McCann chose to create the new proof-of-concept and commercial models from scratch. “I wanted to build all of the parts individually, making sure that all of the tolerances were correct and that they all worked together,” says McCann. To redesign the system, McCann relied upon software products obtained through the company’s membership in the Autodesk Clean Tech Partner Program.

The Autodesk Clean Tech Partner Program supports clean technology innovators with design and engineering software they can use to accelerate their development of epic solutions to the world’s most pressing environmental challenges. For more information, visit autodesk.com/cleantech.

nanoICE used Autodesk software to design digital prototypes of its innovative product

The solution

nanoICE, Inc. embraced digital prototyping using Autodesk® Product Design Suite Ultimate, which includes a range of products, including Inventor, Autodesk® Showcase® 3D visualization and presentation software, and Autodesk® Sim 360® software.

The company's goal was to use Inventor to design the entire system and to outsource all component manufacturing, with the exception of the system's proprietary ice generator, which it would build in house. NanoICE partners with a local firm for product and parts manufacturing and assembly. Through local manufacturing, the team helps ensure quality, minimize shipping delays and transportation costs, and employ local, skilled labor.

Using Inventor, McCann designed all of the individual system components, created assembly drawings, and then combined the assemblies and parts into 3D models and data-rich technical drawings. "Because the nanoICE system contains many complex components, we used Autodesk Inventor to create and compare digital prototypes of multiple configurations," says McCann, "Using Inventor, we did it all digitally." McCann also used 3D printing to quickly generate physical prototypes from the digital prototypes to test and iterate concepts. The process helped minimize the expense and lost time associated with building multiple physical prototypes.

Upon completion of the design phase, McCann sent the digital prototypes and technical drawings to the component manufacturers. "As long as the manufacturers built the individual component within the tolerances we created, we knew

it would work," says McCann. "We had already tested it on the digital prototype and with 3D printing."

nanoICE, Inc. used Inventor for other tasks, including producing 3D models of possible installation locations at customer sites, creating 3D models for use in an operation manual, and analyzing the strength and durability of the system's frames. To share his progress with management reviewers, McCann used Showcase to create high-quality visualizations of the system.

The result

nanoICE, Inc. has tested proof-of-concept models in Africa, Hawaii, Japan, and the United States and has begun serial production of its first commercial models. The newly designed system is robust, efficient, and environmentally friendly, using up to 70 percent less energy than conventional ice machines and as much as 90 percent less Freon.

"The nanoICE system is a complete revolution in our ability to preserve food and prevent waste," says McCann. "We are excited to complete testing and begin distributing our product throughout the world." To facilitate distribution in the developing world, nanoICE, Inc. has begun talks with Non-Governmental Organizations and for-profit companies focused on food waste and sustainability.

"The Autodesk Clean Tech Partner Program was invaluable—especially since we are a startup company with limited funding," says Hermann. "Inventor and Showcase helped us create digital prototypes and accelerate time to production." Moving forward, nanoICE, Inc. plans to use Sim 360 to perform simultaneous resource-intensive simulation studies of the complex phase changes that occur in the ice generator. "We anticipate that those studies will help us further optimize system design and produce an even better machine."

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—Bjørn Hermann
CEO
nanoICE, Inc.

For more information

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Image courtesy of nanoICE, Inc.