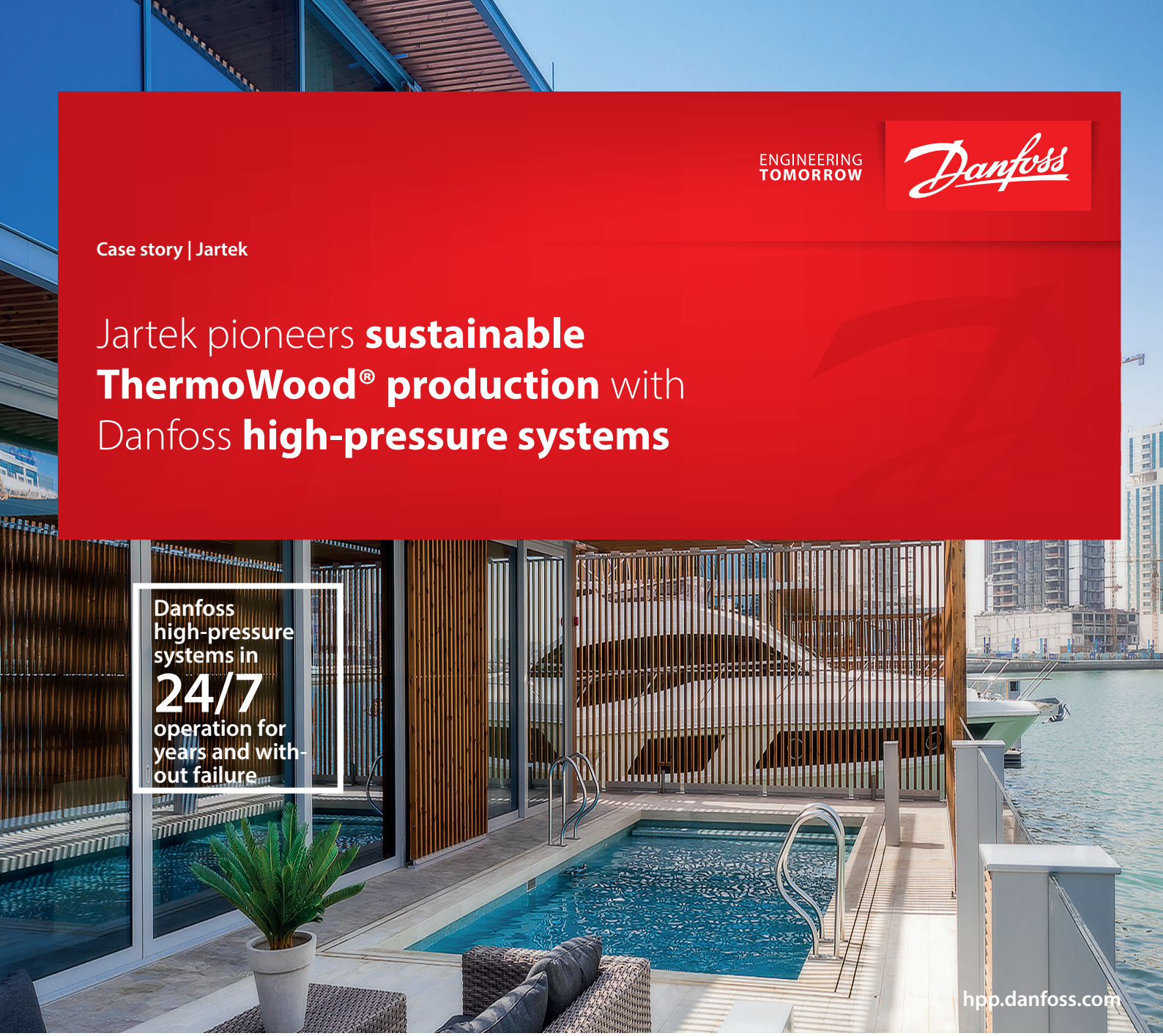
ENGINEERING TOMORROW

Case story | Jartek

Jartek pioneers **sustainable ThermoWood® production** with Danfoss **high-pressure systems**



HIGHLIGHTS

- Outstanding reliability
- Low and easy maintenance
- Customized solutions

ThermoWood® is a thermal treatment system for wood developed by Finland´s national research and innovation hub VTT. Decay-resistant lumber without the environmentally harzardous chemicals, ThermoWood® products are at the leading edge of sustainable architecture trend that combines wood´s many advantages with unprecedented, enviromentally friendly durability.

Jartek, a leading Finnish producer of wood processing equipment, develops and produces more industrial ThermoWood®process chambers for customers worldwide than any other company - and has integrated Danfoss high-pressure systems from the start.

The challenge:

Treat wood in an **environmentally sustainable way**

People have relied on wood as a building material for thousands of years because it is strong and light, easy to shape, relatively inexpensive, and abundant. As environmental concerns have grown in recent decades, so has interest in wood as this recyclable and renewable natural resource has a much lower carbon footprint than concrete or steel.

But while wood's many qualities make it appealing to architects and builders, its natural biodegradability does not: unless treated, all wood types rot, some faster than others. Pressure treatment with chemical compounds reduces wood decay, but at high costs to human health and the environment. So toxic are the chemical compounds used for decades that pressure-treated wood cannot be safely left in landfills or burned outside of special incinerators. Thus, in the early 1990's, researchers at VTT set out to develop a wood treatment technique that would increase wood's durability against decay without harmful chemicals.

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The solution

A combination of heat, water, and technological knowhow – including **Danfoss high-pressure systems**

ThermoWood® changes the game with a skillful mix of simple heat and water. The unique thermal modification process uses special kilns, designed and produced by Jartek, to heat wood up to 200-230º Celsius under precisely controlled conditions. Water plays a vital role within the stainless-steel chambers: first, as steam injected to keep the chamber oxygen-free at high heat and manage the chemical changes within the wood, then, as tiny water droplets produced at high pressure to cool the chamber temperature and re-condition the wood's moisture level to specified levels.

According to Jartek's business manager, Timo Tetri, Danfoss power packs built around PAHT pumps have been integrated into these high-tech chambers since the very beginning. "We were familiar with Danfoss high-pressure pumps from other applications, so it was natural to consider them for the ThermoWood® project, too," he explains. "Danfoss high-pressure systems have been standard in all of our kilns from the very beginning. Their reliability means they run for years without complicated maintenance routines – and they require very little service at all. This dependability is essential for us and our customers, who operate the kilns 24/7 around the world."

"But we are also very happy with the flexibility of their systems," Tetri continues. "We can order the Danfoss power packs with or without control boxes, depending on our customers' requirements. Because precise control of the adiabatic cooling and re-conditioning phase is so critical to the ThermoWood® process, we develop our own proprietary PLCs and software in addition to the chambers and material handling. Danfoss makes it simple for us to take control of their high-pressure systems in exactly the way that fits each customer´s precise needs."

The result:

Constant growth in production, adaptation, and applications

Since Jartek's first ThermoWood® chamber went into production in the early 2000s, growth has been constant. Although VTT originally developed the process for the Finnish forestry industry, the technology is now in use worldwide and treats a variety of wood types in addition to Finland's indigenous pine, spruce, and birch.

"The volume of produced ThermoWood® has increased ten-fold since we started," says Tetri, "and continues to grow year on year. Architects worldwide are using it in amazing projects that are as beautiful as they are sustainable."

"With Jartek kilns now running 24/7 in Europe, North America, Turkey, Japan, and New Zealand, the reliability of Danfoss high-pressure systems is more important than ever. The first power packs we delivered many years ago are still running today, and we have not had any failures yet. Most of the spare parts we have sent to customers have been filter cartridges to keep incoming water free from impurities. We look forward to our continued collaboration in providing our customers with reliably sustainable solutions."

Jartek *is a Finnish specialist in log-handling and lumber-handling lines, and ThermoWood® kilns. Founded in 1957 and still family-owned, Jartek collaborates with leading wood processors in Finland and worldwide to provide solutions that are reliably sustainable, efficient, and competitive. For more information,* ***see https://www.jartek.fi/en***

ThermoWood® *products are well suited to architectural applications in demanding weather conditions. Durable and stable, ThermoWood® is the 100% natural choice for architects, builders, and designers who want to take advantage of wood's many benefits without the use of harmful chemicals. The ThermoWood® trademark is used for wood products manufactured via a patented process developed in Finland by VTT. The ThermoWood® registered trademark is owned by the International ThermoWood Association, founded in 2000 to enhance the utilization of ThermoWood® products. Only the members of the International ThermoWood Association have the legal right to use the word ThermoWood with thermally modified timber. Today, the association comprises sixteen members from eight countries. For more information,* ***see https://www.thermowood.fi***

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