

Ebook

Phononic Solid-State Cooling Solutions Transforming COVID-19 Vaccine Storage and Protection



Table of Contents

P.03 Protecting lives in worldwide vaccine effort

P.04 Providing innovative, sustainable solutions for the cold chain

P.04 Ensuring highest-quality protection

P.04 Providing ENERGY STAR®- certified refrigeration solutions with industry leaders

P.05 Delivering the ideal mobile solution for vaccine administration



Protecting lives in worldwide vaccine effort

As the global effort to control and ultimately eradicate COVID-19 continues, Phononic, a global leader in solid-state cooling and heating technology, is providing critical cold chain support to urgent vaccine efforts by delivering refrigeration solutions and empowering patient-centered care through the entire chain of custody. What has become clear in the roll-out of the COVID-19 vaccines now being administered worldwide is that transport, storage and administration environments are all-important in the

protection and viability of these critical vaccines. The danger of destroyed vaccines is real: the World Health Organization [WHO] estimated in 2019 that 50% of vaccines are wasted worldwide, in large part due to a lack of temperature control and the logistics to support an unbroken cold chain.

Today, the challenges are even greater with new types of vaccines, all requiring different and evolving storage conditions, for COVID-19. And given the amounts to be administered –

Pharmaceutical giant, Pfizer, estimates that it will be able to manufacture 2 billion doses of its vaccine this year; both Pfizer and Moderna have pledged to deliver a combined 400 million doses in the U.S. by the end of July 2021 – there is no room for failure.

Phononic's advanced solid-state technology is playing a critical role protecting these life-saving vaccines and drugs, transforming how they are being stored, transported and administered to patients.

Providing innovative, sustainable solutions for the cold chain

Since 2016, the company has provided innovative and sustainable solid-state refrigeration products to laboratories, hospitals, clinics and pharmacies. Phononic has joined forces with industry leaders in life sciences and healthcare to provide first-ever ENERGY STAR®-certified products offering the most precise temperature control for vaccine storage, distribution and administration across North America.

Said Dr. Tony Atti, CEO and co-founder of Phononic, "Phononic is now very much

on the COVID-19 front lines and has been contributing to the protection of all vaccines for some time. As an innovator of semiconductor cooling solutions that sustainably displace compressors, we chose the most demanding environment to showcase our capabilities: the life sciences and healthcare industry. Our ENERGY STAR® products are now mainstream parts of Thermo Fisher, Helmer, Follett and other name brand life sciences product portfolios. Our partnerships with the leaders in the industry speak for themselves."



Ensuring highest-quality protection

As the battle against COVID-19 continues, the safe storage of vaccines is a crucial component of protecting patients against the virus. Phononic's compressor-free, solid-state cooling technology provides unique advantages for those within life sciences and healthcare, including: unparalleled temperature stability that protects high-value inventory, quiet operation for in-room use with no vibration, cleanroom-compatible readiness, and sustainable ENERGY STAR® efficiency. The solid-state refrigerators also use environmentally-friendly CO2 as its refrigerant, making it the most sustainable refrigerator on the market. Fundamentally more reliable, the system requires minimal maintenance and, without moving parts, provides unprecedented vaccine protection.

Providing ENERGY STAR-certified refrigeration solutions with industry leaders



Thermo Fisher Scientific TSX



Thermo Fisher Scientific TSG505



Follett Solid-State Undercounter Medical Grade Refrigerator



Helmer MRL 102 Countertop Refrigerator



Delivering the ideal mobile solution for vaccine administration

In addition to its highest-quality finished products offered through industry leaders, Thermo Fisher Scientific, Helmer and Follett, Phononic has also recently developed the **Phononic Solid-State Tote**, an innovative, high-tech solution for mobile vaccine transport, storage and protection.

As the entire global population recently witnessed, the vaccines now available were developed in record time and with an urgency very few remember in our lifetimes. Yet while these vaccines were developed using the most sophisticated technology and methods, the ensuing storage and transport of these critical substances is much less sophisticated. The current cold chain continues to rely on the same methods used for years: cardboard boxes packed with dry ice. Prone to failure and with large

Phononic Solid-State Tote

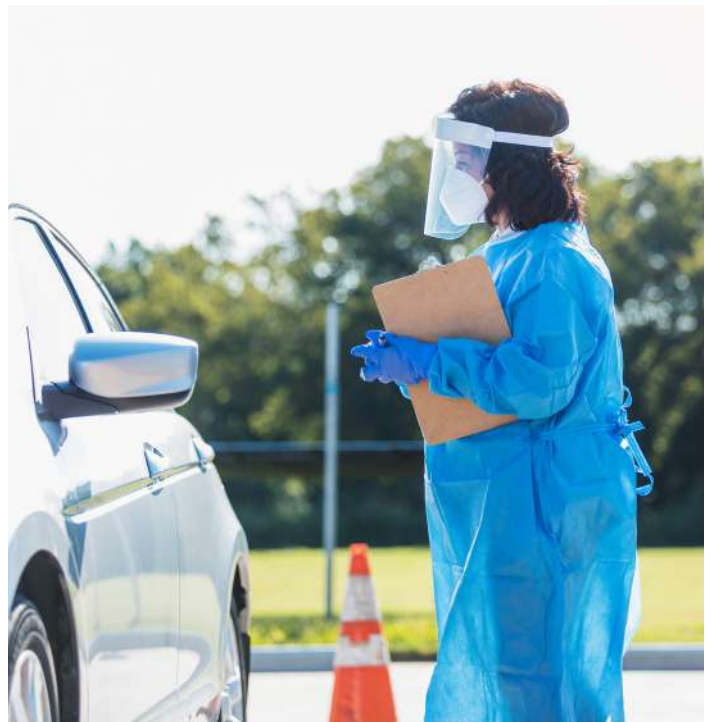
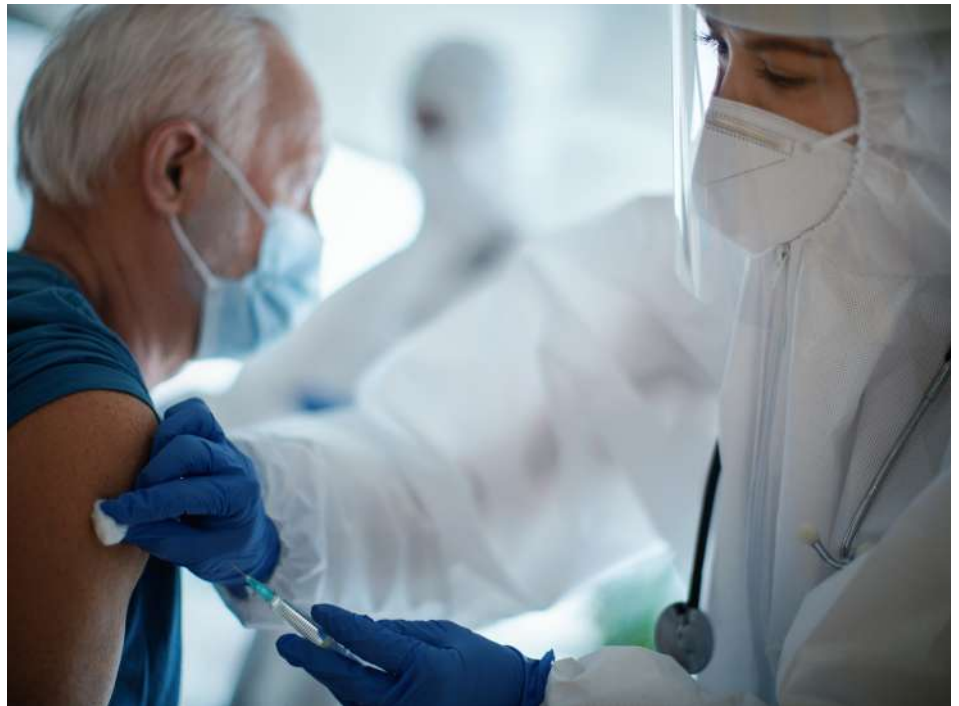
swings in temperature, this is a crude solution for precious life-saving cargo.

Phononic's Solid-State Tote exceeds the temperature stability and uniformity needed for vaccines and drugs at administration and last mile transport – while ensuring the reliability and stability resulting from solid-state technology.

The Phononic totes are a critical tool for administration: including the 5-day period that the Pfizer vaccine can be



refrigerated at 2-8°C storage conditions as well as the less aggressive, evolving requirements now being seen for the newer vaccines to be rolled out this year. Given the current need for mass distribution at sites such as parking lots and stadiums (the NFL has just promised the use of every one of its stadiums for vaccine distribution), our portable solution is ideal for protecting vaccines during last mile delivery and on-site administration, using a myriad of power sources.



The Phononic Solid-State Tote is also an ideal solution for medical drone delivery, which could be a critical tool in the fight to combat COVID-19. As new treatments and vaccines become available, drone delivery looks to be a viable solution for direct delivery to patients or ambulatory clinics, lowering the risk of exposure and extending the reach of the global healthcare system.

“There is no harder proving ground for a technology than laboratories, hospitals, clinics and pharmacies; and no more important inventory today than COVID-19 vaccines. With an established market foothold achieved through differentiated solid-state products and now the development of our innovative mobile tote solution, the time is now to empower patient-centered care through the entire chain of custody.”

Keith Lewis, Director of Strategic Partnerships at Phononic

About: Phononic, Inc. is an innovator of semiconductor cooling solutions that sustainably displace antiquated mechanical incumbents. The Company's thermoelectric chips and fully integrated products are used in micro cooling [5G/Optoelectronics/LiDAR applications]; fulfillment (food storage, curbside pick-up and delivery); and licensed to leaders in the life sciences & healthcare, food & beverage and climate control sectors. Phononic's innovations are revolutionizing the way people work and communicate, how grocers merchandize and deliver food, how life-saving vaccines and drugs are protected, and how houses and buildings are cooled – setting a new global standard of efficiency and sustainability. For additional Company and product information, visit: <https://phononic.com/>

Phononic is proud to deliver sustainable, solid-state solutions for vaccine storage – across the entire critical cold chain. For more information on Phononic's refrigeration technology, **visit <https://phononic.com/license-with-phononic/life-sciences-healthcare/>**.