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BIO/PHARMA SUCCESS
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CASE STUDY

Sonoco ThermoSafe and DHL Global Forwarding use new active technology with real-time data to provide flawless performance while shipping high-value biopharmaceuticals on a difficult lane.



PharmaPort® 360 Model 7628
holds a standard US or Euro pallet

PRECISE 5°C TEMPERATURE CONTROL
REAL-TIME COMPLETE VISIBILITY
MULTI-MODAL

Americas | Europe | Asia Pacific
thermosafe.com/PharmaPort

THE NEW PHARMAPORT 360

A SOLUTION FOR CHALLENGING JOURNEYS IN GLOBAL LOGISTICS

Sonoco ThermoSafe and DHL Global Forwarding meet the needs of shipping high-value biopharmaceuticals with rock-steady performance

Today's pharma cold chains are more complex than ever. Bulk shipments of highly valuable biologics and other cold chain products are moving through national and international transits, while meeting tighter regulations for performing to exacting temperature ranges; integrating well with fast-moving logistics processes; and providing greater access to operational data on environmental conditions inside and outside the container. All the while, managers are looking to keep a tight rein on operating costs.

Technology has developed at a pace commensurate with the more complex supply chain. Better insulation materials, higher reliability in cooling processes; and electronics to streamline the collection and documentation of shipment data are more readily available. One of the more competitive areas of pharma cold chain technology is in the movement of pallets of product, whether by air or other transportation modes. This is where Sonoco ThermoSafe's PharmaPort 360 operates, and recent operational experience demonstrates the benefits of deploying the latest technologies.

“Active (powered) pallet containers are preferred by many biopharma manufacturers because of the reassurance they provide in keeping high value product within specification,” says Chris Day, director of global business development at Sonoco ThermoSafe. “At the same time, the cost of active systems is driving the industry toward less expensive, but more complicated—and less reliable—passive systems. Our experience to date tells us that PharmaPort 360 solves many of the difficulties of active systems, while providing cost economies competitive with passive systems.”

PHARMAPORT 360 TECHNOLOGY

The PharmaPort system has been on the market for several years, but with its acquisition by Sonoco ThermoSafe in 2016, it has undergone comprehensive upgrading since then. While it contains the batteries, refrigeration compressor and heating element that other active systems contain, the heart of the proprietary technology is a multiple eutectic plate design inside a vacuum insulated panel (VIP) shell, which maintains a rock-steady 5°C temperature, for a minimum of 72 hours in constant +30°C heat (and

over 96 hours in controlled ambient conditions). (“Eutectic” refers to the plate’s ability to absorb or give up energy while maintaining a designed-in, steady temperature. In fact, the PharmaPort is automatically centered on 5°C without operator adjustment.)

Once the PharmaPort is charged (by simply plugging it into any world power source) and then unplugged, the compressor and heater shut off, and fans circulate air within the container, accessing cool or warm air from the eutectic chambers as necessary. As a result of this energy-efficient process, there is no noise or hot air discharge from the container. Operational experience demonstrates that the PharmaPort can maintain its +5°C set temperature to within +/- 0.7°C, even during around-the-globe air shipments.

Dimensionally, the PharmaPort 360 is a rectangular box, with rigid walls (see table for dimensions). Use of high-tech vacuum insulating panels help protect shipments while maximizing payload space. On aircraft, the container fits within a standard NAS aircraft pallet; depending on customer requirements, even two PharmaPort units can be positioned onto the cookie sheet.

PharmaPort has had FAA approval ever since it came on the market; additionally, it meets World Health Organization GDP criteria under Annex 5 of the WHO Good Distribution Practices for pharmaceutical products.

PHARMAPORT 360 DIMENSIONS

Exterior: 80”L x 52.2”W x 58.5”H (203 x 133 x 149 cm, nominal)

Interior: 50.5”L x 44”W x 46”H (128 x 111 x 116 cm, nominal)

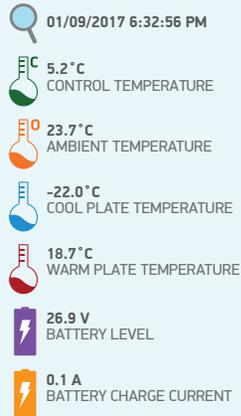
Payload Dimensions: 49.5”L x 41.5”W x 44”H (125 x 105 x 112 cm, nominal)

Payload Weight: 1102 lbs. (500 kg)

Container Weight (Net): 1200 lbs. (544 kg)

HOME VIEW

Multiple ways to see latest information, just hover over icon to see yellow box with container sensor information. You can also access this data using your computer, tablet or mobile phone.

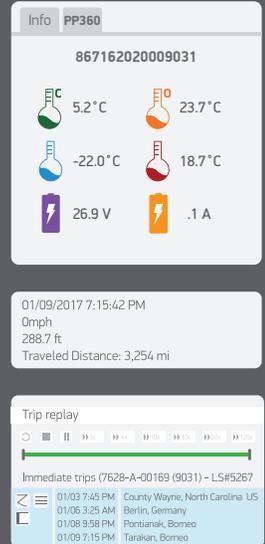


MAP VIEW



TRIP REPLAY

Replay a trip start to finish.



The squared-off dimensions of PharmaPort, combined with a base platform that allows for forklift movement from all four sides, has other, broader implications. PharmaPort can easily be loaded into a ground-transportation truck or trailer, providing an easy, precise LTL service which avoids the need for expensive, hard to fill reefer trucks. PharmaPort has even been used as a static, laboratory-grade refrigeration system, simply by plugging in multiple stationary units in a warehouse. Accommodating temporary refrigerated product overflow is a breeze.

TELEMETRY

Where PharmaPort really shines, though, is in its built-in telemetry. As the only active container with comprehensive monitoring built into the container structure and approved by the FAA, the PharmaPort provides a wealth of operational and environmental information: monitoring all internal/external temperature, location and mechanical functions; transmitted to the cloud in near real time; and requiring no human involvement to start/stop/retrieve monitors of any kind.

Gone are the days of waiting until the end of a shipment for information, or lost data from an operator losing or forgetting to start or stop a logger, or weeks-long investigation processes while waiting for a logger to return from its next trip. Airlines and freight forwarders can monitor PharmaPort shipments in real time, allowing preventive action throughout a shipment. Subscribing PharmaPort shippers can access their shipment data for the last 5 years in minutes instead of weeks, including the

PharmaPort's telemetry allows for simultaneous geolocation, payload and ambient temperature, and maintenance information, all viewable in one's smartphone.

ambient temperature lane data gathered by the PharmaPort.

The fact that all of the sensors and transmitters are built into the PharmaPort allows for full synchronization of all data – time, place, temperature and mechanical. This means at any moment of transmission, the container's location, internal/external temperature and battery/mechanical statistics are known—simultaneously. The data are securely stored in the cloud for near-instant retrieval.

At the same time, ambient conditions are similarly recorded, and with onboard GPS and accelerometers, a quick and easy assessment of operational conditions can be made (i.e., shipment in motion; shipment in flight; container loading/unloading, etc.). The telemetry includes software for geofencing (ensuring that the container stays within a specified port or roadway).

In fact, the ease of data collection and retrieval of the PharmaPort makes it an attractive option for conducting

lane validation studies. Working with a knowledgeable logistics provider like DHL Global Forwarding (see below), a manufacturer can use the PharmaPort to collect precise ambient data, even while mimicking ground-handling or transfer activities. The PharmaPort might be used for a number of initial runs at product launch, and then the manufacturer and logistics provider have the documentation and performance data to justify shifting to other packaging options as a product reaches full commercial distribution.

“Some of these capabilities exist in piecemeal fashion in the industry, usually not in real time and always requiring human effort to place, program and retrieve devices,” notes Day. “PharmaPort's built-in ability to securely track all these location, environmental and mechanical conditions just by powering on the container brings significant new capability to the market. Additionally, as the newest vintage active container, our fleet age provides additional relief from mechanical issues present elsewhere.”

CASE STUDY

PHARMAPORT 360 INTERNAL TEMPERATURE RECORD

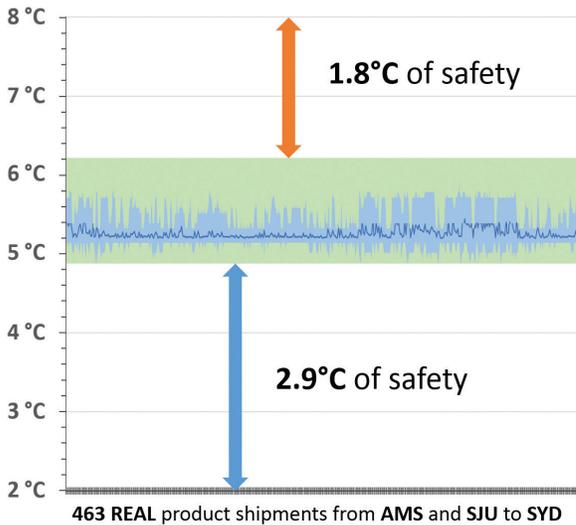


Fig 1. These data represent 463 trips between Amsterdam, Netherlands, San Juan, PR, and Sydney, Australia, on multi-leg flights. The PharmaPort internal temperature, set at 5°C, never varied more than 1.2° above the setpoint, or 0.1° below the setpoint.

Sonoco ThermoSafe has worked with DHL Global Forwarding to handle high-value biologics from a major biopharma manufacturer, in this case making a run from Amsterdam, Holland, to Sydney, Australia for the last 18 months. Edwin Groenewoud, Customer Relations Team Leader at DHL Amsterdam, who has been managing these shipments, says that “We’ve had problems with active containers on this shipping lane, due to reliability issues and the lack of visibility in tracking data. The PharmaPort 360 has provided us flawless reliability, no temperature excursions and great visibility through the real-time GPS tracking. Additionally, the Sonoco PharmaPort team has done everything we could have asked, including creating a custom software visibility platform specific to our needs.”

The actual performance of the PharmaPort is shown in two charts: Fig. 1 is operational data from the internal temperature sensors of

the container, over several hundred shipments. The steady performance there is even more dramatically demonstrated in Fig. 2, which shows external temperature data collected one shipment of multiple PharmaPort units, some of which took different connecting flights to get to the same destination. Operational managers could not only see the varying conditions on these routes, but also be assured of near-identical internal temperatures of the PharmaPort units.

David Bang, CEO of LifeConEx and global head of DHL Temperature Management Solutions at DHL Global Forwarding, was the driving force behind introducing the

PharmaPort into the DHL portfolio. “Customers routinely come to us for advice on packaging selection. What has attracted us to the PharmaPort 360 solution is its flexibility, reliability and predictability. The telemetry allows us to manage shipments predictably, and between the ground handling and data analytics capabilities of DHL and the reliability of the PharmaPort, we can

provide a high level of assurance to our customers.”

Bang notes that PharmaPort has been foundational in building a stronger partnership between DHL and Sonoco ThermoSafe, as the global capabilities of both organizations became recognized by the two. The pharma logistics “game,” so to speak, is in part a balancing act in the availability of containers in the right places at the right times, and with an ability to service them, globally, as needed. “Both organizations have an international footprint, and for us this has been a wake-up call that we can meet demanding client needs successfully,” he says.

Today’s international pharma-logistics market is being buffeted by capacity constraints, growing demand for high-reliability services, and tightening regulatory requirements. At the same time, the biopharma industry is reaching out to more global markets—in some cases, where its quality standards are challenging to meet. Use of the PharmaPort 360, with its reliability, simplicity and predictable performance, can take many of the worries off the plate for supply chain managers and logistics providers alike.

VISIBILITY TO AMBIENT LANE DATA

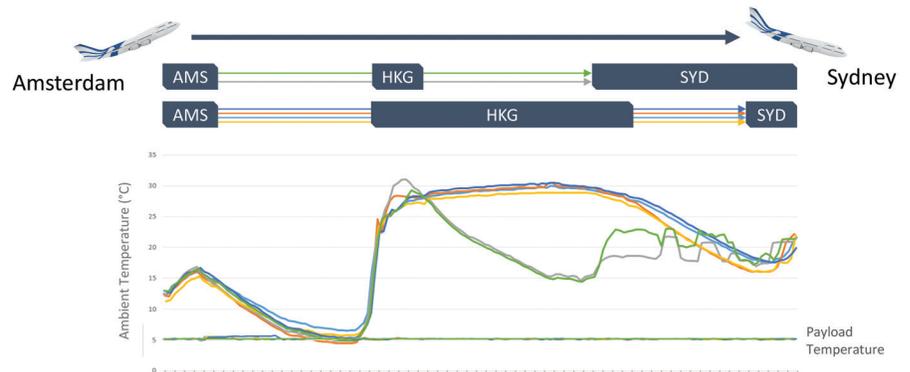


Fig 2. This chart represents one trip of six PharmaPort units between Amsterdam and Sydney, with a stop at Hong Kong. Note that the ambient (external) temperatures varied considerably at that point, since the shipment was broken up, with a layover for four of the units, then departing on a separate flight. Nevertheless, the internal (payload) temperatures of all six units hardly varied at all.