



AIR CARGO NEWS AWARDS 2021
AWARD SUBMISSION - INNOVATION AWARD - PRODUCT

GIST & POLAR THERMAL: CHILLED AIR PACKAGING SOLUTION



"We spent many months in workshops and testing the solution and a great product has come out of it."



AT GIST, OUR CUSTOMERS ARE AT THE HEART OF EVERYTHING WE DO

Gist has a long history of moving chilled, perishable and hazardous products by air, road and sea as part of its Global Freight management division, providing end-to-end supply chain management. It is dedicated to supporting the needs of its customers and prides itself of building solutions to complex, global supply chains thanks to Gist's dedicated people, technology and ability to innovate.

In 2018, Gist enhanced its long-standing relationship with international retailers, winning a contract with Britain's leading retailer, Tesco, to process, add value and transport to its chilled product via air freight to a number of customers in the Asia Pacific and MENA regions.

Building on its proven capability to maintain temperature controlled supply chains, Gist was challenged to build a bespoke 60-hour solution that would maintain product temperature throughout the supply chain.

Gist and Polar Thermal have worked together to create a bespoke, eco-friendly and UK-made solution for transporting chilled food across the globe.

In the last 18 months, Gist has:

- Built a **unique, market-leading** packaging solution that is a **cost-effective, UK-sourced** and **environmentally-friendly** solution
- A **passive temperate controlled solution** requiring no onward external temperature controls
- Continued to develop the design and enhance the solution making it more efficient and ergonomic to pack
- **Fully reusable solution** through return supply chain with **recyclable materials** at end of life
- **No temperature rejections** since go-live in over 18 months of operation
- **Products not compromised** with goods retaining both temperature and quality even in circumstances of uncontrollable supply chain delays (e.g. aircraft technical failure/diversion)



Overall, the Gist solution, integrated with its Export Hub, has **reduced waste by more than 30%** and **improved speed of chain by more than 20%**.



SUPPORTING THE CUSTOMER

Gist was challenged to build a solution that was cost effective for the volumes being shipped, while maintaining temperature throughout the supply chain. The usual temperature range when shipping chilled product is between 0°C and 6°C. However, Tesco stipulated its shipments must not go above 4°C.

Polar Thermal Packaging Ltd manufacture a range of temperature control insulated systems such as transport packaging for food, vaccines, pharmaceuticals and fine chemicals. Together, Gist and Polar Thermal worked through the customer requirements to create a bespoke packing solution that is unique to the customer, not deployed elsewhere on the market.

The packing solution is made from Polar Thermal proprietary material which, along with a high density, low weight cardboard honeycomb construct, with insulating materials, sourced from Yorkshire and Somerset.

DEVELOPING A CHILLED AIR PACKAGING SOLUTION

Gist mapped out the cargo journey through the supply chain from packing the pallet in its Hemel Hempstead depot, to delivery in Hong Kong, which would take circa 20 to 30 hours. Gist and Polar Thermal carried out a 30-hour simulation to stress test the unique pallet solution, building in contingency on time to allow for a delayed flight.



Solution 1:

Contained two separate thermal insulated sheets crisscrossed inside to give all round insulation, along with coolants (gel packs) placed on all external surfaces bottom, sides and top. An additional thermal blanket was placed over the top of the packaging solution and secured.



Solution 2:

An insulated bag was placed inside packaging solution 2 and, once packed, was sealed with Velcro over the top. Inside, coolants were placed on all external surfaces bottom, sides and top.



Solution 3:

This was the same packaging solution as above, but the third option instead featured a double insulated bag.



The simulation in July 2018 tested three packaging solutions all using the same high density corrugated honeycomb box and corrugated pallet. Temperature recording data logging devices were placed into the top, middle and bottom of each packaging solution.

All three prepared packaging solutions were taken out of a refrigerated environment and placed into an insulated tent where the ambient temperature could be altered to simulate the end to end supply chain and long-haul flight to the Asia Pacific area.



All three solutions packed ready for simulation

All three solutions performed very well during the simulation with no solution breaching the 4°C limit. Packaging solution 1, as expected with the least amount of insulation, at the end of the simulation was started to show signs of deterioration. Solutions 2 and 3 performed the best with no signs of deterioration.

Temperature results recorded for each packaging solution following the 30-hour simulation:

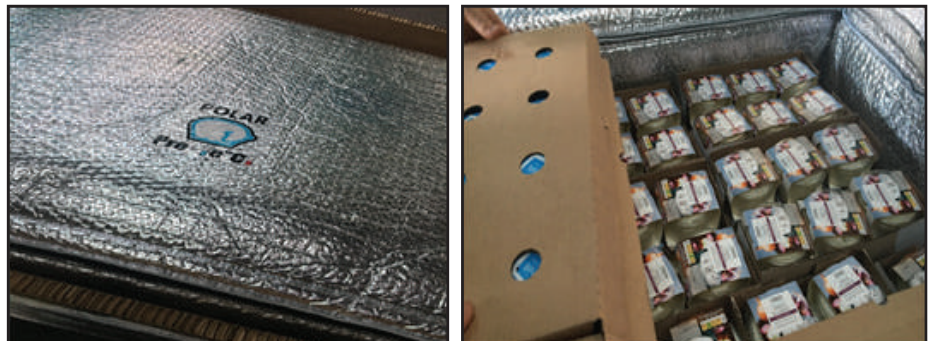
	Top	Middle	Bottom
Solution 1	2.1	2.8	2.8
Solution 2	2.1	2.1	2.4
Solution 3	1.7	1.9	2.3



REFINING THE SOLUTION

The team were then challenged by Tesco to build a 60-hour solution as it was found that 30 hour transit times had a potential for failure. Despite the door-to-door journey from Hemel to Asia sitting within the 30-hour timescale, it came to light there were occasions where longer timelines would be demanded, due to unexpected delays in the onward chain or the need to use indirect flight routings.

Gist and Polar Thermal refined the packaging solution, testing two solutions in October 2018, varying the amount of coolant used to cool the packaging solution.



The two solutions packed and ready for simulation.

Both solutions performed well during the simulation, with neither solution breaching the temperature restrictions.



Temperature results recorded for each packaging solution following the 60-hour simulation

ial Number	Location	Test	Engineer	Column1	Loggers No: 1/2/3/4/5/6/7/8/ 9 are for Box No 1 with 5% Coolants to vol / Loggers No: 10/11/12/13/14/15/16/17/ 18
17BF00568	bottom -left	Temp: 0.1C / Product 0.7C	PCH	Box No 1	0.2%
17BF00563	Bottom-Middle	Temp: 0.1C / Product 0.000	PCH	Box No 1	0.58%
17BF00590	bottom - right	temp: 1.5C / Product 0.7C	PCH	Box No 1	0.7%
17BF00481	middle -left	Temp: 1.1C / Product 0.7C	PCH	Box No 1	0.50%
17BF00482	middle -middle	Temp:0.1C / Product 0.4C	PCH	Box No 1	0.5%
17BF00561	middle-right	Temp:1.6C/ product 0.00	PCH	Box No 1	0.3%
17BF00564	Top-Left	Temp:0.7C/ product 0.00	PCH	Box No 1	0.0%
17BF00485	Top- Middle	Temp: 1.1C / Product 0.7C	PCH	Box No 1	0.50%
17AD01509	Top- Right	Temp:1.8C / Product 1.4C	PCH	Box No 1	0.7%
17AD01508	Bottom-Left	Temp:0.7C / Product 0.0C	PCH	Box No2	0%
17AD01480	Bottom- Middle	Temp: 0.8C / Product 0.0C	PCH	Box No2	0%
17AD01478	Bottom - right	Temp: 0.7C / Products 0.00	PCH	Box No2	0.5%
17AD01507	Middle - Left	Temp: 1.8C / Product 0.0C	PCH	Box No2	0.0%
17AD01474	Middle - Middle	Temp: 1.8C / Product 1.4C	PCH	Box No2	0%
17AD01506	Middle - Right	Temp: 1.7C / Products 1.7C	PCH	Box No2	0%
17BF00473	Top - Right	Temp: 2.9C / Product 2.9C	PCH	Box No2	0%
17BF00569	Top - Middle	Temp: 1.6C / Product 1.0C	PCH	Box No2	0%
17BF00570	Top - Left	Temp:2.7C / Product 2.00	PCH	Box No2	0%

PERFORMANCE TO DATE

Tesco's Technical Compliance Team signed off the 60-hour simulation and the packaging solution went live in February 2019. Gist currently flies multiple shipments a week, which can be in excess of 30 pallets. Since the launch it has not had a single temperature rejection due to product exceeding the 4°C limit.

ENVIRONMENTAL BENEFITS

Creating the packaging solution was not only important for Gist in order to meet the customer's requirements, but it offers a unique alternative to air freight solutions in the industry. It is a durable option and boasts environmental benefits as a reusable solution designed to be returned and reused multiple times. In addition, as costs for shipping by air are on a per kilo basis, the packaging solution was designed to be as lightweight as possible to maximize value and minimise the environmental impact.

Once the packaging reaches the end of its useable life, it is re-engineered into warm sleeping bags that are produced at Polar Thermal and donated to xxxx charity to be given to those in need. To date, x bags have been donated.



FURTHER DEVELOPMENTS

Together, Gist and Polar Thermal have continued to develop the initial design, making a larger solution to allow further flexibility to optimise the space available on aircraft types, including cargo freighters. The packaging solution has also been enhanced so that it is easier to pack for the operative, adding ergonomic and efficiency benefits.

"Working with Gist has been a great partnership. It all started with a concept idea when Gist approached me and that was the start of our journey working together. Since then we spent many months in workshops and testing the solution and a great product has come out of it."

Paul Harrison, Polar Thermal Packaging Ltd CEO

