WHITE PAPER
November 2024

CORRIDOR 3.0
Hong Kong - Miami

Use case: Route validation based on the
Template Protocol of Pharma.Aero Project Corridor 2.0

PHARMA AERO
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CATHAY CARGO

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

MIA MIAMI INTERNATIONAL AIRPORT

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ABSTRACT

The Corridor 3.0 initiative, a collaboration between Hong Kong International Airport (HKG), Miami International Airport (MIA), and Cathay Cargo - strategic members of Pharma.Aero—aims to advance the mission of establishing reliable, high-quality airport-to-airport pharmaceutical corridors.

This spin-off initiative builds on the achievements of Pharma.Aero projects Corridor 1.0 and Corridor 2.0, which validated a foundational framework for airport-to-airport pharma logistics. Corridor 3.0 leverages the proven Template Protocol from Corridor 2.0, seeking to validate the route between Miami and Hong Kong specifically for the safe, temperature-controlled transportation of pharmaceutical products.

INTRODUCTION

In 2019, Pharma.Aero initiated a project to create a standardized protocol ensuring quality and consistency in temperature-controlled pharmaceutical logistics. The first successful airport-to-airport pharma corridor[1], established in 2020 between Brussels Airport and Hong Kong International Airport, validated a process for secure handling and visibility in the supply chain. Building on this, Pharma Corridor Project 2.0 was launched to refine and expand the protocol framework, testing a detailed Protocol Template on the Brussels–Miami route[2].

This validated Protocol Template outlines critical requirements and performance indicators for end-to-end shipment monitoring, including a comprehensive operational roadmap with route descriptions, transport phases, stakeholder roles, and contingency planning. The template also includes annexes with route qualification guides, data logging procedures, and control point checklists, providing a robust toolset for Pharma.Aero members focused on maintaining high standards for time-and temperature-sensitive cargo.

In 2023, Hong Kong International Airport and Miami International Airport, both CEIV Pharma-certified, and strategic members of Pharma.Aero, partnered with Cathay Cargo, (also a CEIV-Pharma certified Pharma.Aero member) to establish a corridor that rigorously adheres to stringent pharmaceutical handling standards.

Corridor 3.0 main objectives:

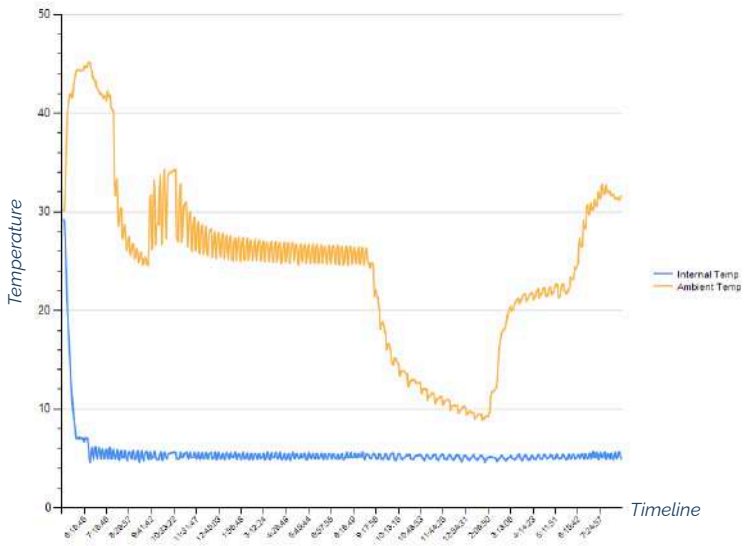
- validate the route for transport time, and
- validate the route for effectively transporting temperature-sensitive pharmaceutical products within defined transport temperature ranges.

1 Airport to Airport Pharma Corridor 1.0 Project White Paper, Pharma.Aero, October 2020

2 Corridor 2.0 Project - Protocol Template for Validation of Airport-to-Airport Pharma Corridors White Paper, Pharma.Aero, December 2021

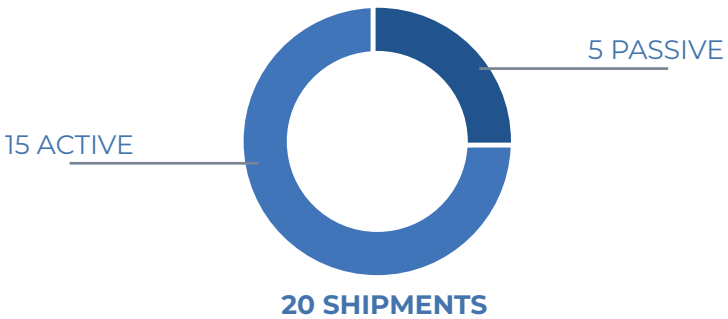
METHODOLOGY

Both Hong Kong International Airport and Miami International Airport have significant CEIV Pharma-certified airport communities. The two airports established the airport-to-airport pharma corridor by partnering with Cathay Cargo, also a CEIV Pharma-certified airline. Furthermore, Cathay Cargo utilized CEIV Pharma-certified Ground Handling Agents (GHAs) at both airports - Cathay Cargo Terminal (Hong Kong) and LATAM Cargo (Miami). The MIA-HKG lane consistently adhered to the highest standards, achieving zero temperature excursions and zero product loss due to temperate incidents.



Temperature chart for one of the validated shipments

To validate the route, temperature-sensitive live shipments were tracked airport-to-airport, MIA to HKG, via Cathay Cargo, from October 2023 to September 2024. Out of the 20 shipments, 15 were active and 5 passive shipments with different temperature requirements (COL 2 - 8°C and CRT 15 - 25°C). The shipments were validated based on the Protocol Template created as part of Pharma.Aero Corridor 2.0. The Protocol Template provides a clear model of all requirements and key performance indicators identified to monitor the shipment from a defined origin airport to a defined destination airport. Furthermore, the document offers a detailed presentation of the entire operational process, including route description, transport steps, relevant stakeholders, available capabilities, communication matrix and contingency plan.



To test and showcase temperature-control capabilities, the route qualification accounted for seasonal temperature variations, with the 20 subject shipments distributed across winter and summer in Hong Kong, with ambient temperature ranging from below 10°C to above 30°C.

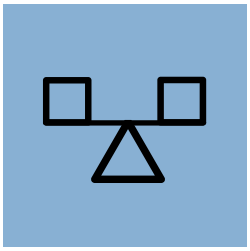
Electronic Data Logging Monitors (EDLM) were used to capture temperature data at every critical control point (CCP) throughout the journey, recording at intervals of 5 to 10 minutes. Each data set was linked to a unique AWB number, ensuring precise tracking and traceability of temperature conditions for each shipment.
Details of EDLM programming are recorded in the Protocol Template. For active shipments, the data loggers built into individual active containers. For passive shipments, Cathay Cargo used their “Ultra Track” logger to monitor temperatures.

Based on data collected by the EDLMs, detailed analysis was conducted, resulting in the creation of reports and graphs for each of the 20 live shipments.
All Critical Control Points were identified and included into Pharma.Aero’s Route Qualification CCP Checklist. Every time the package entered or exited a CCP, it was logged on the checklist. Specifics controls or checks can be applied to prevent or reduce hazards or risks.

RESULTS

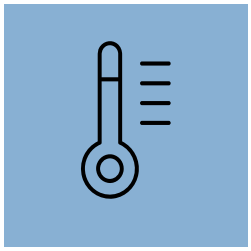
The results of these 20 shipments, documented using Pharma.Aero's protocol templates, confirmed a 100% success rate with no shipment failures throughout the study period. Additionally, all 20 shipments maintained stable conditions, with no temperature excursions recorded in the validated data.

20 SHIPMENTS



STABLE CONDITIONS

100% SUCCESS



NO TEMP EXCURSIONS

The temperature data collected shows that instances of higher temperature fluctuations align with the Critical Control Points (CCPs) outlined in the protocol, such as during aircraft loading and unloading, as well as in the buildup and breakdown of loose shipments. While control procedures are in place to minimize these fluctuations, there are stages – such as inflight conditions – where ambient control by the carrier or handler is limited. In these cases, carriers or handlers can only make their best efforts to maintain a regulated ambient environment whenever feasible, with the packaging itself as the ultimate protection for temperature-sensitive pharmaceutical shipments.

It is observed that the ambient temperature in both Miami and Hong Kong are generally higher than the required temperature ranges for much of the year. Consequently, rapid handling and the proximity of aircraft parking bays to cargo terminals are critical in minimizing the risk of temperature excursions.

CONCLUSION

During the course of live shipment data collection, despite the absence of excursion cases, there had been instances where irregular situations such as flight delays and extended layover times occurred due to uncontrollable circumstances.

Nevertheless, Pharma.Aero's Template offers a comprehensive model outlining all necessary requirements and key performance indicators in order to monitor shipments from a specified origin airport to a designated destination airport. It is recommended that future studies and protocol template define such irregularities and take into account what had been done by relevant stakeholders to mitigate the increased risks under these situations.

Pharmaceutical manufacturers can confidently rely on the validated MIA-HKG Pharma Corridor to ensure stringent handling standards and secure, reliable transportation for temperature-sensitive pharmaceutical products.

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