

AIR & OCEAN FREIGHT PRESENTATION AGENDA

Summary of Air & Ocean Freight temperature management



Deep dive into Air Freight temperature management



Deep dive into Ocean Freight temperature management



FOCUS ON TEMPERATURE
MANAGEMENT

SUMMARY OF AIR & OCEAN FREIGHT TEMPERATURE MANAGEMENT



DHL Global Forwarding – The Freight Forwarding Experts. Since 1815.

AIR FREIGHT TEMPERATURE MANAGEMENT PRODUCTS

Comparison guide: every service is built on a strong foundation of process documentation and innovation

		AIRCONTROLNET	AIRTHERMONET	LIFECONEX
Standard	SOP & LRA	✓	✓	✓
	Root cause & CAPA	✓	✓	✓
Intermediate	Temperature control		✓	✓
	Standard analytics		✓	✓
	Visibility, intervention		✓	✓
Advanced	Customization			✓
	Specialty courier			✓
	Advanced analytics			✓ *
	Expedited	SAMEDAY	SAMEDAY	SAMEDAY

* Expedited white-glove process management in combination with DHL Same Day

OCEAN FREIGHT TEMPERATURE MANAGEMENT PRODUCTS

Our Ocean Freight Portfolio of Temperature Management for your temperature-sensitive cargo



DHL Ocean ThermoNet is the product solution with two service levels for our Pharmaceutical and Healthcare Customers.

		<i>DHL STANDARD OCEAN REEFER</i>	<i>DHL OCEAN THERMONET CONTROL</i>	<i>DHL OCEAN THERMONET PROTECT</i>
Standard	DtD temperature managed transport capabilities	✓	✓	✓
	Compliant, regularly audited vendors	✓	✓	✓
	Corrective and Preventive Action	✓	✓	✓
Intermediate	Staff trained on GDP guidelines		✓	✓
	Custom Lane-level SOP with Lane Risk Assessment		✓	✓
	Quality Agreement with suppliers		✓	✓
Advanced	Temperature, Humidity and Light Tracking	<i>With Ocean Secure</i>	<i>With Ocean Secure</i>	✓
	24/7 Monitoring			✓
	Intervention Management in case of deviation from SOP			✓
	Customized Tracking and Reporting Capabilities			✓

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AIR FREIGHT TEMPERATURE MANAGEMENT PRODUCTS

Deep-Dive in Air ControlNet

AIRCONTROLNET



DHL Air ControlNet provides process management for shipments that require a supply chain which documents the transportation milestones, in alignment with quality and GxP standards

How Air ControlNet Works For You

Certified global network of LSH stations

Managed & compliant to GxP guidelines for consistent, controlled shipment transport.

The GxP network of compliant facilities covers 2,000+ trade lane pairs, providing operational reach across all regions.

Integrated Lane Risk Assessment

Reduced regulatory concern with the right transport documentation process built on risk-based approach.

Tools

IT platform “LifeTrack” is functionally compliant and validated as per GxP and industry requirements.

Self Service CAPA tools

1,000+ trained Certified LSH specialists

Single Quality Management System with GxP guidelines embedded into the processes.

Global consistency through DHL Air Pharma GxP Guidelines

End-to-end compliant SOP

Less time spent resolving issues due to a single program for SOP design, implementation and automated document control.

Partners

Supplier Management program inclusive of Quality Agreements.

LSH specific supplier management program to assess all trade lanes and carrier partners.

AIR FREIGHT TEMPERATURE MANAGEMENT PRODUCTS

Which one is made for you? Meet our suite of Air Freight Temperature Management Products

AIRCONTROLNET

GxP Process Standards

DHL Air ControlNet is the global standard for **non-temperature** controlled shipments that require general GxP compliance

- Process management for GxP compliance
- Validated SOP management system
- Lane risk assessment
- Access to dedicated IT platform
- The entire shipment journey is recorded on LifeTrack ensuring full traceability

AIRTHERMONET

Temperature Monitoring

DHL Air ThermoNet is the global standard for **temperature** controlled GxP compliant shipments that require 24/7 visibility and proactive intervention

- Visibility and intervention management
- Continuous improvement (Root cause analysis and CAPA)
- Risk mitigation
- Shipment tracking history upon arrival

LIFECONEX

Bespoke White-Glove Solutions

DHL LifeConEx is available for customers that require tailor-made, temperature and non-temperature-controlled shipping solutions

- Customized / White glove solutions
- Consultative services
- Data analytics
- Real time tracking devices
- DHL Same Day Specialty Courier when applicable

AIR FREIGHT TEMPERATURE MANAGEMENT PRODUCTS

Deep-Dive in Air ThermoNet

AIRTHERMONET



DHL Air ThermoNet is a fully GxP compliant solution available for customers that require a temperature-controlled shipment service with high visibility and intervention.

It is the global standard for LSH professionals who ship pharmaceutical products that are highly sensitive to temperature excursions and process deviations.

Air ThermoNet Offers All the Benefits of Air ControlNet Plus:

Proactive Monitoring, Intervention and Investigation

Minimize product loss with enhanced traceability and proactive intervention.

Temperature data recording during transport with IoT devices. 24/7/365 proactive monitoring & intervention through dedicated #WeCare team.

Network analysis is streamlined through ambient temperature sensor placement that provide greater logistics transparency. CEIV and QEP certified.

Data-driven transportation decisions

Data analytics for faster and more informed decision-making.

Enhanced process efficiency and cost optimization.

Reporting can be accessed and customized by each Customer via the LifeTrack portal.

LifeTrack is fully API configurable

Compliance from end to end

Dedicated customs brokerage provided to facilitate products arriving in the right timeframe and condition.

AIR FREIGHT TEMPERATURE MANAGEMENT PRODUCTS

Deep-Dive in LifeConEx

LIFECONEX



LifeConEx is available for those LSH customers who require the highest level of reliability. A dedicated team of specialists customize a purpose-built solution to meet the needs of high value, time sensitive, temperature-controlled shipments.

LifeConEx Offers All the Benefits of Air ControlNet and Air ThermoNet, Plus:

Tailored processes

Allows for flexibility in new route design to extend market reach

- Dedicated, single point of contact for each process implementation
- Real-time, active sensors to monitor temperature, humidity and GPS position
- Telemetry/IoT agnostic

Advanced analytics / Data-as-a-service

Augment continuous improvement and standardize risk evaluation across multiple platforms with benchmarking capabilities.

- Dynamic lane risk assessment continuously incorporates new risk factors based on customer requirements
- Packaging analysis and consulting to validate and qualify trade lanes and packaging solutions

Same Day Specialty Courier

High speed to market thanks to fast quotation and pickup in 60-90 min.

Services include:

- Next flight out
- On-board courier
- Charter solutions

Best for:

- New product launch
- Dangerous goods
- Clinical trials
- Direct-to-patient deliveries

AIR FREIGHT TEMPERATURE MANAGEMENT PRODUCTS

Powering our Air Freight Temperature Management Products: Meet our Air Freight network of 86 Life Sciences Stations



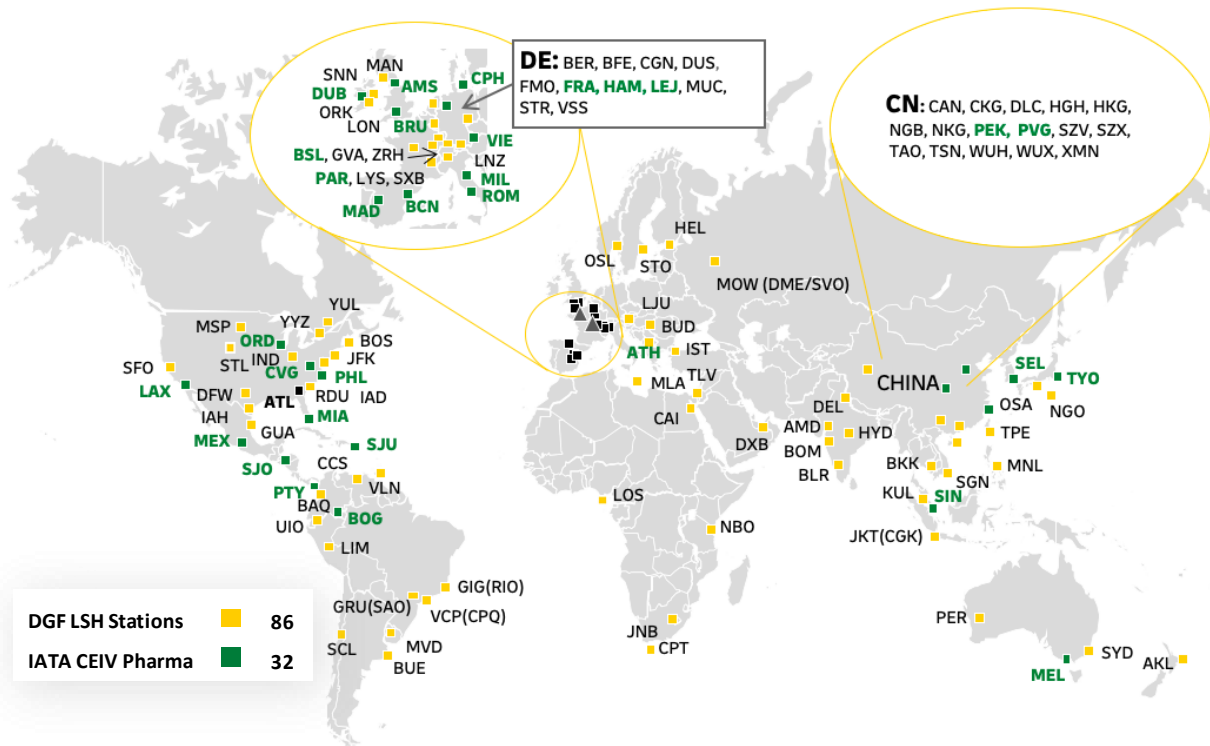
This is our GxP qualified network of compliant facilities, strong with 86 DGF LSH certified stations.

It provides operational coverage to over 2,000 trade lane pairs through:

- 32 Global IATA CEIV Pharma
- 52 QEP Certified stations

They house 1,000+ trained, certified LSH specialists. The Quality team approves and audits all carriers to ensure highest DHL quality standards met.

Temperature ranges with packaging recommendations for 2-8 c, 15-25c, -20, -60, -80 if needed.



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	Intervention Management in case of deviation from SOP			✓
	Customized Tracking and Reporting Capabilities			✓

OCEAN FREIGHT TEMPERATURE MANAGEMENT PRODUCTS

Deep-Dive in Ocean ThermoNet Control



ThermoNet Control is the cost-effective ocean freight solution for safe transportation in a **temperature-controlled environment**. It is ideal if you do not require 24/7 shipment monitoring, tracking devices or intervention management.

It offers GxP compliance through a documented process, covered in a lane level SOP that includes a Lane Risk Assessment.

The Key Features of Ocean ThermoNet Control



Lane Level SOP

Lane Level SOP – document control to record changes and version control



Lane Risk Assessment (LRA)

Ensuring identification and analyzing of all potential risks for each individual lane keeping product integrity protected



Quality

Shipments are handled through our Specialists in the network of Ocean ThermoNet certified stations



Supplier Management

We use our preferred vendors under consideration of GxP requirements



OCEAN FREIGHT TEMPERATURE MANAGEMENT PRODUCTS

Deep-Dive in Ocean ThermoNet Protect



DHL Ocean ThermoNet Protect offers a GDP compliant ocean freight solution including supplier management for customers who require also shipment visibility, 24/7 monitoring and intervention management.

It is ideal if you require active monitoring during the journey and providing regular notifications on cargo conditions and transport milestones.

All the Features of Ocean ThermoNet Control, Plus:



Intervention

24/7/365 Monitoring and Intervention Management paired with Ocean ThermoNet milestones. Actions are triggered when deviation from the defined procedures of the Lane Level SOP occur to protect the cargo



Proactive Notifications

Customer receives updated milestones throughout the journey along with the temperature conditions of the container, as predefined in the SOP

SmartSensor, the monitoring device powering ThermoNet Protect via active transmission

Near Real-Time Visibility
& Notifications

Via GSM network

Active reporting

Condition Sensing

Monitor temperature,
humidity, shock, light

Proof of Delivery

Be notified when your
shipment is delivered



OCEAN FREIGHT TEMPERATURE MANAGEMENT PRODUCTS

Powering Ocean ThermoNet:

Meet our Ocean Freight network of 60 Life Sciences Stations

[Read & subscribe to our monthly Ocean Reefer Market Update](#)



Our Expert network of 60 Certified Life Sciences Stations is compliant to DHL ThermoNet's GxP Guidelines, covering the most important trade countries for Life Sciences and Healthcare.

What the ThermoNet Network does for you



Experts here for you

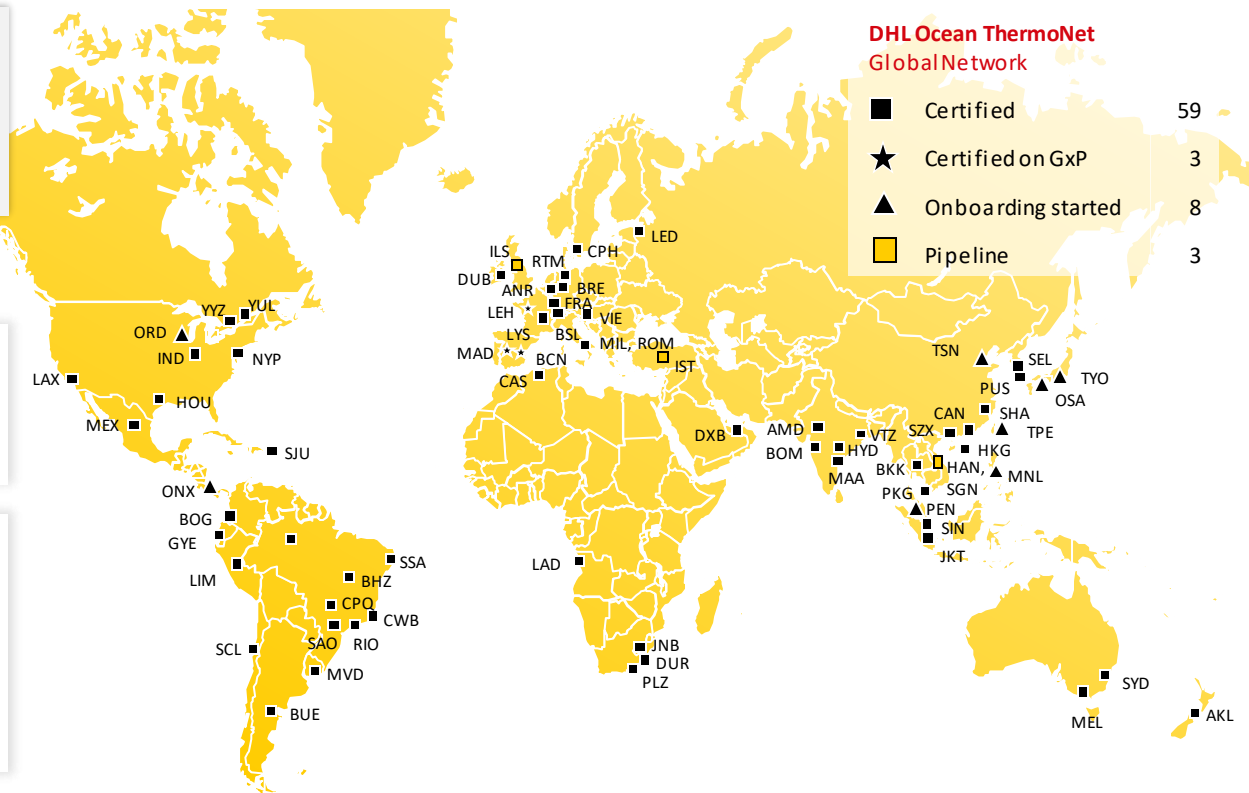
Life Science experts available in the commercial teams of all regions to address specific questions and for sharing expertise internally and externally.



Excellence in transportation

Centrally certified network of Life Science stations handle your DHL Ocean ThermoNet shipments.

As a result, your shipments are handled within the relevant regulatory requirements by Life Science specialists who ensure safe and reliable transportation of sensitive cargo.






OCEAN THERMONET CASE STUDY

Reliable, accurate monitoring achieved for the combined sea and ground transport of insulin products

To transport insulin products from Germany to the US, the shipment needed to be kept in a temperature range between 2-8 degrees Celsius. During critical situations such as vessel loading, the container could not be heated up over 15 degrees over an extended period.

Bespoke SOPs and monitoring devices enabled temperature and position control and sharing, from end to end.




The Benefits Delivered for the Firm

- | | | |
|--|--|---|
|  Fast FDA Inspection
Timely, automatic position & temperature upload |  GxP Compliance
Documented shipping process |  Simple container tracking
Standardized processes for end-to-end control |
|--|--|---|

How DHL Global Forwarding Made It Happen

- Door to Door, 2-8 degrees Celsius service routing based on bespoke SOP.
- Equipment qualification (e.g. container age) checked and temperature monitoring device mounted on cargo and activated at origin station. Sensor deactivated and returned to origin by consignee
- E-mail notification in case of deviation and irregularities via 24/7 monitoring

The Scale of the Firm

 360,000 employees, 160 countries  72bn revenue (2018)  The company's systems, medical imaging






MEDICAL DEVICES CASE STUDY

How DHL redesigned – fast – a leading French firm's cargo routing to address a sudden surge in temperature-controlled Air Freight

To address a shortage of raw material & production delays, a leading French firm had to shift 100% of the temperature-controlled shipments of their main shipping location from Ocean to Air Freight.

To accommodate for the sudden volume increase, DHL swiftly designed an innovative routing, leveraging dedicated U.S. Life Science hubs, for successful shipping to Asia-Pacific and Latin America.




The Benefits Delivered for the Firm

- | | | |
|---|---|--|
|  Extra volume shipped
Additional 30 tons of temp-controlled AFR, weekly |  98% on-time performance
Meeting the firm's targets.
👉 "Thank you, DHL team!" |  Challenge overcome
Addressed production and inventory challenges |
|---|---|--|

How DHL Global Forwarding Made It Happen

- DHL account management team and DHL stations partnered to design 70 new Thermonet SOPs – mapping the new routes, processes, stations and flights involved, along with Lane Risk Assessment 2.0.
- Station AFR Product teams secured all the new capacity required with vetted partner airlines.

The Scale of the Solution

- | | | |
|--|---|---|
|  1,000 Export shipments |  1.2M kg of temperature-controlled freight |  EMEA, LATAM, ASPA |
|--|---|---|



PHARMACEUTICALS CASE STUDY – VACCINES

Successful cold chain route implementation for compliant Covid vaccine distribution

To deliver much anticipated Covid vaccines, a major Pharmaceutical laboratory first had to set up safe cold chain routes to the Central and Latin American governments.

To help them reach their patients, DHL Global Forwarding sourced active packaging and airline capacity, and set up secure new routes.

The Benefits Delivered for the Firm

100 Mil.+ vaccines!

Delivered safely to the nations
– that's 480+ pallets!

Ownership for peace of mind

DGF chartered flights & secured
capacity with vetted airlines

Easy communication

Daily meetings, emails & SMS
for milestones & updates

How DHL Global Forwarding Made It Happen

- **Designing and implementing LifeConEx SOPs**
DGF Stations & LifeConEx designed detailed routes, with LRA 2.0 to each destination.
Regional DGF organization's security teams provided options to protect the high value cargo.
Every shipment was equipped with temperature, humidity sensor and active tracking device.
- **Managing vendors to secure capacity and equipment**
DGF secured the necessary airline capacity and number of charter flights to accommodate the demand.
DGF secured multiple passive packaging vendors to provide over 700 RKNs amidst capacity shortages.
Team set up frequent meetings and planning sessions with each trucking, airline and passive packaging vendors, to ensure all steps of the process got monitored and any deviation reported immediately.






PHARMACEUTICALS CASE STUDY – VACCINES

Temperature exposure avoided: solution design to safely deliver time- and temperature-sensitive vaccines to South Africa

A major European vaccine manufacturer was faced with high security as well as temperature exposure risks, as life-saving cargo was pending Port Health inspection at Johannesburg's main airport.

DGF provided secure armored transportation from airside to our new Life Sciences cold chain facility. Cargo was safely kept in our cold room, awaiting Port Health and Customs inspection, and eventual release.




The Benefits Delivered for the Firm

 Vaccines safeguarded... Dedicated communications channels for full visibility	 ... Vaccines delivered! On-time, the first time and in full: 900,000 doses!	 99% exposure reduction Cold chain maintained from end to end
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How DHL Global Forwarding Made It Happen

- Mapped the firm's SOPs, incl. resilience solutions, pre-alerts and communication channels, mitigating delays.
- Prep calls between Life Science Competency Center & Resilience teams and the firm, plus local authorities.
- DGF teams – including Security – shared detailed updates, incl. photos of the cargo, up to point of delivery.

The Scale of the Solution

 100 Imports  9,000 vaccines per shipment  From EURO to ZA



DHL LCL PHARMA REEFER SOLUTION +15/+25°C

SUSTAINABLE & COST EFFECTIVE OCEAN FREIGHT SOLUTION FOR YOUR SMALLER PHARMACEUTICAL SHIPMENTS



Customer's Product
Pharmaceuticals
+15/+25°C



Key Origins
Spain



Volume p.a.
Weekly sailings



Key Destinations
Mexico



With DHL LCL Pharma Reefer we were able to implement an environmental friendly and competitive solution for our small and medium size shipments with no compromises to the product integrity and GxP compliance.

Customer's Logistics Efficiency Manager



CUSTOMER CHALLENGES

- ✗ Having only 10-15 pallets but forced to use 40 foot FCL Reefer due to equipment shortage
- ✗ Cargo need to be split from other cargo, due to quality approvals, impacting the utilization of the FCL
- ✗ Challenge to secure empty equipment on spot basis for FCL shipments



DHL SOLUTION

- DHL LCL Pharma Reefer service
- In-house pharma inspections in our LSHC Competence Center in Barcelona, Spain
- GxP compliant deconsolidation in Veracruz, Mexico
- Temperature controlled pick-up and delivery



CUSTOMER BENEFITS

- ✓ Cost savings of up to 50% per pallet vs. FCL
- ✓ Service improvement with weekly sailing opportunities vs. a solely FCL solution
- ✓ CO₂ reduction at no extra cost



DHL LCL PHARMA REEFER SOLUTION +15/+25°C

SUSTAINABLE & COST EFFECTIVE OCEAN FREIGHT SOLUTION FOR YOUR SMALLER PHARMACEUTICAL SHIPMENTS



“

The LCL Pharma Reefer Product from DHL provides us with a GxP compliant transport solution for our smaller shipments, leading to tremendous CO₂ and cost reductions.

Customer's Director Global Distribution & Logistics



Customer's Product

Pharmaceuticals +15/+25°C



Volume p.a.

Bi-weekly sailings



Key Origins

Belgium, France, Germany, Switzerland



Key Destinations

Panama

CUSTOMER CHALLENGES

- ✗ Forced to use 40 foot FCL Reefer even for small shipment sizes (<10 pallets)
- ✗ Forced to use Air Freight for smaller shipment sizes
- ✗ Space and equipment constraints for Air Freight and FCL shipments
- ✗ Dependency on passive loggers for temperature data and quality release



DHL SOLUTION

- DHL LCL Pharma Reefer service incl. Go Green Plus and DHL Ocean Thermonet Protect
- GxP compliant consolidation at DHL facility in Mechelen, Belgium
- GxP compliant deconsolidation at destination in Panama



CUSTOMER BENEFITS

- ✓ Cost advantage of 60% vs. Air Freight and 50% vs. FCL
- ✓ CO₂ reduction at no extra cost
- ✓ Risk mitigation through active temperature monitoring



THANK YOU