



Lufthansa Cargo

planet

Special Edition: Enabling Healthcare

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Emergency

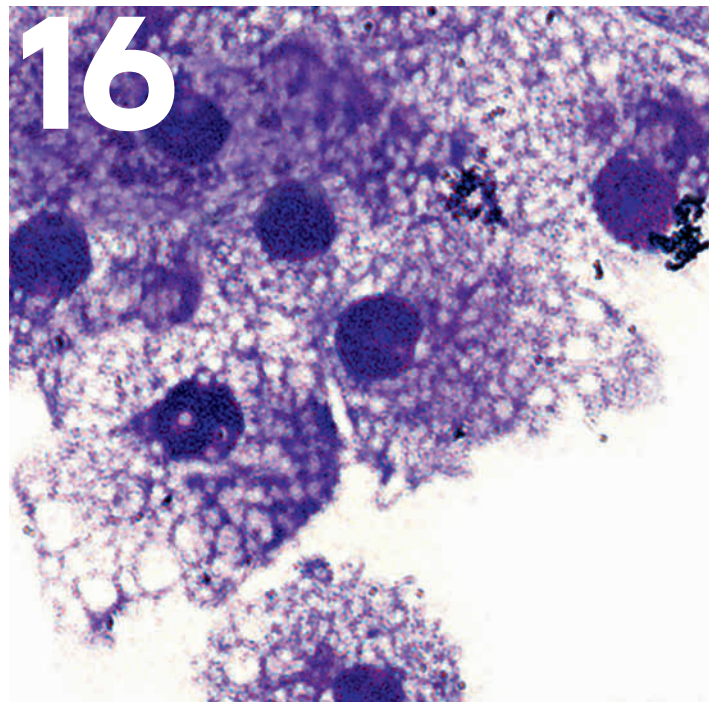


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582,000

metric tons

of pharma freight currently pass through airport customs every year. And the figure is set to rise. Demand for pharmaceuticals is growing rapidly as a result of improvements in medical care, particularly in China, Brazil and India



Market

Healthcare is growing

Vaccines, insulin, blood and plasma as well as generic drugs and raw materials for medicines – most pharmaceutical products are transported via airfreight.

This is due to the high number of global players operating in the industry and the international nature of the business of drug development and production. A further aspect is the improvement in medical care being witnessed in many emerging countries. The fact that many countries are facing ageing populations is another key growth driver. Finally, pharmaceutical products require special handling, for instance precise temperature management.

Often, these requirements can only be met by airlines capable of complying with the most demanding quality standards. In October 2016, the airline association IATA awarded Lufthansa Cargo with the CEIV* Pharma certification for the Lufthansa Cargo Cool Center at Frankfurt airport as well as for its global airline processes, enabling the freight airline to further advance its pioneering role in terms of quality.

According to experts at Seabury Consulting, 582,000 metric tons of pharma freight pass through airport customs around the world every year. By 2019, the volume is expected to rise to more than 661,000 tons. And yet, this figure does not even take into account the share of airfreight dispatched within the EU, NAFTA and large single markets like China, India and Brazil. The USA currently tops the list as the No. 1 exporter by air, with around 133,000 metric tons per year, followed by India with 86,100 tons and Germany with 51,400 tons.

*Center of Excellence for Independent Validators in Pharmaceutical Logistics

Lufthansa Cargo

Cool, smart and fast

Lufthansa Cargo offers customers from the pharmaceutical and medical technology industry the right solution for each of their needs. When using “Cool”, shipments are passively or actively cooled during flights. Several container types are available to ensure goods are actively cooled, including Unicooler and Opticooler, which both record numerous data throughout the transportation process. A combination with “Care” is possible for temperature-sensitive shipments also classed as dangerous goods. Valuable goods are best transported with the additional “Safe 1” option. Customers choose whether the shipments should be dispatched as standard (“td.Pro”) or express freight (“td.Flash”).

There is another solution for temperature-sensitive freight that requires neither passive thermal packaging nor transport in a cool container: the aircraft used by Lufthansa Cargo are equipped with individually temperature-adjustable cargo holds. Whatever the customer chooses, he can be sure his shipment is handled and supervised by specialists. Each of the company's locations has the suitable infrastructure to meet customers' needs – most notably the Lufthansa Cargo Cool Center in Frankfurt.

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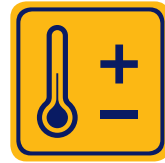
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to 27 degrees Celsius

is the range at which the holds of the Lufthansa

Cargo fleet can be temperature-controlled from the cockpit. Pilots have a choice of six temperature ranges in the B777F and five in the MD-11F





Cool

The right conditions for temperature-sensitive goods.



Care

The safe way to transport dangerous goods.



Safe 1

Optimum safety for valuable goods.



td.Pro

When time is crucial.



td.Flash

When time is everything.

Dr. Reddy's, India

Cool connection

A major share of the world's generic drugs are produced in India. One of the most important manufacturers is Dr. Reddy's Laboratories in the pharma stronghold of Hyderabad. For years, the company has relied on Lufthansa Cargo to transport its temperature-sensitive freight. The Pharma Zone at Hyderabad Airport



The global exchange of pharmaceutical products has long since become firmly established in the airfreight industry. Dr. Reddy's is one of the most important manufacturer of generics in the world. The consignment shown here is destined for Philadelphia, USA

boasts exactly the right ambient conditions for freight, for example, the 2.4 metric tons of capsules containing a gastrointestinal drug that are stored loosely in blue receptacles. In just a few hours, the capsules will be loaded into a Lufthansa Cargo MD-11F aircraft as part of an 80-ton consignment. At this point, a transport

container will ensure the correct and constant temperature is maintained: the Unicooler.

Like many other companies in this industry, Dr. Reddy's is headquartered just a few dozen kilometers from the airport. Hyderabad, which has a population of several million, ranks as India's pharmaceuticals capital. With a revenue of several billion dollars, Dr. Reddy's is one of the subcontinent's largest pharmaceutical companies. Its key markets are the USA, Russia, Germany, Great Britain and India. Founded in 1984 by Dr. Kallam Anji Reddy, the company today employs a staff of several thousand, two thirds of whom are in India. Other manufacturing facilities are located in Mexico and the USA, among other places. International revenues account for more than 80 percent of the business, which is why it is of paramount importance that exports via airfreight run smoothly. At Lufthansa Cargo, Dr. Reddy's consignments are in good hands. When using the "Cool Active" service, Unicooler and Opticooler containers ensure that the temperature, which can be set at between -20 and +30 degrees Celsius, remains constant throughout the flight. In addition, the airport at the "pharma city" Hyderabad has installed a special Pharma Zone with temperature management and sterile areas to ensure that the highly sensitive freight is handled securely.

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MAWB DESTINATION

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MAWB PCS

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HAWB NO.

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HAWB DESTINATION

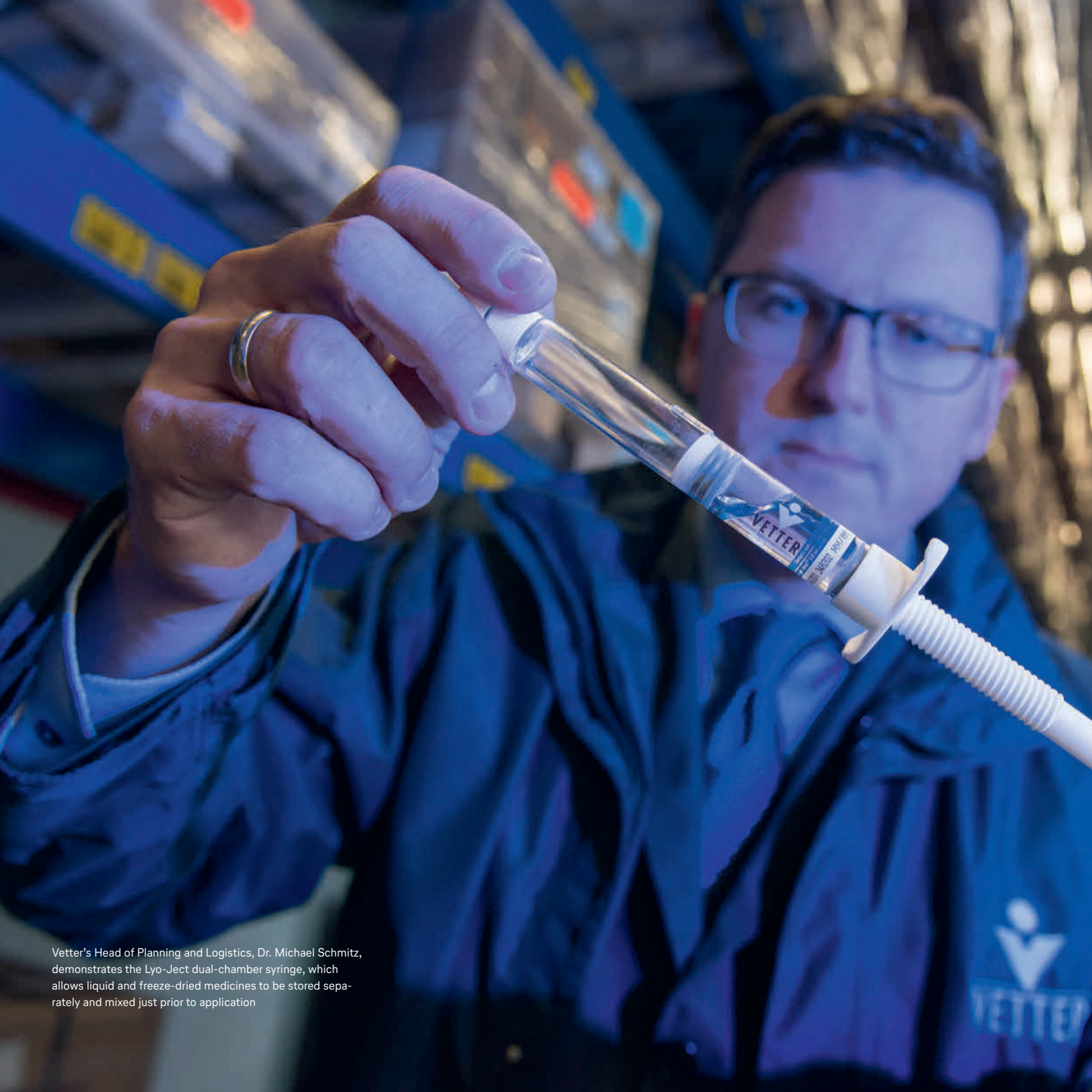
PHL

HAWB PCS

124

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Vetter's Head of Planning and Logistics, Dr. Michael Schmitz, demonstrates the Lyo-Ject dual-chamber syringe, which allows liquid and freeze-dried medicines to be stored separately and mixed just prior to application



Vetter Pharma, Germany

Pharma is a matter of trust

The pallets and cartons in the Center for Optical Control and Logistics at the pharmaceutical services provider Vetter near Ravensburg contain syringes and vials with active substances for the treatment of cancer, multiple sclerosis and anemia. The hopes of thousands of patients are pinned on these medicines. Any damage during transit to the medicinal compounds that Vetter fills and prepares for dispatch on behalf of the big pharmaceutical companies could jeopardize the therapeutic success.

The pharmaceuticals business is all about trust. The punctual arrival of effective medicines is often a matter of life and death. And the industry is global, which is why Vetter, based in Ravensburg, relies on Lufthansa Cargo and its range of services. Apart from special products, like “Care” for dangerous substances and “Cool” for temperature-sensitive goods, Vetter also uses express solutions such as “td.Flash” and “Emergency.Solutions” when speedy delivery is needed for consignments going from its Ravensburg cold storage warehouse to its branch office in Chicago. Once, when a batch of materials needed urgently in production could not be released as a result of minimal defects in quality, the deadline for the aseptic filling of a new active substance was under threat. A substitute delivery with “Emergency.Solutions” prevented substantial losses in the six-digit range.

The goods are shipped in special cooled containers, the Envirotainers. They are marked with individual codes that enable seamless shipment tracking. Vetter’s logistics center in Ravensburg is an airfreight security zone, and the company is accredited as a Known Consignor. Handling pharmaceuticals requires a great deal of effort, but it pales by comparison to the damage that could result from the negligent shipment of a piece of cargo. As such occurrences could easily damage the trust that has been built up over many years, Vetter Pharma prefers to play it safe by relying on Lufthansa Cargo.



After the injection, the alpha-emitter Radium-223 dichloride is desposited in areas of high bone turnover, such as bone metastases

Targeted effect

A targeted alpha therapy from Bayer is used as a treatment for patients with prostate cancer that has spread to the bones. Since it is radioactive with a rapid decay rate, transporting it is one of the ultimate tests in logistics operations. The therapeutic agent is radium-223, a radioactive alpha emitter with an extremely short particle range of less than 100 micrometers. Due to its chemical similarity with calcium, the radium isotope is quickly absorbed in the patient's bone substance, where it takes effect. Bayer manufactures it in a research reactor outside Oslo. Because radium-223 only has a half-life of eleven days, Bayer relies on a transit procedure specially developed by two logistics specialists, Kuehne + Nagel and Lufthansa Cargo. Packaged into special lead containers at the research reactor, the drug is transported to Oslo airport (OSL) by KN PharmaChain service.

Within Lufthansa Cargo's route network, it is shipped as a "td.Flash" consignment. For example, via the airline's hub in Frankfurt to Beijing (PEK), some 7,000 kilometers away, where it is available to doctors and patients the very next day.

Radium-223 has a half-life of only eleven days, making speedy shipping imperative



PEK

中國醫藥酒店



西安交通大学
口腔医院



FRA



"This cargo can save lives":
QCS Managing Director Stephan
Haltmayer, seen here with First
Officer Joseph Rodney,
accompanied the vast consignment
right up to the freighter



PVG

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Providing nutrition,
stabilizing body weight:
many Chinese physicians
place their trust in tube-fed
nutritionals from Germany

The human factor

Patients who need to be tube-fed for medical reasons require the very best in nutritional supplements. Very often, these are “Made in Germany,” which is why, in cases of emergencies, Quick Cargo Service (QCS) will charter an entire Triple Seven to supply hospitals in China. It’s a cold winter’s day when the Boeing 777F named “Hallo Germany” takes off from Frankfurt (FRA) at 1.45 pm bound for Shanghai (PVG). Its hold is filled with around 100 metric tons. Each of the pallets was consigned by the forwarding company Quick Cargo Service and each contains enteral nutrition. These supplements can only tolerate temperatures between 10 and 20 degrees Celsius; otherwise their quality deteriorates. 100 metric tons in one go – that’s exceptional, even for the most experienced logistics manager. Thanks to perfect planning and preparation by QCS and the charter staff at Lufthansa Cargo, the entire process – from delivery at the Lufthansa Cargo Cool Center over security scanning right up to loading – took only a few hours: efficient handling that brought fast help to patients.

A high-magnification microscopic image of blood cells, specifically white corpuscles (leukocytes). The cells are characterized by large, dark, spherical nuclei and lighter, granular cytoplasm. They are densely packed, filling most of the frame. In the upper left, the letters 'FRA' are printed in a large, white, sans-serif font. A horizontal dotted line extends from the right side of 'FRA', and a small white airplane icon is positioned on this line, pointing towards the right.

FRA

Highly magnified white corpuscles – in blood cancer patients their proliferation is uncontrolled, thus preventing blood from fighting infections

Lifesaver

Infinitely precious: Walter Pszyk, Managing Director of in time Kuriersysteme & Speditionen GmbH from Mörfelden-Walldorf, is a specialist in the express transport of pharmaceutical products and bone marrow to destinations anywhere in the world. For many patients suffering from blood cancer, the only prospect of a cure is the transplantation of stem cells. Bone marrow must reach the terminally ill recipient as quickly as possible. Obtained from a donor in Ratingen, the precious cargo is driven to Frankfurt Airport (FRA) in an “in time” courier vehicle. The bone marrow is dissolved in blood and stored in a padded, pre-cooled case. The ambient temperature must remain between two and eight degrees Celsius at all times, and the cargo is neither allowed to be shaken nor X-rayed at the airport. A courier takes the case on board the 10.35 am Lufthansa passenger flight, which arrives at Seattle-Tacoma International Airport (SEA) at 11.50 am local time. The drive to the clinic, where the blood cancer patient is waiting, takes only 20 minutes. The team from in time has commissioned a partner courier company to do this. Nothing now stands in the way of a successful infusion. All the effort has been well worthwhile.



Life-giving: This is how
a patient smiles who
has received a spinal
cord donation on time
and as good as
overcome her illness



1,800

cubic meters

is the volume of
pharmaceuticals
transported each day
by Lufthansa Cargo





Bayer Yakuhin, Japan

Pharma ninjas

A small town in the southwest of Japan's largest island Honshu:

a museum honoring legendary ninja warriors, lush vegetation with vast woodlands and plenty of rivers and almost 90,000 people spread over several villages. What the rural communities of Kōka have in common with the inhabitants of Japan's major metropolitan areas is their first-class treatment in the event of an illness. The Japanese public health system is regarded as one of the most highly developed in the world. It is based on providing treatment for all 127 million of the island state's inhabitants. And an increasing number of them are requiring regular treatment or prescription medicines. One third of Japan's population is now over 60 and therefore potentially more likely to suffer from cardiovascular diseases, including strokes, than younger people.

Whether they are young or old, when it comes to supplying the Japanese populace with medicines, the town of Kōka has played a crucial role for centuries. In times past, the region's ninjas were not only martial arts masters but also skilled in preparing medicines based on herbs. Today, Kōka is home to the Supply Center Shiga, the plant belonging to Bayer Yakuhin, the subsidiary of the German global company Bayer which is named after the surrounding prefecture. Japan is of

4.7

billion

euros is the amount the Bayer corporation invested in R&D worldwide in 2015, which also included new products at Bayer Yakuhin

particular strategic importance to Bayer: after the US, Japan's pharmaceutical market is the second largest worldwide, at least in terms of original drugs. Even though it lags far behind the growth figures generated in the emerging economies, Japan's pharmaceutical and healthcare sector is developing well. This has also had an effect on Bayer's business in Japan, which in 2015 generated well over 2.3 billion euros nationwide – 4.4 percent more than the previous year. Bayer Yakuhin employs a staff of around 2,660 in Japan.

The company's significant growth in this fiercely competitive market is attributable to the innovative products manufactured at the Supply Center Shiga, which include tablets for cardiovascular diseases, for example. Japanese approval times are among the shortest in the world. To avoid disruptions to the steady stream of products from the Supply Center Shiga, Lufthansa flight LH740 lands at Kansai International Airport (KIX), just outside Osaka, punctually at 8.40 am. The belly of the passenger jet from Frankfurt contains half a dozen Unicooler containers for temperature-controlled transport. The container displays show an internal temperature of five degrees Celsius. The manufacturer has been relying on the carrier services provided by the freight airline since 2008.

Raw materials and preliminary stage products are flown in from various European countries. As a result, the Unicooler containers that arrived on flight LH740 have already completed a feeder flight from Milan to Frankfurt. Finished Bayer products for the Japanese market also regularly land at KIX on board Lufthansa aircraft; from there, they are transported directly to the manufacturer's distribution center in Osaka.

Imports: once a week, a Lufthansa Boeing 747-400 lands at Kansai International Airport loaded with freight for Bayer Yakuhin



Standing together: Dr. Hirohito Katayama, Head of Product Supply Japan at Bayer Yakuhin (far left), with Yoshihiro Yamamoto (Lufthansa Cargo) and the supply chain managers Peter G. Meyer (Asia Pacific) and Nobuyuki Hirono (Japan)

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Pharma handling at KIX

Lufthansa Cargo has been providing ultra-fast handling services for Bayer Yakuhin at Kansai International Airport (KIX) just outside Osaka since 2011. A customs agent takes just 70 minutes to complete the necessary formalities regarding the consignments, stored in Unicooler containers, that arrive each week on board a Boeing 747-400. Meanwhile, the goods, as valuable as they are sensitive, are stored in Lufthansa Cargo's cooled import warehouse to protect them from exposure to the sun. The "KIX Medica" pharmaceutical warehouse provides excellent infrastructure for breakdown and interim storage until the goods are collected by the truck forwarding agent.

On their last transport leg from KIX, spectacularly located on man-made islands in the bay of the city with close to three million inhabitants, the valuable goods are driven to the Supply Center Shiga by truck. By this time, they are no longer shipped in Unicoolers but in the trucks' temperature-controlled freight holds. Once offloaded, the materials are stored in a temperature-controlled environment for precisely defined periods before processing commences under the most stringent of hygiene precautions. Delivery and production conditions that would have delighted even the legendary Kōka ninjas!



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Dachser, Germany

Cold start!

The life science business at Dachser Air & Sea Logistics is booming. Each year, pharmaceutical patents worth several billion US dollars expire. When this patent protection ends, these medicines compete directly with less expensive generic products that are seeing increased demand, particularly in emerging market countries. This is creating tremendous growth potential. In the US, annual per capita pharmaceuticals spending exceeds 850 US dollars, whereas in India, the corresponding figure is less than ten US dollars. This shows just how much catching up remains to be done.

Numerous active ingredients are more complex and sensitive today than they were just a few years ago. That is why Dachser is meticulous in ensuring that only absolutely reliable partners are entrusted with transportation and handling along the transport chain. Lufthansa Cargo's extensive experience has enabled this highly productive collaboration, which is also crucial to Dachser in light of increasing cost pressure within the industry.

Dachser and Lufthansa Cargo work together on a worldwide scale as global partners. A large part of the Dachser pharma shipments also pass through the Lufthansa Cargo Cool Center (LCCC), which has qualified personnel and storage rooms with varying controlled temperature ranges from -40 to +25 degrees Celsius. This just goes to show that substantial sections of the door-to-door cool chain are not handled in the air but on the ground.

Staff at the Competence Center Temperature Control check the data transmitted by a cool container (below). The Cool Center always has sufficient numbers of special containers on hand (l.)



Cool

Lufthansa Cargo offers a range of reliable transport solutions for temperature-sensitive pharmaceutical products under the brand name "Cool". The "Cool" service is available at around 300 destinations in more than 100 countries.

Cool Active: Transport in special containers with active temperature control

Cool Passive: Thermal packaging, processes and infrastructure for goods requiring passive temperature control

Container: The Unicooler uses dry ice to regulate the temperature. The Opticooler uses compressors and electrical power for heating. Recently, va-Q-tainer are offered at numerous stations around the world. The passive thermal containers offer constant temperature control over several days.



Because every degree counts.

Cool – Your shipment. Your temperature. Your choice.

If you rely on the right temperature for your freight, then **Cool** is the best solution for you. Whether warm, cold or perfectly insulated, your shipment is subject to rigorous controls to ensure it arrives in top condition every time. Enjoy quality that you can rely on down to the very degree.

Find out more at lufthansa-cargo.com/cool



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Networking the world.