



A stratospheric peak calls for bigger and better cold-chain containers

Overcoming the pharmaceutical cold-chain challenges of 2022

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01 Executive summary

Peak 2022 is going to be challenging – and there will be many mini peaks as we approach the end of the year. At the same time, air freight capacity is still significantly below pre-pandemic levels. It's a perfect storm of high demand and low supply. In this context, air cargo space should be used wisely.

To minimise costs and maximise capacity, pharmaceutical firms should consider the biggest air freight containers with the least wasted space. They also need the best performance, so consignments are not lost. In short, to deal with peak 2022, there's a requirement for bigger, better and more flexible shipping solutions.

This paper aims to explore the demands being made of the cold-chain sector and how it can respond to them in one of the most challenging periods it has ever faced.

02 The scale of the challenge in 2022

Demand keeps going up

Every year, we're warned the next pre-Christmas explosion in deliveries will be even bigger. And every year, it's proven right. Just as the economy keeps growing, peak keeps getting higher as more goods flow through all parts of the global supply chain – air, sea and land.

You might be forgiven for thinking global GDP had stalled, but it grew to \$94,935 billion in 2021, up from \$87,390 billion in 2019¹ – despite the pandemic. This means one thing: greater pressure on logistics. 2022 isn't going to be any different with GDP forecast to be \$102,404 billion – another rise². In short, demand for logistics will keep going up.

Capacity is limited – especially air

Normally, capacity creeps up to meet demand. But the pandemic has reversed the trend. This has been felt in all areas, with analysts saying disruption and shortages caused by COVID are set to continue well into 2022³.

Air freight has been impacted badly and there is now a significant squeeze on space. As lockdowns hit, the traveling public decided not to fly and were often banned from doing so. Yet passenger aircraft accounted for nearly half (47 per cent) of global air freight prior to the pandemic⁴.

Sea shippers opting for air

To add a further layer of complexity, shippers that usually use sea routes are opting for air freight. This is because outlooks suggest logjams in ocean shipping⁵. In fact, as of January, average delays on shipping from China to Europe rose to six days⁶.

This puts even greater pressure on those sectors that usually rely on air freight, such as manufacturers of temperature-sensitive pharmaceuticals. Their consignments must reach destinations quickly to assure the cold-chain and get life-saving treatments to patients. They have little choice but to use air. Yet other sectors, such as eCommerce are muscling in on their routes.

Pharmaceutical firms face growth in biomedicines

While pharmaceutical firms battle to hold onto the air freight capacity they're used to, they face the added pressure of continuing to deliver the vaccine airlift with 40 per cent of the globe having not received even a single dose⁷.

Added to this is the ever-growing use of other temperature-sensitive pharmaceuticals and biomedicines, such as insulin for those with diabetes. The prevalence of this shot up from 108 million in 1980 to 422 million in 2014 – and is still growing⁸.

The airlift will only get harder

As if the situation couldn't get any tougher for pharmaceutical companies, there's another burden they must bear. While 60 per cent of the globe has received at least one vaccine⁹, this is predominantly in developed nations.

For example, the UK has 77 per cent of its people vaccinated. The US sits at 75 per cent¹⁰ at the time of writing. These are often the countries where the vaccine is manufactured¹¹. While air freight has undoubtedly been used, some of the burden has been taken by road and rail.

Meanwhile, Nigeria has just 6.5 per cent of its nation vaccinated with a single dose¹². There are no manufacturing sites in the country. To get vaccines there, it needs to be flown. This tells us one thing: the hardest part of the airlift is still to come.

More than one peak

What's more, the traditional peak season will be less focussed on the end-of-year crescendo. It will remain at fever pitch throughout 2022 with mini peaks as vaccine surges take place. We saw this in late 2021 when developed nations rushed to introduce boosters in the face of omicron¹³.



In summary, there has never been greater pressure on pharmaceutical companies as they attempt to maintain the flow of life-saving treatments to where they're needed: patients. Peak 2022 could be a struggle if planning doesn't take place now.

This is because the extraordinary pressures on air cargo will be felt for at least the next year, although some suggest it could be 2029 before we see European air traffic back to pre-pandemic levels¹⁴. And who knows where COVID may lead. With the WHO warning leaders not to assume we're in the "end game," the situation could change rapidly¹⁵.

03 How did the cold-chain sector cope in 2021?

In many ways, these pressures are a continuation of what was happening in late 2021, but at a bigger scale. Peak 2021 was an Everest in its own right. At the time, UPS CEO Carol Tomé talked of capacity being exceeded by about five million pieces per day¹⁶. This begs the question, how has the cold-chain sector coped to date?

Triangular shipping

One solution has been to become ever smarter in the way cold-chain logistics is managed, cutting out as much waste as possible, using triangular shipping methods. This allows for greater levels of direct delivery, reducing unnecessary trips.

Changing packaging

To maintain a cold-chain, manufacturers often pack their products in a “passive” container before being loaded onto a plane. This is essentially a giant cool box with insulation and cool packs, often using dry ice.

They’re bulky, inefficient, take up space that could otherwise be used for actual pharmaceuticals (reducing payload efficiency) and if there’s a delay, will eventually lose their ability to maintain temperature. This is why companies have turned to temperature-controlled containers.

These, in contrast, are more like giant, rechargeable units that move around the globe in a circular economy, a little like high-tech shipping containers. With an 11-hour charge, some can maintain internal temperatures for over a week.

The main – and significant – benefit of a temperature-controlled container is that it can increase payload. In short, you can squeeze more drugs into a plane. Up to 35 per cent more in some cases. When capacity is so limited, this is an important factor. It eases the pressure on the system and reduces costs, which have been spiralling. In fact, the shipping crisis became so bad in 2021 that some companies chartered air cargo planes for \$2 million or more for a single flight. This is more than double its peak pre-pandemic price¹⁷.

Reducing waste of medicines

Anecdotally, it’s recognised that a proportion of vaccines are degraded by the time they reach their destination. This creates huge waste, potentially requiring consignments to be scrapped and new supplies flown out. As a result, shippers have been looking for ways to minimise losses.

Just before the pandemic hit, Hashim Ahmed, Supply Chain Integrity Senior Analyst at GlaxoSmithKline said, “We often get temperature deviations in the supply chain, but in most cases, we don’t know the root cause.” He went on to say that to mitigate the likelihood of this and to maintain product integrity, the industry needs to improve the investigation process¹⁸.

And all good investigations start with data, which is why more shippers have been investing in monitoring of their consignments. They are increasingly working to understand position, temperature, humidity and more to assure it arrives in the best condition.



04 How can cold-chain go further as pressures mount?

There is no silver bullet to solve this problem. But what 2021 has shown is that small innovations can make a significant difference. Such as creating 35 per cent more space for drugs in shipments simply by changing the type of packaging used. This choice sits firmly in the hands of the shipper and can be implemented immediately.

When deciding how to make the most of the limited capacity on offer in 2022, there are key factors to keep in mind:

1. Consider temperature-control

As has been learnt in the initial stages of the pandemic, using temperature-controlled containers increases the amount of space that can be given to drugs rather than packaging. This is because the battery-powered system within the reusable containers works hard to maintain a constant temperature so additional coolants and insulation aren't required.

In addition, active containers have a near zero failure rate, meaning vaccines and treatments nearly never have to be scrapped following a temperature deviation.

They also cost less overall when the Total Landed Cost (TLC) is calculated. More information is available on this important topic at the Envirotainer website.

2. Consider bigger containers

To maximise payload per container, the advice is to choose the biggest one on the market. As the dimensions of the box get bigger, the internal payload space increases significantly, without needing additional layers of insulation. The usable space within a large container is therefore more efficient than in smaller models.

To explain this a little more, it can be worthwhile understanding the universal codes for air freight containers. Known as Unit Load Devices (ULDs), they have three letter codes such as RKN, RLP and RAP. The first relates to the type of container. R stands for refrigerated, or more accurately, thermal certified aircraft container. There are many types, from A – Z, but R is the one for active cold-chain.

The middle letter corresponds to the base size and the third to contour. Because aircraft are tubular, we need angled containers as well as rectangles. Those with rectangular shapes are more space efficient. So, the third letter needs to be A, B, M or P – all of which are rectangular. The largest temperature-controlled containers on the market are the RLP (large) and RAP (extra-large). The RAP models are therefore the best choice for shipments of 5 EU pallets or more.

3. Consider the best functionality

As pointed out above, some vaccines are degraded by the time they arrive at their destination. It's not controversial to try and reduce this with better temperature control within a container, monitoring of the consignment, and intervention if needed.

When it comes to control, it's worth looking for solutions that offer consistent temperature throughout, so no hot or cold spots emerge. This ensures cargo will be protected independent of size, mass or position inside the container.

In terms of monitoring, it's important to consider live data, allowing you to continuously track a shipment as well as the status of your cargo. Furthermore, this information needs to be closely monitored by specialists who know what to look for and to act if required.

4. Look for flexibility

At a time when there is so little flex in air cargo capacity, it's useful to have flexibility in other areas. This means containers must be as autonomous as possible. If a flight is delayed, or a container ends up sitting on the tarmac at an airport, it requires as much charge as possible to ensure the precious contents remains safe.

It's also worth remembering that containers themselves can be in limited supply. It's worth weighing up options and going for suppliers with the largest fleets so there's always availability – even if that means a mix-and-match approach where different types of large containers are made available.

Larger fleets also make it easier to book one-way use of a container. With more of them positioned around the globe, it's more likely there will be one where it's needed, rather than having to reposition it specifically for a consignment, or to undertake an empty return leg.



05 Answering the need

Envirotainer has listened to these customer needs and developed the Releye[®] RAP container and the Control Tower service.

Releye[®] RAP

Like its RLP-sized forebear, the Releye[®] RAP is designed to meet the strictest requirements in pharmaceutical air freight. With its unsurpassed 170 hours of autonomy (more than one week) it will maintain temperature and protect cargo longer than any other available solution, without recharging. The integrated live monitoring enables a unique insight into product condition, location and progress of the shipment.

Vitality, the RAP is the biggest thermally-controlled container available. It has a base size of 2,235mm x 3,175mm compared to its little brother, the RLP, which has a base of 1,534mm x 3,175mm. It's therefore a bigger and better active solution that also comes with flexibility thanks to the sheer scale of the Envirotainer fleet, which stands at about 6,000 – the largest in the world. RAP containers will be in high demand this year.

Control Tower

The availability of the Releye[®] RAP is complemented by Envirotainer's Control Tower service. It's the next step in real-time connectivity, physical monitoring and 24/7 action. Control Tower provides shippers with active monitoring and expertise to take care of consignments should something happen as they speed around the globe. And in the unlikely event of an incident, action is undertaken to start resolving the issue on the ground.

Coping with peak 2022

If pharmaceutical companies want to benefit from bigger, better, more flexible containers, they need to consider qualifying the use of the Releye[®] RAP. In doing so, they will have created a greater range of options to deal with the stratospheric peak we're facing in 2022.

About Envirotainer

Envirotainer is the world leader in air-transportation solutions for temperature-sensitive pharmaceuticals. We believe that our largest contribution to a sustainable world is helping our customers enable global access to life-saving pharmaceuticals, through patient-safe, reliable and efficient cold chain solutions.

We operate through an open, global network of airlines and forwarders and the headquarters is located outside of Stockholm, Sweden.

Envirotainer^o

The Active Cold Chain



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