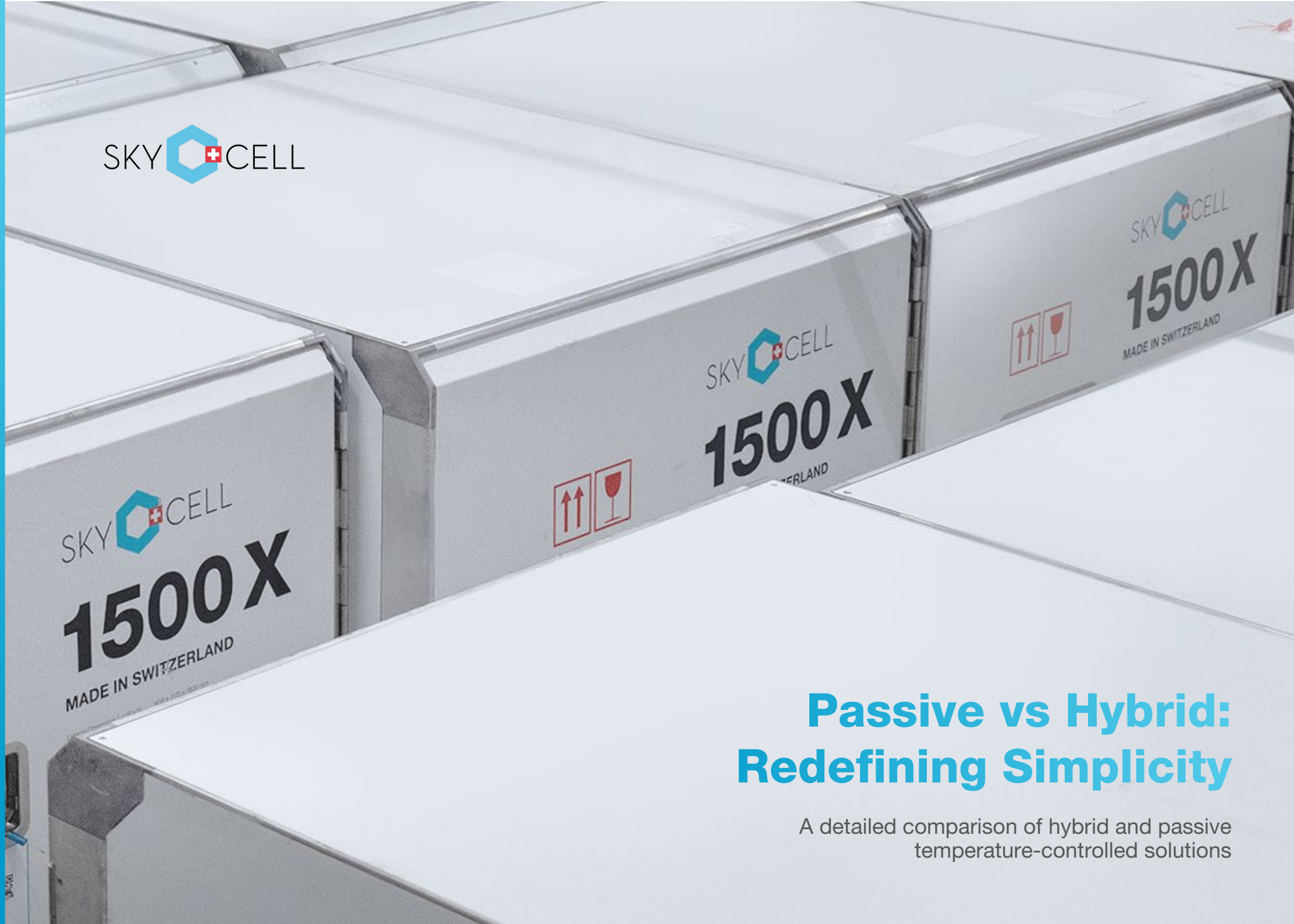

Passive vs Hybrid: Redefining Simplicity

A detailed comparison of hybrid and passive temperature-controlled solutions

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Chapter 1

Executive Summary

The real cost of “simple”

Passive packaging has long been the go-to solution for less temperature-sensitive pharmaceutical shipments. With no power requirements, no mechanical parts, and low upfront prices, it appears to be the simplest and most economical choice.

But this “simplicity” can be misleading. Hidden labor, handling, and waste expenses quietly inflate the total cost of ownership. Each additional manual step adds complexity and increases the chance of temperature excursions or even product loss. The cost can quickly spiral out of control, vastly eclipsing the initial savings.

SkyCell’s hybrid containers redefine simplicity:

- **Simple to use:** preconditioned, no build-up, easy handling, no charging. Simply open, load, ship.
- **Simple to plan:** predictable cost per shipment and a more resilient and reliable supply chain.
- **Simple to reduce risk and emissions:** <0.05% excursion rate, up to 50% lower emissions[1] , ocean freight returns.

What do hybrid and passive mean?

Passive shippers maintain a temperature-controlled environment using a defined amount of pre-conditioned coolant in the form of chilled or frozen phase change material (often paraffins or water) or dry ice. They can be either single-use or reusable (called advanced passive). During transit, they do not require power sources for temperature control.

Hybrid solutions are reusable high-performance containers that can be used in place of advanced passive solutions. They offer a unique combination of performance, simplicity, intelligence, and sustainability.

[1] Compared to passive solutions.

Chapter 2

The Passive Promise

And its hidden costs

Passive solutions promise convenience and affordability: a low-tech option that seems ideal for short lanes and stable climates. Yet beneath that promise lies complexity and cost that are often overlooked in traditional procurement comparisons.

Hidden labor, storage, and handling costs 1

To meet shipment schedules, passive containers are built in advance and stored, consuming valuable warehouse capacity. They often require manual build-up, gel pack conditioning, and assembly, usually inside refrigerated environments.

Every container represents hours of human effort, specialized equipment, and cold-room space that could be used elsewhere. The larger the shipment volume, the more resources used.

Inconsistent performance and product risk 2

Manual assembly introduces variability. Mistakes during manual assembly, preconditioning, and loading that only become apparent later can result in excursion, leading to investigations, rework, or even loss.

Even well-designed passive systems rely on how evenly energy moves through the PCM. Inconsistent heat distribution can leave pockets of over- or under-temperature, especially during long dwell times or exposure to high ambient heat.

Once in transit, the risk continues to rise, with over 50% of excursions occurring at airports (IATA) where containers can sit on hot tarmac for hours.

Inefficient freight utilization and waste 3

Passive units require temperature-controlled vehicles (TCVs) for road freight. While some single-use passive boxes are compact, larger reusable passive containers and those requiring extra protective layers often reduce payload efficiency. This redundancy adds cost and emissions that accumulate with volume.

Most passive packaging is single use, generating landfill waste and compliance costs. As regulators tighten sustainability mandates, disposal and recycling fees are rising worldwide alongside restrictions and taxes on plastic packaging.

KEY TAKEAWAYS

Passive may look simple, but it adds layers of manual handling, hidden costs, and risk that only increase with scale.

Chapter 3

Hybrid Containers: Cost Efficiency at Scale

Fewer touchpoints, lower risk

The upfront cost of a packaging solution matters, but true cost efficiency is determined by the total lifecycle cost: preparation, performance, reliability, and reuse.

SkyCell's hybrid containers are designed to reduce cost and risk across every stage of that lifecycle. Delivered preconditioned and ready to load, they eliminate manual build-up, minimize storage needs, and reduce human intervention. Simply open, load, and ship.

Each unit offers consistent protection for up to 270 hours without power; self-recharging in cold environments and surviving long airport delays and customs with ease. The proprietary heat distribution technology used in hybrid containers eliminates variability and extends protection far beyond standard passive ranges.

Operational simplicity

- No gel packs, no plugs, no build-up
- Fewer SOPs and reduced handling time.
- Easy movement across air, road, and sea.

Predictable performance

- Proven <0.05% excursion rate.
- Integrated IoT sensors provide near real-time visibility.
- Predictive analytics identify risks before they occur.
- Heat distribution technology ensures consistent protection across payload.

Freight and cost efficiency

- Can be shipped over short distances without TCVs.
- Eligible for passive freight rates.
- Reusable; circular economy (costs spread over lifecycle).

KEY TAKEAWAYS

When all costs are counted — from labor to loss prevention — hybrid containers can reduce overall costs even when compared with cheap passive packaging solutions.

Chapter 4

Building a Sustainable Supply Chain

Efficiency and sustainability combined

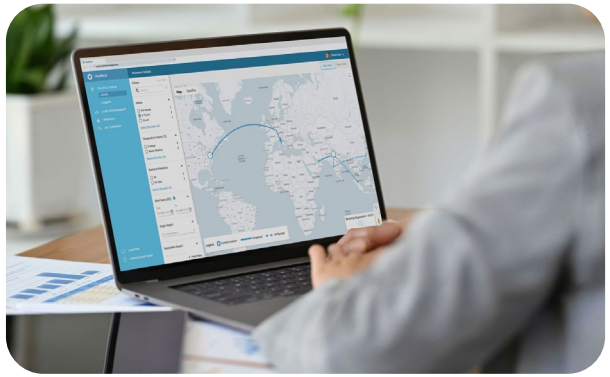
With rising temperatures, tightening legislation, costly carbon credit programs, and complex supply chains, reaching ESG targets while delivering on time and in full can seem impossible. At SkyCell, sustainability is a function of good engineering, not a separate consideration.

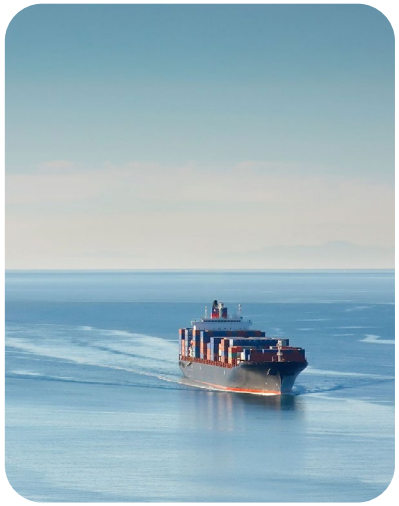
SkyCell's hybrid containers are built for circular use (reusable, repairable, and recyclable), dramatically reducing waste and emissions. Each hybrid container replaces dozens of single-use passive boxes. Built to last and repaired when needed, SkyCell hybrid containers reduce total emissions by up to 50% compared to passive systems (myclimate).

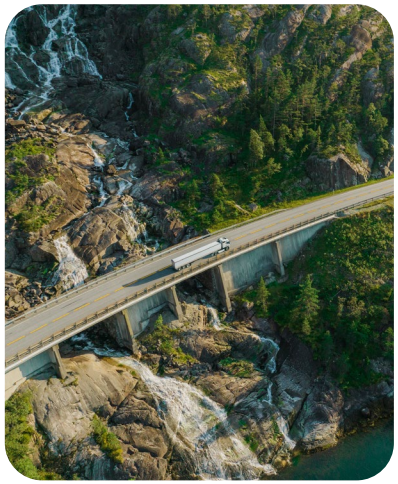
Less waste also means fewer disposal fees, fewer penalties under emerging waste-reduction regulations, and fewer resources spent on managing obsolete packaging.

Through the Net ZERO Reverse program, containers return by ocean rather than air, cutting return-trip CO_2 by over 90%. Any residual emissions are removed using high-quality permanent removal projects.

The result: sustainability that is as simple as our containers.







Chapter 5

Passive vs. Hybrid

At a glance

Features	Runtime	Excursion Rate	Performance	Preparation	Visibility	In-Transit Requirements	Reusability	Lifecycle CO_2
Passive 	Very limited, typically from 24 to 120 hour	Varies hugely	Extremely limited	Build up and strict preparation SOPs	Manual checks/ external loggers	Cold chain environments	Mostly single-use or with limited reusability	High due to bulky volume, materials and disposal
Hybrid 	270 hours in 20°C	<0.05%	Reliable in extremes	Delivered preconditioned and ready to load	Integrated loggers and analytics	Minimal intervention required if any	Reusable, repairable, recyclable	50% lower than passive

Chapter 6

Summary

Simplicity, redefined

Redefining simplicity means designing systems that work smoothly and predictably.

Hybrid containers reduce labor, eliminate waste, and deliver consistent protection without added complexity or cost. They turn reliability into a financial advantage and sustainability into standard practice.

If you’re interested in comparing SkyCell’s hybrid containers with your current passive solutions, our team can help assess performance, cost, and sustainability across your operations.

Get in touch

Let’s make every shipment safer, more secure, and more sustainable. Contact us at **sales@skycell.ch**

SKYCELL

SkyCell is a Swiss supply chain technology company on a mission to eliminate medicine loss and drive net-zero emissions in pharma logistics.

Founded in 2012 and trusted by the top 20 pharma companies, SkyCell combines hybrid containers, smart software, and tailored services to enable safe, secure, and sustainable pharmaceutical transport.

Its end-to-end offering includes hybrid pharma containers, AI-powered pharma monitoring, and global Unit Load Device (ULD) tracking, with over 5 million shipments monitored annually.

With gateway infrastructure in 255+ airports and integrations with systems like Microsoft Teams and Validaide, SkyCell ensures unmatched visibility and control across the supply chain. Recognized among the top 1% of sustainable companies globally, SkyCell helps pharma companies, airlines, and logistics providers reduce risk, cost, and emissions.

The Sky is the Limit

Our trusted airline partners

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