Whitepaper

Envirotainer

Five Key Considerations for Contract Pharma Cold Chain Logistics

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Executive Summary

Industry analysts project the global pharmaceutical CDMO market to more than double over the coming decade, driven by increasing demand for biologics, biosimilars, cell and gene therapies and other advanced medicines that require specialized development and manufacturing capabilities. At the same time, pharmaceutical companies are relying more heavily on external partners to provide the expertise, flexibility and global scale needed to support commercialization, supply continuity and market expansion.

As outsourcing grows, expectations of CDMOs and CMOs are expanding beyond manufacturing. Sponsors increasingly evaluate partners on their ability to support reliable distribution, maintain product quality and ensure supply continuity across complex global supply chains. Operational readiness, shipment reliability and effective cold chain execution are becoming increasingly important components of overall customer confidence.

In this environment, cold chain logistics has evolved from an operational transportation function into a strategic capability that connects manufacturing, quality and distribution. Every shipment becomes part of the customer experience, with the potential to influence product availability, release timelines, regulatory compliance and sponsor confidence. This shift is particularly important for contract pharma organizations who are responsible for managing multiple products, customers and distribution requirements simultaneously.

This whitepaper explores five key considerations for building cold chain strategies that can support this environment: temperature control, release confidence, partner capability, risk management and total value.

Together, these considerations provide a practical framework for helping contract pharma organizations strengthen customer confidence, improve supply chain resilience, support long-term growth and help ensure life-changing medicines reach patients safely and reliably.

KEY TAKEAWAYS

- Temperature control must be planned around the product, route and real-world operating conditions.
- Cold chain performance includes proving compliance, not just maintaining temperature.
- Partners need the scale, infrastructure and expertise to support global growth.
- Effective risk management depends on visibility, escalation processes and experienced support.
- Total value should consider performance, handling, monitoring and the cost of disruption, not cost alone.

The Growing Strategic Importance of Cold Chain Logistics

Pharmaceutical manufacturing and distribution networks are becoming increasingly complex. A single product may move between multiple manufacturing sites, packaging facilities, logistics providers and regions before reaching patients. At the same time, biologics, biosimilars, GLP-1 therapies and advanced therapeutics continue to increase the number of medicines requiring strict temperature-controlled transportation.

This complexity is growing alongside a broader shift in pharmaceutical outsourcing. As drug pipelines become more specialized and manufacturing requirements more complex, pharmaceutical companies are increasingly relying on CDMOs and CMOs to provide the expertise, flexibility and scale needed to support development, manufacturing and commercialization. As a result, the responsibilities of contract pharma organizations increasingly extend beyond manufacturing alone. Sponsors expect confidence that products can be delivered safely, reliably and compliantly across global supply chains.

External pressures add further challenges. Geopolitical disruption, customs delays, capacity constraints, policy changes and extreme weather can all affect shipment performance with little warning. At the same time, product launches, global market expansion and growing patient demand place increasing pressure on supply chain reliability.

For many, cold chain performance is tested most visibly during product launches, where supply continuity, responsiveness and execution can directly influence customer confidence.

https://visionlifesciences.com/insights/cdmo-market-analysis
https://www.globalgrowthinsights.com/market-reports/pharmaceutical-cdmo-market-101455

As a result, cold chain logistics has evolved beyond an operational transportation function. For contract pharma organizations, shipment performance can directly influence product availability, quality processes, customer confidence and long-term partnerships. Successful cold chain execution is increasingly viewed as an extension of the overall service experience provided to pharmaceutical customers.

The role of packaging and logistics providers has evolved alongside these expectations. Partners are expected to contribute expertise throughout the shipment lifecycle, from packaging selection, qualification and route planning through to shipment monitoring, operational support and post-shipment reporting.

Their ability to help protect product integrity and support supply continuity plays a vital role in overall supply chain performance.

For contract pharma, the ability to consistently deliver products safely and reliably has become an important differentiator in a competitive outsourcing market. Manufacturing excellence remains essential, but it must be supported by cold chain strategies that can meet customer expectations, maintain supply continuity and support global growth.

The following five considerations explore how organizations can strengthen shipment performance, enhance resilience and build greater confidence across increasingly complex pharmaceutical supply chains.

CONTRACT PHARMA IN NUMBERS

$330 billion by 2030

The global CDMO market reached approx $210 billion in 2025, and is projected to approach $330 billion by 2030.

~40% of total pharma manufacturing

Approx 40% of total pharmaceutical manufacturing is now outsouced, up from ~30% in 2018.

~4,500 biologics in clinical development

Approx 4,500 biologics are in clinical development globally, highlighting a sustained demand for CDMO services across the development lifecycle.

https://www.mordorintelligence.com/industry-reports/biologics-contract-development-and-manufacturing-organization-cdmo-market
https://www.precedenceresearch.com/pharmaceutical-cdmo-market

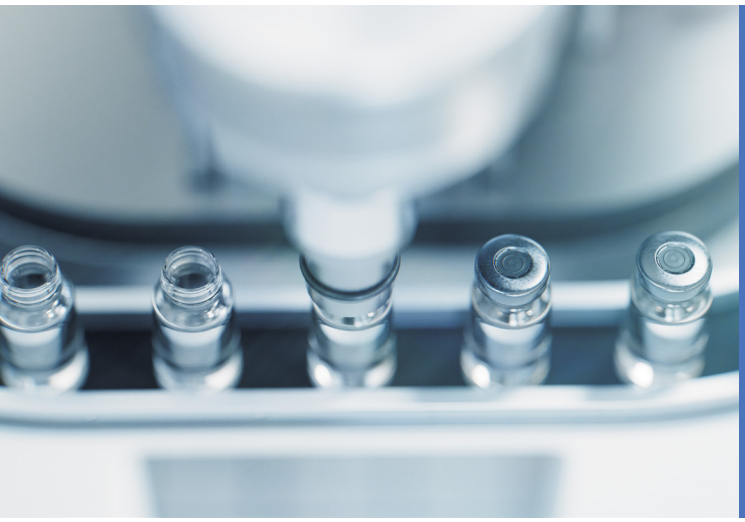
1. Maintaining Temperature Control from Origin to Destination

Temperature control remains the foundation of every successful pharmaceutical shipment. As biologics, GLP-1 therapies, biosimilars and advanced therapies become a larger part of pharmaceutical portfolios, protecting product integrity throughout increasingly complex global journeys has never been more important.

For CDMOs and CMOs, the challenge is rarely limited to a single product or customer. Organizations may be supporting commercial manufacturing, clinical supply, product launches and global distribution programs simultaneously, each with different stability requirements, quality expectations and distribution networks.

Effective temperature control should begin long before the shipment leaves the site. Packaging strategies should be aligned not only to product requirements, but also to route-specific risks, seasonal conditions and potential disruption scenarios.

When these decisions are made consistently and proactively, organizations can reduce the likelihood of excursions, simplify quality reviews and strengthen customer confidence across global supply chains.



ASK YOURSELF

- Are packaging solutions selected by route risk or defaulted by product type?
- Which trade lanes experience the highest disruption rates?
- Do teams have visibility into the shipment across the journey?
- Can packaging maintain protection if shipments do not proceed as planned?

IN PRACTICE

Leading manufacturers increasingly match packaging to both product requirements and lane-specific risks. This allows them to balance protection, efficiency and cost while improving consistency across global distribution networks.

2. Building Release Confidence into Every Shipment

WHAT SUPPORTS RELEASE CONFIDENCE?

- Verified temperature performance throughout the shipment journey
- Reliable monitoring and shipment data
- Clear exception reporting if excursions occur
- Consistent reporting formats across trade lanes
- Rapid access to shipment documentation
- Standardized data that supports quality review processes

Maintaining temperature within specification is only part of a successful pharmaceutical shipment. Organizations must also be able to demonstrate that product integrity was maintained throughout the journey and provide the evidence needed to support quality review and product release.

This is an important challenge for CDMOs and CMOs. As pharmaceutical companies continue to outsource manufacturing and supply chain activities, contract pharma organizations are often required to meet the quality expectations of multiple customers, each with their own documentation requirements, review processes and release criteria.

This means the value of a cold chain solution extends beyond temperature protection alone. The ability to provide reliable shipment data, consistent reporting and support post-shipment review can play an important role in helping quality teams assess shipment performance and make informed release decisions.

Building release confidence begins before a shipment leaves the manufacturing site. Packaging solutions, monitoring strategies and reporting requirements should be aligned upfront to ensure the right information is available throughout the shipment lifecycle.

As supply chains become more global and product portfolios become more complex, the ability to quickly access trusted shipment evidence is becoming an increasingly valuable part of cold chain performance.

IN PRACTICE

Leading pharmaceutical organizations increasingly look for logistics partners that can provide more than temperature protection alone. Access to standardized shipment reporting, monitoring information and supporting documentation can help quality teams review shipments more efficiently, reduce time spent gathering information from multiple stakeholders and provide greater confidence in release decisions.

3. Choosing Partners That Can Support Scale, Complexity and Global Reach

A successful cold chain shipment depends on coordination across multiple stakeholders, including manufacturers, packaging providers, freight forwarders, airlines, ground handlers and local operations teams. While each plays a critical role, packaging providers are often at the center of shipment readiness, helping shape how temperature-sensitive products are prepared to withstand real-world transportation conditions.

For CDMOs and CMOs, selecting a packaging provider is about more than choosing a container or packaging type. It is about identifying a partner with the infrastructure, expertise and operational capabilities to support reliable global distribution over the long term.

As customer portfolios expand and products launch into new markets, packaging providers must be able to support evolving distribution requirements without compromising performance or reliability. This includes global availability, lane-specific expertise, qualification support, operational responsiveness and the ability to support a wide range of shipment profiles across different geographies.

The strongest partnerships extend beyond equipment supply. Leading packaging providers contribute expertise in qualification, shipment planning and route assessment, helping organizations navigate complexity while maintaining product protection and supply continuity.

As a result, contract pharma organizations are increasingly evaluating packaging providers not only on product performance, but also on their ability to act as a long-term strategic partner supporting growth, resilience and global supply chain execution.

WHAT TO LOOK FOR IN A COLD CHAIN PARTNER

- Global network coverage
- Local operational expertise
- Qualified temperature-controlled solutions
- Responsive customer support
- Contingency planning capabilities
- Reliable shipment data and reporting
- Experience across complex international supply chains

IN PRACTICE

Many organizations now evaluate packaging providers on their ability to support the full shipment lifecycle. Network coverage, local support, operational responsiveness and experience managing complex pharmaceutical supply chains have become equally important selection criteria.

4. Managing Risk in an Increasingly Unpredictable World

MANAGING RISK ACROSS THE JOURNEY

A comprehensive risk strategy should address:

- Temperature excursions
- Airport and customs delays
- Route changes
- Geopolitical disruption
- Capacity constraints
- Infrastructure limitations
- Handling errors
- Shipment visibility

Disruption has become a recurring feature of global pharmaceutical distribution. Geopolitical events, changing trade policies, customs delays, airport congestion, capacity shortages and extreme weather can all affect carefully planned shipments.

For contract pharma organizations, the consequences often extend beyond transportation performance. Disruptions can increase quality workload, delay customer deliveries, affect launch schedules and place additional pressure on customer relationships.

As a result, cold chain strategies must be designed not only to prevent excursions, but also to support faster decision-making and more effective intervention when issues arise.

Real-time visibility has become increasingly valuable in this environment. Insights into a shipment's location, condition and status can help stakeholders identify potential issues earlier and make more informed decisions before product quality is compromised.

However, data alone is not enough. Its value depends on how quickly it can be translated into action through experienced operational teams, clear escalation processes and defined response plans.

IN PRACTICE

Managing risk requires a combination of packaging performance, shipment visibility, global support and clear escalation processes. Capabilities such as live monitoring, control tower services and post-shipment reporting show how organizations are connecting data with operational support to reduce uncertainty across critical shipments.

5. Maximizing Value Across the Cold Chain

Contract pharma organizations operate in an environment where customers expect both reliability and cost efficiency. As a result, cold chain decisions are increasingly evaluated on their contribution to overall supply chain performance rather than transportation costs alone.

This broader perspective recognizes that the impact of a cold chain solution extends far beyond moving a shipment from origin to destination. Packaging choices can influence shipment reliability, product availability, operational workload, release timelines and the ability to respond effectively when disruptions occur. For organizations managing multiple customers, products and global trade lanes, these factors can have a significant impact on customer satisfaction, operational efficiency and long-term profitability.

Total landed cost provides a more complete framework for evaluating cold chain solutions. While packaging costs are visible, many of the most significant supply chain costs sit elsewhere, including investigations, delays, additional handling, product loss, shipment recovery activities and the operational resources required to manage exceptions.

Packaging decisions can have a direct impact on these costs. Factors such as payload capacity, shipment consolidation opportunities, packaging autonomy, handling requirements and route suitability can all influence transportation efficiency and overall supply chain costs. Solutions that help move more products per shipment, reduce handling touchpoints and minimize disruption-related costs can lower overall logistics spend while maintaining product protection.

Increasingly, contract pharma organizations are also evaluating the value of services that support the shipment lifecycle, including planning expertise, operational support, shipment monitoring and access to experienced teams during critical shipments. These capabilities can help improve decision-making, reduce administrative burden, avoid costly disruptions and contribute to lower total supply chain costs.

Ultimately, the most effective cold chain strategies focus on delivering the highest overall value across the supply chain. In many cases, the lowest packaging cost does not equate to the lowest total cost. By considering factors such as reliability, payload efficiency, operational workload, disruption risk and service support, contract pharma organizations can identify solutions that both reduce costs and improve supply chain performance.

BEYOND UPFRONT COST

- Product value and risk of loss
- Temperature performance and reliability
- Payload capacity and shipment consolidation
- Aircraft space utilization and handling requirements
- Monitoring, visibility and customer support
- Impact on quality review and release timelines

IN PRACTICE

The most effective cold chain strategies do not force organizations to choose between performance and cost. By improving shipment efficiency, reducing disruption-related expenses and streamlining operations, the right packaging can help lower total supply chain costs while enhancing reliability and product protection.

Conclusion

The continued growth of biologics, advanced therapies and outsourced manufacturing is reshaping the role of contract pharma organizations. Pharmaceutical companies are looking for partners that can do more than manufacture products. They expect confidence that medicines can be delivered safely, reliably and consistently across complex global supply chains.

In this environment, cold chain performance is becoming increasingly visible. The ability to protect product integrity, support supply continuity and respond effectively to disruption can influence customer relationships as much as manufacturing performance itself.

The question now for CDMOs and CMOs is how well equipped they are to support the demands of increasingly complex products, global distribution networks and rising customer expectations.

As organizations assess their readiness, five questions are worth considering:

1. Are products protected under real-world transportation conditions?
2. Can shipment integrity be demonstrated with confidence?
3. Do cold chain partners have the capability and scale to support future growth?
4. Are shipments prepared to withstand disruption and unexpected delays?
5. Are cold chain decisions optimizing total supply chain value?

The organizations best positioned for future success will be those that view cold chain logistics not as a transportation requirement, but as a strategic capability that supports product quality, customer confidence and business growth. In an increasingly competitive outsourcing market, the ability to consistently deliver reliable cold chain performance may become as important as manufacturing excellence itself.

CONTINUE THE CONVERSATION

Whether you are evaluating your current cold chain strategy, preparing for growth or looking to improve shipment reliability, Envirotainer can support.

Contact us to discuss your cold chain challenges and explore approaches to building a more resilient and efficient pharmaceutical supply chain.

www.envirotainer.com/contact

About Envirotainer

Envirotainer transports life-saving pharmaceuticals around the world with innovative temperature-controlled solutions.

With 40 years leading the industry, the world's largest pharmaceutical companies trust us to deliver. We offer the widest choice of cold chain solutions with a range of shipment monitoring services, all backed by our extensive global network to get your product to where it needs to be, precisely when it needs to be there.

When it comes to sustainability, we lead by example. Our ambitious science-based targets guide us, so we can reduce not only our emissions but our customers', too. Our transparent reporting, data-driven approach, and precise CO2 calculations allow us to measure our environmental impact all the way down to emissions per vial.

From research and development all the way to commercial distribution, we can deliver large quantities down to single patient samples. So, no matter what the pharma industry produces, we can ensure the safety and efficacy of medicines for every phase of the pharmaceutical life cycle.