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The Road to Reliability: Navigating Cold-Chain Success

REAL-TIME VISIBILITY

TEMPERATURE-
CONTROLLED

SECURITY
PROTOCOLS

REGULATORY
EXCELLENCE



PREMIUM
SERVICES

HEALTHCARE/PHARMA

The pharmaceutical supply chain is one of the most complex and highly regulated in the world for a reason. Transporting medications across long distances demands precision, control and accountability. Successful transport and delivery depend heavily on maintaining strict temperature integrity, complying with stringent government and industry requirements and using the right equipment and trained personnel. Each of these elements plays a critical role in protecting patient outcomes and supporting the broader healthcare value chain.

Given the stakes, there is no room for error in the healthcare and pharmaceutical industries. Vaccines and pharmaceutical advances, such as large-molecule treatments and cell-based therapies, are shipped at ultra-cold temperatures. Other medicines and biologics may be sensitive to environmental factors, such as humidity, light and vibration, that must be monitored in real-time. Disaster relief supplies and experimental drugs in clinical trials also require monitoring to ensure efficacy.

If a pharmaceutical shipment exceeds a specified temperature range — known as an excursion — at any point between pickup and delivery, the integrity of the medication may be compromised, and the shipment must be discarded. Administering out-of-spec medications could lead to health risks, as people would think they've been treated for a condition when they haven't received an effective dose.

Under pressure from the regulatory environment and due to the potential risks associated with out-of-spec product, healthcare shippers are looking to partner with transportation and logistics providers that have proven experience in handling temperature-sensitive goods. The provider's expertise ensures that they understand the unique requirements of cold chain logistics and can effectively manage potential challenges.

Cold-chain logistics providers must have the necessary infrastructure, including qualified drivers, suitable equipment and technology to support real-time visibility, proactive asset recovery and stringent security protocols.

This playbook dives deep into how healthcare supply chain leaders can address their cold-chain concerns by partnering with Werner® and its subsidiary Baylor Trucking to seamlessly execute both safety and service for time-sensitive, temperature-sensitive, high-value cargo.

RIISING COLD-CHAIN EXPECTATIONS

With so much at stake in every cold chain move, it's critical to work with a transportation and logistics provider that has demonstrated expertise in managing the process from end to end. It's not only about loading the shipment into a trailer maintained to the precise environmental conditions; the cold chain is also about navigating complex regulations, ensuring cargo security and managing any exceptions along the way.

Today, on-time delivery is just table stakes. Cold-chain shippers demand real-time visibility, enhanced security, regulatory compliance and risk mitigation. In the healthcare and pharma sector, shippers want assurance that providers understand the sensitivity of their freight and can demonstrate proactive measures.

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COLD-CHAIN TEMPERATURE BANDS

Cold-chain products must be maintained within a specific temperature range to ensure product integrity and quality.

- **Controlled room temperature (CRT):** 15°C to 25°C (59°F to 77°F)
- **Cold:** 2°C to 8°C (35°F to 46°F)
- **Frozen:** -10°C to -25°C (14°F to -13°F)



COLD CHAIN VS. TEMPERATURE CONTROL

While similar, these terms are not entirely interchangeable.

- **Cold chain:**

Maintaining continuous low temperature for products in an end-to-end climate-controlled environment.

- **Temperature control:**

Maintaining a specific temperature range for goods during transit.

The cold-chain evolution has led to increased demand for:

- End-to-end tracking transparency
- Data-driven decision-making
- Backup systems and rapid response protocols
- Customizable equipment for specialized needs
- Tighter communication loops between the carrier and the customer

“Werner meets these expectations with 24/7 operations support, GPS-tracked trailers, Samsara-powered cameras and a dedicated ‘Power Team,’ ensuring immediate updates and oversight.”

Brett Saddler, Director of Health Sciences and Expedited at Werner



COLD-CHAIN EXPERTISE EXCELLENCE

Your cold-chain logistics provider plays a vital role in preserving the efficacy and safety of temperature-sensitive pharmaceutical products throughout the cold chain.

Remember, sub- or near-zero temperatures aren't the only requirement for a cold-chain product. Room temperature pharmaceuticals may degrade if temperatures spike above 86°F for an extended period.

Your provider must excel at following regulations, managing temperature monitoring programs and leveraging data-driven strategies to enable pharmaceutical companies to significantly enhance their cold-chain management practices.

Your cold-chain provider should excel at these aspects of cold-chain shipping for your sensitive products:

- **Maintain temperature integrity** across varied climates and long distances, especially for pharmaceuticals or perishables that require specific temperature ranges.
- **Prevent cargo theft and fraud**, particularly for high-value or time-sensitive goods.
- **Navigate complex regulations** related to healthcare and food safety compliance.
- **Mitigate equipment failure**, especially in remote or cross-border shipments.
- **Scale during peak demand periods** while maintaining service consistency and quality.

Werner addresses these challenges with real-time temperature and location tracking, redundant trailer monitoring systems, strict security protocols and a fleet built for temperature-sensitive loads.



CHOOSING A COLD-CHAIN LOGISTICS PROVIDER

If you're adding new sources or destinations, launching a product or entering new markets, the choice of a cold-chain logistics provider is critical to the success of your strategy.

Look for a partner experienced in all aspects of this complex, highly technical operation. Ensure that your logistics provider has the specialized infrastructure to maintain the required temperature range in trucks and warehouses, as well as real-time temperature tracking to monitor shipments and receive alerts in case of a temperature excursion.

Shippers should also evaluate carriers using tools like Carrier Assure and GenLogs to confirm standing with the FMCSA, insurance coverage and reputation within peer groups.

Werner answers these questions through transparent reporting, 24/7 communication, certified operations and technology designed for mission-critical freight.

“Werner’s layered security, extensive compliance infrastructure and tech-enabled transparency make us a trusted partner for sensitive, high-value freight.”

Brett Saddler, Director of Health Sciences and Expedited at Werner

To properly vet a cold-chain provider, shippers should ask:

- ✓ Can you maintain strict temperature ranges (e.g., 2° to 8°C)?
- ✓ What certifications do you hold? (GDP, CTPAT, TAPA Level 2, UPS Gold, etc.)
- ✓ Are your drivers trained and credentialed for high-value freight?
- ✓ What does your visibility stack look like, and do you have redundant tracking systems in place to ensure reliability and continuity?
- ✓ How do you handle theft, fraud or impersonation risks?
- ✓ How is your equipment customized or adaptable to my specific requirements?
- ✓ Can your equipment handle cross-border complexities or multi-temp loads?
- ✓ What kind of visibility will I have, and how quickly can I get updates?

HIGH PRIORITY OPERATIONAL & SECURITY PRACTICES

Cargo security goes beyond locks and sensors; it's about partnership, technology and prevention. To protect high-value pharmaceutical products, Werner and Baylor deploy a layered approach that includes:

Driver credentialing: Werner and Baylor go beyond the basics with enhanced driver credentialing, including HazMat, TSA and TWIC certifications.

Driver policies: Werner enforces a 200-mile "No Stop" policy post-pickup to deter opportunistic theft.

Technology: Samsara-powered video, door sensors and anti-tampering seal tech on trailers deter theft, while 24/7 asset monitoring, with geofencing alerts and dual GPS tracking devices, provides backup visibility. This technology supports Werner's proactive asset recovery, with real-time response teams ready to act on suspicious movement. Technology-based temperature monitoring and notification ensure product integrity door to door.

Risk assessment: Lane-specific risks, such as seasonal high or low ambient temperatures, must be considered not only in the trailer but also at handoff points at warehouses or transfer facilities, which may not have strict temperature controls.

Best practices: In partnership with GenLogs, Werner leverages AI and computer vision to identify and validate trucks and trailers. These tools help expose fraud schemes, such as carrier impersonation, and enable quicker recovery when theft occurs. Werner also utilizes platforms like Carrier Assure to assess carrier legitimacy and risk profiles, thereby helping safeguard the broader supply chain.

"As healthcare products are often targets for thieves, maintaining chain of custody is vital, especially in potential trouble spots in the supply chain such as distribution centers and truck stops. Werner's comprehensive programs provide a high level of comfort for high-risk shipments."

Brett Saddler, Director of Health Sciences and Expedited at Werner

DON'T SHIP WITHOUT STATE-OF-THE-ART REAL-TIME VISIBILITY

In the past, data loggers were used to monitor pharmaceutical shipments, which were downloaded upon delivery. By then, it was too late to do anything about variances from specified environmental conditions, and the load had to be rejected.

While data loggers still have their place, GPS tracking capabilities overcome the lag time of data loggers, providing real-time indications of a load's location. That's just the beginning of using visibility to ensure product integrity.

Werner's technology integration for real-time visibility means more than just pinging GPS locations — it's about predictive insight, proactive alerts and backup systems.

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WERNER'S APPROACH INCLUDES:

- **GPS tracking on tractors and trailers** with geofencing and 24/7 monitoring
- **Samsara camera systems** for enhanced visual and sensor-based oversight
- **Real-time temperature monitoring** across the defined cold chain
- **Secondary tracking devices** to provide failover if tampering occurs
- **AI-backed platforms** like GenLogs, which use computer imagery to verify carrier identity and movement patterns, reduce fraud and enhance supply chain transparency

Werner's visibility systems support a continuous chain of custody and control verification, passive tracking, monitoring, reverse logistics and loss prevention, regardless of transportation mode.

“These layers give our customers unparalleled visibility and trust, especially important for pharma, healthcare and food logistics.”

Brett Saddler, Director of Health Sciences and Expedited at Werner



EXPERTISE BEHIND THE WHEEL

Drivers are the foundation of the supply chain, and safety and security begin with the expertise of the person behind the wheel of the truck. Drivers must have the training and experience to understand the requirements of the cold chain and how to ensure the integrity of the product even when things don't go according to plan.

Werner's Roadmaster Driver School network ensures new drivers get the training they need to earn their Class A CDL and become safe, efficient drivers. Many of them go on to become drivers for refrigerated trailers based on their performance and understanding of the special care that perishable cargo requires.

These elite drivers receive specialized training and knowledge necessary for handling refrigerated freight, including temperature management, the use of refrigeration units and monitoring systems. They learn how to maintain accurate temperature logs to support audits and inspections, as well as operational practices such as pre-cooling trailers to help preserve cargo integrity. Drivers are trained to respond to unexpected events, like a truck breakdown or an issue with the refrigeration system, to protect the product.



Regardless of where drivers earn their CDLs, Werner has a range of policies in place to protect cargo. Refrigerated truck drivers carrying high-value cargo must not stop within 200 miles of the pickup point to deter crimes of opportunity at truck stops. Thieves may pursue cargo leaving a facility, but are unlikely to follow for long distances.

Geofences — or virtual boundaries — define areas where drivers are allowed to go. The system can send alerts when the truck is driven outside the designated areas. This oversight helps prevent cargo theft and loss. Additionally, drivers are instructed not to post on social media about their loads, origin or destination points to avoid tipping off potential thieves.

When it comes to transporting temperature- and time-sensitive items, you can feel confident in shipping with the cold-chain experts at Werner behind the wheel.

REFRIGERATED EQUIPMENT REQUIREMENTS

Ensure your cold-chain logistics provider offers refrigerated equipment that meets your product and supply chain requirements. Reefer units, also known as temperature control units, have some critical differences from standard dry vans.

The equipment must be able to maintain the product's required temperature range, which is accomplished by an integrated refrigeration unit and insulated walls. To improve insulation performance, the walls are made of metal or fiberglass instead of wood. Traditionally, refrigeration units have been powered by diesel, but electric units are now entering the market to reduce greenhouse gas emissions.

Some trailers offer multiple zones to carry products with different temperature requirements. In a single-zone trailer, air chutes located in the floor and ceiling evenly distribute chilled air, ensuring the entire load of product is protected against temperature variation.

Technological advancements have led to the introduction of passive thermal systems, such as insulated pallets with gel packs or phase-change materials, for biologics, insulin, certain vaccines and other temperature-sensitive drugs. These options may prove more reliable than mechanical systems and further reduce the environmental impact of transportation.

Trailers are equipped with GPS tracking devices to ensure visibility for the load. Real-time temperature monitors produce documentation of the trailer's temperature throughout transit and can send alerts in the event of a temperature excursion.

For all types of health care and pharmaceutical shipments, Werner provides comprehensive solutions for temperature-controlled needs, including temperature monitoring and cross-border facilities with temperature-controlled/reefer storage solutions.



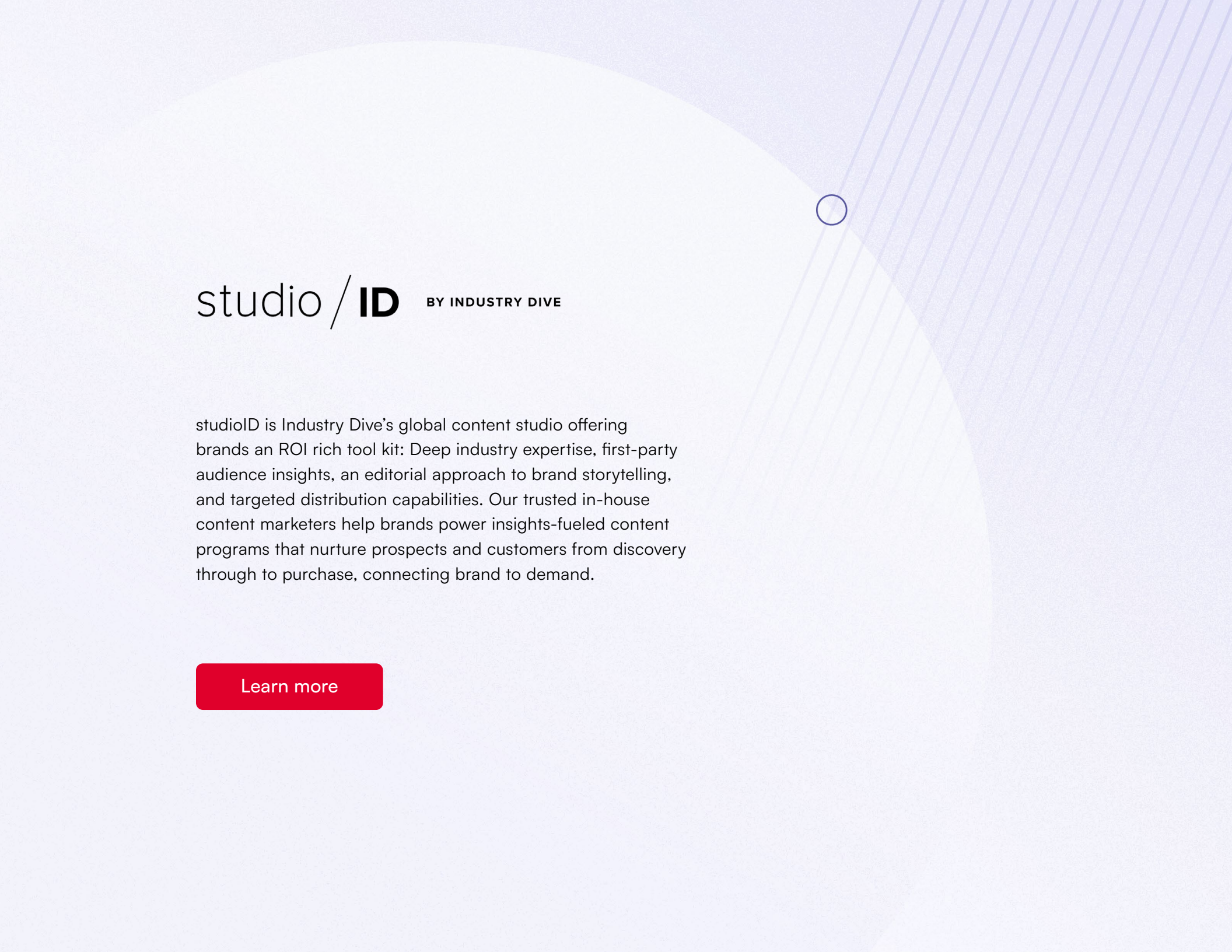
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OPERATIONS AND DRIVE LONG-TERM SUCCESS?**

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Nearly 70 years ago, Werner started with just one truck and a vision. Today, we are one of the nation's top transportation and logistics providers, delivering innovative asset-based and non-asset solutions with a relentless commitment to safety, service and sustainability. As the 6th largest dedicated carrier in the U.S., we continue to drive the industry forward and deliver beyond expectations for our customers. Our comprehensive, multi-modal solutions include Dedicated, One-Way Truckload, Intermodal, Final Mile, Temperature-Controlled and more. Werner's strength in transportation and logistics enhances the businesses of our customers, ensuring their supply chains operate smoothly and efficiently.

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