

Give your perishables a fresh start

Your 5 point guide to mastering reefer container shipping



Keeping the promise of freshness

Safeguarding perishable and frozen foods along their entire journey is the foundation of cold chain logistics. Precise and reliable temperature control from source to destination ensures your products reach consumers around the world at the peak of their freshness.

The condition of your shipment could be affected by anything from weather to infrastructure to local regulations. Understanding each of these challenges offers opportunities for proactive intervention. Avoid unwelcome surprises by mastering the key elements for transporting perishables that arrive market-fresh.

While everyone enjoys foods from around the world, behind each delicious morsel is a high level of care. From proper container loading to temperature monitoring, the cold chain is carefully designed to eliminate spoilage and unnecessary loss. By following these shipping essentials, your perishable and frozen foods arrive ready for market, every time.

The reefer shipment journey



Reefer container essentials

The basic principle of refrigeration is to slow down the respiration rate of fruits and bacterial activity in all food and, with deep freezing, halt the activity. Many factors affect the shelf life of products from pre-transit sanitation and pre-cooling to stowage techniques and storage temperatures.

Inside each container is a microprocessor that functions as an electronic climate monitor. The device records essential real-time data including:

- Specific set point temperature
- Supply and return air temperature
- Remote cargo probe temperature (cold treatment)
- Defrost activity
- Power on and off times

Reefer units are designed to maintain a set temperature, not to lower the cargo to that temperature. Cargo must be pre-cooled to an optimal transport temperature prior to loading.

Cold-storing your produce immediately after harvest is essential for ensuring quality and long shelf life. Once products are chilled or frozen, the conditions are preserved, and respiration rates slowed until delivered to consumers - a distribution cycle known as the "cold chain".

Internal air circulation is essential to maintain the set temperature within a reefer container. Stowage should ensure that the circulated cold air flows freely over as much surface area as possible while the cargo remains secure.

1

Loading and securing your cargo

When you first use reefer containers, understanding the basics of how to properly load and secure your goods is fundamental to protecting shelf life and overall quality.

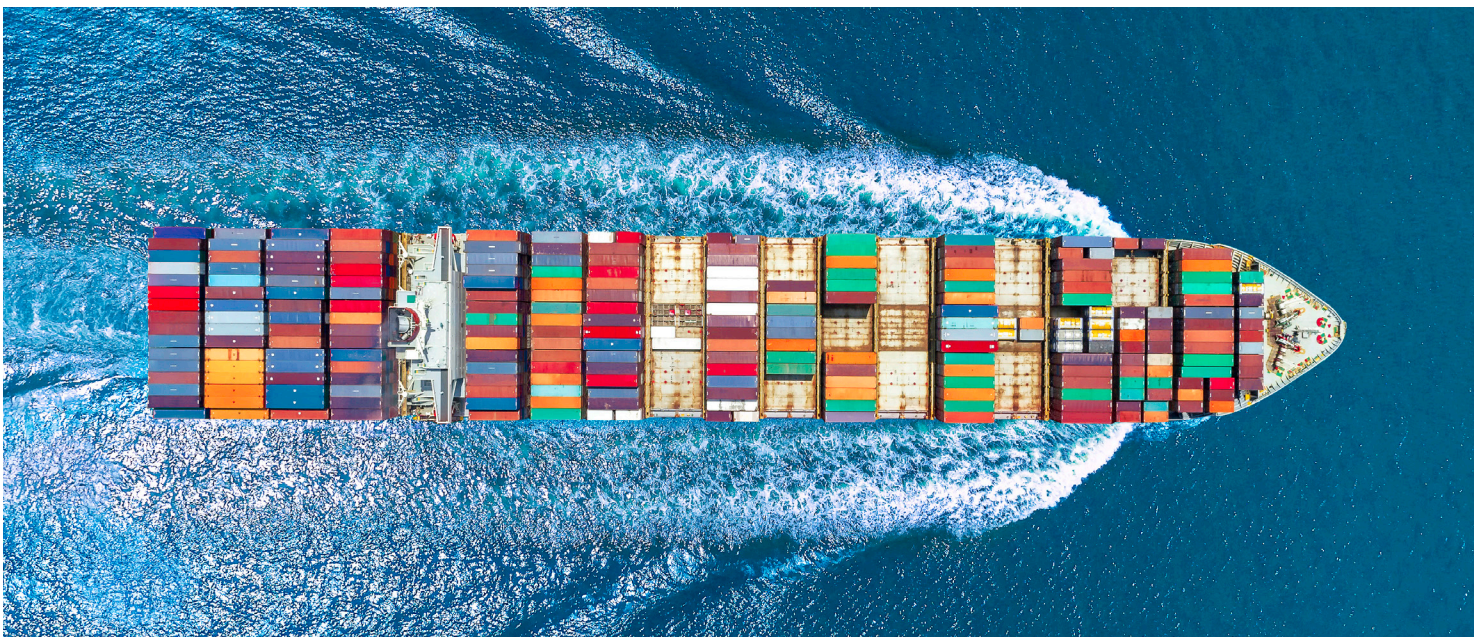
The container is constructed to maintain the temperature of the cargo, not reduce it. That means your goods must be pre-cooled to the set temperature point before loading.

If you want to precool your container prior loading with a genset, they require the loading bay to be of equal temperature. If they vary, hot air rushes into the container creating condensation and warming it to the ambient temperature. Similarly, when you load

a running reefer with the doors open, warmer ambient air is drawn in and flows over the cargo.

Three essential practices to maintain optimum temperature and product freshness:

- Keep your loading time to a minimum
- Pre-cool the cargo to the set temperature
- Only load to the load limit lines and the end of the T floor, ensuring a gap is left at door end



2

Documentation and processes

Whether issuing health certificates, phytocerts or commercial invoices, preventing delays begins and ends with preparing accurate documentation.

Even the smallest mistake can block or delay customs or agricultural clearance at the destination and each country has specific requirements. For instance, if you want to ship to the Middle East, it's important to know that labelling has to be in Arabic to enter the market. The rules and regulations become more varied depending on the overseas market access requirements (OMAR).

Standardised processes prevent errors and subsequent claims while helping to reduce product loss. Working with our Reefer Logistics expert takes the guesswork out of shipping to far-flung destinations.



3

Temperature control and tracking

Maintaining temperature integrity and humidity levels for the duration of your shipment is crucial. Even the slightest fluctuation could result in high percentages of premature spoilage, preventing products from reaching consumers.

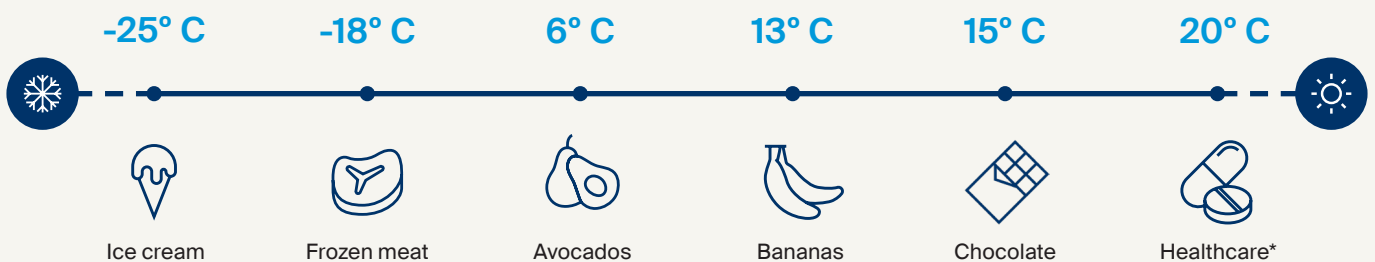
Refrigeration equipment is never going to be 100% reliable and conditions vary as products pass through multiple handlers. Cargo may exceed permissible or safe temperature levels, even if only briefly.

Quality depends on visibility. When products are subjected to unfavourable conditions, receiving immediate alerts is invaluable.

With sensors that provide real-time data at each touchpoint in the journey, your products arrive fresh and meet vital regulatory standards.

With Kuehne+Nagel, you can set up alerts that monitor when the pre-defined temperature corridor is exceeded or the container doors are opened. An email notification gets sent to the freight forwarder's station where the operator analyses the data and escalates it to the ocean or road carrier.

Indicative guide for goods shipped in reefer containers



*Shipped deep frozen as well and chilled between 2-8° C and 5° C

Four key factors to consider when shipping reefer cargo:



Temperature

All standard reefer units are designed to maintain a temperature between +25° C and -25° C for chilled and frozen cargo. A certain percentage of the global reefer fleet can also maintain a temperature of -35° C or even lower. Special containers known as super freezers can maintain a temperature as low as -70° C.



Ventilation

When shipping "breathing" fruit and vegetables, the ventilation is opened, bringing in fresh oxygen and removing carbon dioxide and ethylene. For other (non-breathing) chilled or frozen goods, the ventilation remains closed. The cargo must also be stowed in blocks with no large gaps between the blocks or walls.



Humidity

Certain products such as onions and garlic require dry conditions to transport safely, therefore standard reefer containers can switch to the dehumidification mode. The current industry standard is between 60% and 85% relative humidity (RH), while newer units can reach as low as 50%.



Drainage

Drains release excess water that often accumulates on the floor of reefer containers. Their design also prevents external water or insects from reaching the container's content. The drains are only opened when fruits and vegetables are shipped.

4

Proactive strategies for reducing product loss

Maintaining the shelf life of perishables is always a race against the clock. The cargo requires a high degree of care for every minute it is in storage or transport. Both temperature deviation and cross-contamination can cause spoilage, leading to unacceptable product loss.

Build resilience into your reefer supply chain with practices that ensure optimal, temperature-controlled **transit times**. Your best defence against food waste is planning and implementing preventative measures that focus on safety.

By using the latest technology to monitor data, you create opportunities for quicker decision-making that mitigates loss. When you work with our professionals who prioritise safety and compliance, you lower risk and increase expertise from origin to destination.





0-25°C

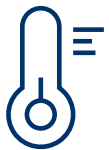
Transporting chilled cargo

With a built-in supply air and return sensor, reefer containers automatically maintain the right balance needed to keep chilled products at low temperatures, but above freezing.

Because fruits and vegetables continue to “live and breathe” after harvest, they absorb oxygen and generate heat and gases as they ripen. Proper ventilation is required to keep cargo fresh

throughout the journey. Consideration should be given to Controlled Atmosphere containers which can be used to lower oxygen exposure, particularly for longer transit cargo.

Cartons should be stacked with their bottom vent holes aligned to allow for fresh air circulation and exchange. Remove any material that can block this airflow.



-20°C

Transporting frozen cargo

While local transport regulations may vary, frozen goods are typically shipped and stored at around -20° C or less.

Frozen cargo should be stacked in block formation with no gaps between the pallets or packages and no holes in the

packaging. The air must be able to flow over the cargo and dissipate any heat that may enter the refrigerated container. Ventilation is not required.



5

Find the right logistics partner

It is essential to keep unforeseen events from becoming obstacles. While skilled logistics partners can help you navigate those hurdles, how do you choose the right one?

Cold chain success depends largely on a combination of know-how, experience and flexibility. Look for providers who offer end-to-end visibility of your shipments, letting you drive decisions with better data. Because reducing food waste is a priority, you need globally standardised processes, in-transit temperature monitoring and teams trained to handle delicate products.

To avoid delays, work with a partner who understands regulations in every market where you do business. When goods have to arrive at peak freshness, Kuehne+Nagel designs solutions that deliver them safely to your customers. Our service is dedicated to extending product shelf life and offers a variety of sailing opportunities with all major reefer carriers and reliable access to the entire global reefer fleet, shipping to every corner of the globe.

"The transport of your sensitive products needs special technology, communication and expertise at every stage of the journey."

Your Kuehne+Nagel Reefer Logistics Team

When your goods are on their journey, they are handled by experts. Whether it's our internal staff or our partner's employees, these experts are trained on industry-leading equipment and know the unique requirements to ensure your cold chain products arrive in perfect condition.



Whatever it takes. Wherever it's going. You get results.

Whether you're shipping fruits, fresh products or frozen seafood and meat by sea, our solutions ensure that your temperature-sensitive products arrive on time and in optimal condition.

[→ Learn more about refrigerated logistics](#)