



# REEFER CARGO SOLUTIONS



# WORLD LEADER IN SHIPPING & LOGISTICS

Founded by Captain Gianluigi Aponte, MSC Mediterranean Shipping Company (MSC) has been headquartered in Geneva, Switzerland, since 1978.

As a world leader in shipping and logistics, MSC operates in 155 countries across five continents, where we provide timely delivery of goods and services to local communities, customers and business partners.

Our international headquarters supervise a worldwide network of offices with each having responsibility for commercial and operational activities in their respective countries.

Over the years, MSC has invested in several initiatives, such as operational strategic alliances, and has further diversified its business-related activities.

We have seen exponential growth in terms of both volume and fleet capacity, and now serve millions of customers globally, with a 365-days-a-year operation.

Today, our focus remains true to our roots: building and retaining long-term trusted partnerships with customers of all size and scale.



# WHY MSC?

## WE DELIVER

As a leader in transport and logistics, MSC reaches every corner of the globe. We bring your cargo safely and quickly from A to B, using tailor-made end-to-end transport solutions across road, rail and sea.

## WE SUPPORT

We pride ourselves on offering the best customer service in the industry, and we make every effort to meet your individual needs and build long-term partnerships. We are known for our local and global expertise, professionalism, and top health and safety record.

## WE INNOVATE

Our fleet is among the most modern in the world, and we invest in state-of-the-art equipment and technology to transport your cargo securely and efficiently to its destination.

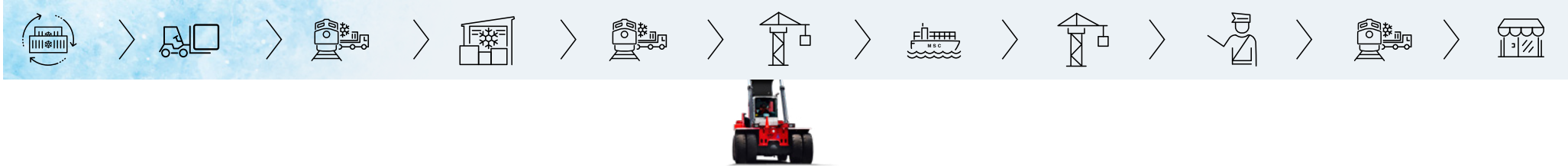
## WE CARE

We connect the world, and we have a responsibility that goes beyond simply transporting cargo. We are committed to protecting our blue planet for future generations. As a growing global company in shipping and logistics, we seek to contribute to building resilient and inclusive supply chains and believe that operating sustainably benefits our colleagues and crew, our customers and the communities in which we operate.



# END-TO-END REEFER SOLUTIONS

Over the past **50 years**, MSC has literally gone **'the extra mile'** by expanding our services beyond ports. Thanks to our integrated road, rail and barge network across the world, we offer door-to-door transport solutions that keep our customers' cargo fresh and cool for the whole journey.



## PRE-TRIP INSPECTION

At the depot, our reefer experts carry out a thorough inspection of the container in preparation for loading. This helps you meet the relevant regulatory requirements and retain the sale value of your cargo at its destination.

## PICK-UP AND LOADING

We come to you to load your cargo into our reefer units:

- ✓ 20ft or 40ft cubes
- ✓ Fresh air adjustment and dehumidification
- ✓ Controlled through an integrated microprocessor
- ✓ CFC-free insulation ensures minimum temperature loss

## INLAND TRANSPORTATION

While the reefer containers are in transit over land, MSC can provide a genset portable diesel generator to keep the container operating at the required temperature. We bring the containers directly to the port, where they undergo strict security checks.

## COLD STORAGE WAREHOUSES

MSC offers cold storage for temperature-sensitive cargo. At our temperature-controlled warehouses, we provide storage for both frozen and chilled goods. Our cold storage solutions ensure that the high quality of your goods is preserved throughout your supply chain. Our temperature monitoring systems track the correct temperature at all times. In addition, we ensure full traceability and the highest standards of quality and certification. Please check with your local agent for availability.

## SHIPPING

While reefer containers are on board our vessels or in a port, they are always plugged into a constant power source. Our reefer containers are fitted with a software programmed to display specific alarm codes should a malfunction be detected. This immediately notifies our fully trained engineers, who can attend to the unit directly.

## CUSTOMS CLEARANCE

From the start of your cargo's journey to its final destination, MSC gives you complete peace of mind. Whether you are importing or exporting, our experienced team know which regulations apply and which documents to submit. They will guide you through customs clearance procedures, including cross-border documentation and customs formalities.

## TRANSPORTATION TO FINAL DESTINATION

We deliver your goods in optimal condition to any address in the world. If necessary, your cargo can also be stored at cold storage warehouses on the way.

# REEFER EXPERTS

Powered by cutting-edge reefer technology, MSC ensures that your products are transported in optimal conditions, safeguarding their quality throughout the journey. Our experts are available to provide you with the very best service and equipment to meet the requirements of your supply chain.

Our customers and business partners appreciate our in-depth understanding of their local markets and our deep sector-specific knowledge. Our network of reefer experts at each of our locations

provides customers with the very best service and equipment to meet their individual requirements.

We understand the importance of preserving the condition of our customers' cargo from the moment it is loaded until the minute it reaches its delivery point. Over many years, we have developed a strong service offering and built one of the largest and most environmentally-friendly reefer container fleets in the world.

## WE TRANSPORT ALL KINDS OF CHILLED AND FROZEN CARGO, INCLUDING:



**FRUIT AND  
VEGETABLES**



**PHARMACEUTICALS**



**FISH AND  
SEAFOOD**



**MEAT AND DAIRY  
PRODUCTS**



## EVERY YEAR, WE DELIVER:

**+2M TEUs** of reefer cargo

**+25,000 TEUs** of Controlled Atmosphere (CA) shipments

**+28,000 TEUs** of Cold Treatment (CT) shipments

# YOUR PRE-SHIPPING CHECKLIST

There are a few factors to keep in mind when transporting chilled and frozen cargo. Our experts will provide full support to ensure that your goods maintain their quality all the way to their final destination.



## FROZEN CARGO e.g. meat, fish, ice cream

- ✓ The cargo must be pre-frozen to the correct temperature
- ✓ The cargo inside the container must form a solid block, with no spaces between boxes and the walls of the unit, to allow air to circulate and maintain a steady temperature
- ✓ Maximum load height must be below the red load line of the container
- ✓ Ventilation of the container must always remain closed and humidity off
- ✓ Packaging must be able to resist moisture and allow for a vertical flow through boxes to maintain the desired temperature



## CHILLED CARGO e.g. fruit, vegetables

- ✓ Chilled cargo requires the highest level of care to avoid compromising size, freshness, firmness, texture, colour, flavour, aroma or chemical balance in transit
- ✓ Goods must be pre-cooled ahead of transportation to achieve optimal temperature levels before loading, and to reduce the impact of outside temperatures during transportation
- ✓ The reefer unit ventilation must be set according to the cargo requirements



# THE PERFECT TEMPERATURE FOR PERISHABLES

Perishable goods require precise temperature control to maintain their quality all the way to their final destination. At MSC, we follow four highly standardised control procedures to optimise the cooling process. These include **Cold Treatment (CT)** and **Controlled Atmosphere (CA)**.

## KEY BENEFITS OF OUR CT AND CA SERVICES

- ✓ Longer shelf-life of the commodity
- ✓ Opening new markets to perishable goods
- ✓ Maintain the appearance, freshness and quality of perishable foods over longer distances
- ✓ Attractive prices and reduced CO<sub>2</sub> emissions compared to air freight



### COLD TREATMENT (CT)

CT is a chemical-free way to eliminate fruit flies and other insects that might damage the biodiversity and agricultural industries of importing countries.



### CONTROLLED ATMOSPHERE (CA)

CA is a highly advanced process to regulate the atmosphere composition in the reefer container during storage or transit.

#### TEMPERATURE LOWERING

The process lowers the temperature of the fruit pulp and maintains it for a specified period of time. The exact settings vary depending on the country of origin, the type of commodity and the country of destination.

#### MONITORED TEMPERATURE

Our reefer equipment monitors temperature readings through three probes (or sensors) placed in the core of the fruit during the voyage and at terminals.

#### TEMPERATURE ADJUSTMENT

Once the cold treatment has been successfully completed during the voyage, MSC informs the shipper immediately and the temperature can be readjusted.

#### RESPECT LOCAL REGULATIONS

MSC helps you to comply with local regulations.

#### CONTROL OF GASES

For low-respiring commodities, gases are injected at the beginning of every shipment to build up the CA environment and keep it under control throughout the journey.

#### ENVIRONMENT CONTROL

Our reefer equipment monitors temperature readings through three probes (or sensors) placed in the core of the fruit during the voyage and at terminals.

#### INCREASED PRODUCT LIFE

This process increases product shelf life and keeps fruit and vegetables in perfect condition for longer.

#### CA SYSTEM PARTNERS

MSC uses various CA systems with the support of our partners, such as StarCool® CA, Liventus®, Maxtend® and Purfresh®.



## DEHUMIDIFICATION

It is important to control humidity levels to maintain the quality of the products: too much humidity may cause mould, while too little may cause dehydration.

### HUMIDITY SENSOR

Our containers meet ATO-testing requirements for flower bulb quality preservation.

### ATO-TESTED

All MSC-operated reefer containers equipped with a humidity sensor have dehumidification capabilities.

### DEHUMIDIFICATION DEVICES

Dehumidification devices enable you to set temperatures above or equal to minus 10°C.

### PRESERVE SENSITIVE COMMODITIES

Our reefer units are specially designed to preserve the quality of commodities which are extremely sensitive to temperature and humidity changes, such as flower bulbs.



## VENT SETTINGS

Proper ventilation is vital, as fruit and vegetables “breathe” during transportation. This produces heat and gases such as ethylene, which speeds up the ripening process and reduces shelf life, and CO<sub>2</sub>, which suffocates cargo and causes discolouration. Fresh air is required to remove these gases.

### COOLING WITH FANS

Our reefer units are fitted with vents to adjust the level of fresh air, depending on the commodity.

### AIR COOLING

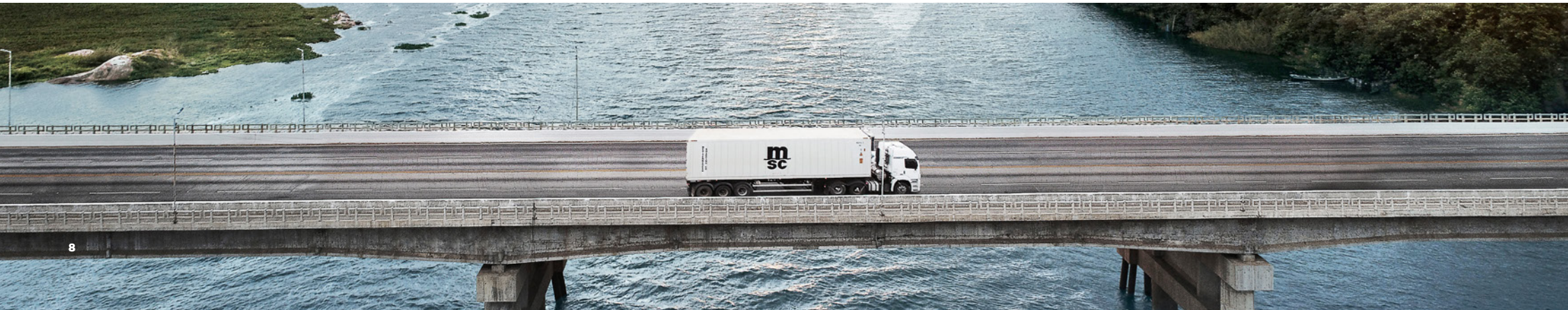
The use of vent settings allows for the intake of external air by adjusting vent openings.

### AIR CIRCULATION

The air is cooled by passing through the evaporator coil and circulating throughout the cargo by fan.

### MANUAL AIRFLOW SETTING

Airflow is set manually between 0 and 245 CMH.





# YOUR CERTIFIED PARTNER FOR SECURE REEFER SHIPMENTS

## GDP FOR PHARMACEUTICALS



## FSM FOR FOOD & BEVERAGES



## RISK MANAGEMENT APPROACH, PREREQUISITE PROGRAMME (PRP) AND OPERATIONAL PREREQUISITE PROGRAMME (OPRP)

Our **risk matrix** is validated and continuously enhanced to integrate our holistic approach in preventing and minimizing incidents. This includes:

- ✓ A spare parts process that ensures the right equipment is available in the right location, minimizing any potential disruptions
- ✓ Robust security and seal management processes that significantly reduce contamination risks
- ✓ A priority checklist designed to minimize equipment handling, thereby reducing the impact on power-off time
- ✓ A thorough vendor homologation process.

## PRP AND OPRP

Our PRP encompasses best distribution practices and prerequisite procedures, meticulously defined and applied across our network. This rigorous process identifies and releases the most suitable equipment for GDP and FSM protocols, effectively preventing contamination risks and damage. The OPRP is meticulously in place to maintain the required temperature, validated and verified through:

- ✓ Seasonal mapping for both summer and winter
- ✓ A reinforced calibration programme
- ✓ Integrated inspection and vendor homologation checklists.

We are dedicated to the continuous improvement of the OPRP, ensuring our **quality system** is not only documented and communicated but also certified in accordance with ISO 22000 and GDP standards.

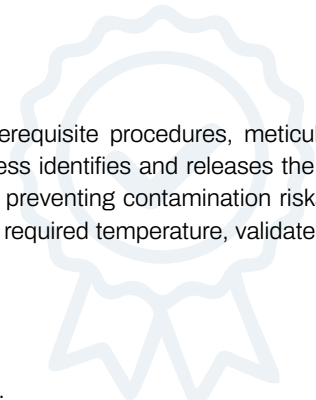
Our reefer units are connected to a control tower allowing **24/7 live centralized monitoring** of the temperature and constant follow-up.

With MSC, you can benefit from an add-on service granting you:

- ✓ A **fast response** to alarms and incidents, ensuring the preserved quality and safety of perishable cargo
- ✓ Recognized process management protocols that adhere to strict **quality standards**
- ✓ Expert support from our continuously trained **workforce** and yearly internal audits based on risk and error analysis
- ✓ An exclusive **trip report** with the recap of the temperature variations registered during the shipment.

## EXTENSIVE QUALITY SYSTEM

Our comprehensive quality system is integrated with certifications including ISO 9001, ISO 28000, ISO 27001, ISO 27017, and ISO 22301.



# BUILDING A BETTER FUTURE

---

We believe that cold chains and cooling technology can make a dramatic difference in enhancing the supply of quality food and reducing food loss around the world. MSC's reefer solutions allow fresh commodities to reach different trade areas, securing food supply regardless of the season and preventing food waste in the event of low local market demand. Our CA containers help perishable goods to travel further and for longer, potentially opening up new markets for exporters and importers.

By increasing the supply and affordability of quality food, reliable cold chains can help reduce poverty, foster responsible consumption and promote the right to health.

Find out more at [msc.com/sustainability](https://www.msc.com/sustainability)





**MOVING THE WORLD, TOGETHER.**



**[msc.com/reefer](https://www.msc.com/reefer)**