



# REEFER CARGO SOLUTIONS

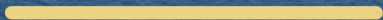




## CONTENTS

- 3 LEADER IN SHIPPING & LOGISTICS**
- 4 WHY MSC?**
- 5 END-TO-END SOLUTIONS**
- 6 REEFER EXPERTS**
- 8 YOUR PRE-SHIPING CHECKLIST**
- 10 THE PERFECT TEMPERATURE**
- 14 ENABLING SUSTAINABLE SUPPLY CHAINS**

# LEADER IN SHIPPING & LOGISTICS



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



**730**  
VESSELS



**260+**  
ROUTES



**520**  
PORTS OF CALL



**23**  
MILLION TEU  
CARRIED ANNUALLY



**155**  
COUNTRIES



**675**  
OFFICES



**150,000**  
MSC GROUP EMPLOYEES

Note: key numbers estimated end of 2022

# WHY MSC?

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 DELIVER**

**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 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.

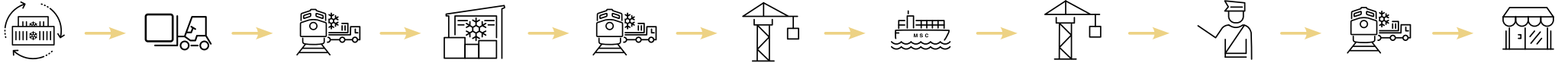
**WE SUPPORT**

**WE CARE**

As a key player in global supply chains, we remain fully committed to contributing to the realisation of the United Nations 2030 Agenda for Sustainable Development. At MSC, sustainability is a strategic imperative and, above all, a business priority. More on [msc.com/sustainability](https://www.msc.com/sustainability)

# END-TO-END SOLUTIONS

Over the past **50 years**, MSC has literally gone **'the extra mile'** by expanding our services beyond ports. Little by little we have developed an **integrated** road, rail and barge **network** across the world. We offer **door-to-door transport solutions**, even to the most remote areas.



## 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 are able to 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

---

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



## FISH AND SEAFOOD



## MEAT AND DAIRY PRODUCTS



## PHARMACEUTICALS





# 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

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)**.

## COLD TREATMENT

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

### KEY BENEFITS OF OUR CT AND CA SERVICES

✓ Longer shelf-life of the commodity

✓ Maintain the appearance, freshness and quality of perishable foods over longer distances

✓ Opening new markets to perishable goods

✓ Attractive prices and reduced CO<sub>2</sub> emissions compared to air freight

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.

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

MONITORED TEMPERATURE



TEMPERATURE ADJUSTMENT

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

**MSC helps you to comply with local regulations.**

RESPECT LOCAL REGULATIONS



**CA maintains the initial concentrations of gases** such as oxygen, nitrogen and carbon dioxide by adding or removing quantities of these gases.

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



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.

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



### CONTROLLED ATMOSPHERE (CA)

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

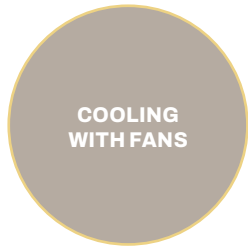
#### EVERY YEAR, WE DELIVER MORE THAN:

<b>1.9 M TEU</b>	of reefer cargo
<b>51,000 TEU</b>	of Controlled Atmosphere (CA) shipments
<b>28,000 TEU</b>	of Cold Treatment (CT) shipments

## 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.





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

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



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

**Airflow is set manually between 0 and 245 CMH.**



### **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 discoloration. Fresh air is required to remove such gases.



# ENABLING SUSTAINABLE SUPPLY CHAINS

---

At MSC, sustainability is a top business priority. We recognise the pivotal role we play in connecting the world and take this responsibility seriously. We are committed to protecting the marine, coastal and land-based ecosystems and to making a positive contribution. As a leader in transport and logistics, MSC is at the heart of global trade, connecting people and continents and contributing to the growth of different sectors.

## RESPONSIBLE INNOVATION

We invest heavily in the latest green technology, systems and processes to help achieve cleaner seas, land and cargo. The average age of our reefer containers is under seven years old, and we invest in the best-performing and most energy efficient refrigeration units in the world: “R-513A ready” units and NaturaLINE® units, the latter having the lowest Global Warming Potential (GWP) of all refrigerants used in commercially available container refrigeration systems today.

## 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)