



# Keep Cool We Care



**Hapag-Lloyd**



## Fresher at the destination

Our reefer containers provide environmentally friendly technology, reliable temperature control as low as -40°C/-40°F and a variety of precise controlling alternatives for all special cargo requirements. Hapag-Lloyd operates a container fleet of more than one million TEU in total, among them various special equipment types and one of the most modern refrigerated container fleets in the field. Careful servicing and inspections before every assignment are just as natural as continual research projects looking into further improving future generations of refrigerated container. This protects both the environment and your cargo. Many years' experience, modern equipment and a highly integrated global network of more than 100 liner services with competitive transit times make Hapag-Lloyd your premium partner for temperature-sensitive goods.



## Your advantages at a glance:

**Especially fresh** For a controlled atmosphere we provide a wide range of technologies such as ExtraFresh, Everfresh, AEM (Air Exchange Management) and Transfresh/Maxtend. The interior atmosphere is controlled to delay respiration and to extend shelf life for fruits and vegetables. Spoiling and mould is minimised. We have the best solution ready for nearly each and every cargo. You will find further information on the various technologies on page 6.

**Especially precise** With some fruits, such as bananas, the slightest temperature deviations are decisive for the quality of the cargo when it reaches its final destination. Therefore, precise temperature control has the highest priority for us. For chilled products with temperatures above -10°C/14°F the advanced refrigerated container technology allows us to reduce the maximum variation to 0.5°. For frozen products below -10°C/14°F the refrigerated container technology operates with a maximum variation of just 1.0° only.

**Especially hygienic** Hapag-Lloyd is the only container line to strictly segregate non-food-grade boxes from reefers exclusively used for food transportation. A special interior design provides more hygienic conditions as well as optimal air circulation. Our reefers are checked and tested before each and every assignment.

**Especially dry** Apart from temperature our reefers can also reduce relative humidity with set values between 50% and 95%. For flower bulbs, Hapag-Lloyd reefers have a special 'bulb mode' which automatically provides an optimal atmosphere for transportation.

**Especially gentle** Our refrigerated containers can be programmed in advance for automatic temperature change up to eight times during one voyage. With this technology, sensitive cargo can be gently cooled in stages and the ripening process for fruits can be accelerated before arrival at the destination.

**Especially well ventilated** For certain goods, such as fresh fruits or ferns, a precisely controlled ventilation system contributes decisively to quality assurance. With Hapag-Lloyd refrigerated containers, up to 280 m³ of fresh air per hour can be automatically supplied. The ventilation flaps can be opened with a time delay of up to 72-hours, an important advantage when the cargo is not sufficiently pre-cooled.

**Especially friendly** To protect our environment Hapag-Lloyd continually carries out research into better solutions with great success. We have reduced average energy consumption by more than 50% in the last eight years without making compromises on temperature control, and at the same time improving performance. Naturally, all coolant used in our reefers is CFC-free. This reduces the carbon footprint of your product.

**Especially reliable** High-value, sensitive reefer cargo from the pharmaceutical, chemical or healthcare industry requires particularly careful handling by an especially reliable partner. Here we offer not only our modern equipment and our extensive experience, but also special internal processes that provide extra protection for your high-value cargo.

**Especially safe and secure** All data relevant to quality, such as temperature, humidity, O<sub>2</sub> and CO<sub>2</sub> content as well as fresh air supply setting, is recorded. With current technologies, Hapag-Lloyd has successfully carried out tracking and tracing trials for highly sensitive cargo. Location, temperatures and events are monitored. A 24/7 technical expert team can respond to automated alerts triggered by extended power-off times during transit, for example.

**Especially large payload** Use of the most modern materials and refrigeration units ensures lower weight for our refrigerated containers and higher payload capacity for our customers. With Hapag-Lloyd reefer equipment, our customers benefit from the highest load capacities available. On average a benefit of 100 to 200 kg compared to others in the market.

**Especially cold** Hapag-Lloyd refrigerated containers can maintain a constant temperature between -40°C/-40°F and 30°C/86°F. Even with outside temperatures of up to 50°C/122°F the refrigerated container technology allows us to keep your cargo fresh and deliver the best quality to the destination. You will find the optimal transport temperature for your product from page 9 onwards.

**Especially fast cooling** especially powerful refrigeration units assist in pre-cooling processes in cases where cargo has not been properly pre-cooled. The considerably faster pull-down times with Hapag-Lloyd reefers enable a higher quality and a longer shelf life for your products.



# Controlled Atmosphere

With the ability to change the composition of the air in a reefer and thus to control the ripening process of 'living' cargo such as fruit or plants, the products reach their destination both considerably fresher and in better quality. Products can be transported over greater distances, opening up new market potential. This makes our refrigerated containers a real cost-effective alternative to airfreight. We can offer the flowing Controlled Atmosphere technologies:

## Extrafresh

A technology designed to control and preserve the desired transport atmosphere for fruits and vegetables. Hapag-Lloyd ExtraFresh takes advantage of the natural fruit respiration process to slow down the ripening and thus maintain the cargo's quality and extend the product's shelf life. Hapag-Lloyd ExtraFresh containers are equipped with oxygen ( $O_2$ ) and carbon dioxide ( $CO_2$ ) sensors, membrane technology and an automatic fresh air ventilation system. The latest controlled atmosphere technology to provide the optimum transport conditions for your fruits and vegetables.

## Everfresh

Everfresh preserves freshness with absolute control. Produces its own atmosphere and actively controls atmosphere with adjustable set points for both oxygen and carbon dioxide. System is fully integrated into the container unit and operates anywhere without special technical support.

## Air Exchange Management (AEM)

With technologies like AFAM+, AV+ or eAuto-fresh, the  $CO_2$  content in the reefer container can be increased by up to ten per cent depending on cargo, by using the ventilation flaps. This results in a delayed ripening process. All the systems are suitable for climatic products that release  $CO_2$  into the surrounding air.

## Transfresh & Maxtend

Transfresh and Maxtend use the same principle as AFAM+ and eAutofresh. However, here an individual gas mixture is initially injected into the reefer. The use of these technologies provides additional quality assurance for the product.



# Other key products

## Remote Reefer Monitoring

Our Remote Reefer Monitoring system offers additional transparency and high-level safety for your temperature-sensitive and high-value reefer cargo, with a focus on interchange locations (e.g. terminals) and inland transport (e.g. barge, rail, truck). The new tracking technology comes as a full service from Hapag-Lloyd with installation of the GPS device connected to the reefer control panel. The technology provides for monitoring every important parameter like supply and return air, humidity, ventilation, power-off periods and Cold Treatment. Remote Reefer Monitoring can trigger alerts and initiate a response from our reefer experts and engineers.

## Cold Treatment

Cold Treatment is a special post-harvest process for perishable products to meet quarantine requirements. By maintaining the goods at a specific temperature for a predetermined, uninterrupted period, Cold Treatment or Cold Sterilisation aims to eliminate insects such as the fruit fly. With the Cold Treatment process, pesticide treatments can be avoided. Reefer containers are fitted with temperature probes to measure the cargo pulp temperature. Temperatures are recorded and presented to the national authorities at the destination prior to the release of the cargo. If the Cold Treatment protocol requirements are fulfilled, the national authorities will grant import approval.

## High Value Pharmaceuticals

The pharmaceutical industry is a global industry with a steadily increasing demand for reefer container transportation. Pharmaceutical transport often involves high-value cargoes. Hapag-Lloyd applies a special high-value process for all reefer cargo exceeding a value of USD 500,000 per container. Within this process a dedicated expert team consisting of container engineers, cargo and insurance specialists evaluate the feasibility of each high-value business prior to acceptance to ensure safety precautions are met.



# Reefer cargo handling

## While preparing your refrigerated transport we recommend you consider:

- the optimal temperature requirement
- the fresh air ventilation requirement (in cbm/hour)
- the transport time
- the practical shelf life of the product
- the volume of cargo
- the packaging materials and cartons used
- the recommended stowage pattern
- the required documentation, including legislative requirements

## Before and during stuffing we recommend you consider:

- the container is set at the optimal temperature and ventilation levels
- cargo is never stowed above the red load line
- cargo is stable and evenly stowed (weight should be distributed evenly for maximum stability and the entire floor should be covered)
- the total cargo weight does not exceed the maximum payload of the container
- the total weight of the container (including container, cargo, chassis and genset) does not exceed the road limitations in any country crossed during transport

- if cargo is palletized dunnage material placed in the centre channel between pallets can avoid shifting cargo
- cargo is blocked and braced as necessary
- frozen or chilled cargo requirements are followed

## For frozen cargo:

- pre-freeze cargo before stuffing
- ensure that fresh-air ventilation is CLOSED

## For chilled cargo:

- pre-cool cargo before stuffing
- set unit at carrying temperature, not lower (a lower set point will not improve the cooling process and may damage cargo)
- set fresh air ventilation as required

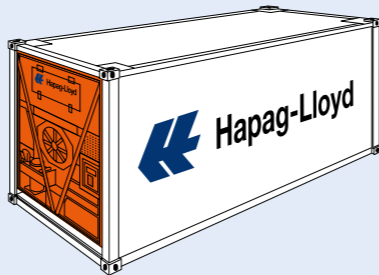
# Technical details

If you have any queries on reefer business, please contact your Hapag-Lloyd sales representative or the nearest Hapag-Lloyd office. For more detailed advice on the packing of refrigerated containers please consult our Container Packing brochure (available on our website in the press and media/publications section). We are present in 112 countries to meet your needs. For contact details of our almost 600 offices worldwide please visit:

[www.hapag-lloyd.com](http://www.hapag-lloyd.com)

## Refrigerated Container 20'

Dimensions vary from series to series.  
Further details on our website: [www.hapag-lloyd.com](http://www.hapag-lloyd.com)



Construction	Inside dimensions					Weights	
8'6" high  Steel frame, sandwich walls	Length	Width	Height	Max storage height	Capacity	Tare weight	Max payload
	mm	mm	mm	mm	m³	kg	kg
	5,529	2,316	2,331	2,290	29.9	2,960	27,520

## High Cube Refrigerated Container 40'

Dimensions vary from series to series.  
Further details on our website: [www.hapag-lloyd.com](http://www.hapag-lloyd.com)



Construction	Inside dimensions					Weights	
8'6" high  Steel frame, sandwich walls	Length	Width	Height	Max storage height	Capacity	Tare weight	Max payload
	mm	mm	mm	mm	m³	kg	kg
	11,580	2,290	2,543	2,505	67.44	4,150	29,850

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