

CARGO ON BOARD REEFER VESSELS AND IN REEFER CONTAINERS

A continuous adaptation to changing customer demands is the key to success in the reefer business. The preferences of consumers all over the world determine the trade patterns for foodstuffs.

There are three types of cargo that dominate the reefer industry: bananas, deciduous fruits and citrus fruits. Other commodities are meat, fish, seafood, vegetables, dairy products and exotic produce. Specialised reefer ships and reefer containers carry all these cargoes, each having their own reefer characteristics. Some cargoes, such as meat, have to be kept either chilled at -1.4°C or frozen at -18°C . Other cargoes, such as fruit, have to be kept at exact temperatures ranging from 0°C to $+13^{\circ}\text{C}$ to ensure that they arrive in the best possible condition. Reefer containers are built to maintain temperatures, not to lower them, and these cargoes should therefore be pre-cooled to the optimal carrying temperature. For some chilled products, such as avocados and asparagus, there has been increasing interest in providing equipment that will adjust the composition of the air inside a container or a reefer vessel. The resulting controlled atmosphere will improve product quality, decrease dehydration and extend shelf life.

General

The main problem in the carriage of refrigerated goods is their end use. Such goods are generally destined for human consumption. Most countries have strict health and sanitary provisions prohibiting damaged cargo from being imported. The consequences of contaminated cargo can be disastrous, as it may not only be very difficult to dispose of the cargo, but also very costly both for the company and the P&I insurer.

Whilst the problems involved in the carriage of reefer cargo are numerous, the main causes of damage are:

- Malfunction of the reefer machinery
- Deviation from the required cooling temperature
- Improper stowage preventing proper air circulation

Other causes: Cargo shift, poor packaging (cartons), contamination/taint damage, fuel oil due to corroded piping (brine), harvest problems, lack of proper pre-cooling, defrosting, stowage and breakdown of compressor/machinery and the reefer plant.

The consequential damages are:

- Premature ripening of fruit, or
- Thawing damage to meat and fish products

LOSS PREVENTION

Written instructions should always be obtained from the shipper prior to loading refrigerated cargo. These instructions should include details of pre-cooling, carriage temperature (only set point can be controlled), ventilation and stowage requirements (where applicable). The Master should not, however, accept carriage instructions that the vessel will not be able to comply with. Should the Master have any doubt about the instructions, he/she should

- Query the instructions in writing
- Ask for specific confirmation that they are correct

This is very important, as even the slightest variation in the carrying temperature may result in a substantial claim. If in any doubt, the local P&I correspondent should be called in to assist.

The Master should obtain a certificate from a class surveyor or other competent expert prior to loading refrigerated cargo on board the vessel. This should confirm the condition and suitability of the refrigeration machinery and reefer compartments for the carriage of the specific cargo in question. For containers, pre-trip inspections should be carried out.

The carrier must show compliance with the carriage instructions and needs to ensure that proper documentation regarding the carriage can be presented in case of a claim or cargo problem.

Pre-shipment origin

- Harvest problems, lack of proper pre-cooling of cargo, defrosting and stowage
- Packaging

Things to consider

- Follow “frozen” or “chilled” cargo specifications as required
- For CA (controlled atmosphere) the carriage instructions should give the recommended gas levels for oxygen and carbon dioxide
- Ensure floor and drains are free of debris
- Arrange stowage mode to optimise vertical cooling
- Ensure weight is distributed evenly in container for maximum stability
- Do not load beyond the end of the T-floor or to the ceiling
- Cargo is to be stowed in cargo holds with vertical air supply and good air circulation. Reefer containers are often stowed by shippers, but otherwise it is important to follow shippers’ instructions and allow for proper air flow
- If palletised, place dunnage in centre channel/”chimneys” between pallets
- Block and brace cargo as necessary
- To cool down the cargo holds, full capacity of the reefer equipment is needed during the first 24 hours and then set on carrying temperature
- For containers, set air vent (for chilled cargo) as per instructions or ensure air vent is closed (for frozen cargo)

LESSONS TO BE LEARNED

A container vessel carried a number of reefer and other containers. Following very heavy weather and a lot of water on deck, there was a power failure on board affecting approximately 130 reefer containers. The reefer containers contained several perishable, frozen and chilled cargoes. Owners immediately contacted the Club, which in turn contacted a reefer/cargo expert. Information regarding the nature of the cargo in all the containers, their monitored temperatures and the carriage instructions were passed to the expert. All the affected reefer container sockets and circuit breakers were repaired or changed by the crew while at sea. On the basis of the information passed to the expert, he was able to recommend a prioritised sequence of repair, according to which cargo was most susceptible to damage within a short time. It took the crew a few days to re-plug all the containers, but in the end there was no claim.

This shows that in case of problems with the reefer system it is important to obtain the necessary assistance from a reefer expert and to contact the P&I club as soon as possible. This may help the carriers in avoiding cargo losses and reject cargo claims.

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