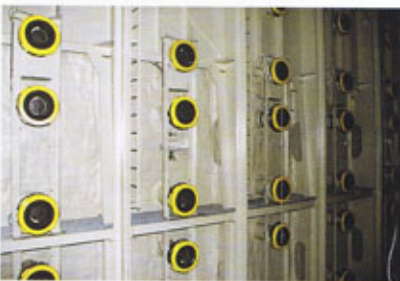




## Tailor-made refrigerated container vessel for Canary Islands trade



Air slots to blow air under the pallets.



Patented Greenco Clips in aft hold.

The latest addition to the fleet of Naviera Pinillos is a dedicated vessel for the transport of bananas and fruits from the Canaries to the Spanish mainland and citrus, frozen and dry cargo on the way back. The vessel is essentially a conventional container ship, with refrigeration capability in all its six holds. The vessel is equipped with a tailor-made refrigerating system from Greenco Marine. The 758 TEU vessel has been built at the De Hoop shipyard in Lobith, the Netherlands.

### Container flatracks for cargo stowage

The design concept developed together with De Hoop envisages that the produce carried in the five forward holds are stowed on container flatracks. Cooled air is circulated vertically down the transverse bulkheads to deck level, then longitudinally under the pallets on the flats, before passing through the cargo. Conventional flatracks, as well as 20 ft and 40 ft containers, can be used thanks to the Greenco

gratingless concept. The air distribution system, which has been specially designed by Greenco Marine for this vessel, provides for 80 air circulations hourly.

### Porthole refrigeration for aft hold

In contrast to the five forward holds, the single hold situated aft is equipped with a blown-air cooling system also designed by Greenco Marine for refrigerating up to 42 TEU porthole containers. Using special insulated containers in conjunction with the blown-air duct system installed onboard, allows cargo to be carried at temperatures down to  $-25^{\circ}\text{C}$ .

Pinillos opted for the porthole arrangement largely because of this system's greater economy, when compared with integral containers. The latter, however, can be carried on deck, for which Greenco Marine provided 48 plugs connected to the Greenco Governing System for monitoring of temperature and status of each container.



The porthole containers are located in the hold behind the deckhouse.



19" Colour screen for monitoring and control of the refrigerating plant.

### Greenco IDAC system™

The Greenco Intelligent Delivery Air Control system (Greenco IDAC system™) is the latest variety of direct expansion systems, allowing for 15% improved energy efficiency compared to conventional direct expansion systems, at a reduced investment. This system controls the delivery air temperature of an aircooler by varying its refrigerant contents, using a motor-operated expansion valve. Next to the considerable energy savings, it also reduces the total refrigerant contents of the plant. The aircooler contains the most refrigerant at full load and the least refrigerant at part load. With conventional systems, the contents are increased at part load, which unnecessarily increases the total refrigerant charge of the system.

### Computer controlled

Efficiency and safety are further enhanced by a Greenco developed, state of the art computer control system, the Greenco Governing System. In addition to the micro processors with display on each of the compressor units, there are micro processors for temperature control, CO<sub>2</sub> control, humidity control and refrigerant detection, all linked together in a network. Using a 19" colour screen with PC-keyboard, the operator can monitor and control the entire refrigeration system.

### Features

- Temperature range:
  - holds 1 to 5: +4°C...+15°C
  - hold 6: -25°C...+15°C
- Air circulation:
  - holds 1 to 5: 80 circulations per hour
  - hold 6: 30 or 60 circulations per hour
- Fully automatic operation, computer controlled, classification 'unmanned engine room'
- Refrigeration system: Greenco IDAC system™ (R22 direct expansion)
- Three screw compressor condensing units
- Seawater cooled shell and tube condenser, Cu/Ni 90/10 tubes and bronze water boxes
- Shell and tube type economiser

### Vessel details

Name: Carmen Dolores H.  
 Owner: Naviera Pinillos S.A., Madrid, Spain  
 Yard: Shipyard De Hoop Lobith, the Netherlands, NB 355  
 Deadweight: 10,425 dwt  
 Container capacity: 758 TEU (286 TEU in holds, 472 on deck)  
 Classification: Germanischer Lloyd, KAZ notation



### Greenco Marine

P.O. Box 205  
 5201 AE 's-Hertogenbosch  
 The Netherlands  
 Telephone +31 73 203111  
 Fax +31 73 210340  
 Telex 50147 gren nl