

Service Bulletin

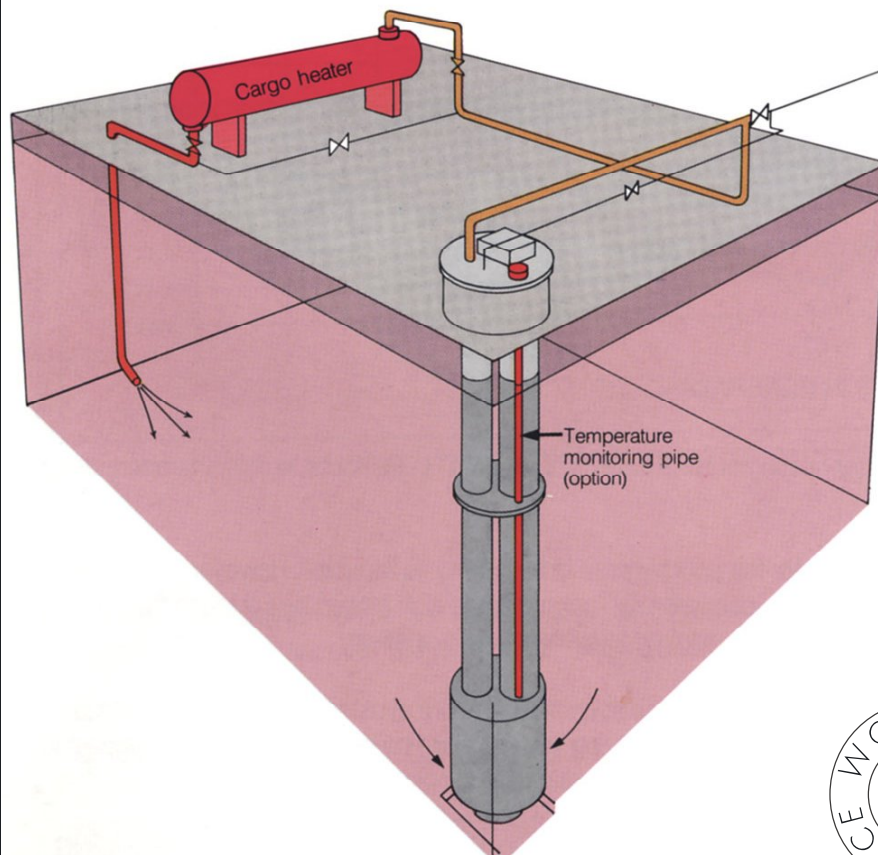
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Cargo Heating



OPERATIONAL ADVICE

Heating by means of deck mounted heat exchangers and forced circulation by Framo submerged cargo pumps.



Advantages

- Small heating surface
- High efficiency
- Easy maintenance

Good mixing of hot/cold cargo in tank

- "Clean" tank surface
- Easy tank washing





DEAR FRAMO - CUSTOMER

SYSTEM ADVANTAGES COMPARED TO COILS IN TANK

- “Clean” tank surface – easy tank washing.
- The heater is only exposed to cargo when heating is required.
- Easy maintenance – on deck only.
- Forced circulation and high velocity of cargo through heater means lower surface temperature and risk of carbonising avoided.
- Easy regulation of temperature in each tank.

HEATING REQUIREMENTS IN GENERAL

Most systems are designed for heating of HFO from 44°C to 66°C in 96 hours, ambient temperature of air 2°C and sea 5°C.

Very few cargoes require heating for the only purpose of becoming “pumpable”. However, on a tanker where pumps are situated in a pump room, viscous cargo creates high friction loss through the suction lines, and heating (reducing viscosity) is required to overcome this problem.

The Framo pump is submerged in the cargo, so such problems are avoided. Rather viscous cargo can be pumped, although at reduced capacity. Heating can therefore be limited to the extent requested by receiver, or to those few cargoes, which are not “pumpable” in cold condition.

HEATING IS EXPENSIVE, SO THE SAVINGS ACHIEVED BY FASTER UNLOADING BY REDUCING VISCOSITY, ARE FAR LESS THAN THE MONEY SPENT ON HEATING.

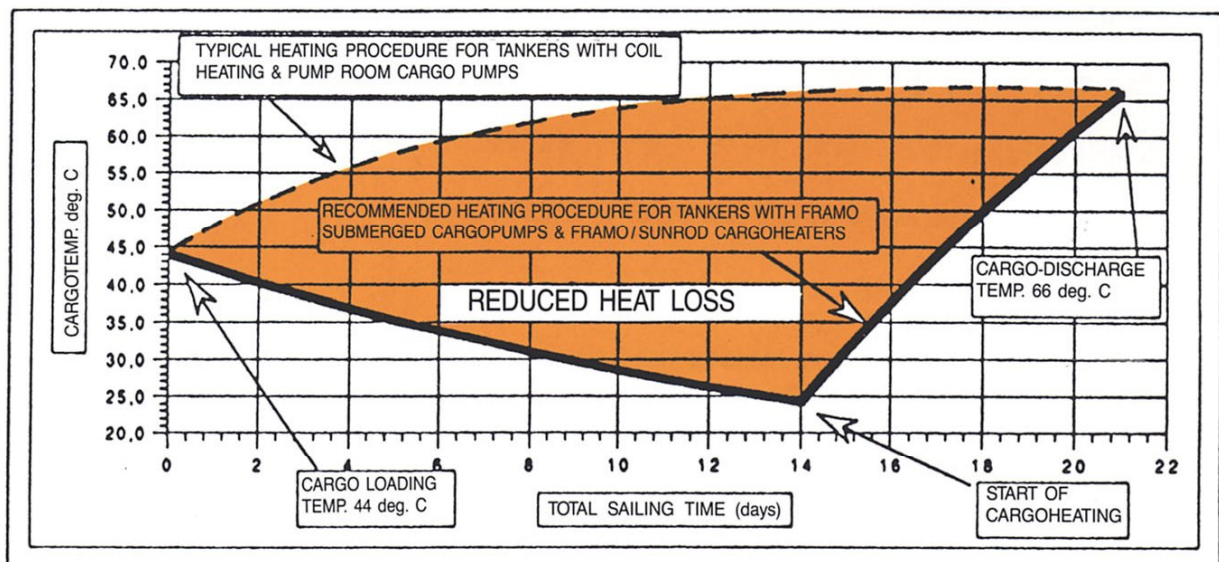


OPERATION OF THE HEATING SYSTEM

MINIMISE HEATING DURING VOYAGE - SAVE ENERGY.

Heat loss is basically proportional to the temperature difference between cargo and ambient air/sea. Permit drop in temperature at beginning of the voyage either by no heating or use exhaust gas boiler only, and then raise temperature in due time prior to arrival at port/discharging. When no heat is being introduced to the cargo, the drop in temperature will be 1 - 2 °C per day (24 h) only. Most heating systems are designed to raise temperature by 5 - 6 °C per day. (Refer data in the Framo Instruction Manual).

The diagram below is showing two different heating procedures. Cargo is received on board at 44 °C, delivered at 66 °C, sailing time 21 days.



Assuming the diagram refers to a 40.000 tdw product carrier, heating according to proposed procedure gives a saving of more than 100 tons of fuel compared with the procedure indicated by the dotted line.

RUN THE HYDRAULIC SYSTEM ECONOMICALLY DURING CARGO CIRCULATION

Running cargo pumps for circulation through heaters require hydraulic pressure of 40 - 60 bar. Many vessels are equipped with "low pressure" power packs for this purpose, but if the "main" power packs to be used, make sure that system pressure is set to correct value.



DO NOT COMBINE HEATING AND DISCHARGING

As mentioned, the cargo temperature will drop by 1 - 2 °C per day only without heating, so the temperature drop during unloading time of a tank is neglectable. Stop heating and close valves on "heating line", otherwise most of the cargo will pass through heater and into tank again.

SPECIAL CARE WITH SENSITIVE CARGOES

While oil products like HFO etc. may withstand rather high temperature of heating medium, cargoes like edible oils and vegetable oils might be damaged by high temperature.

Check available data of maximum recommended temperature of both heating medium and cargo. If any doubt - contact FMS AS.

Note that as cargo is passing the heating surface at high velocity, the temperature of heating medium can be kept higher than in coils in tank.

START / STOP OF HEATING

To avoid "overheating", never heat without correct cargo flow through heater.

START CARGO PUMP BEFORE VALVE FOR HEATING MEDIUM IS OPENED.

SHUT OFF HEATING MEDIUM BEFORE PUMP IS STOPPED.

CLEANING OF HEATERS

The heaters are fitted with connections for steam cleaning. Washing water used for tank cleaning can also be pumped through heater, however: Do not use sea water for cleaning of Framo/BENDEK heater because stainless material is very sensitive to chloride corrosion at temperatures above 60 °C.

Drain heater properly afterwards.

For any further information - please contact one of FM Service stations.



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