

CARGO HEATER

Deck Mounted Wave
Type Cargo Heater



KWANG SAN

CARGO HEATER IN GENERAL

- **SAVING ENERGY**

The cargo heaters expect 15~25% of energy saving higher than other conventional type of heaters and saving approximately 30% than conventional heating coil systems.

- **SAVING CLEAN TANK WITH SHORTENS TANK WASHING TIME**

No heating coils in tanks of which offers a quite clean with shortens the washing time.

- **SAVING LIGHT WEIGHT**

The weight comparing between heater and conventional heating coil for example, 5000 cargo oil tank in weight of which gives approximately of light weight

- **SAVING EXPENSES OF INSTALLATION AND REPAIR MAN-HOUR**

Comparing to conventional heating coil, the man-hour cost could save approximately 80% of which means not only saving man-hour cost but also repair expenses by both shipbuilders and ship owners.

- **SAVING FROM VARIOUS DAMAGES WHILE SHIP'S CONSTRUCTION**

The damages, like a paint in the cargo oil tanks and a metal drop from deck to heating coils while ship's construction, can be avoided.

- **SAVING A PAINT LIFE IN BALLAST TANKS.**

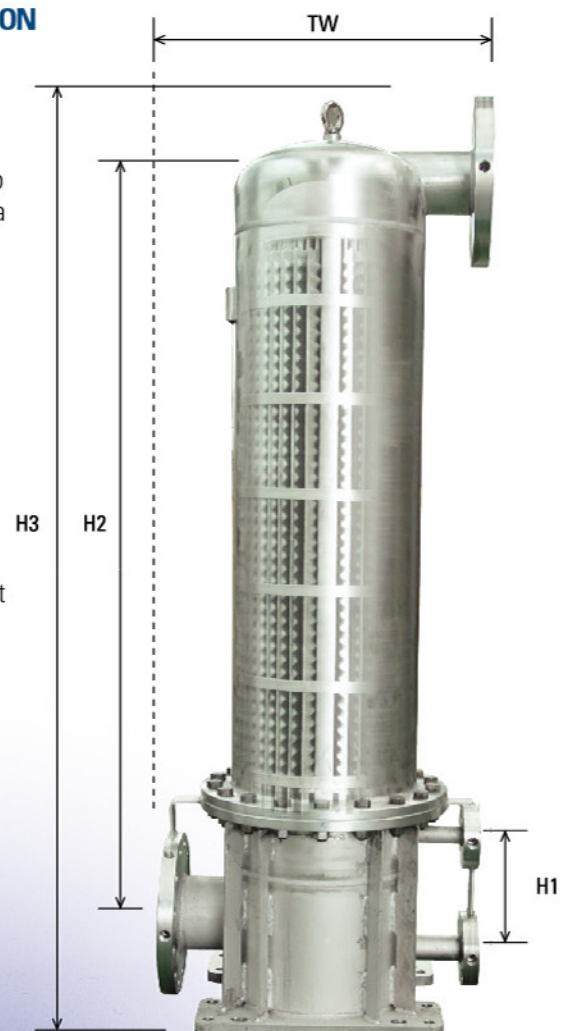
In case of conventional heating coils installed in cargo oil tanks which mean no ballast water in the tanks, the paint in overhead of the ballast tanks will have a paint damage gradually due to cargo heating during heating of which will be needed a repair expense a lot by ship owner lately.

CARGO HEATER IN GENERAL

Heat loss is basically proportioned to the temperature difference between cargo and ambient air/sea water.

The cargo temperature drops at beginning of the voyage, and generally exhaust gas boiler is only used.

Then raise temperature in due time prior to arrival at port to discharge. Without heating, the temperature drop will be 1~2 °C per day (24hrs), and most heating systems are designed by raise temperature by 5~6 °C per day.



WHY KWANG SAN'S CARGO HEATER?

• MAXIMIZED HEAT TRANSFER WITH MINIMIZED ΔP OF CARGO SIDE

- 1) Counter flow direction between heating media and cargo which offers the best way of a heat transmission in thermodynamics.
- 2) The heat plates consisted like waves of which offers maximized heat transfer with minimized a pressure drop.
By means of the special design, the Kwang-san Heaters will save approximately 20% energy than other types.

• NO SHADOW AREA BETWEEN HEAT PLATES

The constant waved heat plates give no shadow area in the heater which gives easy to clean, saves cleaning man-hour and providing no contamination after cargo discharged.

• RIGID STRUCTURE AGAINST VIBRATION

Since conventional heat plate type exchangers have been troubled due to both ship's vibration and cargo/steam flows.

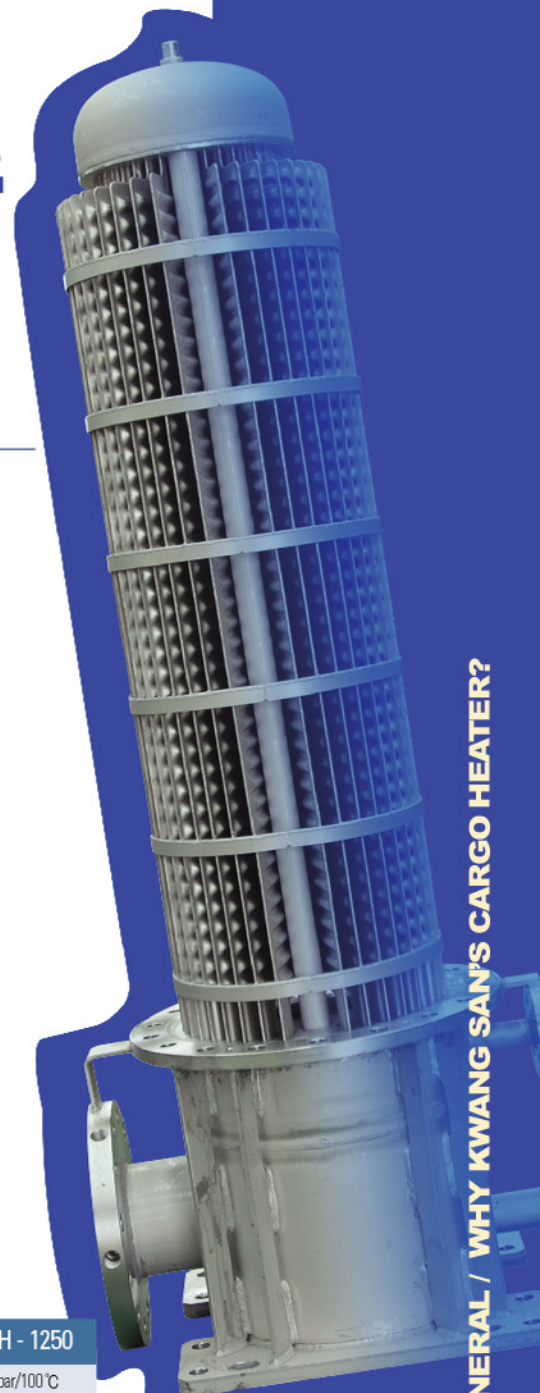
The waved plate offers the best countermeasure against not only ship's vibration but also cargo/steam flows providing by ;

- 1) Six pieces of guards around heat plates provided
- 2) Top guard between bundle and shell head provided
- 3) Bottom and top guards between bundle and bundle seat provided

• EASY TO INSTALL

The heater is a shape of cylinder with a 2 parallel seat of which gives easy to install by fastening bolts and nuts at a designated position onboard.

Model. no	KCH - 200	KCH - 360	KCH - 500	KCH - 700	KCH - 1250
MAX. P/TEMP. CARGO SIDE	14bar/100°C	14bar/100°C	14bar/100°C	14bar/100°C	14bar/100°C
MAX. P/TEMP. HEATING MEDIUM SIDE	10bar/185°C	10bar/185°C	10bar/185°C	10bar/185°C	10bar/185°C
LENGTH OF STEAM ELEMENT PLATE	1078mm				
NUMBER OF ELEMENTS	16EA	20EA	24EA	36EA	54EA
HEATING SURFACE	5.3m ²	6.8m ²	8.4m ²	12.4m ²	17.8m ²
MATERIAL	316L				
HEATING MEDIUM TYPE	SATURATED STEAM OR HOT WATER				
"TW" TOTAL WIDTH	280mm		600mm		700mm
"W" WIDTH	Ø318.5mm		Ø355.6mm		Ø406.4mm
"H1" HEIGHT	175mm		222mm		222mm
"H2" HEIGHT	1331.8mm		1391.2mm		1351.1mm
"H3" HEIGHT	1593mm		1688mm		1648mm
TOTAL WEIGHT DRY HEATER	148kg	177kg	276kg	321kg	368kg
COVER WEIGHT	57kg	57kg	68kg	68kg	74kg





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