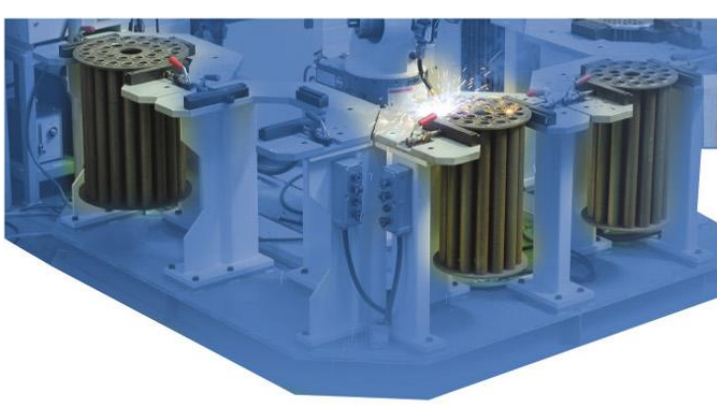


FLAT HEATER

Previously Called BEND HEATER

Pioneer in Oil Heating System not only
Marine but also Industrial use





FLAT HEATER

FLAT HEATER

APPLICATIONS OF FLAT HEATERS

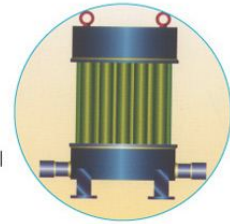
● CARBON STEEL MADE FLAT HEATER

For Marine use : HFO(Bunker oil), Sludge oil, Lubricating oil and Cargo oil tanks.

For Land use : Storage tanks like Crude oil, HFO(Bunker oil), Chemical storage, mainly oil refinery plant

● STAINLESS STEEL MADE FLAT HEATER

Applicable keeping a Constant and Raising a temperature between Cofferdams of cargo holds in LNGC

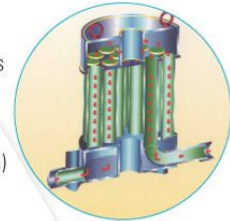


FUNCTIONS OF FLAT HEATER

- **The principal of FLAT** is to heat external fluid by saturated steam (or hot water) which is supplied by means of a Inlet nozzle and goes up to the top chamber by one supply pipe then the top chamber distributes saturated steam (or hot water) to the remain down comer pipes and the steam (or hot water) is gathering into the bottom chamber. Between these two fluids (HFO and Saturated steam) make COUNTER FLOW of which is the best way in the heat exchange theory. By this process the external fluid repeats convection and conduction.

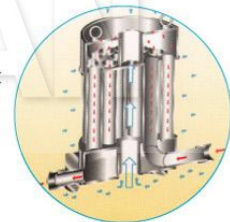
- **FLAT HEATER** maintains or raises the external fluid of 40-60 °C depends upon heating ratio calculated by saturated steam or hot water.

- **FLAT HEATER** can be replaced existing conventional heating coil of which needed costly Manpower and spacious Installation area with a lower efficiency of heat exchange.



ADVANTAGES OF FLAT HEATER

- The heater saves Installation labor cost not only Minimum 40% (Korean shipyards base) but also saves subsidiary materials of welding during the installation than conventional heating coil.
- Both Series and Parallel connections are available.
- Easy removing a solid residue from HFO for a long time loading because of having a wide gap of 18-20mm between the heat pipes.
- No clogging from a residue of HFO because of having a larger hole in the top and bottom steam chambers.
- Easy inspection and maintenance because of collective locations of welding are in the heater.



FOR MARINE USE

• SLUDGE TANK • CARGO TANK • HFO TANK • LNG COFFERDAM(S.S material)

DIMENTION OF FLAT HEATERS, CARBON STEEL MATERIALS

- These heaters offer 18 models in 3 groups based on outer Diameters (D) and Height (H) and can be selected by Heating Ratio of the tank.

DIMENSIONS OF KSFH HEATERS, CARBON STEEL MATERIALS [50A RISER & DOWN COMERS]																
SURFACE AREA(m ²)	KSFH35C MODELS				KSFH45C MODELS				KSFH60C MODELS				EqV.Length			
	W mm	D mm	H mm	WEIGHT KG	W mm	D mm	H mm	WEIGHT KG	W mm	D mm	H mm	WEIGHT KG	40A M	50A M		
1.5	560	368	734	83	642	470	808	154	850	622	878	275	9.8	7.9		
2.0			997	103									558	115	13.1	10.5
2.5			683	134									16.4	13.2		
3.0													513	177	19.6	15.8
3.5													586	196	22.9	18.4
4.0													659	216	26.2	21
4.5													732	235	29.5	23.7
5.0													805	255	32.7	26.3
5.5													36	28.9		
6.0													951	294	39.3	31.6
6.5													1024	314	42.6	34.2
7.0													1097	333	45.8	36.8
7.5													1170	353	49.1	39.5
8.0													1243	373	52.4	42.1

※ other models are available on the request.

- These heaters offer 20 models in 3 groups based on outer Diameters (D) and Height (H) and can be selected by Heating Ratio of the tank.

DIMENSIONS OF KSFH HEATERS, CARBON STEEL MATERIALS [40A RISER & DOWN COMERS]															
SURFACE AREA(m ²)	KSFH-35C MODELS				KSFH-45C MODELS				KSFH-60C MODELS				EqV.Length		
	W mm	D mm	H mm	WEIGHT KG	W mm	D mm	H mm	WEIGHT KG	W mm	D mm	H mm	WEIGHT KG	40A M	50A M	
1.5	560	368	625	80	642	470							9.8	7.9	
2.0			781	105									13.1	10.5	
2.5			937	120									16.4	13.2	
3.0			1092	150									19.6	15.8	
3.5															
4.0							805	119					22.9	18.4	
4.5							914	155			600	200	26.2	21	
5.0							1023	173			660	220	29.5	23.7	
5.5											721	240	32.7	26.3	
6.0											782	260	36	28.9	
6.5											842	275	39.3	31.6	
7.0											903	290	42.6	34.2	
7.5											964	310	45.8	36.8	
8.0											1024	330	49.1	39.5	
8.5											1085	350	52.4	42.1	
9.0											1146	365	55.7	44.7	
											1206	380	58.9	47.4	
											1267	400			

※ other models are available on the request.



50A RISER & DOWN COMERS



40A RISER & DOWN COMERS

DIMENTION OF FLAT HEATERS, CARBON STEEL MATERIALS

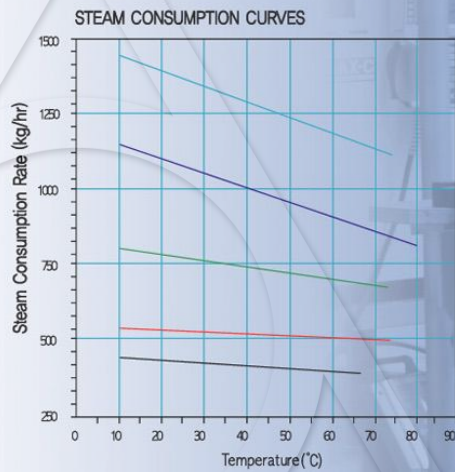
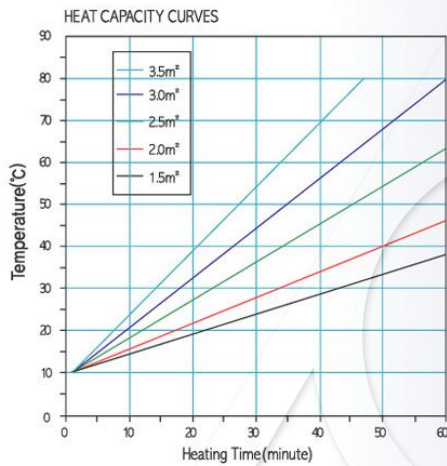
- K S F H 35 C 15 40A



FOR LAND USE

• CRUDE OIL STORAGE TANK • HFO STORAGE TANK • CHEMICAL OIL STORAGE TANK • OIL REFINERY PLANT

PERFORMANCE CURVES



Test Condition

- Test Time : 60Min
- Steam Pressure : 7kgf/cm²
- Test Fluid : Water
- Supply Steam Temp : 169.6 °C
- Test Tank Volume : 6.9m²

KWANG SAN



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