

# SHELL & TUBE HEAT EXCHANGER FOR OIL, WATER, STEAM, REFRIGERANT



BRAND 3Q

# SHELL & TUBE HEAT EXCHANGER



THE SHELL & TUBE HEAT EXCHANGER IS THE MOST COMMON TYPE OF HEAT EXCHANGER WHICH USED IN THE PETROLEUM, CHEMICAL AND HVAC (HEATING, VENTILATION AND AIR CONDITIONING) PROCESS



# WATER COOLED COMPLETE SET



## WATER COOLED UNIT BY CHILLER

- CAPACITY 500 HP

### INCLUDE

- EVAPORATER
- CONDENSER
- MUFFLER
- DRIER CORE
- COMPERSOR
- PLAT HEAT EXCHANGER
- SUCTION ACCUMLATOR
- OIL SEPARATOR
- RECEIVER TANK



BRAND 3Q



# SHELL & TUBE HEAT EXCHANGER

FOR EXCHANGE OIL AND WATER

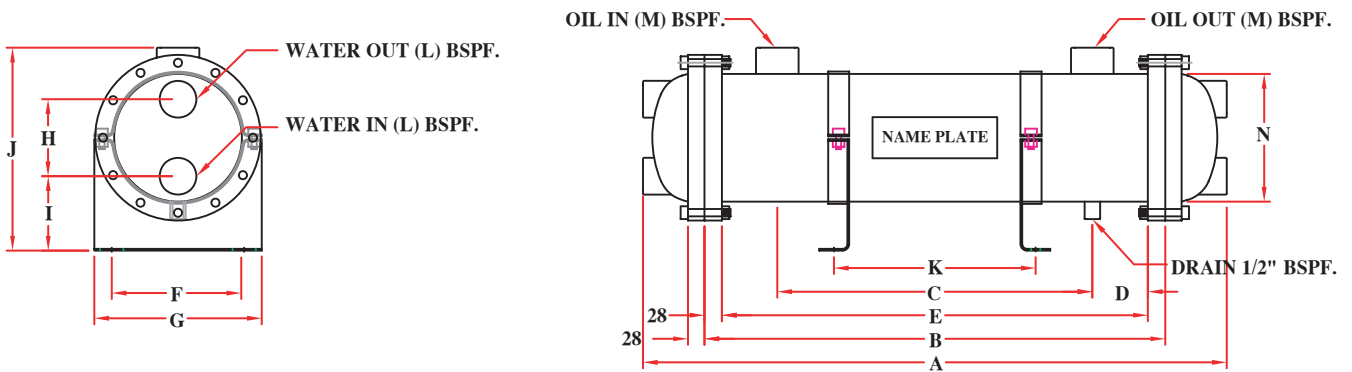


BRAND 3Q <sub>25</sub>

# SHELL & TUBE HEAT EXCHANGER

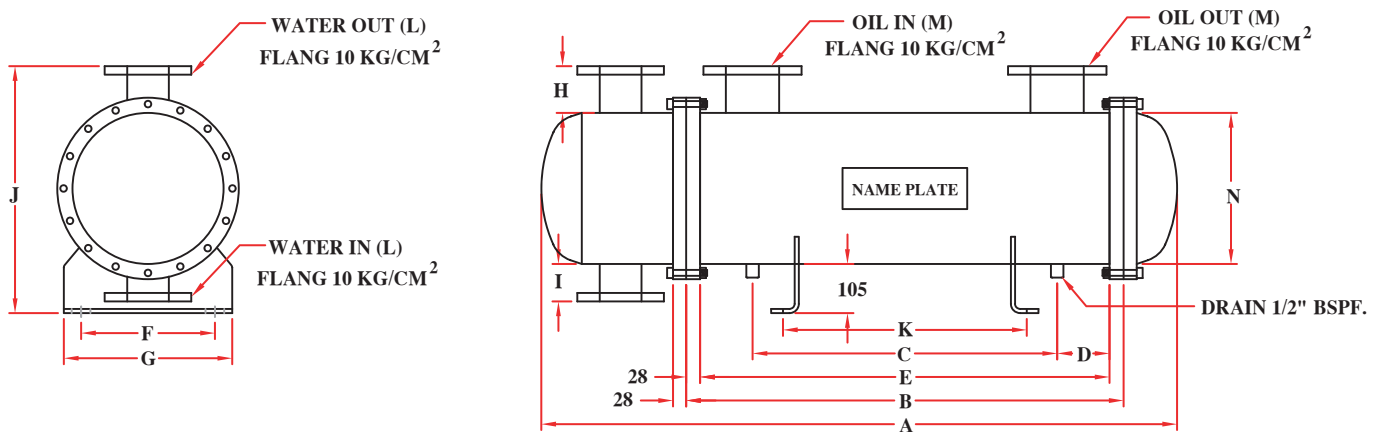
ASF 200 -10 C

- MATERIAL TUBE C = COPPER
- SIZE SHELL.....INCH ( SHELL 8 INCH )
- SURFACE AREA (FT<sup>2</sup>)
- F = LOW FIN TUBE (COPPER Ø1/2" , 26 FINS/INCH)
- AS = NORMAL OIL COOLER TYPE , FAS = MODIFIED TYPE
- BS = REMOVABLE TUBE BUNDLE OIL COOLER TYPE , FBS = MODIFIED TYPE
- HS = HEAT EXCHANGER TYPE , FHS = MODIFIED TYPE



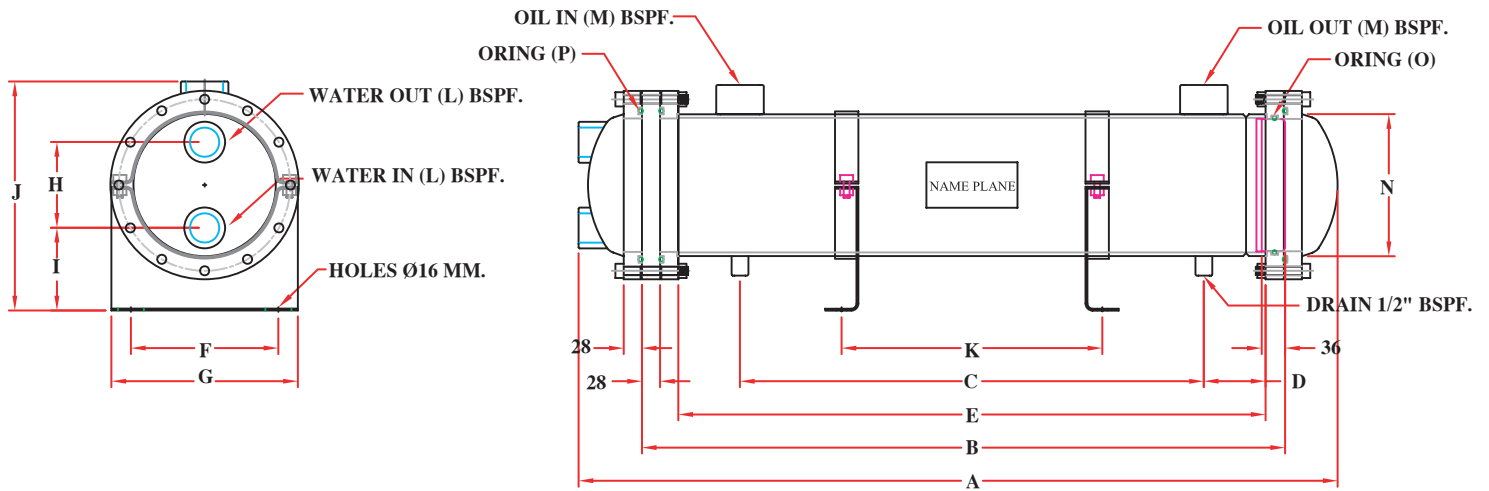
## HEAT EXCHANGER MODEL ASF ( LOW FIN TUBE )

MODEL	DIMENSION (millimetre)											DIMENSION (inch)			NO OF TUBE	HEAT TRANSFER (ft <sup>2</sup> )	APPROX WEIGHT (kg)
	A	B	C	D	E	F	G	H	I	J	K	L	M	N			
ASF 15 - 04	878	740	566	59	684	122	182	66	90	217	ADJUST SUPPORT	3/4"	1"	4 1/2"	18	15	31
ASF 21 - 04	1128	990	816		934											21	34
ASF 25 - 04	1328	1190	1016		1134											25	38
ASF 34 - 05	877	740	537	74	684	149	209	97	98	257	ADJUST SUPPORT	1"	1 1/4"	5 1/2"	40	34	48
ASF 46 - 05	1127	990	787		934											46	56
ASF 55 - 05	1327	1190	987		1134											55	65
ASF 68 - 06	1146	990	770	82	934	176	236	108	107	283	ADJUST SUPPORT	1 1/4"	1 1/2"	6 1/2"	60	68	66
ASF 82 - 06	1346	1190	970		1134											82	77
ASF 103 - 06	1646	1490	1270		1434											103	98
ASF 112 - 08	1176	990	748	93	934	227	287	132	127	348	ADJUST SUPPORT	1 1/2"	2"	8 1/2"	100	112	104
ASF 136 - 08	1376	1190	948		1134											136	115
ASF 171 - 08	1676	1490	1248		1434											171	133
ASF 231 - 08	2176	1990	1748	103	1934	286	360	174	145	413	ADJUST SUPPORT	2"	2 1/2"	10 1/2"	180	231	162
ASF 200 - 10	1200	990	728		934											200	147
ASF 242 - 10	1400	1190	928		1134											242	162
ASF 306 - 10	1699	1490	1228	1050	1434	286	360	174	145	413	ADJUST SUPPORT	2 1/2"	3"	10 1/2"	180	306	188
ASF 413 - 10	2199	1990	1728		1934											413	219



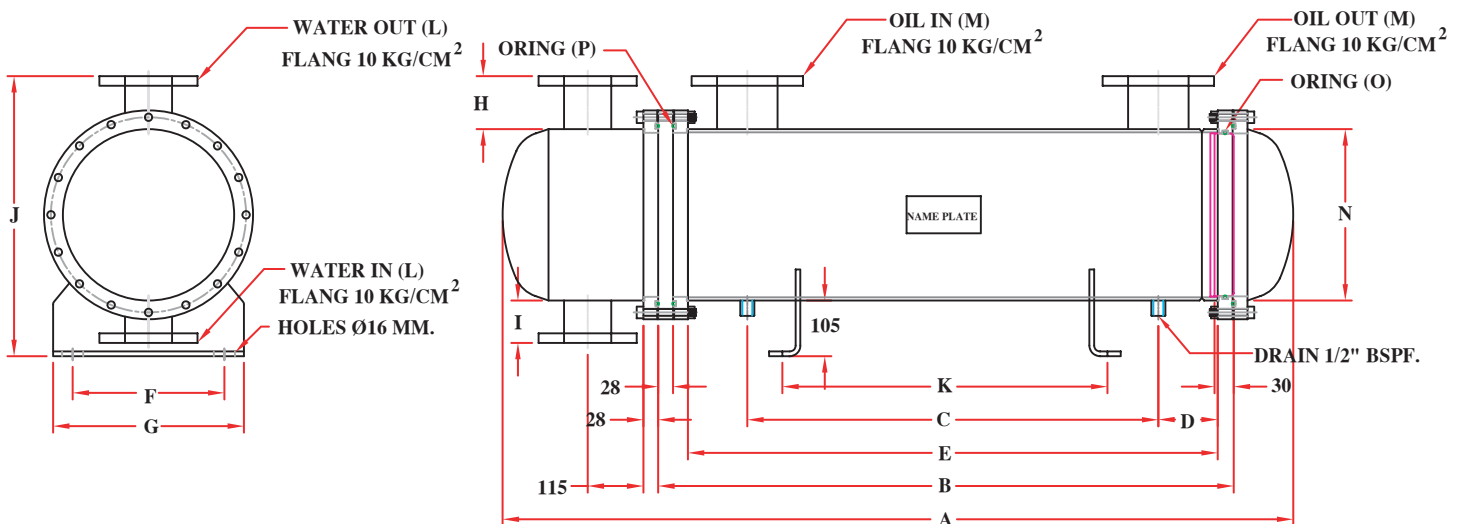
MODEL	DIMENSION (millimetre)											DIMENSION (inch)			NO OF TUBE	HEAT TRANSFER (ft <sup>2</sup> )	APPROX WEIGHT (kg)
	A	B	C	D	E	F	G	H	I	J	K	L	M	N			
ASF 358 - 12	1583	1190	914	110	1134	286	360	100	80	528	ADJUST SUPPORT	3"	4"	12"	268	358	268
ASF 453 - 12	1883	1490	1214		1434											453	310
ASF 611 - 12	2383	1990	1714		1934											611	357

# SHELL & TUBE HEAT EXCHANGER



## HEAT EXCHANGER MODEL BSF ( LOW FIN TUBE )

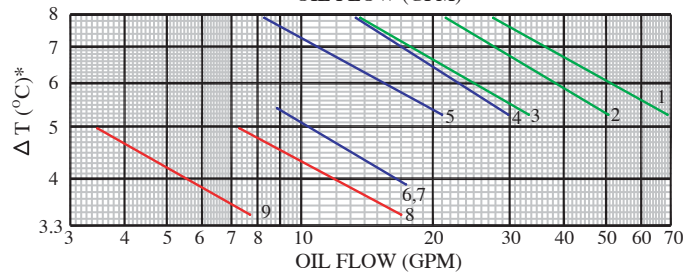
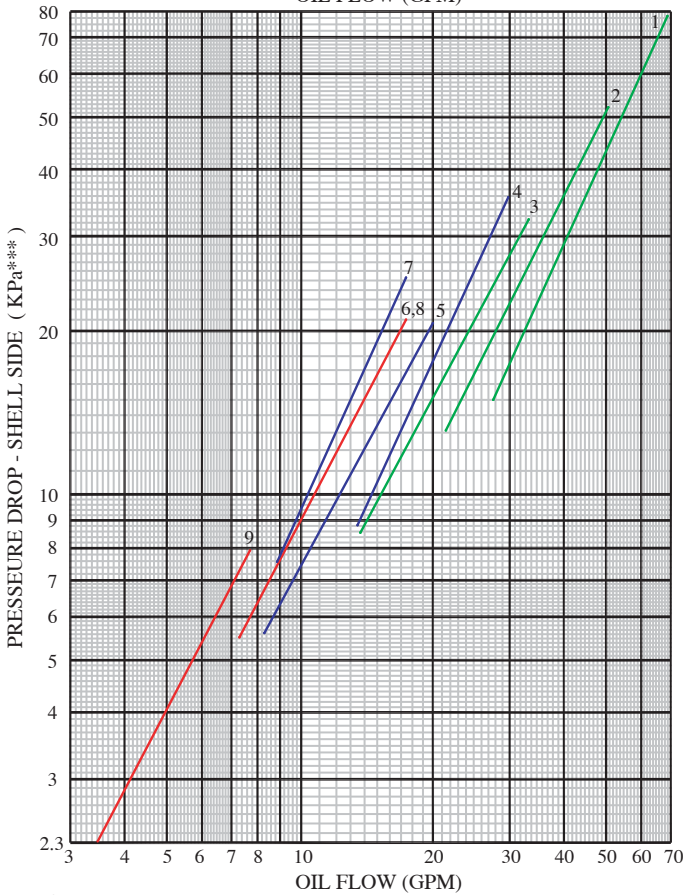
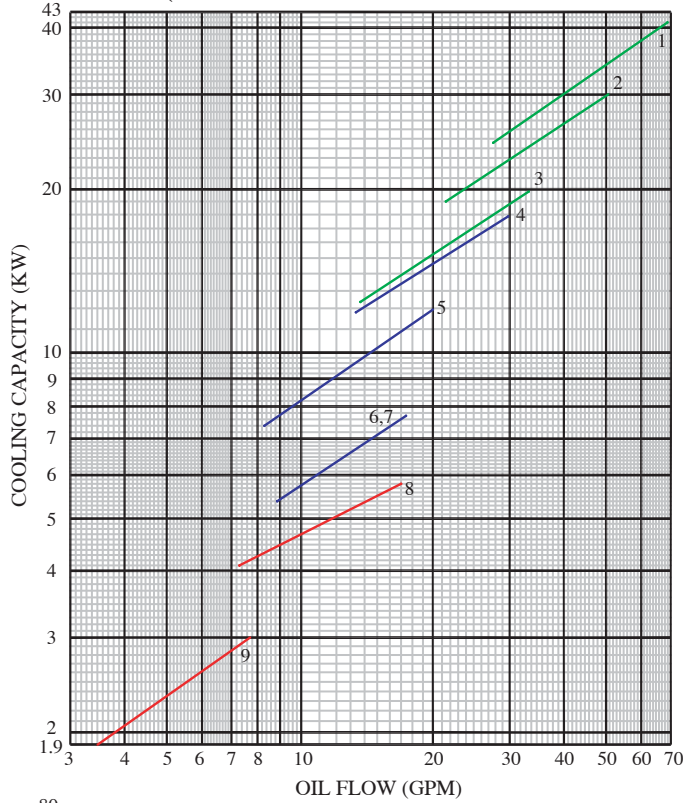
MODEL	DIMENSION (millimetre)											DIMENSION (inch)			ORING		NO OF TUBE	HEAT TRANSFER (ft <sup>2</sup> )	APPROX WEIGHT (kg)											
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P														
BSF 112 - 08	1168	990	714	95	904	227	287	132	127	353	ADJUST SUPPORT	1 1/2"	2"	8 1/2"	Ø202.57 x6.99	Ø221.62 x6.99	100	112	120											
BSF 136 - 08	1382	1190	914		1104							2"	2 1/2"							10 1/2"	Ø253.37 x6.99	Ø278.77 x6.99	180	136	132					
BSF 171 - 08	1682	1490	1214		1404							2 1/2"	3"													Ø253.37 x6.99	Ø278.77 x6.99	180	171	153
BSF 231 - 08	2182	1990	1714		1904																									
BSF 200 - 10	1198	990	698	103	904	286	360	160	152	413	500	2 1/2"	10 1/2"	Ø253.37 x6.99	Ø278.77 x6.99	180	200	169												
BSF 242 - 10	1398	1190	898		1104						700								242	186										
BSF 306 - 10	1697	1490	1198		1404						1000	306							216											
BSF 413 - 10	2197	1990	1698		1904						1500	413							252											



MODEL	DIMENSION (millimetre)											DIMENSION (inch)			ORING		NO OF TUBE	HEAT TRANSFER (ft <sup>2</sup> )	APPROX WEIGHT (kg)		
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P					
BSF 358 - 12	1585	1190	880	112	1104	286	360	100	80	528	ADJUST SUPPORT	3"	4"	12"	Ø304.17 x6.99	Ø329.57 x6.99	268	358	328		
BSF 453 - 12	1885	1490	1180		1404															453	356
BSF 611 - 12	2385	1990	1680		1904															611	410

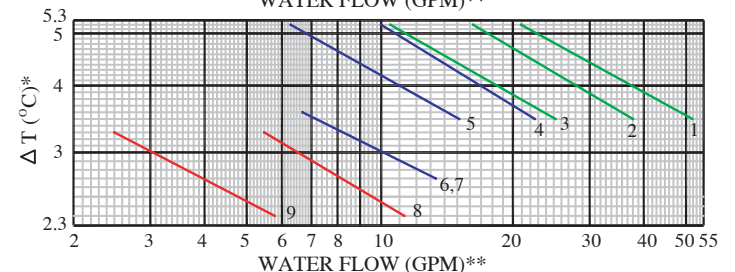
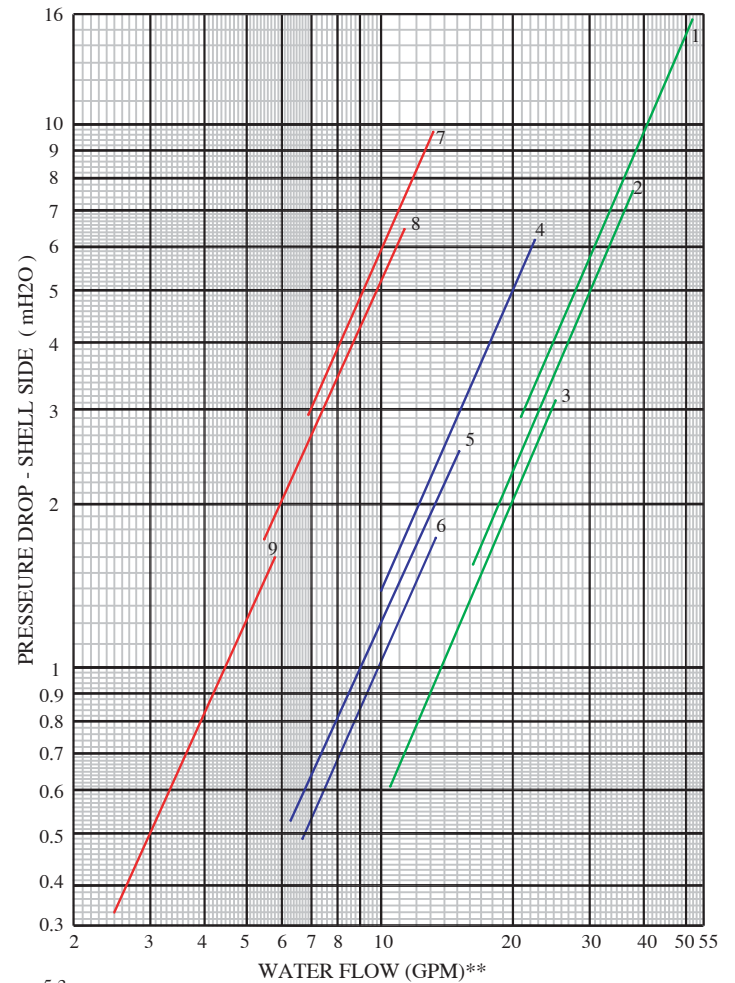
# PERFORMANCE DATA

## OIL COOLER (MODEL ASF - LOW FIN TUBE 1/2")



	Shell side	Tube side
Fluid	Hydraulic oil ISO68	Water
Flow ratio	1.5	1
Density (kg/m <sup>3</sup> )	880	994.25
Viscosity (cP)	38	0.807
Specific heat (kJ/kg.°C)	2.092	4.1832
At max flow, Temp. In/Out (°C)	50.27/45	30/33.5
At min flow, Temp. In/Out (°C)	52.87/45	30/35.2
Line 6,7 : At max flow, Temp. In/Out (°C)	48.92/45	30/32.6
Line 6,7 : At min flow, Temp. In/Out (°C)	50.42/45	30/33.6
Line 8,9 : At max flow, Temp. In/Out (°C)	48.46/45	30/32.3
Line 8,9 : At min flow, Temp. In/Out (°C)	49.97/45	30/33.3
Material	Carbon steel	Copper Low fin tube 26 fins/inch
Approximately safety factor	25%	

Line No.	MODEL	PASS
1	ASF 103 - 6C	4
2	ASF 82 - 6C	4
3	ASF 68 - 6C	4
4	ASF 55 - 5C	2
5	ASF 46 - 5C	4
6	ASF 34 - 5C	4
7	ASF 25 - 4C	4
8	ASF 21 - 4C	2
9	ASF 15 - 4C	4



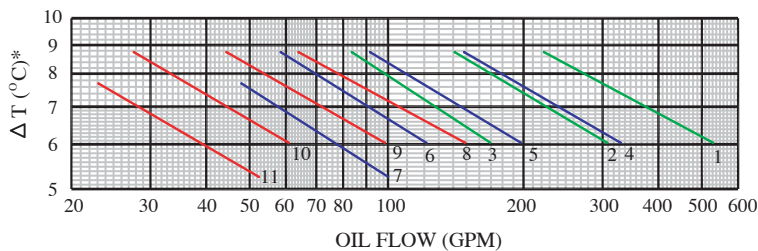
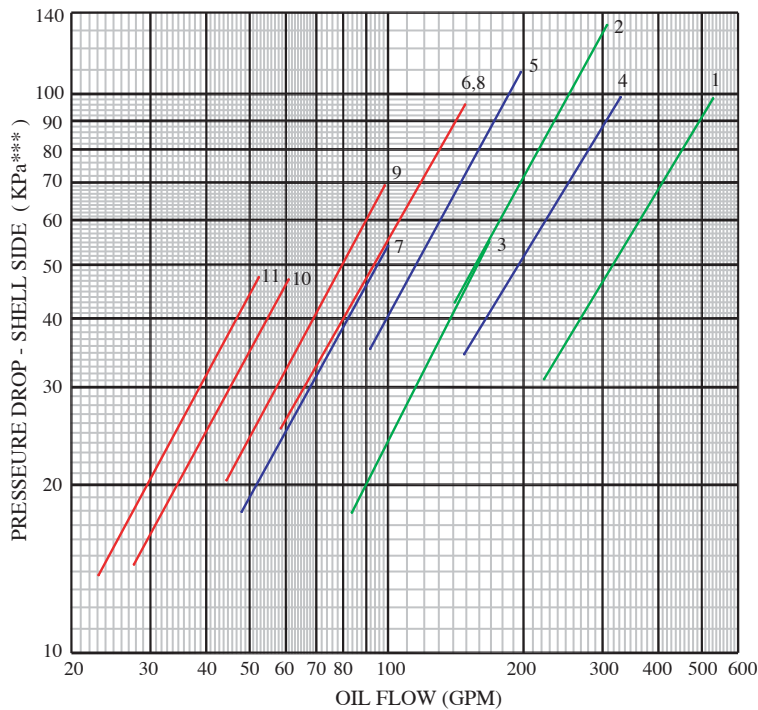
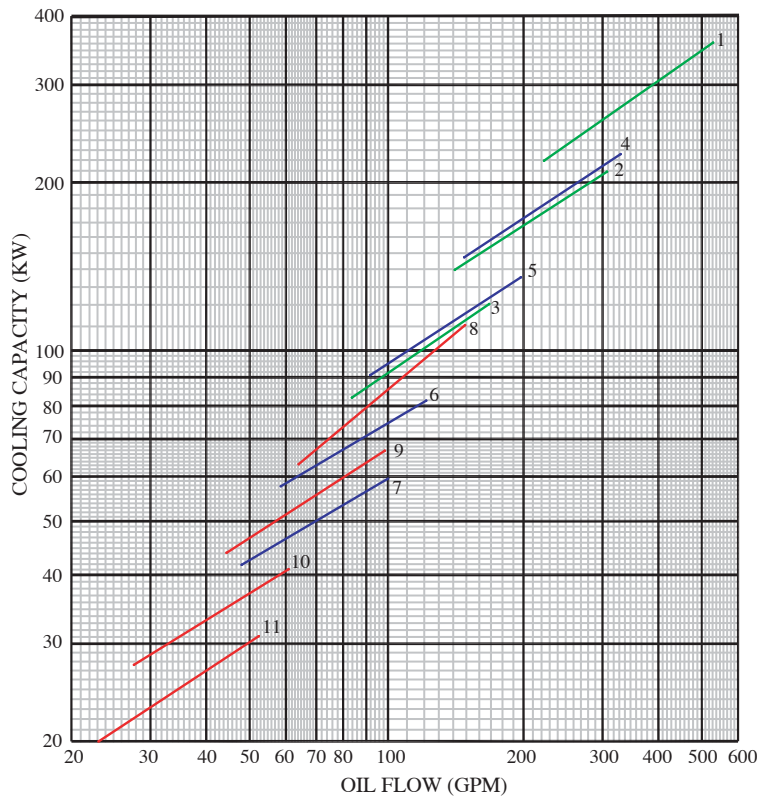
\*SHELL SIDE : TEMP IN = 45 + ΔT °C, TEMP OUT = 45 °C  
 \*\*\* 6.895 Kpa = 1 PSIG

\*TUBE SIDE : TEMP IN = 30 °C, TEMP OUT = 30 + ΔT °C  
 \*\* FLOW OIL : WATER = 1.5 : 1



# PERFORMANCE DATA

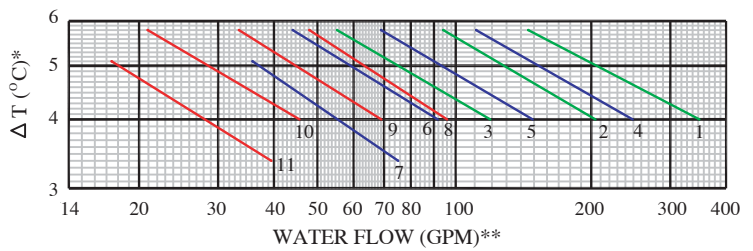
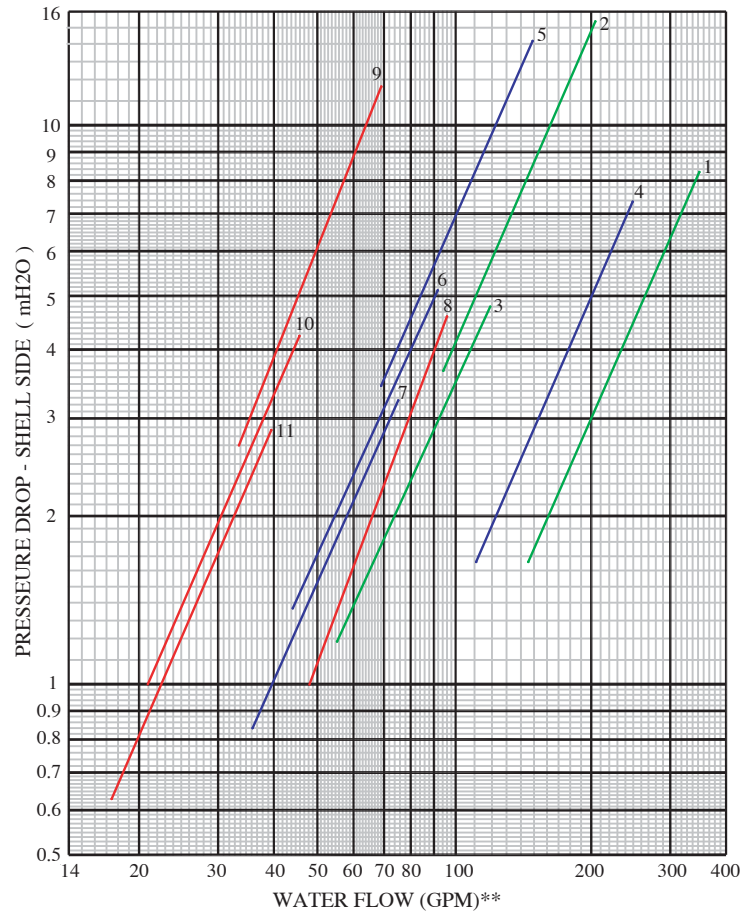
## OIL COOLER (MODEL ASF - LOW FIN TUBE 1/2")



\*SHELL SIDE : TEMP IN =  $45 + \Delta T$  °C, TEMP OUT = 45 °C  
 \*\*\* 6.895 Kpa = 1 PSIG

	Shell side	Tube side
Fluid	Hydraulic oil ISO68	Water
Flow ratio	1.5	1
Density (kg/m <sup>3</sup> )	880	994.25
Viscosity (cP)	38	0.807
Specific heat (kJ/kg. °C)	2.092	4.1832
At max flow, Temp. In/Out (°C)	51.02/45	30/34
At min flow, Temp. In/Out (°C)	53.73/45	30/35.8
Line 7,11 : At max flow, Temp. In/Out (°C)	50.27/45	30/33.5
Line 7,11 : At min flow, Temp. In/Out (°C)	52.68/45	30/35.1
Material	Carbon steel	Copper Low fin tube 26 fins/inch
Approximately safety factor		25%

Line No.	MODEL	PASS
1	ASF 611 - 1 - 12C	2
2	ASF 453 - 1 - 12C	4
3	ASF 358 - 1 - 12C	4
4	ASF 413 - 1 - 10C	2
5	ASF 306 - 1 - 10C	4
6	ASF 242 - 1 - 10C	4
7	ASF 200 - 1 - 10C	4
8	ASF 231 - 1 - 8C	2
9	ASF 171 - 1 - 8C	4
10	ASF 136 - 1 - 8C	4
11	ASF 112 - 1 - 8C	4

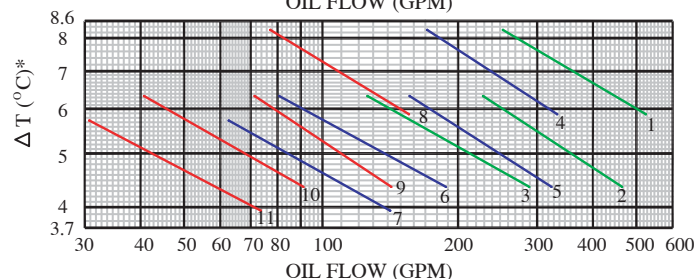
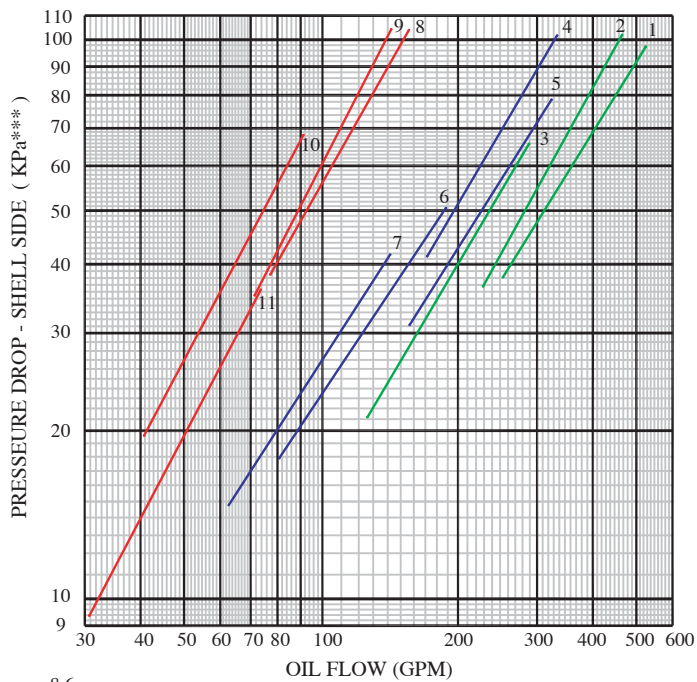
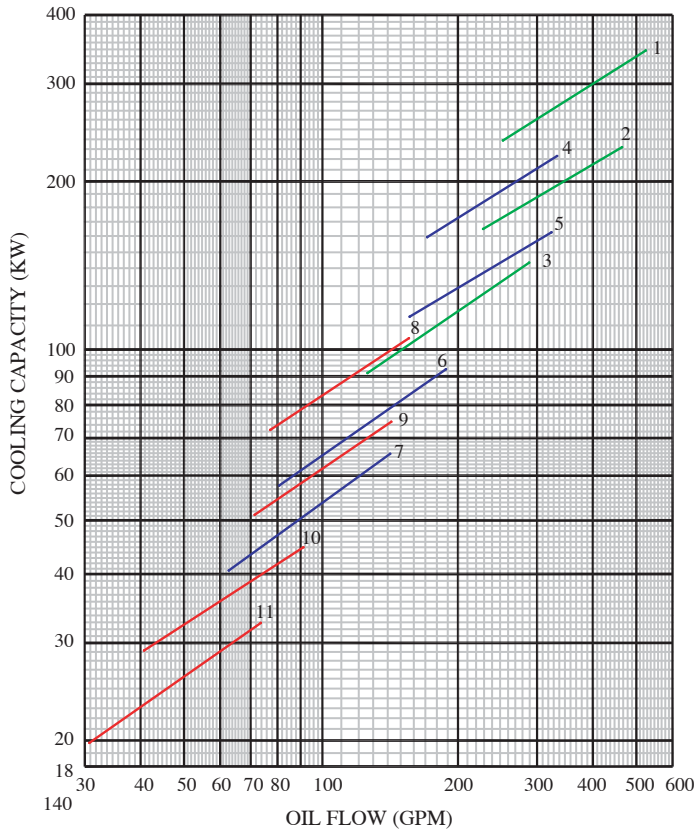


\*TUBE SIDE : TEMP IN = 30 °C, TEMP OUT = 30 +  $\Delta T$  °C  
 \*\* FLOW OIL : WATER = 1.5 : 1



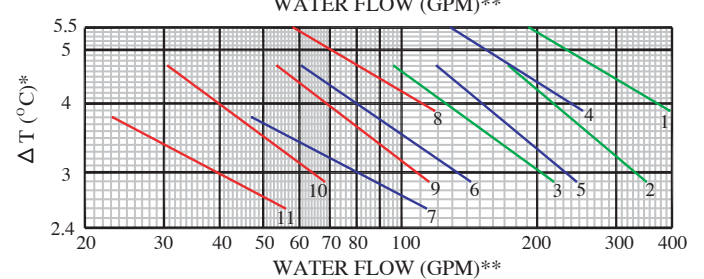
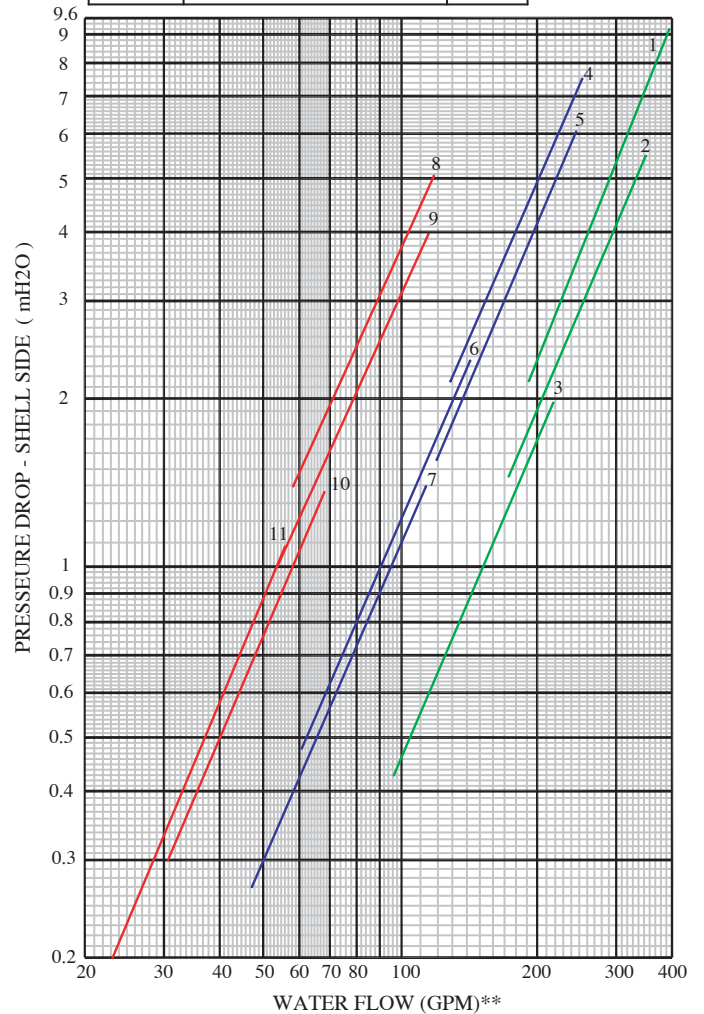
# PERFORMANCE DATA

## OIL COOLER (MODEL BSF - LOW FIN TUBE 1/2") (REMOVABLE TUBE BUNDLE)



	Shell side	Tube side
Fluid	Hydraulic oil ISO68	Water
Flow ratio	1.5	1
Density (kg/m <sup>3</sup> )	880	994.25
Viscosity (cP)	38	0.807
Specific heat (kJ/kg.°C)	2.092	4.1832
At max flow, Temp. In/Out (°C)	49.37/45	30/32.9
At min flow, Temp. In/Out (°C)	51.32/45	30/34.2
Line 1,4,8 : At max flow, Temp. In/Out (°C)	50.87/45	30/33.9
Line 1,4,8 : At min flow, Temp. In/Out (°C)	53.28/45	30/35.5
Line 7,11 : At max flow, Temp. In/Out (°C)	48.95/45	30/32.6
Line 7,11 : At min flow, Temp. In/Out (°C)	50.72/45	30/33.8
Material	Carbon steel	Copper Low fin tube 26 fins/inch
Approximately safety factor		25%

Line No.	MODEL	PASS
1	BSF 611 - 12C	2
2	BSF 453 - 12C	2
3	BSF 358 - 12C	2
4	BSF 413 - 10C	2
5	BSF 306 - 10C	2
6	BSF 242 - 10C	2
7	BSF 200 - 10C	2
8	BSF 231 - 8C	2
9	BSF 171 - 8C	2
10	BSF 136 - 8C	2
11	BSF 112 - 8C	2



\*SHELL SIDE : TEMP IN = 45 + ΔT °C , TEMP OUT = 45 °C  
 \*\*\* 6.895 Kpa = 1 PSIG

\*TUBE SIDE : TEMP IN = 30 °C , TEMP OUT = 30 + ΔT °C  
 \*\* FLOW OIL : WATER = 1.5 : 1