

付属資料 5.3.3-6

Run5-2における総括伝熱係数(U)と汚れ係数(f)

(5.2)

RUN 5-2 における運転条件

1. 運転期間	10/24~11/7
2. 運転時間	230 h
3. スケール抑制方法	ハイブリッド法
4. 運転方式	再循環
5. ボールクリーニング時期	BHのFF:0.34-0.36m ² K/kWのとき
6. ブライン最高温度	112°C
7. 流量	
-補給海水量	2.45 m ³ /h
-再循環ブライン量	6.5 m ³ /h
-生産水量	0.79 m ³ /h
-ブローブライン量	1.66 m ³ /h
8. ブライン水質	
-pH at 25°C	8.12
-M-アルカリ度 as CaCO ₃	55-60
-塩素イオン	32,720 mg/L
-濃縮度 as Cl ⁻	1.39
9. 薬剤添加	
-スケール抑制剤 (PPN(M))	1 mg/L
-酸 (98% H ₂ SO ₄)	72 mg/L

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 25, 94 Time: 00:00 Total Operation Time: 8.0 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	
Flowrate (kg/h)	6500	6500	6500	6500	6500	6500	6500	6500	
Specific Heat (kJ/kg/°C)	3.961	3.926	3.912	3.900	3.968	3.965	3.965	3.965	
Inlet Temp. (deg. C)	89.5	63.3	50.1	37.5	31.9	27	31.9	31.9	
Outlet Temp. (deg. C)	112	76.8	63.3	50.1	37	31.9	31.9	31.9	
Temp. Rise (deg. C)	22.5	13.5	13.2	12.6	5.1	4.9	4.9	4.9	
Flashing Temp. (deg. C)	116	82.3	69.8	56.7	41.6	35.7	35.7	35.7	
Heat Transfer Rate (kJ/s)	160.932	95.690	93.240	88.729	87.122	83.645	83.645	83.645	
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	
L.M.T.D. (deg. C)	11.899	10.890	11.905	11.800	6.836	5.916	5.916	5.916	
U (kW/sq.m/°C)	2.895	4.536	4.044	3.882	2.572	2.853	2.853	2.853	
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
f (sq.m K/kW)	0.0891	0.0244	0.0512	0.0615	0.1927	0.1544	0.1544	0.1544	

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 25, 94 Time: 04:00 Total Operation Time: 12.0 hr.

Variables	Evaporator Stages						
	Brine Heater	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	6500	15500	15500
Specific Heat (KJ/kg/K)	3.961	3.940	3.925	3.911	3.899	3.967	3.964
Inlet Temp. (deg. C)	89	76.1	62.3	49	36.2	30.8	27
Outlet Temp. (deg. C)	112	89	76.1	62.3	49	35	30.8
Temp. Rise (deg. C)	23	12.9	13.8	13.3	12.8	4.2	3.8
Flashing Temp. (deg. C)	119.5	91.6	81.3	69.1	55.7	39.8	34.5
Heat Transfer Rate (KJ/S)	164.495	91.758	97.794	93.922	90.113	71.731	64.863
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	16.396	7.226	10.650	12.272	11.982	6.681	5.378
U (kW/sq.m/K)	2.147	6.556	4.741	3.951	3.883	2.166	2.434
Clean-U Value (kW/sq.m/K)	3.9	6.6	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.2093	0.0010	0.0149	0.0570	0.0615	0.2655	0.2148

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 25, 94 Time: 8:00 Total Operation Time: 16 hr.

Variables	Evaporator Stages				
	# 1	# 2	# 3	# 4	# 5
Flowrate (kg/h)	6500	6500	6500	6500	18500
Specific Heat (kJ/kg/K)	3.961	3.925	3.912	3.900	3.965
Inlet Temp. (deg. C)	89	62.9	49.4	36.8	29
Outlet Temp. (deg. C)	112	76.4	62.9	49.4	31
Temp. Rise (deg. C)	23	13.5	13.5	12.6	2
Flashing Temp. (deg. C)	119	82.2	69.9	56.4	36.4
Heat Transfer Rate (kJ/s)	164.495	95.680	95.346	88.715	40.752
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556
L.M.T.D. (deg. K)	15.804	11.229	12.564	12.238	6.348
U (kW/sq.m/K)	2.228	4.399	3.918	3.743	1.296
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.1925	0.0312	0.0592	0.0711	0.0585

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 25, 94 Time: 12:00 Total Operation Time: 20 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18500	18500
Specific Heat (kJ/kg/°C)	3.961	3.925	3.912	3.900	3.967	3.965
Inlet Temp. (deg. C)	89	63.1	50	37.5	31.4	29
Outlet Temp. (deg. C)	112	76.5	63.1	50	36	31.4
Temp. Rise (deg. C)	23	13.4	13.1	12.5	4.6	2.4
Flashing Temp. (deg. C)	119	82.9	70.2	56.9	41	35.7
Heat Transfer Rate (kJ/S)	164.495	94.975	92.530	88.024	93.780	48.904
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	15.804	11.865	12.529	12.092	7.052	5.412
U (kW/sq.m/°C)	2.228	4.133	3.813	3.758	2.684	1.824
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.1925	0.0459	0.0662	0.0700	0.1766	0.3523

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 25, 94 Time: 16:00 Total Operation Time: 24 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	
Flowrate (kg/h)	6500	6500	6500	6500	18500	18500	18500	18500	
Specific Heat (kJ/kg/K)	3.961	3.925	3.912	3.900	3.967	3.965	3.965	3.965	
Inlet Temp. (deg. C)	89.5	63	50	37.4	31.5	28	31.5	31.5	
Outlet Temp. (deg. C)	112	76.5	63	50	36	31.5	31.5	31.5	
Temp. Rise (deg. C)	22.5	13.5	13	12.6	4.5	3.5	3.5	3.5	
Flashing Temp. (deg. C)	118	83.1	70.1	56.9	40.8	35.5	35.5	35.5	
Heat Transfer Rate (kJ/s)	160.932	95.682	91.823	88.727	91.742	71.313	71.313	71.313	
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	
L.M.T.D. (deg. K)	14.440	12.122	12.492	12.128	6.804	5.568	5.568	5.568	
U (kW/sq.m/K)	2.385	4.075	3.795	3.777	2.721	2.585	2.585	2.585	
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
f (sq.m K/KW)	0.1628	0.0493	0.0675	0.0687	0.1714	0.1908	0.1908	0.1908	

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 25, 94 Time: 20:00 Total Operation Time: 28 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18500	18500
Specific Heat (kJ/kg/K)	3.961	3.925	3.912	3.900	3.967	3.965
Inlet Temp. (deg. C)	89.5	62.9	49.7	37	31.2	28
Outlet Temp. (deg. C)	112	76.4	62.9	49.7	36	31.2
Temp. Rise (deg. C)	22.5	13.5	13.2	12.7	4.8	3.2
Flashing Temp. (deg. C)	118	82.6	70.1	56.6	40.5	35.3
Heat Transfer Rate (kJ/S)	160.932	95.680	93.231	89.424	97.856	65.199
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	14.440	11.678	12.675	12.165	6.612	5.547
U (kW/sq.m/K)	2.385	4.230	3.797	3.795	2.986	2.372
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.1628	0.0403	0.0673	0.0674	0.1388	0.2255

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 26, 94 Time: 00:00 Total Operation Time: 32 hr.

Variables	Evaporator Stages						
	Brine Heater	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	6500	18500	18500
Specific Heat (kJ/kg/°C)	3.961	3.925	3.912	3.967	3.900	3.965	3.965
Inlet Temp. (deg. C)	89	62.7	49.6	31.1	36.9	27	27
Outlet Temp. (deg. C)	112	76.3	62.7	35.5	49.6	31.1	31.1
Temp. Rise (deg. C)	23	13.6	13.1	4.4	12.7	4.1	4.1
Flashing Temp. (deg. C)	117.5	82.5	70	40.5	56.6	35.2	35.2
Heat Transfer Rate (kJ/S)	164,495	96,385	92,521	89,422	89,697	85,530	85,530
Heat Transfer Area (sq.m)	4,6723	1,937	1,937	1,937	1,937	4,9556	4,9556
L.M.T.D. (deg. K)	13,980	11,713	12,747	12,274	12,274	6,970	5,915
U (kW/sq.m/°C)	2,518	4,248	3,747	3,761	3,761	2,597	2,850
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.1407	0.0393	0.0708	0.0698	0.0698	0.1890	0.1548

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 28, 94

Time: 04:00

Total Operation Time: 36 hr.

Variables	Evaporator Stages						
	Brine Heater	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	6500	18500	18500
Specific Heat (kJ/kg/K)	3.961	3.925	3.912	3.912	3.900	3.967	3.964
Inlet Temp. (deg. C)	89	62.7	49.6	49.6	36.9	31	27
Outlet Temp. (deg. C)	112	76	62.7	62.7	49.6	35	31
Temp. Rise (deg. C)	23	13.3	13.1	13.1	12.7	4	4
Flashing Temp. (deg. C)	118	82.3	69.9	69.9	56.7	40.6	35.2
Heat Transfer Rate (kJ/S)	164.495	94.255	92.521	92.521	89.422	81.539	81.492
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	14.598	11.718	12.638	12.638	12.383	7.421	5.979
U (kW/sq.m/K)	2.412	4.153	3.779	3.779	3.728	2.217	2.751
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.1582	0.0447	0.0685	0.0685	0.0722	0.2550	0.1675

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 26, 94 Time: 08:00 Total Operation Time: 40 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	
Flowrate (kg/h)	6500	6500	6500	6500	18000	18000	18000	18000	
Specific Heat (kJ/kg/K)	3.960	3.925	3.912	3.900	3.967	3.965	3.965	3.965	
Inlet Temp. (deg. C)	88	63.2	50	37.5	31.3	29.5	29.5	29.5	
Outlet Temp. (deg. C)	112	76.4	63.2	50	37	31.3	31.3	31.3	
Temp. Rise (deg. C)	24	13.2	13.2	12.5	5.7	1.8	1.8	1.8	
Flashing Temp. (deg. C)	119	82.8	70.4	57.2	41	35.6	35.6	35.6	
Heat Transfer Rate (kJ/S)	171.620	93.557	93.238	88.024	113.072	35.687	35.687	35.687	
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	
L.M.T.D. (deg. K)	16.128	11.794	12.675	12.419	6.435	5.148	5.148	5.148	
U (kW/sq.m/K)	2.277	4.095	3.798	3.659	3.546	1.399	1.399	1.399	
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
f (sq.m K/kW)	0.1827	0.0481	0.0672	0.0772	0.0859	0.5187	0.5187	0.5187	

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 26, 94

Time: 12:00

Total Operation Time: 44 hr.

Variables	Brine Heater			Evaporator Stages						
	#1	#2	#3	#4	#5	#6	#7	#8	#9	
Flowrate (kg/h)	6500	6500	6500	6500	6500	6500	6500	6500	6500	18000
Specific Heat (kJ/kg/°C)	3.961	3.925	3.912	3.900	3.967	3.965	3.965	3.965	3.965	3.965
Inlet Temp. (deg. C)	89	62.6	49.9	37.7	31.7	28.5	28.5	28.5	28.5	28.5
Outlet Temp. (deg. C)	112	75.6	62.6	49.9	36.5	31.7	31.7	31.7	31.7	31.7
Temp. Rise (deg. C)	23	13	12.7	12.2	4.8	3.2	3.2	3.2	3.2	3.2
Flashing Temp. (deg. C)	118.5	82.3	69.9	57	41.3	35.9	35.9	35.9	35.9	35.9
Heat Transfer Rate (kJ/s)	164,495	92,123	89,698	85,912	95,218	63,442	63,442	63,442	63,442	63,442
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	4.9556	4.9556
L.M.T.D. (deg. C)	15.206	12.054	12.601	12.200	6.925	5.650	5.650	5.650	5.650	5.650
U (kW/sq.m/°C)	2.315	3.946	3.675	3.636	2.775	2.266	2.266	2.266	2.266	2.266
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.1755	0.0574	0.0760	0.0790	0.1643	0.2452	0.2452	0.2452	0.2452	0.2452

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 26, 94 Time: 16:00 Total Operation Time: 48 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 6		
Flowrate (kg/h)	6500	6500	6500	6500	18500	18500	18500		
Specific Heat (KJ/kg/K)	3.961	3.925	3.912	3.900	3.967	3.965	3.965		
Inlet Temp. (deg. C)	88.5	62.6	49.9	37.5	31.5	28	28		
Outlet Temp. (deg. C)	112	75.8	62.6	49.9	36	31.5	31.5		
Temp. Rise (deg. C)	23.5	13.2	12.7	12.4	4.5	3.5	3.5		
Flashing Temp. (deg. C)	120	82.8	70.2	57	40.9	35.8	35.8		
Heat Transfer Rate (KJ/S)	168.058	93.542	89.898	87.319	91.742	71.313	71.313		
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556		
L.M.T.D. (deg. K)	17.146	12.456	12.927	12.273	6.907	5.877	5.877		
U (kW/sq.m/K)	2.098	3.877	3.582	3.673	2.680	2.448	2.448		
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1	5.1		
f (sq.m K/kW)	0.2203	0.0618	0.0831	0.0762	0.1770	0.2123	0.2123		

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 26, 94

Time: 20:00

Total Operation Time: 52 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6480	6480	6480	6480	18500	18500
Specific Heat (kJ/kg/K)	3.961	3.925	3.912	3.900	3.967	3.965
Inlet Temp. (deg. C)	89	62.6	49.9	37.5	31.6	28
Outlet Temp. (deg. C)	112	75.7	62.6	49.9	36	31.6
Temp. Rise (deg. C)	23	13.1	12.7	12.4	4.4	3.6
Flashing Temp. (deg. C)	120	82.4	70	57.1	41	35.9
Heat Transfer Rate (kJ/s)	163.989	92.547	89.422	87.050	89.704	73.351
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	16.980	12.090	12.710	12.382	6.970	5.919
U (kW/sq.m/K)	2.067	3.952	3.632	3.629	2.597	2.501
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.2274	0.0570	0.0792	0.0794	0.1890	0.2038

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 27, 94 Time: 00:00 Total Operation Time: 56 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18200	18200
Specific Heat (kJ/kg/°C)	3.961	3.925	3.912	3.900	3.967	3.965
Inlet Temp. (deg. C)	88.5	62.8	50.1	37.9	31.9	28
Outlet Temp. (deg. C)	112	75.9	62.8	50.1	36	31.9
Temp. Rise (deg. C)	23.5	13.1	12.7	12.2	4.1	3.9
Flashing Temp. (deg. C)	121	82.6	70.4	57.5	41.3	36.2
Heat Transfer Rate (kJ/s)	168.058	92.837	89.703	85.916	82.234	78.177
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	18.302	12.090	12.927	12.525	7.155	6.042
U (kW/sq.m/°C)	1.965	3.964	3.583	3.541	2.319	2.611
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.2524	0.0562	0.0831	0.0863	0.2351	0.1869

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 27, 94 Time: 04:00 Total Operation Time: 60 hr.

Variables	Evaporator Stages					
	#1	#2	#3	#4	#5	#6
Flowrate (kg/h)	6500	6500	6500	6500	18500	18500
Specific Heat (kJ/kg/°C)	3.961	3.925	3.912	3.900	3.967	3.965
Inlet Temp. (deg. C)	88.5	62.8	50	37.7	31.6	28
Outlet Temp. (deg. C)	112	75.8	62.8	50	36	31.6
Temp. Rise (deg. C)	23.5	13	12.8	12.3	4.4	3.6
Flashing Temp. (deg. C)	121	82.1	70.1	57.3	41	36
Heat Transfer Rate (KJ/S)	168.058	92.127	90.408	86.617	89.704	73.351
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	18.302	11.612	12.638	12.454	6.970	6.022
U (kW/sq.m/°C)	1.965	4.096	3.693	3.591	2.597	2.458
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (Sq.m K/KW)	0.2524	0.0481	0.0747	0.0824	0.1890	0.2107

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 27, 94 Time: 08:00 Total Operation Time: 84 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18000	18000
Specific Heat (KJ/kg/K)	3.961	3.925	3.912	3.900	3.968	3.966
Inlet Temp. (deg. C)	88.5	63	50.3	38	31.7	30
Outlet Temp. (deg. C)	112	76.1	63	50.3	37	31.7
Temp. Rise (deg. C)	23.5	13.1	12.7	12.3	5.3	1.7
Flashing Temp. (deg. C)	121	82.2	70.5	57.5	41.3	36.2
Heat Transfer Rate (KJ/s)	168,058	92,842	89,707	86,623	105,140	33,707
Heat Transfer Area (sq.m)	4,6723	1,937	1,937	1,937	4,9556	4,9556
L.M.T.D. (deg. K)	18,302	11,425	12,818	12,345	6,599	5,305
U (KW/sq.m/K)	1,965	4,195	3,613	3,622	3,215	1,282
Clean-U Value (KW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.2524	0.0423	0.0807	0.0800	0.1150	0.5838

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 27, 94

Time: 12:00

Total Operation Time: 68 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 6		
Flowrate (kg/h)	6500	6500	6500	6500	18000	18000	18000		
Specific Heat (KJ/kg/K)	3.961	3.925	3.912	3.900	3.968	3.965	3.965		
Inlet Temp. (deg. C)	88.5	62.8	50.1	37.9	32.6	29	29		
Outlet Temp. (deg. C)	112	75.7	62.8	50.1	37	32.6	32.6		
Temp. Rise (deg. C)	23.5	12.9	12.7	12.2	4.4	3.6	3.6		
Flashing Temp. (deg. C)	121	82.7	70.4	57.5	41.8	36.1	36.1		
Heat Transfer Rate (K/s)	168.058	91.418	89.703	85.916	87.292	71.379	71.379		
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556		
L.M.T.D. (deg. K)	18.302	12.347	12.927	12.525	6.763	5.090	5.090		
U (KW/sq.m/K)	1.965	3.822	3.583	3.541	2.605	2.830	2.830		
Clean-U Value (KW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1	5.1		
f (sq.m K/KW)	0.2524	0.0655	0.0831	0.0863	0.1879	0.1573	0.1573		

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 27, 94

Time: 16:00

Total Operation Time: 72 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18300	18300
Specific Heat (kJ/kg/°C)	3.961	3.925	3.912	3.901	3.968	3.965
Inlet Temp. (deg. C)	88.5	62.9	50.4	38.5	32.5	29
Outlet Temp. (deg. C)	112	75.8	62.9	50.4	37	32.5
Temp. Rise (deg. C)	23.5	12.9	12.5	11.9	4.5	3.5
Flashing Temp. (deg. C)	122	82.8	70.7	57.9	41.8	36.7
Heat Transfer Rate (KJ/S)	168.058	91.420	88.295	85.812	90.764	70.552
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	19.438	12.347	13.069	12.521	6.804	5.774
U (kW/sq.m/K)	1.850	3.823	3.488	3.456	2.692	2.466
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.2840	0.0655	0.0906	0.0933	0.1754	0.2095

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 27, 94 Time: 20:00 Total Operation Time: 76 hr.

Variables	Evaporator Stages						
	Brine Heater	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	6500	18200	18200
Specific Heat (KJ/kg/K)	3.961	3.925	3.912	3.901	3.965	3.965	3.965
inlet Temp. (deg. C)	88.5	62.9	50.4	38.1	32	29	29
Outlet Temp. (deg. C)	112	75.8	62.9	50.4	37	32	32
Temp. Rise (deg. C)	23.5	12.9	12.5	12.3	5	3	3
Flashing Temp. (deg. C)	122	82.8	70.7	57.9	41.6	36.5	36.5
Heat Transfer Rate (KJ/S)	168.058	91.420	88.295	86.625	100.293	60.141	60.141
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556
L.M.T.D. (deg. K)	19.438	12.347	13.069	12.670	6.796	5.873	5.873
U (KW/sq.m/K)	1.850	3.823	3.488	3.530	2.978	2.066	2.066
Clean-U Value (kw/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.2840	0.0655	0.0906	0.0872	0.1397	0.2878	0.2878

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 28, 94 Time: 00:00 Total Operation Time: 80 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	
Flowrate (kg/m)	6500	6500	6500	6500	18200	18200	18200	18200	
Specific Heat (KJ/kg/K)	3.961	3.925	3.912	3.900	3.967	3.965	3.965	3.965	
Inlet Temp. (deg. C)	88.5	62.7	50.1	37.9	31.9	28.5	28.5	28.5	
Outlet Temp. (deg. C)	112	75.7	62.7	50.1	36	31.9	31.9	31.9	
Temp. Rise (deg. C)	23.5	13	12.6	12.2	4.1	3.4	3.4	3.4	
Flashing Temp. (deg. C)	122.5	82.7	70.7	57.8	41.4	36.3	36.3	36.3	
Heat Transfer Rate (KJ/S)	168.058	92.125	88.995	85.916	82.234	68.157	68.157	68.157	
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	
L.M.T.D. (deg. K)	20.000	12.583	13.321	12.849	7.258	5.939	5.939	5.939	
U (kW/sq.m/K)	1.798	3.841	3.449	3.452	2.286	2.316	2.316	2.316	
Clean-U value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
f (sq.m K/kW)	0.2996	0.0643	0.0939	0.0936	0.2413	0.2357	0.2357	0.2357	

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 28, 94 Time: 04:00 Total Operation Time: 84 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18200	18200
Specific Heat (kJ/kg/K)	3.961	3.925	3.912	3.900	3.967	3.965
Inlet Temp. (deg. C)	88.5	62.8	50.2	37.9	31.8	28
Outlet Temp. (deg. C)	112	75.7	62.8	50.2	36	31.8
Temp. Rise (deg. C)	23.5	12.9	12.6	12.3	4.2	3.8
Flashing Temp. (deg. C)	124	81.9	70.6	57.7	41.4	36.3
Heat Transfer Rate (kJ/S)	168.058	91.418	88.998	86.621	84.239	76.172
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	21.666	11.465	13.106	12.670	7.300	6.207
U (kW/sq.m/K)	1.660	4.116	3.506	3.529	2.329	2.476
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.3460	0.0469	0.0892	0.0872	0.2333	0.2078

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 28, 94 Time: 08:00 Total Operation Time: 88 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18200	18200
Specific Heat (KJ/kg/K)	3.960	3.925	3.912	3.900	3.968	3.965
Inlet Temp. (deg. C)	88	62.5	49.9	37.7	31.7	29.5
Outlet Temp. (deg. C)	112	75.5	62.5	49.9	37	31.7
Temp. Rise (deg. C)	24	13	12.6	12.2	5.3	2.2
Flashing Temp. (deg. C)	124	82.1	70.3	57.4	41.2	36
Heat Transfer Rate (KJ/S)	171.620	92.120	88.991	85.912	106.309	44.104
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	21.846	11.943	13.106	12.633	6.493	5.324
U (kW/sq.m/K)	1.681	3.982	3.506	3.511	3.304	1.671
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.3383	0.0551	0.0892	0.0888	0.1066	0.4022

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 28, 94

Time: 12:00

Total Operation Time: 92 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18500	18500
Specific Heat (KJ/kg/K)	3.960	3.925	3.912	3.900	3.968	3.965
Inlet Temp. (deg. C)	88	62.8	50.4	37.7	32	29
Outlet Temp. (deg. C)	112	75.6	62.8	50.4	37	32
Temp. Rise (deg. C)	24	12.8	12.4	12.7	5	3
Flashing Temp. (deg. C)	124	82.9	70.9	58.1	41.6	36.5
Heat Transfer Rate (kJ/S)	171.620	90.708	87.587	89.438	101.947	61.132
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	21.846	12.638	13.354	13.035	6.796	5.873
U (KW/sq.m/K)	1.681	3.706	3.386	3.542	3.027	2.101
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.3383	0.0738	0.0992	0.0862	0.1343	0.2800

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 28, 94 Time: 16:00 Total Operation Time: 96 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 6		
Flowrate (kg/h)	6500	6500	6500	6500	18500	18500	18500		
Specific Heat (kJ/kg/°C)	3.960	3.925	3.912	3.901	3.968	3.965	3.965		
Inlet Temp. (deg. C)	88	62.7	50.3	38.1	32.1	29	29		
Outlet Temp. (deg. C)	112	75.5	62.7	50.3	37	32.1	32.1		
Temp. Rise (deg. C)	24	12.8	12.4	12.2	4.9	3.1	3.1		
Flashing Temp. (deg. C)	124	82.8	70.7	58	41.6	36.6	36.6		
Heat Transfer Rate (kJ/s)	171.620	90.705	87.585	85.920	99.908	63.170	63.170		
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556		
L.M.T.D. (deg. C)	21.846	12.638	13.247	12.848	6.756	5.915	5.915		
U (kW/sq.m/°C)	1.681	3.705	3.413	3.452	2.984	2.155	2.155		
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1	5.1		
f (sq.m K/kW)	0.3383	0.0738	0.0969	0.0936	0.1390	0.2680	0.2680		

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 28, 94

Time: 20:00

Total Operation Time: 100 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6350	6350	6350	6350	18300	18300
Specific Heat (kJ/kg/K)	3.960	3.925	3.912	3.900	3.967	3.965
Inlet Temp. (deg. C)	88	62.6	50.2	38.1	31.9	29
Outlet Temp. (deg. C)	112	75.6	62.6	50.2	36.5	31.9
Temp. Rise (deg. C)	24	13	12.4	12.1	4.6	2.9
Flashing Temp. (deg. C)	124	82.7	70.6	57.9	41.5	36.4
Heat Transfer Rate (kJ/s)	167.660	89.997	85.562	83.248	92.773	58.455
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	21.846	12.492	13.247	12.812	7.052	5.830
U (kW/sq.m/K)	1.643	3.719	3.335	3.355	2.655	2.023
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.3524	0.0728	0.1038	0.1020	0.1806	0.2982

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 29, 94 Time: 00:00 Total Operation Time: 104 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6350	6350	6350	6350	18200	18200
Specific Heat (KJ/kg/K)	3.960	3.925	3.912	3.900	3.967	3.965
Inlet Temp. (deg. C)	88	62.4	49.9	37.7	31.8	28.5
Outlet Temp. (deg. C)	112	75.4	62.4	49.9	36	31.8
Temp. Rise (deg. C)	24	13	12.5	12.2	4.2	3.3
Flashing Temp. (deg. C)	124	82.2	70.4	57.6	41.2	36.1
Heat Transfer Rate (KJ/S)	167.660	89.992	86.246	83.950	84.239	66.152
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	21.846	12.164	13.284	12.849	7.094	5.794
U (KW/sq.m/K)	1.643	3.820	3.352	3.372	2.396	2.304
Clean-U Value (KW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.3524	0.0657	0.1023	0.1005	0.2212	0.2380

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 29, 94 Time: 06:00 Total Operation Time: 112 hr.

Variables	Evaporator Stages						
	Brine Heater	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6350	6350	6350	6350	6350	18400	18400
Specific Heat (kJ/kg/°C)	3.961	3.925	3.912	3.912	3.900	3.968	3.965
Inlet Temp. (deg. C)	88.5	62.5	49.9	49.9	37.4	32.2	29
Outlet Temp. (deg. C)	112	75.6	62.5	62.5	49.9	37	32.2
Temp. Rise (deg. C)	23.5	13.1	12.6	12.6	12.5	4.8	3.2
Flashing Temp. (deg. C)	126	83.7	71.6	71.6	58.7	42.1	36.8
Heat Transfer Rate (kJ/S)	164.180	90.688	86.937	86.937	85.990	97.341	64.856
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. °C)	23.851	13.616	14.499	14.499	14.141	7.237	6.060
U (kW/sq.m/°C)	1.473	3.439	3.096	3.096	3.139	2.714	2.160
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.4224	0.0947	0.1270	0.1270	0.1225	0.1723	0.2669

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 28, 94 Time: 12:00 Total Operation Time: 116 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18400	18400
Specific Heat (kJ/kg/°C)	3.961	3.925	3.912	3.901	3.968	3.966
Inlet Temp. (deg. C)	88.5	62.9	50.4	38.2	32.3	29.5
Outlet Temp. (deg. C)	112	75.8	62.9	50.4	37	32.3
Temp. Rise (deg. C)	23.5	12.9	12.5	12.2	4.7	2.8
Flashing Temp. (deg. C)	125	83.7	71.6	58.7	42.1	36.8
Heat Transfer Rate (kJ/S)	168.058	91.420	88.295	85.922	95.314	56.751
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. °C)	22.763	13.325	14.034	13.493	7.196	5.788
U (kW/sq.m/°C)	1.580	3.542	3.248	3.287	2.673	1.979
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.3764	0.0863	0.1118	0.1081	0.1781	0.3093

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 29, 94 Time: 16:00 Total Operation Time: 120 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18300	18300
Specific Heat (Kj/kg/K)	3.938	3.924	3.912	3.901	3.968	3.965
Inlet Temp. (deg. C)	88	62.4	50.2	38.3	32.5	28
Outlet Temp. (deg. C)	112	75.3	62.4	50.2	37	32.5
Temp. Rise (deg. C)	24	12.9	12.2	11.9	4.5	4.5
Flashing Temp. (deg. C)	124	83.3	71.1	58.4	42	36.8
Heat Transfer Rate (KJ/S)	171.620	91.408	86.168	83.808	90.764	90.704
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	21.846	13.433	13.920	13.273	7.011	6.284
U (kW/sq.m/K)	1.681	3.513	3.196	3.260	2.612	2.913
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.3383	0.0886	0.1168	0.1107	0.1867	0.1472

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 29, 94

Time: 20:00

Total Operation Time: 124 hr.

Variables	Evaporator Stages						
	Brine Heater	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	6500	18400	18400
Specific Heat (kJ/kg/°C)	3.960	3.938	3.924	3.911	3.900	3.968	3.965
Inlet Temp. (deg. C)	88	75	62	49.6	37.5	32	28.5
Outlet Temp. (deg. C)	112	88	75	62	49.6	37	32
Temp. Rise (deg. C)	24	13	13	12.4	12.1	5	3.5
Flashing Temp. (deg. C)	124	93.1	82.5	70.5	57.8	41.5	36.4
Heat Transfer Rate (kJ/s)	171.620	92.441	92.108	87.570	85.203	101.396	70.933
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	21.846	10.263	12.929	13.783	13.348	6.692	5.980
U (kW/sq.m/°C)	1.681	4.650	3.678	3.280	3.295	3.058	2.393
Clean-U Value (kW/sq.m/°C)	3.9	6.6	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.3583	0.0635	0.0758	0.1088	0.1074	0.1310	0.2217

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 30, 94 Time: 00:00 Total Operation Time: 128 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6400	6400	6400	6400	18400	18400
Specific Heat (kJ/kg/K)	3.960	3.925	3.912	3.900	3.968	3.965
Inlet Temp. (deg. C)	88	62.4	49.7	37.5	32.1	28.5
Outlet Temp. (deg. C)	112	75.6	62.4	49.7	37	32.1
Temp. Rise (deg. C)	24	13.2	12.7	12.2	4.9	3.6
Flashing Temp. (deg. C)	125	82.4	70.7	57.8	41.4	36.3
Heat Transfer Rate (K/S)	168.960	92.098	88.314	84.587	99.368	72.960
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	22.945	12.236	13.681	13.279	6.547	5.815
U (kW/sq.m/K)	1.576	3.886	3.332	3.289	3.063	2.532
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.3780	0.0613	0.1040	0.1080	0.1304	0.1989

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 30, 94 Time: 04:00 Total Operation Time: 152 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	
Flowrate (kg/h)	6400	6400	6400	6400	18400	18400	18400	18400	
Specific Heat (kJ/kg/°C)	3.960	3.924	3.911	3.900	3.968	3.968	3.965	3.965	
Inlet Temp. (deg. C)	87	61.9	49.4	37.4	32.2	32.2	28	28	
Outlet Temp. (deg. C)	112	74.8	61.9	49.4	36.5	36.5	32.2	32.2	
Temp. Rise (deg. C)	25	12.9	12.5	12	4.3	4.3	4.2	4.2	
Flashing Temp. (deg. C)	124	81.5	70	57.6	41.6	41.6	36.6	36.6	
Heat Transfer Rate (kJ/s)	175.993	89.989	86.915	83.196	87.198	87.198	85.118	85.118	
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	
L.M.T.D. (deg. C)	22.202	12.018	13.392	13.310	7.032	7.032	6.267	6.267	
U (kW/sq.m/°C)	1.697	3.866	3.351	3.227	2.502	2.502	2.741	2.741	
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
f (sq.m K/kW)	0.3330	0.0626	0.1024	0.1138	0.2036	0.2036	0.1688	0.1688	

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 30, 94

Time: 08:00

Total Operation Time: 136 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6400	6400	6400	6400	18400	18400
Specific Heat (kJ/kg/°C)	3.939	3.924	3.911	3.900	3.968	3.966
Inlet Temp. (deg. C)	88	62.3	49.7	37.3	32	30
Outlet Temp. (deg. C)	112	75.4	62.3	49.7	37	32
Temp. Rise (deg. C)	24	13.1	12.6	12.4	5	2
Flashing Temp. (deg. C)	126	82.8	71	58	41.4	36.2
Heat Transfer Rate (kJ/s)	168.980	91.397	87.618	85.971	101.396	40.537
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	24.035	12.856	14.072	13.569	6.587	5.135
U (kW/sq.m/°C)	1.505	3.670	3.214	3.271	3.106	1.593
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.4082	0.0764	0.1150	0.1096	0.1258	0.4317

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 30, 94 Time: 20:00 Total Operation Time: 148 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	
Flowrate (kg/h)	6400	6400	6400	6400	18000	18000	18000	18000	
Specific Heat (kJ/kg/°C)	3.961	3.926	3.912	3.900	3.967	3.965	3.965	3.965	
Inlet Temp. (deg. C)	89.5	63.6	50.4	57.5	32.1	28.5	28.5	28.5	
Outlet Temp. (deg. C)	112	77.2	63.6	50.4	36	32.1	32.1	32.1	
Temp. Rise (deg. C)	22.5	13.6	13.2	12.9	3.9	3.6	3.6	3.6	
Flashing Temp. (deg. C)	114	82.7	69.9	56.7	41.2	36.4	36.4	36.4	
Heat Transfer Rate (kJ/s)	158.456	94.925	91.813	89.447	77.364	71.374	71.374	71.374	
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	
L.M.T.D. (deg. C)	8.980	10.924	11.683	11.576	6.969	5.919	5.919	5.919	
U (kW/sq.m/°C)	3.777	4.486	4.057	3.989	2.240	2.433	2.433	2.433	
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
f (sq.m K/kW)	0.0084	0.0268	0.0504	0.0546	0.2503	0.2149	0.2149	0.2149	

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 31, 84

Time: 00:00

Total Operation Time: 152 hr.

Variables	Evaporator Stages						
	Brine Heater	#1	#2	#3	#4	#5	#6
Flowrate (kg/h)	6400	6400	6400	6400	6400	18000	18000
Specific Heat (kJ/kg/K)	3.961	3.940	3.926	3.912	3.900	3.967	3.965
Inlet Temp. (deg. C)	89	77.2	63.6	50.2	37.3	31.9	28.5
Outlet Temp. (deg. C)	112	89	77.2	63.6	50.2	36	31.9
Temp. Rise (deg. C)	23	11.8	13.6	13.4	12.9	4.1	3.4
Flashing Temp. (deg. C)	114	93.6	82.7	70	56.6	41	36.1
Heat Transfer Rate (KJ/S)	161.965	82.656	94.925	93.201	89.443	81.330	67.408
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	9.106	9.282	10.924	11.865	11.687	6.847	5.733
U (kW/sq.m/K)	3.807	4.597	4.486	4.055	3.951	2.397	2.373
Clean-U Value (kW/sq.m/K)	3.9	6.6	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.0063	0.0660	0.0268	0.0505	0.0570	0.2211	0.2254

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 31, 94 Time: 04:00 Total Operation Time: 156 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6400	6400	6400	6400	18000	18000
Specific Heat (kJ/kg/°C)	3.961	3.926	3.912	3.900	3.967	3.965
Inlet Temp. (deg. C)	89	63.5	50.1	37.2	31.8	28.5
Outlet Temp. (deg. C)	112	77.1	63.5	50.1	36	31.8
Temp. Rise (deg. C)	23	13.6	13.4	12.9	4.2	3.3
Flashing Temp. (deg. C)	114	82.5	70.1	56.5	40.8	36.1
Heat Transfer Rate (kJ/s)	161.965	94.922	93.199	89.441	83.313	65.425
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	9.106	10.810	12.087	11.687	6.681	5.794
U (kW/sq.m/°C)	3.807	4.533	3.961	3.951	2.516	2.279
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.0063	0.0245	0.0551	0.0570	0.2013	0.2428

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: October 31, 94 Time: 08:00 Total Operation Time: 160 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6490	6490	6490	6490	18200	18200
Specific Heat (kJ/kg/°C)	3.961	3.926	3.912	3.900	3.967	3.966
Inlet Temp. (deg. C)	89	63.7	50.3	37.4	31.9	30
Outlet Temp. (deg. C)	112	77.1	63.7	50.3	36.5	31.9
Temp. Rise (deg. C)	23	13.4	13.4	12.9	4.6	1.9
Flashing Temp. (deg. C)	115.5	82.7	70.2	56.8	41	36.3
Heat Transfer Rate (kJ/S)	164.242	94.844	94.514	90.703	92.266	38.092
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	11.361	10.969	11.976	11.797	6.532	5.293
U (kW/sq.m/°C)	3.094	4.464	4.074	3.969	2.850	1.452
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.0688	0.0279	0.0494	0.0559	0.1548	0.4926

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 31, 94

Time: 12:00

Total Operation Time: 164 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 6	# 6	
Flowrate (kg/h)	6500	6500	6500	6500	18200	18200	18200	18200	
Specific Heat (kJ/kg/°C)	3.961	3.926	3.913	3.901	3.968	3.968	3.966	3.966	
Inlet Temp. (deg. C)	89.5	64.1	51	38.4	32.2	32.2	30	30	
Outlet Temp. (deg. C)	112	77.3	64.1	51	36.5	36.5	32.2	32.2	
Temp. Rise (deg. C)	22.5	13.2	13.1	12.6	4.3	4.3	2.2	2.2	
Flashing Temp. (deg. C)	116.5	83.7	71	57.7	41.6	41.6	37	37	
Heat Transfer Rate (kJ/s)	160.932	93.580	92.553	88.747	86.250	86.250	44.107	44.107	
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	
L.M.T.D. (deg. C)	12.557	11.794	12.310	11.909	7.032	7.032	5.831	5.831	
U (kW/sq.m/°C)	2.743	4.096	3.882	3.847	2.475	2.475	1.526	1.526	
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
f (sq.m K/kW)	0.1082	0.0480	0.0615	0.0639	0.2080	0.2080	0.4591	0.4591	

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 31, 94

Time: 16:00

Total Operation Time: 168 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18000	18000
Specific Heat (KJ/kg/K)	3.961	3.926	3.913	3.901	3.968	3.965
Inlet Temp. (deg. C)	89.5	63.9	50.9	38.2	32.3	29
Outlet Temp. (deg. C)	112	77.2	63.9	50.9	37	32.3
Temp. Rise (deg. C)	22.5	13.3	13	12.7	4.7	3.3
Flashing Temp. (deg. C)	116	83.1	70.7	57.5	41.6	37
Heat Transfer Rate (kJ/s)	160.932	94.285	91.843	89.448	93.242	65.429
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	11.899	11.272	12.164	11.836	6.677	6.204
U (kW/sq.m/K)	2.895	4.318	3.898	3.902	2.818	2.128
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.0891	0.0355	0.0605	0.0602	0.1588	0.2738

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: October 31, 94

Time: 20:00

Total Operation Time: 172 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9
Flowrate (kg/h)	6500	6500	6500	6500	6500	18000	18000	18000	18000
Specific Heat (kJ/kg/°C)	3.961	3.926	3.913	3.901	3.965	3.965	3.965	3.965	3.965
Inlet Temp. (deg. C)	89	63.7	50.6	37.8	32.2	29	29	29	29
Outlet Temp. (deg. C)	112	77.1	63.7	50.6	36	32.2	32.2	32.2	32.2
Temp. Rise (deg. C)	23	13.4	13.1	12.8	3.8	3.2	3.2	3.2	3.2
Flashing Temp. (deg. C)	117	83	70.7	57.3	41.5	36.7	36.7	36.7	36.7
Heat Transfer Rate (kJ/S)	164.495	94.990	92.544	90.146	75.381	63.446	63.446	63.446	63.446
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	4.9556
L.M.T.D. (deg. C)	13.351	11.307	12.419	11.982	7.234	5.957	5.957	5.957	5.957
U (kW/sq.m/°C)	2.637	4.337	3.847	3.884	2.103	2.149	2.149	2.149	2.149
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.1228	0.0345	0.0639	0.0614	0.2795	0.2692	0.2692	0.2692	0.2692

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 01, 94 Time: 00:00 Total Operation Time: 176 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6400	6400	6400	6400	18000	18000
Specific Heat (kJ/kg/°C)	3.961	3.926	3.913	3.900	3.968	3.965
Inlet Temp. (deg. C)	89	63.8	50.5	37.7	32.2	28.5
Outlet Temp. (deg. C)	112	77.2	63.8	50.5	36.5	32.2
Temp. Rise (deg. C)	23	13.4	13.3	12.8	4.3	3.7
Flashing Temp. (deg. C)	117.5	83.1	70.8	57.2	41.3	36.6
Heat Transfer Rate (kJ/S)	161.965	93.531	92.512	88.757	85.303	73.357
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	13.980	11.307	12.492	11.982	6.722	6.063
U (kW/sq.m/°C)	2.480	4.271	3.823	3.824	2.561	2.442
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.1469	0.0381	0.0655	0.0654	0.1945	0.2135

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 01, 94 Time: 04:00 Total Operation Time: 180 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6400	6400	6400	6400	18200	18200
Specific Heat (kJ/kg/K)	3.961	3.926	3.913	3.900	3.968	3.965
Inlet Temp. (deg. C)	89	63.7	50.4	37.5	32	28.5
Outlet Temp. (deg. C)	112	77.1	63.7	50.4	36.5	32
Temp. Rise (deg. C)	23	13.4	13.3	12.9	4.5	3.5
Flashing Temp. (deg. C)	118	83.4	70.8	57.1	41.1	36.4
Heat Transfer Rate (kJ/S)	161.965	93.529	92.509	89.447	90.261	70.162
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	14.598	11.754	12.601	12.018	6.596	5.980
U (kW/sq.m/K)	2.375	4.108	3.790	3.843	2.761	2.367
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.1647	0.0473	0.0678	0.0642	0.1661	0.2263

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: November 01, 94

Time: 08:00

Total Operation Time: 184 hr.

Variables	Evaporator Stages						
	Brine Heater	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6450	6450	6450	6450	6450	18000	18000
Specific Heat (KJ/kg/K)	3.961	3.926	3.913	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	89	64.1	50.9	50.9	38.2	32.4	30
Outlet Temp. (deg. C)	112	77.3	64.1	64.1	50.9	38	32.4
Temp. Rise (deg. C)	23	13.2	13.2	13.2	12.7	5.6	2.4
Flashing Temp. (deg. C)	118.5	94.1	83.4	71	57.7	41.7	36.8
Heat Transfer Rate (KJ/S)	163.230	92.860	92.541	92.541	88.760	111.106	47.589
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	15.206	11.460	12.346	12.346	12.055	6.076	5.513
U (KW/sq.m/K)	2.298	4.183	3.870	3.870	3.801	3.690	1.742
Clean-U Value (KW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.1788	0.0430	0.0623	0.0670	0.0670	0.0749	0.3780

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 01, 94 Time: 12:00 Total Operation Time: 188 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18200	18200
Specific Heat (kJ/kg/°C)	3.961	3.927	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	89	64.6	51.5	38.8	32.8	30
Outlet Temp. (deg. C)	112	77.4	64.6	51.5	38	32.8
Temp. Rise (deg. C)	23	12.8	13.1	12.7	5.2	2.8
Flashing Temp. (deg. C)	118.5	84.3	72	58.5	42.2	37.1
Heat Transfer Rate (kJ/s)	164.495	90.752	92.565	89.461	104.320	56.139
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	15.206	12.201	12.856	12.274	6.455	5.583
U (kW/sq.m/°C)	2.315	3.840	3.717	3.763	3.261	2.029
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.1755	0.0643	0.0730	0.0697	0.1105	0.2968

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: November 01, 94

Time: 16:00

Total Operation Time: 192 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18500	18500
Specific Heat (kJ/kg/K)	3.961	3.927	3.914	3.902	3.968	3.966
Inlet Temp. (deg. C)	89	64.7	51.8	39.6	32.2	29.5
Outlet Temp. (deg. C)	112	77.5	64.7	51.8	37	32.2
Temp. Rise (deg. C)	23	12.8	12.9	12.2	4.8	2.7
Flashing Temp. (deg. C)	118.5	84.2	71.8	58.8	42.6	39.3
Heat Transfer Rate (kJ/S)	164.495	90.754	91.156	85.950	97.870	55.022
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	15.206	11.982	12.456	12.091	7.754	8.378
U (kW/sq.m/K)	2.315	3.910	3.778	3.670	2.547	1.325
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.1755	0.0596	0.0686	0.0764	0.1965	0.5585

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 01, 94 Time: 20:00 Total operation Time: 196 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18200	18200
Specific Heat (kJ/kg/°C)	3.961	3.927	3.914	3.902	3.968	3.965
Inlet Temp. (deg. C)	89	64.6	51.6	39.2	32	29
Outlet Temp. (deg. C)	112	77.5	64.6	51.6	37	32
Temp. Rise (deg. C)	23	12.9	13	12.4	5	3
Flashing Temp. (deg. C)	120	84	71.8	58.5	42.3	38.9
Heat Transfer Rate (kJ/S)	164.495	91.462	91.860	87.353	100.293	60.141
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	16.980	11.797	12.602	12.055	7.525	8.310
U (kW/sq.m/°C)	2.073	4.002	3.763	3.741	2.689	1.460
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.2259	0.0538	0.0696	0.0712	0.1757	0.4887

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 02, 94 Time: 00:00 Total Operation Time: 200 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 6		
Flowrate (kg/h)	6500	6500	6500	6500	18000	18000	18000		
Specific Heat (kJ/kg/°C)	3.961	3.926	3.913	3.902	3.968	3.965	3.965		
Inlet Temp. (deg. C)	89	64.3	51.5	39.2	32.3	29	29		
Outlet Temp. (deg. C)	112	77.2	64.3	51.5	37	32.3	32.3		
Temp. Rise (deg. C)	23	12.9	12.8	12.3	4.7	3.3	3.3		
Flashing Temp. (deg. C)	120.5	84	71.7	58.6	42.7	38.9	38.9		
Heat Transfer Rate (kJ/s)	164.495	91.455	90.442	86.647	95.242	65.429	65.429		
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556		
L.M.T.D. (deg. K)	17.558	12.128	12.746	12.237	7.816	8.139	8.139		
U (kW/sq.m/°C)	2.005	3.893	3.663	3.656	2.407	1.622	1.622		
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1	5.1		
f (sq.m K/kW)	0.2423	0.0608	0.0769	0.0775	0.2193	0.4204	0.4204		

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: November 02, 94

Time: 04:00

Total Operation Time: 204 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	
Flowrate (kg/h)	6500	6500	6500	6500	18000	18000	18000	18000	
Specific Heat (KJ/kg/K)	3.961	3.927	3.913	3.901	3.968	3.968	3.965	3.965	
Inlet Temp. (deg. C)	89	64.5	51.5	39	32.3	32.3	29	29	
Outlet Temp. (deg. C)	112	77.3	64.5	51.5	37	37	32.3	32.3	
Temp. Rise (deg. C)	23	12.8	13	12.5	4.7	4.7	3.3	3.3	
Flashing Temp. (deg. C)	120.5	83.7	71.9	58.6	42.6	42.6	38.5	38.5	
Heat Transfer Rate (KJ/S)	164.495	90.749	91.857	88.054	93.242	93.242	65.429	65.429	
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	
L.M.T.D. (deg. K)	17.558	11.651	12.820	12.310	7.713	7.713	7.733	7.733	
U (kW/sq.m/K)	2.005	4.021	3.699	3.693	2.440	2.440	1.707	1.707	
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
f (sq.m K/KW)	0.2423	0.0526	0.0743	0.0747	0.2138	0.2138	0.3896	0.3896	

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 02, 94 Time: 08:00 Total Operation Time: 208 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	18000	18000
Specific Heat (kJ/kg/°C)	3.961	3.927	3.914	3.902	3.968	3.966
Inlet Temp. (deg. C)	89	64.7	51.7	39.4	32.3	31
Outlet Temp. (deg. C)	112	77.4	64.7	51.7	38	32.3
Temp. Rise (deg. C)	23	12.7	13	12.3	5.7	1.3
Flashing Temp. (deg. C)	120.5	83.7	71.9	58.8	42.8	38.7
Heat Transfer Rate (kJ/S)	164.495	90.044	91.862	86.651	113.089	25.779
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	17.558	11.505	12.602	12.237	7.282	7.030
U (kW/sq.m/°C)	2.005	4.041	3.763	3.656	3.134	0.740
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.2423	0.0514	0.0696	0.0775	0.1230	1.1553

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 02, 94 Time: 12:00 Total Operation Time: 212 hr.

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 6		
Flowrate (kg/h)	6500	6500	6500	6500	18000	18000	18000		
Specific Heat (kJ/kg/K)	3.961	3.926	3.913	3.902	3.968	3.968	3.966		
Inlet Temp. (deg. C)	88.5	64.2	51.5	39.4	33.2	30.5	30.5		
Outlet Temp. (deg. C)	112	77	64.2	51.5	38	33.2	33.2		
Temp. Rise (deg. C)	23.5	12.8	12.7	12.1	4.8	2.7	2.7		
Flashing Temp. (deg. C)	121	83.2	72	59	43	38.3	38.3		
Heat Transfer Rate (kJ/s)	168.058	90.742	89.734	85.240	95.240	53.542	53.542		
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556		
L.M.T.D. (deg. K)	18.302	11.430	13.143	12.596	7.133	6.355	6.355		
U (kW/sq.m/K)	1.965	4.099	3.525	3.494	2.694	1.700	1.700		
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1	5.1		
f (sq.m K/kW)	0.2524	0.0479	0.0876	0.0902	0.1751	0.3921	0.3921		

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 02, 94 Time: 16:00 Total Operation Time: 216 hr.

Variables	Brine Heater			Evaporator Stages					
	#1	#2	#3	#4	#5	#6	#7	#8	
Flowrate (kg/h)	6500	6500	6500	6500	17500	17500	17500	17500	
Specific Heat (kJ/kg/°C)	3.961	3.926	3.913	3.901	3.968	3.968	3.968	3.966	
Inlet Temp. (deg. C)	88.5	64	51.2	38.9	33.3	33.3	30	30	
Outlet Temp. (deg. C)	112	76.6	64	51.2	38	38	33.3	33.3	
Temp. Rise (deg. C)	23.5	12.6	12.8	12.3	4.7	4.7	3.3	3.3	
Flashing Temp. (deg. C)	121	83.1	71.9	58.8	43.1	43.1	37.6	37.6	
Heat Transfer Rate (kJ/S)	168.058	89.317	90.435	86.641	90.666	90.666	63.621	63.621	
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	
L.M.T.D. (deg. C)	18.302	11.690	13.288	12.778	7.196	7.196	5.794	5.794	
U (kW/sq.m/°C)	1.965	3.945	3.514	3.500	2.542	2.542	2.216	2.216	
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
f (sq.m K/kW)	0.2524	0.0574	0.0865	0.0896	0.1972	0.1972	0.2552	0.2552	

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 02, 94 Time: 20:00 Total Operation Time: 220 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	17200	17200
Specific Heat (kJ/kg/°C)	3.961	3.926	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	88.5	63.9	51.1	38.6	33.1	29
Outlet Temp. (deg. C)	112	76.8	63.9	51.1	38	33.1
Temp. Rise (deg. C)	23.5	12.9	12.8	12.5	4.9	4.1
Flashing Temp. (deg. C)	121.5	83.2	71.9	58.7	43	37.3
Heat Transfer Rate (kJ/S)	168.058	91.445	90.433	88.046	92.902	77.682
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	18.872	11.687	13.396	12.853	7.173	6.019
U (kW/sq.m/°C)	1.906	4.040	3.485	3.537	2.613	2.604
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.2683	0.0515	0.0909	0.0867	0.1866	0.1879

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: November 03, 94

Time: 00:00

Total Operation Time: 224 hr.

Variables	Evaporator Stages						
	Brine Heater	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	6500	17200	17200
Specific Heat (KJ/kg/K)	3.961	3.926	3.913	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	88.5	76.9	64.1	51.1	38.6	33.1	29
Outlet Temp. (deg. C)	112	88.5	76.9	64.1	51.1	37.5	33.1
Temp. Rise (deg. C)	23.5	11.6	12.8	13	12.5	4.4	4.1
Flashing Temp. (deg. C)	121.5	94.7	83.4	71.9	58.7	43	37.2
Heat Transfer Rate (KJ/S)	168.058	82.515	90.740	91.848	88.046	83.419	77.682
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	18.872	10.999	11.761	13.254	12.853	7.486	5.915
U (KW/sq.m/K)	1.906	3.873	3.983	3.578	3.537	2.249	2.650
Clean-U Value (KW/sq.m/K)	3.9	6.6	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.2683	0.1067	0.0550	0.0834	0.0867	0.2486	0.1813

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 03, 94 Time: 04:00 Total Operation Time: 228 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	17200	17200
Specific Heat (kJ/kg/K)	3.961	3.926	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	88.2	63.8	50.8	38.3	33	29
Outlet Temp. (deg. C)	112	76.6	63.8	50.8	37.5	33
Temp. Rise (deg. C)	23.8	12.8	13	12.5	4.5	4
Flashing Temp. (deg. C)	122	83.7	71.4	58.2	42.6	36.9
Heat Transfer Rate (KJ/S)	170.195	90.732	91.841	88.040	85.314	75.787
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	19.542	12.420	13.037	12.636	7.114	5.667
U (kW/sq.m/K)	1.864	3.772	3.637	3.597	2.420	2.699
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.2801	0.0691	0.0789	0.0819	0.2172	0.1745

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: November 05, 94

Time: 08:00

Total Operation Time: 232 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	17500	17500
Specific Heat (kJ/kg/K)	3.960	3.926	3.913	3.901	3.968	3.967
Inlet Temp. (deg. C)	88	63.8	50.8	38.3	33	33
Outlet Temp. (deg. C)	112	76.6	63.8	50.8	38	33
Temp. Rise (deg. C)	24	12.8	13	12.5	5	0
Flashing Temp. (deg. C)	123	83.4	71.1	58.1	42.6	36.8
Heat Transfer Rate (kJ/S)	171.620	90.732	91.841	88.040	96.451	0.000
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	20.735	12.091	12.711	12.527	6.796	ERR
U (kW/sq.m/K)	1.771	3.874	3.730	3.628	2.864	ERR
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.3081	0.0621	0.0720	0.0795	0.1531	ERR

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 03, 94 Time: 12:00 Total Operation Time: 236 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	17500	17500
Specific Heat (kJ/kg/K)	3.960	3.926	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	88	64.2	51.4	39.1	33.4	30
Outlet Temp. (deg. C)	112	76.9	64.2	51.4	38	33.4
Temp. Rise (deg. C)	24	12.7	12.8	12.3	4.6	3.4
Flashing Temp. (deg. C)	123	84.5	72.3	59.2	43.2	37.5
Heat Transfer Rate (kJ/s)	171.620	90.032	90.440	86.645	88.737	65.549
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	20.735	12.927	13.504	12.994	7.259	5.630
U (kW/sq.m/K)	1.771	3.596	3.458	3.442	2.467	2.349
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.3081	0.0820	0.0931	0.0944	0.2093	0.2295

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 03, 94 Time: 18:00 Total Operation Time: 240 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	17500	17500
Specific Heat (kJ/kg/°C)	3.960	3.926	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	88	63.7	50.8	38.4	33.1	29
Outlet Temp. (deg. C)	112	76.5	63.7	50.8	38	33.1
Temp. Rise (deg. C)	24	12.8	12.9	12.4	4.9	4.1
Flashing Temp. (deg. C)	123.5	84.3	71.9	58.8	42.8	37.1
Heat Transfer Rate (KJ/S)	171.620	90.730	91.134	87.336	94.522	79.037
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	21.292	13.180	13.649	13.247	6.965	5.811
U (kW/sq.m/°C)	1.725	3.554	3.447	3.404	2.739	2.745
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.3233	0.0853	0.0940	0.0977	0.1691	0.1683

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: November 03, 94

Time: 20:00

Total Operation Time: 244 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	17500	17500
Specific Heat (kJ/kg/°C)	3.960	3.926	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	88	63.8	50.9	38.3	33.1	29
Outlet Temp. (deg. C)	112	76.7	63.8	50.9	38	33.1
Temp. Rise (deg. C)	24	12.9	12.9	12.6	4.9	4.1
Flashing Temp. (deg. C)	124	84.4	72	58.9	43	37
Heat Transfer Rate (kJ/s)	171.620	91.442	91.136	88.745	94.522	79.037
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	21.846	13.109	13.649	13.321	7.173	5.707
U (kW/sq.m/°C)	1.681	3.601	3.447	3.439	2.659	2.795
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.3383	0.0816	0.0940	0.0947	0.1800	0.1617

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 04, 84 Time: 00:00 Total Operation Time: 248 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	17200	17200
Specific Heat (kJ/kg/°C)	3.961	3.926	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	89	63.8	50.8	38.1	33	29
Outlet Temp. (deg. C)	112	76.7	63.8	50.8	37.5	33
Temp. Rise (deg. C)	23	12.9	13	12.7	4.5	4
Flashing Temp. (deg. C)	123.5	84.3	72	58.8	42.8	36.8
Heat Transfer Rate (kJ/s)	164,495	91,442	91,841	89,446	85,314	75,787
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	20.936	13.000	13.686	13.359	7.321	5.562
U (kW/sq.m/°C)	1.682	3.631	3.464	3.457	2.352	2.749
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.3382	0.0793	0.0926	0.0932	0.2292	0.1676

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 04, 94 Time: 04:00 Total Operation Time: 252 hr.

Variables	Evaporator Stages						
	Brine Heater	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	6500	17000	17000
Specific Heat (kJ/kg/°C)	3.961	3.926	3.913	3.913	3.901	3.968	3.965
Inlet Temp. (deg. C)	89	76.4	63.4	50.7	38.6	32.8	28.5
Outlet Temp. (deg. C)	112	89	76.4	63.4	50.7	37	32.8
Temp. Rise (deg. C)	23	12.6	13	12.7	12.1	4.2	4.3
Flashing Temp. (deg. C)	113.5	93.7	83.2	71.4	58.4	42.6	36.6
Heat Transfer Rate (kJ/S)	164.495	89.628	92.142	89.716	85.224	78.697	80.520
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	8.234	9.669	12.164	13.359	12.812	7.505	5.681
U (kW/sq. m/°C)	4.276	4.786	3.911	3.467	3.434	2.116	2.860
Clean-U Value (kW/sq. m/°C)	3.9	6.6	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	-0.0225	0.0574	0.0596	0.0923	0.0951	0.2765	0.1536

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 04, 84 Time: 08:00 Total Operation Time: 256 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/m)	6500	6500	6500	6500	17100	17100
Specific Heat (kJ/kg/°C)	3.961	3.926	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	89	63.7	51	38.8	32.8	30
Outlet Temp. (deg. C)	112	76.6	63.7	51	38	32.8
Temp. Rise (deg. C)	23	12.9	12.7	12.2	5.2	2.8
Flashing Temp. (deg. C)	113	83.4	71.5	58.7	42.7	36.6
Heat Transfer Rate (kJ/S)	164.495	91.440	89.723	85.934	98.014	52.746
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. C)	7.237	12.128	13.143	12.849	6.980	5.072
U (kW/sq.m/°C)	4.865	3.893	3.524	3.453	2.834	2.099
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	-0.0508	0.0608	0.0877	0.0935	0.1568	0.2804

Brine Heater

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 04, 94 Time: 12:00 Total Operation Time: 260 hr.

Variables	Brine Heater			Evaporator Stages					
	#1	#2	#3	#4	#5	#6	#7	#8	
Flowrate (kg/m)	6500	6500	6500	6500	17100	17100	17100	17100	
Specific Heat (kJ/kg/°C)	3.961	3.926	3.913	3.902	3.968	3.968	3.968	3.966	
Inlet Temp. (deg. C)	89	64	51.5	39.4	33.1	33.1	30	30	
Outlet Temp. (deg. C)	112	76.7	64	51.5	38	38	33.1	33.1	
Temp. Rise (deg. C)	23	12.7	12.5	12.1	4.9	4.9	3.1	3.1	
Flashing Temp. (deg. C)	114	84.1	72	59.2	43.2	43.2	37.2	37.2	
Heat Transfer Rate (kJ/S)	164.495	90.027	88.319	85.240	92.562	92.562	58.398	58.398	
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	
L.M.T.D. (deg. K)	9.106	12.710	13.284	12.812	7.381	7.381	5.505	5.505	
U (kW/sq.m/°C)	3.866	3.657	3.432	3.435	2.525	2.525	2.141	2.141	
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
f (sq.m K/kW)	0.0022	0.0774	0.0953	0.0951	0.1999	0.1999	0.2711	0.2711	

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 04, 84 Time: 16:00 Total Operation Time: 264 hr.

Variables	Evaporator Stages					
	#1	#2	#3	#4	#5	#6
Flowrate (kg/h)	6500	6500	6500	6500	17100	17100
Specific Heat (kJ/kg/K)	3.961	3.926	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	88.5	63.6	51.1	39.1	33.1	29
Outlet Temp. (deg. C)	112	76.3	63.6	51.1	38	33.1
Temp. Rise (deg. C)	23.5	12.7	12.5	12	4.9	4.1
Flashing Temp. (deg. C)	114	82.9	71.3	58.8	43	37.2
Heat Transfer Rate (kJ/s)	168.058	90.017	88.310	84.529	92.362	77.231
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	9.232	11.836	12.961	12.774	7.173	5.915
U (kW/sq.m/K)	3.896	3.927	3.518	3.416	2.598	2.635
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.0003	0.0586	0.0882	0.0966	0.1888	0.1835

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 04, 94 Time: 20:00 Total Operation Time: 268 hr.

Variables	Evaporator Stages						
	Brine Heater	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	6500	17100	17100
Specific Heat (kJ/kg/K)	3.961	3.926	3.913	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	88.5	76.6	63.6	51	38.8	32.8	29
Outlet Temp. (deg. C)	112	88.5	76.6	63.6	51	38	32.8
Temp. Rise (deg. C)	23.5	11.9	13	12.6	12.2	5.2	3.8
Flashing Temp. (deg. C)	114	93.5	82.8	71.6	58.5	42.7	36.8
Heat Transfer Rate (kJ/S)	168.058	84.645	92.147	89.015	85.934	98.014	71.578
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	9.232	9.771	11.501	13.321	12.633	6.980	5.690
U (kW/sq.m/K)	3.896	4.472	4.136	3.450	3.512	2.834	2.538
Clean-U Value (kW/sq.m/K)	3.9	6.6	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.0003	0.0721	0.0457	0.0938	0.0687	0.1568	0.1979

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: November 05, 94

Time: 00:00

Total Operation Time: 272 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/m)	6500	6500	6500	6500	17100	17100
Specific Heat (kJ/kg/K)	3.961	3.926	3.913	3.901	3.968	3.965
Inlet Temp. (deg. C)	89	63.7	50.9	38.6	32.7	28.5
Outlet Temp. (deg. C)	112	76.6	63.7	50.9	37.5	32.7
Temp. Rise (deg. C)	23	12.9	12.8	12.3	4.8	4.2
Flashing Temp. (deg. C)	114.5	82.9	71.5	58.4	42.5	36.6
Heat Transfer Rate (kJ/S)	164.495	91.440	90.428	86.635	90.471	79.109
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	9.904	11.576	13.180	12.670	7.133	5.746
U (kW/sq.m/K)	3.555	4.078	3.542	3.530	2.559	2.778
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.0249	0.0491	0.0862	0.0872	0.1946	0.1639

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 05, 94 Time: 04:00 Total Operation Time: 276 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	17100	17100
Specific Heat (kJ/kg/°C)	3.961	3.926	3.913	3.901	3.968	3.965
Inlet Temp. (deg. C)	88.5	63.6	50.8	38.5	32.6	28.5
Outlet Temp. (deg. C)	112	76.5	63.6	50.8	37.5	32.6
Temp. Rise (deg. C)	23.5	12.9	12.8	12.3	4.9	4.1
Flashing Temp. (deg. C)	114.5	82.8	71.2	58.2	42.4	36.5
Heat Transfer Rate (kJ/S)	168,058	91,437	90,426	86,633	92,355	77,225
Heat Transfer Area (sq.m)	4,6723	1,937	1,937	1,937	4,9556	4,9556
L.M.T.D. (deg. K)	10,035	11,576	12,964	12,562	7,069	5,707
U (kW/sq.m/°C)	3,584	4,078	3,601	3,560	2,636	2,731
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.0226	0.0491	0.0816	0.0648	0.1832	0.1701

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2

Date: November 05, 94

Time: 08:00

Total Operation Time: 260 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/hr)	6500	6500	6500	6500	18200	18200
Specific Heat (KJ/kg/K)	3.961	3.926	3.913	3.901	3.968	3.966
Inlet Temp. (deg. C)	88.5	63.6	51	38.7	32.8	29.5
Outlet Temp. (deg. C)	112	76.3	63.6	51	37.5	32.8
Temp. Rise (deg. C)	23.5	12.7	12.6	12.3	4.7	3.3
Flashing Temp. (deg. C)	114	82.3	71.2	58.1	42.6	36.8
Heat Transfer Rate (KJ/S)	168.058	90.017	89.015	86.837	94.285	66.161
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	9.232	11.172	12.890	12.237	7.196	5.486
U (KW/sq.m/K)	3.896	4.160	3.565	3.655	2.644	2.434
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/KW)	0.0003	0.0443	0.0844	0.0775	0.1821	0.2148

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 06, 94 Time: 20:00 Total Operation Time: 316 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	17100	17100
Specific Heat (kJ/kg/°C)	3.960	3.925	3.912	3.900	3.968	3.966
Inlet Temp. (deg. C)	88	63.3	50.4	37.7	32.7	29
Outlet Temp. (deg. C)	112	76.2	63.3	50.4	38	32.7
Temp. Rise (deg. C)	24	12.9	12.9	12.7	5.3	3.7
Flashing Temp. (deg. C)	117	83.2	71.6	58.3	42.4	36.1
Heat Transfer Rate (kJ/S)	171.620	91.430	91.125	89.438	99.899	69.694
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	13.653	12.347	13.756	13.251	6.704	5.025
U (kW/sq.m/°C)	2.690	3.823	3.420	3.485	3.007	2.799
Clean-U Value (kW/sq.m/°C)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m ² /kW)	0.1153	0.0655	0.0963	0.0909	0.1365	0.1612

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 07, 94 Time: 00:00 Total Operation Time: 320 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	17100	17100
Specific Heat (kJ/kg/K)	3.960	3.925	3.912	3.900	3.968	3.965
Inlet Temp. (deg. C)	88	63.3	50.3	37.7	32.7	28
Outlet Temp. (deg. C)	112	76.2	63.3	50.3	38	32.7
Temp. Rise (deg. C)	24	12.9	13	12.6	5.3	4.7
Flashing Temp. (deg. C)	117	83.2	71.4	58.1	42.4	36.1
Heat Transfer Rate (kJ/s)	171.620	91.430	91.830	88.733	99.899	88.524
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	13.653	12.347	13.578	13.106	6.704	5.414
U (kW/sq.m/K)	2.690	3.823	3.491	3.495	3.007	3.299
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.1153	0.0655	0.0903	0.0900	0.1365	0.1070

CALCULATIONS OF OVERALL HEAT TRANSFER COEFFICIENT AND FOULING FACTOR

Run No. 5-2 Date: November 07, 94 Time: 04:00 Total Operation Time: 324 hr.

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	17200	17200
Specific Heat (kJ/kg/K)	3.960	3.925	3.912	3.900	3.968	3.965
Inlet Temp. (deg. C)	88	63.3	50.2	37.7	32.4	28
Outlet Temp. (deg. C)	112	76.2	63.3	50.2	38	32.4
Temp. Rise (deg. C)	24	12.9	13.1	12.5	5.6	4.4
Flashing Temp. (deg. C)	117.5	83.7	71.7	58.4	42.3	35.9
Heat Transfer Rate (kJ/S)	171.620	91.430	92.535	88.028	106.168	83.356
Heat Transfer Area (sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	14.289	12.892	13.939	13.499	6.715	5.405
U (kW/sq.m/K)	2.571	3.661	3.427	3.367	3.190	3.112
Clean-U Value (kW/sq.m/K)	3.9	5.1	5.1	5.1	5.1	5.1
f (sq.m K/kW)	0.1326	0.0770	0.0957	0.1010	0.1174	0.1252