

付属資料 5.3.3-1

Run 1における総括伝熱係数 (U) と汚れ係数 (f)





Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 16, 94 Time: 20:00

Variables	Brine Heater						Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	6000	13500	6000	6000	6000	6000	13500	13500
Specific Heat (kJ/kg/K)	3.971	3.944	3.931	3.917	3.903	3.958	3.944	3.931	3.917	3.903	3.958	3.954
Inlet Temp. (deg. C)	82	70	56	42	28	22	82	70	56	42	28	18
Outlet Temp. (deg. C)	105	82	70	56	42	28	105	82	70	56	42	22
Temp. Rise (deg. C)	23	12	14	14	14	6	23	12	14	14	6	4
Flashing Temp. (deg. C)	107	88	75	60	48	32	107	88	75	60	32	27
Heat Transfer Rate (kJ/S)	152.222	78.880	91.723	91.397	91.070	89.055	152.222	78.880	91.723	91.397	89.055	59.310
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	9.106	10.923	10.487	9.308	11.628	6.548	9.106	10.923	10.487	11.628	6.548	6.805
U (kW/sq.m/K)	3.578	3.728	4.515	5.069	4.043	2.744	3.578	3.728	4.515	5.069	2.744	1.759
Clean-U Value (kW/sq.m/K)												
f (sq.m K/kW)												

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 16, 94 Time: 24:00

Variables	Brine Heater						Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	6000	13500	6000	6000	6000	6000	13500	13500
Specific Heat (kJ/kg/K)	3.971	3.943	3.931	3.917	3.903	3.958	3.971	3.943	3.931	3.917	3.958	3.954
Inlet Temp. (deg. C)	81	70	56	42	29	22	81	70	56	42	22	18
Outlet Temp. (deg. C)	105	81	70	56	42	28	105	81	70	56	28	22
Temp. Rise (deg. C)	24	11	14	14	13	6	24	11	14	14	6	4
Flashing Temp. (deg. C)	107	88	75	61	49	32	107	88	75	61	32	28
Heat Transfer Rate (kJ/S)	158.840	72.288	91.723	91.397	84.565	89.055	158.840	72.288	91.723	91.397	89.055	59.310
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	9.357	11.647	10.487	10.487	12.383	6.548	9.357	11.647	10.487	12.383	6.548	7.830
U (kW/sq.m/K)	3.633	3.204	4.515	4.499	3.526	2.744	3.633	3.204	4.515	4.499	2.744	1.528
Clean-U Value (kW/sq.m/K)												
f (sq.m K/kW)												

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 3, 94 Time: 10:00

Variables	Brine Heater					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6500	6500	6500	6500	17500	17500
Specific Heat (kj/kg/K)	3.979	3.919	3.904	3.898	3.952	3.951
Inlet Temp. (deg. C)	76	43	37	38	18	18
Outlet Temp. (deg. C)	112	58	43	37	19	18
Temp. Rise (deg. C)	36	15	6	-1	1	0
Flashing Temp. (deg. C)	119	72	64	51	44	52
Heat Transfer Rate (kj/S)	258.635	106.140	42.293	-7.038	19.211	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)	19.832	20.598	23.874	13.494	25.497	ERR
U (kW/sq.m/K)	2.791	4.327	0.915	-0.269	0.152	ERR
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kW)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 3, 94 Time: 16:00

Variables	Brine Heater					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	5000	5000	5000	5000	17500	17500
Specific Heat (kj/kg/K)	3.953	3.919	3.909	3.897	3.952	3.952
Inlet Temp. (deg. C)	69	48	36	26	19	18
Outlet Temp. (deg. C)	90	58	48	36	20	19
Temp. Rise (deg. C)	21	11	12	10	1	1
Flashing Temp. (deg. C)	105	72	52	42	36	36
Heat Transfer Rate (kj/S)	115.296	54.431	65.150	54.125	19.211	19.211
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	23.987	7.141	8.656	10.195	16.495	17.495
U (kW/sq.m/K)	1.029	4.342	3.886	2.741	0.235	0.222
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kW)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.                      Date: Feb 3, 94                      Time: 20:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	5500	5500	5500	5500	13500	13500
Specific Heat (kJ/kg/K)	3.956	3.921	3.911	3.899	3.957	3.951
Inlet Temp. (deg. C)	72	50	38	27	18	18
Outlet Temp. (deg. C)	92	60	50	38	27	18
Temp. Rise (deg. C)	20	10	12	11	9	0
Flashing Temp. (deg. C)	105	64	54	44	34	34
Heat Transfer Rate (kJ/S)	120.878	59.904	71.702	65.525	133.549	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)	21.469	7.982	8.656	10.562	10.887	ERR
U (kW/sq.m/K)	1.205	3.874	4.276	3.203	2.475	ERR
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kW)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.                      Date: Feb 3, 94                      Time: 23:02

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	5500	5500	5500	5500	14000	14000
Specific Heat (kJ/kg/K)	3.958	3.921	3.909	3.898	3.954	3.951
Inlet Temp. (deg. C)	72	48	37	26	18	17
Outlet Temp. (deg. C)	94	60	48	37	22	18
Temp. Rise (deg. C)	22	12	11	11	4	1
Flashing Temp. (deg. C)	106	65	53	43	34	34
Heat Transfer Rate (kJ/S)	133.033	71.885	65.693	65.508	61.507	15.365
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	21.124	9.806	9.457	10.562	13.904	16.495
U (kW/sq.m/K)	1.348	3.785	3.586	3.202	0.893	0.188
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kW)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 4, 94 Time: 08:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	5600	5600	5600	5600	11000	11000
Specific Heat (kj/kg/K)	3.956	3.923	3.913	3.901	3.954	3.951
Inlet Temp. (deg. C)	72	52	40	25	18	18
Outlet Temp. (deg. C)	92	62	52	40	22	18
Temp. Rise (deg. C)	20	10	12	15	4	0
Flashing Temp. (deg. C)	105	64	54	44	33	30
Heat Transfer Rate (kj/S)	123.076	61.024	73.043	91.023	48.327	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)	21.469	ERR	6.167	9.627	12.897	ERR
U (kW/sq.m/K)	1.227	ERR	6.115	4.881	0.756	ERR
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kW)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 5, 94 Time: 14:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	18000	18000
Specific Heat (kj/kg/K)	3.965	3.925	3.913	3.899	3.954	3.951
Inlet Temp. (deg. C)	76	52	38	24	18	16
Outlet Temp. (deg. C)	100	64	52	38	23	18
Temp. Rise (deg. C)	24	12	14	14	5	2
Flashing Temp. (deg. C)	112	80	71	45	29	29
Heat Transfer Rate (kj/S)	158.600	78.500	91.303	90.977	98.850	39.510
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	8.656	12.018	12.743	8.249	11.972
U (kW/sq.m/K)	1.554	4.697	3.372	3.686	2.418	0.666
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kW)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 6, 94 Time: 04:00

Variables	Brine Heater						Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	6000	14000	6000	6000	6000	6000	14000	14000
Specific Heat (kj/kg/K)	3.979	3.947	3.932	3.919	3.905	3.951	3.947	3.932	3.919	3.905	3.952	3.951
Inlet Temp. (deg. C)	84	71	58	44	30	18	84	71	58	44	30	18
Outlet Temp. (deg. C)	112	84	71	58	44	18	112	84	71	58	44	18
Temp. Rise (deg. C)	28	13	13	14	14	0	28	13	13	14	14	0
Flashing Temp. (deg. C)	117	85	75	61	50	41	117	85	75	61	50	41
Heat Transfer Rate (kj/s)	185.687	85.518	85.193	91.443	91.117	0.000	185.687	85.518	85.193	91.443	91.117	0.000
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.6723	1.937	1.937	1.937	1.937	4.9556
L.M.T.D. (deg. K)	14.838	4.926	8.985	8.071	11.628	ERR	14.838	4.926	8.985	8.071	11.628	ERR
U (kW/sq.m/K)	2.678	8.963	4.895	5.849	4.045	ERR	2.678	8.963	4.895	5.849	4.045	ERR
Clean-U Value (kW/sq.m/K)												
f (sq.m K/kW)												

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 7, 94 Time: 04:00

Variables	Brine Heater						Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	6000	14000	6000	6000	6000	6000	14000	14000
Specific Heat (kj/kg/K)	3.965	3.938	3.925	3.914	3.901	3.951	3.965	3.938	3.925	3.914	3.955	3.951
Inlet Temp. (deg. C)	76	64	53	40	27	16	76	64	53	40	27	16
Outlet Temp. (deg. C)	100	76	64	53	40	18	100	76	64	53	40	18
Temp. Rise (deg. C)	24	12	11	13	13	2	24	12	11	13	13	2
Flashing Temp. (deg. C)	117	78	68	56	45	25	117	78	68	56	45	25
Heat Transfer Rate (kj/s)	158.600	78.760	71.958	84.803	84.522	30.730	158.600	78.760	71.958	84.803	84.522	30.730
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.6723	1.937	1.937	1.937	1.937	4.9556
L.M.T.D. (deg. K)	27.262	6.167	8.322	7.766	10.149	7.958	27.262	6.167	8.322	7.766	10.149	7.958
U (kW/sq.m/K)	1.245	6.594	4.464	5.638	4.300	0.779	1.245	6.594	4.464	5.638	4.300	0.779
Clean-U Value (kW/sq.m/K)												
f (sq.m K/kW)												



Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 8, 94 Time: 16:00

Variables	Brine Heater						Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	6000	18500	6000	6000	6000	6000	18500	18500
Specific Heat (kj/kg/K)	3.977	3.948	3.931	3.917	3.903	3.956	3.977	3.948	3.931	3.917	3.903	3.951
Inlet Temp. (deg. C)	85	69	56	42	28	18	110	85	69	56	42	17
Outlet Temp. (deg. C)	25	16	13	14	14	25	110	85	69	56	42	18
Temp. Rise (deg. C)	111	91	80	63	50	7	110	85	69	56	42	1
Flashing Temp. (deg. C)	165.708	105.280	85.172	91.397	91.070	29	165.708	105.280	85.172	91.397	91.070	27
Heat Transfer Rate (kj/S)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.6723	1.937	1.937	1.937	1.937	4.9556
Heat Transfer Area (Sq.m)	7.673	12.314	16.663	12.743	13.839	9.491	7.673	12.314	16.663	12.743	13.839	9.491
L.M.T.D. (deg. K)	4.622	4.414	2.639	3.703	3.397	0.432	4.622	4.414	2.639	3.703	3.397	0.432
U (kW/sq.m/K)												
Clean-U Value (kW/sq.m/K)												
f (sq.m K/kW)												

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 9, 94 Time: 04:00

Variables	Brine Heater						Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	6000	18000	6000	6000	6000	6000	18000	18000
Specific Heat (kj/kg/K)	3.977	3.948	3.931	3.917	3.902	3.955	3.977	3.948	3.931	3.917	3.902	3.951
Inlet Temp. (deg. C)	85	70	56	41	28	17	110	85	70	56	41	18
Outlet Temp. (deg. C)	25	15	14	15	13	6	110	85	70	56	41	18
Temp. Rise (deg. C)	112	85	73	58	45	27	110	85	73	58	45	1
Flashing Temp. (deg. C)	165.708	98.700	91.723	97.925	84.543	19.755	165.708	98.700	91.723	97.925	84.543	19.755
Heat Transfer Rate (kj/S)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.6723	1.937	1.937	1.937	1.937	4.9556
Heat Transfer Area (Sq.m)	9.605	ERR	8.071	7.009	8.985	7.489	9.605	ERR	8.071	7.009	8.985	7.489
L.M.T.D. (deg. K)	3.692	ERR	5.867	7.213	4.858	0.532	3.692	ERR	5.867	7.213	4.858	0.532
U (kW/sq.m/K)												
Clean-U Value (kW/sq.m/K)												
f (sq.m K/kW)												

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 10, 94 Time: 04:00

Variables	Brine Heater						Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	6000	18500	6000	6000	6000	6000	18500	18500
Specific Heat (kj/kg/K)	3.977	3.947	3.934	3.913	3.904	3.954	3.977	3.934	3.913	3.904	3.954	3.951
Inlet Temp. (deg. C)	84	72	52	43	28	18	84	52	43	28	18	17
Outlet Temp. (deg. C)	110	84	72	52	43	23	110	72	52	43	23	18
Temp. Rise (deg. C)	26	12	20	9	15	5	26	20	9	15	5	1
Flashing Temp. (deg. C)	111	85	75	60	49	34	111	75	60	49	34	34
Heat Transfer Rate (kj/S)	172.337	78.940	131.133	58.695	97.600	101.596	172.337	131.133	58.695	97.600	101.596	20.304
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	7.889	4.678	9.819	11.940	11.974	13.344	7.889	4.678	9.819	11.940	13.344	16.495
U (kW/sq.m/K)	4.676	8.711	6.895	2.538	4.208	1.536	4.676	8.711	6.895	4.208	1.536	0.248
Clean-U Value (kW/sq.m/K)												
f (sq.m K/kW)												

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 11, 94 Time: 04:00

Variables	Brine Heater						Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6200	6200	6200	6200	6200	18000	6200	6200	6200	6200	18000	18000
Specific Heat (kj/kg/K)	3.979	3.949	3.934	3.919	3.905	3.954	3.979	3.934	3.919	3.905	3.954	3.951
Inlet Temp. (deg. C)	86	72	58	44	29	18	86	58	44	29	18	17
Outlet Temp. (deg. C)	110.2	86	72	58	44	23	110.2	72	58	44	23	18
Temp. Rise (deg. C)	24.2	14	14	14	15	5	24.2	14	14	15	5	1
Flashing Temp. (deg. C)	112	88	76	61	50	34	112	76	61	50	34	34
Heat Transfer Rate (kj/S)	165.836	95.215	94.853	94.491	100.879	98.850	165.836	94.853	94.491	100.879	98.850	19.755
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	9.063	6.733	9.308	8.071	11.974	13.344	9.063	6.733	8.071	11.974	13.344	16.495
U (kW/sq.m/K)	3.916	7.301	5.261	6.044	4.350	1.495	3.916	7.301	6.044	4.350	1.495	0.242
Clean-U Value (kW/sq.m/K)												
f (sq.m K/kW)												

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.

Date: Feb 12, 94

Time: 00:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6200	6200	6200	6200	18000	18000
Specific Heat (kj/kg/K)	3.965	3.927	3.912	3.901	3.886	3.879
Inlet Temp. (deg. C)	86	58	44	30	18	17
Outlet Temp. (deg. C)	111	72	58	44	24	18
Temp. Rise (deg. C)	25	14	14	14	6	1
Flashing Temp. (deg. C)	112	76	61	50	34	34
Heat Transfer Rate (kj/S)	170.715	94.684	94.323	94.057	116.580	19.395
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	7.673	9.308	8.071	11.628	12.766	16.495
U (kw/sq.m/K)	4.762	5.252	6.033	4.176	1.843	0.237
f (sq.m K/kw)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 12, 94 Time: 16:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	17000	17000
Specific Heat (kJ/kg/K)	3.98	3.947	3.931	3.917	3.903	3.952
Inlet Temp. (deg. C)	84	70	56	42	28	20
Outlet Temp. (deg. C)	113	84	70	56	42	26
Temp. Rise (deg. C)	29	14	14	14	14	6
Flashing Temp. (deg. C)	113	90	80	63	50	30
Heat Transfer Rate (kJ/S)	192.367	92.097	91.723	91.397	91.070	112.087
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556
L.M.T.D. (deg. K)	ERR	11.628	15.991	12.743	13.839	8.963
U (kW/sq.m/K)	ERR	4.089	2.961	3.703	3.397	3.454
Clean-U Value (kW/sq.m/K)						0.840
f (sq.m K/kW)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 13, 94 Time: 16:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	17000	17000
Specific Heat (kJ/kg/K)	3.979	3.934	3.918	3.903	3.957	3.952
Inlet Temp. (deg. C)	87	72	57	42	28	20
Outlet Temp. (deg. C)	112	87	72	57	42	27
Temp. Rise (deg. C)	25	15	15	15	14	7
Flashing Temp. (deg. C)	114	92	80	64	52	32
Heat Transfer Rate (kJ/S)	165.792	98.750	97.950	97.950	91.070	130.801
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556
L.M.T.D. (deg. K)	9.605	10.820	14.204	13.099	15.991	7.996
U (kW/sq.m/K)	3.694	4.712	3.575	3.860	2.940	3.301
Clean-U Value (kW/sq.m/K)						0.840
f (sq.m K/kW)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.

Date: Feb 14, 94

Time: 08:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	17000	17000
Specific Heat (kj/kg/K)	3.979	3.936	3.92	3.905	3.956	3.952
Inlet Temp. (deg. C)	87	59	44	28	20	18
Outlet Temp. (deg. C)	112	74	59	44	26	20
Temp. Rise (deg. C)	25	15	15	16	6	2
Flashing Temp. (deg. C)	115	78	63	50	30	28
Heat Transfer Rate (kj/S)	165.792	98.400	98.000	104.133	112.087	37.324
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	11.193	8.985	9.627	12.314	6.548	8.963
U (kW/sq.m/K)	3.170	4.918	5.277	4.366	3.454	0.840
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kw)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.

Date: Feb 15, 94

Time: 4:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	17000	17000
Specific Heat (kj/kg/K)	3.971	3.929	3.915	3.901	3.955	3.951
Inlet Temp. (deg. C)	78	54	40	26	18	18
Outlet Temp. (deg. C)	105	68	54	40	24	18
Temp. Rise (deg. C)	27	14	14	14	6	0
Flashing Temp. (deg. C)	108	70	56	46	28	26
Heat Transfer Rate (kj/S)	178.695	91.677	91.350	91.023	112.058	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)	11.726	7.982	6.733	11.628	6.548	ERR
U (kW/sq.m/K)	3.262	4.247	7.030	4.041	3.453	ERR
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kw)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 16, 94 Time: 4:00

Variables	Brine Heater						Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	6000	13000	6000	6000	6000	6000	13000	13000
Specific Heat (kj/kg/K)	3.962	3.927	3.914	3.901	3.956	3.952	3.938	3.927	3.914	3.901	3.956	3.952
Inlet Temp. (deg. C)	76	53	40	27	20	18	66	53	40	27	20	18
Outlet Temp. (deg. C)	98	66	53	40	26	20	76	66	53	40	26	20
Temp. Rise (deg. C)	22	13	13	13	6	2	10	13	13	13	6	2
Flashing Temp. (deg. C)	102	64	54	44	29	26	80	64	54	44	29	26
Heat Transfer Rate (kj/S)	145.273	85.085	84.803	84.522	85.713	28.542	65.633	85.085	84.803	84.522	85.713	28.542
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	1.937	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	11.753	ERR	4.926	8.985	5.461	6.952	7.982	ERR	4.926	8.985	5.461	6.952
U (kW/sq.m/K)	2.645	ERR	8.888	4.857	3.167	0.828	4.245	ERR	8.888	4.857	3.167	0.828
Clean-U Value (kW/sq.m/K)												
f (sq.m K/kW)												

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 16, 94 Time: 08:10

Variables	Brine Heater						Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	5800	5800	5800	5800	5800	13000	5800	5800	5800	5800	13000	13000
Specific Heat (kj/kg/K)	3.965	3.927	3.914	3.901	3.957	3.953	3.939	3.927	3.914	3.901	3.957	3.953
Inlet Temp. (deg. C)	77	53	40	28	21	19	66	53	40	28	21	19
Outlet Temp. (deg. C)	100	66	53	40	27	21	77	66	53	40	27	21
Temp. Rise (deg. C)	23	13	13	12	6	2	11	13	13	12	6	2
Flashing Temp. (deg. C)	104	73	59	47	31	27	84	73	59	47	31	27
Heat Transfer Rate (kj/S)	146.925	82.249	81.977	75.419	85.735	28.549	69.808	82.249	81.977	75.419	85.735	28.549
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556	1.937	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	12.045	12.383	11.278	12.018	6.548	6.952	11.647	12.383	11.278	12.018	6.548	6.952
U (kW/sq.m/K)	2.611	3.429	3.753	3.240	2.642	0.829	3.094	3.429	3.753	3.240	2.642	0.829
Clean-U Value (kW/sq.m/K)												
f (sq.m K/kW)												

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 16, 94 Time: 12:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	13500	13500
Specific Heat (kJ/kg/K)	3.971	3.93	3.916	3.902	3.958	3.954
Inlet Temp. (deg. C)	81	55	41	29	22	19
Outlet Temp. (deg. C)	105	69	55	41	28	22
Temp. Rise (deg. C)	24	14	14	12	6	3
Flashing Temp. (deg. C)	107	76	61	49	32	27
Heat Transfer Rate (kJ/S)	158.840	91.700	91.373	78.040	89.055	44.483
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	9.357	12.743	11.628	13.096	6.548	6.383
U (kW/sq.m/K)	3.633	3.715	4.057	3.076	2.744	1.406
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kW)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No. Date: Feb 16, 94 Time: 16:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	13500	13500
Specific Heat (kJ/kg/K)	3.971	3.93	3.916	3.902	3.958	3.954
Inlet Temp. (deg. C)	81	56	42	29	22	19
Outlet Temp. (deg. C)	105	69	56	42	28	22
Temp. Rise (deg. C)	24	13	14	13	6	3
Flashing Temp. (deg. C)	107	78	62	50	33	28
Heat Transfer Rate (kJ/S)	158.840	85.150	91.373	84.543	89.055	44.483
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	9.357	14.544	11.628	13.470	7.610	7.399
U (kW/sq.m/K)	3.633	3.022	4.057	3.240	2.362	1.213
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kW)						





付属資料 5.3.3-2

Run 2における総括伝熱係数 (U) と汚れ係数 (f)



Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.                      Date: July 10, 94                      Time: 16:00

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9
Flowrate (kg/h)	5900	5900	5900	5900	19000	19000	19000	19000	19000
Specific Heat (kj/kg/K)	3.965	3.931	3.921	3.906	3.896	3.896	3.896	3.896	3.894
Inlet Temp. (deg. C)	90	65	53	40	33	33	33	33	32
Outlet Temp. (deg. C)	111	78	65	53	38	38	38	38	33
Temp. Rise (deg. C)	21	13	12	13	5	5	5	5	1
Flashing Temp. (deg. C)	112	86	70	59	42	42	42	42	41
Heat Transfer Rate (kj/S)	136.462	83.752	77.113	83.220	102.811	102.811	102.811	102.811	20.552
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556
L.M.T.D. (deg. K)	6.794	13.470	9.806	11.278	6.166	6.166	6.166	6.166	8.490
U (kW/sq.m/K)	4.299	3.210	4.060	3.809	3.365	3.365	3.365	3.365	0.488
Clean-U Value (kW/sq.m/K)									
f (sq.m K/kw)									

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.

Date: July 10, 94

Time: 20:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	5900	5900	5900	5900	18800	18800
Specific Heat (kj/kg/K)	3.965	3.931	3.921	3.906	3.896	3.894
Inlet Temp. (deg. C)	91	66	53	40	33	32
Outlet Temp. (deg. C)	112	79	66	53	38	33
Temp. Rise (deg. C)	21	13	13	13	5	1
Flashing Temp. (deg. C)	114	84	69	58	41	40
Heat Transfer Rate (kj/S)	136.462	83.752	83.539	83.220	101.729	20.335
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	8.598	10.149	7.766	10.149	5.098	7.489
U (kW/sq.m/K)	3.397	4.260	5.553	4.233	4.027	0.548
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kW)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.

Date: July 11, 94

Time: 00:00

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9
Flowrate (kg/h)	6000	6000	6000	6000	6000	6000	6000	6000	6000
Specific Heat (kj/kg/K)	3.965	3.948	3.931	3.921	3.906	3.896	3.894	3.896	3.894
Inlet Temp. (deg. C)	90	79	66	53	41	33	32	33	33
Outlet Temp. (deg. C)	112	90	79	66	53	38	33	38	33
Temp. Rise (deg. C)	22	11	13	13	12	5	1	5	1
Flashing Temp. (deg. C)	113	96	84	69	58	41	40	41	40
Heat Transfer Rate (kj/s)	145.383	72.380	85.172	84.955	78.120	100.106	20.011	100.106	20.011
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556
L.M.T.D. (deg. K)	7.016	10.562	10.149	7.766	9.806	5.098	7.489	9.806	7.489
U (kW/sq.m/K)	4.435	3.538	4.333	5.648	4.113	3.963	0.539	4.113	0.539
Clean-U Value (kW/sq.m/K)									
f (sq.m K/kW)									

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.                      Date: July 11, 94                      Time: 04:00

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9
Flowrate (kg/h)	5900	5900	5900	5900	5900	5900	5900	5900	5900
Specific Heat (kj/kg/K)	3.965	3.931	3.921	3.906	3.896	3.894	3.896	3.896	3.894
Inlet Temp. (deg. C)	89	65	52	40	32	31	32	32	31
Outlet Temp. (deg. C)	112	79	65	52	38	32	38	38	32
Temp. Rise (deg. C)	23	14	13	12	6	1	6	6	1
Flashing Temp. (deg. C)	113	84	68	58	41	40	41	41	40
Heat Transfer Rate (kj/S)	149.458	90.195	83.539	76.818	126.620	21.093	126.620	126.620	21.093
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. K)	7.237	10.487	7.766	10.923	5.461	8.490	5.461	5.461	8.490
U (kW/sq.m/K)	4.420	4.440	5.553	3.631	4.678	0.501	4.678	4.678	0.501
Clean-U Value (kW/sq.m/K)									
f (sq.m K/kW)									

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.                      Date: July 11, 94                      Time: 08:00

Variables	Brine Heater		Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 6	
Flowrate (kg/h)	6000	6000	6000	6000	18600	18600	18600	
Specific Heat (kJ/kg/K)	3.965	3.931	3.921	3.906	3.896	3.896	3.894	
Inlet Temp. (deg. C)	90	67	54	42	33	33	32	
Outlet Temp. (deg. C)	112	80	67	54	38	38	33	
Temp. Rise (deg. C)	22	10	13	12	5	5	1	
Flashing Temp. (deg. C)	114	84	70	60	42	42	38	
Heat Transfer Rate (kJ/S)	145.383	85.172	84.955	78.120	100.647	100.647	20.119	
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)	8.853	8.985	7.766	10.923	6.166	6.166	5.485	
U (kW/sq.m/K)	3.515	4.894	5.648	3.692	3.294	3.294	0.740	
Clean-U Value (kW/sq.m/K)								
f (sq.m K/kW)								

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.                      Date: July 11, 94                      Time: 12:00

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9
Flowrate (kg/h)	6000	6000	6000	6000	6000	6000	6000	6000	6000
Specific Heat (kJ/kg/K)	3.965	3.931	3.921	3.906	3.896	3.896	3.896	3.896	3.896
Inlet Temp. (deg. C)	90	66	54	42	33	33	33	33	33
Outlet Temp. (deg. C)	111	78	66	54	38	33	33	33	33
Temp. Rise (deg. C)	21	12	12	12	12	5	5	5	1
Flashing Temp. (deg. C)	112	84	70	60	42	40	40	40	40
Heat Transfer Rate (kJ/S)	138.775	78.620	78.420	78.120	94.694	18.929	18.929	18.929	18.929
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. K)	6.794	9.806	8.656	10.923	6.166	7.489	7.489	7.489	7.489
U (kW/sq.m/K)	4.372	4.157	4.677	3.692	3.099	3.099	3.099	3.099	3.099
Clean-U Value (kW/sq.m/K)									
f (sq.m K/kW)									



Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.

Date: July 11, 94

Time: 16:00

Variables	Brine Heater			Evaporator Stages							
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9		
Flowrate (kg/h)	5800	5800	5800	5800	5800	5800	5800	5800	5800	17800	17800
Specific Heat (kj/kg/K)	3.953	3.928	3.918	3.908	3.899	3.894	3.894	3.894	3.894	3.899	3.894
Inlet Temp. (deg. C)	88	62	52	42	33	32	32	32	32	33	32
Outlet Temp. (deg. C)	102	72	62	52	38	33	33	33	33	38	33
Temp. Rise (deg. C)	14	10	10	10	5	1	1	1	1	5	1
Flashing Temp. (deg. C)	110	79	67	57	48	39	39	39	39	48	39
Heat Transfer Rate (kj/S)	89.162	63.284	63.123	62.962	96.392	19.254	19.254	19.254	19.254	96.392	19.254
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	1.937	4.9556
L.M.T.D. (deg. K)	13.839	9.941	9.102	9.102	9.102	6.487	6.487	6.487	6.487	12.332	6.487
U (kW/sq.m/K)	1.379	2.899	3.580	3.571	1.577	0.599	0.599	0.599	0.599	1.577	0.599
Clean-U Value (kW/sq.m/K)											
f (sq.m K/kW)											

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.                      Date: July 11, 94                      Time: 20:00

Variables	Brine Heater			Evaporator Stages							
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9		
Flowrate (kg/h)	5800	5800	5800	5800	5800	5800	5800	5800	5800	17600	17600
Specific Heat (kj/kg/K)	3.953	3.928	3.918	3.908	3.899	3.894	3.894	3.894	3.894	3.899	3.894
Inlet Temp. (deg. C)	80	61	52	41	33	32	32	32	32	33	32
Outlet Temp. (deg. C)	92	70	61	52	38	33	33	33	33	38	33
Temp. Rise (deg. C)	12	9	9	11	5	1	1	1	1	5	1
Flashing Temp. (deg. C)	110	78	64	56	41	38	38	38	38	41	38
Heat Transfer Rate (kj/S)	76.425	56.956	56.811	69.258	95.309	19.037	19.037	19.037	19.037	95.309	19.037
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	4.9556
L.M.T.D. (deg. K)	23.491	11.940	6.492	8.322	5.098	5.485	5.485	5.485	5.485	5.098	5.485
U (kW/sq.m/K)	0.696	2.463	4.518	4.296	3.773	0.700	0.700	0.700	0.700	3.773	0.700
Clean-U Value (kW/sq.m/K)											
f (sq.m K/kw)											

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.

Date: July 12, 94

Time: 00:00

Variables	Brine Heater			Evaporator Stages							
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9		
Flowrate (kg/h)	5600	5600	5600	5600	5600	5600	5600	5600	5600	18000	18000
Specific Heat (kj/kg/K)	3.953	3.928	3.918	3.908	3.899	3.894	3.894	3.894	3.894	3.899	3.894
Inlet Temp. (deg. C)	76	58	49	40	32	31	31	31	31	32	31
Outlet Temp. (deg. C)	92	67	58	49	34	32	32	32	32	34	32
Temp. Rise (deg. C)	16	9	9	9	9	2	1	1	1	2	1
Flashing Temp. (deg. C)	110	78	60	52	43	38	38	38	38	43	38
Heat Transfer Rate (kj/S)	98.386	54.992	54.852	54.712	38.990	19.470	19.470	19.470	19.470	38.990	19.470
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556	4.9556	4.9556	4.9556	4.9556
L.M.T.D. (deg. K)	25.158	6.492	5.279	6.492	6.492	6.487	6.487	6.487	6.487	9.967	6.487
U (kW/sq.m/K)	0.837	4.373	5.364	4.351	0.789	0.606	0.606	0.606	0.606	0.789	0.606
Clean-U Value (kW/sq.m/K)											
f (sq.m K/kW)											

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.

Date: July 12, 94

Time: 04:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	5600	5600	5600	5600	18000	18000
Specific Heat (kj/kg/K)	3.953	3.928	3.918	3.908	3.899	3.894
Inlet Temp. (deg. C)	75	58	49	40	32	31
Outlet Temp. (deg. C)	91	67	58	49	34	32
Temp. Rise (deg. C)	16	9	9	9	2	1
Flashing Temp. (deg. C)	110	70	60	52	43	38
Heat Transfer Rate (kj/S)	98.386	54.992	54.852	54.712	38.990	19.470
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	26.190	6.492	5.279	6.492	9.967	6.487
U (kW/sq.m/K)	0.804	4.373	5.364	4.351	0.789	0.606
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kW)						

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.

Date: July 12, 94

Time: 08:00

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	
Flowrate (kg/h)	6000	6000	6000	6000	6000	6000	6000	18500	18500
Specific Heat (kj/kg/K)	3.965	3.931	3.921	3.906	3.896	3.896	3.896	3.896	3.894
Inlet Temp. (deg. C)	90	67	54	42	33	33	33	33	32
Outlet Temp. (deg. C)	111	78	67	54	38	33	33	33	33
Temp. Rise (deg. C)	21	11	13	12	5	5	5	5	1
Flashing Temp. (deg. C)	112	85	71	60	43	41	41	41	41
Heat Transfer Rate (kj/S)	138.775	72.068	84.955	78.120	100.106	20.011	20.011	20.011	20.011
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. K)	6.794	10.923	8.985	10.923	7.213	8.490	8.490	8.490	8.490
U (kW/sq.m/K)	4.372	3.195	4.882	3.692	2.800	0.476	0.476	0.476	0.476
Clean-U Value (kW/sq.m/K)									
f (sq.m K/kW)									

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.

Date: July 12, 94

Time: 12:00

Variables	Brine Heater			Evaporator Stages							
	# 1	# 2	# 3	# 4	# 5	# 6	# 5	# 4	# 3	# 2	# 1
Flowrate (kg/h)	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Specific Heat (kj/kg/K)	3.965	3.931	3.921	3.906	3.896	3.894	3.896	3.896	3.896	3.896	3.894
Inlet Temp. (deg. C)	90	67	55	42	33	32	33	33	33	33	32
Outlet Temp. (deg. C)	110	78	67	55	38	33	38	38	38	38	33
Temp. Rise (deg. C)	20	11	12	13	5	1	5	5	5	5	1
Flashing Temp. (deg. C)	113	94	71	60	43	42	43	43	43	43	42
Heat Transfer Rate (kj/S)	132.167	72.068	78.420	84.630	97.400	19.470	97.400	97.400	97.400	97.400	19.470
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	4.9556
L.M.T.D. (deg. K)	9.819	12.717	8.656	10.149	7.213	9.491	7.213	7.213	7.213	7.213	9.491
U (kW/sq.m/K)	2.881	2.926	4.677	4.305	2.725	0.414	2.725	2.725	2.725	2.725	0.414
Clean-U Value (kW/sq.m/K)											
f (sq.m K/kw)											

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.

Date: July 12, 94

Time: 16:00

Variables	Brine Heater			Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6	# 5	# 6	
Flowrate (kg/h)	6000	6000	6000	6000	18100	18100	18100	18100	
Specific Heat (kj/kg/K)	3.965	3.948	3.931	3.921	3.906	3.896	3.896	3.894	
Inlet Temp. (deg. C)	91	78	67	55	42	33	33	32	
Outlet Temp. (deg. C)	110	91	78	67	55	38	33	33	
Temp. Rise (deg. C)	19	13	11	12	13	5	1	1	
Flashing Temp. (deg. C)	112	98	88	72	61	45	42	42	
Heat Transfer Rate (kj/s)	125.558	85.540	72.068	78.420	84.630	97.941	19.578	19.578	
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	1.937	4.9556	4.9556	4.9556	
L.M.T.D. (deg. K)	8.080	12.383	14.826	9.806	11.278	9.276	9.491	9.491	
U (kW/sq.m/K)	3.326	3.566	2.510	4.129	3.874	2.131	0.416	0.416	
Clean-U Value (kW/sq.m/K)									
f (sq.m K/kW)									

Calculations of Overall Heat Transfer Coefficient (U) and Fouling Factor (f)

Run No.

Date: July 12, 94

Time: 20:00

Variables	Evaporator Stages					
	# 1	# 2	# 3	# 4	# 5	# 6
Flowrate (kg/h)	6000	6000	6000	6000	18000	18000
Specific Heat (kj/kg/K)	3.965	3.931	3.921	3.906	3.896	3.894
Inlet Temp. (deg. C)	90	67	54	41	33	32
Outlet Temp. (deg. C)	110	78	67	54	37	33
Temp. Rise (deg. C)	20	11	13	13	4	1
Flashing Temp. (deg. C)	112	86	72	60	44	41
Heat Transfer Rate (kj/S)	132.167	72.068	84.955	84.630	77.920	19.470
Heat Transfer Area (Sq.m)	4.6723	1.937	1.937	1.937	4.9556	4.9556
L.M.T.D. (deg. K)	8.341	12.717	10.149	11.278	8.850	8.490
U (kW/sq.m/K)	3.391	2.926	4.322	3.874	1.777	0.463
Clean-U Value (kW/sq.m/K)						
f (sq.m K/kW)						