

APPENDIX D

Test Results

D.1 Variation of the generator heat input

Table D.1 Helium charge pressure 6.1bar

Input kW	MPa	7	8	2	1	13	3	Cooling effect	COP
1	1.236	72.24	31.45	135.21	105.59	36.71	132.87	67.60	0.0942
1.1	1.251	72.48	31.42	135.73	106.27	37.25	133.61	92.86	0.1110
1.2	1.321	73.15	31.63	139.39	109.91	43.46	137.30	120.50	0.1273
1.3	1.318	73.34	31.77	139.14	109.14	43.07	137.35	131.82	0.1273
1.5	1.274	73.21	31.66	136.26	104.70	39.07	134.95	132.79	0.1110
1.75	1.268	73.39	31.24	136.07	103.65	39.61	135.04	132.54	0.0950
2	1.312	74.76	31.87	138.98	107.41	44.50	138.54	158.33	0.0974
2.25	1.340	75.86	31.56	140.50	109.66	46.66	141.35	188.44	0.1014
2.5	1.275	74.47	31.33	136.87	101.53	41.79	135.58	167.53	0.0820

Table D.2 Helium charge pressure 6.8bar

Input kW	MPa	7	8	2	1	13	3	Cooling effect	COP
1.0	14.103	72.48	32.16	142.00	112.16	41.61	140.19	96.56	0.126
1.1	13.601	72.43	31.64	139.53	109.48	37.67	137.37	126.96	0.145
1.2	13.742	72.46	31.92	139.80	108.64	38.05	138.12	126.22	0.133
1.3	13.745	73.17	32.95	141.28	109.72	42.78	139.64	162.19	0.153
1.4	13.767	73.84	32.53	140.89	110.07	42.46	139.64	147.82	0.131
1.5	13.741	73.37	32.31	139.83	108.08	40.26	138.86	156.17	0.128
1.75	14.022	74.89	32.13	141.72	110.32	44.64	141.05	149.07	0.105
2.0	13.729	75.29	30.95	141.09	109.23	44.55	140.89	161.70	0.099
2.25	14.056	76.05	31.38	142.88	111.35	46.85	143.58	182.96	0.099
2.5	13.535	75.62	32.28	140.80	105.27	43.22	139.67	190.86	0.093

Table D.3 Helium charge pressure 8.2bar

Input kW	MPa	7	8	2	1	13	3	Cooling effect	COP
1.5	1.439	74.41	32.01	142.22	111.26	41.31	142.27	192.21	0.165
1.75	1.438	75.20	32.23	142.45	109.94	42.11	142.15	196.10	0.144
2	1.440	75.34	32.35	142.71	108.80	42.37	142.02	181.40	0.117
2.25	1.425	75.64	32.19	142.33	107.01	42.67	141.10	181.47	0.104
2.5	1.437	75.76	32.07	142.88	107.21	43.38	142.05	199.49	0.102

Table D.4 Helium charge pressure 9.5bar

Input kW	MPa	7	8	2	1	13	3	Cooling effect	COP
1.75	16.083	70.13	32.16	114.78	146.67	44.24	146.66	154.96	0.109
2	15.542	75.54	31.81	112.56	145.03	43.69	145.89	182.92	0.111
2.1	15.348	75.39	31.37	110.27	144.53	43.20	144.59	163.11	0.095
2.25	15.890	76.16	31.65	114.34	147.38	45.74	148.16	193.30	0.104
2.4	15.742	76.36	31.96	113.16	147.28	45.75	147.44	209.92	0.126
2.5	15.577	76.07	31.73	111.23	146.22	45.03	146.28	218.46	0.132
2.6	16.028	77.03	31.71	116.43	150.55	47.90	151.28	241.72	0.113

D.2 Variation of rectification temperature**Table D.5** Helium charge pressure 6.1bar

Rect. temp	MPa	7	8	2	1	13	3	Cooling effect	COP
50-55	1.246	51.75	31.87	135.78	103.34	39.97	134.39	122.71	0.089
55-60	1.276	56.63	31.60	137.85	106.47	43.49	136.63	137.59	0.098
60-65	1.267	61.48	30.21	137.57	105.96	43.27	136.44	140.76	0.100
65-70	1.289	66.09	31.69	138.48	107.21	44.67	137.35	125.08	0.090
70-75	1.245	70.21	31.71	136.14	103.64	40.39	134.72	125.47	0.090
75-80	1.268	73.39	31.24	136.07	103.65	39.61	135.04	132.54	0.095
80-85	1.248	77.67	31.34	135.58	102.74	40.01	134.47	118.30	0.086
85-90	1.245	82.31	31.23	135.55	102.83	40.20	134.50	115.33	0.084

Table D.6 Helium charge pressure 6.8bar

Rect. temp	MPa	7	8	2	1	13	3	Cooling effect	COP
50-55	13.274	52.01	31.56	138.73	105.94	40.47	137.66	171.10	0.119
55-60	13.676	56.67	31.48	140.82	109.59	44.40	140.15	139.66	0.099
60-65	13.593	61.56	31.71	140.65	109.15	44.61	139.91	144.92	0.103
65-70	13.439	66.24	31.35	140.05	108.64	43.64	139.25	145.92	0.103
70-75	13.017	70.28	31.32	137.68	104.98	40.07	136.75	153.40	0.108
75-80	14.022	74.89	32.13	141.72	110.32	44.64	141.05	149.07	0.105
80-85	13.040	78.21	31.50	138.15	105.58	40.22	137.18	150.84	0.107
85-90	13.401	82.83	30.92	139.89	108.66	44.31	139.43	142.07	0.101
90-95	12.978	87.00	31.39	137.53	105.02	39.89	136.41	137.32	0.098

Table D.7 Helium charge pressure 8.2bar

Rect. temp	MPa	7	8	2	1	13	3	cooling effect	COP
50-55	1.416	51.73	32.06	141.71	108.1526	40.96	140.772	174.15	0.121
55-60	1.443	56.75	31.64	143.51	111.51	44.56	143.19	153.93	0.109
60-65	1.404	61.50	31.03	141.54	109.25	42.25	140.99	164.69	0.115
65-70	1.377	65.99	31.33	140.43	107.24	40.30	139.38	176.85	0.123
70-75	1.368	70.51	30.81	139.71	106.74	39.91	138.79	175.19	0.122
75-80	1.438	75.20	32.24	142.46	109.95	42.12	142.16	196.11	0.135
80-85	1.409	79.36	31.34	141.93	109.99	43.82	141.15	153.52	0.108
85-90	1.358	82.18	30.92	139.15	106.00	39.56	138.20	166.30	0.116
90-95	1.433	86.63	31.97	142.02	108.99	41.08	141.12	157.43	0.111