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## **APPENDICES**

**APPENDIX A**  
**DATA OF TESTING PROPERTIES**

**Table A** The parameters for preparation of rubber wood-polymer composites

WPC	Monomer	Initiator content (%)	Evacuating time (hrs.)	Soaking time (hrs.)
A	2-HPA	0.5	1	4
B	2-HPA	1	1	4
C	2-HPA	2	1	4
D	2-HPA	3	1	4
E	BA	0.5	2	4
F	BA	1	2	4
G	BA	2	2	4
H	BA	3	2	4
I	2-EHA	0.5	2	4
J	2-EHA	1	2	4
K	2-EHA	2	2	4
L	2-EHA	3	2	4

**Table A-1** Testing properties of rubber wood-polymer composites A

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
1 / 1	53.85	0.9325	20.33	40.21	48.30	6456	110.8	57.45	51.12
1 / 2	46.64	0.9118	25.71	37.45	55.74	5860	88.8	61.98	57.11
1 / 3	55.73	0.9769	19.02	41.03	56.55	6056	109.7	64.95	61.70
1 / 4	52.26	0.9201	20.45	40.66	58.90	6598	105.7	54.46	51.87
1 / 5	49.17	0.9444	22.34	39.01	53.09	6181	98.8	51.00	45.04
Average	51.53	0.9371	21.57	39.67	54.52	6230	102.8	57.97	53.37
S.D	3.641	0.0254	2.599	1.456	4.05	298	9.11	5.612	6.33

2 / 1	47.64	0.9375	24.56	38.47	49.60	7354	99.3	55.00	50.73
2 / 2	63.37	1.0200	16.13	43.75	59.41	4773	85.1	55.91	45.51
2 / 3	41.18	0.9089	28.47	35.08	59.78	6818	101.3	55.44	52.03
2 / 4	51.45	0.9707	23.33	38.18	46.52	7411	94.7	44.50	55.61
2 / 5	53.11	0.9315	21.01	39.94	52.26	5754	92.1	54.82	49.71
Average	51.35	0.9537	22.7	39.08	53.52	6422	94.5	53.13	50.72
S.D	8.136	0.0431	4.560	3.152	5.914	1136.8	6.392	4.848	3.669

**Table A-1** Testing properties of rubber wood-polymer composites A (Continued)

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
3 / 1	40.14	0.9010	29.22	34.21	48.88	6920	101.9	57.67	57.38
3 / 2	49.61	0.9291	25.14	37.46	50.65	6086	85.9	63.25	62.80
3 / 3	43.46	0.9216	25.45	37.39	56.55	6878	122.8	64.47	56.26
3 / 4	39.39	0.9023	30.01	33.68	37.15	3929	75.8	60.44	57.75
3 / 5	41.41	0.9205	28.87	34.99	37.83	5581	114.1	61.40	57.16
Average	42.80	0.9149	27.74	35.55	46.21	5879	100.1	61.45	58.27
S.D	4.107	0.0125	2.271	1.778	8.460	1226.4	19.41	2.629	2.589

**Table A-2** Average and S.D of properties of rubber wood-polymer composites A

Average	48.56	0.9353	24.00	38.10	51.41	6177	99.1	57.52	54.12
S.D	6.730	0.0321	4.129	2.812	7.055	937.3	12.48	5.49	5.261

**Table A-3** Testing properties of rubber wood-polymer composites B

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
1 / 1	49.63	0.9245	27.97	36.15	47.80	6175	90.8	54.75	62.98
1 / 2	58.66	0.9698	22.75	39.63	47.22	5717	109.8	53.93	61.05
1 / 3	50.62	0.9601	23.23	38.27	60.81	6409	83.5	56.98	63.65
1 / 4	42.75	0.9191	24.99	37.38	57.95	6152	78.9	52.69	62.89
1 / 5	52.92	0.9046	26.86	36.94	49.13	6115	106.2	48.00	61.83
Average	50.92	0.9356	24.96	37.67	52.58	6114	93.8	53.27	62.48
S.D	5.753	0.0280	2.548	1.335	6.325	249.9	13.66	3.336	1.030

2 / 1	55.79	0.9707	21.77	39.88	57.09	9044	127.3	62.96	74.54
2 / 2	64.32	1.0193	18.89	42.37	65.35	8109	105.4	67.37	55.00
2 / 3	46.27	0.9699	23.46	38.16	59.94	6127	92.1	63.02	68.66
2 / 4	56.83	0.9914	19.22	41.21	73.85	7856	94.0	72.41	61.02
2 / 5	53.65	0.9772	21.98	39.14	65.65	5012	82.2	63.24	51.94
Average	55.37	0.9857	21.06	40.15	64.38	7230	100.2	65.80	62.23
S.D	6.482	0.0207	1.950	1.666	6.427	1627.2	17.24	4.139	9.386



**Table A-3** Testing properties of rubber wood-polymer composites B (Continued)

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
3 / 1	56.73	0.9998	18.98	41.03	50.82	8250	113.1	55.32	74.71
3 / 2	40.40	0.9010	25.97	37.23	52.87	7497	109.4	61.24	67.76
3 / 3	47.50	0.9813	19.03	41.55	57.51	7536	122.1	61.17	62.48
3 / 4	47.54	0.9285	25.68	37.28	57.45	7271	120.7	67.82	67.82
3 / 5	46.89	0.9798	19.69	41.74	46.68	7424	104.7	67.28	62.95
Average	47.81	0.9581	21.87	39.77	53.07	7596	114.0	62.57	67.14
S.D	5.822	0.0415	3.623	2.307	4.604	379.6	7.40	5.151	4.934

**Table A-4** Average and S.D of properties of rubber wood-polymer composites B

Average	51.37	0.9598	22.90	39.20	56.68	6979	102.7	60.55	63.95
S.D	6.439	0.0359	3.116	2.023	7.817	1114.1	15.16	6.773	6.157

**Table A-5** Testing properties of rubber wood-polymer composites C

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
1 / 1	54.18	0.9927	20.16	40.65	53.98	7300	118.0	76.51	85.61
1 / 2	48.48	0.9346	24.61	38.41	41.47	6133	108.9	56.22	68.13
1 / 3	45.24	0.9660	26.88	35.99	39.85	6215	91.0	74.58	85.97
1 / 4	50.82	0.9532	22.34	38.87	44.49	6387	107.2	64.17	70.58
1 / 5	45.19	0.9518	27.03	35.74	44.43	6986	112.8	63.83	72.04
Average	48.78	0.9597	24.20	37.93	44.84	6604	107.6	67.06	76.47
S.D	3.838	0.02158	2.964	2.066	5.479	512.5	10.16	8.398	8.627

2 / 1	61.86	1.0121	17.55	42.60	65.23	9624	97.9	70.21	54.02
2 / 2	60.96	1.0089	18.39	42.31	68.35	7090	104.2	73.10	58.25
2 / 3	61.88	1.0074	17.07	48.79	70.99	7715	103.8	82.98	72.37
2 / 4	60.97	0.9969	18.11	42.13	76.22	6571	124.5	89.27	73.40
2 / 5	54.65	0.9998	19.79	41.07	77.04	7606	135.6	80.79	70.93
Average	60.06	1.0050	18.18	43.38	71.56	7721	113.2	79.27	65.79
S.D	3.060	0.00640	1.033	3.079	5.059	1157.0	16.07	7.683	8.987

**Table A-5** Testing properties of rubber wood-polymer composites C (Continued)

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
3 / 1	47.29	0.9358	25.44	37.53	48.78	7855	132.1	63.59	93.69
3 / 2	50.93	0.9502	21.88	39.89	61.26	8172	141.6	59.09	70.88
3 / 3	46.12	0.9211	26.17	36.57	52.69	6780	138.5	62.32	83.43
3 / 4	39.33	0.8779	29.80	33.27	54.55	7914	124.7	65.76	85.35
3 / 5	44.49	0.9555	27.61	35.43	55.64	8126	146.9	59.57	80.61
Average	45.63	0.9281	26.30	36.54	54.58	7769	136.8	62.07	82.79
S.D	4.247	0.0311	2.903	2.456	4.554	569.3	8.61	2.788	8.255

**Table A-6** Average and S.D of properties of rubber wood-polymer composites C

Average	51.49	0.9643	22.63	39.28	57.00	7364	119.2	69.47	75.02
S.D	7.291	0.0386	4.232	3.872	12.347	927.7	17.19	9.757	10.794

**Table A-7** Testing properties of rubber wood-polymer composites D

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
1 / 1	47.47	0.9521	22.33	39.89	56.64	6988	108.0	65.05	84.23
1 / 2	52.61	1.0003	20.10	40.75	62.55	6616	116.3	51.98	78.09
1 / 3	51.25	0.9561	22.00	38.88	52.44	7292	101.8	43.07	71.70
1 / 4	42.86	0.9397	27.74	35.64	59.60	6234	111.0	58.25	77.85
1 / 5	44.53	0.9604	24.25	38.35	70.21	7101	119.3	48.50	75.4
Average	47.74	0.9617	22.28	38.70	60.29	6846	111.3	53.37	77.45
S.D	4.191	0.02291	2.89	1.95	6.687	421.8	6.90	8.545	4.576

2 / 1	52.31	0.9721	18.71	42.14	49.44	6873	80.7	51.42	58.73
2 / 2	60.80	1.0003	26.36	36.84	53.28	5982	108.0	46.00	57.59
2 / 3	51.49	0.9561	15.82	44.17	53.99	8943	114.2	67.48	59.10
2 / 4	58.59	0.9897	18.16	42.68	53.25	6122	116.6	55.98	58.54
2 / 5	54.59	0.9604	23.24	38.45	56.83	7967	133.2	48.22	56.02
Average	55.55	0.9757	20.06	40.86	53.36	7177	110.5	53.82	57.99
S.D	4.025	0.01892	3.75	3.08	2.635	1262.6	19.11	8.510	1.239

**Table A-7** Testing properties of rubber wood-polymer composites D (Continued)

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
3 / 1	59.21	1.0013	17.97	43.54	43.52	7568	94.9	49.01	58.92
3 / 2	55.65	0.9555	25.63	37.70	46.57	8431	123.7	57.44	67.63
3 / 3	44.35	0.9275	29.85	34.56	47.95	7770	119.8	52.02	68.97
3 / 4	46.37	0.9502	25.11	37.82	38.48	7020	136.0	63.32	71.15
3 / 5	56.02	0.9697	26.37	36.84	39.16	8311	130.6	57.98	71.51
Average	56.32	0.9608	24.19	38.09	43.14	7820	121.0	55.95	67.64
S.D	7.955	0.0272	3.937	3.315	4.257	574.5	15.87	5.572	5.126

**Table A-8** Average and S.D of properties of rubber wood-polymer composites D

Average	51.87	0.9700	22.18	39.22	52.26	7281	114.3	54.38	67.7
S.D	5.733	0.023	3.727	2.904	8.552	880.7	14.63	7.195	9.03

Table A-9 Testing properties of rubber wood-polymer composites E

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
1 / 1	32.11	0.7829	27.23	29.08	36.84	6486	98.1	42.86	67.39
1 / 2	30.04	0.7785	27.97	29.84	48.38	6326	84.3	50.55	56.60
1 / 3	25.87	0.7394	29.22	27.21	36.26	6228	101.3	51.10	56.60
1 / 4	30.88	0.7807	27.82	29.98	35.67	7016	110.4	32.52	65.54
1 / 5	35.93	0.8829	25.17	30.34	50.60	8456	114.2	42.25	61.78
Average	30.97	0.7929	27.48	29.29	41.55	6902	101.7	43.86	61.58
2 / 1	36.87	0.8313	24.94	30.82	30.60	6821	113.5	60.37	67.39
2 / 2	31.58	0.7737	27.56	28.74	36.04	5854	115.4	42.86	56.6
2 / 3	41.70	0.8564	22.62	28.86	34.15	5918	115.9	60.71	65.54
2 / 4	36.65	0.8289	24.84	29.84	31.05	7186	117.0	38.39	56.6
2 / 5	34.09	0.7878	25.00	27.73	34.33	6114	110.8	45.13	61.78
Average	36.18	0.8156	24.99	29.20	33.23	6378	114.5	49.49	61.58
Average	33.58	0.8043	26.24	29.24	37.39	6640	108.1	46.67	61.58
S.D	4.440	0.04388	2.015	1.145	6.73	780.2	10.46	9.06	4.69

**Table A-10** Testing properties of rubber wood-polymer composites F

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
1 / 1	34.31	0.7781	24.79	30.55	38.42	8741	127.2	45.50	55.06
1 / 2	35.96	0.7869	25.14	28.97	44.70	7179	121.9	41.21	65.69
1 / 3	50.61	0.9017	19.2	35.02	37.81	7092	104.9	40.22	51.42
1 / 4	41.67	0.841	22.58	33.13	48.83	8195	120.5	40.43	60.78
1 / 5	27.41	0.7323	28.36	26.24	36.28	8524	92.8	43.20	63.99
Average	37.99	0.808	24.01	30.782	41.21	7946	113.5	42.11	59.39
2 / 1	43.97	0.8651	22.06	33.00	34.93	6738	114.5	29.90	63.53
2 / 2	34.31	0.7816	24.88	30.60	37.87	6609	105.9	36.65	62.20
2 / 3	40.49	0.8543	22.98	32.86	38.99	6319	100.8	38.92	66.36
2 / 4	31.13	0.7546	27.74	28.48	45.91	6498	111.1	30.00	65.39
2 / 5	36.88	0.8019	24.3	26.99	40.26	6760	125.9	40.11	62.23
Average	37.35	0.8115	24.39	30.39	39.59	6584	111.6	35.11	63.94

Average	37.09	0.8098	24.20	30.58	40.40	7265	112.6	38.61	61.67
S.D	6.710	0.05364	2.692	2.906	4.54	889.0	11.45	5.14	4.84

**Table A-11** Testing properties of rubber wood-polymer composites G

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
1 / 1	37.12	0.7824	24.15	28.38	35.02	7607	123.2	53.53	70.84
1 / 2	46.41	0.8916	21.71	34.62	49.62	7527	122.2	57.38	73.67
1 / 3	42.74	0.8037	22.47	33.88	44.28	8162	140.3	61.83	71.49
1 / 4	48.97	0.9011	20.25	35.24	48.96	6972	113.1	53.65	72.67
1 / 5	50.59	0.9247	19.14	36.56	44.51	7911	128.4	51.45	73.10
Average	45.17	0.8607	21.54	33.75	44.48	7635	125.4	55.57	72.35
2 / 1	38.83	0.8045	23.75	31.37	39.60	5902	101.3	45.73	56.45
2 / 2	53.13	0.9462	17.27	38.25	39.24	7093	120.5	38.97	59.11
2 / 3	42.91	0.7996	22.01	34.44	39.66	7588	118.1	36.97	71.05
2 / 4	47.64	0.9004	20.89	35.00	41.79	5598	108.7	39.60	62.07
2 / 5	35.69	0.7767	24.89	27.77	43.54	5779	100.4	55.06	44.68
Average	43.64	0.8455	21.76	33.36	40.77	6392	109.8	43.26	58.67
Average	44.40	0.8531	21.65	33.55	42.62	7013	117.6	49.42	65.51
S.D	5.914339	0.06525	2.357	3.384	4.52	933.43	12.27	8.58	9.66



**Table A-12** Testing properties of rubber wood-polymer composites H

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
1 / 1	38.84	0.7997	23.34	31.24	37.95	5703	101.0	41.21	68.12
1 / 2	39.54	0.8108	22.71	33.76	44.72	5870	86.0	51.18	57.47
1 / 3	46.56	0.9005	21.35	35.34	47.72	6007	107.0	62.79	63.70
1 / 4	44.70	0.8143	22.00	33.91	54.77	5594	93.0	56.57	56.63
1 / 5	44.39	0.8176	21.90	33.19	46.72	5885	95.5	41.80	71.63
Average	42.81	0.8286	22.26	33.49	46.38	5811	96.5	50.71	63.51
2 / 1	50.20	0.9233	18.89	37.27	43.90	7883	118.1	45.11	62.50
2 / 2	47.33	0.9088	20.74	35.69	45.78	5434	80.3	52.60	64.91
2 / 3	38.53	0.8123	23.12	31.10	43.01	5533	93.4	49.26	63.00
2 / 4	46.59	0.8930	21.65	34.87	50.93	5852	79.3	53.77	53.50
2 / 5	57.08	0.9571	16.01	38.43	44.72	6522	107.9	43.40	61.58
Average	47.94	0.8989	20.08	35.47	45.67	6244	95.8	48.83	61.10

Average	45.38	0.8637	21.17	34.48	46.02	6028	96.15	49.77	62.30
S.D	5.696	0.0583	2.221	2.361	4.55	719.1	12.55	7.00	5.41

**Table A-13** Testing properties of rubber wood-polymer composites I

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
1 / 1	36.68	0.9015	35.45	38.74	37.71	8077	128.4	52.26	55.51
1 / 2	42.07	0.9216	31.40	40.75	61.46	7584	94.6	52.85	51.30
1 / 3	49.02	0.9569	28.31	41.98	49.41	8433	135.3	43.54	50.50
1 / 4	41.51	0.9187	32.15	40.61	44.61	8440	120.5	48.60	65.27
1 / 5	52.42	0.9982	26.84	41.04	60.49	8600	136.0	47.15	50.09
Average	44.34	0.9394	30.83	40.62	50.74	8226	123.0	48.88	54.53
S.D	6.306	0.0386	3.379	1.181	10.235	407.1	17.05	3.833	6.378

2 / 1	41.73	0.9201	32.00	40.60	58.13	7656	112.1	55.09	56.32
2 / 2	35.94	0.9089	37.01	37.22	71.74	7230	101.6	57.14	41.74
2 / 3	46.21	0.9498	29.11	41.02	68.65	7738	107.7	54.85	43.35
2 / 4	42.68	0.9293	31.97	40.14	64.21	8487	125.8	45.24	50.10
2 / 5	50.43	0.9885	27.78	41.34	62.45	8740	109.4	46.84	44.92
Average	43.40	0.9393	31.57	40.06	65.04	7970	111.3	51.83	47.29
S.D	5.394	0.0313	3.548	1.653	5.318	624.5	8.97	5.393	5.944

**Table A-13** Testing properties of rubber wood-polymer composites I (Continued)

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
3 / 1	36.21	0.9156	36.32	38.10	33.99	7022	125.8	50.00	54.16
3 / 2	43.65	0.9418	30.99	40.68	37.27	6884	117.6	40.22	58.24
3 / 3	33.73	0.8997	39.64	36.13	36.78	6531	100.9	38.95	58.83
3 / 4	42.74	0.9414	31.76	39.98	36.83	7792	129.0	42.16	50.25
3 / 5	35.96	0.9100	36.80	38.06	26.79	6512	116.1	44.78	64.93
Average	38.46	0.9217	35.10	38.59	34.33	6948	117.9	43.22	57.28
S.D	4.441	0.0190	3.641	1.794	4.409	521.0	10.93	4.382	5.498

**Table A-14** Average and S.D of properties of rubber wood-polymer composites I

Average	42.07	0.9335	32.50	39.76	50.04	7715	117.4	47.98	53.03
S.D	5.695	0.0297	3.791	1.699	14.567	750.4	12.82	5.627	7.029

**Table A-15** Testing properties of rubber wood-polymer composites J

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
1 / 1	42.55	0.9328	31.97	40.11	42.55	8943	154.5	59.22	66.76
1 / 2	40.00	0.9147	33.15	39.45	53.27	8698	144.1	65.57	66.71
1 / 3	40.68	0.9221	33.96	39.00	71.93	10183	172.2	52.20	65.40
1 / 4	42.55	0.9336	32.23	40.57	56.42	8600	125.7	46.63	53.64
1 / 5	43.80	0.9501	30.00	41.07	70.99	8954	132.3	51.14	62.27
Average	41.92	0.9307	32.26	40.04	59.03	9075	145.8	54.95	62.95
S.D	1.544	0.0134	1.490	0.833	12.460	637.9	18.45	7.456	5.519

2 / 1	52.63	1.0087	25.40	42.70	45.20	8317	118.1	48.33	56.24
2 / 2	46.12	0.9601	27.24	41.33	54.95	8985	136.0	55.56	69.30
2 / 3	38.30	0.9279	35.19	38.65	51.26	8571	112.1	47.87	56.85
2 / 4	46.47	0.9589	26.99	41.21	51.51	10181	155.6	53.76	69.05
2 / 5	49.43	0.9642	26.16	41.68	45.81	10104	126.3	51.50	62.32
Average	46.59	0.9640	28.20	41.11	49.75	9231	129.6	51.40	62.75
S.D	5.328	0.0289	3.976	1.497	4.141	865.5	17.08	3.347	6.325

**Table A-15** Testing properties of rubber wood-polymer composites J (Continued)

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
3 / 1	38.71	0.9330	34.84	39.83	54.58	7807	135.8	54.49	63.12
3 / 2	40.30	0.9187	33.21	40.12	47.86	6627	110.5	67.39	72.68
3 / 3	46.39	0.9556	27.30	41.14	54.87	7777	112.8	63.31	67.47
3 / 4	46.32	0.9603	26.96	41.69	48.13	5633	106.7	49.00	56.94
3 / 5	46.99	0.9547	26.22	41.99	47.79	6801	112.3	63.28	60.98
Average	43.74	0.9445	29.71	40.95	50.65	6929	115.6	59.49	64.24
S.D	3.918	0.0179	4.004	0.950	3.729	905.2	11.53	7.524	6.059

**Table A-16** Average and S.D of properties of rubber wood-polymer composites J

Average	44.08	0.9464	30.05	40.70	53.14	8412	130.3	55.28	63.32
S.D	4.140	0.02410	3.571	1.156	8.483	1321.7	19.52	6.855	5.575

**Table A-17** Testing properties of rubber wood-polymer composites K

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
1 / 1	43.93	0.9642	29.17	41.16	63.53	8272	117.3	48.82	57.20
1 / 2	56.85	1.0337	23.77	43.33	52.51	8014	112.6	63.91	63.63
1 / 3	49.57	1.0099	27.98	40.96	54.78	11064	146.4	68.06	58.73
1 / 4	50.21	1.0174	26.45	41.58	47.06	9149	116.9	45.97	68.97
1 / 5	40.70	0.9224	31.10	40.20	60.28	9414	133.9	77.53	60.08
Average	48.25	0.9895	27.69	41.446	55.63	9182	125.4	60.86	61.72
S.D	6.231	0.0455	2.775	1.165967	6.478	1203.0	14.27	13.283	4.695
2 / 1	41.51	0.9378	30.72	40.74	60.53	9587	130.7	56.52	31.80
2 / 2	42.46	0.9509	30.09	40.04	55.75	8474	111.2	53.59	58.51
2 / 3	44.74	0.9784	28.49	41.82	56.20	10008	133.3	56.10	40.68
2 / 4	35.34	0.9079	36.97	38.15	54.73	8787	111.0	72.96	33.00
2 / 5	33.33	0.9007	39.78	36.63	65.04	8790	124.2	53.55	54.83
Average	39.48	0.9351	33.21	39.47	58.45	9129	122.1	58.54	43.77
S.D	4.888	0.0318	4.887	2.078	4.300	641.0	10.56	8.174	12.331

**Table A-17** Testing properties of rubber wood-polymer composites K (Continued)

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
3 / 1	41.86	0.9411	29.45	41.22	49.37	9130	139.4	54.36	59.82
3 / 2	40.65	0.9279	30.74	40.64	52.34	7116	100.7	43.41	61.14
3 / 3	43.68	0.9681	29.41	41.45	62.70	5909	102.3	49.28	55.36
3 / 4	53.30	1.0779	24.12	42.97	51.96	9134	139.6	45.58	57.67
3 / 5	48.21	0.9981	28.33	42.01	53.35	7266	122.4	48.73	65.42
Average	45.54	0.9826	28.41	41.66	53.94	7711	120.9	48.27	59.88
S.D	5.204	0.0597	2.546	0.883	5.108	1399.8	19.028	4.157	3.796

**Table A-18** Average and S.D of properties of rubber wood-polymer composites K

Average	44.42	0.9691	29.77	40.86	56.01	8674	122.8	55.89	55.12
S.D	6.330	0.05026	4.159	1.697	5.333	1260.3	14.05	10.320	11.118

**Table A-19** Testing properties of rubber wood-polymer composites L

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
1 / 1	44.83	0.9692	28.63	41.10	48.02	8573	125.3	47.92	47.31
1 / 2	43.87	0.9690	30.32	40.97	51.63	7628	77.3	48.44	45.15
1 / 3	47.49	0.9813	27.39	41.35	55.12	8168	84.0	48.47	65.12
1 / 4	46.30	0.9634	27.05	41.88	50.21	7285	96.0	52.53	54.42
1 / 5	50.80	0.9897	25.82	42.09	65.85	7984	119.7	47.24	51.72
Average	46.66	0.9745	27.84	41.48	54.17	7927	100.5	48.92	52.74
S.D	2.698	0.0107	1.709	0.488	7.022	495.0	21.30	2.078	7.811

2 / 1	45.19	0.9700	28.44	41.97	53.42	7756	102.4	40.29	43.37
2 / 2	47.56	0.9798	27.79	41.36	72.25	10375	138.9	58.03	60.29
2 / 3	45.69	0.9317	29.14	41.07	41.57	8622	116.2	47.06	45.27
2 / 4	63.05	1.1094	22.07	44.31	56.06	7246	108.6	53.33	64.93
2 / 5	47.72	0.9847	27.39	40.99	44.42	7507	119.1	52.15	62.64
Average	49.84	0.99517	26.97	41.94	53.55	8301	117.0	50.17	55.30
S.D	7.470	0.0672	2.816	1.380	12.073	1269.4	13.86	6.764	10.177



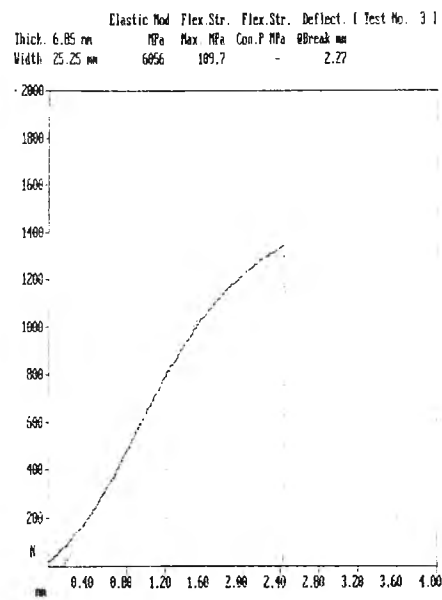
**Table A-19** Testing properties of rubber wood-polymer composites L (Continued)

Physical properties					Mechanical properties				
Sample/piece (unit)	Polymer loading (%)	Density(g/cm <sup>3</sup> )	Water absorption(%)	ASE (%)	Polymer loading (%)	MOE (MPa)	Flexure stress (MPa)	Polymer loading (%)	Compression (N/mm <sup>2</sup> )
3 / 1	48.01	0.9821	26.88	41.27	45.05	7401	121.9	53.50	64.65
3 / 2	45.22	0.9379	27.97	41.06	44.56	7441	129.4	54.59	64.39
3 / 3	41.76	0.9002	31.30	39.82	45.89	7872	119.1	43.84	51.79
3 / 4	44.40	0.9211	28.31	41.71	46.14	5865	104.6	54.12	54.09
3 / 5	54.30	0.9976	25.68	41.89	42.78	5923	105.6	49.20	63.29
Average	46.74	0.9478	28.03	41.15	44.88	6900	116.1	51.05	59.64
S.D	4.778	0.0410	2.099	0.814	1.337	937.3	10.75	4.565	6.195

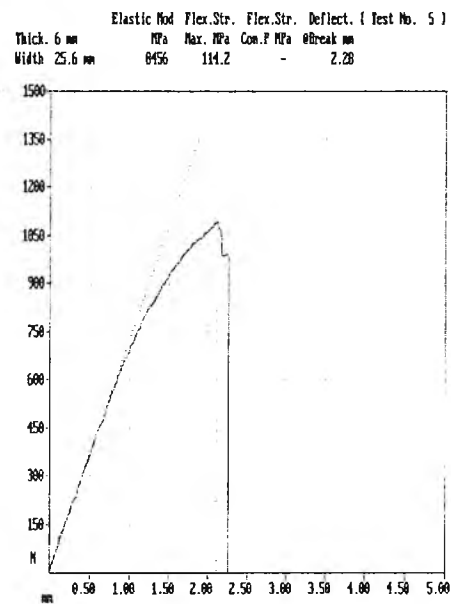
**Table A-20** Average and S.D of properties of rubber wood-polymer composites L

Average	47.75	0.9725	27.61	41.52	50.87	7709	111.2	50.05	55.90
S.D	5.185	0.04697	2.142	0.956	8.687	1075.7	16.72	4.591	8.166

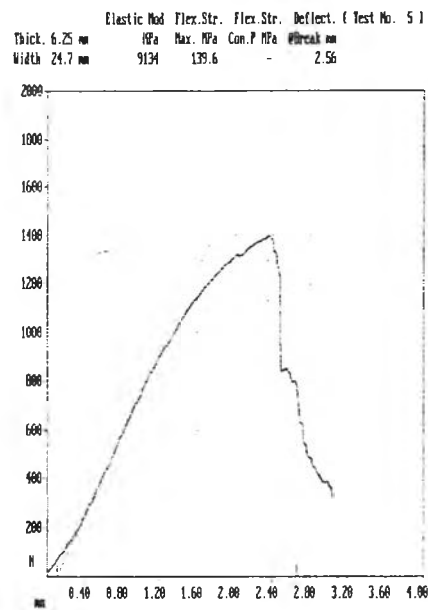
**APPENDIX B**  
**GRAPHS OF TESTING RESULTS**



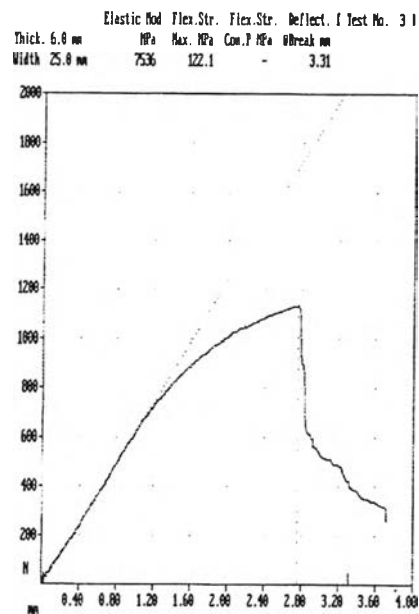
**Figure B-1** The MOE, flexure stress of rubber wood-polymer composites A



**Figure B-2** The MOE, flexure stress of rubber wood-polymer composites B



**Figure B-3** The MOE, flexure stress of rubber wood-polymer composites C



**Figure B-4** The MOE, flexure stress of rubber wood-polymer composites D

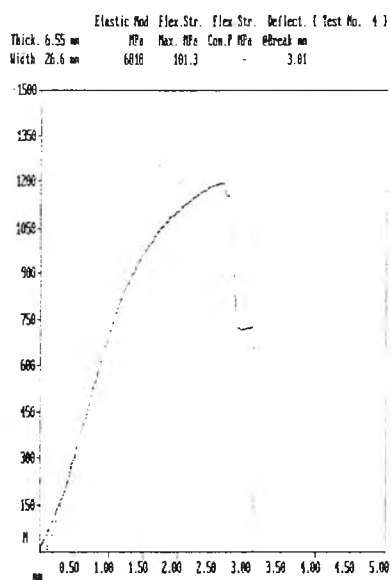


Figure B-5 The MOE, flexure stress of rubber wood-polymer composites E

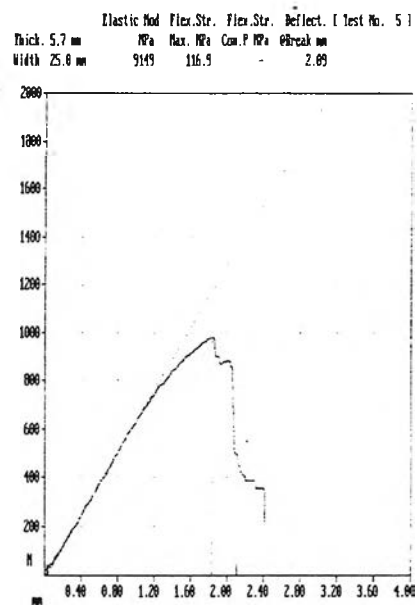


Figure B-6 The MOE, flexure stress of rubber wood-polymer composites F

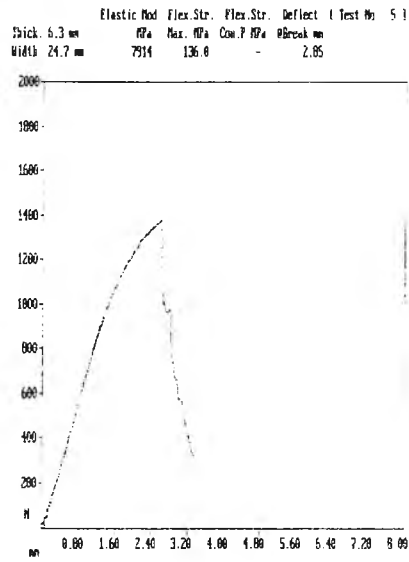


Figure B-7 The MOE, flexure stress of rubber wood-polymer composites G

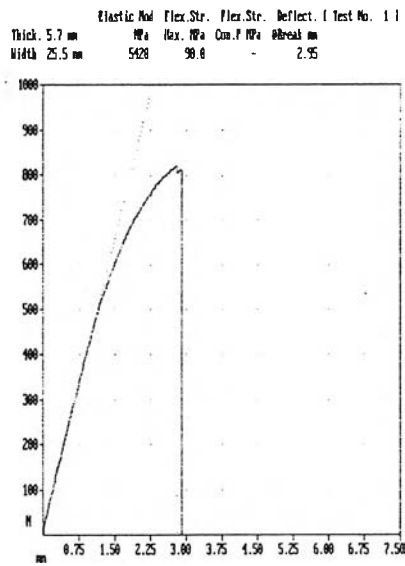


Figure B-8 The MOE, flexure stress of rubber wood-polymer composites H

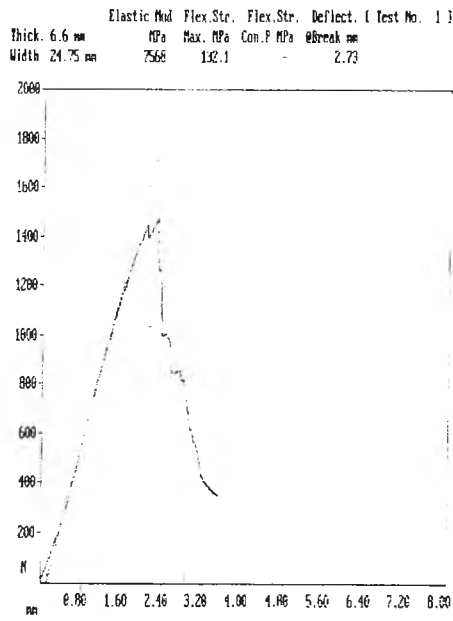


Figure B-9 The MOE, flexure stress of rubber wood-polymer composites I

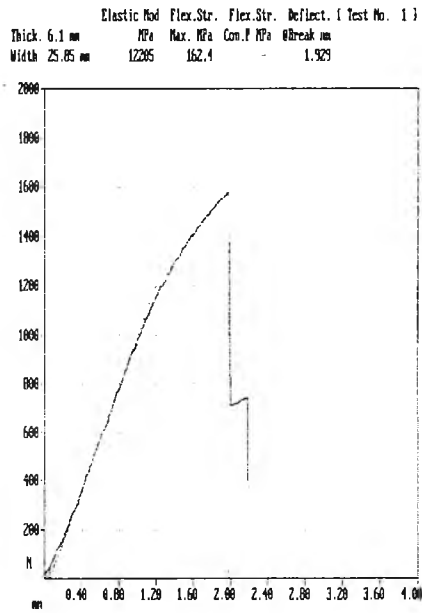


Figure B-10 The MOE, flexure stress of rubber wood-polymer composites J

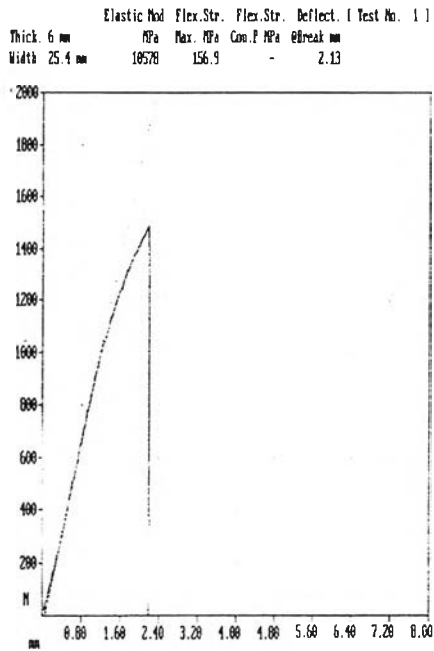


Figure B-11 The MOE, flexure stress of rubber wood-polymer composites K

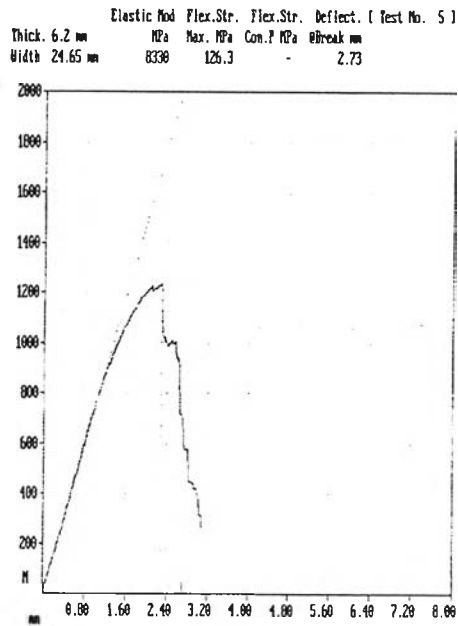


Figure B-12 The MOE, flexure stress of rubber wood-polymer composites L



## VITAE

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