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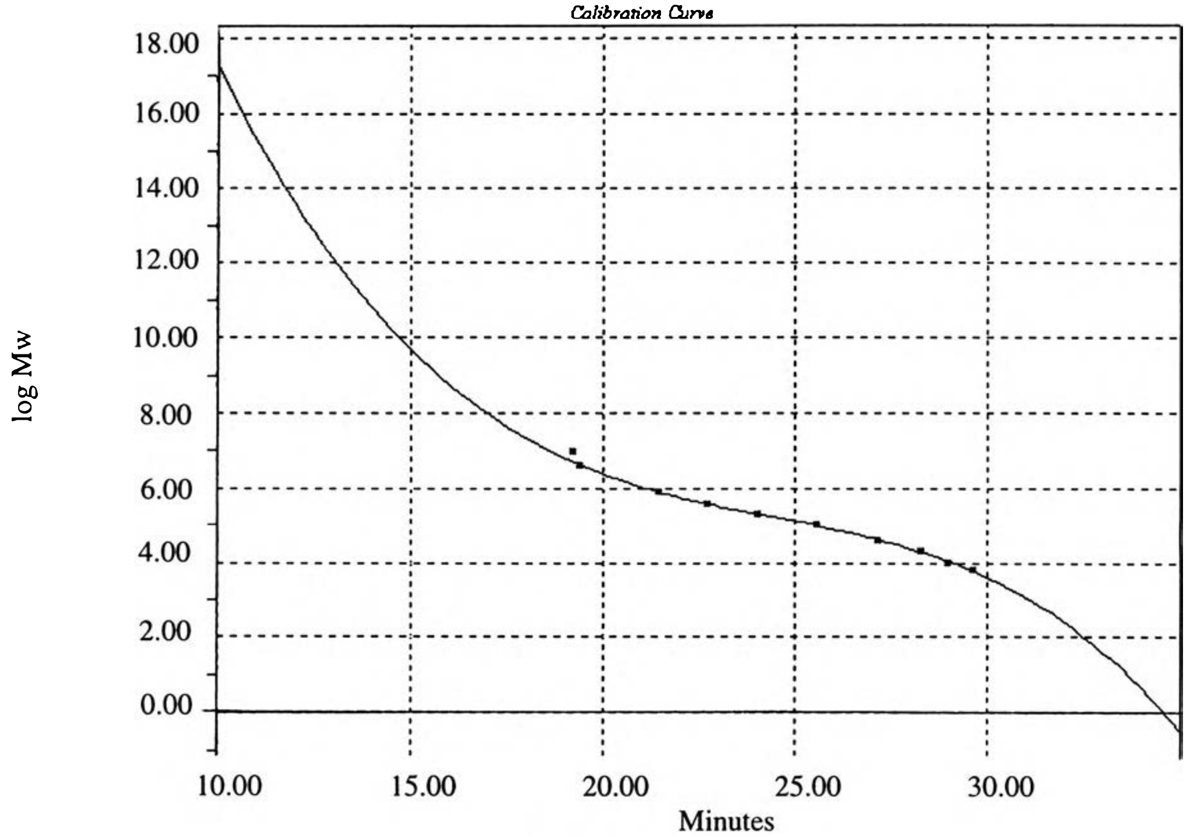
APPENDICES

APPENDIX A

- The molecular parameter from Gel Permeation Chromatography at 140°C by using 1,2-dichrolobenzene as a solvent.

HDPE	Mw	Mn	MWD
H5603B	176,604	6,776	26.061
H6205JU	64,997	2,817	23.071
5000S	70,560	2,310	30.544
HDPE_X	64,482	1,953	33.024
2208J	64,920	3,670	17.689
1600J	48,361	3,807	12.701
H5818J	51,073	4,077	12.528

- Calibration Curve for measuring molecular parameters.



Calibration Information

Processing Method	gpc4	System	satin_ch1
Channel	SATIN	Date	04-Nov-98
Type	GPC	Manual Coeffs	No
Data Origin		Order	3
A	55.368828	B	-5.758222
C	0.227331	D	-0.003098
E	0.000000	F	0.000000
R	0.999707	R^2	0.999413
Standard Error	0.063710	Vo	10.000 ml,min
Vt	35.000 ml,min	Valid	Yes
Mo		b	
Slope		K	1.000000000 dl/g
Alpha	0.000000		

Narrow Standard Table

#	Retention Time (min)	Elution Volume (ml)	Mol Wt (Daltons)	Log Mol Wt	Calculated Weight (Daltons)	% Residual
1	19.250	19.250	8420000	6.925312		
2	19.450	19.450	3840000	6.584331	3766759	1.944
3	21.467	21.467	706000	5.848805	742291	-4.889
4	22.750	22.750	355000	5.550228	354216	0.221
5	24.083	24.083	190000	5.278754	186342	1.963
6	25.617	25.617	96400	4.984077	91611	5.227
7	27.200	27.200	37900	4.578639	38897	-2.563
8	28.371	28.317	18100	4.257679	17986	0.632
9	29.017	29.017	9100	3.959041	10025	-9.223
10	29.633	29.633	5970	3.775974	5540	7.756

APPENDIX B

- Data of Melt Flow Index

1. Blend system 1

LW1/HW1	#1	#2	#3	#4	#5	#6	average g/10 min
100/0	6.369	6.374	6.352	6.360	6.500	6.363	6.386
75/25	1.535	1.539	1.503	1.483	1.520	1.516	1.516
50/50	0.335	0.332	0.331	0.333	0.330	0.336	0.333
25/75	0.099	0.089	0.090	0.093	0.095	0.093	0.093
0/100	0.028	0.027	0.028	0.027	0.028	0.027	0.027

LW2/HW2	#1	#2	#3	#4	#5	#6	average g/10 min
100/0	0.814	0.803	0.812	0.810	0.841	0.813	0.815
75/25	0.495	0.524	0.514	0.431	0.472	0.504	0.490
50/50	0.312	0.313	0.311	0.302	0.325	0.312	0.313
25/75	0.175	0.179	0.180	0.179	0.179	0.179	0.179
0/100	0.030	0.030	0.030	0.030	0.030	0.030	0.030

2. Blend system 2

LD3/LW1	#1	#2	#3	#4	#5	#6	average g/10 min
100/0	4.093	5.576	3.609	4.187	4.316	4.117	4.316
75/25	4.474	4.518	4.435	4.518	4.382	4.396	4.454
50/50	5.134	5.100	5.216	5.171	5.216	5.105	5.157
25/75	5.856	5.872	5.859	5.950	5.830	5.835	5.867
0/100	6.369	6.374	6.352	6.360	6.500	6.363	6.386

LD3/LW2	#1	#2	#3	#4	#5	#6	average g/10 min
100/0	4.093	5.576	3.609	4.187	4.316	4.117	4.316
75/25	1.708	1.604	1.704	1.667	1.681	1.717	1.680
50/50	0.579	0.572	0.573	0.574	0.571	0.574	0.574
25/75	0.240	0.239	0.244	0.241	0.241	0.240	0.241
0/100	0.030	0.030	0.030	0.030	0.030	0.030	0.030

3. Blend system 3

LD2/LD1	#1	#2	#3	#4	#5	#6	average g/10 min
100/0	10.948	10.952	11.158	10.931	10.905	10.979	10.979
75/25	11.008	11.024	11.038	11.018	11.027	11.023	11.023
50/50	11.010	11.714	11.632	11.155	11.340	11.452	11.384
25/75	12.092	12.068	11.950	11.934	12.020	12.012	12.013
0/100	12.406	12.226	12.139	12.506	12.304	12.316	12.316

APPENDIX C

- Data of mechanical properties of blend system 1,2 and reference sample.

1. Blend system 1 (at crosshead speed 450 mm/min).

LW1/HW1	Tensile Strength (MPa)	Young's Modulus (MPa)
100/0	15.46	1166.46
75/25	15.54	1300.20
50/50	15.95	1364.27
25/75	16.30	1348.69
0/100	18.25	1380.42

LW2/HW2	Tensile Strength (MPa)	Young's Modulus (MPa)
100/0	14.682	928.38
75/25	14.904	1058.53
50/50	15.782	1082.72
25/75	15.961	1137.34
0/100	16.269	1158.50

2. Blend system 2 (at crosshead speed 100 mm/min).

LD3/LW1	Tensile Strength (MPa)
100/0	13.118
75/25	13.878
50/50	13.882
25/75	15.634
0/100	16.163

LD3/LW2	Tensile Strength (MPa)
100/0	13.118
75/25	12.877
50/50	12.365
25/75	12.855
0/100	12.350

3. Blend system 3 (at crosshead speed 100 mm/min).

LD2/LD1	Tensile Strength (MPa)
100/0	10.704
75/25	10.805
50/50	11.020
25/75	11.176
0/100	11.296

APPENDIX D

- Data of output rate (g/min) and pressure build-up (MPa) of blend system 1,2 and reference at various screw speed and diameter of die.

1. Blend system 1

LW1/HW1	1 mm						4 mm					
ratio	speed 10	pressure	speed 20	pressure	speed 30	pressure	speed 10	pressure	speed 20	pressure	speed 30	pressure
100/0	13.0	29.0	26.0	41.5	39.0	51.0	13.0	4.8	27.0	8.2	40.0	11.25
75/25	13.0	47.0	27.0	67.0	39.0	89.8	13.9	15.5	28.0	19.1	41.6	22.8
50/50	13.0	63.8	26.0	84.0	39.0	98.1	13.2	16.0	26.2	24.0	39.8	26.8
25/75	13.0	79.8	27.0	106.0	41.8	125.8	13.7	26.0	27.5	36.0	42.0	43.2
0/100	13.0	95.8	27.0	127.0	41.0	149.0	13.5	41.0	27.5	50.0	41.5	58.0

LW2/HW2	1 mm						4 mm					
ratio	speed 10	pressure	speed 20	pressure	speed 30	pressure	speed 10	pressure	speed 20	pressure	speed 30	pressure
100/0	12.5	6.70	25.5	8.6	39.0	10.1	13.0	2.6	26.0	3.2	39.8	3.7
75/25	12.5	6.42	25.0	8.35	38.0	9.8	13.0	2.38	26.0	3.15	38.5	3.62
50/50	12.0	6.38	24.5	8.38	37.5	9.82	12.5	2.18	25.2	3.0	38.0	3.6
25/75	13.0	6.40	26.2	8.6	39.8	10.38	13.2	2.01	26.4	2.98	41.0	3.78
0/100	12.0	5.93	24.0	7.9	36.8	9.5	12.2	1.562	24.8	2.5	37.0	3.187

2. Blend system 2

LD3/LW2	1 mm						4 mm					
ratio	speed 10	pressure	speed 20	pressure	speed 30	pressure	speed 10	pressure	speed 20	pressure	speed 30	pressure
100/0	12.4	32.64	25.5	45.92	38.00	55.28	12.8	5.28	26	9.34	38.7	12.83
75/25	12.7	40.00	25.5	60.00	38.10	68.43	13	9.93	26.1	14.46	39.2	18.67
50/50	13.1	50.46	25.3	66.33	41.00	82.22	13.5	14.7	26.7	20.3	42	24.61
25/75	12.0	56.84	27.9	79.26	37.3	88.9	12.5	18.9	25.5	24.7	38	28.9
0/100	12.5	67.00	25.5	86.00	39.00	101	13	26	26	32	39.8	37

LD3/LW1	1 mm						4 mm					
ratio	speed 10	pressure	speed 20	pressure	speed 30	pressure	speed 10	pressure	speed 20	pressure	speed 30	pressure
100/0	12.4	32.64	25.5	45.92	38	55.28	12.8	5.28	26	9.34	38.7	12.83
75/25	12.5	31.5	25.2	44.44	37.4	53.7	12.8	5.74	25.7	9.63	38	12.6
50/50	12.9	30.93	26.8	44.68	40	54.06	13.2	5.31	27.9	9.375	41.8	12.34
25/75	12.5	29.22	25	41.44	37.8	50.63	12.7	4.68	25.5	8.43	38.7	11.7
0/100	13	29	26	41.5	39	51	13	4.8	27	8.2	40	11.25

3. Reference sample

LD2/LD1	1 mm						4 mm					
ratio	speed 10	pressure	speed 20	pressure	speed 30	pressure	speed 10	pressure	speed 20	pressure	speed 30	pressure
100/0	12.1	20.2	25	27.5	37	33.1	12.3	1.2	25.3	2.8	37.5	4.5
75/25	12	15.62	24.8	24.3	36.8	30.83	12.4	1.7	24.8	3.75	37	6.05
50/50	11.75	14.46	23.7	23.21	36	29.6	12.1	1.6	24	3.12	36.5	4.82
25/75	10.95	14.64	23.8	23	36	29.64	11	1.34	24	2.86	37.5	4.38
0/100	11	18	23.3	26.46	35.2	33.23	12	1.37	24	5.42	36.1	7

APPENDIX E

- Viscosity data at speed 10, 20 and 30 rpm for blend system 1, 2 and reference sample.

			Big Diff Mw			
	10 rpm	shear rate (1/sec)	20 rpm	shear rate (1/sec)	30 rpm	shear rate (1/sec)
LW1/HW1	η (Pa·s)		η (Pa·s)		η (Pa·s)	
100/0	30.65	3177.50	20.14	6330.00	15.88	9534
75/25	37.05	3298.50	21.60	6684.00	16.35	10059.5
50/50	38.95	3220.50	22.15	6481.00	18.85	9632
25/75	43.25	3272.00	27.05	6638.00	20.40	9964
0/100	45.70	3445.00	29.65	6587.00	22.60	10113
LW2/HW2			Small Diff Mw			
100/0	32.90	3001	20.65	6123	16.05	9595
75/25	33.80	3081	22.10	6200	17.35	9672
50/50	34.40	3090	22.75	6210	18.10	9873
25/75	35.80	3100	23.95	6363	18.80	9880
0/100	36.10	3140.5	25.35	6450	20.65	9790
LD3/LW2			Big Diff MWD			
100/0	34.30	2979.00	22.05	6112.00	16.45	9282.00
75/25	36.30	3080.50	23.00	6206.00	17.05	9305.50
50/50	37.05	3148.50	23.15	6217.00	17.35	9435.00
25/75	38.35	3313.00	24.30	6601.00	17.75	9839.00
0/100	38.90	3535.10	24.90	6801.00	18.05	9907.00
LD3/LW1			Small Diff MWD			
100/0	34.30	2979.00	22.05	6112.00	16.45	9289.00
75/25	31.10	2910.00	21.45	6018.00	15.75	9170.00
50/50	31.30	2807.00	20.55	5979.00	14.85	9007.00
25/75	30.50	2800.00	19.60	5959.00	14.05	8949.00
0/100	29.80	2771.00	19.10	5907.00	13.20	8797.00
LD2/LD1			Reference Sample			
100/0	21.30	2627.00	18.30	5959	15.95	9160
75/25	21.15	2685.00	18.30	5970	15.15	9280
50/50	22.50	2704.00	18.90	5790	15.45	9208
25/75	21.60	2652.00	19.65	6002.5	15.50	9090
0/100	21.60	2826.00	18.95	5992	15.75	9230

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