

ภาคผนวก ง

ผลการทดสอบการต้านทานการฉีกขาด

ตารางผลการทดสอบชิ้นงาน คันชนู

ชุดที่ 1	STR5L 0 phr	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	sample						
	1	22.90	22.89	138.7	213.4	22.02	1.040
	2	33.87	33.87	197.8	304.2	31.95	1.060
	3	32.88	32.88	189.2	291.1	30.73	1.070
	4	31.51	31.51	186.4	286.7	28.91	1.090
	5	35.40	35.4	198.7	305.6	32.18	1.100
	Mean						
	Standard						

ชุดที่ 2	d50=0.5 10 phr	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	sample						
	1	35.63	35.63	182.5	280.8	32.39	1.100
	2	33.87	33.87	170.9	262.9	30.51	1.110
	3	31.59	31.59	170.3	262	29.25	1.080
	4	36.7	36.7	188	288.2	33.67	1.090
	5	29.91	29.91	164.8	253.5	27.69	1.080
	Mean						
	Standard						

ชุดที่ 3	d50=0.5 12.5 phr	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	sample						
	1	33.26	33.26	185.7	285.7	32.29	1.030
	2	34.94	34.94	202.0	310.8	33.92	1.030
	3	35.86	35.86	199.6	307	34.15	1.050
	4	35.40	35.40	196.8	302.8	33.71	1.050
	5	32.81	30.44	187.2	288	28.72	1.060
	Mean						
	Standard						

ชุดที่ 4	d50=0.5 15 phr	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	sample						
	1	38.07	37.99	211.6	325.6	35.50	1.070
	2	33.95	33.95	190.6	293.2	33.61	1.010
	3	39.67	39.67	210.1	323.2	38.14	1.040
	4	33.77	37.38	203.6	313.2	36.29	1.030
	5	36.85	36.85	203.1	312.5	35.43	1.040
	Mean						
	Standard						

ชุดที่ 5	d50=0.5 20 phr	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	sample						
	1	34.71	34.71	158.2	243.4	31.27	1.110
	2	35.63	35.63	155.8	239.7	31.81	1.120
	3	38.51	41.81	186.2	286.4	34.38	1.120
	4	39.75	39.75	176.4	271.4	36.14	1.100
	5	36.47	36.47	168.8	259.8	33.77	1.080
	Mean						
	Standard						

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สูตรที่ 6	d50=0.5 25 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	36.23	36.23	179.9	276.8	34.18	1.060
	2	37.38	37.38	185.1	284.8	35.26	1.060
	3	37.77	37.77	195.6	301	35.97	1.050
	4	35.63	35.63	186.3	286.6	34.93	1.020
	5	34.48	34.48	184.9	284.5	34.14	1.010
	Mean	36.30	36.30	186.36	286.74	34.90	1.040
Standard	1.33	1.33	5.72	8.82	0.77	0.02	

สูตรที่ 7	d50=0.5 30 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	36.24	36.24	167.3	257.4	35.18	1.030
	2	38.22	38.22	177.6	273.3	34.43	1.110
	3	38.49	36.62	172.7	265.6	35.64	1.080
	4	38.53	38.53	165.9	255.2	35.03	1.100
	5	38.56	43.56	191.4	291.5	35.70	1.080
	Mean	38.01	38.63	174.98	268.60	35.20	1.080
Standard	1.00	2.93	10.28	14.67	0.52	0.031	

สูตรที่ 8	d50=0.5 40 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	42.42	42.42	179.9	276.8	38.56	1.100
	2	38.6	38.6	164.3	252.8	34.77	1.110
	3	37.69	37.69	166.6	256.3	34.58	1.090
	4	39.98	39.58	169.4	260.6	36.68	1.090
	5	37.08	37.08	162.4	249.8	34.33	1.080
	Mean	39.15	39.07	168.52	259.26	35.79	1.094
Standard	2.13	2.10	6.88	10.60	1.81	0.011	

สูตรที่ 9	d50=0.5 50 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	37.77	37.77	182.5	280.8	34.65	1.090
	2	37.99	37.99	170.9	262.9	34.54	1.100
	3	39.44	39.44	170.3	262	35.53	1.110
	4	40.74	40.74	188	289.2	37.38	1.090
	5	38.38	38.38	164.8	253.5	36.21	1.060
	Mean	38.86	38.86	175.30	269.68	35.66	1.090
Standard	1.23	1.23	9.59	14.76	1.18	0.019	

สูตรที่ 10	beaker 15 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	34.33	34.33	190.9	293.7	30.65	1.120
	2	33.49	33.49	183.7	282.6	29.64	1.130
	3	35.55	35.55	200	307.8	32.32	1.100
	4	35.40	35.40	195.2	300.2	32.78	1.080
	5	35.93	35.93	193.5	297.3	32.08	1.120
	Mean	34.94	34.94	192.66	296.32	31.49	1.11
Standard	1.00	1.00	6.01	9.26	1.31	0.02	

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สูตรที่ 11	Microcal 10 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	35.10	35.10	211.6	325.6	33.11	1.060
2	34.33	34.33	206.6	317.9	32.39	1.060	
3	35.02	35.02	205.5	316.2	33.04	1.060	
4	34.79	34.79	199	306.1	31.63	1.100	
5	34.48	34.48	211.8	325.9	32.53	1.060	
Mean	34.74	34.74	206.90	318.34	32.54	1.07	
Standard	0.33	0.33	5.26	8.13	0.60	0.02	

สูตรที่ 12	Microcal 15 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	31.81	31.81	202	310.8	31.50	1.010
2	30.29	30.29	185.5	285.5	29.41	1.030	
3	27.62	27.62	171.1	263.2	27.35	1.010	
4	34.71	34.71	201.1	309.4	32.14	1.080	
5	33.87	33.87	187.5	288.5	30.24	1.120	
Mean	31.66	31.66	189.44	291.48	30.13	1.05	
Standard	2.85	2.85	12.74	19.61	1.88	0.05	

สูตรที่ 13	Microcal 20 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	28.53	28.53	176.7	271.8	27.70	1.030
2	31.20	31.20	199.1	306.3	30.59	1.020	
3	30.52	30.52	188.5	290	29.63	1.030	
4	31.66	31.66	203.9	313.6	31.04	1.020	
5	28.99	28.99	177.6	273.2	28.15	1.030	
Mean	30.18	30.18	189.16	290.98	29.42	1.03	
Standard	1.37	1.37	12.30	18.92	1.47	0.01	

สูตรที่ 14	Microcal 25 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	33.65	33.65	210	323	30.87	1.090
2	31.05	31.05	191.6	294.7	29.57	1.050	
3	31.36	31.36	203.9	313.6	30.75	1.020	
4	34.10	34.10	208	320	31.00	1.100	
5	27.27	27.27	172.3	265	25.97	1.050	
Mean	31.49	31.49	197.16	303.26	29.63	1.06	
Standard	2.72	2.72	15.63	24.05	2.12	0.03	

สูตรที่ 15	Microcal 30 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	32.27	32.27	182.2	280.3	30.73	1.050
2	31.74	31.74	183.6	282.4	30.52	1.040	
3	32.73	32.73	187	287.7	31.17	1.050	
4	29.98	29.98	171.1	263.3	29.39	1.020	
5	32.81	32.81	185.5	285.5	31.25	1.050	
Mean	31.91	31.91	181.88	279.84	30.61	1.04	
Standard	1.16	1.16	6.30	9.67	0.75	0.01	

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สูตรที่ 16	Thurboplex 10 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	28.23	28.23	171.4	263.6	26.38	1.070
	2	32.58	32.58	201.1	309.4	30.74	1.060
	3	33.49	33.49	211.2	324.9	31.90	1.050
	4	32.65	32.65	299.4	306.7	30.80	1.060
	5	32.42	32.42	201.7	310.3	30.58	1.060
	Mean	31.87	31.87	216.96	302.98	30.08	1.06
Standard	2.08	2.08	48.45	23.13	2.13	0.01	

สูตรที่ 17	Thurboplex 15 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	32.42	32.42	198.4	305.2	32.10	1.010
	2	32.96	32.96	192.2	295.7	31.69	1.040
	3	32.12	32.12	188.6	290.2	30.59	1.050
	4	32.14	32.14	195.8	301.2	30.90	1.040
	5	33.34	33.34	206.8	318.1	32.37	1.030
	Mean	32.60	32.60	196.36	302.08	31.53	1.03
Standard	0.54	0.54	6.91	10.59	0.76	0.02	

สูตรที่ 18	Thurboplex 20 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	32.50	32.50	194.1	298.6	30.95	1.050
	2	32.96	32.96	198.8	305.9	30.80	1.070
	3	31.59	31.59	193.8	298.1	29.52	1.070
	4	30.29	30.29	190.5	293.1	29.99	1.010
	5	29.60	29.60	173.3	266.6	28.19	1.050
	Mean	31.39	31.39	190.10	292.46	29.89	1.05
Standard	1.43	1.43	9.85	15.16	1.12	0.02	

สูตรที่ 19	Thurboplex 25 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	33.49	33.49	189.8	292	31.59	1.060
	2	31.81	31.81	184.4	283.7	30.59	1.040
	3	24.57	24.57	134.5	206.9	28.26	1.040
	4	37.46	37.46	128.3	335.8	34.69	1.080
	5	32.81	32.81	186.8	287.5	31.25	1.050
	Mean	32.03	32.03	164.76	281.18	31.27	1.05
Standard	4.69	4.69	30.59	46.54	2.31	0.02	

สูตรที่ 20	Thurboplex 30 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	30.98	30.98	164.4	252.9	29.50	1.050
	2	32.50	32.50	188.7	290.3	30.95	1.050
	3	32.88	32.88	187.1	287.8	30.17	1.090
	4	32.88	32.88	181.5	279.2	31.31	1.050
	5	32.96	32.96	182.8	281.2	31.09	1.060
	Mean	32.44	32.44	180.90	278.28	30.61	1.06
Standard	0.84	0.84	9.69	14.90	0.75	0.02	

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สูตรที่ 21	stearic 10 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	29.98	29.98	189.4	291.4	28.55	1.050
2	32.88	32.88	185.2	285	28.59	1.150	
3	32.12	32.12	189.7	291.8	29.20	1.100	
4	32.65	32.65	196.5	302.2	29.95	1.090	
5	31.89	31.89	196.4	302.1	29.53	1.080	
Mean	31.90	31.90	191.44	294.50	29.17	1.09	
Standard	1.15	1.15	4.91	7.49	0.60	0.04	

สูตรที่ 22	stearic 15 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	31.05	31.05	178.7	274.9	28.75	1.080
2	29.45	29.45	177.1	272.4	28.87	1.020	
3	34.33	34.33	180.2	277.2	29.85	1.150	
4	30.75	34.75	170.3	262	31.59	1.100	
5	29.91	29.91	175.4	269.8	28.49	1.050	
Mean	31.10	31.90	176.34	271.26	29.51	1.08	
Standard	1.92	2.49	3.82	5.87	1.27	0.05	

สูตรที่ 23	stearic 20 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	34.33	34.33	182.5	280.8	32.08	1.070
2	34.71	34.71	180.1	277	30.99	1.120	
3	31.89	31.89	167.2	257.3	29.53	1.080	
4	32.65	32.65	173.2	266.4	31.10	1.050	
5	34.94	34.94	174.4	268.3	30.92	1.130	
Mean	33.70	33.70	175.48	269.96	30.92	1.09	
Standard	1.35	1.35	6.03	9.26	0.91	0.03	

สูตรที่ 24	stearic 25 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	33.19	33.19	170.1	261.7	29.37	1.130
2	33.72	33.72	169	260	30.65	1.100	
3	31.59	31.59	169.3	260.5	28.26	1.050	
4	30.44	30.44	168	258.5	29.55	1.030	
5	33.80	33.80	175.6	270.2	32.19	1.050	
Mean	32.55	32.55	170.40	262.18	30.01	1.07	
Standard	1.48	1.48	3.00	4.63	1.49	0.04	

สูตรที่ 25	stearic 30 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	34.48	34.48	164.2	252.6	31.35	1.100
2	34.71	34.71	161.9	249.1	30.18	1.150	
3	35.63	35.63	165.3	254.2	30.98	1.150	
4	32.42	32.42	158.9	244.5	30.88	1.050	
5	34.41	34.41	165.6	254.7	31.57	1.090	
Mean	34.33	34.33	163.18	251.02	30.99	1.11	
Standard	1.17	1.17	2.80	4.25	0.53	0.04	

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สูตรที่ 26	Stirrer PMA 10 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	32.35	32.35	192.6	296.3	29.95	1.080
2	32.81	32.81	183.2	281.8	30.66	1.070	
3	37.80	37.80	213.4	328.3	33.75	1.120	
4	37.52	37.52	244.4	376	32.34	1.160	
5	36.32	36.32	193.6	297.9	30.78	1.180	
Mean	35.36	35.36	205.44	316.06	31.50	1.12	
Standard	2.60	2.60	24.40	37.54	1.53	0.05	

สูตรที่ 27	Stirrer PMA 15 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	38.30	38.30	205.9	316.8	33.30	1.150
2	33.57	33.57	182.7	281.1	29.97	1.120	
3	32.81	32.81	191.9	295.2	29.56	1.110	
4	39.52	39.52	220.7	339.6	34.67	1.140	
5	37.61	37.61	215.6	331.7	33.58	1.120	
Mean	36.36	36.36	203.36	312.88	32.22	1.13	
Standard	2.99	2.99	15.93	24.53	2.30	0.02	

สูตรที่ 28	Stirrer PMA 20 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	40.21	40.21	221.2	340.3	36.89	1.090
2	39.14	39.14	217.6	334.1	36.92	1.060	
3	40.21	40.21	211.5	325.4	35.90	1.120	
4	41.66	41.66	218	335.3	36.23	1.150	
5	40.36	40.36	204.4	314.2	34.50	1.170	
Mean	40.32	40.32	214.54	329.86	36.09	1.12	
Standard	0.90	0.90	6.67	10.27	0.99	0.04	

สูตรที่ 29	Stirrer PMA 25 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	40.05	40.05	190	292.4	34.53	1.160
2	39.60	39.60	211.8	325.8	35.04	1.130	
3	39.44	39.44	191.5	294.6	35.21	1.120	
4	42.19	42.19	191.8	295.1	35.75	1.180	
5	43.11	43.11	200.4	308.3	36.85	1.170	
Mean	40.88	40.88	197.10	303.24	35.48	1.15	
Standard	1.67	1.67	9.18	14.08	0.88	0.03	

สูตรที่ 30	Stirrer PMA 30 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	53.18	53.18	270.8	416.7	45.45	1.170
2	39.22	39.22	174.3	268.2	34.40	1.140	
3	38.76	38.76	197.2	303.4	34.30	1.130	
4	39.44	39.44	220.4	308.3	35.53	1.110	
5	40.66	40.66	206.6	317.9	35.98	1.130	
Mean	42.25	42.25	213.86	322.90	37.13	1.14	
Standard	6.15	6.15	35.99	55.70	4.71	0.02	

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สูตรที่ 31	Stirrer PAA 10 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	36.47	36.47	211.2	324.9	33.15	1.100
2	37.38	37.38	206.1	317.1	33.68	1.110	
3	37.31	37.31	203.5	313.2	31.89	1.170	
4	37.61	37.61	210.9	324.4	32.42	1.160	
5	39.22	39.22	222.1	341.6	34.71	1.130	
Mean	37.60	37.60	210.76	324.24	33.17	1.13	
Standard	1.00	1.00	7.13	10.89	1.10	0.03	

สูตรที่ 32	Stirrer PAA 15 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	39.06	39.06	203.3	312.8	34.26	1.140
2	39.60	39.60	208.3	320.4	34.43	1.150	
3	37.92	37.92	195.8	301.2	32.97	1.150	
4	38.83	38.83	204.7	314.9	33.19	1.170	
5	36.16	36.16	196	301.5	32.87	1.100	
Mean	38.31	38.31	201.62	310.16	33.55	1.14	
Standard	1.35	1.35	5.53	8.51	0.74	0.03	

สูตรที่ 33	Stirrer PAA 20 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	40.66	40.66	198.2	304.9	34.75	1.170
2	41.12	41.12	210.3	323.5	36.71	1.120	
3	39.75	39.75	197.2	303.4	35.18	1.130	
4	38.45	38.45	191	293.9	33.43	1.150	
5	36.01	36.01	182.7	281.1	32.44	1.110	
Mean	39.20	39.20	195.88	301.36	34.50	1.14	
Standard	2.05	2.05	10.16	15.60	1.64	0.02	

สูตรที่ 34	Stirrer PAA 25 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	36.54	36.54	193.3	297.3	33.52	1.090
2	37.69	37.69	183.2	281.8	34.26	1.100	
3	36.85	36.85	187.5	288.5	28.26	1.110	
4	36.24	36.24	187.1	287.8	33.25	1.090	
5	38.60	38.60	191.8	295.1	35.09	1.100	
Mean	37.18	37.18	188.58	290.10	32.88	1.10	
Standard	0.96	0.96	4.03	6.20	2.68	0.01	

สูตรที่ 35	Stirrer PAA 30 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	38.38	38.38	180.1	277.1	33.96	1.130
2	39.90	39.90	190.6	293.2	36.27	1.100	
3	39.44	39.44	180.7	278.1	34.90	1.130	
4	40.28	40.28	193.5	297.7	35.96	1.120	
5	37.84	37.84	173.6	267	33.49	1.130	
Mean	39.17	39.17	183.70	282.62	34.92	1.12	
Standard	1.03	1.03	8.18	12.59	1.21	0.01	

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สูตรที่ 36	Jar mill PMA 10 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	35.86	35.86	215.1	331	32.02	1.120
	2	32.88	32.88	197.4	303.8	29.89	1.100
	3	34.56	34.56	235	361.5	31.71	1.090
	4	38.22	38.22	235.3	362	34.13	1.120
	5	32.81	32.81	210	323.1	31.55	1.040
	Mean	34.87	34.87	218.56	336.28	31.86	1.09
Standard	2.26	2.26	16.46	25.27	1.51	0.03	

สูตรที่ 37	Jar mill PMA 15 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	37.46	37.46	214.2	329.6	34.37	1.090
	2	36.24	36.24	217.6	334.8	32.65	1.110
	3	37.61	37.61	218.7	336.4	33.58	1.120
	4	37.38	37.38	222.9	343	33.68	1.110
	5	37.22	37.22	174.1	267.9	33.23	1.120
	Mean	37.18	37.18	209.50	322.34	33.50	1.11
Standard	0.55	0.55	20.03	30.81	0.63	0.01	

สูตรที่ 38	Jar mill PMA 20 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	36.39	36.39	206.8	318.1	33.39	1.090
	2	40.51	40.51	228.4	351.4	35.23	1.150
	3	38.30	38.30	206.9	318.3	31.92	1.200
	4	36.16	36.16	219.9	338.3	33.48	1.080
	5	40.44	40.44	224.9	346	33.98	1.190
	Mean	38.36	38.36	217.38	334.42	33.60	1.14
Standard	2.10	2.10	10.08	15.52	1.19	0.06	

สูตรที่ 39	Jar mill PMA 25 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	39.22	39.22	207.2	318.8	33.81	1.160
	2	38.91	38.91	208.3	320.4	33.26	1.170
	3	43.03	43.03	211.5	325.4	28.26	1.190
	4	39.60	39.60	201	309.2	33.28	1.190
	5	39.29	39.29	204.2	314	33.02	1.190
	Mean	40.01	40.01	206.44	317.56	32.32	1.18
Standard	1.71	1.71	4.01	6.20	2.29	0.01	

สูตรที่ 40	Jar mill PMA 30 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	38.83	38.83	210.7	324.2	34.06	1.140
	2	39.98	39.98	216.8	333.5	35.38	1.130
	3	36.09	36.09	187.2	288	31.94	1.130
	4	37.69	37.69	199.6	307.1	32.77	1.150
	5	41.35	41.35	209	321.5	35.34	1.170
	Mean	38.79	38.79	204.66	314.86	33.90	1.14
Standard	2.03	2.03	11.55	17.75	1.53	0.02	

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สูตรที่ 41	Jar mill PAA 10 phr	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	sample						
	1	37.38	37.38	206.5	317.6	32.79	1.140
	2	34.48	34.48	206.6	317.9	31.35	1.100
	3	36.47	36.47	225.4	346.7	34.73	1.050
	4	35.78	35.78	206.1	317.1	33.44	1.070
	5	32.96	32.96	223.2	343.4	33.29	0.990
	Mean	35.41	35.41	213.56	328.54	33.12	1.07
	Standard	1.73	1.73	9.84	15.12	1.22	0.06

สูตรที่ 42	Jar mill PAA 15 phr	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	sample						
	1	34.33	34.33	207.1	318.6	31.79	1.080
	2	35.55	35.55	215.7	331.8	32.61	1.090
	3	39.60	39.60	229	352.4	36.00	1.100
	4	38.76	38.76	209.7	322.5	34.00	1.140
	5	39.83	39.83	212.1	326.3	35.56	1.120
	Mean	37.61	37.61	214.72	330.32	33.99	1.11
	Standard	2.51	2.51	8.59	13.27	1.82	0.02

สูตรที่ 43	Jar mill PAA 20 phr	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	sample						
	1	37.46	37.46	200.7	308.7	34.37	1.090
	2	38.91	38.91	203.3	312.8	34.13	1.140
	3	37.99	37.99	198	304.6	33.62	1.130
	4	39.29	39.29	202.2	311	33.87	1.160
	5	38.15	38.15	197.8	304.2	33.17	1.150
	Mean	38.36	38.36	200.40	308.26	33.83	1.13
	Standard	0.73	0.73	2.46	3.81	0.46	0.03

สูตรที่ 44	Jar mill PAA 25 phr	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	sample						
	1	36.62	36.62	172.6	265.5	32.99	1.110
	2	40.44	40.44	188.6	290.2	35.79	1.130
	3	39.39	39.39	171.4	263.7	35.17	1.120
	4	36.93	36.93	176.4	271.4	33.27	1.110
	5	36.04	36.04	116.3	179	31.89	1.130
	Mean	37.88	37.88	165.06	253.96	33.82	1.12
	Standard	1.92	1.92	28.09	43.20	1.61	0.01

สูตรที่ 45	Jar mill PAA 30 phr	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	sample						
	1	38.60	38.60	188.1	289.4	34.46	1.120
	2	37.38	37.38	175.9	270.5	33.68	1.110
	3	38.91	38.91	178.1	274.1	35.05	1.110
	4	38.60	38.60	182	280.1	34.77	1.110
	5	37.54	37.54	170.4	262.2	33.52	1.120
	Mean	38.21	38.21	178.90	275.26	34.30	1.11
	Standard	0.69	0.69	6.64	10.22	0.67	0.01

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สูตรที่ 46	d50=1.0 10 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	35.32	35.32	207.7	319.5	32.40	1.090
2	35.48	35.48	204.6	314.8	32.85	1.080	
3	35.93	35.93	204.5	314.6	32.96	1.090	
4	32.42	32.42	197.1	303.2	30.30	1.070	
5	32.35	32.35	189.8	292	30.52	1.060	
Mean	34.30	34.30	200.74	308.82	31.81	1.078	
Standard	1.76	1.76	7.25	11.15	1.30	0.013	

สูตรที่ 47	d50=1.0 15 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	35.48	35.48	205.7	316.4	33.79	1.050
2	35.02	35.02	184.1	283.2	33.04	1.060	
3	36.7	36.7	189.4	291.3	33.06	1.110	
4	37.31	37.31	185.9	285.9	33.61	1.110	
5	35.32	35.32	179.1	275.6	32.11	1.100	
Mean	35.97	35.97	188.84	290.48	33.12	1.086	
Standard	0.99	0.99	10.13	15.56	0.66	0.029	

สูตรที่ 48	d50=1.0 20 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	34.71	34.71	158.2	243.4	31.27	1.110
2	35.63	35.63	155.8	239.7	31.81	1.120	
3	38.51	41.81	186.2	286.4	34.38	1.120	
4	39.75	39.75	176.4	271.4	36.14	1.100	
5	36.47	36.47	168.8	259.8	33.77	1.080	
Mean	37.01	37.67	169.08	260.14	33.47	1.106	
Standard	2.08	2.99	12.66	19.46	1.98	0.017	

สูตรที่ 49	d50=1.0 25 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	36.24	36.24	167.3	257.4	35.18	1.030
2	38.22	38.22	177.6	273.3	34.43	1.110	
3	38.49	36.62	172.7	265.6	35.64	1.080	
4	38.53	38.53	165.9	255.2	35.03	1.100	
5	38.56	43.56	191.4	291.5	35.70	1.080	
Mean	38.01	38.63	174.98	268.60	35.20	1.080	
Standard	1.00	2.93	10.28	14.67	0.52	0.031	

สูตรที่ 50	d50=1.0 30 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	38.76	38.76	196.1	301.7	35.24	1.100
2	36.7	36.7	194.2	298.8	33.98	1.080	
3	39.14	39.14	191.3	294.4	34.95	1.120	
4	38.99	38.99	186.8	287.3	33.61	1.160	
5	39.75	39.75	195.8	301.3	34.87	1.140	
Mean	38.67	38.67	192.84	296.70	34.53	1.120	
Standard	1.16	1.16	3.88	6.00	0.69	0.032	

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สูตรที่ 51	d50=1.5 10 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	33.11	33.11	189.8	292	31.24	1.060
	2	34.64	34.64	192.3	295.8	30.93	1.120
	3	33.19	33.19	188.4	289.9	31.31	1.060
	4	36.01	36.01	193.3	297.4	31.87	1.130
	5	34.33	34.33	192.9	296.7	31.50	1.090
	Mean	34.26	34.26	191.34	294.36	31.37	1.092
Standard	1.19	1.19	2.13	3.25	0.35	0.033	

สูตรที่ 52	d50=1.5 15 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	35.78	35.78	203.1	312.5	32.23	1.110
	2	35.1	35.1	198.4	305.2	31.62	1.110
	3	32.8	32.8	183.7	282.6	31.54	1.040
	4	34.33	34.33	196.2	301.8	31.21	1.100
	5	35.17	35.17	197.8	304.4	31.40	1.120
	Mean	34.64	34.64	195.84	301.30	31.60	1.096
Standard	1.15	1.15	7.26	11.18	0.39	0.032	

สูตรที่ 53	d50=1.5 20 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	31.59	31.59	171.9	264.4	30.09	1.050
	2	30.36	30.36	162.2	249.5	30.06	1.010
	3	36.7	36.7	176.6	271.7	32.19	1.140
	4	33.8	33.8	174.9	269	30.73	1.100
	5	35.86	35.86	174.6	268.7	32.02	1.120
	Mean	33.66	33.66	172.04	264.66	31.02	1.084
Standard	2.71	2.71	5.75	8.87	1.03	0.053	

สูตรที่ 54	d50=1.5 25 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	38.87	38.87	167.5	257.8	36.67	1.060
	2	37.84	37.84	184.4	283.7	35.36	1.070
	3	39.67	39.67	184.2	283.3	36.06	1.100
	4	39.06	39.06	168.6	259.4	36.17	1.080
	5	39.09	39.09	161.6	284.6	36.19	1.080
	Mean	38.91	38.91	173.26	273.76	36.09	1.078
Standard	0.67	0.67	10.42	13.86	0.47	0.015	

สูตรที่ 55	d50=1.5 30 phr sample	Maximum load (N)	Load Break (N)	Ext Break (mm)	Strain Break (%)	Tear resistance (kN/m)	Sample Thick (mm)
	1	38.45	38.45	167.8	258.2	34.03	1.130
	2	37.38	37.38	167.5	257.6	34.93	1.070
	3	42.92	42.92	202.2	311	39.38	1.090
	4	37.99	37.99	175.8	270.4	35.18	1.080
	5	38.22	38.22	171.1	263.2	35.06	1.090
	Mean	38.99	38.99	176.88	272.08	35.72	1.092
Standard	2.23	2.23	14.54	22.35	2.10	0.023	