

LAMPIRAN 1

**PERHITUNGAN FRAKSI VOLUME SERAT
KOMPOSIT SERAT SISAL / PMMA**

Diketahui :

Massa jenis serat sisal = 1,45 gr/cm³

Massa jenis PMMA = 1,19 gr/cm³

Dimensi cetakan : panjang (p) = 19 cm

lebar (l) = 9 cm

tebal (t) = 0,4 cm

Perbandingan fraksi volume serat dan matriks 20% : 80%

Fraksi volume serat sisal/ PMMA 20/80

Volume cetakan, V_c = p x l x t
= 19 cm x 9 cm x 0,4cm
= 68,4 cm

Volume matriks, V_m = $\frac{vm}{100} x V_c$
= $\frac{80}{100} x 68,4 \text{ cm}^3$
= 54.72 cm³

Volume serat , V_f = $\frac{vf}{100} x V_c$
= $\frac{20}{100} x 68,4 \text{ cm}^3$
= 13.68 cm³

Massa matriks, m_m = $V_m x \rho_m$
= 54.72 cm³ x 1,19 gr/cm³
= 65.1168 gr

Massa serat sisal, m_{sisal} = $V_{\text{sisal}} x \rho_{\text{sisal}}$
= 13,68 cm³ x 1,45 gr/cm³
= 19,836 gr

LAMPIRAN 2

HASIL PENGUJIAN SERAT TUNGGAL

No	Diameter (mm)	Lc (mm)	Fmax (N)	Tensile Strength (MPa)	Strain at Fmax %	Modulus Elastisitas (GPa)
1	0,16974	50	6,894	348	0,05	6,96
2	0,18081	50	6,393	337,05	0,0525	6,42
3	0,11808	50	2,1574	88,4	0,04	2,21
4	0,09779	50	3,3146	177,5	0,05	3,55
5	0,17158	50	10,551	760,2	0,06	12,67
Rata – rata			5,862	342,23	0,0505	6,362

GRAFIK PENGUJIAN SERAT TUNGGAL

2096/IX/17

13.09.2017

KUAT TARIK SERAT TUNGGAL

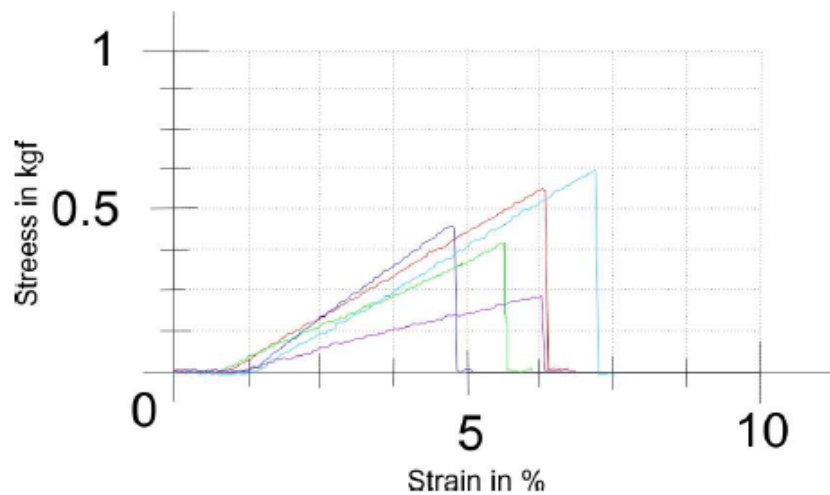
Parameter table:

Headline	: KUAT TARIK SERAT TUNGGAL	Pre-treatment	: Kecepatan 5 mm/menit
Company name	: 2096/IX/17	Testing machine	: ASTM D 3799-75
Tester	: APRIAL	Extensometer	:
Material	: Serat Sisal (I)		
Test speed	: 5 mm/min		
Standard travel gauge length	: 20 mm		

Results:

Nr	σ Fmax kgf
1	0,703
2	0,652
3	0,220
4	0,338
5	1,076

Series graph:



2097/IX/17

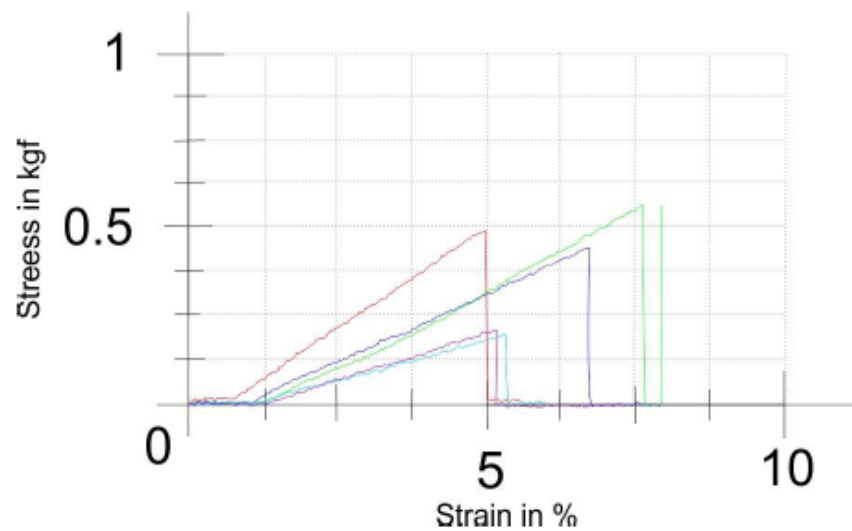
13.09.2017

KUAT TARIK SERAT TUNGGAL**Parameter table:**

Headline	: KUAT TARIK SERAT TUNGGAL	Pre-treatment	: Kecepatan 5 mm/menit
Company name	: 2097/IX/17	Testing machine	: ASTM D 3799-75
Tester	: APRIAL	Extensometer	:
Material	: Serat Sisal (II)		
Test speed	: 5 mm/min		
Standard travel gauge length	: 20 mm		

Results:

Nr	σ Fmax
	kgf
1	0,499
2	0,573
3	0,451
4	0,190
5	0,200

Series graph:

2098/IX/17

13.09.2017

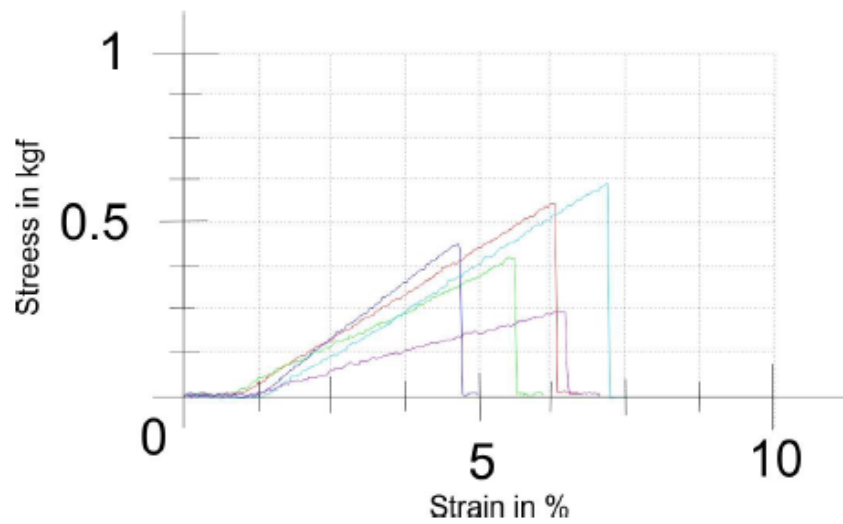
KUAT TARIK SERAT TUNGGAL**Parameter table:**

Headline	: KUAT TARIK SERAT TUNGGAL	Pre-treatment	: Kecepatan 5 mm/menit
Company name	: 2098/IX/17	Testing machine	: ASTM D 3799-75
Tester	: APRIAL	Extensometer	:
Material	: Serat Sisal (III)		

Test speed: 5 mm/min

Results:

Nr	σ_{Fmax} kgf
1	0,559
2	0,386
3	0,444
4	0,619
5	0,230

Series graph:

POLIMER MODULUS OF ELASTICITY (Callister, 2007)

<i>Material</i>	<i>Modulus of Elasticity</i>	
	<i>GPa</i>	<i>10⁶psi</i>
Polyethylene		
• Low density (LDPE)	0.172–0.282	0.025–0.041
• High density (HDPE)	1.08	0.157
• Ultrahigh molecular weight (UHMWPE)	0.69	0.100
Poly(ethylene terephthalate) (PET)	2.76–4.14	0.40–0.60
Poly(methyl methacrylate) (PMMA)	2.24–3.24	0.325–0.470
Polypropylene (PP)	1.14–1.55	0.165–0.225
Polystyrene (PS)	2.28–3.28	0.330–0.475
Poly(tetrafluoroethylene) (PTFE)	0.40–0.55	0.058–0.080
Poly(vinyl chloride) (PVC)	2.41–4.14	0.35–0.60

LAMPIRAN 3

**TABEL HASIL PENGUJIAN BENDING KOMPOSIT
SISAL/PMMA**

No Spes	Jenis Komposit	L (mm)	d (mm)	b (mm)	Defleksi (mm)	Beban (N)	m (N/mm)	Teg Bending (MPa)	Regangan (mm/mm)	Modulus Elastisitas (MPa)
1	Aquades	62	13	4	8,95	237,11	38,96	32,620	18,161	264,146
2	Aquades	62	13	4	8	225,03	37,83	30,958	16,233	256,485
3	Aquades	62	13	4	8,05	260,93	35,56	35,897	16,335	241,094
4	Aquades	62	13	4	10	259,15	32,82	35,652	20,291	222,517
5	Aquades	62	13	4	9,3	214,01	40,4	29,442	18,871	273,909
Nilai rata-rata		62,000	13,000	4,000	8,860	239,246	37,114	32,914	17,978	251,630
SD		0,000	0,000	0,000	0,851	20,675	2,982	2,844	1,727	20,218
Max		62,000	13,000	4,000	10,000	260,930	40,400	35,897	20,291	273,909
Min		62,000	13,000	4,000	8,000	214,010	32,820	29,442	16,233	222,517
1	Deterjen	62	13	4	7,95	172,77	26,67	23,769	0,161	180,821
2	Deterjen	62	13	4	7,05	218,98	39,88	30,126	0,143	270,383
3	Deterjen	62	13	4	7,4	166,73	26,05	22,938	0,150	176,617
4	Deterjen	62	13	4	8,2	201,92	30,3	27,779	0,166	205,432
5	Deterjen	62	13	4	8,5	250,62	47,04	34,479	0,172	318,928
Nilai rata-rata		62,000	13,000	4,000	7,820	202,204	33,988	27,818	0,159	230,436
SD		0,000	0,000	0,000	0,590	34,462	9,155	4,741	0,012	62,068
Max		62,000	13,000	4,000	8,500	250,620	47,040	34,479	0,172	318,928
Min		62,000	13,000	4,000	7,050	166,730	26,050	22,938	0,143	176,617
1	Rebus	62	13	4	7,4	173,48	94	23,866	0,150	637,313
2	Rebus	62	13	4	5,7	167,79	92,5	23,084	0,116	627,143
3	Rebus	62	13	4	7,05	192,68	124,24	26,508	0,143	842,338
4	Rebus	62	13	4	7,6	148,24	24,28	20,394	0,154	164,617
5	Rebus	62	13	4	6,3	184,86	38,01	25,432	0,128	257,705
Nilai rata-rata		62,000	13,000	4,000	6,810	173,410	74,606	23,857	0,138	505,823
SD		0,000	0,000	0,000	0,794	17,085	41,928	2,350	0,016	284,269
Max		62,000	13,000	4,000	7,600	192,680	124,240	26,508	0,154	842,338
Min		62,000	13,000	4,000	5,700	148,240	24,280	20,394	0,116	164,617