

Lampiran 1 Tabel Hasil Uji Tarik Serat Tunggal Tanpa Perlakuan

SERAT WARU TANPA PERLAKUAN ALKALI NaOH / 0%											
SAMPEL	TEBAL ( $\mu\text{m}$ )			RATA2	WAKTU	LEBAR	PANJANG	PERTAMBAHAN	PANJANG	F.MAX	Kekuatan Tarik (MPa)
	1	2	3	( $\mu\text{m}$ )	(s)	(m)	(cm)	PANJANG (cm)	AKHIR (cm)	(N)	
SW01	66.6	66.2	57.1	63.30	1.81	0.003	10	0.15	10.15	11.70	61.61137441
SW02	99.8	89.4	110	99.73	1.86	0.003	10	0.20	10.20	62.94	210.3609626
SW03	107	105	90.4	100.80	1.69	0.003	10	0.25	10.25	78.11	258.3002646
SW04	96.9	93.5	103	97.80	1.46	0.003	10	0.15	10.15	75.34	256.7825494
SW05	93	87.9	92.5	91.13	1.95	0.003	10	0.10	10.10	68.20	249.4513533
RATA-RATA				90.55	1.75	0.003	10.00	0.170	10.17	59.26	207.30

Lampiran 2 Tabel Hasil Uji Tarik Serat Tunggal Perlakuan Alkali NaOH 3%

SERAT WARU DENGAN PERLAKUAN ALKALI NaOH 3%											
SAMPEL	TEBAL ( $\mu\text{m}$ )			RATA2	WAKTU	LEBAR	PANJANG	PERTAMBAHAN	PANJANG	F.MAX	Kekuatan Tarik (MPa)
	1	2	3	( $\mu\text{m}$ )	(s)	(m)	(cm)	PANJANG (cm)	AKHIR (cm)	(N)	
SW31	89.5	77.1	83.7	83.43	1.60	0.003	10	0.10	10.10	12.98	51.85777068
SW32	92.1	84.6	88.6	88.43	1.27	0.003	10	0.15	10.15	51.58	194.4214097
SW33	91.2	94.9	81.9	89.33	1.46	0.003	10	0.18	10.18	72.67	271.1567164
SW34	96.4	99.5	97.6	97.83	1.32	0.003	10	0.15	10.15	48.61	165.6218058
SW35	88.1	90.8	98.2	92.37	1.84	0.003	10	0.12	10.12	41.58	150.0541321
RATA-RATA				90.28	1.50	0.003	10.00	0.140	10.14	45.48	166.62

Lampiran 3 Tabel Hasil Uji Tarik Serat Tunggal Perlakuan Alkali NaOH 6%

SERAT WARU DENGAN PERLAKUAN ALKALI NaOH 6%											
SAMPSEL	TEBAL ( $\mu\text{m}$ )			RATA2	WAKTU	LEBAR	PANJANG	PERTAMBAHAN	PANJANG	F.MAX	Kekuatan Tarik (MPa)
	1	2	3	( $\mu\text{m}$ )	(s)	(m)	(cm)	PANJANG (cm)	AKHIR (cm)	(N)	
SW61	76.7	98.6	95.4	90.23	1.21	0.003	10	0.15	10.15	9.63	35.57443665
SW62	90.5	87.7	81.6	86.60	1.56	0.003	10	0.30	10.30	51.44	197.9984604
SW63	107.6	109.6	101.2	106.13	1.31	0.003	10	0.15	10.15	77.51	243.4359296
SW64	95	97.9	87.4	93.43	1.33	0.003	10	0.10	10.10	50.46	180.0214056
SW65	81.9	68.5	83.3	77.90	1.36	0.003	10	0.13	10.13	24.96	106.8035944
RATA-RATA				90.86	1.35	0.003	10.00	0.166	10.17	42.80	152.77

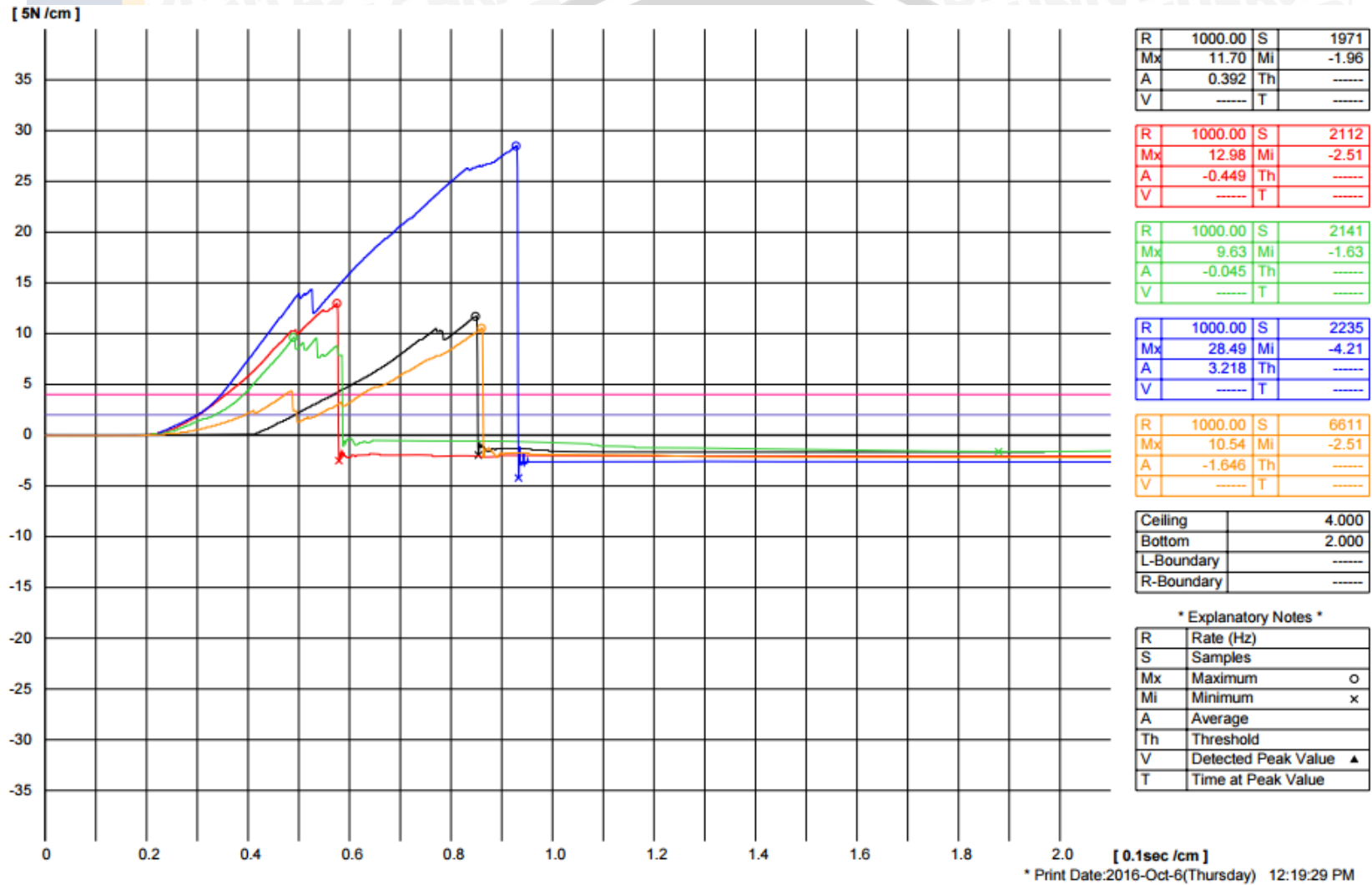
Lampiran 4 Tabel Hasil Uji Tarik Serat Tunggal Perlakuan Alkali NaOH 9%

SERAT WARU DENGAN PERLAKUAN ALKALI NaOH 9%											
SAMPSEL	TEBAL ( $\mu\text{m}$ )			RATA2	WAKTU	LEBAR	PANJANG	PERTAMBAHAN	PANJANG	F.MAX	Kekuatan Tarik (MPa)
	1	2	3	( $\mu\text{m}$ )	(s)	(m)	(cm)	PANJANG (cm)	AKHIR (cm)	(N)	
SW91	68.8	73.9	81.4	74.70	1.10	0.003	10	0.05	10.05	28.49	127.1307452
SW92	91.5	93.8	91.6	92.30	1.56	0.003	10	0.17	10.17	42.54	153.6294691
SW93	93.4	98.6	81.8	91.27	1.28	0.003	10	0.16	10.16	78.33	286.0847334
SW94	90.9	94.1	85.5	90.17	1.36	0.003	10	0.20	10.20	46.45	171.7190388
SW95	70.5	78.3	84.5	77.77	1.56	0.003	10	0.20	10.20	62.38	267.3810544
RATA-RATA				85.24	1.37	0.003	10.00	0.156	10.16	51.64	201.19

Lampiran 5 Tabel Hasil Uji Tarik Serat Tunggal Perlakuan Alkali NaOH 12%

SERAT WARU DENGAN PERLAKUAN ALKALI NaOH 12%											
SAMPSEL	TEBAL ( $\mu\text{m}$ )			RATA2	WAKTU	LEBAR	PANJANG	PERTAMBAHAN	PANJANG	F.MAX	Kekuatan Tarik (MPa)
	1	2	3	( $\mu\text{m}$ )	(s)	(m)	(cm)	PANJANG (cm)	AKHIR (cm)	(N)	
SW121	96.4	79.4	67.4	81.07	1.03	0.003	10	0.15	10.15	10.54	43.33881579
SW122	90.6	88.9	86.9	88.80	1.42	0.003	10	0.20	10.20	59.51	223.3858859
SW123	97.2	97.1	99.3	97.87	1.32	0.003	10	0.17	10.17	79.64	271.253406
SW124	99.7	88.1	94.4	94.07	1.34	0.003	10	0.17	10.17	44.33	157.0871722
SW125	78.8	83.6	79.1	80.50	1.30	0.003	10	0.10	10.10	47.52	196.7701863
RATA-RATA				88.46	1.28	0.003	10.00	0.158	10.16	48.31	178.37

Lampiran 6 Grafik Tegangan-Regangan Uji Tarik Serat tunggal



Lampiran 7 Tabel Hasil uji Tarik Matrik *Bisphenol*

Kode Spesimen	Regangan	Regangan Rata-rata	Tegangan	Tegangan Rata-rata
1	0	0	1.237593	1.126775
2	0		1.015957	
1	0.0211515	0.0209697	33.70658	33.54528
2	0.0207879		33.38398	
1	0.0353939	0.03545455	40.66687	40.89701
2	0.0355152		41.12714	

Lampiran 8 Tabel Hasil uji Tarik Matrik *Epoxy*

Kode Spesimen	Regangan	Regangan Rata-rata	Tegangan	Tegangan Rata-rata
1	0	0	0.804147	0.463139
2	0		0.12213	
1	0.0219394	0.02184848	27.2235	28.64961
2	0.0217576		30.07572	
1	0.0418788	0.04187879	38.13364	38.24489
2	0.0418788		38.35613	

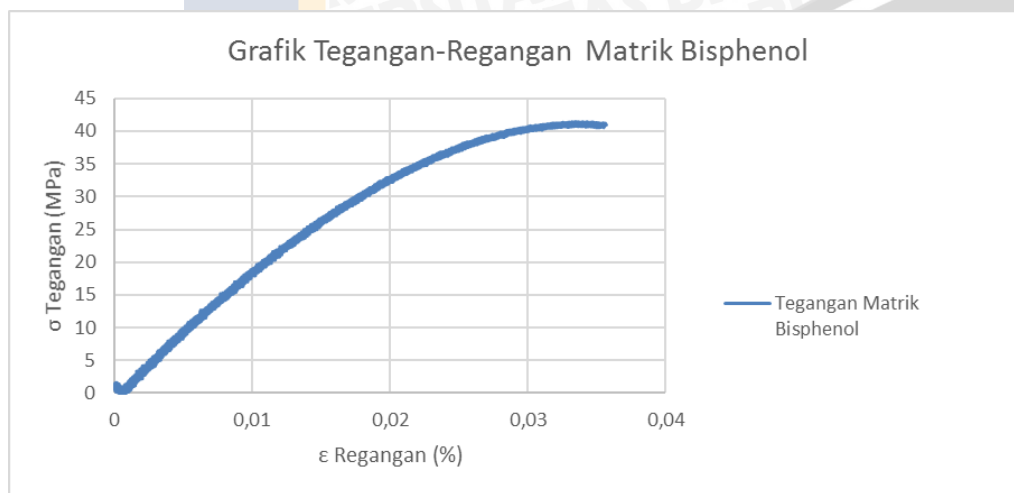
Lampiran 9 Tabel Hasil uji Tarik Matrik *Ripoxy*

Kode Spesimen	Regangan	Regangan Rata-rata	Tegangan	Tegangan Rata-rata
1	0	0	0.485734	1.247905
2	0		2.010076	
1	0.0110303	0.01063636	19.10474	19.28411
2	0.0102424		19.46348	
1	0.0206061	0.02060606	39.05891	38.11384
2	0.0206061		37.16877	

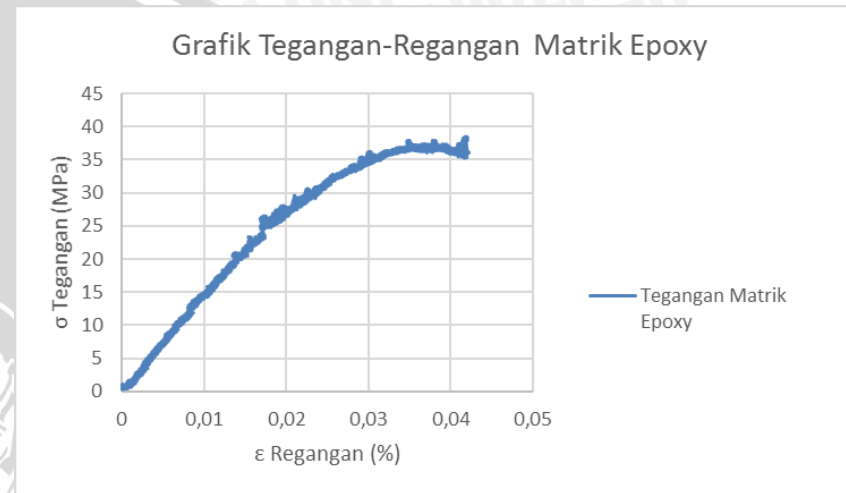
Lampiran 10 Tabel Hasil uji Tarik Matrik *Polyester*

Kode Spesimen	Regangan	Regangan Rata-rata	Tegangan	Tegangan Rata-rata
1	0	0	0.134168	0.240161
2	0		0.346154	
1	0.0137576	0.01357576	36.24955	35.26516
2	0.0133939		34.28077	
1	0.0275152	0.02733333	58.18873	56.0136
2	0.0271515		53.83846	

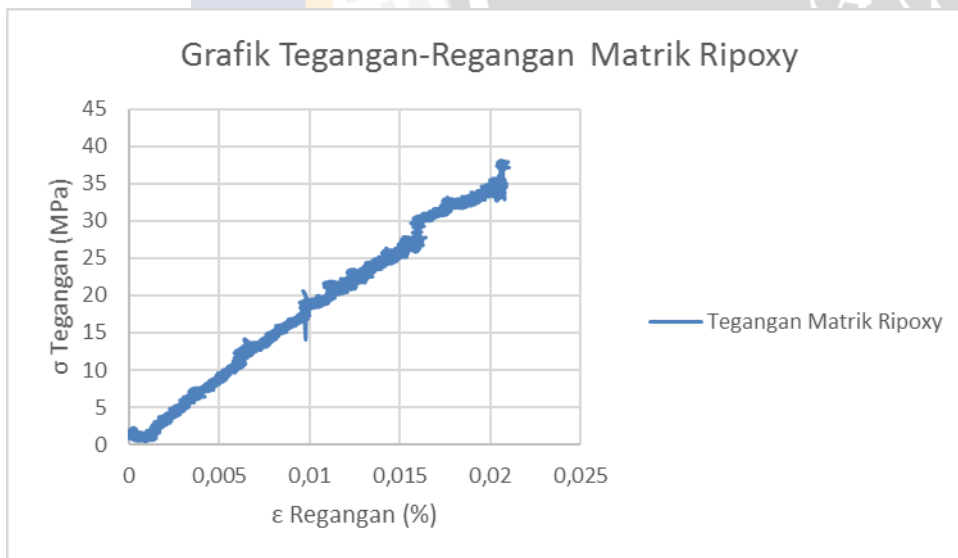
Lampiran 11 Grafik Tegangan-Regangan Uji Tarik Matrik *Bisphenol*



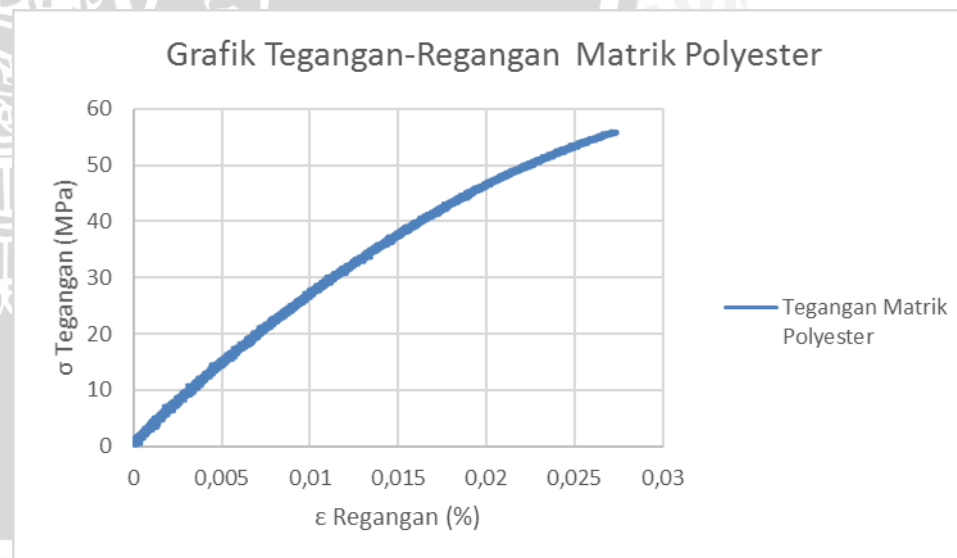
Lampiran 12 Grafik Tegangan-Regangan Uji Tarik Matrik *Epoxy*



Lampiran 13 Grafik Tegangan-Regangan Uji Tarik Matrik *Ripoxy*



Lampiran 14 Grafik Tegangan-Regangan Uji Tarik Matrik *Polyester*



Lampiran 15 Tabel Hasil Uji Tarik Komposit *Bisphenol*

No. Sample	Kode Spesimen	Regangan	Regangan Rata-rata	Tegangan	Tegangan Rata-rata
1	KB1	0	0	2.18125	1.323773
	KB6	0		0.466297	
2	KB1	0.0150909	0.0152424	205.0292	212.1834
	KB6	0.0153939		219.3377	
3	KB1	0.0309697	0.0308788	321.2646	311.4348
	KB6	0.0307879		301.6051	

Lampiran 16 Tabel Hasil Uji Tarik Komposit *Epoxy*

No. Sample	Kode Spesimen	Regangan	Regangan Rata-rata	Tegangan	Tegangan Rata-rata
1	KE2	0.0001818	0	27.03355	13.77123
	KE3	0.0001818		1.219115	
2	KE2	0.0132727	0.0129091	196.5602	200.1634
	KE3	0.0130909		204.385	
3	KE2	0.0253333	0.0253939	261.0041	277.2001
	KE3	0.0252727		292.9134	

Lampiran 17 Tabel Hasil Uji Tarik Komposit *Ripoxy*

No. Sample	Kode Spesimen	Regangan	Regangan Rata-rata	Tegangan	Tegangan Rata-rata
1	KR2	0	0	0.935156	0.647004
	KR3	0		0.358852	
2	KR2	0.0135758	0.0135758	186.0516	177.3775
	KR3	0.0135758		168.7033	
3	KR2	0.0278788	0.028	272.9156	260.5882
	KR3	0.0281212		248.2608	

Lampiran 18 Tabel Hasil Uji Tarik Komposit *Polyester*

No. Sample	Kode Spesimen	Regangan	Regangan Rata-rata	Tegangan	Tegangan Rata-rata
1	KP1	0	0	3.217826	2.478194
	KP2	0		1.738562	
2	KP1	0.0107273	0.0109697	170.1644	163.153
	KP2	0.0112121		156.1416	
3	KP1	0.0233333	0.0232424	242.4318	229.3477
	KP2	0.0231515		216.2636	

Lampiran 19 Tabel Perhitungan *Modulus Young*

NO	Matrik	Pengulangan	Kekuatan tarik (MPa)	Rata-rata (MPa)	$\epsilon$ (%)	Rata-rata $\epsilon$ (%)	Reg.yield %	Tegangan Yield (MPa)	Rata-rata yield (%)	E (Gpa)	Rata-rata E (Gpa)
1	Bisphenol	1	329	316.5	0.032363636	0.031848485	0.017756813	217.1155	228.1929	12227.1662	12294.7632
		2	304		0.031333333		0.01935475	239.2704		12362.3603	
2	Epoxy	1	263	285.5	0.026	0.026727273	0.01722561	217.7122	214.9983	12638.8662	13040.6997
		2	308		0.027454545		0.015792	212.2845		13442.5331	
3	Ripoxy	1	291	269.5	0.03169697	0.03	0.020642202	238.7892	208.7955	11568.012	11557.8155
		2	248		0.02830303		0.015483871	178.8018		11547.619	
4	Polyester	1	249	239	0.023818182	0.025575758	0.013536122	185.2535	175.7685	13685.8593	12777.7199
		2	229		0.027333333		0.014009217	166.2835		11869.5806	



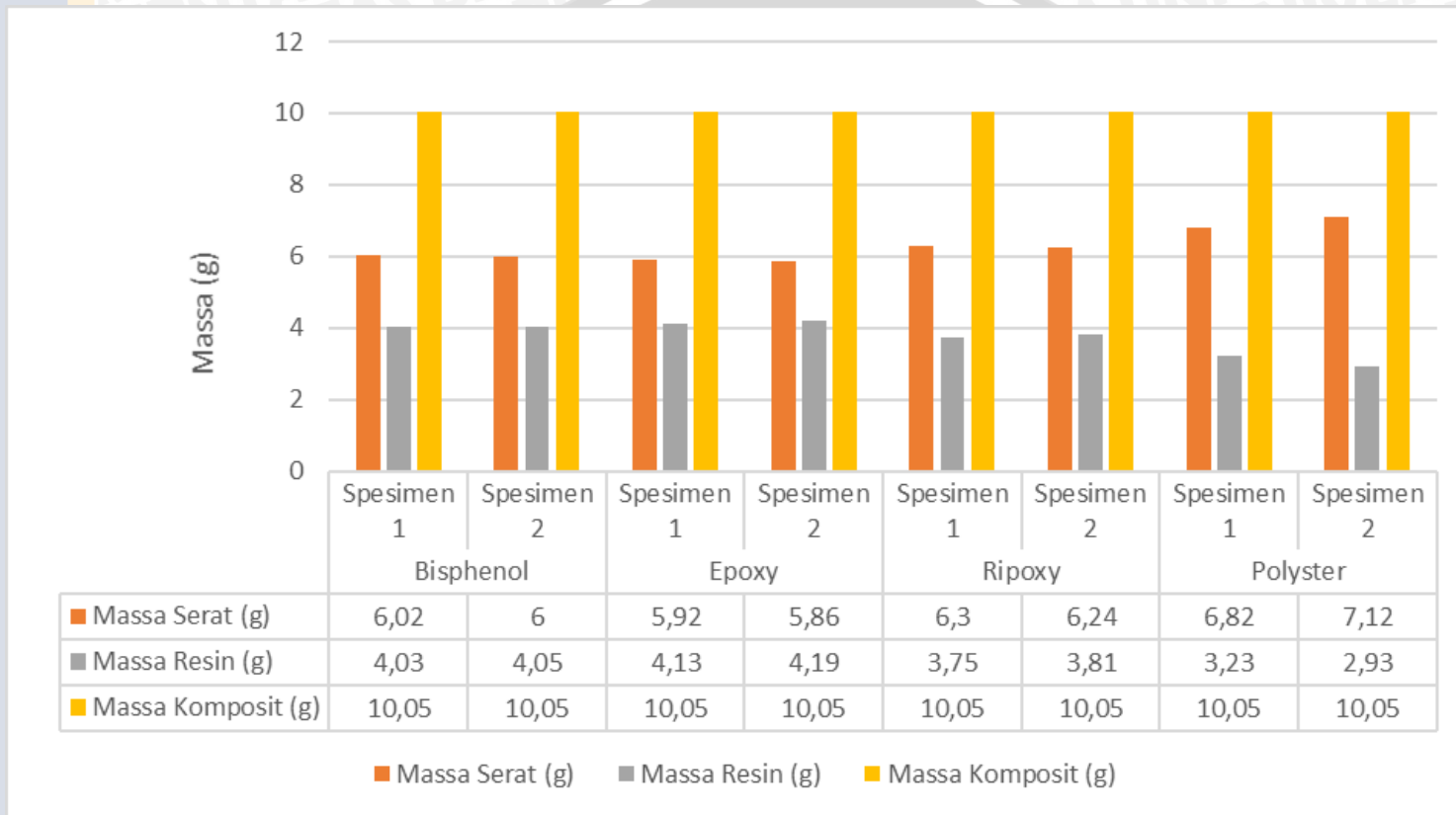
Lampiran 20 Tabel Massa Serat, Resin, Komposit

Massa	Bisphenol		Epoxy		Ripoxy		Polyster	
	Spesimen 1	Spesimen 2	Spesimen 1	Spesimen 2	Spesimen 1	Spesimen 2	Spesimen 1	Spesimen 2
Massa Serat (g)	6.02	6	5.92	5.86	6.3	6.24	6.82	7.12
Massa Resin (g)	4.03	4.05	4.13	4.19	3.75	3.81	3.23	2.93
Massa Komposit (g)	10.05	10.05	10.05	10.05	10.05	10.05	10.05	10.05

Lampiran 21 Tabel Fraksi Berat Resin dan Serat Terhadap Komposit

Fraksi Berat	Bisphenol		Epoxy		Ripoxy		Polyester	
	Spesimen 1	Spesimen 2	Spesimen 1	Spesimen 2	Spesimen 1	Spesimen 2	Spesimen 1	Spesimen 2
Fraksi Berat Resin Terhadap Komposit (%)	40.1	40.3	41.1	41.7	37.3	37.9	32.1	29.2
Fraksi Berat Serat Terhadap Komposit (%)	59.9	59.7	58.9	58.3	62.7	62.1	67.9	70.8

Lampiran 22 Diagram Massa Serat, Resin, Komposit



Lampiran 23 Diagram Fraksi Berat Resin dan Serat terhadap Komposit

