

## **LAMPIRAN**

## Lampiran A. Perhitungan

### 1. Perhitungan Volume Sampel

$$\text{Volume Fisis} = P \times L \times T$$

$$\text{Volume Fisis} = 10 \text{ cm} \times 5 \text{ cm} \times 1.5 \text{ cm}$$

$$\text{Volume Fisis} = 75 \text{ cm}^3$$

Dik :

P = Panjang

L = Lebar

T = Tebal

### 2. Perhitungan Fraksi Volume

$$\text{massa} = \rho \times v \times \text{fraksi volume}$$

$$\text{massa} = 1.17 \frac{\text{g}}{\text{cm}^3} \times 75 \text{ cm}^3 \times 0.2$$

$$\text{massa} = 17.55 \text{ g}$$

Dik :

$\rho$  = Massa Jenis Bahan

$v$  = Volume

### 3. Perhitungan Densitas

#### a. Densitas Aktual

$$\rho_m = \frac{m}{v}$$

$$\rho_m = \frac{14,2}{9}$$

$$\rho_m = 1,78 \text{ g/cm}^3$$

#### b. Densitas Teoritis

$$\rho_{th} = \rho_{al} \cdot V_{al} + \rho_{gr} \cdot V_{gr} + \rho_{ZnO} \cdot V_{ZnO} + \rho_C \cdot V_C + \rho_B \cdot V_B + \rho_R \cdot V_R$$

$$\rho_{th} = (5,61 \times 0,05) + (0,641 \times 0,1) + (3,99 \times 0,1) + (1,2 \times 0,5)$$

$$+ (0,60 \times 0,1) + (1,17 \times 20)$$

$$\rho_{th} = 1,607 \text{ g/cm}^3$$

#### 4. Perhitungan Porositas

$$\text{Porositas} = \frac{\rho_{th} - \rho_m}{\rho_{th}} \times 100\%$$

$$\text{Porositas} = \frac{1.607 - 1.586}{1.607} \times 100\%$$

$$\text{Porositas} = 1.307 \%$$

#### 5. Perhitungan Daya Serap Air

$$\text{Serapan Air} = \frac{B - A}{A} \times 100\%$$

$$\text{Serapan Air} = \frac{14.48 - 14.27}{14.27} \times 100\%$$

$$\text{Serapan Air} = 1.427\%$$

Keterangan :

A = Berat Sampel Sebelum direndam (g)

B = Berat Sampel Sesudah direndam (g)

#### 6. Perhitungan Kompaksi

Dik :

$$A_1 \text{ Luas penampang hidrolis} = 490,874 \text{ mm}^2$$

$$A_2 \text{ Luas penampang komaksi} = 5000 \text{ mm}^2$$

$$P_1 \text{ Tekanan hidrolis} = 40 \text{ bar}$$

$$P = \frac{F}{A}$$

$$F = P \times A$$

$$P = P_1 \times A_1 = P_2 \times A_2$$

$$P_2 = \frac{P_1 \times A_1}{A_2}$$

$$P_2 = \frac{40 \times 490.874}{5000}$$

$$P_2 = 3.92 \text{ bar} = 0.392$$

## Lampiran B. Dokumentasi Kegiatan

### 1. Pembuatan Serat Bambu



### 2. Proses Perhitungan Fraksi untuk pengadukan komposit



### 3. Proses Kompaksi



### 4. Proses Penghalusan Permukaan

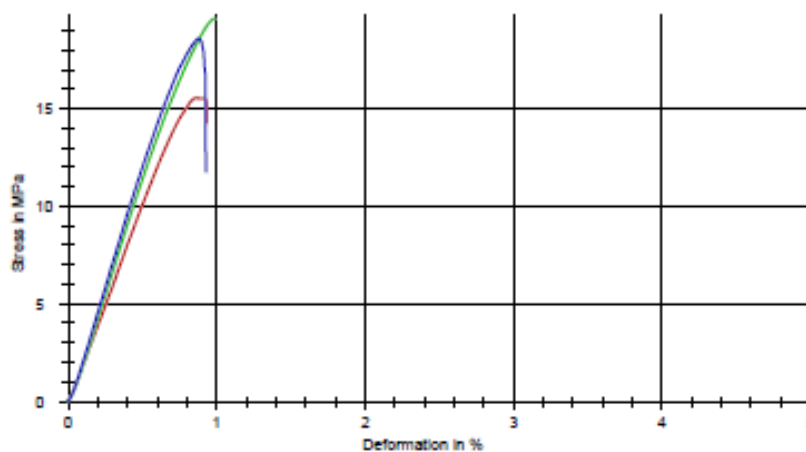


**Flexural Test report**

Customer : Rahfie Ramadhan  
 Test standard : ASTM D 790  
 Material : Resin, Alumina, Graphite, ZnO, Cangkang Kelapa Sawit, Serat Bambu  
 Notes : V1  
 Machine data : Zwick Z020  
 Pre-load : 0,2 N  
 Test speed : 2 mm/min

**Test results:**

Legend	No.	Force N	E <sub>11</sub> MPa	σ <sub>M</sub> MPa	ε <sub>r</sub> %	ε <sub>p</sub> %	σ <sub>B</sub> MPa	L mm	d mm	b mm
Red	1	81,51	2060	15,5	0,94	0,94	14,3	80	7,72	10,56
Green	2	95,17	2430	19,6	0,99	0,99	19,6	80	7,4	10,64
Blue	3	85,39	2540	18,6	0,93	0,93	11,8	80	7,24	10,52

**Series graph:****Statistics:**

Series	Force N	E <sub>11</sub> MPa	σ <sub>M</sub> MPa	ε <sub>r</sub> %	ε <sub>p</sub> %	σ <sub>B</sub> MPa	L mm	d mm	b mm
n = 3									
$\bar{x}$	87,36	2340	17,9	0,95	0,95	15,2	80	7,453	10,57
s	7,04	253	2,11	0,032	0,032	3,99	0,000	0,2444	0,0611
v [%]	8,06	10,79	11,80	3,35	3,35	26,20	0,00	3,28	0,58



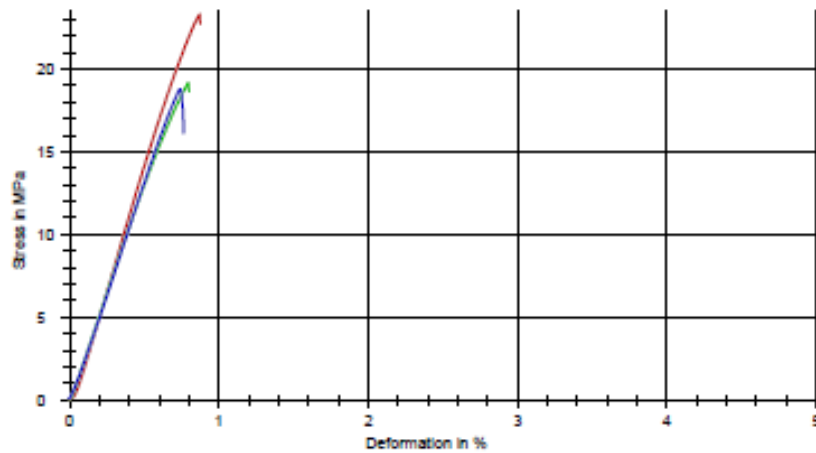
## Flexural Test report

Customer : Rahfe Ramadhan  
 Test standard : ASTM D 790  
 Material : Resin, Alumina, Graphite, ZnO, Cangkang Kelapa Sawit, Serat Bambu  
 Notes : V2  
 Machine data : Zwick Z020  
 Pre-load : 0,2 N  
 Test speed : 2 mm/min

### Test results:

Legend	No.	Force N	$E_{II}$ MPa	$\sigma_M$ MPa	$\epsilon_f$ %	$\epsilon_b$ %	$\sigma_b$ MPa	L mm	d mm	b mm
Red	1	103,70	3060	23,3	0,87	0,87	22,7	80	6,88	11,28
Green	2	88,29	2690	19,2	0,80	0,80	18,7	80	7,12	10,9
Blue	3	86,08	2700	18,8	0,76	0,76	16,2	80	7	11,22

### Series graph:



### Statistics:

Series	Force N	$E_{II}$ MPa	$\sigma_M$ MPa	$\epsilon_f$ %	$\epsilon_b$ %	$\sigma_b$ MPa	L mm	d mm	b mm
n = 3									
$\bar{y}$	92,69	2820	20,4	0,81	0,81	19,2	80	7	11,13
s	9,60	213	2,50	0,057	0,057	3,32	0,000	0,12	0,2043
v [%]	10,35	7,58	12,26	6,98	6,98	17,30	0,00	1,71	1,83



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**Zwick / Roell**

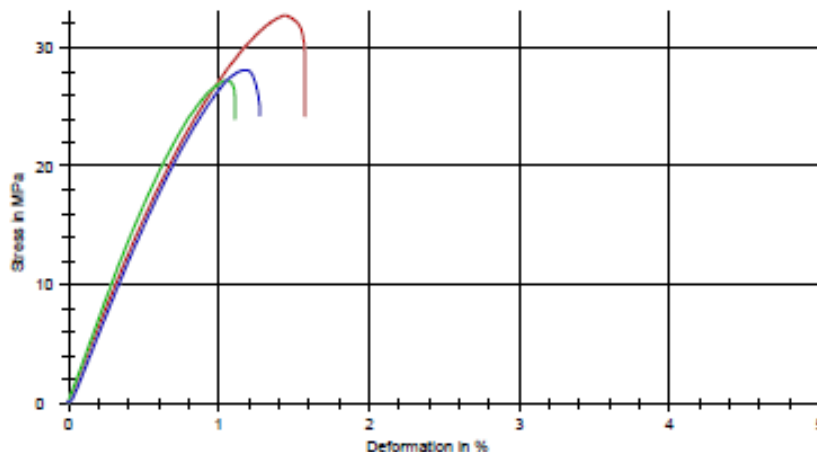
### Flexural Test report

Customer : Rahfe Ramadhan  
 Test standard : ASTM D 790  
 Material : Resin, Alumina, Graphite, ZnO, Cangkang Kelapa Sawit, Serat Bambu  
 Notes : V3  
 Machine data : Zwick Z020  
 Pre-load : 0,2 N  
 Test speed : 2 mm/min

#### Test results:

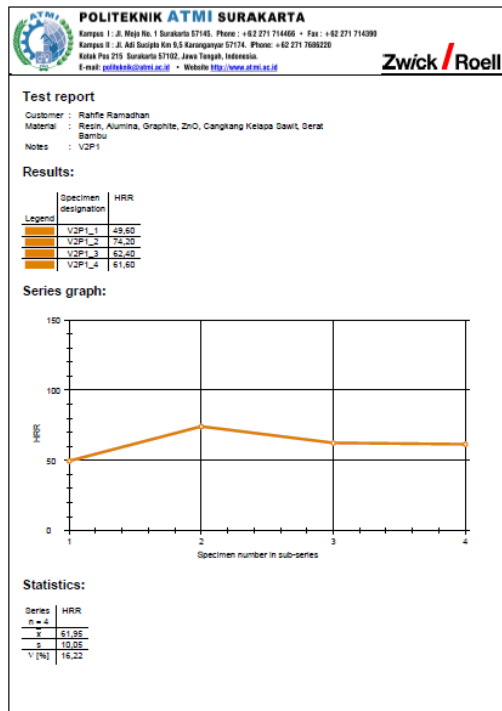
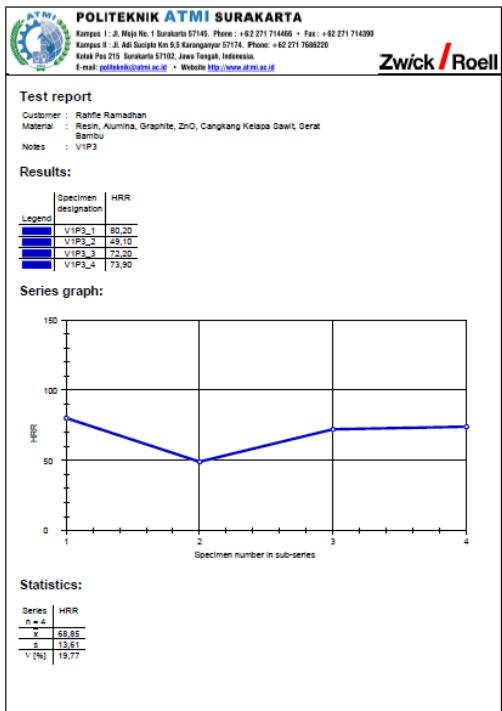
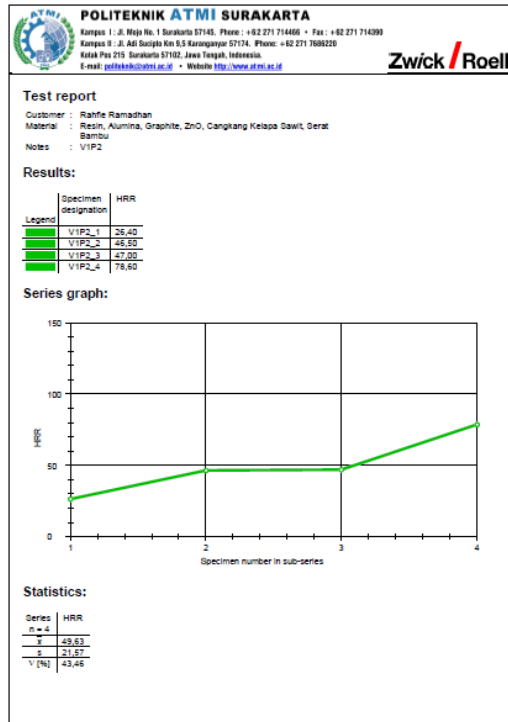
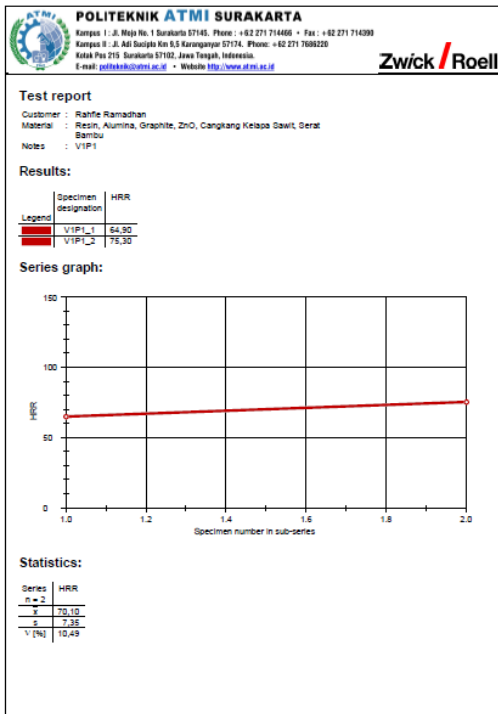
Legend	No.	Force N	E <sub>II</sub> MPa	σ <sub>0,2</sub> MPa	ε <sub>r</sub> %	ε <sub>b</sub> %	σ <sub>b</sub> MPa	L mm	d mm	b mm
Red	1	113,69	3150	32,7	1,6	1,6	24,2	80	6,3	10,5
Green	2	99,27	3410	27,3	1,1	1,1	24,0	80	6,5	10,32
Blue	3	106,27	3150	28,1	1,3	1,3	24,3	80	6,54	10,6

#### Series graph:

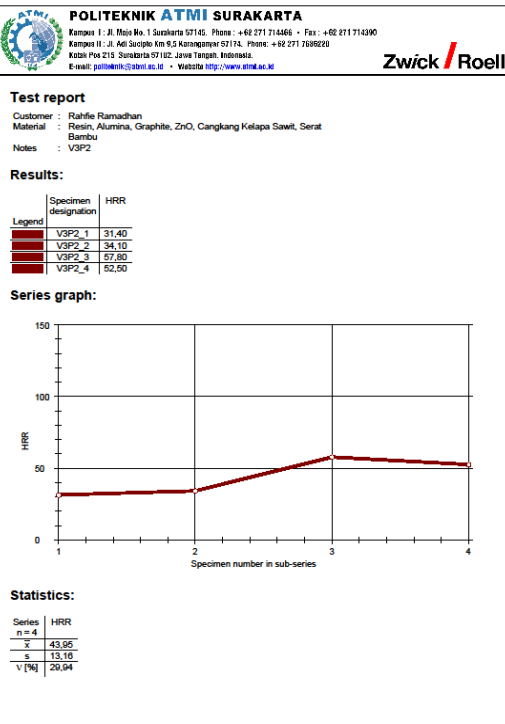
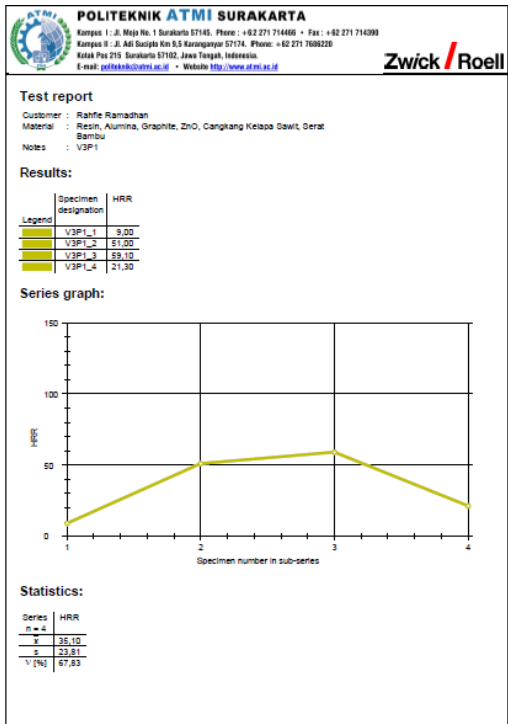
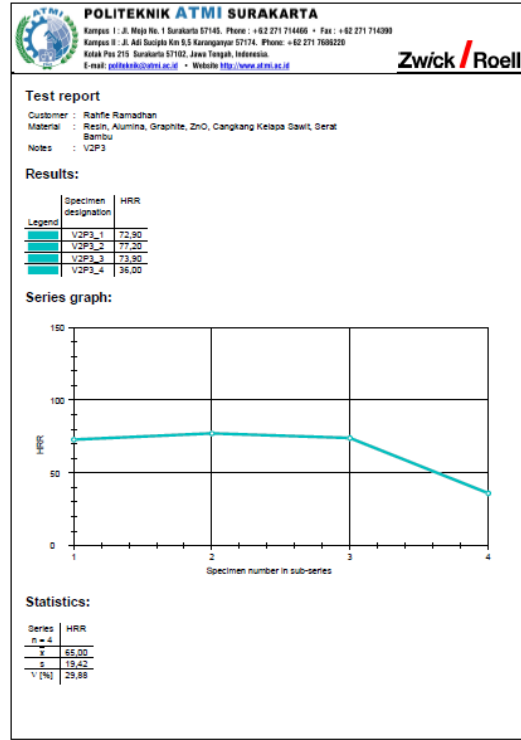
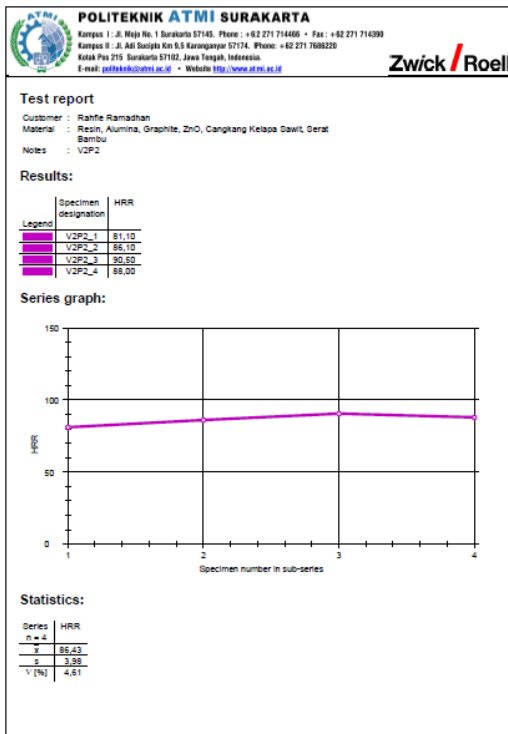


#### Statistics:

Series	Force N	E <sub>II</sub> MPa	σ <sub>0,2</sub> MPa	ε <sub>r</sub> %	ε <sub>b</sub> %	σ <sub>b</sub> MPa	L mm	d mm	b mm
n = 3									
ȳ	106,41	3230	29,4	1,3	1,3	24,2	80	6,447	10,47
s	7,21	149	2,92	0,24	0,24	0,199	0,000	0,1286	0,1419
v [%]	6,78	4,62	9,94	17,91	17,91	0,66	0,00	1,99	1,35









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**Zwick / Roell**

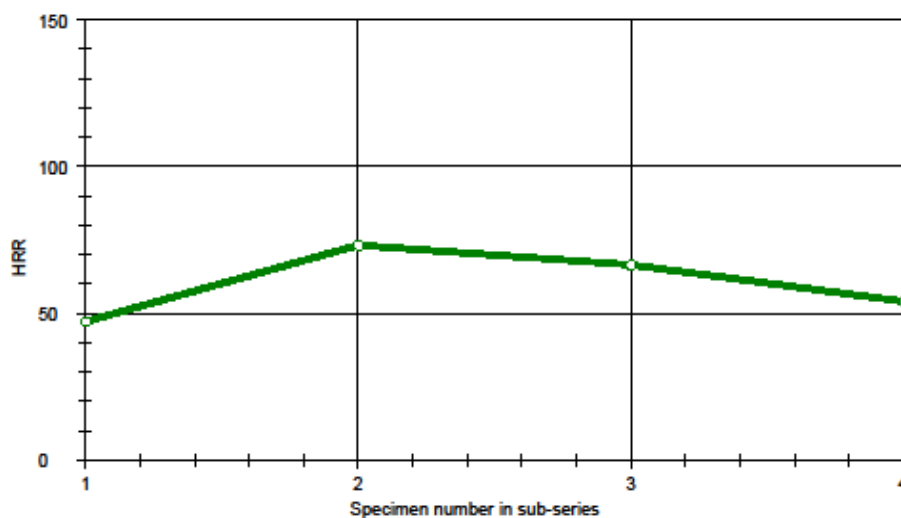
### Test report

Customer : Rahfie Ramadhan  
Material : Resin, Alumina, Graphite, ZnO, Cangkang Kelapa Sawit, Serat  
Bambu  
Notes : V3P3

### Results:

Legend	Specimen designation	HRR
■	V3P3_1	47,20
■	V3P3_2	73,20
■	V3P3_3	66,60
■	V3P3_4	54,00

### Series graph:



### Statistics:

Series	HRR
n = 4	
$\bar{x}$	60,25
s	11,80
v [%]	19,58