LAMPIRAN

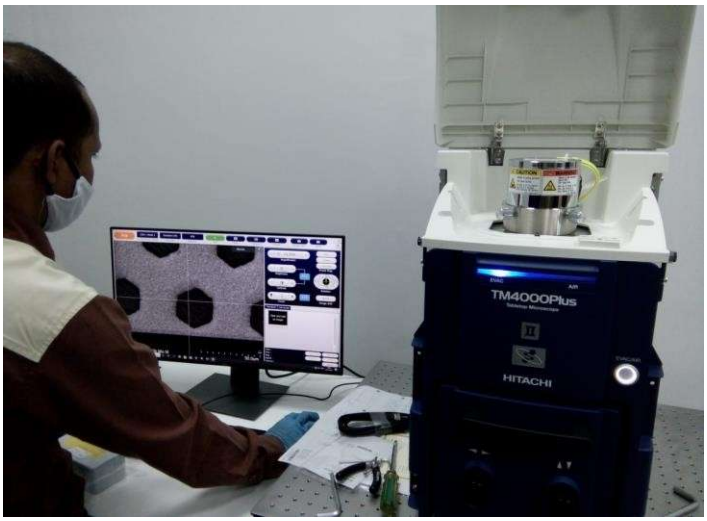
Gambar saat proses pengadukan

Gambar Proses penakaran epoxy resin

Gambar proses tuang kedalam cetakan

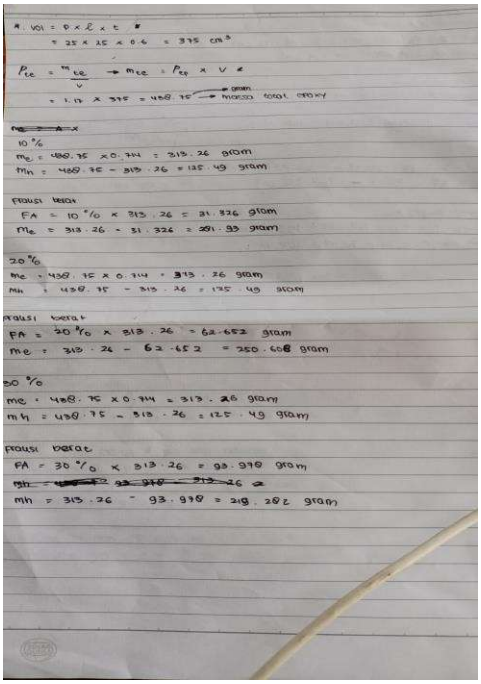
Gambar penutup cetakan

Gambar Proses pengujian Bending



Gambar Proses Pengujian SEM

Gambar hasil spesimen uji bending



Sheet1

	G	H	I	J
17				
18				
19	FA			
20	10%	94.01785714		
21	20%	188.0357143		
22	30%	282.0535714		
23	TOTAL	564.107143 mg		
24		0.6 kg		
25	EPOXY			
26	90%	846.1607143		
27	80%	752.1428571		
28	70%	658.125		
29	TOTAL	2256.42857		
30		2.256 kg		
31				
32	HARDENER	1128.21429		
33		1,128 kg		
34				
35	kebutuhan Epoxy untuk 3 grup :			
36				
37		6.768 kg		
38		7 kg		
39				
40	Hardener untuk 3 Grup :			
41		3,385 kg		
42		4 kg		

4			
5			
6			
7	LUAS	625	
8	TEBAL	0.6	
9	VOLUME	375	
10			
11	RATIO	10	4
12		14	
13		0.714285714	
14			
15			
16			
17	MASA TOTAL	438.75	
18	MASA EPOXY	313.3928571	
19	MASA HARDENER	125.3571429	
20			
21	FA 10%	31.33928571	
22	MASA EPOXY	282.0535714	
23	MASA HARDENER	125.3571429	
24			
25			
26	FA 20%	62.67857143	
27	MASA EPOXY	250.7142857	
28	MASA HARDENER	125.3571429	
29			
30	FA 30%	94.01785714	
31	MASA EPOXY	219.375	
32	MASA HARDENER	125.3571429	
33			

Gambar proses perhitungan fraksi berat fly ash dan epoxy resin hardener

Tegangan Bending 10% (σb)

A1 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,06\times1000\times50}{2\times12\times6,00^2}$ = 10,41 MPa

A2 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,07\times1000\times50}{2\times12\times5,50^2}$ = 14,46 MPa

A3 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,10\times1000\times50}{2\times12\times5,70^2}$ = 19,23 MPa

B1 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,11\times1000\times50}{2\times12\times4,50^2}$ = 33,95 MPa

B2 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,10\times1000\times50}{2\times12\times4,50^2}$ = 30,86 MPa

B3 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,10\times1000\times50}{2\times12\times4,40^2}$ = 31,93 MPa

C1 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,07\times1000\times50}{2\times12\times3,60^2}$ = 33,75 MPa

C2 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,17\times1000\times50}{2\times12\times5,60^2}$ = 33,88 MPa

C3 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,09\times1000\times50}{2\times12\times4,00^2}$ = 35,15 MPa

Tegangan Bending 20% (σb)

A1 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,14\times1000\times50}{2\times12\times5,50^2}$ = 28,92 MPa

A2 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,14\times1000\times50}{2\times12\times4,30^2}$ = 47,32 MPa

A3 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,08\times1000\times50}{2\times12\times6,00^2}$ = 13,88 MPa

B1 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,08\times1000\times50}{2\times12\times5,60^2}$ = 15,94 MPa

B2 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,11\times1000\times50}{2\times12\times4,70}$ = 31,12 MPa

B3 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,9\times1000\times50}{2\times12\times5,70^2}$ = 17,31 MPa

C1 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,23\times1000\times50}{2\times12\times4,80^2}$ = 62,39 MPa

C2 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,20\times1000\times50}{2\times12\times5,20^2}$ = 46,22 MPa

C3 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3\times0,18\times1000\times50}{2\times12\times5,80^2}$ = 33,44 MPa

Tegangan bending 30%(σb)

A1 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3 \times 0{,}07 \times 1000 \times 50}{2 \times 12 \times 4{,}00^2}$ = 27,34 MPa

A2 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3 \times 0{,}09 \times 1000 \times 50}{2 \times 12 \times 4{,}30^2}$ = 30,42 MPa

A3 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3 \times 0{,}09 \times 1000 \times 50}{2 \times 12 \times 4{,}50^2}$ = 27,77 MPa

B1 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3 \times 0{,}11 \times 1000 \times 50}{2 \times 12 \times 4{,}80^2}$ = 29,83 MPa

B2 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3 \times 0{,}13 \times 1000 \times 50}{2 \times 12 \times 5{,}60^2}$ = 25,90 MPa

B3 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3 \times 0{,}11 \times 1000 \times 50}{2 \times 12 \times 5{,}80^2}$ = 20,43 MPa

C1 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3 \times 0{,}08 \times 1000 \times 50}{2 \times 12 \times 4{,}00^2}$ = 31,25MPa

C2 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3 \times 0{,}06 \times 1000 \times 50}{2 \times 12 \times 4{,}00^2}$ = 23,43 MPa

C3 : $Gb = \frac{3PL}{2bd^2} = \frac{3 \text{ x F x L}}{2 \text{ x b x d}^2} = \frac{3 \times 0{,}08 \times 1000 \times 50}{2 \times 12 \times 4{,}20^2}$ = 28,34 MPa

Modulus Elastisitas Bending 10%

A1 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 6{,}00^3}$ = 31,15GPa

A2 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 5{,}50^3}$ = 40,44 GPa

A3 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 5{,}70^3}$ = 36,33 GPa

B1 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}50^3}$ = 73,85 GPa

B2 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}50^3}$ = 73,85 GPa

B3 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}40^3}$ = 79,00 GPa

C1 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 3{,}60^3}$ = 144,24 GPa

C2 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 5{,}60^3}$ = 38,32 GPa

C3 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}00^3}$ = 105,15 GPa

Modulus Elastisitas Bending 20%

A1 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 5{,}50^3} = 40{,}44$ GPa

A2 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}30^3} = 84{,}64$ GPa

A3 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 6{,}00^3} = 31{,}15$ GPa

B1 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 5{,}60^3} = 38{,}32$ GPa

B2 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}70^3} = 84{,}64$ GPa

B3 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 5{,}70^3} = 36{,}33$ GPa

C1 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}80^3} = 60{,}85$ GPa

C2 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 5{,}20^3} = 47{,}86$ GPa

C3 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 5{,}80^3} = 34{,}49$ GPa

Modulus Elastisitas Bending 30%

A1 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}00^3} = 105{,}15$ GPa

A2 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}30^3} = 84{,}64$ GPa

A3 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}50^3} = 73{,}85$ GPa

B1 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}80^3} = 60{,}85$ GPa

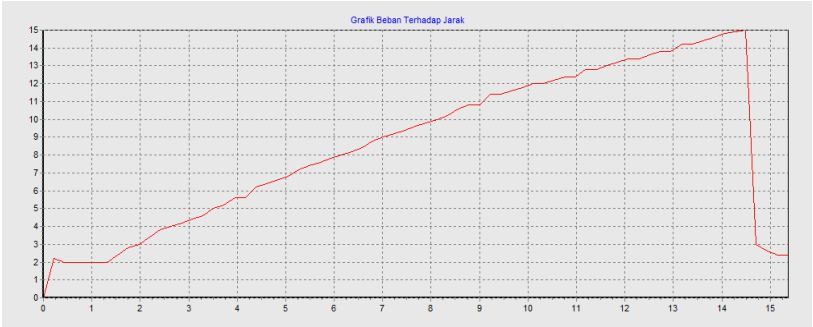
B2 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 5{,}60^3} = 38{,}32$ GPa

B3 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 5{,}80^3} = 34{,}49$ GPa

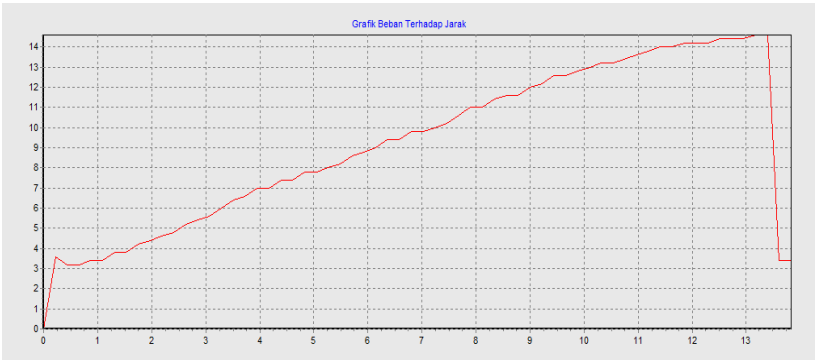
C1 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}00^3} = 105{,}15$ GPa

C2 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}00^3} = 105{,}15$ GPa

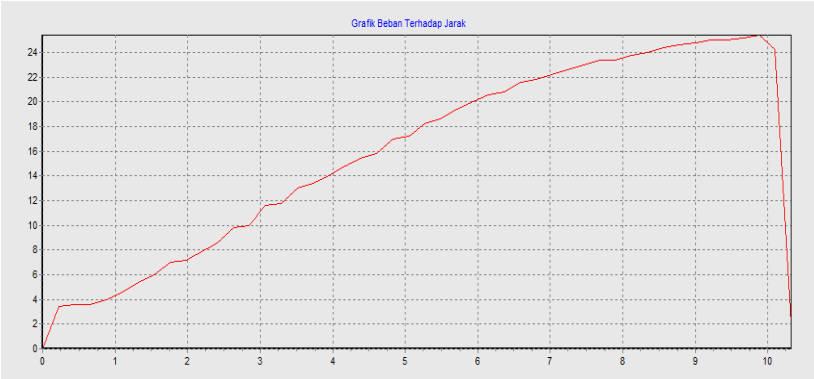
C3 : $Eb = \frac{L^3 m}{4bd^3} = \frac{50^3 \times 2{,}5842}{4 \times 12 \times 4{,}20^3} = 90{,}83$ GPa



Gambar Grafik beban terhadap jarak dengan variasi100 rpm



Gambar Grafik beban terhadap jarak dengan variasi 150 rpm



Gambar Grafik beban terhadap jarak dengan variasi 200 rpm