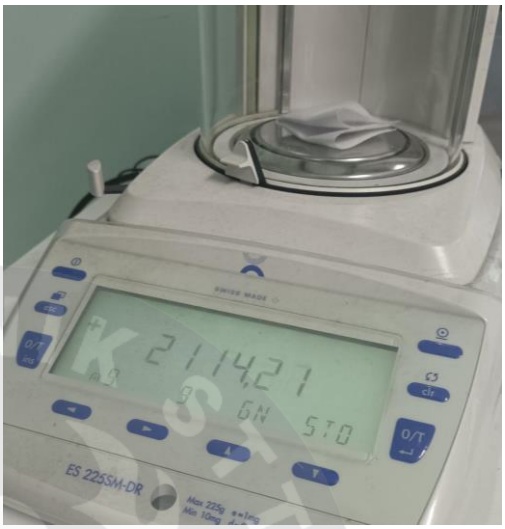
LAMPIRAN

1. Dekomposisi kain

Kain tenun poliester-rayon

Jenis anyaman: keper 2/2

Berat kain : 2,11 gr



Lampiran 1 Kain 10 x 10 cm dan berat kain 10 x 10 cm

Berat B. Lusi (10 helai) : 0,03002 gr

Berat B. Pakan (10 helai) : 0,03202 gr

Lampiran 2 Berat 10 helai benang lusi dan 10 helai benang pakan

Lampiran 3 Tabel tetal lusi dan paka

No	Tetal (helai/inch)	
	Lusi	Pakan
1	114	58
2	114	58
3	114	58
Σ	342	174
$\dot{x}$	114	58

Lampiran 4 tabel Panjang lusi dan pakan

No.	Panjang Benang (cm)	
	Lusi	Pakan
1	10,5	10,5
2	10,5	10,5
3	10,5	10,7
4	10,6	10,5
5	10,5	10,6
6	10,6	10,5
7	10,7	10,6
8	10,5	10,6
9	10,6	10,7
10	10,5	10,7
Σ	105,5 cm	105,9 cm
	1,055 m	1,059 m
$\dot{x}$	10,55 cm	10,59 cm

A. Perhitungan Benang Lusi

- Tetal : 114 helai/” = 44,88 helai/cm
- Jumlah Panjang 10 hl benang : 105,5 cm = 1,055 m
- Berat Benang 10 hl : 0,03002 g
- Panjang rata-rata 10 hl benang : 10,55 cm
- Mengkeret $= \frac{\bar{x}\ panjang\ 10\ benang - panjang\ kain}{\bar{x}\ panjang\ 10\ benang} \times 100\%$

$= \frac{10{,}55-10}{10{,}55} \times 100\% = 5{,}2\%$

- $N_m = \frac{Panjang\ (m)}{Berat\ (g)} = \frac{1{,}055}{0{,}03002} = 35{,}14$
- $Ne_1 = 0{,}59 \times N_m = 0{,}59 \times \ 35{,}14 \ = 20{,}7$
- $Tex = \frac{1000}{N_m} = \frac{1000}{35{,}14} \ = 28{,}45$
- $Td = \frac{9000}{N_m} = \frac{9000}{35{,}14} = 256{,}11$

B. Perhitungan Benang Pakan

- Tetal : 58 helai/" = 22,8 helai/cm
- Jumlah Panjang 10 hl benang : 105,9 cm = 1,059 m
- Berat Benang 10 hl : 0,03202 g
- Panjang rata-rata 10 hl benang : 10,59
- Mengkeret $= \frac{\bar{x}\ panjang\ 10\ benang - panjang\ kain}{\bar{x}\ panjang\ 10\ \ benang} \times 100\%$

  $= \frac{10{,}59-10}{10{,}59} \times 100\% = 5{,}57\%$
- $N_m = \frac{Panjang\ (m)}{Berat\ (gr)} = \frac{1{,}059}{0{,}03202} = 33{,}07$
- $Ne_1 = 0{,}59 \times N_m = 0{,}59 \times \quad 33{,}07 \qquad = 19{,}51$
- $Tex = \frac{1000}{N_m} = \frac{1000}{33{,}07} \ = 30{,}2$
- $Td = \frac{9000}{N_m} = \frac{9000}{33{,}07} = 272{,}14$

C. Berat Kain Contoh

- Berat per m^2 penimbangan $= \frac{100\ cm \times 100\ cm}{ukuran\ kain\ uji\ (10x10)\ cm} \times$ berat kain uji (g)

  $= \frac{100\times100}{10\times10} \times 2{,}11\ gr = \quad 211 \quad {}^{g}/_{m^2}$
- Berat per m^2 perhitungan

  1) Berat lusi per m^2 $= \frac{Tetal\ lusi/_{cm} \times 100\ cm \times 100\ cm}{Nm \times 100\ cm/m} \times \frac{100}{(100-M_L)}$

  $= \frac{44{,}88 \ \times 100 \times 100}{35{,}14 \ \times 100} \times \frac{100}{(100-\ 5{,}2\ )}$

  = 134,73 g/m2

  2) Berat pakan per m^2 $= \frac{Tetal\ pakan/_{cm} \times 100\ cm \times 100\ cm}{Nm \times 100\ cm/m} \times \frac{100}{(100-M_L)}$

  $= \frac{22{,}83 \ \times 100 \times 100}{33{,}07 \times 100} \times \frac{100}{(100-\ 5{,}57)}$

= 73,1 g/m2

Berat per m^2 penimbangan = B. lusi per m^2 + B. pakan per m^2

= 134,73 + 73,1 = 207,852 g/m2

- Selisih berat = $\frac{Berat\ besar - Berat\ kecil}{Berat\ besar} \times 100\%$

  $= \frac{211 - 207,852}{211} \times 100\% =$

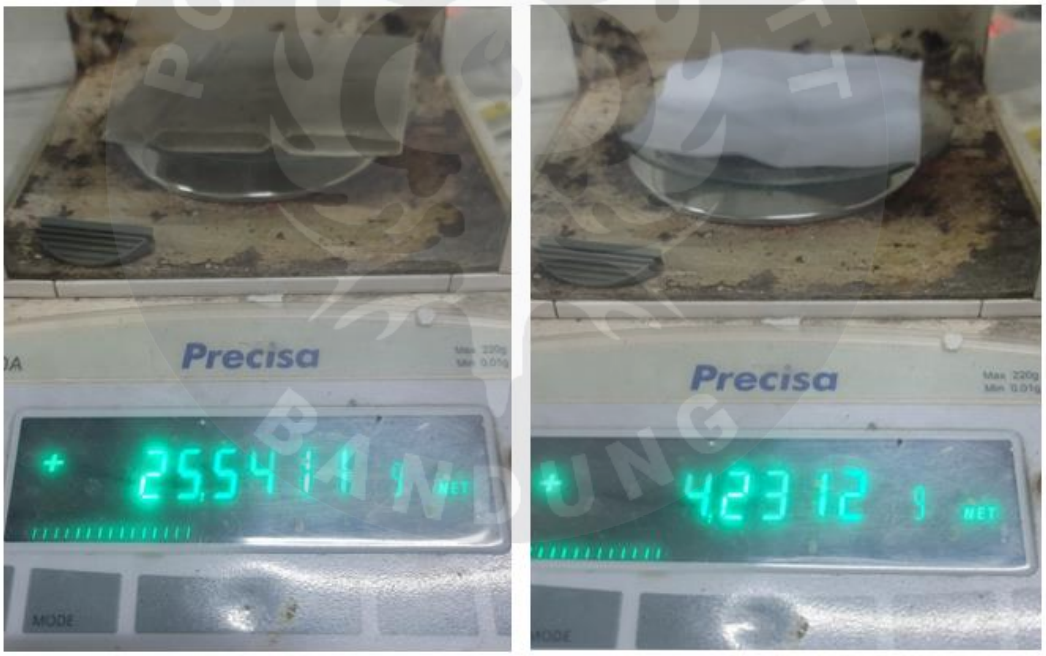
  $= 1,51\%$

1. Fraksi *Weight*

$\frac{B_{komposit} - B_{kain}}{B_{komposit}}$ x 100

$= \frac{25,5411 - 4,2312}{25,5411}$ x 100

= 0,83



Lampiran 5 Berat komposit 10 x 10 cm dan berat kain 3D 10 x 10 cm

3. Burn Out Rayon

= $\frac{B_0 - B_1}{B_0}$ x 100%

= $\frac{2,1534 - 1,7587}{2,1534}$ x 100%

= 18 % *Rayon*

Lampiran 6 Berat awal kain dan berat akhir kain

4. Tensile Modulus

a) Tarik Horizontal Komposit

Stress = $\frac{Max\ Force\ (N)}{Luas\ Penampang\ (mm^2)} = \frac{2137,83}{288,7056} = 7,40\ Mpa$

Strain = $\frac{\Delta L}{L0} = \frac{15,245}{50} = 0,3049$

ΔL = *Sampel Length* (mm) x rata-rata *max elongation* (%)

= 50 x 30,4 = 15,245

Tensile modulus = $\frac{stress}{strain}$

= $\frac{7,40}{0,304} = 24,743\ Mpa$

LABORATORIUM PENGUJIAN TEKSTIL - SEKOLAH TINGGI TEKNOLOGI TEKSTIL
Jl. Jakarta no. 31, Bandung, Jawa Barat
(022) 7272580, (022) 7271894, sttt@bdg.centrin.net.id

Test of Traction with MesdanLab Strength Tester

Customer Code	**BELINDA**	Test Code	**HORIZONTAL**	Date	**10/3/2023** Time **3:51:01 AM**

Sample Description				Sample Number	**3**
Parcel		Lot			
Material					
Examiner					
Sample Length	**50** [mm]		Load cell ID/FS [kg]	**6 / 1000**	**X 1**
Clamp Speed	**50** [mm/min]		Pretension	**0** [N]	
Test Machine					

Observations

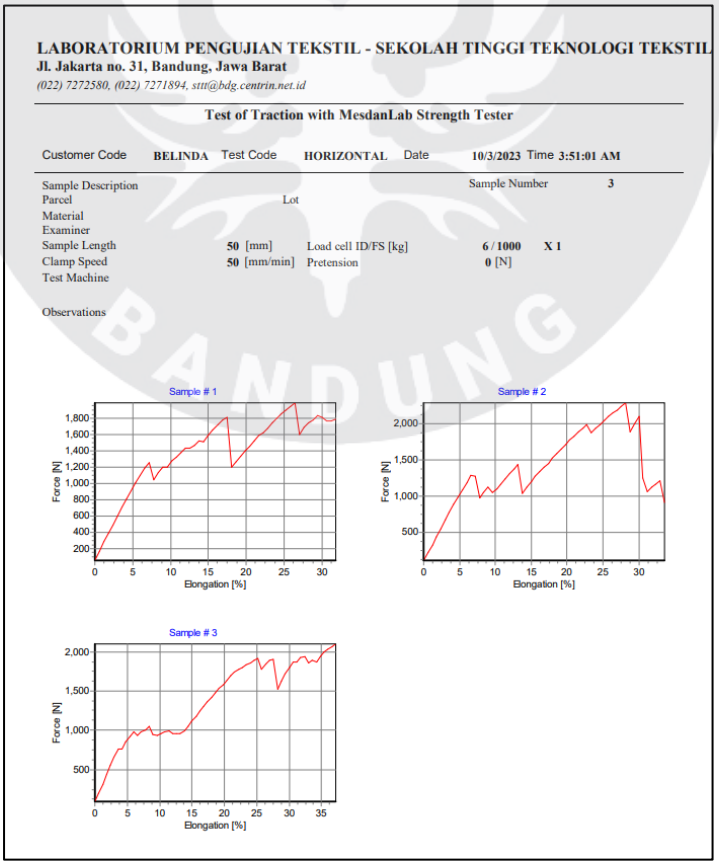
Statistical Results of the Test

	Force [N]	Elongation [%]	Average Time of Breakage **18.2** [s]
Maximum	2292.879 (2)	36.600 (3)	
Minimum	2006.954 (3)	26.400 (1)	
Average	2137.837	30.400	
Range	13.375 [%]	33.553 [%]	
CV	6.758 [%]	17.909 [%]	
Deviation	144.485	5.444	
IC95%	163.497	6.161	
IC99%	214.873	8.096	

Results of Single Samples

Sample #	Max Force [N]	Max Elongation [%]	Time [s]
1	2006.95	26.40	15.8
2	2292.88	28.20	16.9
3	2113.68	36.60	22.0

Lampiran 7 Hasil pengujian tarik komposit arah horizontal



Lampiran 8 Grafik hasil pengujian tarik komposit arah horizontal

b) Tarik Vertical Komposit

$$\text{Stress} = \frac{Max\ Force\ (N)}{Luas\ Penampang\ (mm^2)} = \frac{4606{,}24}{223{,}4084} = 20{,}61\ Mpa$$

$$\text{Strain} = \frac{\Delta L}{L0} = \frac{15{,}58}{36} = 0{,}432$$

ΔL = *Sampel Length* (mm) x rata-rata *max elongation* (%)

= 36 x 43,3 = 15,58

$$\textit{Tensile modulus} = \frac{stress}{strain}$$

$$= \frac{20{,}61}{0{,}432} = 47{,}7\ Mpa$$

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Test of Traction with MesdanLab Strength Tester

Customer Code	**BELINDA**	Test Code	**VERTIKAL**	Date	**10/4/2023** Time **10:43:57 PM**
Sample Description				Sample Number	**3**
Parcel		Lot			
Material					
Examiner					
Sample Length	**36** [mm]	Load cell ID/FS [kg]		**6 / 1000**	**X 1**
Clamp Speed	**50** [mm/min]	Pretension		**0** [N]	
Test Machine					
Observations					

Statistical Results of the Test

	Force [N]	Elongation [%]	Average Time of Breakage **18.7** [s]
Maximum	4608.015 (1)	50.833 (2)	
Minimum	4603.188 (2)	36.667 (3)	
Average	4606.240	43.333	
Range	0.105 [%]	32.692 [%]	
CV	0.058 [%]	16.431 [%]	
Deviation	2.655	7.120	
IC95%	3.004	8.057	
IC99%	3.948	10.589	

Results of Single Samples

Sample #	Max Force [N]	Max Elongation [%]	Time [s]
1	4608.01	36.67	15.8
2	4603.19	50.83	22.0
3	4607.52	42.50	18.4

Lampiran 9 Hasil pengujian tarik komposit arah vertikal

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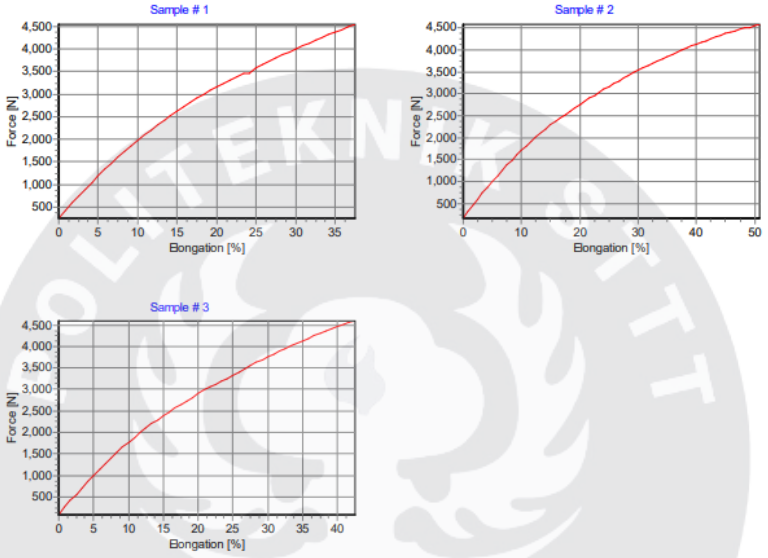
(022) 7272580, (022) 7271894, sttt@bdg.centrin.net.id

Test of Traction with MesdanLab Strength Tester

Customer Code	**BELINDA**	Test Code	**VERTIKAL**	Date	**10/4/2023** Time **10:43:57 PM**
Sample Description				Sample Number	**3**
Parcel		Lot			
Material					
Examiner					
Sample Length	**36** [mm]	Load cell ID/FS [kg]		**6 / 1000**	**X 1**
Clamp Speed	**50** [mm/min]	Pretension		**0** [N]	
Test Machine					

Observations



Lampiran 10 Grafik hasil pengujian tarik komposit arah horizontal

4. Compress modulus

a) Tekan Horizontal

Crack 1

$$\text{Stress} = \frac{Max\ Force\ (N)}{Luas\ Penampang\ (mm^2)} = \frac{32{,}15}{100} = 0{,}3215\ Mpa$$

$$\text{Strain} = \frac{\Delta L}{L0} = \frac{2{,}90}{10} = 0{,}29$$

$$\textit{Compress modulus} = \frac{stress}{strain}$$

$$= \frac{1{,}3215}{0{,}29} = 1{,}108\ Mpa$$

Crack 2

$$\text{Stress} = \frac{Max\ Force\ (N)}{Luas\ Penampang\ (mm^2)} = \frac{103{,}02}{100} = 1{,}030\ Mpa$$

$$\text{Strain} = \frac{\Delta L}{L0} = \frac{3{,}99}{10} = 0{,}399$$

Compress modulus $= \frac{stress}{strain}$

$= \frac{1,0302}{0,399} = 2,58\ Mpa$

b) Tekan Vertical

Crack 1

Stress $= \frac{Max\ Force\ (N)}{Luas\ Penampang\ (mm^2)} = \frac{110,36}{100} = 1,1036\ Mpa$

Strain $= \frac{\Delta L}{L0} = \frac{2,35}{10} = 0,235$

Compress modulus $= \frac{stress}{strain}$

$= \frac{1,1036}{0,235} = 4,69\ Mpa$

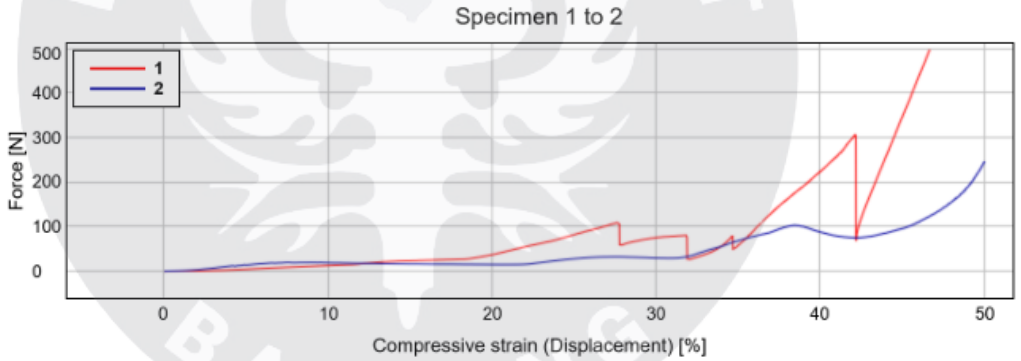
Crack 2

Stress $= \frac{Max\ Force\ (N)}{Luas\ Penampang\ (mm^2)} = \frac{308,13}{100} = 3,0813\ Mpa$

Strain $= \frac{\Delta L}{L0} = \frac{3,58}{10} = 0,358$

Compress modulus $= \frac{stress}{strain}$

$= \frac{3,0813}{0,358} = 8,606\ Mpa$



Lampiran 11 Grafik hasil pengujian tekan komposit

2. *Modulus Elastis Bending*

Stress $= \frac{3\ x\ 48,73\ N\ x\ 160\ mm}{2\ x\ 10\ mm\ x\ 7^2 mm} = \frac{3\ x\ 48,73\ x\ 160}{2\ x\ 490} = \frac{23390,4}{980}$ = 23,86 *Mpa*

$strain = \frac{6.D.h}{L^2}$ = $\frac{6\ x\ 25,66\ x\ 7}{160^2\ mm}$ = 0,042

Elastic *modulus* $= \frac{stress}{strain} = \frac{23,86}{0,042}$ = 781,19 Mpa

RESULT OF BENDING TEST

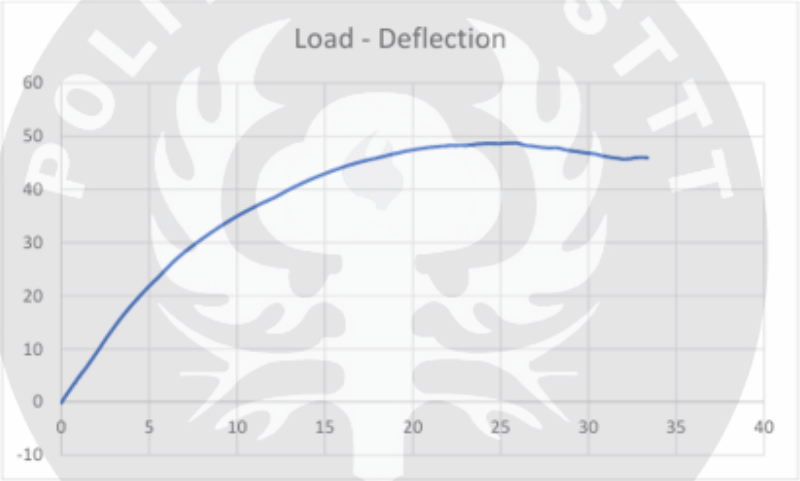
Customer Information

Belinda Azkalina
Mahasiswa/Dosen Non ITB
STT Tekstil Bandung

Characterization Information

Machine : Tensilon RTF-1310 / MSAT
Testing Code : TENS 0031
Amount of Sample : 1

No	Code	Standard	Dimension			Support Span	Max. Force	Deflection @ Max. Force
			L	W	T			
1	D	ASTM D790	220 mm	10 mm	7 mm	160 mm	48.73 N	25.66 mm



Lampiran 12 Hasil pengujian bending