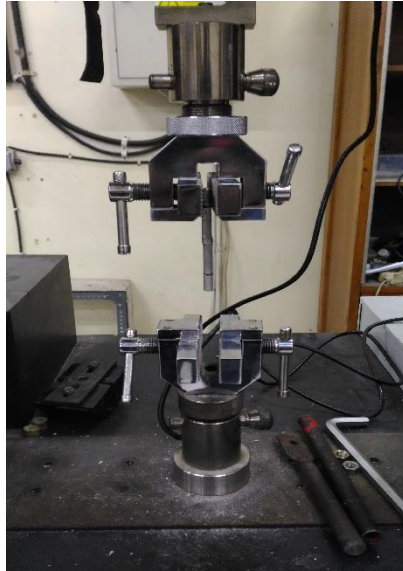


LAMPIRAN

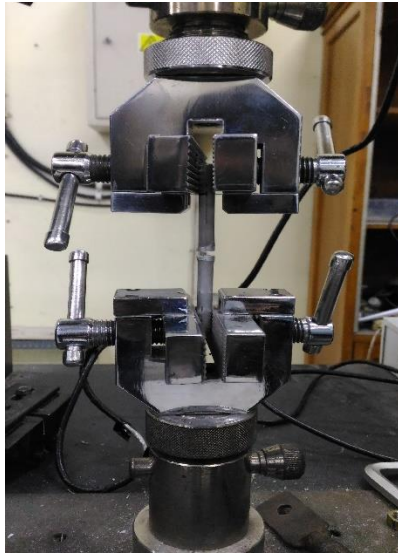
Lampiran 1. Proses pengujian Tarik



Gambar 1.1 Pemasangan *Spesimen* Pada Ragum.



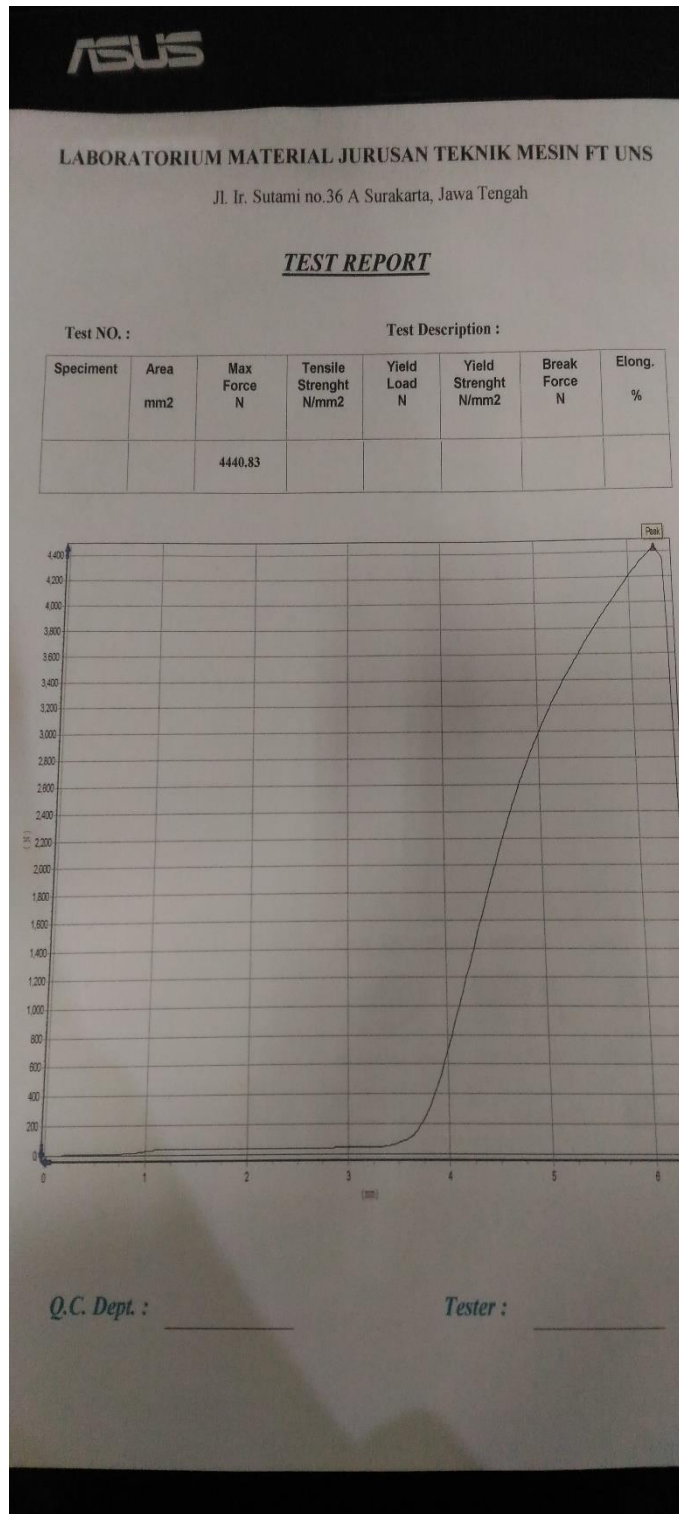
Gambar 1.2 Proses pembebanan.



Gambar 1.3 Spesimen Pada Saat *Break*.

Lampiran 2. Perhitungan Tarik

Spesimen 2



Gambar 2.1 Diagram Hasil Uji Tarik Spesimen 2.

Luas penampang (area):

$$\begin{aligned}A_o &= \frac{1}{4} \pi (d)^2 \\&= \frac{1}{4} 3.14 (8)^2 \\&= \frac{1}{4} 3.14 (64) \\&= 50.24 \text{ mm}^2\end{aligned}$$

Ultimate Tensile Strength

$$\begin{aligned}S_u &= \frac{P_{\text{maks}}}{A_o} \\&= \frac{4440.83 \text{ N}}{50.24 \text{ mm}^2} \\&= 88.39 \text{ N/mm}^2 \text{ atau } 88.39 \text{ MPa}\end{aligned}$$

Elongation

Diketahui : l_o : 64 mm

l : 65 mm

$$\begin{aligned}e &= \frac{l - l_o}{l_o} \times 100\% \\&= \frac{65 \text{ mm} - 64 \text{ mm}}{64 \text{ mm}} \times 100\% \\&= 1.56 \%\end{aligned}$$

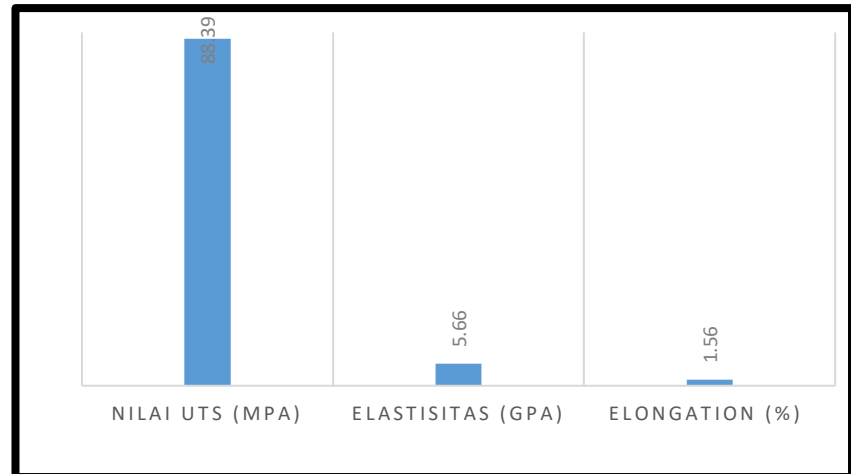
Modulus Elastisitas

$$\begin{aligned}E &= \frac{\sigma}{e} \\&= \frac{88.39 \text{ N/mm}^2}{1.56 \%} = \frac{88.39 \text{ N/mm}^2}{\frac{1.56}{100}}\end{aligned}$$

$$= \frac{88.39 \text{ N/mm}^2 \times 100}{1.56}$$

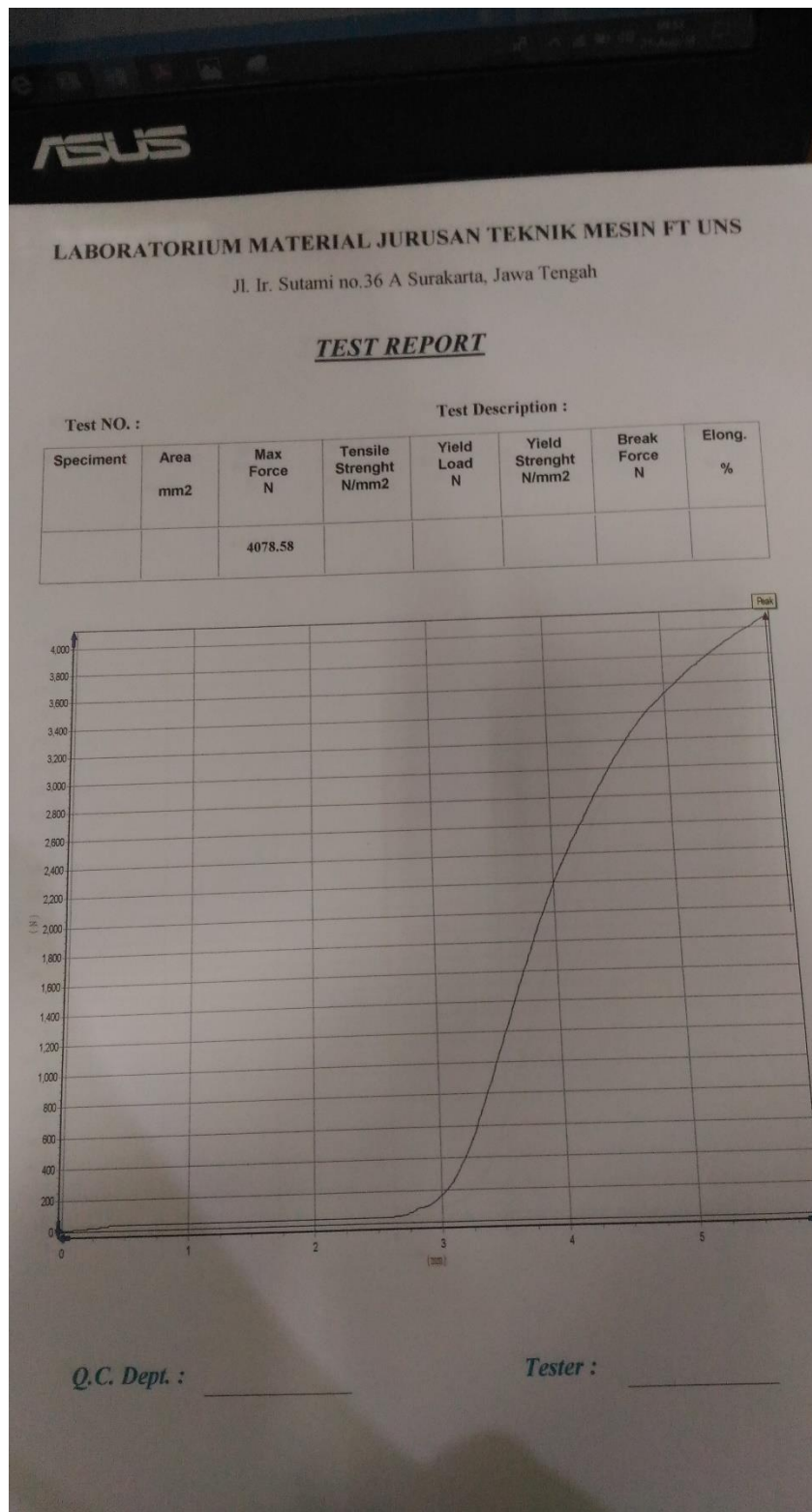
$$= 5666 \text{ N/mm}^2 \text{ atau } 5666 \text{ MPa}$$

$$= 5.66 \text{ GPa}$$



Gambar 2.2 Hasil Uji Tarik Spesimen 2.

Spesimen 3



Gambar 2.3 Diagram Hasil Uji Tarik Spesimen 3.

Luas penampang (area):

$$\begin{aligned}A_o &= \frac{1}{4} \pi (d)^2 \\ &= \frac{1}{4} 3.14 (8)^2 \\ &= \frac{1}{4} 3.14 (64) \\ &= 50.24 \text{ mm}^2\end{aligned}$$

Ultimate Tensile Strength

$$\begin{aligned}S_u &= \frac{P_{\text{maks}}}{A_o} \\ &= \frac{4078.58 \text{ N}}{50.24 \text{ mm}^2} \\ &= 81.18 \text{ N/mm}^2 \text{ atau } 81.18 \text{ MPa}\end{aligned}$$

Elongation

Diketahui : l_o : 64 mm

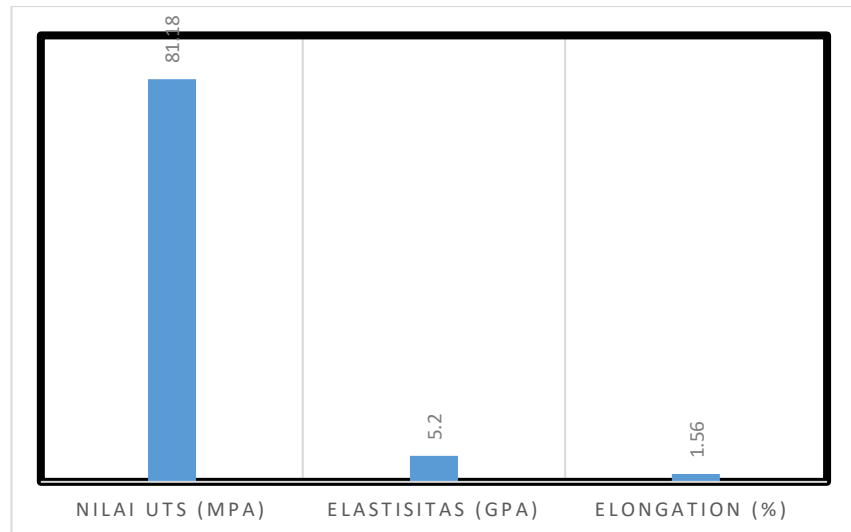
l : 65 mm

$$\begin{aligned}e &= \frac{l - l_o}{l_o} \times 100\% \\ &= \frac{65 \text{ mm} - 64 \text{ mm}}{64 \text{ mm}} \times 100\% \\ &= 1.56 \%\end{aligned}$$

Modulus Elastisitas

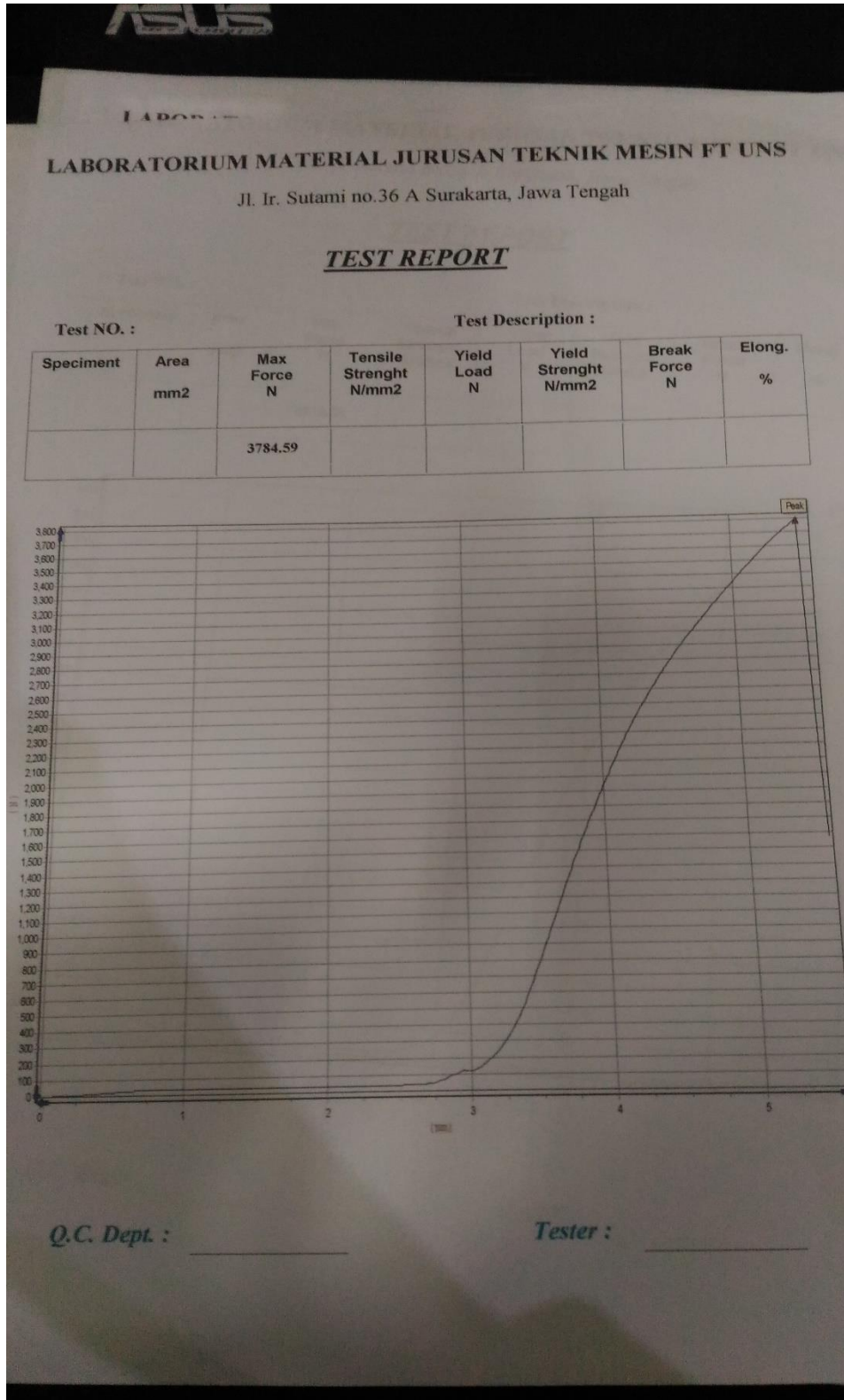
$$\begin{aligned}E &= \frac{\sigma}{e} \\ &= \frac{81.18 \text{ N/mm}^2}{1.56 \%} = \frac{81.18 \text{ N/mm}^2}{\frac{1.56}{100}}\end{aligned}$$

$$\begin{aligned} &= \frac{81.18 \text{ N/mm}^2 \times 100}{1.56} \\ &= 5203 \text{ N/mm}^2 \text{ atau } 5203 \text{ MPa} \\ &= 5.2 \text{ GPa} \end{aligned}$$



Gambar 2.4 Hasil Uji Tarik Spesimen 3.

Spesimen 4



Gambar 2.5 Diagram Hasil Uji Tarik Spesimen 4.

Luas penampang (area):

$$\begin{aligned}A_o &= \frac{1}{4} \pi (d)^2 \\&= \frac{1}{4} 3.14 (8)^2 \\&= \frac{1}{4} 3.14 (64) \\&= 50.24 \text{ mm}^2\end{aligned}$$

Ultimate Tensile Strength

$$\begin{aligned}S_u &= \frac{P_{\text{maks}}}{A_o} \\&= \frac{3784.56 \text{ N}}{50.24 \text{ mm}^2} \\&= 75.33 \text{ N/mm}^2 \text{ atau } 75.33 \text{ MPa}\end{aligned}$$

Elongation

Diketahui : l_o : 64 mm

l : 65 mm

$$\begin{aligned}e &= \frac{l - l_o}{l_o} \times 100\% \\&= \frac{65 \text{ mm} - 64 \text{ mm}}{64 \text{ mm}} \times 100\% \\&= 1.56 \%\end{aligned}$$

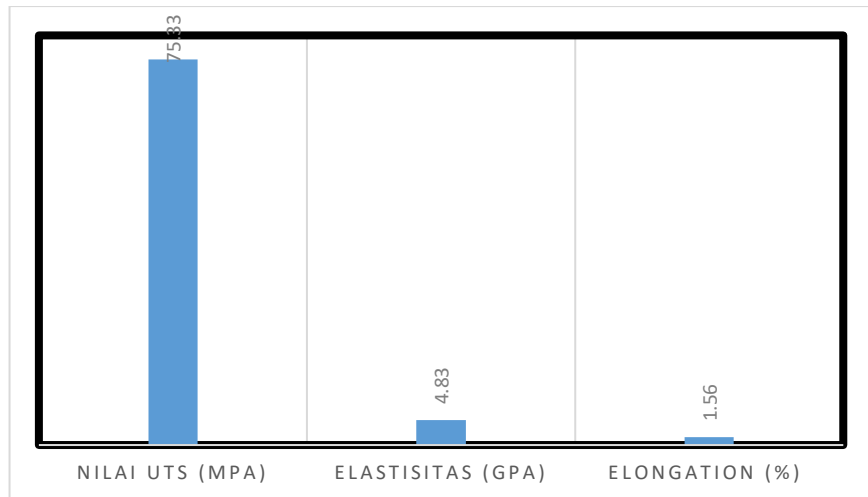
Modulus Elastisitas

$$\begin{aligned}E &= \frac{\sigma}{e} \\&= \frac{75.33 \text{ N/mm}^2}{1.56 \%} = \frac{75.33 \text{ N/mm}^2}{\frac{1.56}{100}}\end{aligned}$$

$$= \frac{75.33 \text{ N/mm}^2 \times 100}{1.56}$$

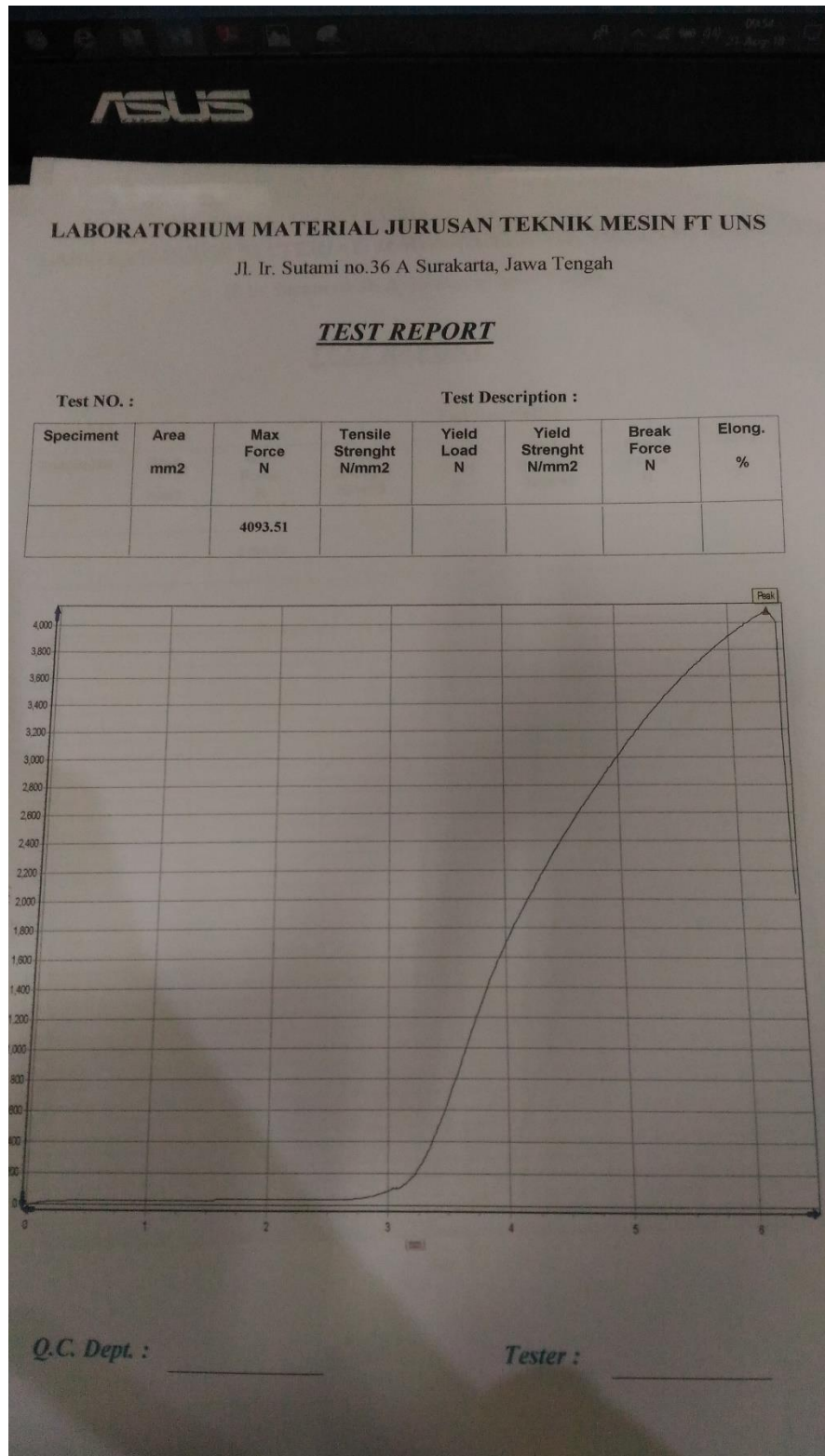
$$= 4828 \text{ N/mm}^2 \text{ atau } 4828 \text{ MPa}$$

$$= 4.83 \text{ GPa}$$



Gambar 2.6 Hasil Uji Tarik Spesimen 4.

Spesimen 5



Gambar 2.7 Diagram Hasil Uji Tarik Spesimen 5.

Luas penampang (area):

$$\begin{aligned}A_o &= \frac{1}{4} \pi (d)^2 \\&= \frac{1}{4} 3.14 (8)^2 \\&= \frac{1}{4} 3.14 (64) \\&= 50.24 \text{ mm}^2\end{aligned}$$

Ultimate Tensile Strength

$$\begin{aligned}S_u &= \frac{P_{\text{maks}}}{A_o} \\&= \frac{4093.51 \text{ N}}{50.24 \text{ mm}^2} = \\&= 81.48 \text{ N/mm}^2 \text{ atau } 81.48 \text{ MPa}\end{aligned}$$

Elongation

Diketahui : l_o : 64 mm

l : 65 mm

$$\begin{aligned}e &= \frac{l - l_o}{l_o} \times 100\% \\&= \frac{65 \text{ mm} - 64 \text{ mm}}{64 \text{ mm}} \times 100\% \\&= 1.56 \%\end{aligned}$$

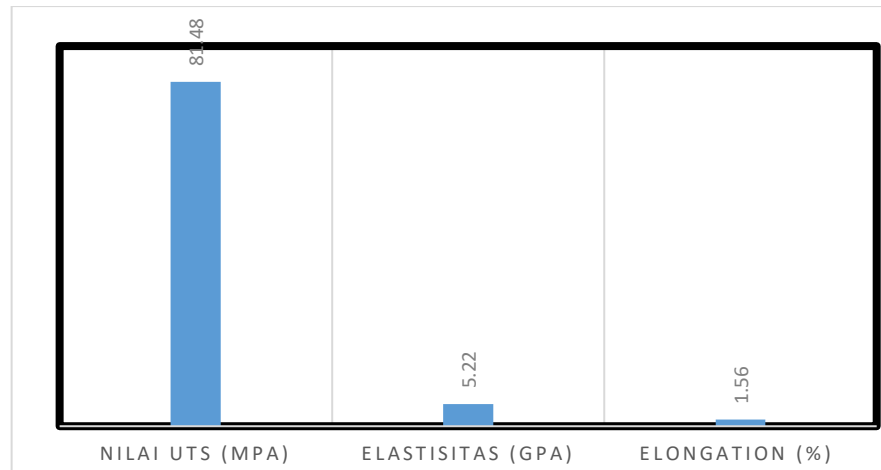
Modulus Elastisitas

$$\begin{aligned}E &= \frac{\sigma}{e} \\&= \frac{81.48 \text{ N/mm}^2}{1.56 \%} = \frac{81.48 \text{ N/mm}^2}{\frac{1.56}{100}}\end{aligned}$$

$$= \frac{81.48 \text{ N/mm}^2 \times 100}{1.56}$$

$$= 5223 \text{ N/mm}^2 \text{ atau } 5223 \text{ MPa}$$

$$= 5.22 \text{ GPa}$$

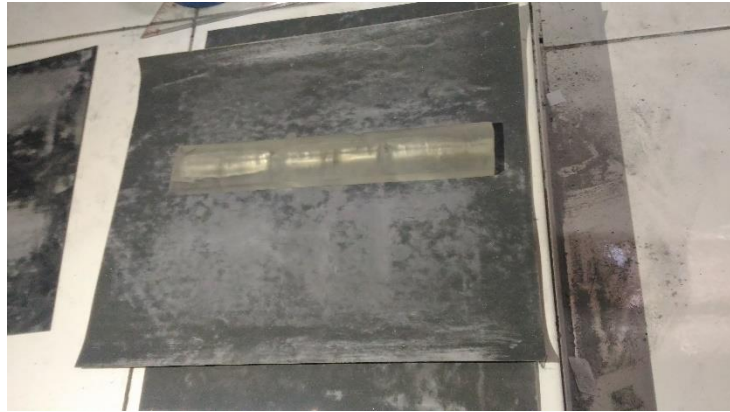


Gambar 2.8 Hasil Uji Tarik Spesimen 5.

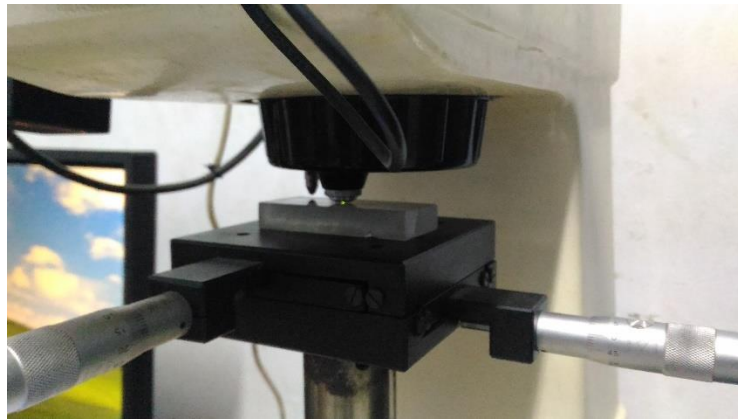
Lampiran 3. Proses Pengujian Kekerasan.



Gambar 3.1 Pembuatan Benda Uji.



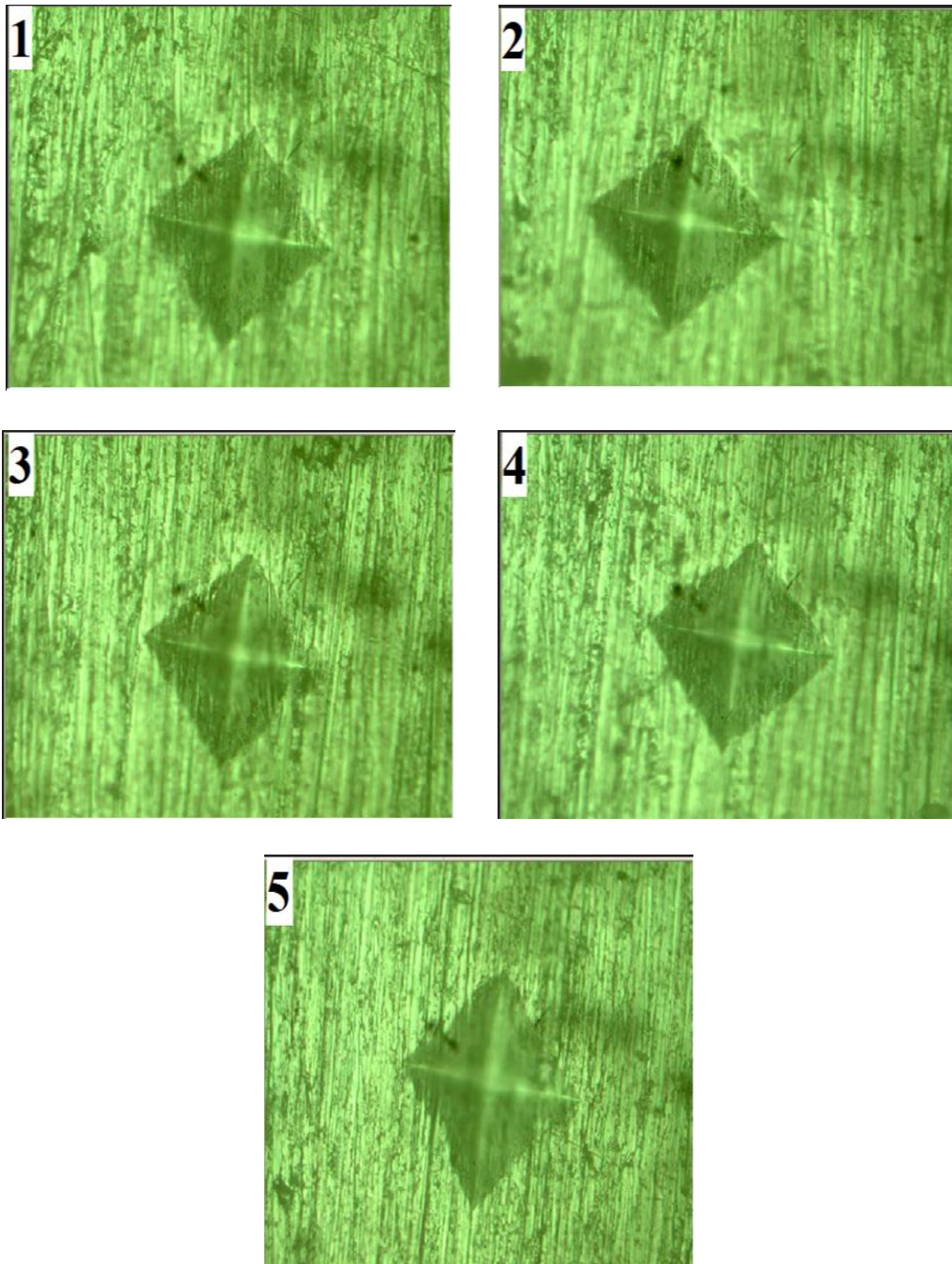
Gambar 3.2 Tahap Perataan dan Penghalusan Benda Uji.



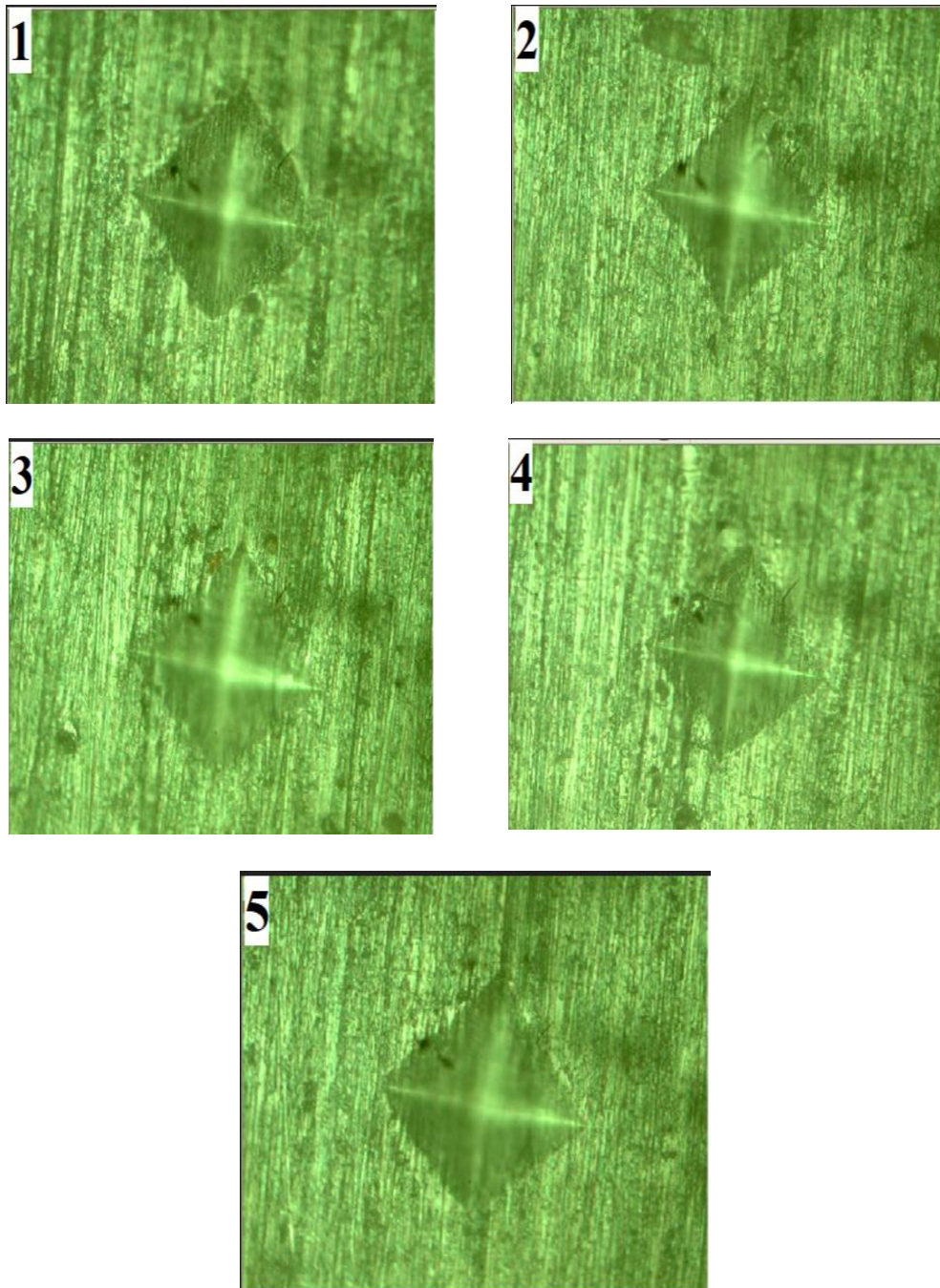
Gambar 3.3 Pemasangan Bahan Pada Alat Uji kekerasan.



Gambar 3.4 Proses Uji Kekerasan



Gambar 3.5 Hasil Jejak Indentor spesimen 1.



Gambar 3.6 Hasil Jejak Indentor spesimen 2.

Lampiran 4. Perhitungan Hasil Uji Kekerasan

+++++
F= 1.962N
01 D1: 73.00
D2: 75.13
HU: 67.7
MIN 67.7
MAX 67.7
A V 67.7

Daerah Logam Induk Kanan

+++++
F= 1.962N
01 D1: 70.63
D2: 73.00
HU: 72.0
MIN 72.0
MAX 72.0
A V 72.0

Daerah HAZ Kanan

+++++
F= 1.962N
01 D1: 72.50
D2: 72.13
HU: 71.0
MIN 71.0
MAX 71.0
A V 71.0

Daerah Inti

+++++
F= 1.962N
01 D1: 72.38
D2: 75.69
HU: 67.8
MIN 67.8
MAX 67.8
A V 67.8

Daerah HAZ Kiri

+++++
F= 1.962N
01 D1: 71.44
D2: 74.50
HU: 69.8
MIN 69.8
MAX 69.8
A V 69.8

Daerah Logam Induk

Gambar 4.1 Hasil Uji Kekerasan Spesimen 1

+++++		F= 1.962N	
01	D1:	76.69	
	D2:	76.69	
	HV:	63.1	
	MIN		63.1
	MAX		63.1
	A U		63.1

Daerah Logam Induk Kanan

+++++		F= 1.962N	
01	D1:	70.69	
	D2:	72.44	
	HV:	72.5	
	MIN		72.5
	MAX		72.5
	A U		72.5

Daerah HAZ Kanan

+++++		F= 1.962N	
01	D1:	75.50	
	D2:	75.25	
	HV:	65.3	
	MIN		65.3
	MAX		65.3
	A U		65.3

Daerah Inti

+++++		F= 1.962N	
01	D1:	75.13	
	D2:	77.00	
	HV:	64.2	
	MIN		64.2
	MAX		64.2
	A U		64.2

Daerah HAZ Kiri

+++++		F= 1.962N	
01	D1:	77.50	
	D2:	78.19	
	HV:	61.3	
	MIN		61.3
	MAX		61.3
	A U		61.3

Daerah Logam Induk

Gambar 4.2 Hasil Uji Kekerasan Spesimen 2