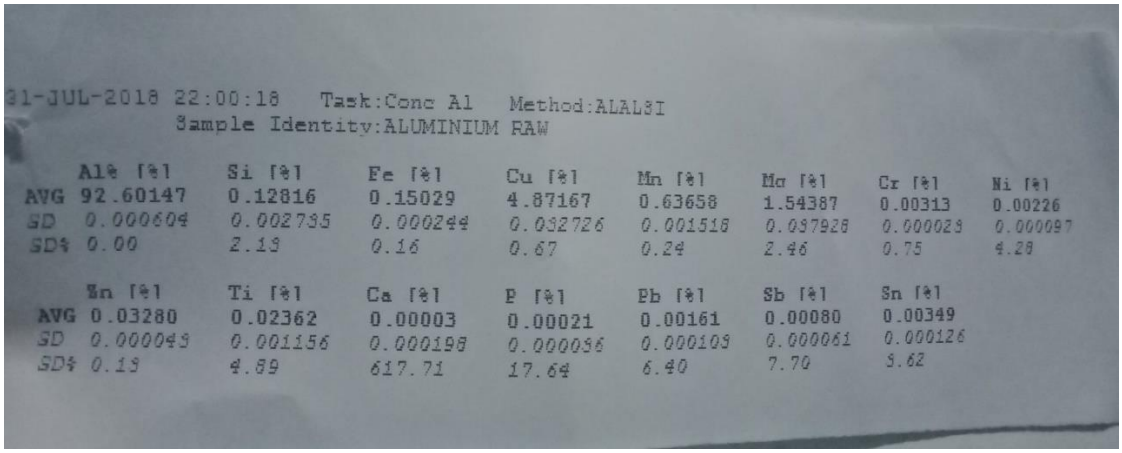
LAMPIRAN

Lampiran 1. Hasil uji komposisi kimia



31-JUL-2018 22:00:18 Task:Conc Al Method:ALAL3I
Sample Identity:ALUMINIUM RAW

	Al% [%]	Si [%]	Fe [%]	Cu [%]	Mn [%]	Mg [%]	Cr [%]	Ni [%]
AVG	92.60147	0.12816	0.15029	4.87167	0.63658	1.54387	0.00313	0.00226
SD	0.000604	0.002735	0.000244	0.032726	0.001518	0.037928	0.000023	0.000097
SD%	0.00	2.13	0.16	0.67	0.24	2.46	0.75	4.28

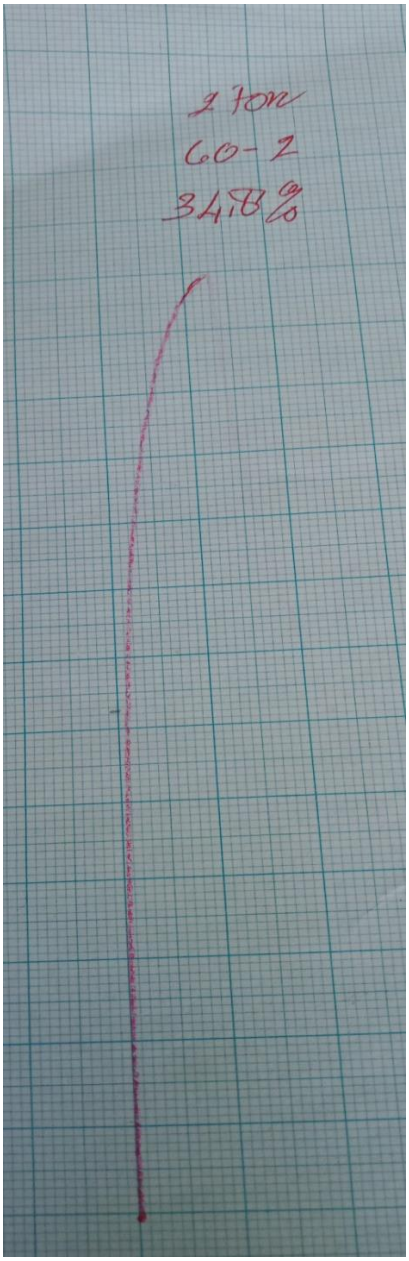
	Zn [%]	Ti [%]	Ca [%]	P [%]	Pb [%]	Sb [%]	Sn [%]
AVG	0.03280	0.02362	0.00003	0.00021	0.00161	0.00080	0.00349
SD	0.000043	0.001156	0.000198	0.000036	0.000103	0.000061	0.000126
SD%	0.13	4.89	617.71	17.64	6.40	7.70	3.62

No	Unsur	Keterangan	Nilai (%)
1	Si	Silikon	0,1281
2	Fe	Karbon	0,1502
3	Cu	Sulfur	4,8716
4	Mn	Mangan	0,6365
5	Mg	Magnesium	1,5438
6	Cr	Krominium	0,0031
7	Ni	Nikel	0,0022
9	Zn	Seng	0,0328
10	Ti	Titanium	0,0236
11	Ca	Calsium	0,0000
12	P	Wolfram	0,0002
13	Pb	Timbel	0,0016
14	Sb	Antimon	0,0008
15	Sn	Stannum	0,0034
16	Al	Alumnium	92,60

Pada Uji komposisi kimia ini dapat disimpulkan bahwa *aluminium* 2024 memiliki unsur paling dominan yaitu Cu sebesar 4,8716% dan Al sebesar 92,60%.

Lampiran 2. Perhitungan kekuatan tarik pada Aluminium dengan variasi arus 60,70 dan 80 A.

Spesimen 1



1. Perhitungan luas penampang

A_O= t x l

A_O= 3 mm x 12 mm

= 36 mm^2

2. Perhitungan *yield point*

$P_y = \frac{t_y}{100}$ x P

$P_y = \frac{34,8}{100}$ x 2.000 kg

= 696 kg x 9,8 m/s^2

=6820,8 $kg.m/s^2$

=6820,8 N

3. Perhitungan tegangan luluh

$$\sigma_y = \frac{p_y}{A_O}$$

$$\sigma_y = \frac{6820,8\ N}{36\ mm^2}$$

= 189,46 N/mm^2

= 189,46 Mpa

4. Perhitungan keuletan (Regangan)

$e = \frac{L_i - L_o}{L_o}$ x 100%

$e = \frac{51,3\ mm - 50\ mm}{50\ mm}$ x 100%

$= \frac{1,3\ mm}{50\ mm}$ x 100%

= 2,6 %

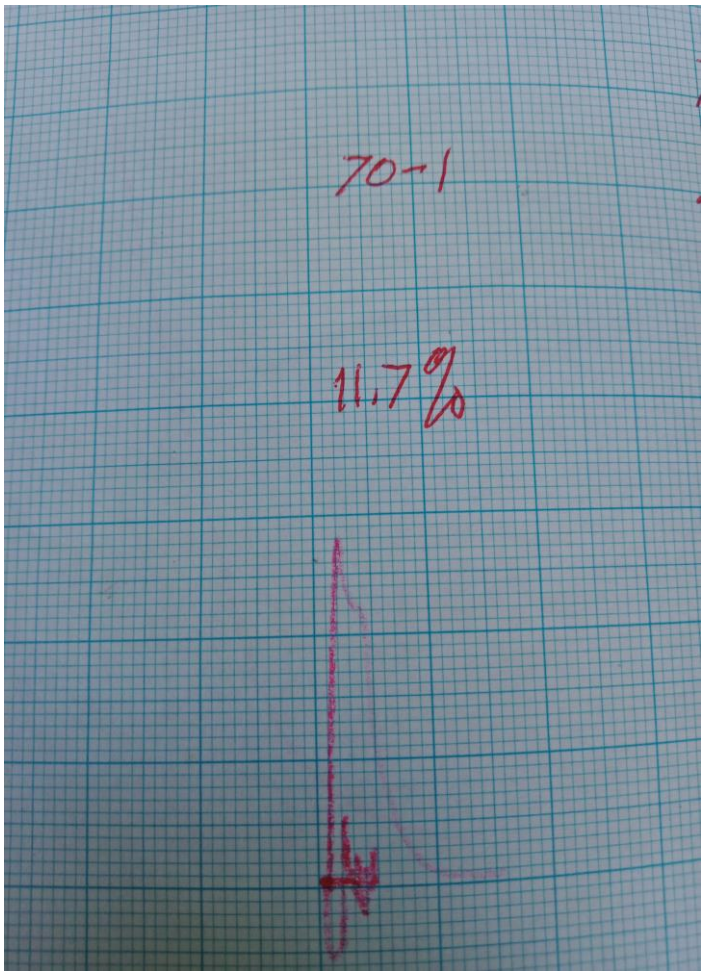
5. Perhitungan modulus elastisitas

$$E = \frac{\sigma_y}{e}$$

$$= \frac{189{,}46 \text{N/mm}^2}{2{,}6\%}$$

$$= 72{,}86 \text{ N/mm}^2$$

Spesimen 2



1. Perhitungan luas penampang

$$A_O = t \times l$$

$$A_O = 3\ mm \times 12\ mm$$

$$= 36\ mm^2$$

2. Perhitungan *yield point*

$$P_y = \frac{t_y}{100} \times P$$

$$P_y = \frac{11,7}{100} \times 2.000\ kg$$

$$= 234\ kg \times 9,8\ m/s^2$$

$$= 2293,2\ kg,m/s^2$$

$$= 2293,2\ N$$

3. Perhitungan tegangan luluh

$$\sigma_y = \frac{p_y}{A_O}$$

$$\sigma_y = \frac{2293,2\ N}{36 mm^2}$$

$$= 63,7\ N/mm^2$$

$$= 63,7\ Mpa$$

4. Perhitungan keuletan (Regangan)

$$e = \frac{L_i - L_o}{L_o} \times 100\%$$

$$e = \frac{50,5\ mm - 50\ mm}{50\ mm} \times 100\%$$

$$= \frac{65\ mm}{50\ mm} \times 100\%$$

= 1 %

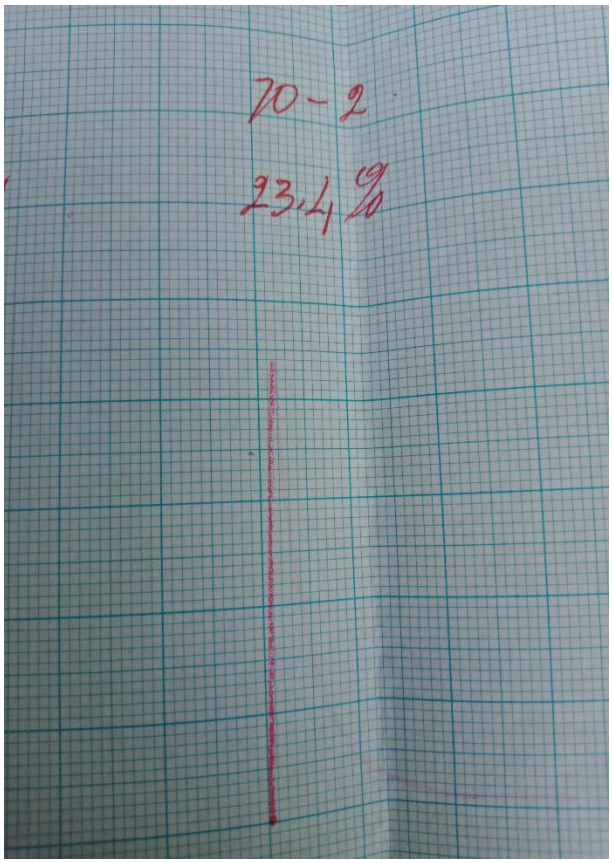
5. Perhitungan modulus elastisitas

$$E = \frac{\sigma_y}{e}$$

$$= \frac{63{,}7 \mathrm{N/mm^2}}{1\%}$$

$$= 63{,}7 \ \mathrm{N/mm^2}$$

Spesimen 3



1. Perhitungan luas penampang

A_O= t x l

A_O= 3 mm x 12 mm

$= 36\ mm^2$

2. Perhitungan *yield point*

$$P_y = \frac{t_y}{100} \text{ x } P$$

$$P_y = \frac{23,4}{100} \text{ x } 2.000\ kg$$

$$= 468\ kg \text{ x } 9,8\ m/s^2$$

$$= 4586,4\ kg.m/s^2$$

$$= 4586,4\ N$$

3. Perhitungan tegangan luluh

$$\sigma_y = \frac{p_y}{A_O}$$

$$\sigma_y = \frac{4586,4\ N}{36 mm^2}$$

$$= 127,4\ N/mm^2$$

$$= 127,4\ Mpa$$

4. Perhitungan keuletan (Regangan)

$$e = \frac{L_i - L_o}{L_o} \text{ x } 100\%$$

$$e = \frac{50,2\ mm - 50\ mm}{50\ mm} \text{ x } 100\%$$

$$= \frac{0,2\ mm}{50\ mm} \text{ x } 100\%$$

$$= 0,4\ \%$$

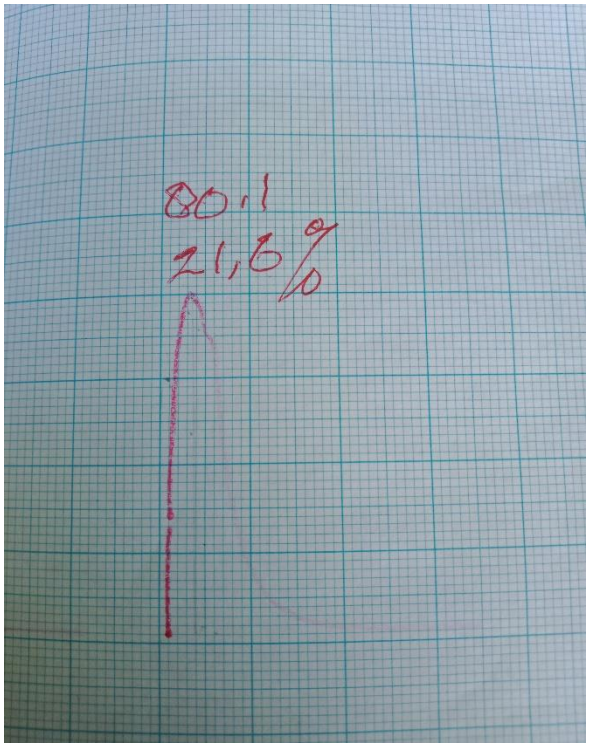
5. Perhitungan modulus elastisitas

$$E = \frac{\sigma_y}{e}$$

$$= \frac{127{,}4\ \mathrm{N/mm^2}}{0{,}4\%}$$

$$= 318{,}5\ \mathrm{N/mm^2}$$

Spesimen 4



1. Perhitungan luas penampang

$$A_O = t \times l$$

$$A_O = 3 \text{ mm} \times 12 \text{ mm}$$

$$= 36 \text{ mm}^2$$

2. Perhitungan *yield point*

$$P_y = \frac{t_y}{100} \times P$$

$$P_y = \frac{21,6}{100} \times 2.000 \text{ kg}$$

$$= 432 \text{ kg} \times 9,8 \text{ m/s}^2$$

$$= 4233,6 \text{ kg.m/s}^2$$

$$= 4233,6 \text{ N}$$

3. Perhitungan tegangan luluh

$$\sigma_y = \frac{p_y}{A_O}$$

$$\sigma_y = \frac{4233,6 \text{ N}}{36 \text{ mm}^2}$$

$$= 117,6 \text{ N/mm}^2$$

$$= 117,6 \text{ Mpa}$$

4. Perhitungan keuletan (Regangan)

$$e = \frac{L_i - L_o}{L_o} \times 100\%$$

$$e = \frac{50,6 \text{ mm} - 50 \text{ mm}}{50 \text{ mm}} \times 100\%$$

$$= \frac{0,6 \text{ mm}}{50 \text{ mm}} \times 100\%$$

= 1,2 %

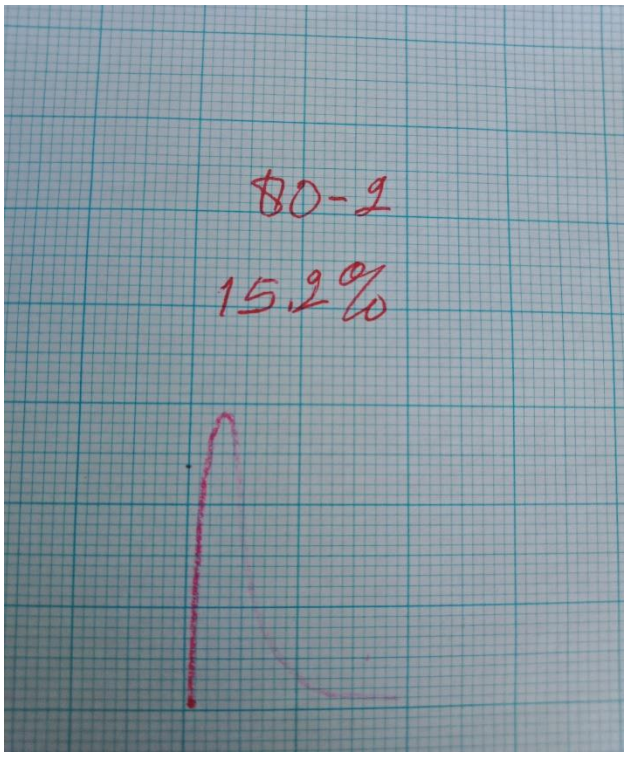
5. Perhitungan modulus elastisitas

$$E = \frac{\sigma_y}{e}$$

$$= \frac{117{,}6\ \mathrm{N/mm^2}}{1{,}2\%}$$

$$= 98\ \mathrm{N/mm^2}$$

Spesimen 5



1. Perhitungan luas penampang

A_O= t x l

A_O= 3 mm x 12 mm

= 36 mm^2

2. Perhitungan *yield point*

$P_y = \frac{t_y}{100}$ x P

$P_y = \frac{15,2}{100}$ x 2.000 kg

= 304 kg x 9,8 m/s^2

= 2979,2 $kg.m/s^2$

= 2979,2 N

3. Perhitungan tegangan luluh

$$\sigma_y = \frac{p_y}{A_O}$$

$$\sigma_y = \frac{2979,2\ N}{36\ mm^2}$$

= 82,75 N/mm^2

= 82,75 Mpa

4. Perhitungan keuletan (Regangan)

$e = \frac{L_i - L_o}{L_o}$ x 100%

$e = \frac{50,5\ mm - 50\ mm}{50\ mm}$ x 100%

$= \frac{0,5\ mm}{50\ mm}$ x 100%

$$= 1\ \%$$

5. Perhitungan modulus elastisitas

$$E = \frac{\sigma_y}{e}$$

$$= \frac{82{,}75\ \mathrm{N/mm^2}}{1\%}$$

$$= 82{,}75\ \mathrm{N/mm^2}$$