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## LAMPIRAN

### Lampiran 1 : Perhitungan Luas Permukaan dan Volume Sampel

Luas permukaan sampel dihitung dengan menggunakan rumus:

$$L = 2 (pl + pt + lt)$$

di mana:

$p$  = panjang kawat (cm)

$l$  = lebar kawat (cm)

$t$  = tinggi kawat (cm)

sehingga luas permukaan sampel didapatkan:

$$\begin{aligned} L &= 2 [(0,025'' \times 0,017'') + (0,025'' \times 6,5 \text{ cm}) + (0,017'' \times 6,5 \text{ cm})] \\ &= 2 [(0,0635 \text{ cm} \times 0,04318 \text{ cm}) + (0,0635 \text{ cm} \times 6,5 \text{ cm}) + (0,04318 \text{ cm} \times 6,5 \\ &\text{cm})] \\ &= 2 (0,00274193 \text{ cm}^2 + 0,41275 \text{ cm}^2 + 0,28067 \text{ cm}^2) \\ &= 2 \times 0,69616193 \text{ cm}^2 \\ &= 1,39232386 \text{ cm}^2 \end{aligned}$$

Volume sampel dihitung dengan menggunakan rumus:

$$V = p \times l \times t$$

di mana:

$p$  = panjang kawat (cm)

$l$  = lebar kawat (cm)

$t$  = tinggi kawat (cm)

sehingga volume sampel didapatkan:

$$V = 0,025'' \times 0,017'' \times 6,5 \text{ cm}$$

$$= 0,0635 \text{ cm} \times 0,04318 \text{ cm} \times 6,5 \text{ cm}$$

$$= 0,017822545 \text{ cm}^3$$

## Lampiran 2 : Data penelitian

**Tabel 1** Data pengukuran kelompok kontrol

| Replikasi | Luas Kawat<br>(cm <sup>2</sup> ) | Volume<br>Kawat (cm <sup>3</sup> ) | Berat<br>Ekuivalen<br>Material (g) | Spesi (g/cm <sup>3</sup> ) | <i>I<sub>corr</sub></i> |
|-----------|----------------------------------|------------------------------------|------------------------------------|----------------------------|-------------------------|
| 1         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0114206058            |
| 2         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0113358149            |
| 3         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0111979634            |
| 4         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0114024920            |
| 5         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0112893579            |
| 6         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0114253419            |
| 7         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0114021506            |
| 8         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0113358613            |
| 9         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0114205064            |
| 10        | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0112893712            |

**Tabel 2** Data pengukuran kelompok dengan konsentrasi ekstrak kulit semangka 200 ppm

| Replikasi | Luas Kawat<br>(cm <sup>2</sup> ) | Volume<br>Kawat (cm <sup>3</sup> ) | Berat<br>Ekuivalen<br>Material (g) | Spesi (g/cm <sup>3</sup> ) | <i>I<sub>corr</sub></i> |
|-----------|----------------------------------|------------------------------------|------------------------------------|----------------------------|-------------------------|
| 1         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0091319836            |
| 2         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0089766695            |
| 3         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0090327411            |

|    |            |             |        |             |              |
|----|------------|-------------|--------|-------------|--------------|
| 4  | 1.39232386 | 0.017822545 | 0.1355 | 7.602730138 | 0.0091329580 |
| 5  | 1.39232386 | 0.017822545 | 0.1355 | 7.602730138 | 0.0091234628 |
| 6  | 1.39232386 | 0.017822545 | 0.1355 | 7.602730138 | 0.0091327774 |
| 7  | 1.39232386 | 0.017822545 | 0.1355 | 7.602730138 | 0.0091234528 |
| 8  | 1.39232386 | 0.017822545 | 0.1355 | 7.602730138 | 0.0090327245 |
| 9  | 1.39232386 | 0.017822545 | 0.1355 | 7.602730138 | 0.0091320002 |
| 10 | 1.39232386 | 0.017822545 | 0.1355 | 7.602730138 | 0.0091329812 |

**Tabel 3** Data pengukuran kelompok dengan konsentrasi ekstrak kulit semangka 600 ppm

| Replikasi | Luas Kawat<br>(cm <sup>2</sup> ) | Volume<br>Kawat (cm <sup>3</sup> ) | Berat<br>Ekuivalen<br>Material (g) | Spesi (g/cm <sup>3</sup> ) | <i>I<sub>corr</sub></i> |
|-----------|----------------------------------|------------------------------------|------------------------------------|----------------------------|-------------------------|
| 1         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0072686052            |
| 2         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0074154035            |
| 3         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0074555353            |
| 4         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0074041998            |
| 5         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0074820789            |
| 6         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0074791491            |
| 7         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0074820971            |
| 8         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0074555187            |
| 9         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0072686069            |
| 10        | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0074041865            |



**Tabel 4** Data pengukuran kelompok dengan konsentrasi ekstrak kulit semangka 1000 ppm

| Replikasi | Luas Kawat<br>(cm <sup>2</sup> ) | Volume<br>Kawat (cm <sup>3</sup> ) | Berat<br>Ekuivalen<br>Material (g) | Spesi (g/cm <sup>3</sup> ) | <i>Icorr</i> |
|-----------|----------------------------------|------------------------------------|------------------------------------|----------------------------|--------------|
| 1         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0061251144 |
| 2         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0061149016 |
| 3         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0061097911 |
| 4         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0061269720 |
| 5         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0061043541 |
| 6         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0061062449 |
| 7         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0061043508 |
| 8         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0061097248 |
| 9         | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0061251078 |
| 10        | 1.39232386                       | 0.017822545                        | 0.1355                             | 7.602730138                | 0.0061269488 |

**Tabel 5** Hasil pelepasan kadar ion logam kawat ortodonti berbahan nikel titanium

| Replikasi | Kontrol                  | 200 ppm                  | 600 ppm                  | 1000 ppm                 |
|-----------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1         | $3.74608 \times 10^{-5}$ | $3.21582 \times 10^{-5}$ | $2.68409 \times 10^{-5}$ | $2.51915 \times 10^{-5}$ |
| 2         | $3.72643 \times 10^{-5}$ | $3.27983 \times 10^{-5}$ | $2.71810 \times 10^{-5}$ | $2.51678 \times 10^{-5}$ |
| 3         | $3.79449 \times 10^{-5}$ | $3.29282 \times 10^{-5}$ | $2.72740 \times 10^{-5}$ | $2.51560 \times 10^{-5}$ |
| 4         | $3.74188 \times 10^{-5}$ | $3.21604 \times 10^{-5}$ | $2.71550 \times 10^{-5}$ | $2.51958 \times 10^{-5}$ |
| 5         | $3.71567 \times 10^{-5}$ | $3.21384 \times 10^{-5}$ | $2.73355 \times 10^{-5}$ | $2.51434 \times 10^{-5}$ |
| 6         | $3.74717 \times 10^{-5}$ | $3.21600 \times 10^{-5}$ | $2.73287 \times 10^{-5}$ | $2.51477 \times 10^{-5}$ |

|    |                          |                          |                          |                          |
|----|--------------------------|--------------------------|--------------------------|--------------------------|
| 7  | $3.74180 \times 10^{-5}$ | $3.21384 \times 10^{-5}$ | $2.73355 \times 10^{-5}$ | $2.51434 \times 10^{-5}$ |
| 8  | $3.72644 \times 10^{-5}$ | $3.29282 \times 10^{-5}$ | $2.72739 \times 10^{-5}$ | $2.51558 \times 10^{-5}$ |
| 9  | $3.74605 \times 10^{-5}$ | $3.21582 \times 10^{-5}$ | $2.68409 \times 10^{-5}$ | $2.51915 \times 10^{-5}$ |
| 10 | $3.71567 \times 10^{-5}$ | $3.21605 \times 10^{-5}$ | $2.71550 \times 10^{-5}$ | $2.51957 \times 10^{-5}$ |

**Lampiran 3 : Hasil Olah Data (Hasil SPSS)**

**kelompok\_perlakuan**

**Case Processing Summary**

|       | kelompok_perlakuan | Cases |         |         |         |       |         |
|-------|--------------------|-------|---------|---------|---------|-------|---------|
|       |                    | Valid |         | Missing |         | Total |         |
|       |                    | N     | Percent | N       | Percent | N     | Percent |
| nilai | Kontrol            | 10    | 100,0%  | 0       | 0,0%    | 10    | 100,0%  |
|       | Kelompok_200ppm    | 10    | 100,0%  | 0       | 0,0%    | 10    | 100,0%  |
|       | Kelompok_600ppm    | 10    | 100,0%  | 0       | 0,0%    | 10    | 100,0%  |
|       | Kelompok_1000ppm   | 10    | 100,0%  | 0       | 0,0%    | 10    | 100,0%  |

**Descriptives**

|       | kelompok_perlakuan | Statistic                           | Std. Error            |
|-------|--------------------|-------------------------------------|-----------------------|
| nilai | Kontrol            | Mean                                | ,000026301675<br>100  |
|       |                    | 95% Confidence Interval<br>for Mean | Lower Bound<br>200    |
|       |                    |                                     | Upper Bound<br>100    |
|       |                    | 5% Trimmed Mean                     | ,000026312048<br>300  |
|       |                    | Median                              | ,000026341200<br>700  |
|       |                    | Variance                            | ,000                  |
|       |                    | Std. Deviation                      | ,000000176011<br>369  |
|       |                    | Minimum                             | ,000025944906<br>9000 |

|                                     |                                     |             |                       |                      |
|-------------------------------------|-------------------------------------|-------------|-----------------------|----------------------|
|                                     | Maximum                             |             | ,000026471727<br>0000 |                      |
|                                     | Range                               |             | ,000000526820<br>1360 |                      |
|                                     | Interquartile Range                 |             | ,000000303896<br>5950 |                      |
|                                     | Skewness                            |             | -,904                 | ,687                 |
|                                     | Kurtosis                            |             | ,112                  | 1,334                |
| Kelompok<br>k_200pp<br>m            | Mean                                |             | ,000021072891<br>800  | ,000000042598<br>511 |
|                                     | 95% Confidence Interval<br>for Mean | Lower Bound | ,000020976527<br>300  |                      |
|                                     |                                     | Upper Bound | ,000021169256<br>300  |                      |
|                                     | 5% Trimmed Mean                     |             | ,000021083279<br>300  |                      |
|                                     | Median                              |             | ,000021148303<br>500  |                      |
|                                     | Variance                            |             | ,000                  |                      |
|                                     | Std. Deviation                      |             | ,000000134708<br>318  |                      |
|                                     | Minimum                             |             | ,000020798322<br>5000 |                      |
|                                     | Maximum                             |             | ,000021160485<br>9000 |                      |
|                                     | Range                               |             | ,000000362163<br>4070 |                      |
|                                     | Interquartile Range                 |             | ,000000231891<br>4310 |                      |
|                                     | Skewness                            |             | -1,304                | ,687                 |
|                                     | Kurtosis                            |             | ,219                  | 1,334                |
|                                     | Kelompok<br>k_600pp<br>m            | Mean        |                       | ,000017172021<br>300 |
| 95% Confidence Interval<br>for Mean |                                     | Lower Bound | ,000017037395<br>900  |                      |
|                                     |                                     | Upper Bound | ,000017306646<br>600  |                      |

|                          |                                     |             |                       |                      |
|--------------------------|-------------------------------------|-------------|-----------------------|----------------------|
|                          | 5% Trimmed Mean                     |             | ,000017181337<br>100  |                      |
|                          | Median                              |             | ,000017227449<br>200  |                      |
|                          | Variance                            |             | ,000                  |                      |
|                          | Std. Deviation                      |             | ,000000188193<br>259  |                      |
|                          | Minimum                             |             | ,000016840855<br>7000 |                      |
|                          | Maximum                             |             | ,000017335501<br>6000 |                      |
|                          | Range                               |             | ,000000494645<br>9210 |                      |
|                          | Interquartile Range                 |             | ,000000253912<br>3390 |                      |
|                          | Skewness                            |             | -1,208                | ,687                 |
|                          | Kurtosis                            |             | ,237                  | 1,334                |
| Kelompo<br>k_1000p<br>pm | Mean                                |             | ,000014168845<br>500  | ,000000007110<br>706 |
|                          | 95% Confidence Interval<br>for Mean | Lower Bound | ,000014152759<br>900  |                      |
|                          |                                     | Upper Bound | ,000014184931<br>000  |                      |
|                          | 5% Trimmed Mean                     |             | ,000014168765<br>600  |                      |
|                          | Median                              |             | ,000014161883<br>900  |                      |
|                          | Variance                            |             | ,000                  |                      |
|                          | Std. Deviation                      |             | ,000000022486<br>026  |                      |
|                          | Minimum                             |             | ,000014143358<br>7000 |                      |
|                          | Maximum                             |             | ,000014195770<br>5000 |                      |
|                          | Range                               |             | ,000000052411<br>7194 |                      |

|                     |               |       |
|---------------------|---------------|-------|
| Interquartile Range | ,000000045877 |       |
|                     | 0519          |       |
| Skewness            | ,186          | ,687  |
| Kurtosis            | -2,062        | 1,334 |

### Tests of Normality

|       | kelompok_perlakuan | Kolmogorov-Smirnov <sup>a</sup> |    |      | Shapiro-Wilk |    |      |
|-------|--------------------|---------------------------------|----|------|--------------|----|------|
|       |                    | Statistic                       | df | Sig. | Statistic    | df | Sig. |
| nilai | Kontrol            | ,246                            | 10 | ,089 | ,870         | 10 | ,100 |
|       | Kelompok_200ppm    | ,387                            | 10 | ,000 | ,696         | 10 | ,001 |
|       | Kelompok_600ppm    | ,264                            | 10 | ,047 | ,791         | 10 | ,011 |
|       | Kelompok_1000ppm   | ,243                            | 10 | ,098 | ,832         | 10 | ,035 |

a. Lilliefors Significance Correction

### NPar Tests

#### Notes

|                |                      |          |
|----------------|----------------------|----------|
| Output Created | 05-JUL-2017 18:38:24 |          |
| Comments       |                      |          |
| Input          | Active Dataset       | DataSet3 |
|                | Filter               | <none>   |
|                | Weight               | <none>   |
|                | Split File           | <none>   |

|                        |                                      |   |
|------------------------|--------------------------------------|---|
|                        | N of Rows in Working Data File       | 40  |
| Missing Value Handling | Definition of Missing                | User-defined missing values are treated as missing.   |
|                        | Cases Used                           | Statistics for each test are based on all cases with valid data for the variable(s) used in that test.      |
| Syntax                 |                                      | NPAR TESTS<br>/K-W=nilai BY<br>kelompok_perlakuan(1 4)<br>/STATISTICS<br>DESCRIPTIVES<br>/MISSING ANALYSIS. |
| Resources              | Processor Time                       | 00:00:00,03   |
|                        | Elapsed Time                         | 00:00:00,15   |
|                        | Number of Cases Allowed <sup>a</sup> | 224694  |

a. Based on availability of workspace memory.

|                    | N  | Mean                 | Std. Deviation       | Minimum               | Maximum               |
|--------------------|----|----------------------|----------------------|-----------------------|-----------------------|
| nilai              | 40 | ,00001967885<br>8400 | ,00000460005<br>7120 | ,00001414335<br>87000 | ,000026471727<br>0000 |
| kelompok_perlakuan | 40 | 2,5000               | 1,13228              | 1,00                  | 4,00                  |

### Kruskal-Wallis Test

#### Ranks

|       | kelompok_perlakuan | N  | Mean Rank |
|-------|--------------------|----|-----------|
| nilai | Kontrol            | 10 | 35,50     |
|       | Kelompok_200ppm    | 10 | 25,50     |
|       | Kelompok_600ppm    | 10 | 15,50     |
|       | Kelompok_1000ppm   | 10 | 5,50      |
|       | Total              | 40 |           |

#### Test Statistics<sup>a,b</sup>

|             | nilai  |
|-------------|--------|
| Chi-Square  | 36,585 |
| df          | 3      |
| Asymp. Sig. | ,000   |

a. Kruskal Wallis Test

b. Grouping Variable:  
kelompok\_perlakuan

### Mann-Whitney Test

#### Ranks

|       | kelompok_perlakuan | N  | Mean Rank | Sum of Ranks |
|-------|--------------------|----|-----------|--------------|
| nilai | Kontrol            | 10 | 15,50     | 155,00       |
|       | Kelompok_200ppm    | 10 | 5,50      | 55,00        |
|       | Total              | 20 |           |              |



**Test Statistics<sup>a</sup>**

|                                | nilai             |
|--------------------------------|-------------------|
| Mann-Whitney U                 | ,000              |
| Wilcoxon W                     | 55,000            |
| Z                              | -3,780            |
| Asymp. Sig. (2-tailed)         | ,000              |
| Exact Sig. [2*(1-tailed Sig.)] | ,000 <sup>b</sup> |

- a. Grouping Variable:  
kelompok\_perlakuan
- b. Not corrected for ties.

**Mann-Whitney Test**

|       |                    | Ranks |           |              |
|-------|--------------------|-------|-----------|--------------|
|       | kelompok_perlakuan | N     | Mean Rank | Sum of Ranks |
| nilai | Kontrol            | 10    | 15,50     | 155,00       |
|       | Kelompok_600ppm    | 10    | 5,50      | 55,00        |
|       | Total              | 20    |           |              |

**Test Statistics<sup>a</sup>**

|                                | nilai             |
|--------------------------------|-------------------|
| Mann-Whitney U                 | ,000              |
| Wilcoxon W                     | 55,000            |
| Z                              | -3,780            |
| Asymp. Sig. (2-tailed)         | ,000              |
| Exact Sig. [2*(1-tailed Sig.)] | ,000 <sup>b</sup> |

- a. Grouping Variable:  
kelompok\_perlakuan
- b. Not corrected for ties.

### Mann-Whitney Test

|       |                    | Ranks |           |              |
|-------|--------------------|-------|-----------|--------------|
|       | kelompok_perlakuan | N     | Mean Rank | Sum of Ranks |
| nilai | Kontrol            | 10    | 15,50     | 155,00       |
|       | Kelompok_1000ppm   | 10    | 5,50      | 55,00        |
|       | Total              | 20    |           |              |

### Test Statistics<sup>a</sup>

|                                | nilai             |
|--------------------------------|-------------------|
| Mann-Whitney U                 | ,000              |
| Wilcoxon W                     | 55,000            |
| Z                              | -3,780            |
| Asymp. Sig. (2-tailed)         | ,000              |
| Exact Sig. [2*(1-tailed Sig.)] | ,000 <sup>b</sup> |

- a. Grouping Variable:  
kelompok\_perlakuan
- b. Not corrected for ties.

### Mann-Whitney Test

|       |                    | Ranks |           |              |
|-------|--------------------|-------|-----------|--------------|
|       | kelompok_perlakuan | N     | Mean Rank | Sum of Ranks |
| nilai | Kelompok_200ppm    | 10    | 15,50     | 155,00       |
|       | Kelompok_600ppm    | 10    | 5,50      | 55,00        |
|       | Total              | 20    |           |              |

**Test Statistics<sup>a</sup>**

|                                | nilai             |
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- a. Grouping Variable:  
kelompok\_perlakuan  
b. Not corrected for ties.

**Mann-Whitney Test**

|       |                    | Ranks |           |              |
|-------|--------------------|-------|-----------|--------------|
|       | kelompok_perlakuan | N     | Mean Rank | Sum of Ranks |
| nilai | Kelompok_200ppm    | 10    | 15,50     | 155,00       |
|       | Kelompok_1000ppm   | 10    | 5,50      | 55,00        |
|       | Total              | 20    |           |              |

**Test Statistics<sup>a</sup>**

|                                | nilai             |
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- a. Grouping Variable:  
kelompok\_perlakuan
- b. Not corrected for ties.

### Mann-Whitney Test

|       |                    | Ranks |           |              |
|-------|--------------------|-------|-----------|--------------|
|       | kelompok_perlakuan | N     | Mean Rank | Sum of Ranks |
| nilai | Kelompok_600ppm    | 10    | 15,50     | 155,00       |
|       | Kelompok_1000ppm   | 10    | 5,50      | 55,00        |
|       | Total              | 20    |           |              |

### Test Statistics<sup>a</sup>

|                                | nilai             |
|--------------------------------|-------------------|
| Mann-Whitney U                 | ,000              |
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| Z                              | -3,780            |
| Asymp. Sig. (2-tailed)         | ,000              |
| Exact Sig. [2*(1-tailed Sig.)] | ,000 <sup>b</sup> |

- a. Grouping Variable:  
kelompok\_perlakuan
- b. Not corrected for ties.