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## LAMPIRAN

Lampiran 1: Spesifikasi unit terkait *hydrocyclone*.

| No | Gambar                                                                                                                                                                     | Keterangan                                                                                                                                                                                                                                       |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  |  <p style="text-align: center;">Gambar 1. LTDS line 1 dan 2</p>                           | <ul style="list-style-type: none"> <li>- LTDS 1 dan 2 pada line 1 dan 2:</li> <li>- Merk : NOVENCO FAN</li> <li>- Fan Type : CBS 630/70/R</li> <li>- Fan RPM : 2400</li> <li>- Rotation : LG 90</li> <li>- Motor : 30 HP</li> </ul>              |
| 2  |  <p style="text-align: center;">Gambar 2. Unit hydrocyclone</p>                          | <ul style="list-style-type: none"> <li>- Washer drum shell keluaran hydrocyclone line 1: 5,8 rpm.</li> <li>- Washer drum shell keluaran hydrocyclone line 2: 15,75 rpm.</li> <li>- Tekanan pompa shell keluaran hydrocyclone 1,8 bar.</li> </ul> |
| 3  |  <p style="text-align: center;">Gambar 3. Bahan sampel penelitian</p>                   | <ul style="list-style-type: none"> <li>- Sampel feed hydrocyclone.</li> <li>- Sampel kernel keluaran hydrocyclone.</li> <li>- Sampel shell keluaran hydrocyclone.</li> </ul>                                                                     |
| 4  |  <p style="text-align: center;">Gambar 4. Proses pemisahan sampel feed hydrocyclone</p> | <p>Proses pemisahan sampel feed hydrocyclone menjadi fraksi nut utuh, nut pecah, kernel utuh, kernel pecah, dan cangkang.</p>                                                                                                                    |

|   |                                                                                                                                                                                     |                                                                                                                                                                       |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 |  <p data-bbox="411 562 863 636">Gambar 5. Sampel kernel keluaran hydrocyclone</p>                  | <p data-bbox="919 230 1348 376">Proses pemisahan sampel kernel keluaran hydrocyclone menjadi fraksi nut utuh, nut pecah, kernel utuh, kernel pecah, dan cangkang.</p> |
| 6 |  <p data-bbox="400 987 877 1061">Gambar 6. Proses pemisahan sampel shell keluaran hydrocyclone</p> | <p data-bbox="919 660 1348 806">Proses pemisahan sampel shell keluaran hydrocyclone menjadi fraksi nut utuh, nut pecah, kernel utuh, kernel pecah, dan cangkang.</p>  |

Lampiran 2: Tabel data mentah feed hydrocyclone sebelum setting damper.

| No                | <i>Feed Hydrocyclone</i> |                      |                       |                      |                       |                      |                       |                      |
|-------------------|--------------------------|----------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|----------------------|
|                   | <i>Nut Utuh</i>          |                      |                       |                      | <i>Nut Pecah</i>      |                      |                       |                      |
|                   | Line 1                   |                      | Line 2                |                      | Line 1                |                      | Line 2                |                      |
|                   | <i>Kernel</i><br>(gr)    | <i>Shell</i><br>(gr) | <i>Kernel</i><br>(gr) | <i>Shell</i><br>(gr) | <i>Kernel</i><br>(gr) | <i>Shell</i><br>(gr) | <i>Kernel</i><br>(gr) | <i>Shell</i><br>(gr) |
| 1                 | 5.00                     | 16.00                | 0.00                  | 1.00                 | 11.00                 | 14.00                | 9.00                  | 10.00                |
| 2                 | 5.00                     | 7.00                 | 3.00                  | 7.00                 | 8.00                  | 7.00                 | 12.00                 | 8.00                 |
| 3                 | 10.00                    | 9.00                 | 1.00                  | 4.00                 | 18.00                 | 4.00                 | 4.00                  | 8.00                 |
| 4                 | 3.00                     | 7.00                 | 0.00                  | 2.00                 | 21.00                 | 19.00                | 4.00                  | 6.00                 |
| 5                 | 0.00                     | 2.00                 | 0.00                  | 0.00                 | 12.00                 | 8.00                 | 10.00                 | 7.00                 |
| 6                 | 2.00                     | 6.00                 | 4.00                  | 11.00                | 17.00                 | 5.00                 | 9.00                  | 13.00                |
| 7                 | 2.00                     | 9.00                 | 1.00                  | 3.00                 | 10.00                 | 9.00                 | 1.00                  | 7.00                 |
| 8                 | 1.80                     | 0.20                 | 2.00                  | 6.00                 | 11.00                 | 8.00                 | 10.00                 | 5.00                 |
| 9                 | 3.00                     | 15.00                | 0.00                  | 1.00                 | 19.00                 | 10.00                | 3.00                  | 5.00                 |
| 10                | 7.00                     | 5.00                 | 0.00                  | 0.00                 | 19.00                 | 10.00                | 4.00                  | 3.00                 |
| 11                | 2.00                     | 8.00                 | 3.00                  | 1.00                 | 20.00                 | 13.00                | 5.00                  | 1.00                 |
| 12                | 1.00                     | 10.00                | 7.00                  | 4.00                 | 9.00                  | 9.00                 | 9.00                  | 3.00                 |
| 13                | 13.00                    | 28.00                | 0.00                  | 0.00                 | 22.00                 | 17.00                | 13.00                 | 5.00                 |
| 14                | 4.00                     | 10.00                | 1.00                  | 5.00                 | 21.00                 | 8.00                 | 5.00                  | 2.00                 |
| 15                | 1.00                     | 9.00                 | 4.00                  | 1.00                 | 10.00                 | 5.00                 | 8.00                  | 3.00                 |
| 16                | 3.00                     | 16.00                | 0.00                  | 4.00                 | 12.00                 | 9.00                 | 4.00                  | 3.00                 |
| 17                | 9.00                     | 20.00                | 3.00                  | 2.00                 | 15.00                 | 13.00                | 7.00                  | 2.00                 |
| 18                | 1.00                     | 4.00                 | 5.00                  | 4.00                 | 15.00                 | 16.00                | 5.00                  | 3.00                 |
| 19                | 1.00                     | 6.00                 | 4.00                  | 3.00                 | 15.00                 | 4.00                 | 2.00                  | 1.00                 |
| 20                | 1.00                     | 8.00                 | 2.00                  | 1.00                 | 22.00                 | 13.00                | 6.00                  | 3.00                 |
| Rat<br>a-<br>rata | 3.74                     | 9.76                 | 2.00                  | 3.00                 | 15.35                 | 10.05                | 6.50                  | 4.90                 |

| No        | <i>Feed Hydrocyclone</i> |        |                          |        |                   |        |
|-----------|--------------------------|--------|--------------------------|--------|-------------------|--------|
|           | <i>Kernel Utuh (gr)</i>  |        | <i>Kernel Pecah (gr)</i> |        | <i>Shell (gr)</i> |        |
|           | Line 1                   | Line 2 | Line 1                   | Line 2 | Line 1            | Line 2 |
| 1         | 449.00                   | 185.00 | 165.00                   | 75.00  | 340.00            | 720.00 |
| 2         | 694.00                   | 185.00 | 119.00                   | 100.00 | 160.00            | 685.00 |
| 3         | 630.00                   | 208.00 | 160.00                   | 122.00 | 169.00            | 653.00 |
| 4         | 535.00                   | 160.00 | 130.00                   | 113.00 | 285.00            | 715.00 |
| 5         | 506.00                   | 162.00 | 172.00                   | 138.00 | 300.00            | 683.00 |
| 6         | 577.00                   | 190.00 | 155.00                   | 120.00 | 238.00            | 653.00 |
| 7         | 580.00                   | 168.00 | 163.00                   | 110.00 | 227.00            | 710.00 |
| 8         | 625.00                   | 164.00 | 169.00                   | 110.00 | 185.00            | 703.00 |
| 9         | 457.00                   | 171.00 | 161.00                   | 120.00 | 335.00            | 700.00 |
| 10        | 644.00                   | 205.00 | 130.00                   | 160.00 | 185.00            | 628.00 |
| 11        | 506.00                   | 176.00 | 172.00                   | 165.00 | 279.00            | 649.00 |
| 12        | 469.00                   | 154.00 | 122.00                   | 179.00 | 380.00            | 644.00 |
| 13        | 684.00                   | 187.00 | 135.00                   | 155.00 | 101.00            | 640.00 |
| 14        | 490.00                   | 166.00 | 149.00                   | 191.00 | 318.00            | 630.00 |
| 15        | 494.00                   | 178.00 | 162.00                   | 176.00 | 319.00            | 630.00 |
| 16        | 392.00                   | 188.00 | 169.00                   | 190.00 | 399.00            | 611.00 |
| 17        | 493.00                   | 177.00 | 150.00                   | 176.00 | 300.00            | 633.00 |
| 18        | 570.00                   | 198.00 | 79.00                    | 165.00 | 315.00            | 620.00 |
| 19        | 520.00                   | 169.00 | 85.00                    | 188.00 | 369.00            | 633.00 |
| 20        | 565.00                   | 180.00 | 121.00                   | 176.00 | 270.00            | 632.00 |
| Rata-rata | 544.00                   | 178.55 | 143.40                   | 146.45 | 273.70            | 658.60 |

Lampiran 3: Tabel data mentah shell keluaran hydrocyclone sebelum setting damper.

| No                | <i>Shell Keluaran Hydrocyclone</i> |                   |                    |                   |                    |                   |                    |                   |
|-------------------|------------------------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|
|                   | <i>Nut Utuh</i>                    |                   |                    |                   | <i>Nut Pecah</i>   |                   |                    |                   |
|                   | Line 1                             |                   | Line 2             |                   | Line 1             |                   | Line 2             |                   |
|                   | <i>Kernel (gr)</i>                 | <i>Shell (gr)</i> | <i>Kernel (gr)</i> | <i>Shell (gr)</i> | <i>Kernel (gr)</i> | <i>Shell (gr)</i> | <i>Kernel (gr)</i> | <i>Shell (gr)</i> |
| 1                 | 1.00                               | 9.00              | 3.00               | 5.00              | 2.00               | 9.00              | 5.00               | 6.00              |
| 2                 | 0.30                               | 18.70             | 0.00               | 3.00              | 0.30               | 0.70              | 5.00               | 8.00              |
| 3                 | 2.00                               | 3.00              | 2.00               | 6.00              | 3.00               | 3.00              | 4.00               | 11.00             |
| 4                 | 5.00                               | 10.00             | 4.00               | 6.00              | 5.00               | 3.00              | 12.00              | 26.00             |
| 5                 | 0.00                               | 3.00              | 3.00               | 5.00              | 10.00              | 8.00              | 6.00               | 12.00             |
| 6                 | 3.00                               | 5.00              | 1.00               | 9.00              | 4.00               | 8.00              | 13.00              | 15.00             |
| 7                 | 2.00                               | 5.00              | 2.00               | 4.00              | 3.00               | 5.00              | 5.00               | 9.00              |
| 8                 | 3.00                               | 9.00              | 1.00               | 4.00              | 8.00               | 9.00              | 3.00               | 7.00              |
| 9                 | 3.00                               | 13.00             | 1.00               | 4.00              | 3.00               | 5.00              | 4.00               | 15.00             |
| 10                | 3.00                               | 12.00             | 4.00               | 11.00             | 5.00               | 10.00             | 1.00               | 4.00              |
| 11                | 2.00                               | 15.00             | 4.00               | 6.00              | 1.00               | 8.00              | 3.00               | 2.00              |
| 12                | 2.00                               | 8.00              | 3.00               | 5.00              | 2.00               | 6.00              | 3.00               | 2.00              |
| 13                | 6.00                               | 15.00             | 3.00               | 2.00              | 9.00               | 13.00             | 6.00               | 3.00              |
| 14                | 1.00                               | 8.00              | 5.00               | 7.00              | 5.00               | 10.00             | 2.00               | 4.00              |
| 15                | 1.00                               | 8.00              | 4.00               | 8.00              | 5.00               | 6.00              | 3.00               | 7.00              |
| 16                | 3.00                               | 15.00             | 0.00               | 3.00              | 5.00               | 7.00              | 7.00               | 4.00              |
| 17                | 8.00                               | 23.00             | 1.00               | 5.00              | 3.00               | 8.00              | 5.00               | 3.00              |
| 18                | 2.00                               | 17.00             | 1.00               | 2.00              | 4.00               | 11.00             | 2.00               | 3.00              |
| 19                | 1.00                               | 4.00              | 2.00               | 4.00              | 3.00               | 6.00              | 5.00               | 7.00              |
| 20                | 1.00                               | 15.00             | 3.00               | 7.00              | 6.00               | 13.00             | 4.00               | 5.00              |
| Rat<br>a-<br>rata | 2.47                               | 10.79             | 2.35               | 5.30              | 4.32               | 7.44              | 4.90               | 7.65              |

| No        | <i>Shell Keluaran Hydrocyclone</i> |        |                          |        |                   |        |
|-----------|------------------------------------|--------|--------------------------|--------|-------------------|--------|
|           | <i>Kernel Utuh (gr)</i>            |        | <i>Kernel Pecah (gr)</i> |        | <i>Shell (gr)</i> |        |
|           | Line 1                             | Line 2 | Line 1                   | Line 2 | Line 1            | Line 2 |
| 1         | 10.00                              | 10.00  | 15.00                    | 20.00  | 954.00            | 951.00 |
| 2         | 4.00                               | 8.00   | 11.00                    | 21.00  | 965.00            | 955.00 |
| 3         | 11.00                              | 9.00   | 13.00                    | 19.00  | 965.00            | 949.00 |
| 4         | 20.00                              | 8.00   | 20.00                    | 48.00  | 937.00            | 896.00 |
| 5         | 20.00                              | 5.00   | 15.00                    | 42.00  | 944.00            | 927.00 |
| 6         | 11.00                              | 12.00  | 16.00                    | 25.00  | 953.00            | 925.00 |
| 7         | 12.00                              | 8.00   | 11.00                    | 18.00  | 962.00            | 954.00 |
| 8         | 13.00                              | 4.00   | 15.00                    | 20.00  | 943.00            | 961.00 |
| 9         | 12.00                              | 5.00   | 11.00                    | 80.00  | 953.00            | 891.00 |
| 10        | 11.00                              | 8.00   | 17.00                    | 15.00  | 942.00            | 957.00 |
| 11        | 19.00                              | 12.00  | 32.00                    | 23.00  | 923.00            | 950.00 |
| 12        | 12.00                              | 11.00  | 19.00                    | 27.00  | 951.00            | 949.00 |
| 13        | 15.00                              | 7.00   | 14.00                    | 35.00  | 928.00            | 944.00 |
| 14        | 17.00                              | 9.00   | 18.00                    | 18.00  | 941.00            | 955.00 |
| 15        | 13.00                              | 4.00   | 11.00                    | 26.00  | 956.00            | 948.00 |
| 16        | 23.00                              | 10.00  | 13.00                    | 17.00  | 934.00            | 959.00 |
| 17        | 21.00                              | 7.00   | 16.00                    | 14.00  | 921.00            | 965.00 |
| 18        | 25.00                              | 9.00   | 20.00                    | 23.00  | 921.00            | 960.00 |
| 19        | 28.00                              | 6.00   | 21.00                    | 21.00  | 937.00            | 955.00 |
| 20        | 22.00                              | 8.00   | 21.00                    | 25.00  | 922.00            | 948.00 |
| Rata-rata | 15.95                              | 8.00   | 16.45                    | 26.85  | 942.60            | 944.95 |

Lampiran 4: Tabel data mentah feed hydrocyclone sesudah setting damper.

| No                | <i>Feed Hydrocyclone</i> |                      |                       |                      |                       |                      |                       |                      |
|-------------------|--------------------------|----------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|----------------------|
|                   | <i>Nut Utuh</i>          |                      |                       |                      | <i>Nut Pecah</i>      |                      |                       |                      |
|                   | Line 1                   |                      | Line 2                |                      | Line 1                |                      | Line 2                |                      |
|                   | <i>Kernel</i><br>(gr)    | <i>Shell</i><br>(gr) | <i>Kernel</i><br>(gr) | <i>Shell</i><br>(gr) | <i>Kernel</i><br>(gr) | <i>Shell</i><br>(gr) | <i>Kernel</i><br>(gr) | <i>Shell</i><br>(gr) |
| 1                 | 7.00                     | 4.00                 | 3.00                  | 1.00                 | 13.00                 | 5.00                 | 5.00                  | 3.00                 |
| 2                 | 11.00                    | 5.00                 | 0.00                  | 1.00                 | 20.00                 | 4.00                 | 3.00                  | 1.00                 |
| 3                 | 6.00                     | 3.00                 | 0.00                  | 0.00                 | 18.00                 | 6.00                 | 5.00                  | 1.00                 |
| 4                 | 3.00                     | 0.00                 | 1.00                  | 0.00                 | 16.00                 | 8.00                 | 5.00                  | 4.00                 |
| 5                 | 6.00                     | 2.00                 | 5.00                  | 0.00                 | 11.00                 | 2.00                 | 2.00                  | 2.00                 |
| 6                 | 3.00                     | 5.00                 | 1.00                  | 0.00                 | 19.00                 | 5.00                 | 2.00                  | 2.00                 |
| 7                 | 5.00                     | 3.00                 | 0.00                  | 2.00                 | 23.00                 | 4.00                 | 1.00                  | 1.00                 |
| 8                 | 3.00                     | 0.00                 | 0.00                  | 1.00                 | 15.00                 | 2.00                 | 4.00                  | 1.00                 |
| 9                 | 4.00                     | 2.00                 | 4.00                  | 0.00                 | 17.00                 | 4.00                 | 3.00                  | 1.00                 |
| 10                | 3.00                     | 1.00                 | 1.00                  | 0.00                 | 10.00                 | 2.00                 | 3.00                  | 3.00                 |
| 11                | 6.00                     | 5.00                 | 2.00                  | 1.00                 | 11.00                 | 8.00                 | 9.00                  | 6.00                 |
| 12                | 16.00                    | 12.00                | 0.00                  | 0.00                 | 19.00                 | 7.00                 | 2.00                  | 2.00                 |
| 13                | 7.00                     | 2.00                 | 0.00                  | 0.00                 | 15.00                 | 9.00                 | 2.00                  | 1.00                 |
| 14                | 2.00                     | 1.00                 | 0.00                  | 0.00                 | 17.00                 | 4.00                 | 2.50                  | 0.50                 |
| 15                | 6.00                     | 4.00                 | 3.00                  | 1.00                 | 12.00                 | 6.00                 | 5.00                  | 1.00                 |
| 16                | 3.00                     | 6.00                 | 8.00                  | 3.00                 | 25.00                 | 7.00                 | 9.00                  | 2.00                 |
| 17                | 12.00                    | 5.00                 | 4.00                  | 1.00                 | 21.00                 | 7.00                 | 2.00                  | 1.00                 |
| 18                | 3.00                     | 1.00                 | 2.00                  | 1.00                 | 13.00                 | 5.00                 | 3.00                  | 1.00                 |
| 19                | 3.00                     | 2.00                 | 0.00                  | 0.00                 | 6.00                  | 3.00                 | 2.00                  | 1.00                 |
| 20                | 2.00                     | 1.00                 | 2.00                  | 1.00                 | 18.00                 | 7.00                 | 2.00                  | 1.00                 |
| Rat<br>a-<br>rata | 5.55                     | 3.20                 | 1.80                  | 0.65                 | 15.95                 | 5.25                 | 3.58                  | 1.78                 |

| No        | <i>Feed Hydrocyclone</i> |        |                          |        |                   |        |
|-----------|--------------------------|--------|--------------------------|--------|-------------------|--------|
|           | <i>Kernel Utuh (gr)</i>  |        | <i>Kernel Pecah (gr)</i> |        | <i>Shell (gr)</i> |        |
|           | Line 1                   | Line 2 | Line 1                   | Line 2 | Line 1            | Line 2 |
| 1         | 163.00                   | 100.00 | 270.00                   | 90.00  | 538.00            | 798.00 |
| 2         | 103.00                   | 178.00 | 289.00                   | 75.00  | 568.00            | 742.00 |
| 3         | 155.00                   | 167.00 | 267.00                   | 43.00  | 545.00            | 784.00 |
| 4         | 135.00                   | 156.00 | 310.00                   | 137.00 | 528.00            | 697.00 |
| 5         | 134.00                   | 189.00 | 311.00                   | 80.00  | 534.00            | 722.00 |
| 6         | 178.00                   | 179.00 | 265.00                   | 110.00 | 525.00            | 706.00 |
| 7         | 180.00                   | 210.00 | 248.00                   | 39.00  | 537.00            | 747.00 |
| 8         | 168.00                   | 203.00 | 290.00                   | 145.00 | 522.00            | 646.00 |
| 9         | 165.00                   | 318.00 | 230.00                   | 128.00 | 578.00            | 546.00 |
| 10        | 145.00                   | 226.00 | 255.00                   | 154.00 | 584.00            | 613.00 |
| 11        | 178.00                   | 180.00 | 231.00                   | 80.00  | 561.00            | 722.00 |
| 12        | 167.00                   | 89.00  | 277.00                   | 179.00 | 502.00            | 728.00 |
| 13        | 110.00                   | 92.00  | 291.00                   | 213.00 | 566.00            | 692.00 |
| 14        | 118.00                   | 165.00 | 311.00                   | 150.00 | 547.00            | 682.00 |
| 15        | 109.00                   | 178.00 | 321.00                   | 128.00 | 542.00            | 684.00 |
| 16        | 189.00                   | 356.00 | 301.00                   | 49.00  | 469.00            | 573.00 |
| 17        | 191.00                   | 216.00 | 299.00                   | 133.00 | 465.00            | 643.00 |
| 18        | 171.00                   | 159.00 | 273.00                   | 119.00 | 534.00            | 715.00 |
| 19        | 169.00                   | 185.00 | 245.00                   | 136.00 | 572.00            | 676.00 |
| 20        | 177.00                   | 159.00 | 281.00                   | 166.00 | 514.00            | 669.00 |
| Rata-rata | 155.25                   | 185.25 | 278.25                   | 117.70 | 536.55            | 689.25 |

Lampiran 5: Tabel data mentah shell keluaran hydrocyclone sesudah setting damper.

| No         | <i>Shell Keluaran Hydrocyclone</i> |                   |                    |                   |                    |                   |                    |                   |
|------------|------------------------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|
|            | <i>Nut Utuh</i>                    |                   |                    |                   | <i>Nut Pecah</i>   |                   |                    |                   |
|            | Line 1                             |                   | Line 2             |                   | Line 1             |                   | Line 2             |                   |
|            | <i>Kernel (gr)</i>                 | <i>Shell (gr)</i> | <i>Kernel (gr)</i> | <i>Shell (gr)</i> | <i>Kernel (gr)</i> | <i>Shell (gr)</i> | <i>Kernel (gr)</i> | <i>Shell (gr)</i> |
| 1          | 5.00                               | 4.00              | 1.00               | 1.00              | 7.00               | 5.00              | 2.00               | 1.00              |
| 2          | 7.00                               | 6.00              | 0.00               | 0.00              | 9.00               | 6.00              | 4.00               | 1.00              |
| 3          | 3.00                               | 3.00              | 2.00               | 2.00              | 2.00               | 5.00              | 2.00               | 2.00              |
| 4          | 6.00                               | 4.00              | 1.00               | 3.00              | 2.00               | 2.00              | 6.00               | 3.00              |
| 5          | 3.00                               | 2.00              | 0.00               | 1.00              | 3.00               | 2.00              | 3.00               | 2.00              |
| 6          | 2.00                               | 1.00              | 0.00               | 0.00              | 3.00               | 4.00              | 3.00               | 2.00              |
| 7          | 4.00                               | 2.00              | 1.00               | 1.00              | 4.00               | 4.00              | 5.00               | 3.00              |
| 8          | 4.00                               | 4.00              | 2.00               | 2.00              | 5.00               | 3.00              | 5.00               | 3.00              |
| 9          | 2.00                               | 2.00              | 1.00               | 2.00              | 4.00               | 6.00              | 4.00               | 3.00              |
| 10         | 3.00                               | 1.00              | 1.00               | 1.00              | 4.00               | 4.00              | 3.00               | 2.00              |
| 11         | 7.00                               | 4.00              | 1.00               | 1.00              | 8.00               | 6.00              | 2.00               | 1.00              |
| 12         | 9.00                               | 14.00             | 0.60               | 0.40              | 9.00               | 6.00              | 5.00               | 2.00              |
| 13         | 4.00                               | 7.00              | 2.00               | 1.00              | 3.00               | 4.00              | 2.00               | 1.00              |
| 14         | 6.00                               | 5.00              | 3.00               | 2.00              | 3.00               | 2.00              | 7.00               | 4.00              |
| 15         | 8.00                               | 4.00              | 3.00               | 1.00              | 3.00               | 4.00              | 3.00               | 1.00              |
| 16         | 6.00                               | 5.00              | 0.00               | 0.00              | 8.00               | 8.00              | 0.00               | 0.00              |
| 17         | 6.00                               | 5.00              | 6.00               | 3.00              | 6.00               | 8.00              | 13.00              | 5.00              |
| 18         | 3.00                               | 1.00              | 5.00               | 2.00              | 5.00               | 2.00              | 5.00               | 3.00              |
| 19         | 2.00                               | 1.00              | 1.00               | 1.00              | 3.00               | 2.00              | 2.00               | 1.00              |
| 20         | 3.00                               | 2.00              | 0.00               | 0.00              | 8.00               | 6.00              | 3.00               | 2.00              |
| Rat a-rata | 4.65                               | 3.85              | 1.53               | 1.22              | 4.95               | 4.45              | 3.95               | 2.10              |

| No        | <i>Shell Keluaran Hydrocyclone</i> |        |                   |        |            |        |
|-----------|------------------------------------|--------|-------------------|--------|------------|--------|
|           | Kernel Utuh (gr)                   |        | Kernel Pecah (gr) |        | Shell (gr) |        |
|           | Line 1                             | Line 2 | Line 1            | Line 2 | Line 1     | Line 2 |
| 1         | 7.00                               | 2.00   | 17.00             | 55.00  | 955.00     | 938.00 |
| 2         | 7.00                               | 8.00   | 16.00             | 17.00  | 949.00     | 970.00 |
| 3         | 6.00                               | 2.00   | 13.00             | 16.00  | 968.00     | 974.00 |
| 4         | 4.00                               | 3.00   | 14.00             | 14.00  | 968.00     | 970.00 |
| 5         | 8.00                               | 2.00   | 15.00             | 28.00  | 967.00     | 964.00 |
| 6         | 9.00                               | 7.00   | 14.00             | 15.00  | 967.00     | 973.00 |
| 7         | 4.00                               | 6.00   | 16.00             | 22.00  | 966.00     | 962.00 |
| 8         | 4.00                               | 4.00   | 17.00             | 23.00  | 963.00     | 961.00 |
| 9         | 9.00                               | 3.00   | 15.00             | 28.00  | 962.00     | 959.00 |
| 10        | 9.00                               | 3.00   | 15.00             | 27.00  | 964.00     | 963.00 |
| 11        | 8.00                               | 0.00   | 19.00             | 61.00  | 948.00     | 934.00 |
| 12        | 8.00                               | 10.00  | 9.00              | 28.00  | 945.00     | 954.00 |
| 13        | 7.00                               | 3.00   | 11.00             | 21.00  | 964.00     | 970.00 |
| 14        | 3.00                               | 5.00   | 8.00              | 19.00  | 973.00     | 960.00 |
| 15        | 4.00                               | 5.00   | 13.00             | 12.00  | 964.00     | 975.00 |
| 16        | 9.00                               | 9.00   | 12.00             | 31.00  | 952.00     | 960.00 |
| 17        | 5.00                               | 5.00   | 13.00             | 45.00  | 967.00     | 923.00 |
| 18        | 7.00                               | 6.00   | 18.00             | 24.00  | 964.00     | 955.00 |
| 19        | 11.00                              | 0.00   | 17.00             | 29.00  | 964.00     | 966.00 |
| 20        | 13.00                              | 13.00  | 18.00             | 19.00  | 950.00     | 963.00 |
| Rata-rata | 7.10                               | 4.80   | 14.50             | 26.70  | 961.00     | 959.70 |