

**Lampiran A – Rekap Data Hasil Pengujian Tebal Outersheath 1.5 mm - 1.8 mm Bulan Mei-Juli
(Ditinjau dari Kategori Tebal Target)**

| Bulan | Tebal | | | Toleransi Maksimum (Batas atas terhadap Target Spec.) | Pencapaian (Aktual terhadap Target Spec.) | Jumlah Pengujian Produk | Hasil Pengujian | | | |
|----------------|-------------|----------------|------------|---|---|-------------------------|-----------------|-------------|---------------------|-------------|
| | Batas Bawah | Target (Spec.) | | | | | Sesuai Target | | Tidak Sesuai Target | |
| | | mm | mm | | | | mm | % | Jumlah | % |
| Mei | 1.4 | 1.5 | 1.6 | 6.7 | 21.4 | 94 | 14 | 11.9 | 80 | 88.1 |
| Juni | 1.4 | 1.5 | 1.6 | 6.7 | 20.7 | 181 | 48 | 24.3 | 133 | 75.7 |
| Juli | 1.4 | 1.5 | 1.6 | 6.7 | 19.8 | 73 | 14 | 18.0 | 59 | 82.0 |
| Sum 1.5 | 1.4 | 1.5 | 1.6 | 6.7 | 20.6 | 348 | 76 | 18.0 | 272 | 82.0 |
| Mei | 1.5 | 1.6 | 1.7 | 6.3 | 20.2 | 54 | 13 | 21.1 | 41 | 78.9 |
| Juni | 1.5 | 1.6 | 1.7 | 6.2 | 15.5 | 72 | 11 | 18.5 | 61 | 81.5 |
| Juli | 1.5 | 1.6 | 1.7 | 6.3 | 37.4 | 11 | 0 | 0.0 | 11 | 100.0 |
| Sum 1.6 | 1.5 | 1.6 | 1.7 | 6.3 | 24.4 | 137 | 24 | 13.2 | 113 | 86.8 |
| Mei | 1.6 | 1.7 | 1.8 | 5.9 | 28.0 | 70 | 8 | 8.5 | 62 | 91.5 |
| Juni | 1.6 | 1.7 | 1.8 | 5.9 | 17.0 | 93 | 19 | 17.5 | 74 | 82.5 |
| Juli | 1.6 | 1.7 | 1.8 | 5.9 | 17.4 | 12 | 1 | 4.5 | 11 | 95.5 |
| Sum 1.7 | 1.6 | 1.7 | 1.8 | 5.9 | 20.8 | 175 | 28 | 10.2 | 147 | 89.8 |
| Mei | 1.7 | 1.8 | 1.9 | 5.6 | 14.8 | 1227 | 428 | 31.2 | 799 | 68.8 |
| Juni | 1.7 | 1.8 | 1.9 | 5.6 | 16.5 | 167 | 80 | 40.9 | 87 | 59.1 |
| Juli | 1.7 | 1.8 | 1.9 | 5.6 | 17.5 | 227 | 60 | 21.3 | 167 | 78.7 |
| Sum 1.8 | 1.7 | 1.8 | 1.9 | 5.6 | 16.3 | 1621 | 568 | 31.2 | 1053 | 68.8 |

Lampiran B -- Rekap Data Mesin Penghasil Tebal *Outersheath* 1.7 mm Bulan Mei-Juli (Ditinjau dari Kelompok Mesin)

| Bulan | Mesin | Tebal | | Toleransi Maksimum (Batas Atas terhadap Target Spek) | Pencapaian (Aktual terhadap Target spek) | Jumlah Pengujian Produk | Hasil Pengujian | | | |
|---------------|-------|---------------|------------|--|--|-------------------------|-----------------|-------------|---------------------|-------------|
| | | Target (Spec) | Batas Atas | | | | Sesuai target | | Tidak sesuai target | |
| | | mm | mm | % | % | | Jumlah | % | Jumlah | % |
| Mei | IS-10 | 1.7 | 1.8 | 5.9 | 26.6 | 14 | 2 | 14.3 | 12 | 85.7 |
| Juni | IS-10 | 1.7 | 1.8 | 5.9 | 9.41 | 1 | 0 | 0.0 | 1 | 100.0 |
| Jumlah | | | | | | 15 | 2 | 13.3 | 13.0 | 86.7 |
| Mei | IS-12 | 1.7 | 1.8 | 5.9 | 23.4 | 42 | 5 | 11.9 | 37 | 88.1 |
| Juni | IS-12 | 1.7 | 1.8 | 5.9 | 22.12 | 63 | 7 | 11.1 | 56 | 88.9 |
| Juli | IS-12 | 1.7 | 1.8 | 5.9 | 13.53 | 1 | 0 | 0.0 | 1 | 100.0 |
| Jumlah | | | | | | 106 | 12 | 11.3 | 94 | 88.7 |
| Mei | IS-19 | 1.7 | 1.8 | 5.9 | 26.8 | 13 | 1 | 7.7 | 12 | 92.3 |
| Juni | IS-19 | 1.7 | 1.8 | 5.9 | 19.48 | 29 | 12 | 41.4 | 17 | 58.6 |
| Juli | IS-19 | 1.7 | 1.8 | 5.9 | 21.24 | 11 | 1 | 9.1 | 10 | 90.9 |
| Jumlah | | | | | | 53 | 14 | 26.4 | 39 | 73.6 |
| Mei | IS-3 | 1.7 | 1.8 | 5.9 | 35.3 | 1 | 0 | 0.0 | 1 | 100.0 |

**Lampiran C – Rekap Data Hasil Pengujian Tebal *Outersheath* 1.5 mm - 1.8 mm Bulan Mei - Juli
(Ditinjau dari Kelompok Mesin)**

| Bulan | Mesin | Pencapaian (Aktual terhadap Target spek) | Jumlah Pengujian Produk | Hasil Pengujian | | | |
|-------|--------------|--|-------------------------------|-----------------|------------------|---------------------|------------------|
| | | | | Sesuai target | | Tidak sesuai target | |
| | | | | Jumlah | % | Jumlah | % |
| Mei | IS-10 | 16.7 | 84 | 31 | 32.1 | 53 | 67.9 |
| Juni | IS-10 | 14.7 | 65 | 24 | 28.8 | 41 | 71.3 |
| Juli | IS-10 | 23.8 | 133 | 36 | 9.6 | 97.0 | 90.4 |
| | IS-10 | | 282 | 91 | Avg. 32.3 | 191 | Avg. 67.7 |
| Mei | IS-12 | 23.7 | 470 | 93 | 17.9 | 377 | 82.1 |
| Juni | IS-12 | 22.6 | 195 | 58 | 27.7 | 137 | 72.3 |
| Juli | IS-12 | 31.5 | 52 | 13 | 13.8 | 39 | 86.3 |
| | IS-12 | | 717 | 164 | Avg. 22.9 | 553 | Avg. 77.1 |
| Mei | IS-17 | 13.2 | 399 | 192 | 48.1 | 207 | 51.9 |
| Juni | IS-17 | 14.6 | 28 | 9 | 20.6 | 19 | 79.4 |
| Juli | IS-17 | 13.3 | 7 | 2 | 25.0 | 5 | 75.0 |
| | IS-17 | | 434 | 203 | Avg. 46.8 | 231 | Avg. 53.2 |
| Mei | IS-18 | 19.9 | 22 | 4 | Avg. 16.7 | 18 | Avg. 83.3 |
| Mei | IS-19 | 23.2 | 72 | 14 | 18.2 | 58 | 81.8 |
| Juni | IS-19 | 19.9 | 77 | 24 | 27.5 | 53 | 72.5 |
| Juli | IS-19 | 20.0 | 115 | 23 | 15.0 | 92 | 85.0 |
| | IS-19 | | 264 | 61 | Avg. 23.1 | 203 | Avg. 76.9 |

Lampiran C – Rekap Data Hasil Pengujian Tebal *Outersheath* 1.5 mm - 1.8 mm Bulan Mei - Juli
(Ditinjau dari Kelompok Mesin) (Lanjutan)

| Bulan | Mesin | Pencapaian (Aktual terhadap Target spek) | Jumlah Pengujian Produk | Sesuai target | | Tidak sesuai target | |
|-------|-------------|--|-------------------------------|---------------|------------------|---------------------|------------------|
| | | | | Jumlah | % | Jumlah | % |
| | | % | | | | | |
| Mei | IS-2 | 8.3 | 2 | 0 | 0.0 | 2 | 100.0 |
| Juni | IS-2 | 16.6 | 23 | 11 | 47.8 | 12 | 52.2 |
| | IS-2 | | 25 | 11 | Avg. 44.0 | 14 | Avg. 56.0 |
| Mei | IS-3 | 22.0 | 396 | 129 | 10.5 | 267 | 89.5 |
| Juni | IS-3 | 15.1 | 101 | 28 | 27.8 | 73 | 72.2 |
| Juli | IS-3 | 20.1 | 12 | 1 | 8.3 | 11 | 91.7 |
| | IS-3 | | 509 | 158 | Avg. 31.0 | 351 | Avg. 69.0 |
| Juni | IS-6 | 16.9 | 24 | 4 | 16.7 | 20 | 83.3 |
| Juli | IS-6 | 11.3 | 4 | 0 | 0.0 | 4 | 100.0 |
| | IS-6 | | 28 | 4 | Avg. 14.3 | 24 | Avg. 85.7 |

Lampiran D.1 – Data Hasil Uji *Outersheath* Tebal Nominal 1.7 mm, Bulan Mei

| No. | PRO ID | MESIN | Item Name | Drum No | Outersheath Color | Outersheath Thickness | | | |
|-----|-----------|-------|----------------------------|------------|-------------------|------------------------|------------|--------------|------|
| | | | | | | Min. at any point (mm) | | Average (mm) | |
| | | | | | | Actual Value | Spec Value | Actual Value | |
| 1 | P00039985 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-562321 | Black | 2.30 | 1.35 | 1.93 | 1.70 |
| 2 | P00040508 | IS-12 | NA2XY 1x240mm 1kV IEC60502 | 161-562894 | Black | 2.10 | 1.35 | 1.92 | 1.70 |
| 3 | P00040508 | IS-12 | NA2XY 1x240mm 1kV IEC60502 | 161-563030 | Black | 2.40 | 1.35 | 1.93 | 1.70 |
| 4 | P00038830 | IS-12 | NA2XY 1x240mm 1kV IEC60502 | 161-562895 | Black | 1.70 | 1.35 | 1.82 | 1.70 |
| 5 | P00038830 | IS-12 | NA2XY 1x240mm 1kV IEC60502 | 161-563523 | Black | 2.00 | 1.35 | 1.73 | 1.70 |
| 6 | P00038830 | IS-12 | NA2XY 1x240mm 1kV IEC60502 | 161-563707 | Black | 1.80 | 1.35 | 1.94 | 1.70 |
| 7 | P00038830 | IS-12 | NA2XY 1x240mm 1kV IEC60502 | 161-564463 | Black | 1.90 | 1.35 | 1.77 | 1.70 |
| 8 | P00038830 | IS-12 | NA2XY 1x240mm 1kV IEC60502 | 161-564464 | Black | 1.90 | 1.35 | 1.83 | 1.70 |
| 9 | P00040508 | IS-12 | NA2XY 1x240mm 1kV IEC60502 | 161-564465 | Black | 1.70 | 1.35 | 1.86 | 1.70 |
| 10 | P00040508 | IS-12 | NA2XY 1x240mm 1kV IEC60502 | 161-564466 | Black | 1.90 | 1.35 | 1.99 | 1.70 |
| 11 | P00040508 | IS-12 | NA2XY 1x240mm 1kV IEC60502 | 161-562893 | Black | 1.60 | 1.35 | 1.89 | 1.70 |
| 12 | P00040508 | IS-12 | NA2XY 1x240mm 1kV IEC60502 | 161-562891 | Black | 1.80 | 1.35 | 1.90 | 1.70 |
| 13 | P00040808 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-564658 | Black | 1.90 | 1.35 | 1.98 | 1.70 |
| 14 | P00040808 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-564886 | Black | 1.80 | 1.35 | 2.03 | 1.70 |
| 15 | P00040808 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-562690 | Black | 1.70 | 1.35 | 1.89 | 1.70 |
| 16 | P00040808 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-562687 | Black | 1.80 | 1.35 | 2.10 | 1.70 |
| 17 | P00040808 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-562689 | Black | 1.70 | 1.35 | 1.84 | 1.70 |
| 18 | P00040808 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-562688 | Black | 1.80 | 1.35 | 1.98 | 1.70 |
| 19 | P00040808 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-564431 | Black | 1.80 | 1.35 | 1.99 | 1.70 |
| 20 | P00040808 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-564430 | Black | 2.20 | 1.35 | 1.97 | 1.70 |
| 21 | P00040808 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-564429 | Black | 1.80 | 1.35 | 1.85 | 1.70 |
| 22 | P00040808 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-564817 | Black | 2.10 | 1.35 | 1.86 | 1.70 |

Lampiran D.1 – Data Hasil Uji *Outersheath* Tebal Nominal 1.7 mm, Bulan Mei (Lanjutan)

| No. | PRO ID | MESIN | Item Name | Drum No | Outersheath Color | Outersheath Thickness | | | |
|-----|-----------|-------|-------------------------|------------|-------------------|------------------------|--------------|--------------|------|
| | | | | | | Min. at any point (mm) | Actual Value | Average (mm) | |
| 23 | P00040808 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-564657 | Black | 2.20 | 1.35 | 2.20 | 1.70 |
| 24 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565363 | Black | 1.90 | 1.35 | 1.94 | 1.70 |
| 25 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565362 | Black | 2.10 | 1.35 | 1.73 | 1.70 |
| 26 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565649 | Black | 2.20 | 1.35 | 1.87 | 1.70 |
| 27 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565650 | Black | 2.20 | 1.35 | 1.99 | 1.70 |
| 28 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565646 | Black | 2.20 | 1.35 | 1.89 | 1.70 |
| 29 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565733 | Black | 2.10 | 1.35 | 1.72 | 1.70 |
| 30 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565732 | Black | 2.10 | 1.35 | 1.91 | 1.70 |
| 31 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565361 | Black | 1.80 | 1.35 | 1.89 | 1.70 |
| 32 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565647 | Black | 2.50 | 1.35 | 1.93 | 1.70 |
| 33 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565342 | Black | 1.70 | 1.35 | 1.83 | 1.70 |
| 34 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565340 | Black | 2.30 | 1.35 | 1.83 | 1.70 |
| 35 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565339 | Black | 2.00 | 1.35 | 1.74 | 1.70 |
| 36 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565341 | Black | 2.20 | 1.35 | 1.93 | 1.70 |
| 37 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565507 | Black | 1.70 | 1.35 | 2.18 | 1.70 |
| 38 | P00041609 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565505 | Black | 2.30 | 1.35 | 1.83 | 1.70 |
| 39 | P00042013 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565338 | Black | 2.00 | 1.35 | 1.92 | 1.70 |
| 40 | P00042013 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565337 | Black | 2.30 | 1.35 | 1.97 | 1.70 |
| 41 | P00042013 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565506 | Black | 1.80 | 1.35 | 2.10 | 1.70 |
| 42 | P00042013 | IS-12 | NY Y 1x185mm 1kV SPLN43 | 141-565508 | Black | 2.30 | 1.35 | 1.94 | 1.70 |

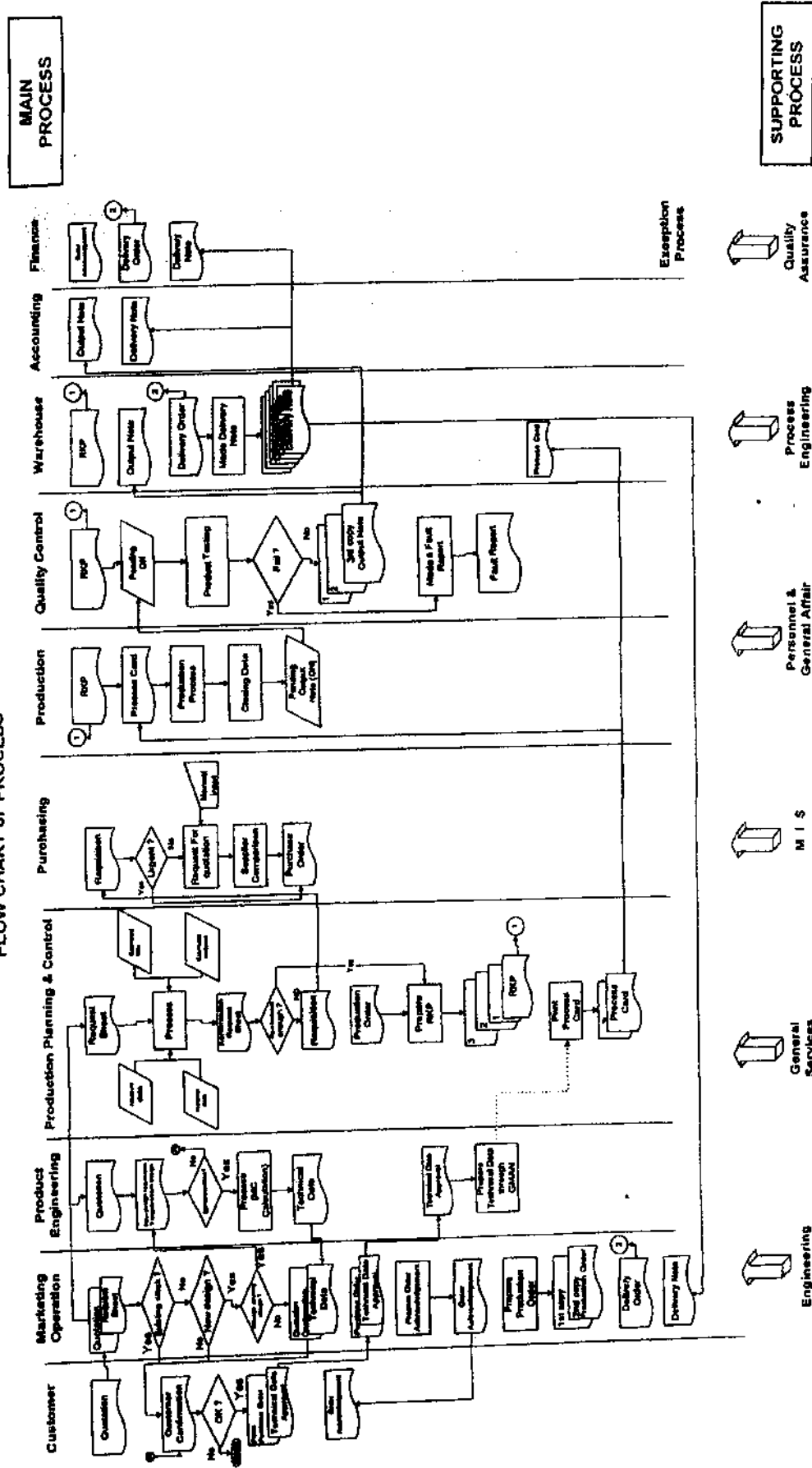
Lampiran D.2 – Data Hasil Uji *Outersheath* Tebal Nominal 1.7 mm, Bulan Juni

| No. | PRO ID | MESIN | Item Name | Drum No | Outersheath Color | Outersheath Thickness | | | |
|-----|-----------|-------|--------------------------|------------|-------------------|------------------------|------------|--------------|------------|
| | | | | | | Min. at any point (mm) | | Average (mm) | |
| | | | | | | Actual Value | Spec Value | Actual Value | Spec Value |
| 1 | P00040277 | IS-12 | NYHYH-i 4x25fx KMIH05VVF | 141-566215 | Blue | 1.60 | 1.16 | 1.66 | 1.70 |
| 2 | P00040277 | IS-12 | NYHYH-i 4x25fx KMIH05VVF | 141-566217 | Blue | 1.60 | 1.16 | 2.06 | 1.70 |
| 3 | P00040386 | IS-12 | NYHYH-i 4x25fx KMIH05VVF | 141-567080 | Blue | 1.80 | 1.16 | 2.10 | 1.70 |
| 4 | P00040386 | IS-12 | NYHYH-i 4x25fx KMIH05VVF | 141-566567 | Blue | 1.70 | 1.16 | 1.93 | 1.70 |
| 5 | P00040386 | IS-12 | NYHYH-i 4x25fx KMIH05VVF | 141-565990 | Blue | 1.55 | 1.16 | 1.97 | 1.70 |
| 6 | P00040386 | IS-12 | NYHYH-i 4x25fx KMIH05VVF | 141-566665 | Blue | 1.60 | 1.16 | 1.85 | 1.70 |
| 7 | P00040330 | IS-12 | NYHYH 4x25fx 750V KMI | 161-567094 | Blue | 2.10 | 1.16 | 1.91 | 1.70 |
| 8 | P00042294 | IS-12 | NYHY 1x185mm 1kV SPLN43 | 141-566403 | Black | 1.90 | 1.35 | 1.85 | 1.70 |
| 9 | P00042294 | IS-12 | NYHY 1x185mm 1kV SPLN43 | 141-567728 | Black | 2.00 | 1.35 | 1.93 | 1.70 |
| 10 | P00042294 | IS-12 | NYHY 1x185mm 1kV SPLN43 | 141-566213 | Black | 2.00 | 1.35 | 1.59 | 1.70 |
| 11 | P00042294 | IS-12 | NYHY 1x185mm 1kV SPLN43 | 141-567727 | Black | 1.80 | 1.35 | 1.93 | 1.70 |
| 12 | P00042294 | IS-12 | NYHY 1x185mm 1kV SPLN43 | 141-567730 | Black | 1.75 | 1.35 | 1.87 | 1.70 |
| 13 | P00042294 | IS-12 | NYHY 1x185mm 1kV SPLN43 | 141-567729 | Black | 1.70 | 1.35 | 1.90 | 1.70 |
| 14 | P00042294 | IS-12 | NYHY 1x185mm 1kV SPLN43 | 141-567737 | Black | 1.70 | 1.35 | 2.06 | 1.70 |
| 15 | P00042301 | IS-12 | NYHY 1x185mm 1kV SPLN43 | 141-566405 | Black | 1.80 | 1.35 | 1.90 | 1.70 |
| 16 | P00042301 | IS-12 | NYHY 1x185mm 1kV SPLN43 | 141-566491 | Black | 1.80 | 1.35 | 1.82 | 1.70 |
| 17 | P00042294 | IS-12 | NYHY 1x185mm 1kV SPLN43 | 141-567736 | Black | 2.00 | 1.35 | 2.00 | 1.70 |
| 18 | P00042294 | IS-12 | NYHY 1x185mm 1kV SPLN43 | 141-567734 | Black | 2.20 | 1.35 | 1.60 | 1.70 |
| 19 | P00042294 | IS-12 | NYHY 1x185mm 1kV SPLN43 | 141-567735 | Black | 2.50 | 1.35 | 1.94 | 1.70 |
| 20 | P00040965 | IS-12 | NA2XSY 1x150cm 20kV | 141-566404 | Red | 1.90 | 1.35 | 1.89 | 1.70 |
| 21 | P00040444 | IS-12 | NA2XSY 1x150cm 20kV | 181-568002 | Red | 1.90 | 1.35 | 2.10 | 1.70 |
| 22 | P00040444 | IS-12 | NA2XSY 1x150cm 20kV | 181-568001 | Red | 1.80 | 1.35 | 1.84 | 1.70 |

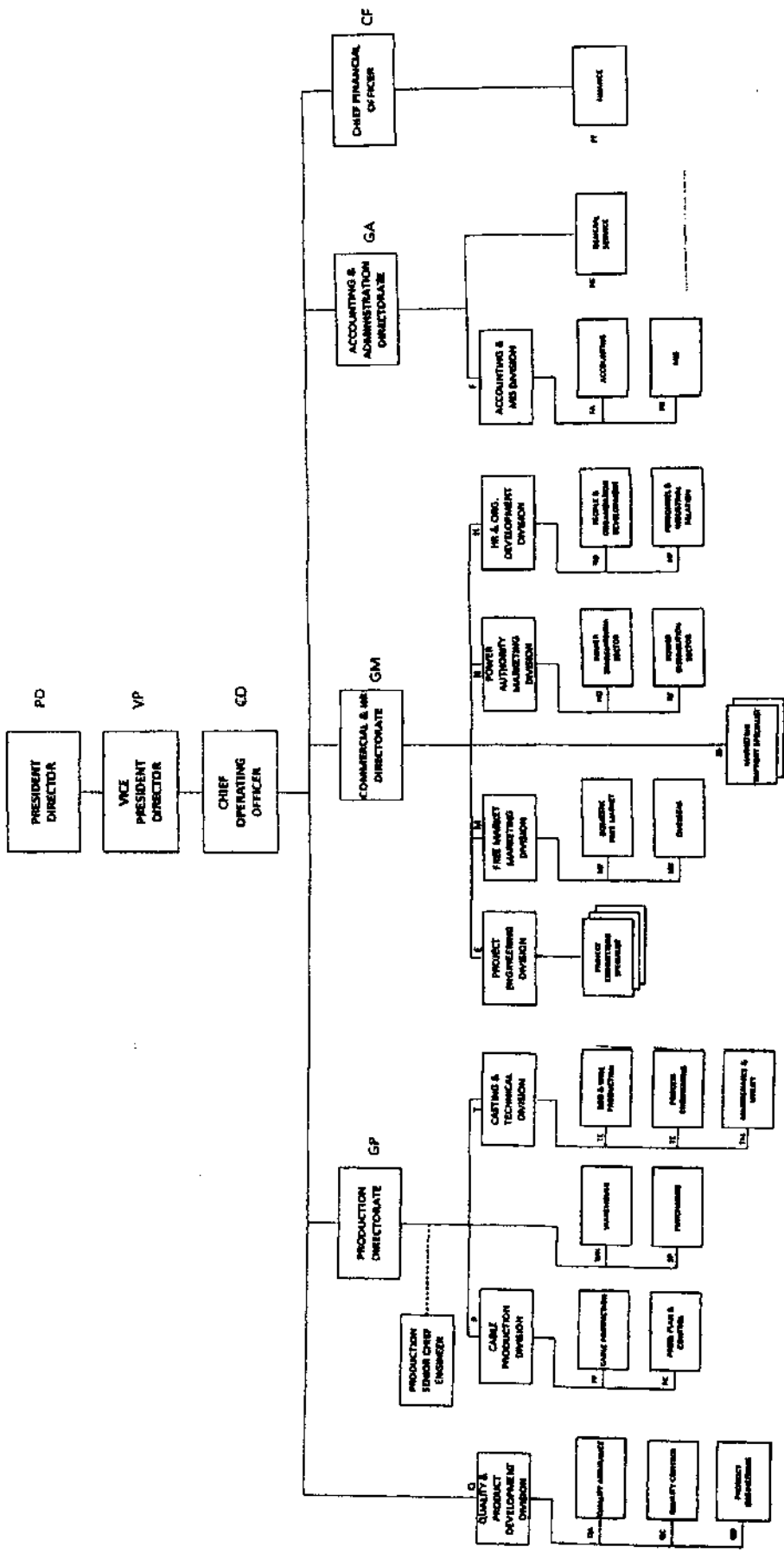
Lampiran D.3 – Data Hasil Uji Outersheath Tebal Nominal 1.7 mm, Bulan Juli

| No. | PROD ID | MESIN | Item Name | Drum No. | Outersheath Color | Outersheath Thickness | | |
|-----|-----------|-------|------------------------------------|------------|-------------------|------------------------|----------------------|--------------------|
| | | | | | | Min. at any point (mm) | Average (mm) | Spec Value |
| 1 | P00042299 | IS-12 | NA2XSY 1x70cm 30kV IEC60502 :Rd | 161-571920 | Red | Actual Value 1.80 | Actual Value 1.95 | Spec Value 1.70 |

FLOW CHART OF PROCESS

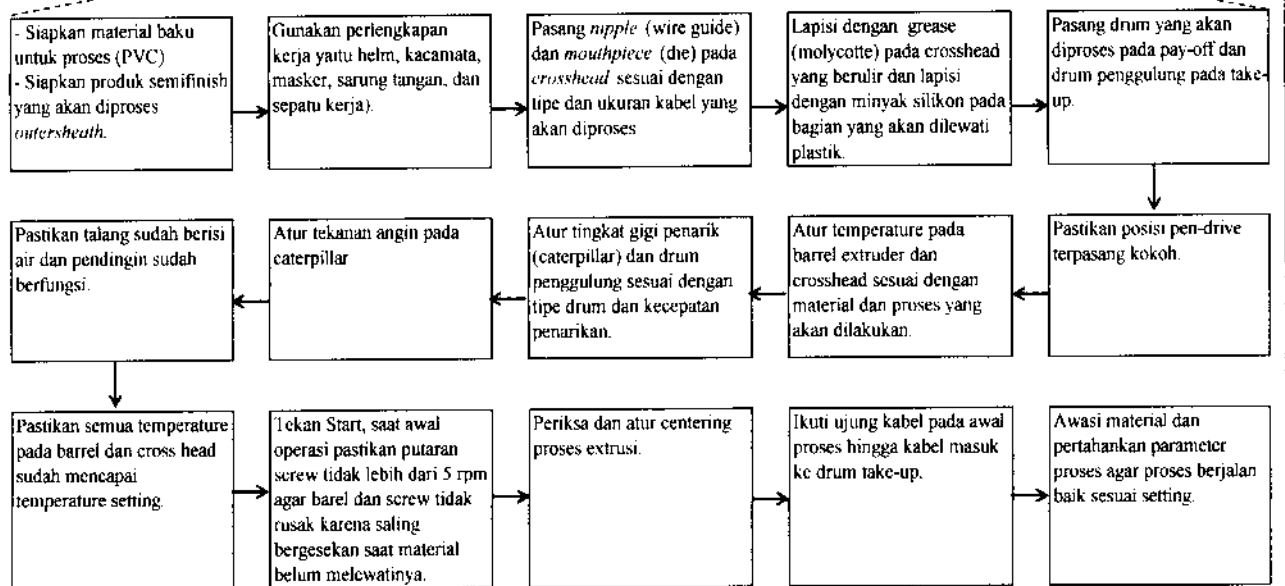


MANAGEMENT ORGANIZATION STRUCTURE



Lampiran G - Diagram SIPOC Proses Ekstrusi Kabel Mesin IS-12

| SUPPLIER | INPUT | PROCESS | OUTPUT | CUSTOMER |
|--|---|------------------|-----------------------------|---|
| <ul style="list-style-type: none"> - External Supplier Material - Product Engineering dan PPIC dept. - Cable Production dept. - Process Engineer dept. | <ul style="list-style-type: none"> - Extrusion raw material - Process card - Operator mesin - Produk semifinish - nipple (wire guide) dan mouth piece (die) - Mesin IS-12 | <p>EXTRUSION</p> | <p>- <i>Finish Good</i></p> | <ul style="list-style-type: none"> - QC dept. (internal customer) untuk melakukan pengtesan - Warehouse dept. (internal customer) menerima produk lulus uji dari QC dept. untuk dikirim ke customer - Distributor atau direct user (external customer) |

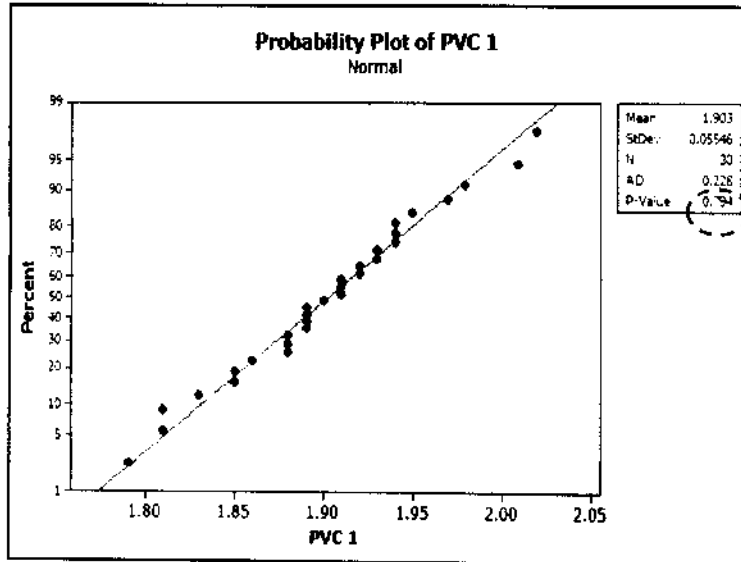


Lampiran J – Hypothesis Testing Faktor Material

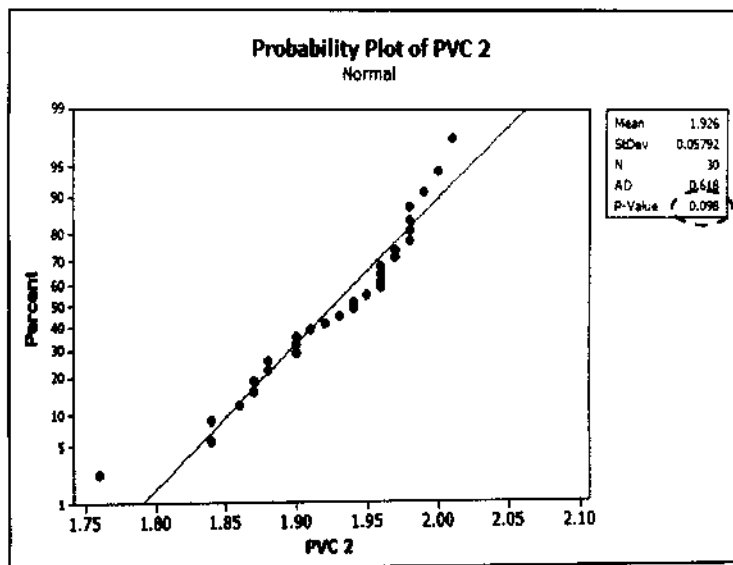
Data tebal *outersheath* material PVC yang berasal dari dua *supplier* yang berbeda.

Tabel J.1. Data tebal *outersheath* (mm) material PVC 1 dan PVC 2

| Sample | PVC Supplier | | Sample | PVC Supplier | |
|--------|--------------|------|--------|--------------|------|
| | 1 | 2 | | 1 | 2 |
| 1 | 2.01 | 1.84 | 16 | 2.02 | 1.91 |
| 2 | 1.81 | 1.97 | 17 | 1.89 | 1.96 |
| 3 | 1.79 | 1.96 | 18 | 1.93 | 1.99 |
| 4 | 1.98 | 1.88 | 19 | 1.97 | 1.76 |
| 5 | 1.92 | 1.90 | 20 | 1.88 | 1.96 |
| 6 | 1.94 | 1.93 | 21 | 1.89 | 1.88 |
| 7 | 1.89 | 1.98 | 22 | 1.81 | 1.94 |
| 8 | 1.91 | 1.96 | 23 | 1.90 | 1.98 |
| 9 | 1.89 | 1.98 | 24 | 1.91 | 2.01 |
| 10 | 1.95 | 1.90 | 25 | 1.85 | 1.87 |
| 11 | 1.91 | 2.00 | 26 | 1.83 | 1.94 |
| 12 | 1.86 | 1.98 | 27 | 1.92 | 1.86 |
| 13 | 1.94 | 1.97 | 28 | 1.94 | 1.92 |
| 14 | 1.85 | 1.90 | 29 | 1.93 | 1.95 |
| 15 | 1.88 | 1.84 | 30 | 1.88 | 1.87 |



Gambar J.1. Normality Test Tebal *Outersheath* Material PVC Supplier 1



Gambar J.2. Normality Test Tebal Outsheath Material PVC Supplier 2

Test for Equal Variances: Thickness versus Material

95% Bonferroni confidence intervals for standard deviations

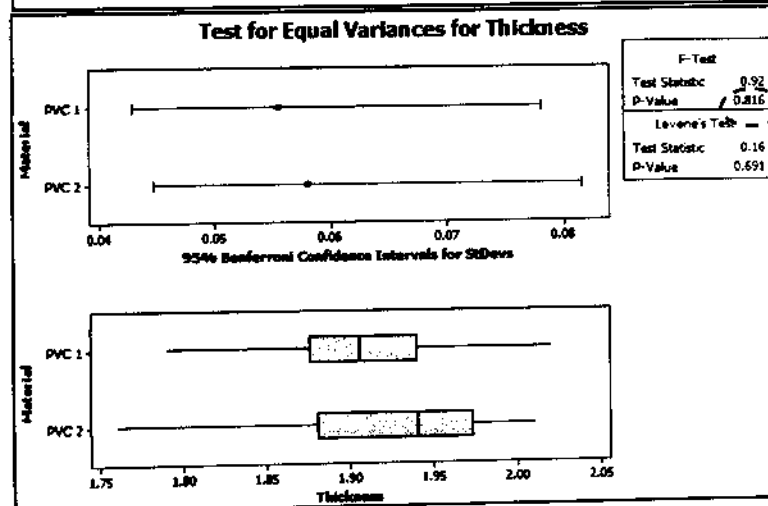
| Material | N | Lower | StDev | Upper |
|----------|----|-----------|-----------|-----------|
| PVC 1 | 30 | 0.0428058 | 0.0554563 | 0.0780022 |
| PVC 2 | 30 | 0.0447097 | 0.0579229 | 0.0814716 |

F-Test (Normal Distribution)
Test statistic = 0.92, p-value = 0.816

Levene's Test (Any Continuous Distribution)
Test statistic = 0.16, p-value = 0.691

Test for Equal Variances for Thickness

Two-Sample T-Test and CI: Thickness, Material



Gambar J.3. Equal Variances Test Tebal Outsheath PVC 1 dan PVC 2

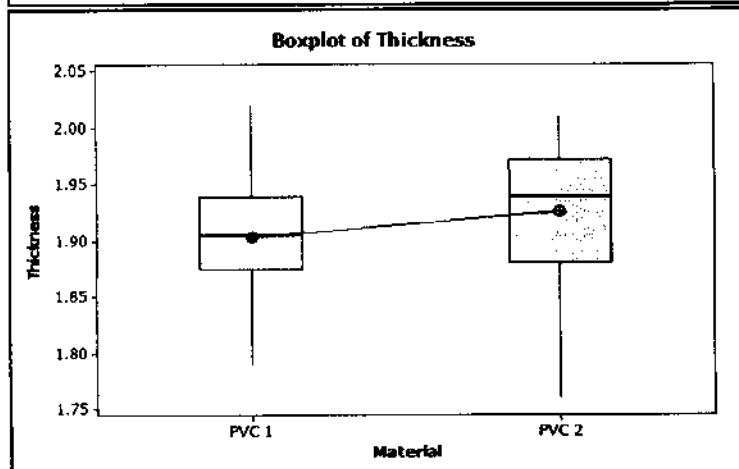
Two-Sample T-Test and CI: Thickness, Material

Two-sample T for Thickness

| Material | N | Mean | StDev | SE Mean |
|----------|----|--------|--------|---------|
| PVC 1 | 30 | 1.9027 | 0.0555 | 0.010 |
| PVC 2 | 30 | 1.9263 | 0.0579 | 0.011 |

Difference = μ (PVC 1) - μ (PVC 2)
 Estimate for difference: -0.0237
 95% CI for difference: (-0.0530, 0.0056)
 T-Test of difference = 0 (vs not =): T-Value = -1.62 P-Value = 0.111 DF = 58
 Both use Pooled StDev = 0.0567

Boxplot of Thickness



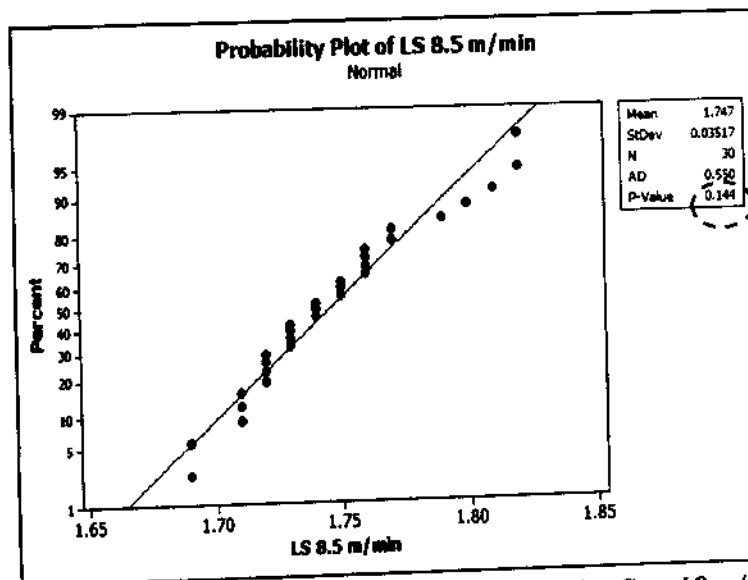
Gambar J.4. Two Sample T-Test Tebal Outersheath PVC 1 dan PVC 2

Lampiran K - Hypothesis Testing Faktor Metode (*Line Speed*)

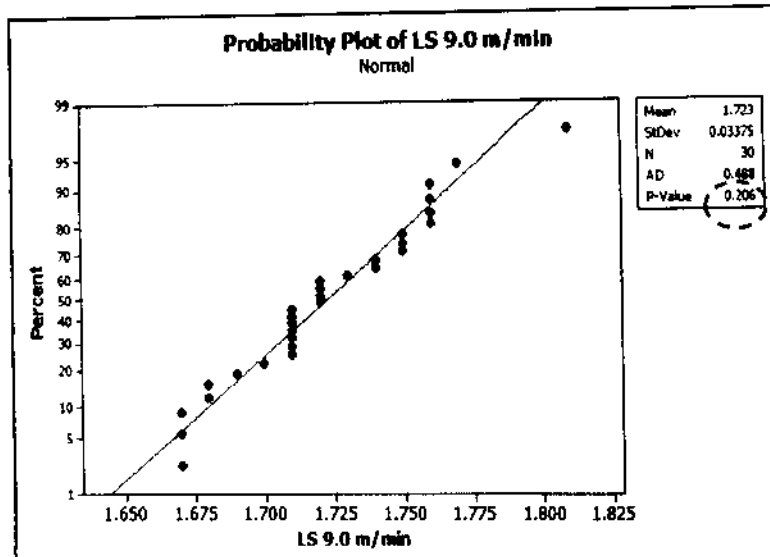
Data tebal *outersheath* material PVC yang berasal dari dua nilai *Line Speed* yang berbeda.

Tabel K.1. Data tebal *outersheath* (mm) pada setting line speed 8.5 m/min dan 9.0 m/min

| Sample | Line Speed (m/min) | | Sample | Line Speed (m/min) | |
|--------|--------------------|------|--------|--------------------|------|
| | 8.5 | 9.0 | | 8.5 | 9.0 |
| 1 | 1.70 | 1.69 | 16 | 1.72 | 1.69 |
| 2 | 1.76 | 1.69 | 17 | 1.72 | 1.66 |
| 3 | 1.70 | 1.72 | 18 | 1.72 | 1.69 |
| 4 | 1.70 | 1.71 | 19 | 1.71 | 1.70 |
| 5 | 1.72 | 1.71 | 20 | 1.71 | 1.70 |
| 6 | 1.71 | 1.73 | 21 | 1.69 | 1.72 |
| 7 | 1.74 | 1.69 | 22 | 1.69 | 1.70 |
| 8 | 1.75 | 1.68 | 23 | 1.72 | 1.72 |
| 9 | 1.70 | 1.70 | 24 | 1.74 | 1.69 |
| 10 | 1.72 | 1.74 | 25 | 1.70 | 1.70 |
| 11 | 1.71 | 1.72 | 26 | 1.71 | 1.72 |
| 12 | 1.71 | 1.72 | 27 | 1.74 | 1.71 |
| 13 | 1.70 | 1.70 | 28 | 1.73 | 1.70 |
| 14 | 1.73 | 1.71 | 29 | 1.67 | 1.74 |
| 15 | 1.74 | 1.75 | 30 | 1.75 | 1.70 |



Gambar K.1. Normality Test Tebal *Outersheath* Line Speed 8 m/min



Gambar K.2. Normality Test Tebal Outersheath Line Speed 9 m/min

95% Bonferroni confidence intervals for standard deviations

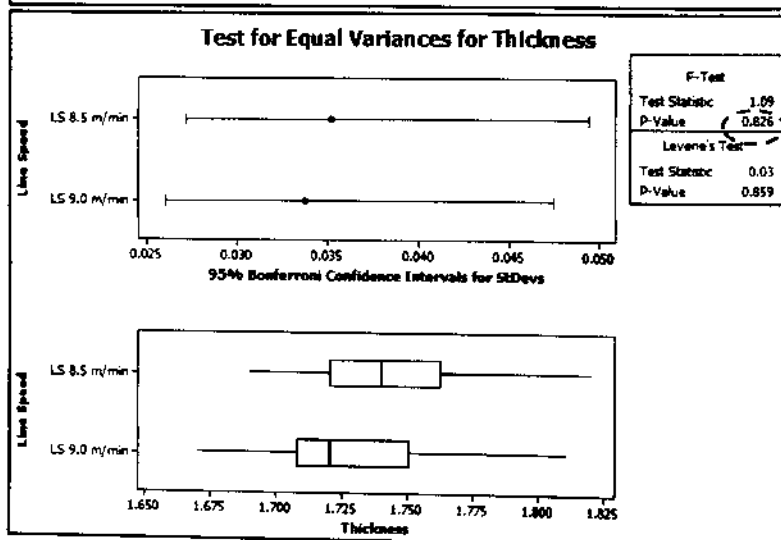
| Line Speed | N | Lower | StDev | Upper |
|--------------|----|-----------|-----------|-----------|
| LS 8.5 m/min | 30 | 0.0271455 | 0.0351679 | 0.0494655 |
| LS 9.0 m/min | 30 | 0.0260499 | 0.0337486 | 0.0474691 |

F-Test (Normal Distribution)
Test statistic = 1.09, p-value = 0.826

Levene's Test (Any Continuous Distribution)
Test statistic = 0.03, p-value = 0.859

Test for Equal Variances for Thickness

Two-Sample T-Test and CI: Thickness, Line Speed



Gambar K.3. Equal Variances Test Tebal Outersheath pada Line Speed 8.0 m/min dan 9.0 m/min.

Two-Sample T-Test and CI: Thickness, Line Speed

Two-sample T for Thickness

| Line Speed | N | Mean | StDev | SE Mean |
|--------------|----|--------|--------|---------|
| LS 8.5 m/min | 30 | 1.7467 | 0.0352 | 0.0064 |
| LS 9.0 m/min | 30 | 1.7230 | 0.0337 | 0.0062 |

Difference = μ (LS 8.5 m/min) - μ (LS 9.0 m/min)

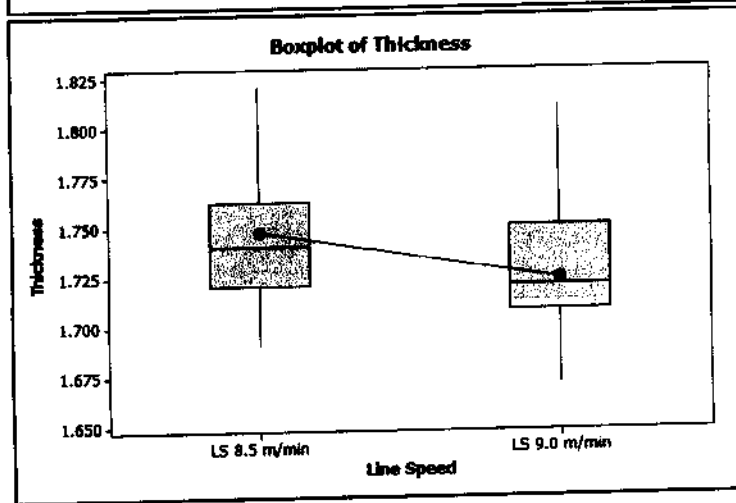
Estimate for difference: 0.02367

95% CI for difference: (0.00585, 0.04148)

T-Test of difference = 0 (vs not =): T-Value = 2.66 P-Value = (0.010) DF = 58

Both use Pooled StDev = 0.0345

Boxplot of Thickness



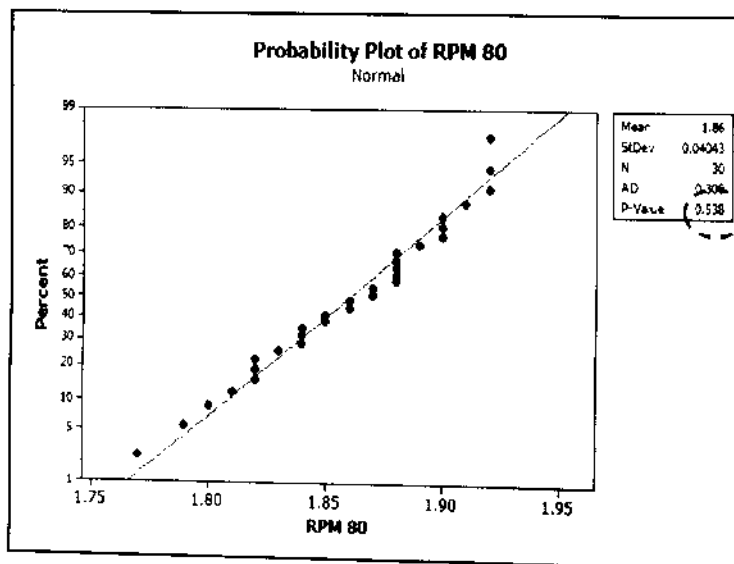
Gambar K.4. Two Sample T-Test Tebal Outersheath pada Line Speed 8.0 m/min dan 9.0 m/min

Lampiran L – Hypothesis Testing Faktor Metode (RPM)

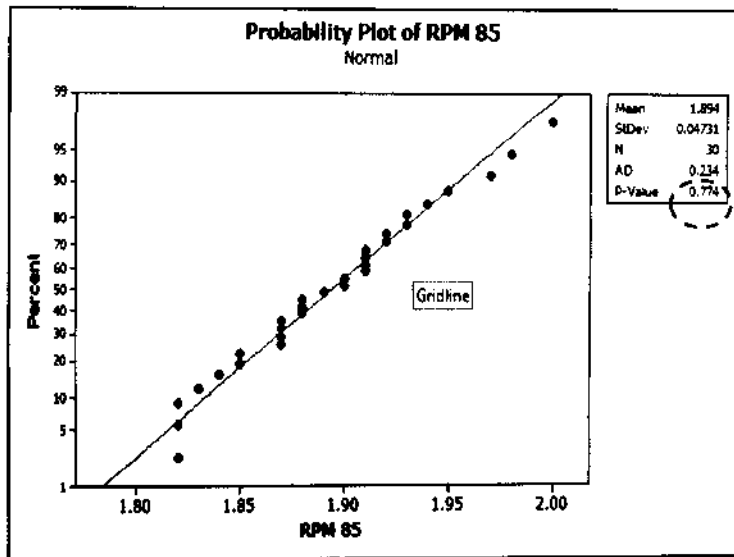
Setting RPM (Rotation per Minutes) ekstruder berfungsi untuk mendorong material dari *hopper* menuju *screw* ekstruder. Berikut adalah data tebal *outersheath* material PVC yang berasal dari dua nilai RPM yang berbeda.

Tabel L.1. Data tebal *outersheath* (mm) pada setting 80 RPM dan 85RPM

| Sample | Setting rpm | | Sample | Setting rpm | |
|--------|-------------|------|--------|-------------|------|
| | 80 | 85 | | 80 | 85 |
| 1 | 1.92 | 1.94 | 16 | 1.88 | 1.87 |
| 2 | 1.84 | 1.85 | 17 | 1.86 | 1.84 |
| 3 | 1.82 | 1.82 | 18 | 1.80 | 1.88 |
| 4 | 1.88 | 1.83 | 19 | 1.88 | 1.97 |
| 5 | 1.90 | 1.91 | 20 | 1.92 | 2.00 |
| 6 | 1.82 | 1.88 | 21 | 1.88 | 1.85 |
| 7 | 1.87 | 1.90 | 22 | 1.77 | 1.90 |
| 8 | 1.79 | 1.91 | 23 | 1.86 | 1.89 |
| 9 | 1.87 | 1.91 | 24 | 1.90 | 1.88 |
| 10 | 1.90 | 1.87 | 25 | 1.85 | 1.95 |
| 11 | 1.89 | 1.82 | 26 | 1.81 | 1.82 |
| 12 | 1.88 | 1.91 | 27 | 1.82 | 1.92 |
| 13 | 1.84 | 1.87 | 28 | 1.83 | 1.98 |
| 14 | 1.92 | 1.92 | 29 | 1.84 | 1.93 |
| 15 | 1.85 | 1.87 | 30 | 1.91 | 1.93 |



Gambar L.1. Normality Test Tebal *Outersheath* pada 80 RPM



Gambar L.2. Normality Test Tebal Outsheath pada 85 RPM

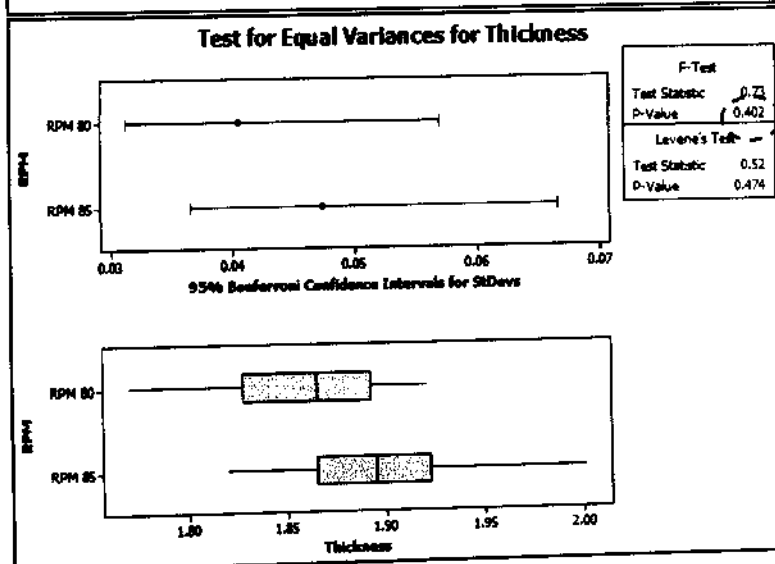
95% Bonferroni confidence intervals for standard deviations

| RPM | N | Lower | StDev | Upper |
|--------|----|-----------|-----------|-----------|
| RPM 80 | 30 | 0.0312063 | 0.0404287 | 0.0568651 |
| RPM 85 | 30 | 0.0365209 | 0.0473141 | 0.0665497 |

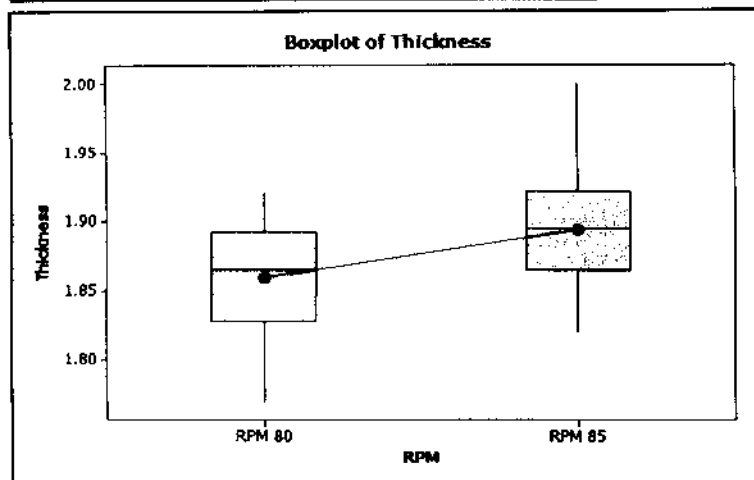
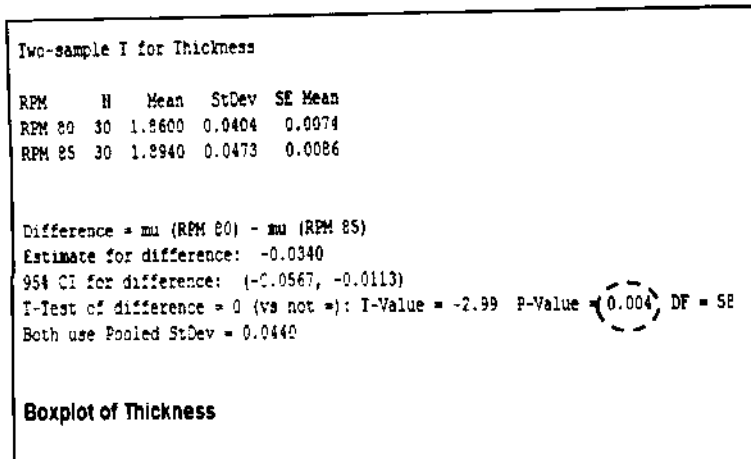
F-Test (Normal Distribution)
Test statistic = 0.73, p-value = 0.402

Levene's Test (Any Continuous Distribution)
Test statistic = 0.52, p-value = 0.474

Test for Equal Variances for Thickness



Gambar L.3. Equal Variances Test Tebal Outsheath pada 80 RPM dan 85 RPM.



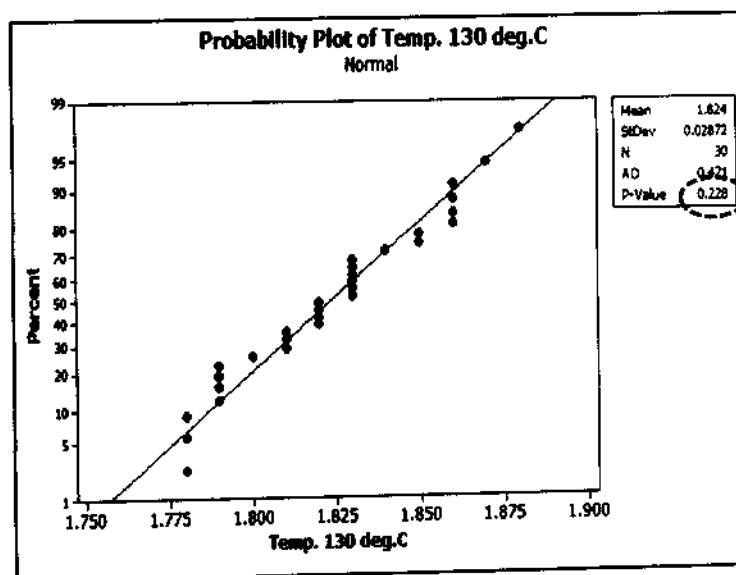
Gambar L.4. Two Sample T-Test Tebal Outersheath pada 80 RPM dan 85 RPM.

Lampiran M – Hypothesis Testing Faktor Metode (Temperature)

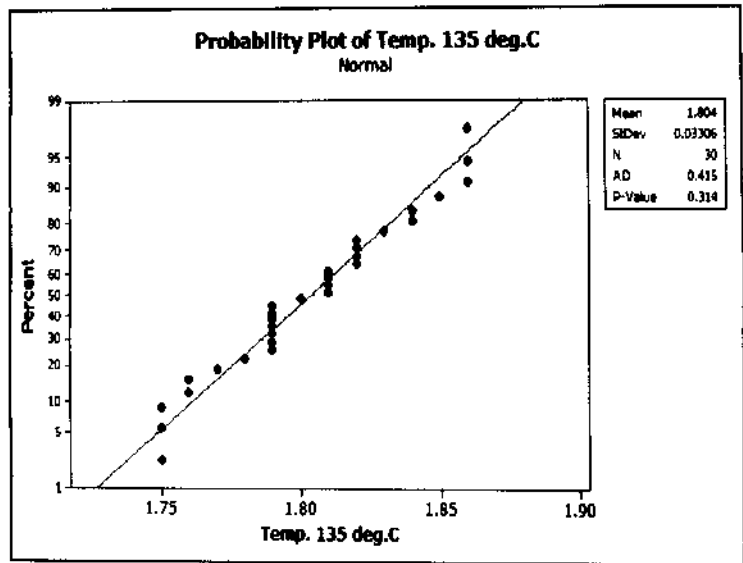
Berikut adalah data tebal *outersheath* material PVC yang berasal dari dua nilai Temperature yang berbeda.

Tabel M.1 Data tebal *outersheath* (mm) pada setting temperature 130°C dan 135°C

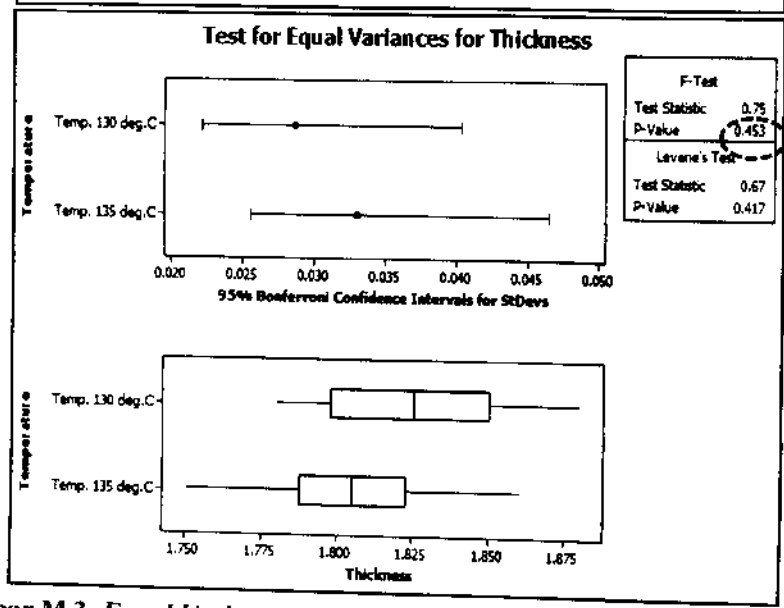
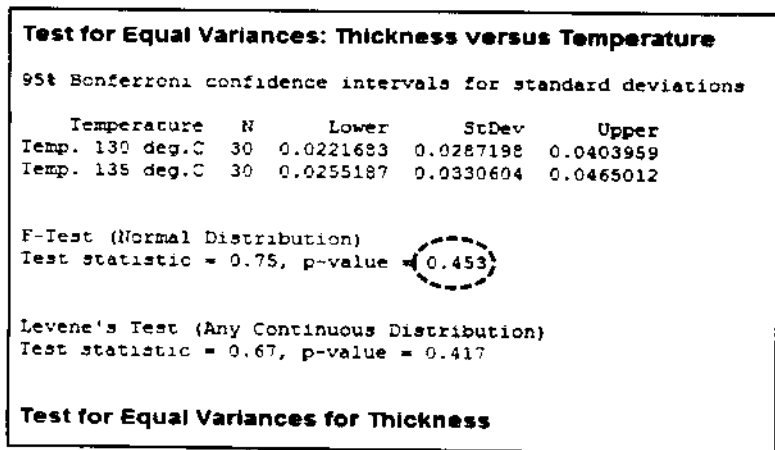
| Sample | Setting temperature | | Sample | Setting temperature | |
|--------|---------------------|-------|--------|---------------------|-------|
| | 130°C | 135°C | | 130°C | 135°C |
| 1 | 1.82 | 1.79 | 16 | 1.86 | 1.81 |
| 2 | 1.83 | 1.79 | 17 | 1.83 | 1.84 |
| 3 | 1.83 | 1.76 | 18 | 1.80 | 1.80 |
| 4 | 1.79 | 1.76 | 19 | 1.81 | 1.79 |
| 5 | 1.78 | 1.78 | 20 | 1.88 | 1.79 |
| 6 | 1.83 | 1.86 | 21 | 1.79 | 1.84 |
| 7 | 1.86 | 1.82 | 22 | 1.86 | 1.82 |
| 8 | 1.86 | 1.86 | 23 | 1.78 | 1.79 |
| 9 | 1.83 | 1.75 | 24 | 1.85 | 1.86 |
| 10 | 1.84 | 1.75 | 25 | 1.82 | 1.81 |
| 11 | 1.81 | 1.81 | 26 | 1.87 | 1.79 |
| 12 | 1.79 | 1.83 | 27 | 1.78 | 1.85 |
| 13 | 1.83 | 1.75 | 28 | 1.79 | 1.82 |
| 14 | 1.85 | 1.81 | 29 | 1.82 | 1.77 |
| 15 | 1.82 | 1.79 | 30 | 1.82 | 1.79 |



Gambar M.1. Normality Test Tebal *Outersheath* pada temperature 130 °C



Gambar M.2. Normality Test Tebal Outersheath pada temperature 135 °C



Gambar M.3. Equal Variances Test Tebal Outersheath pada 130°C dan 135°C

Two-Sample T-Test and CI: Thickness, Temperature

Two-sample T for Thickness

| Temperature | N | Mean | StDev | SE Mean |
|-----------------|----|--------|--------|---------|
| Temp. 130 deg.C | 30 | 1.8240 | 0.0287 | 0.0052 |
| Temp. 135 deg.C | 30 | 1.8037 | 0.0331 | 0.0060 |

Difference = μ (Temp. 130 deg.C) - μ (Temp. 135 deg.C)

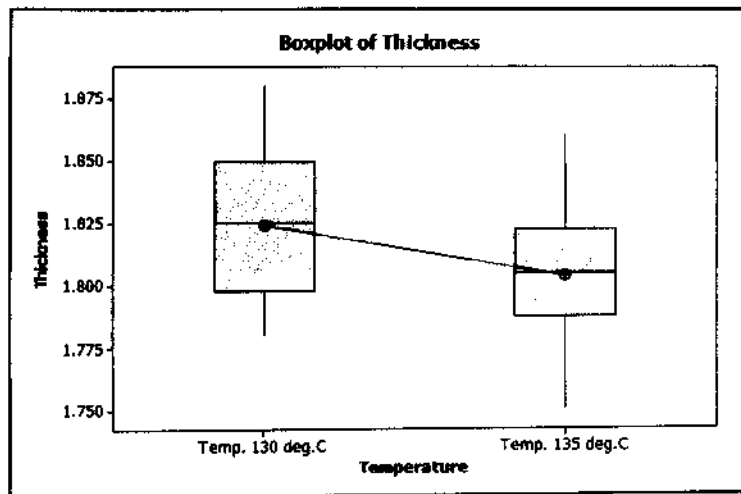
Estimate for difference: 0.02033

95% CI for difference: (0.00433, 0.03634)

T-Test of difference = 0 (vs not =): T-Value = 2.54 P-Value = 0.014 DF = 58

Both use Pooled StDev = 0.0310

Boxplot of Thickness



Gambar M.4. Two Sample T-Test Tebal *Outersheath* pada Temperature 130°C dan 135°C

Lampiran N – Hypothesis Testing Faktor Measurement (Alat Ukur)

Untuk melakukan pengukuran tebal ekstrusi ada dua macam *tools* yang dipakai yaitu *loup* dan *profile projector*.



Gambar 4.40. *Loup*



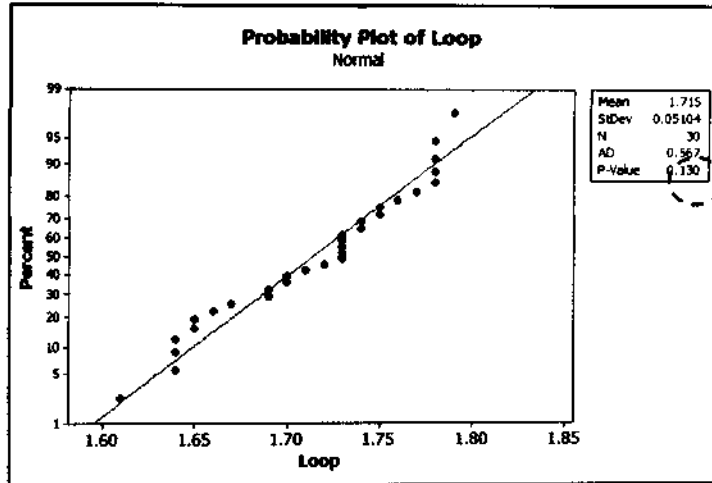
Gambar 4.41. *Profile Projector*

Setiap operator mesin ekstrusi wajib melakukan pengukuran tebal pada produk yang diproses yang mana alat ukur yang digunakan adalah *loup*. Pengukuran dilakukan pada setiap awal dan akhir proses dengan cara melakukan pemotongan *sample*. Potongan *sample* awal dan akhir tersebut kemudian dibawa ke laboratorium QC untuk dilakukan pengukuran oleh operator QC yang mana alat ukur yang digunakan adalah *profile projector*. Hasil penelitian menunjukkan kedua alat ukur tersebut memiliki jadwal kalibrasi yang dipatuhi. *Loup* dikalibrasi setiap satu tahun sekali dan *profile projector* setiap tiga bulan sekali. Kalibrasi yang dilakukan secara periodik menjadikan kedua alat ukur tersebut ada dalam kondisi akurat. Berikut adalah data hasil observasi dari dua alat ukur tersebut.

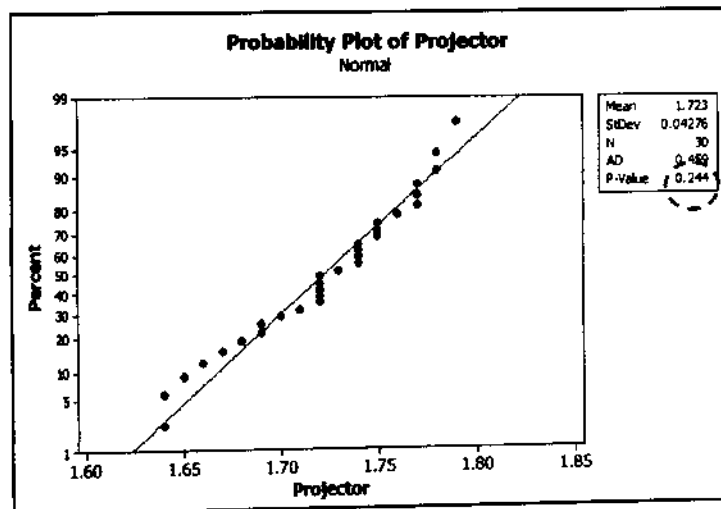
Tabel N.I. Data tebal *outersheath* (mm) hasil pengukuran *Loup* dan *Profile Projector*

| Sample | Alat Ukur | | Sample | Alat Ukur | |
|--------|-------------|--------------------------|--------|-------------|--------------------------|
| | <i>Loup</i> | <i>Profile Projector</i> | | <i>Loup</i> | <i>Profile Projector</i> |
| 1 | 1.72 | 1.72 | 16 | 1.69 | 1.72 |
| 2 | 1.65 | 1.68 | 17 | 1.78 | 1.74 |
| 3 | 1.67 | 1.69 | 18 | 1.64 | 1.67 |
| 4 | 1.79 | 1.78 | 19 | 1.65 | 1.64 |
| 5 | 1.66 | 1.69 | 20 | 1.75 | 1.72 |
| 6 | 1.76 | 1.78 | 21 | 1.78 | 1.77 |
| 7 | 1.69 | 1.70 | 22 | 1.70 | 1.72 |
| 8 | 1.78 | 1.77 | 23 | 1.74 | 1.72 |
| 9 | 1.77 | 1.79 | 24 | 1.78 | 1.76 |
| 10 | 1.74 | 1.77 | 25 | 1.75 | 1.74 |
| 11 | 1.64 | 1.65 | 26 | 1.73 | 1.75 |
| 12 | 1.73 | 1.74 | 27 | 1.71 | 1.73 |

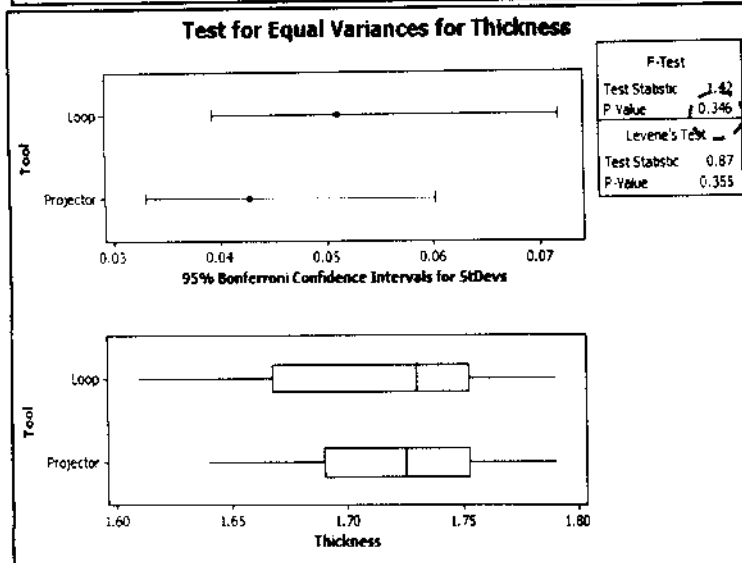
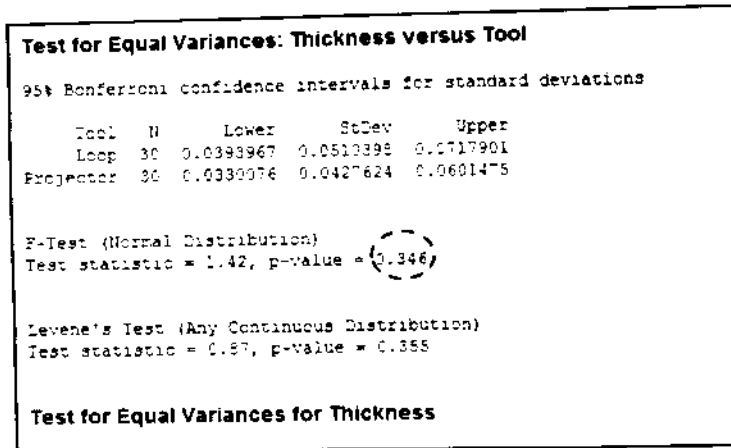
| Sample | Alat Ukur | | Sample | Alat Ukur | |
|--------|-----------|-------------------|--------|-----------|-------------------|
| | Loup | Profile Projector | | Loup | Profile Projector |
| 13 | 1.61 | 1.64 | 28 | 1.73 | 1.75 |
| 14 | 1.73 | 1.74 | 29 | 1.70 | 1.71 |
| 15 | 1.73 | 1.75 | 30 | 1.64 | 1.66 |



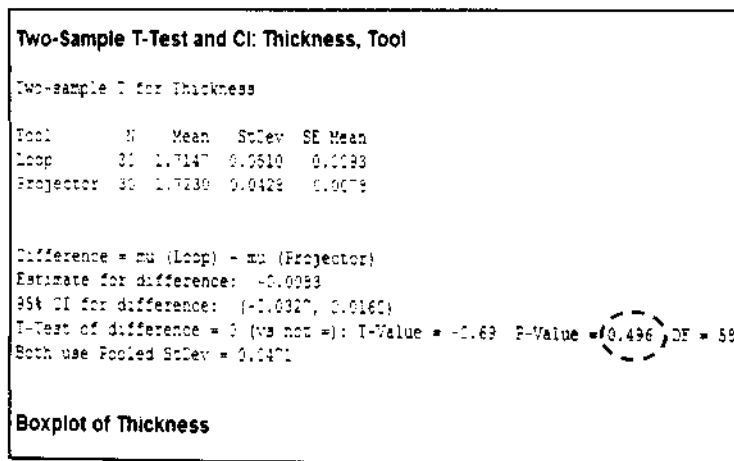
Gambar N.1. Normality Test Tebal Outersheath Hasil Pengukuran Loup

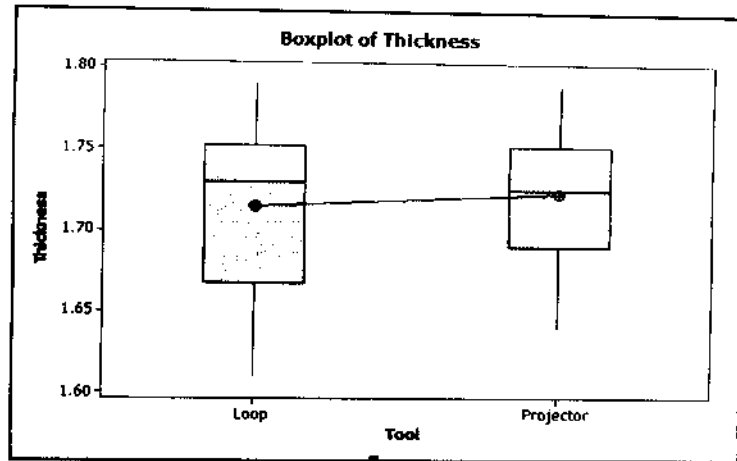


Gambar N.2. Normality Test Tebal Outersheath Hasil Pengukuran Profile Projector



Gambar N.3. Equal Variances Test Tebal Outersheath Hasil Pengukuran Loup dan Profile Projector





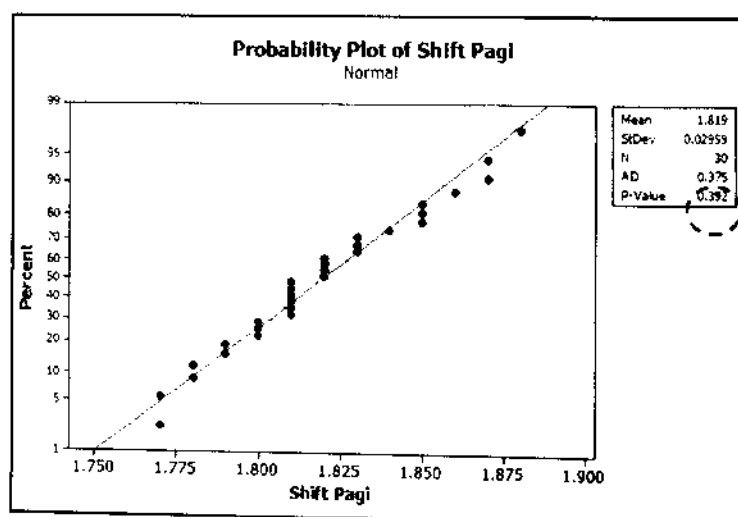
Gambar N.4. Two Sample T-Test Tebal Outersheath Hasil Pengukuran Loop dan Profile Projector

Lampiran O – Hypothesis Testing Faktor Environment (Waktu Kerja)

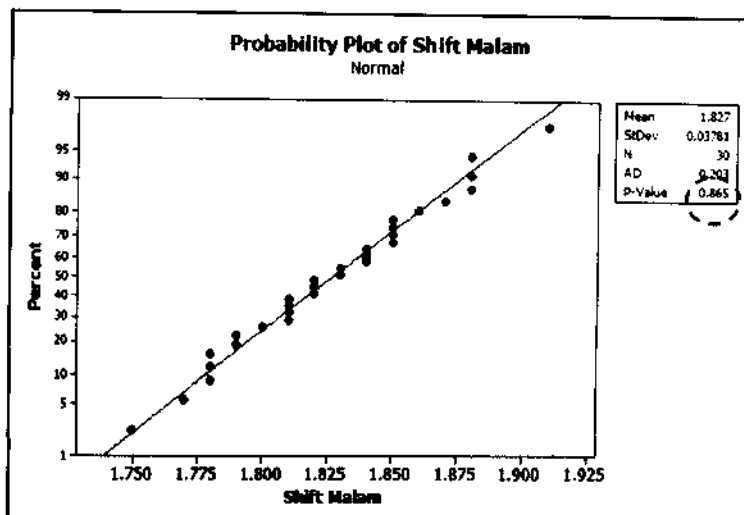
Faktor *environment* yang diteliti dalam hal ini adalah waktu kerja yang berbeda antara operator. Lini produksi pada perusahaan ini beroperasi secara bergantian yang terdiri dari tiga shift yang mana masing-masing shift bekerja selama delapan jam. Pengumpulan data dilakukan untuk kabel yang sama yang mana waktu pengerjaannya dibagi ke dalam dua bagian yaitu pagi (data jam 06.00 – 18.00) dan malam (18.00 – 06.00).

Tabel O.1. Data tebal *outersheath* (mm) shift pagi dan malam

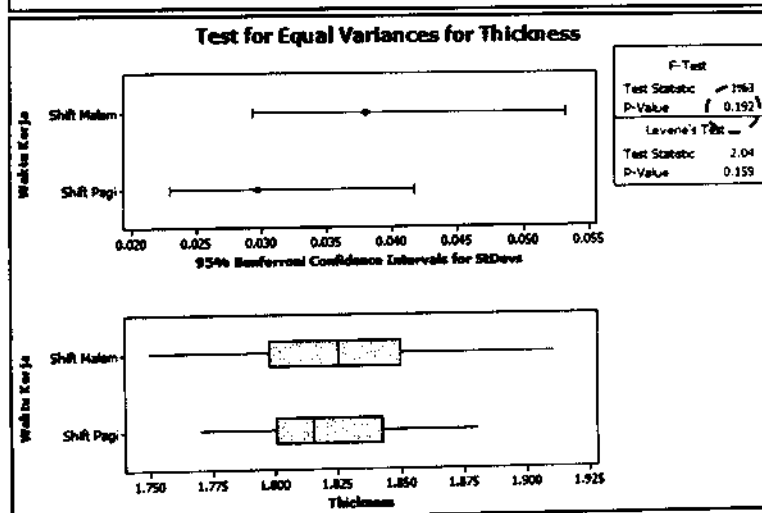
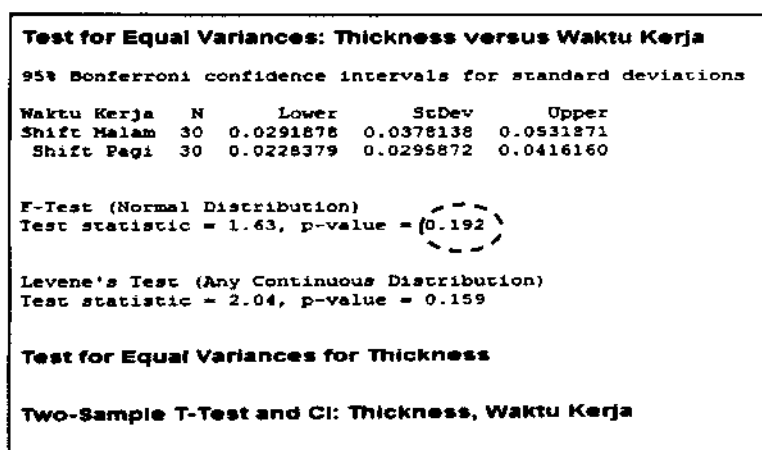
| Sample | Waktu Kerja | | Sample | Waktu Kerja | |
|--------|-------------|-------|--------|-------------|-------|
| | Pagi | Malam | | Pagi | Malam |
| 1 | 1.82 | 1.88 | 16 | 1.83 | 1.82 |
| 2 | 1.81 | 1.82 | 17 | 1.83 | 1.81 |
| 3 | 1.82 | 1.91 | 18 | 1.83 | 1.80 |
| 4 | 1.85 | 1.81 | 19 | 1.85 | 1.84 |
| 5 | 1.85 | 1.84 | 20 | 1.80 | 1.85 |
| 6 | 1.81 | 1.82 | 21 | 1.79 | 1.79 |
| 7 | 1.88 | 1.81 | 22 | 1.80 | 1.75 |
| 8 | 1.86 | 1.78 | 23 | 1.80 | 1.85 |
| 9 | 1.81 | 1.87 | 24 | 1.82 | 1.88 |
| 10 | 1.77 | 1.77 | 25 | 1.78 | 1.85 |
| 11 | 1.84 | 1.78 | 26 | 1.87 | 1.88 |
| 12 | 1.87 | 1.78 | 27 | 1.81 | 1.86 |
| 13 | 1.81 | 1.85 | 28 | 1.81 | 1.81 |
| 14 | 1.79 | 1.79 | 29 | 1.77 | 1.83 |
| 15 | 1.82 | 1.83 | 30 | 1.78 | 1.84 |



Gambar O.1. Normality Test Tebal *Outersheath* Hasil Shift Pagi



Gambar O.2. Normality Test Tebal Outersheath Hasil Shift Malam



Gambar O.3. Equal Variances Test Tebal Outersheath Hasil Proses Shift Pagi dan Shift Malam

Two-Sample T-Test and CI: Thickness, Waktu Kerja

Two-sample T for Thickness

| Waktu Kerja | N | Mean | StDev | SE Mean |
|-------------|----|--------|--------|---------|
| Shift Malam | 30 | 1.8267 | 0.0378 | 0.0069 |
| Shift Pagi | 30 | 1.8193 | 0.0296 | 0.0054 |

Difference = μ (Shift Malam) - μ (Shift Pagi)

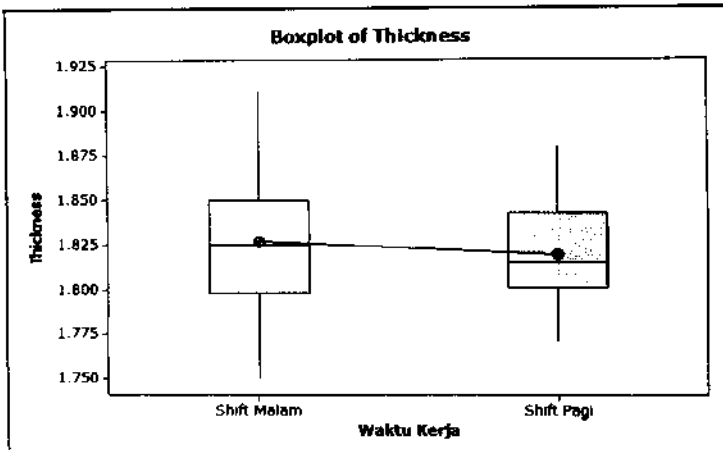
Estimate for difference: 0.00733

95% CI for difference: (-0.01021, 0.02488)

T-Test of difference = 0 (vs not =): T-Value = 0.84 P-Value = 0.406 DF = 58

Both use Pooled StDev = 0.0340

Boxplot of Thickness



Gambar O.4. Two Sample T-Test Tebal Outersheath Hasil Proses Shift Pagi dan Shift Malam.