



LAMPIRAN

Lampiran 1. Hasil uji komposisi *raw material*



PT. ITOKOH CEPERINDO
Stainless Steel & Alloy Steel Casting



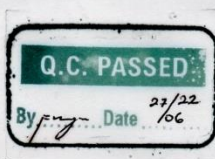
COMPANY : PT. ITOKOH CEPERINDO
 SAMPLE NAME : Fe
 CUSTOMER : Sdr. Ismail, Risky K. Rep W.
 FURNACE : AF2730C02/56
 OPERATOR : WENDY
 DATE / TIME : 27-JUN-2022 10:44:21
 TASK : Conc_Fei METHOD : FEGLFE

| | Fe | S | Al | C | Ni | Nb | Si |
|-----|---------|---------|---------|---------|---------|---------|---------|
| 1 | 98.8642 | 0.0197 | -0.0015 | 0.1908 | 0.0404 | 0.0033 | 0.1433 |
| 2 | 98.8449 | 0.0205 | -0.0025 | 0.1953 | 0.0521 | 0.0035 | 0.1458 |
| AVG | 98.8645 | 0.0201 | -0.0020 | 0.1930 | 0.0463 | 0.0034 | 0.1446 |
| SD | 0.02780 | 0.00059 | 0.00067 | 0.00319 | 0.00829 | 0.00009 | 0.00183 |
| SD% | 0.03 | 2.92 | 33.50 | 1.65 | 17.90 | 2.70 | 1.27 |

| | Cr | V | Mn | Mo | W | P | Cu |
|-----|---------|---------|---------|---------|---------|---------|---------|
| 1 | 0.1460 | 0.0042 | 0.3991 | 0.0056 | 0.0057 | 0.0261 | 0.0924 |
| 2 | 0.1599 | 0.0043 | 0.3976 | 0.0058 | 0.0060 | 0.0268 | 0.0973 |
| AVG | 0.1525 | 0.0042 | 0.3984 | 0.0057 | 0.0059 | 0.0265 | 0.0949 |
| SD | 0.00916 | 0.00009 | 0.00105 | 0.00017 | 0.00022 | 0.00049 | 0.00347 |
| SD% | 6.01 | 2.19 | 0.26 | 2.89 | 3.69 | 1.82 | 3.65 |

| | Ti | N | B | Pb | Sb | Ca | Mg |
|-----|---------|---------|---------|---------|---------|---------|---------|
| 1 | 0.0007 | 0.0001 | 0.0005 | 0.0018 | 0.0038 | 0.0006 | 0.0001 |
| 2 | 0.0007 | 0.0001 | 0.0006 | 0.0017 | 0.0045 | 0.0006 | 0.0001 |
| AVG | 0.0007 | 0.0001 | 0.0005 | 0.0018 | 0.0041 | 0.0006 | 0.0001 |
| SD | 0.00001 | 0.00000 | 0.00003 | 0.00009 | 0.00045 | 0.00004 | 0.00000 |
| SD% | 0.89 | 0.00 | 6.27 | 5.34 | 10.96 | 6.74 | 0.00 |

| | Zn | Co |
|-----|---------|---------|
| 1 | 0.0353 | 0.0060 |
| 2 | 0.0366 | 0.0062 |
| AVG | 0.0359 | 0.0061 |
| SD | 0.00087 | 0.00019 |
| SD% | 2.43 | 3.18 |




INDONESIA OFFICE & FACTORY : Jl. KH. Hasyim As'ari By Pass Selatan Klaten 57417, Jateng - Indonesia
 Phone : (0272) 324208, 324038, Fax. (324213), E-mail : itokohci@indosat.net.id


JAPAN OFFICE : 3-22-2 Motogo, Kawaguchi City, Saitama, Japan
 Phone : 81 482 248 401, Fax : 81 482 242070

Sumber : PT. ITOKOH CEPERINDO.

Lampiran 2. Hasil uji komposisi *weld metal*



PT. ITOKOH CEPERINDO
Stainless Steel & Alloy Steel Casting




COMPANY : PT. ITOKOH CEPERINDO
 SAMPLE NAME : BAJA KARBON
 CUSTOMER : Sdr Peo W. Risky, Ismail
 FURNACE : AL2009F01/46
 OPERATOR : FIYAN
 DATE / TIME : 20-DEC-2022 13:32:26
 TASK : Cond_Fei METHOD : FEGLFE

| | Fe | S | Al | C | Ni | Nb | Si |
|-----|---------|---------|---------|---------|---------|---------|---------|
| 1 | 98.9071 | 0.0202 | 0.0007 | 0.1915 | 0.0363 | 0.0016 | 0.1468 |
| 2 | 98.9823 | 0.0193 | 0.0003 | 0.1776 | 0.0326 | 0.0021 | 0.1461 |
| AVG | 98.9447 | 0.0198 | 0.0005 | 0.1846 | 0.0344 | 0.0019 | 0.1464 |
| SD | 0.05320 | 0.00066 | 0.00030 | 0.00556 | 0.00265 | 0.00033 | 0.00046 |
| SD% | 0.05 | 3.36 | 55.86 | 5.35 | 7.68 | 17.32 | 0.31 |

| | Cr | V | Mn | Mo | W | P | Cu |
|-----|---------|---------|---------|---------|---------|---------|---------|
| 1 | 0.1321 | 0.0047 | 0.3884 | 0.0063 | 0.0060 | 0.0280 | 0.0845 |
| 2 | 0.1143 | 0.0060 | 0.3615 | 0.0052 | 0.0045 | 0.0273 | 0.0760 |
| AVG | 0.1232 | 0.0053 | 0.3749 | 0.0058 | 0.0052 | 0.0277 | 0.0802 |
| SD | 0.01257 | 0.00094 | 0.01901 | 0.00078 | 0.00104 | 0.00050 | 0.00599 |
| SD% | 10.21 | 17.70 | 5.07 | 13.50 | 19.77 | 1.75 | 7.47 |

| | Ti | N | B | Pb | Sb | Ca | Mg |
|-----|---------|---------|---------|---------|---------|---------|---------|
| 1 | 0.0013 | 0.0001 | 0.0009 | 0.0007 | 0.0016 | 0.0005 | 0.0001 |
| 2 | 0.0032 | 0.0001 | 0.0006 | 0.0002 | 0.0013 | 0.0005 | 0.0001 |
| AVG | 0.0023 | 0.0001 | 0.0007 | 0.0005 | 0.0014 | 0.0005 | 0.0001 |
| SD | 0.00134 | 0.00000 | 0.00020 | 0.00034 | 0.00019 | 0.00003 | 0.00000 |
| SD% | 56.83 | 0.00 | 27.33 | 69.91 | 13.33 | 5.58 | 0.00 |

| | Zn | Co |
|-----|---------|---------|
| 1 | 0.0339 | 0.0057 |
| 2 | 0.0282 | 0.0052 |
| AVG | 0.0311 | 0.0055 |
| SD | 0.00403 | 0.00032 |
| SD% | 12.86 | 5.83 |



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 Phone : 81 482 248 401, Fax : 81 482 242070

Sumber : PT. ITOKOH CEPERINDO.

Lampiran 3. Hasil uji Ketangguhan Impact



LABORATORIUM BAHAN TEKNIK
DEPARTEMEN TEKNIK MESIN SEKOLAH VOKASI
UNIVERSITAS GADJAH MADA

HASIL PENGUJIAN IMPACT

| No. | Variasi Arus | Sudut α (°) | Energi (J) | Sudut β (°) | Energi Terserap (J) | Luas (mm ²) | Harga Impact (J/mm ²) |
|-----|--------------|-----------------------|---------------|----------------------|------------------------|----------------------------|--------------------------------------|
| 1 | Raw_1 | 151 | 300 | 125.00 | 48.2 | 47.3 | 1.019 |
| 2 | Raw_2 | 151 | 300 | 127.00 | 43.6 | 45.0 | 0.969 |
| 3 | Raw_3 | 151 | 300 | 127.00 | 43.6 | 47.6 | 0.918 |
| 4 | 80A_1 | 151 | 300 | 134.00 | 28.8 | 46.4 | 0.620 |
| 5 | 80A_2 | 151 | 300 | 131.00 | 35.0 | 53.8 | 0.650 |
| 6 | 80A_3 | 151 | 300 | 131.00 | 35.0 | 48.0 | 0.728 |
| 7 | 90A_1 | 151 | 300 | 131.00 | 35.0 | 49.2 | 0.711 |
| 8 | 90A_2 | 151 | 300 | 132.00 | 32.9 | 46.3 | 0.712 |
| 9 | 90A_3 | 151 | 300 | 131.00 | 35.0 | 45.4 | 0.772 |
| 10 | 100A_1 | 151 | 300 | 133.00 | 30.9 | 48.1 | 0.642 |
| 11 | 100A_2 | 151 | 300 | 132.00 | 32.9 | 43.2 | 0.762 |
| 12 | 100A_3 | 151 | 300 | 128.00 | 41.5 | 44.7 | 0.928 |

Lembar asli, tidak untuk digandakan

Keterangan :

1. Menggunakan metode Charpy
2. Standar benda uji mengacu ASTM E23
3. Panjang lengan 0,8 meter
4. Berat palu 20 kilogram
5. Pengujian dilakukan pada tanggal 26 November 2022

Yogyakarta, 26 November 2022
Staf Laboratorium Bahan Teknik



Dr. Lilik Dwi Setyana, S.T.ⁱⁿ M.T
NIP. 197703312002121002

Kampus : Jl. Grafika 2A Yogyakarta 55281

Sumber : Laboratorium Bahan Teknik Mesin Vokasi UGM.

Lampiran 4. Hasil uji *Bending*



LABORATORIUM BAHAN TEKNIK DEPARTEMEN TEKNIK MESIN SEKOLAH VOKASI UNIVERSITAS GADJAH MADA

HASIL PENGUJIAN BENDING

| No. | Variasi Arus | Tebal (mm) | Lebar (mm) | Pmax (KN) | Defleksi (mm) | Tegangan Bending (MPa) |
|-----|--------------|------------|------------|-----------|---------------|------------------------|
| 1 | Raw_1 | 5.44 | 20.7 | 5.96 | 25.86 | 583.75 |
| 2 | Raw_2 | 5.46 | 21.22 | 6.13 | 26.47 | 581.41 |
| 3 | Raw_3 | 5.46 | 21.21 | 6.37 | 27.19 | 604.46 |
| 4 | 80A_1 | 5.67 | 21.20 | 6.45 | 17.72 | 567.82 |
| 5 | 80A_2 | 5.57 | 22.34 | 9.66 | 18.99 | 836.25 |
| 6 | 80A_3 | 5.67 | 20.95 | 7.34 | 19.69 | 653.88 |
| 7 | 90A_1 | 5.58 | 21.25 | 7.87 | 20.09 | 713.67 |
| 8 | 90A_2 | 5.89 | 20.24 | 7.90 | 19.53 | 675.05 |
| 9 | 90A_3 | 5.71 | 20.45 | 7.76 | 18.93 | 698.31 |
| 10 | 100A_1 | 5.94 | 20.39 | 8.35 | 19.14 | 696.38 |
| 11 | 100A_2 | 5.58 | 20.29 | 7.52 | 18.56 | 714.20 |
| 12 | 100A_3 | 5.53 | 20.55 | 8.15 | 19.47 | 778.12 |

Keterangan:

1. Pengujian dilakukan tanggal 26 November 2022
2. Pengujian menggunakan Universal Testing Machine
3. Standar spesimen menggunakan ASTM E190

Yogyakarta, 26 November 2022
Staf Laboratorium Bahan Teknik



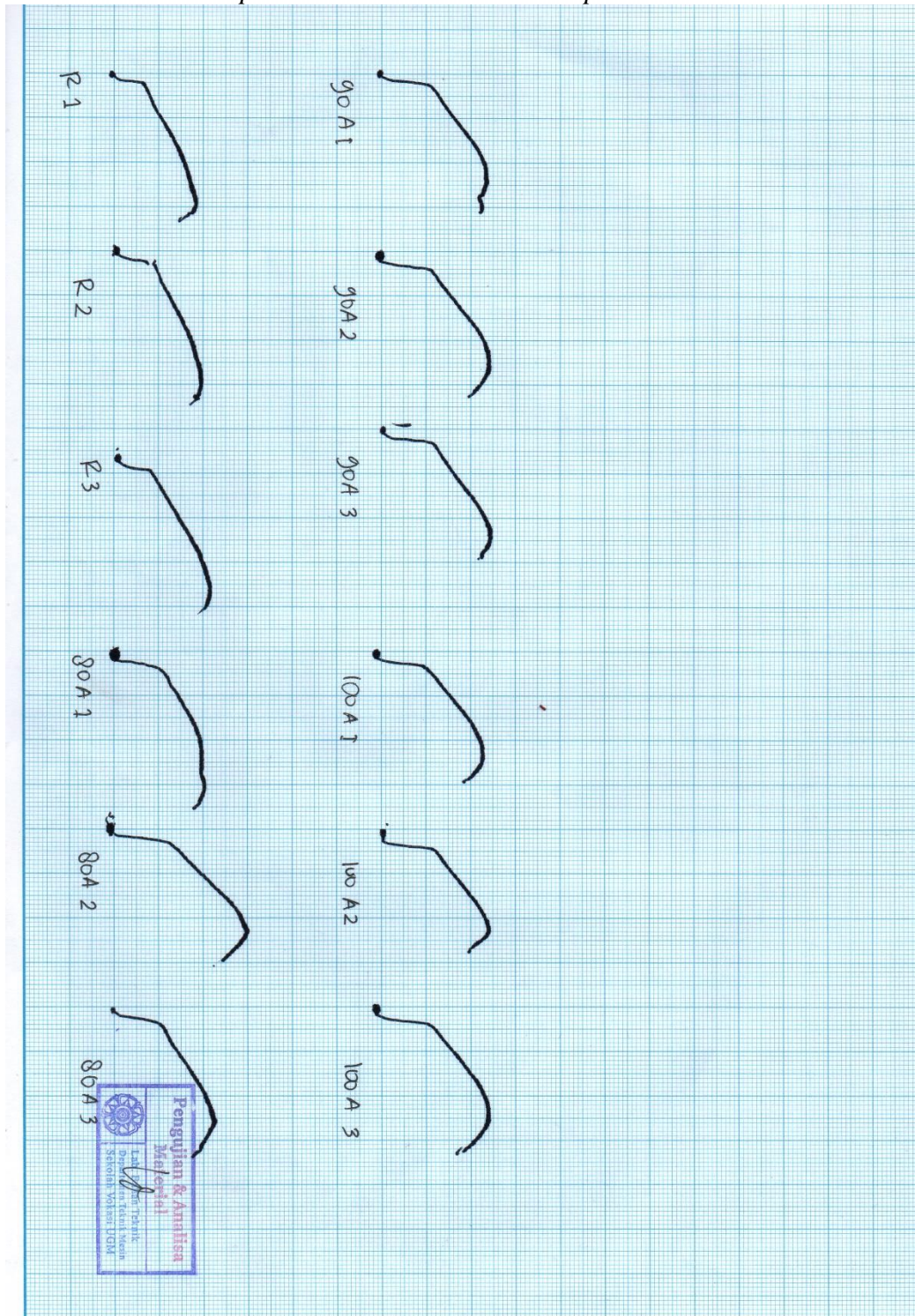
Dr. Luk Dwi Setyana, S.T., M.T.
NIP. 197703312002121002

Lembar asli, tidak untuk digandakan

Kampus : Jl. Grafika 2A Yogyakarta 55281

Sumber : Laboratorium Bahan Teknik Mesin Vokasi UGM.

Lampiran 5. Grafik Hasil uji *Bending Raw Material*, *Heat Input 762 Joule/mm*, *Heat Input 767 Joule/mm* dan *Heat Input 764 Joule/mm*



Sumber : Laboratorium Bahan Teknik Mesin Vokasi UGM.