



**PT. ITOKOH CEPERINDO**  
Stainless Steel & Alloy Steel Casting



COMPANY : PT. ITOKOH CEPERINDO  
SAMPLE NAME : BESI PIPE  
CUSTOMER : MUHAMAR UNWAHA3  
FURNACE : WF0449B01/20  
OPERATOR : AJI  
DATE / TIME : 04-JUN-2018 10:15:02  
TASK : Conc\_Fei METHOD : FEGLFE

|     | Fe      | S       | Al      | C       | Ni      | Nb      | Si      | Cr      | V     |
|-----|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| 1   | 98.5168 | 0.0182  | -0.0052 | 0.1729  | 0.0081  | -0.0002 | 0.2218  | 0.0217  | 0.001 |
| 2   | 98.5167 | 0.0168  | -0.0055 | 0.1632  | 0.0077  | -0.0000 | 0.2198  | 0.0213  | 0.001 |
| AVG | 98.5167 | 0.0175  | -0.0054 | 0.1681  | 0.0079  | -0.0001 | 0.2208  | 0.0215  | 0.001 |
| SD  | 0.00005 | 0.00099 | 0.00016 | 0.00690 | 0.00027 | 0.00010 | 0.00145 | 0.00030 | 0.000 |
| SD% | 0.00    | 5.67    | 3.04    | 4.11    | 3.58    | 108.71  | 0.66    | 1.40    | 2.95  |

|     | Mn      | Mo      | W       | P       | Cu      | Ti      | N       | B       | Pb    |
|-----|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| 1   | 0.8525  | -0.0009 | 0.0005  | 0.0390  | 0.0069  | 0.0008  | 0.1407  | 0.0005  | -0.00 |
| 2   | 0.8639  | -0.0011 | 0.0009  | 0.0316  | 0.0068  | 0.0007  | 0.1447  | 0.0005  | -0.00 |
| AVG | 0.8582  | -0.0010 | 0.0007  | 0.0323  | 0.0068  | 0.0008  | 0.1427  | 0.0005  | -0.00 |
| SD  | 0.00805 | 0.00010 | 0.00028 | 0.00098 | 0.00007 | 0.00001 | 0.00281 | 0.00000 | 0.000 |
| SD% | 0.94    | 9.70    | 42.50   | 3.03    | 0.99    | 1.17    | 1.97    | 0.70    | 12.73 |

|     | Sb      | Ca      | Hg      | Sn      | Co      |
|-----|---------|---------|---------|---------|---------|
| 1   | 0.0042  | -0.0001 | -0.0011 | 0.0006  | 0.0018  |
| 2   | 0.0043  | -0.0004 | -0.0011 | 0.0006  | 0.0018  |
| AVG | 0.0043  | -0.0002 | -0.0011 | 0.0006  | 0.0018  |
| SD  | 0.00011 | 0.00020 | 0.00005 | 0.00000 | 0.00002 |
| SD% | 2.53    | 79.96   | 4.64    | 0.50    | 1.34    |



**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



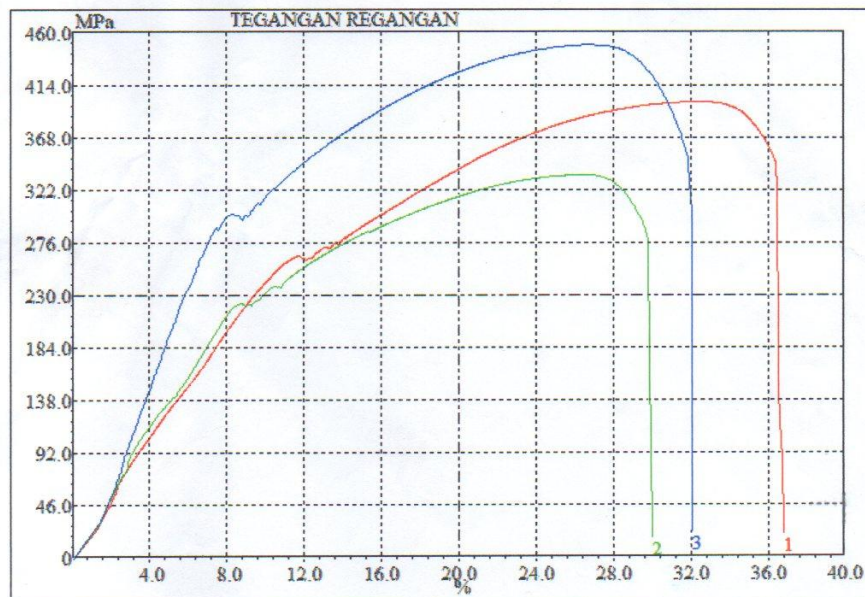
Laboratorium  
**Material Teknik**  
JURUSAN TEKNIK MESIN FAKULTAS TEKNIK  
UNIVERSITAS WAHID HASYIM

Nama : AFIFUDIN  
Instansi : Unwahis

Bahan : Pipa Baja Karbon Rendah  
Standard : ASME -IX

#### HASIL PENGUJIAN TARIK

| No | Material | Area<br>mm <sup>2</sup> | Yield Point<br>N | Yield Stress<br>MPa | Max. Load<br>N | Max. Stress<br>MPa | Break<br>N | Break<br>MPa | Extension<br>mm | Elongation<br>% |
|----|----------|-------------------------|------------------|---------------------|----------------|--------------------|------------|--------------|-----------------|-----------------|
| 1  | Raw      | 39.200                  | 14119.758        | 360.198             | 15670.873      | 399.767            | 773.197    | 19.724       | 25.188          | 36.770          |
| 2  | Raw      | 39.200                  | 9324.567         | 237.872             | 13155.799      | 335.607            | 655.459    | 16.721       | 20.513          | 29.945          |
| 3  | Raw      | 39.200                  | 15891.892        | 405.405             | 17624.601      | 449.607            | 850.915    | 21.707       | 21.938          | 32.026          |



Semarang, 19-07-2018  
Kepala Laboratorium

Helmy Purwanto, ST., MT  
NPP. 05.01.1.0060

Tested By : Nur Kholis, ST  
NPP. 02.14.0.0303

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Jl. Mamanreh Tengah X/22, Sampangan Semarang 50276  
Telp. +62 24 8505680 (ext. 160), Fax: +62 24 8505681, www.teknik.unwahis.ac.id



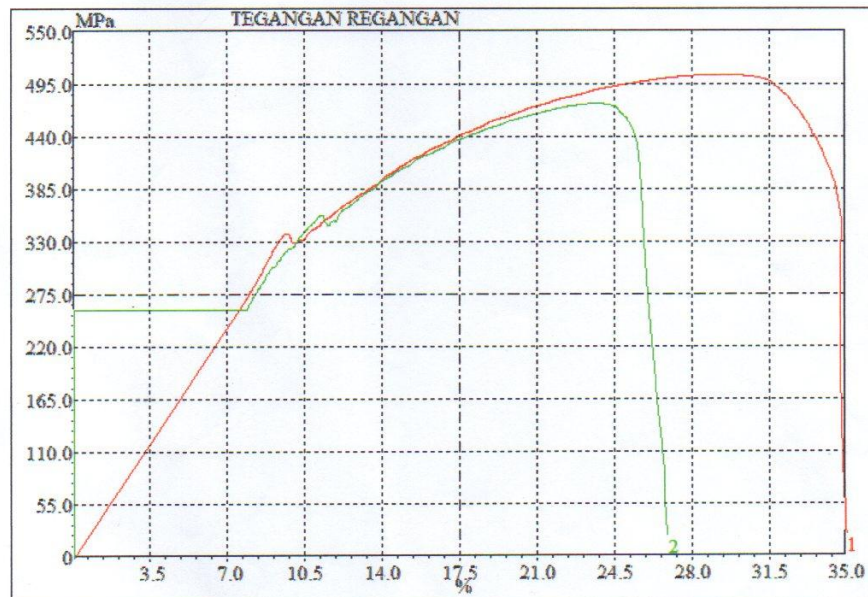
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JURUSAN TEKNIK MESIN FAKULTAS TEKNIK  
UNIVERSITAS WAHID HASYIM

Nama : Afifudin  
Instansi : Unwahas

Bahan : tanpa perlakuan  
Standard : ASME -IX

#### HASIL PENGUJIAN TARIK

| No | Material | Area<br>mm <sup>2</sup> | Yield Point<br>N | Yield Stress<br>MPa | Max. Load<br>N | Max. Stress<br>MPa | Break<br>N | Break<br>MPa | Extension<br>mm | Elongation<br>% |
|----|----------|-------------------------|------------------|---------------------|----------------|--------------------|------------|--------------|-----------------|-----------------|
| 1  | tanpa pe | 39.200                  | 17946.604        | 457.822             | 19788.585      | 504.811            | 894.959    | 22.831       | 23.950          | 34.964          |
| 2  | tanpa pe | 39.200                  | 14016.903        | 357.574             | 18616.280      | 474.905            | 841.742    | 21.473       | 18.413          | 26.880          |



Semarang, 05-09-2018  
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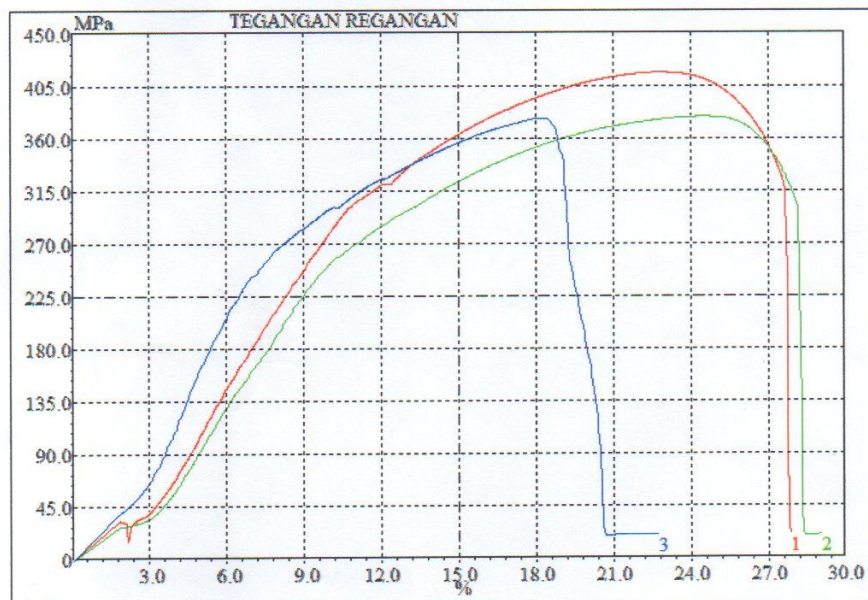
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UNIVERSITAS WAHID HASYIM

Nama : AFIFUDUN  
Instansi : Unwahas

Bahan : pipa baja karbon rendah  
Standard : ASME -IX

#### HASIL PENGUJIAN TARIK

| No | Material | Area<br>mm <sup>2</sup> | Yield Point<br>N | Yield Stress<br>MPa | Max. Load<br>N | Max. Stress<br>MPa | Break<br>N | Break<br>MPa | Extension<br>mm | Elongation<br>% |
|----|----------|-------------------------|------------------|---------------------|----------------|--------------------|------------|--------------|-----------------|-----------------|
| 1  | TEMP     | 39.200                  | 12566.161        | 320.565             | 16334.700      | 416.702            | 816.551    | 20.830       | 19.050          | 27.810          |
| 1  | TEMP     | 39.200                  | 11914.728        | 303.947             | 14858.120      | 379.034            | 791.401    | 20.189       | 19.875          | 29.015          |
| 1  | TEMP     | 39.200                  | 11826.926        | 301.707             | 14805.153      | 377.682            | 811.183    | 20.693       | 15.563          | 22.719          |



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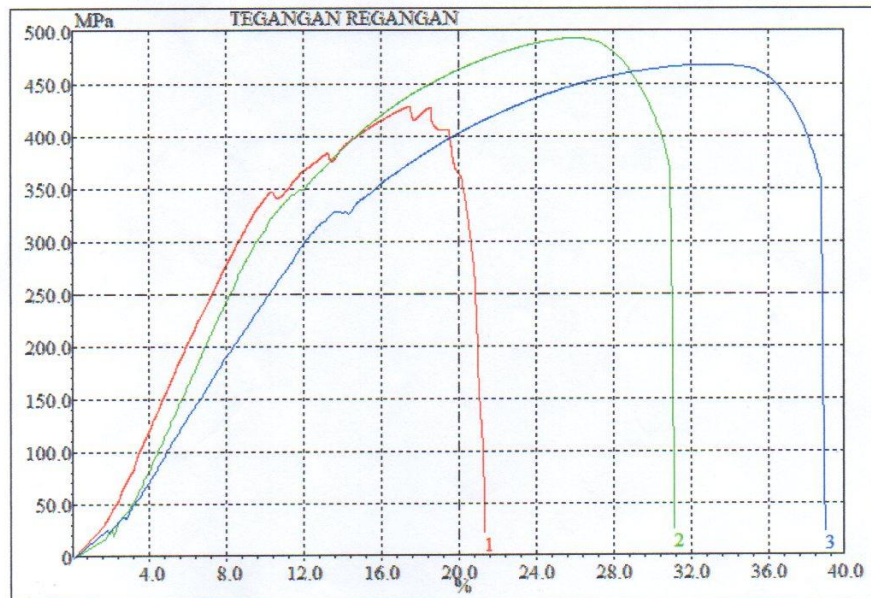
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|----|----------|-------------------------|------------------|---------------------|----------------|--------------------|------------|--------------|-----------------|-----------------|
| 1  | TEMP     | 39.200                  | 13625.788        | 347.597             | 16804.776      | 428.693            | 836.995    | 21.352       | 14.588          | 21.296          |
| 1  | TEMP     | 39.200                  | 13717.067        | 349.925             | 19349.773      | 493.617            | 962.137    | 24.544       | 21.300          | 31.095          |
| 1  | TEMP     | 39.200                  | 12896.905        | 329.003             | 18354.060      | 468.216            | 899.184    | 22.938       | 26.638          | 38.887          |



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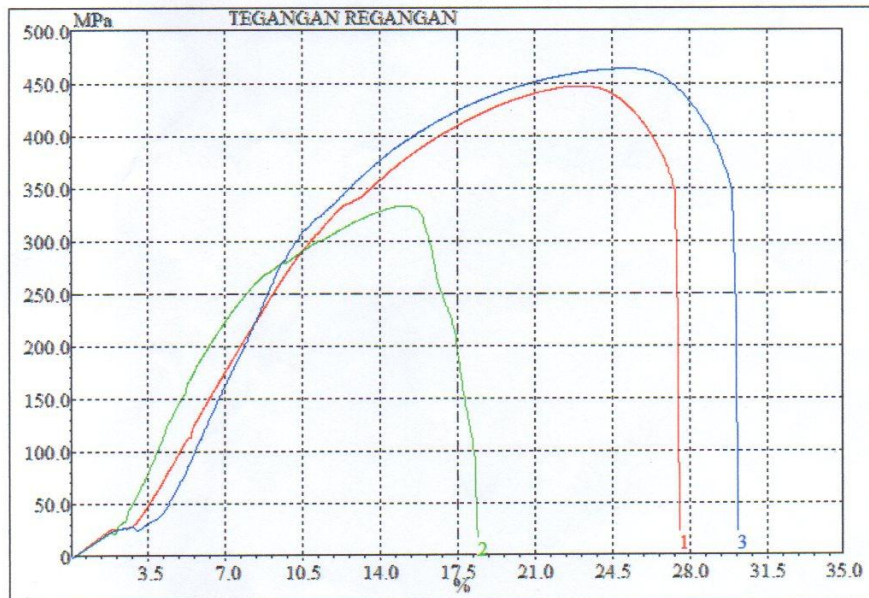
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|----|---------------|-------------------------|------------------|---------------------|----------------|--------------------|------------|--------------|-----------------|-----------------|
| 1  | TEMP : 39.200 | 15825.100               | 15825.100        | 403.702             | 17543.417      | 447.536            | 873.817    | 22.291       | 18.850          | 27.518          |
| 1  | TEMP : 39.200 | 10997.798               | 10997.798        | 280.556             | 13070.582      | 333.433            | 652.541    | 16.646       | 12.575          | 18.358          |
| 1  | TEMP : 39.200 | 16420.734               | 16420.734        | 418.896             | 18204.835      | 464.409            | 905.798    | 23.107       | 20.638          | 30.128          |



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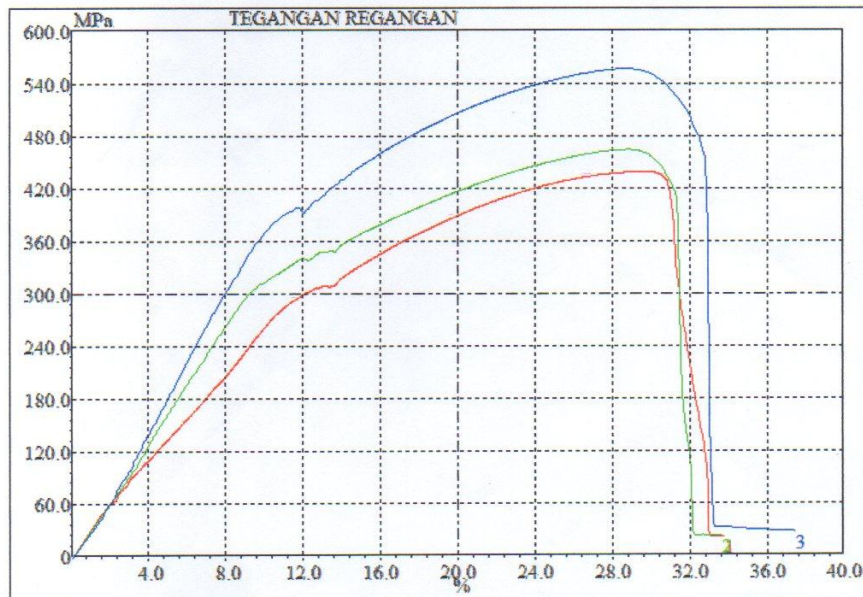
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|----|---------------|-------------------------|------------------|---------------------|----------------|--------------------|------------|--------------|-----------------|-----------------|
| 1  | TEMP : 39.200 | 12111.648               | 308.971          | 17222.989           | 439.362        | 861.139            | 21.968     | 23.138       | 33.777          |                 |
| 1  | TEMP : 39.200 | 13371.602               | 341.112          | 18218.544           | 464.759        | 910.912            | 23.238     | 23.038       | 33.631          |                 |
| 1  | TEMP : 39.200 | 15619.545               | 398.458          | 21835.149           | 557.019        | 1091.652           | 27.848     | 25.650       | 37.445          |                 |



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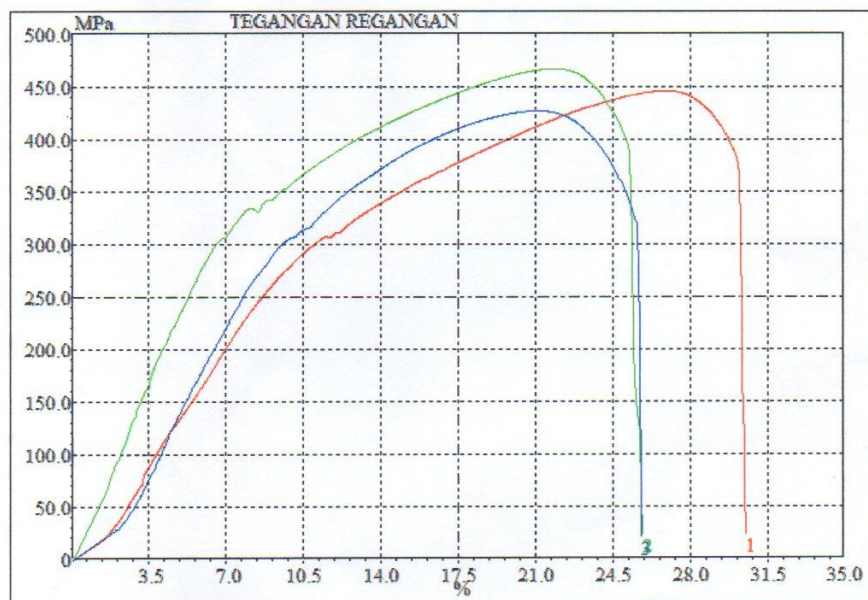
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|----|---------------|-------------------------|------------------|---------------------|----------------|--------------------|------------|--------------|-----------------|-----------------|
| 1  | TEMP ( 39.200 | 14517.402               | 370.342          | 17497.564           | 446.366        | 873.387            | 22.280     | 20.888       | 30.493          |                 |
| 1  | TEMP ( 39.200 | 13107.857               | 334.384          | 18312.722           | 467.161        | 913.234            | 23.297     | 17.675       | 25.803          |                 |
| 1  | TEMP ( 39.200 | 12045.563               | 307.285          | 16750.470           | 427.308        | 817.204            | 20.847     | 17.625       | 25.730          |                 |



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