Lampiran 1

Rumus perhitungan uji tarik

1. Perhitungan luas penampang

   $Ao = t \times I$

   Dimana :

   Ao = Luas Penampang (mm^2)

   t = Tinggi benda uji (mm)

   I = Lebar benda uji (mm)

2. Perhitungan *yield point*

   $P_y = \frac{ty \; x \; 1 \; mm}{100} P.max$

   Dimana :

   P_y = yield point

   t_y = tinggi yield point (mm)

   P.max = Beban maximun yang diberikan (kg)

3. Perhitungan Tegangan luluh

   $\sigma_y = \frac{Py}{Ao}$

4. Perhitungan Keuletan (Regangan)

   $E = \frac{Lf \; x \; Lo}{Lo} 100 \; \%$

   Dimana

   e = Regangan (%)

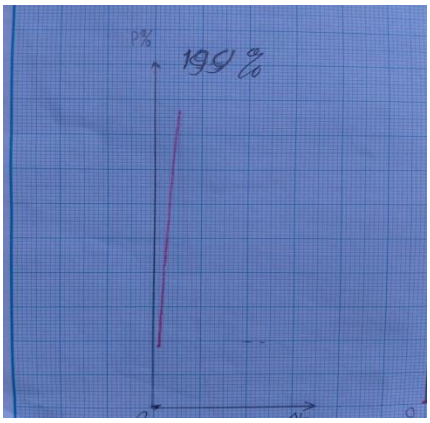
   Lf = Panjang akhir spesimem (mm)

   Lo = panjang awal spesimem (mm)

Lampiran 2

Perhitungan hasil pengujian untuk spesimen uji tarik pada variasi suhu cetakan 450 ^{0}C.

Kode spesimen B450-a



1. Perhitungan Luas penampang

   Ao = 104.96 mm^2

2. Perhitungan yield point

   $P_y = \frac{87\ x\ 1\ mm}{100} 10000$ kg

   = 8700 kg

3. Perhitungan tegangan luluh

   $\sigma_y = \frac{8700\ \text{kg}}{104{,}96\ \text{mm}}$

   = 82,88 kg/mm^2

   = 82,88 kg/mm^2 x 9,8 m/s^2

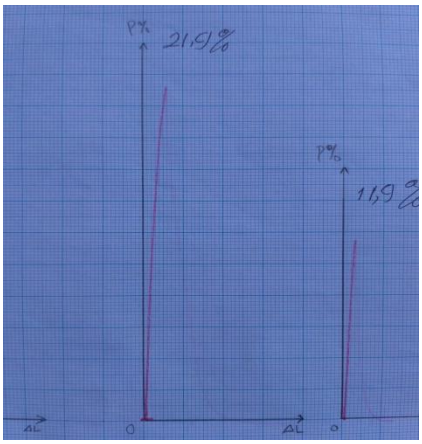
   = 812,22 N/mm^2

4. Perhitungan keuletan / Regangan

   $\varepsilon = \frac{50{,}20\ mm - 50{,}00\ mm}{50{,}00\ mm} 100$ %

   = 0,4 %

Kode spesimen B450-b



1. Perhitungan Luas penampang

   Ao = 104.96 mm^2

2. Perhitungan yield point

   $P_y = \frac{106\ x\ 1\ mm}{100} 10000$ kg

   = 10600 kg

3. Perhitungan tegangan luluh

   $\sigma_y = \frac{10600\ kg}{104{,}96\ mm}$

   = 100,99 kg/mm^2

   = 100,99 kg/mm^2 x 9,8 m/s^2

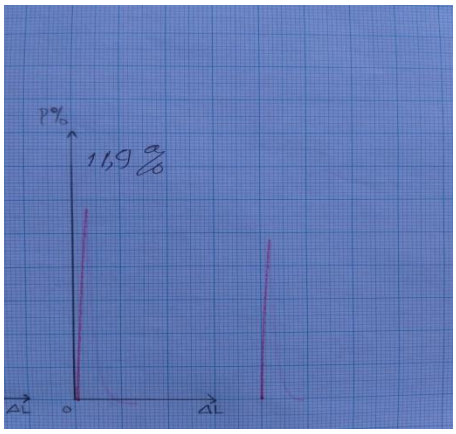
   = 989,70 N/mm^2

4. Perhitungan keuletan / Regangan

   $\varepsilon = \frac{50{,}30\ mm - 50{,}00\ mm}{50{,}00\ mm} 100\ \%$

   = 0,6%

Kode spesimen B450-c



1. Perhitungan Luas penampang

   Ao = 104.96 mm^2

2. Perhitungan yield point

   $P_y = \frac{57\ x\ 1\ mm}{100} 10000$ kg

   = 5700 kg

3. Perhitungan tegangan luluh

   $\sigma_y = \frac{5700\ kg}{104{,}96\ mm}$

   = 53,30 kg/mm^2

   = 53,30 kg/mm^2 x 9,8 m/s^2

   = 522,34 N/mm^2

4. Perhitungan keuletan / Regangan

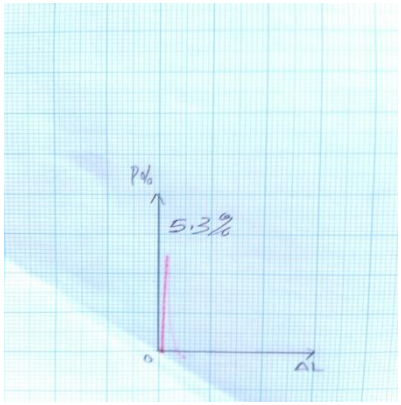
   $\varepsilon = \frac{50{,}10\ mm - 50{,}00\ mm}{50{,}00\ mm} 100\ \%$

   = 0,2%

Lampiran 3

Perhitungan hasil pengujian untuk spesimen uji tarik pada variasi suhu cetakan 500 ^{0}C.

Kode spesimen : B500-a



1. Perhitungan Luas penampang

   Ao = 104.96 mm^2

2. Perhitungan yield point

   $P_y = \frac{25\ mm\ x\ 1\ mm}{100} 10000$ kg

   = 2500 kg

3. Perhitungan tegangan luluh

   $\sigma_y = \frac{2500\ \text{kg}}{104{,}96\ \text{mm}}$

   = 23,81 kg/mm^2

   = 23,81 kg/mm^2 x 9,8 m/s^2

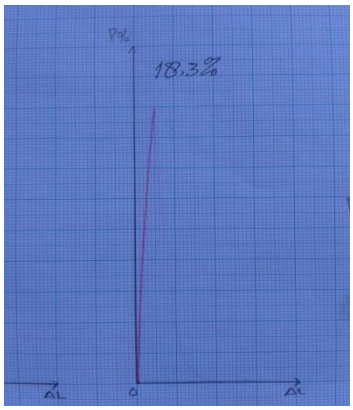
   = 233,33 N/mm^2

4. Perhitungan keuletan / Regangan

   $\varepsilon = \frac{50{,}40\ mm - 50{,}00\ mm}{50{,}00\ mm} 100$ %

   = 0,8 %

Kode spesimen : B500-b



1. Perhitungan Luas penampang

   Ao = 104.96 mm^2

2. Perhitungan yield point

   $P_y = \frac{90\ mm\ x\ 1\ mm}{100} 10000$ kg

   = 9000 kg

3. Perhitungan tegangan luluh

   $\sigma_y = \frac{9000\ kg}{104{,}96\ mm}$

   = 85,74 kg/mm^2

   = 85,74 kg/mm^2 x 9,8 m/s^2

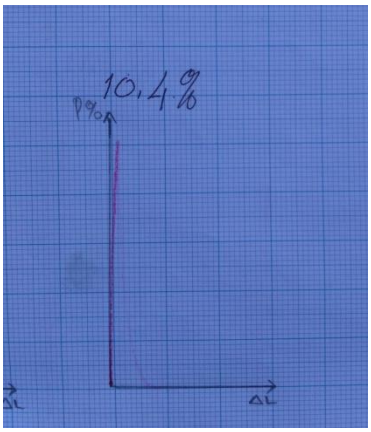
   = 840,25 N/mm^2

4. Perhitungan keuletan / Regangan

   $\varepsilon = \frac{50{,}20\ mm - 50{,}00\ mm}{50{,}00\ mm} 100\ \%$

   = 0,4 %

Kode spesimen : B500-c



1. Perhitungan Luas penampang

   Ao = 104.96 mm^2

2. Perhitungan yield point

   $P_y = \frac{51\ mm\ x\ 1\ mm}{100} 10000$ kg

   = 5100 kg

3. Perhitungan tegangan luluh

   $\sigma_y = \frac{5100\ kg}{104{,}96\ mm}$

   = 48,58 kg/mm^2

   = 48,58 kg/mm^2 x 9,8 m/s^2

   = 476,08 N/mm^2

4. Perhitungan keuletan / Regangan

   $\varepsilon = \frac{50{,}30\ mm - 50{,}00\ mm}{50{,}00\ mm} 100\ \%$

   = 0,6 %

Lampiran 4

Perhitungan rata-rata nilai uji tarik kedua spesimen

a. Rata-rata perhitungan Spesimen suhu 450 ^{0}C

1. Yield Point Py $= \frac{8700+10600+5700}{3}$ Kg

$= 21200$ kg

2. Tegangan Luluh $\sigma_y = \frac{812,22+989,70+522,34}{3}$ N/mm^2

$= 774,75$ N/mm^2

3. Regangan e $= \frac{0,4+0,6+0,2}{3}$ %

$= 0,4$ %

b. Rata-rata perhitunhan spesimen suhu 500 ^{0}C

1. Yield Point Py $= \frac{5100+9000+2500}{3}$ Kg

$= 5533$ kg

2. Tegangan Luluh $\sigma_y = \frac{476,08+840,25+233,33}{3}$ N/mm^2

$= 516,55$ N/mm^2

3. Regangan e $= \frac{0,8+0,4+0,6}{3}$ %

$= 0,6$ %