



## **LAMPIRAN – LAMPIRAN**

**Lampiran A – Mix design**

**Lampiran B – Form Pengujian Agregat Kasar**

**Lampiran C – Form Pengujian Agregat Halus**

**Lampiran D – Kuat Tekan Beton Ringan**

**Lampiran E – Modulus Elastisitas dan Poisson Rasio**

**Lampiran F – Foto-Foto Pengujian, Pembuatan Agregat  
dan Tes Beton**



## RANCANG CAMPUR BETON RINGAN DENGAN AGREGAT RINGAN PLASTIK BERDASARKAN METODE SNI 03-3449-2002

### I. Data Perencanaan

- ◆ Kuat tekan beton ringan ( $f'_{cB}$ ) = 172,40 kg/cm<sup>2</sup>
- ◆ Nilai tambah/margin (M)  $M = k \times s$   
dengan : M = nilai tambah  
k = tetapan statistik (1,64)  
s = deviasi standar (70 kg/cm<sup>2</sup>)  
M = 1,64 x 70 kg/cm<sup>2</sup> = 114,80 kg/cm<sup>2</sup>
- ◆ Kuat tekan beton ringan yang ditargetkan ( $f'_{cBr}$ )  
 $f'_{cBr} = f'_{cB} + M$   
= 172,40 + 114,80 = 287,20 kg/cm<sup>2</sup>
- ◆ Berat Isi beton ringan yang disyaratkan ( $BI_{Br}$ ) = 1850 kg/m<sup>3</sup>
- ◆ Semen yang digunakan OPC (type I / S-550)
- ◆ Agregat kasar ringan yang digunakan adalah agregat kasar dari limbah botol plastik (HDPE) dengan sifat – sifat yang didapat dari hasil pengujian laboratorium sebagai berikut :

Sifat – sifat	Agregat Plastik
Berat Jenis, ssd	0,954
Penyerapan Air, % berat	0,817
Kadar Lengas, % berat	0

- ◆ Agregat halus yang digunakan adalah agregat halus normal (Pasir Beton) dengan sifat – sifat dari hasil pengujian laboratorium sebagai berikut :

Sifat – sifat	Agregat Halus
Berat Jenis (Bulk Spesific Gravity)	2,592
Penyerapan Air, % berat	0,503
Kadar Lengas, % berat	4,800



### Perhitungan Rancang Campur

Kuat Tekan Adukan ( Mortar) terhadap Kuat Tekan Hancur Agregat

- ♦ Berdasarkan pengujian terhadap agregat kasar ringan di laboratorium, di dapat kuat tekan hancur agregat ( $f'_{c_A}$ ) = 42,03 kg/cm<sup>2</sup>.
- ♦ Kuat Tekan Beton Ringan yang ditargetkan ( $f'_{c_{Br}}$ ) = 287,20 kg/cm<sup>2</sup>
- ♦ Syarat Jumlah Fraksi Agregat Kasar Ringan,  $n_f$  :  $0,35 \leq n_f \leq 0,50$

Maka Kuat Tekan Adukan ( $f'_{c_M}$ ) yang dibutuhkan :

Untuk  $n_f = 0,35$

$$n_f = \frac{\log(f'_{c_{Br}} / f'_{c_M})}{\log(f'_{c_A} / f'_{c_M})}$$

$$0,35(\log 42,03 - \log f'_{c_M}) = (\log 287,2 - \log f'_{c_M})$$

$$0,35(1,624 - \log f'_{c_M}) = (2,458 - \log f'_{c_M})$$

$$0,65 \log f'_{c_M} = 1,890$$

$$f'_{c_M} = 808,52 \text{ kg / cm}^2$$

$f'_{c_M} = 934,91 \text{ kg/cm}^2$ , adalah batas minimum kuat tekan adukan yang masih dapat digunakan untuk mendapatkan kuat tekan beton yang ditargetkan pada rancang campur beton ringan dengan kuat tekan hancur agregat ( $f'_{c_A}$ ) = 42,03 kg/cm<sup>2</sup>.

Untuk  $n_f = 0,50$

$$n_f = \frac{\log(f'_{c_{Br}} / f'_{c_M})}{\log(f'_{c_A} / f'_{c_M})}$$

$$0,50(\log 42,03 - \log f'_{c_M}) = (\log 287,2 - \log f'_{c_M})$$

$$0,50(1,624 - \log f'_{c_M}) = (2,458 - \log f'_{c_M})$$

$$0,50 \log f'_{c_M} = 1,646$$

$$f'_{c_M} = 1958,84 \text{ kg / cm}^2$$



$f'_{cM} = 1958,84 \text{ kg/cm}^2$ , adalah batas maksimum kuat tekan adukan yang dapat digunakan pada rancang campur beton ringan dengan kuat tekan hancur agregat ( $f'_{cA} = 42,03 \text{ kg/cm}^2$ ).

- ♦ Maka kuat tekan adukan yang dibutuhkan untuk dapat mencapai kuat tekan beton yang ditargetkan adalah :

$$808,52 \text{ kg/cm}^2 = f'_{cM} = 1958,84 \text{ kg/cm}^2$$

- ♦ Cek Kuat tekan adukan maksimum yang dibutuhkan pada grafik 7, apakah masih dapat memenuhi Kuat tekan maksimum yang tersedia.

Berdasarkan hasil perhitungan kuat tekan adukan yang dibutuhkan dengan kuat tekan hancur agregat, didapat kuat tekan adukan rencana berada diatas kuat tekan adukan maksimum grafik 7 SNI 03-3449-2002 yang memberikan batasan kuat tekan adukan maksimum ekonomis untuk campuran beton ringan struktural sebesar  $535 \text{ kg/cm}^2$ . Maka digunakan kuat tekan adukan maksimum yaitu  $535 \text{ kg/cm}^2$  dengan fraksi agregat kasar ringan ( $n_f$ ) yang digunakan 0,5.

#### Menentukan Susunan Campuran Adukan ( $BI_M$ )

Berdasarkan grafik 7 diketahui dengan kuat tekan adukan maksimum ( $f'_{cM} = 535 \text{ kg/cm}^2$ ), didapatkan susunan campuran adukannya, sebagai berikut :

♦ Semen	= 750	kg/m <sup>3</sup>	
♦ Air	= 162	kg/m <sup>3</sup>	
♦ Pasir	= 1500	kg/m <sup>3</sup>	+
Jumlah = Bobot isi total adukan		= 2412	kg/m <sup>3</sup>

#### Menentukan Susunan Campuran Beton ( $BI_{Br}$ ) tiap m<sup>3</sup>

♦ Semen	= $750 \times 0,5$	= 375	kg
♦ Air	= $162 \times 0,5$	= 81	kg
♦ Pasir	= $1500 \times 0,5$	= 750	kg
♦ Agregat Kasar	= $1000 \times 0,5 \times 0,954$	= 477	kg +
Jumlah = Bobot isi beton		= 1683	kg



Koreksi susunan campuran beton terhadap kandungan air dalam agregat

Dengan memperhitungkan jumlah air yang dapat di serap oleh agregat ringan kasar yang digunakan, yaitu

Penyerapan agregat ringan plastik = 0,817 %

Kadar air = 0 %

Hal ini berarti agregat tersebut masih dapat menyerap air sebanyak 0,817 %, maka :

- ♦ Jumlah air yang ditambahkan =  $477 \times 0,00817 = 3,9$  kg
- ♦ Kebutuhan air pencampur seluruhnya menjadi =  $81 + 3,9 = 84,9$  kg
- ♦ Agregat kasar ringan plastik dikurangi menjadi =  $477 - 3,9 = 473,1$  kg

Susunan campuran beton ringan /m<sup>3</sup> untuk uji coba setelah dikoreksi dan dibulatkan, menjadi

- ♦ Semen = 375 kg
- ♦ Air Pencampur = 85 kg
- ♦ Pasir = 750 kg
- ♦ Agregat ringan kasar = 473 kg

Koreksi terhadap agregat halus :

Kadar air = 4,8% ; penyerapan 0,503%

- Jumlah air yang dikurangi :  $\left( \frac{4,8 - 0,503}{100} \right) \times 750 = 32,23$  Kg
- Kebutuhan air menjadi =  $84,9 - 32,23 = 52,67$  Kg
- Agregat halus yang ditambahkan menjadi =  $750 + 32,23 = 782,23$  Kg

Susunan campuran beton /m<sup>3</sup> menjadi :

- Semen = 375 Kg
- Air = 52,67 Kg
- Pasir = 782,23 Kg
- Agregat = 473.10 Kg



**TEST FOR SPECIFIC GRAVITY  
AND ABSORPTION-TEST OF COARSE AGGREGATE**

Sample : Agregat kasar ringan buatan  
Source : Limbah botol plastik (HDPE)  
Date Tested : November, 12<sup>th</sup> 2007

	I	II
A) Weight of oven - dry specimen in air (gr)	4967	4952
B) Weight of ssd specimen in air (gr)	5000	5000
C) Weight of saturated specimen in water (gr)	-242	-246
Bulk Specific Gravity $= \frac{B}{B - C}$	0,954	0,953
Average of above	0,954	
Apparent Specific Gravity $= \frac{A}{A - C}$	0,953	0,952
Average of above	0,952	
Absorption (%) $= \frac{B - A}{A} \times 100\%$	0,664	0,969
Average of above (%)	0,817	

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(Head of Laboratory)



**TEST FOR UNIT WEIGHT AND VOLDS IN COARSE AGGREGATE**

Sample : Agregat kasar ringan buatan  
 Source : Limbah botol plastik (HDPE)  
 Date Tested : November, 12<sup>th</sup> 2007

	I	II
a) Weight of Measure (kg)	5,089	5,089
b) Weight of Measure + Water (kg)	14,361	14,361
c) Weight of Measure and Sample (kg)	10,118	10,166
d) Weight of Sample (kg)	5,029	5,077
e) Volume of Measure (liter)	9,272	9,272
f) Unit weight of aggregate (kg/liter)	0,542	0,548
B) Average of above (kg/liter)	0,545	
A) Bulk Spesific Gravity of Aggregate	0,954	
W) Unit Weight of Water (kg/liter)	0,998	
Void (%)	42,76	42,76
Average	42,76	
$d = c - a$ $e = b - a$ $f = \frac{d}{e}$	Void (%) $\frac{(A \times W) - B}{(A \times W)} \times 100\%$	

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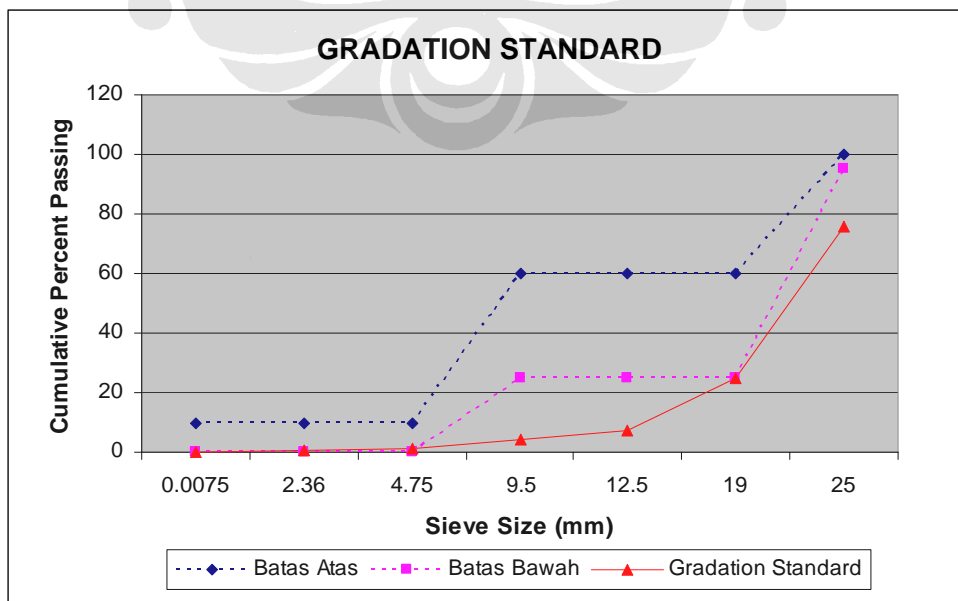
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**SIEVE ANALYSIS OF COARSE AGGREGATE  
(ASTM C 330 – 04)**

Sample : Agregat kasar ringan buatan  
 Source : Limbah botol plastik (HDPE)  
 Date Tested : November, 12<sup>th</sup> 2007

Sieve Size (mm)	Sample No.1			Sample No.2			Average		
	Weight Ret Grams	Ind % Ret	Cum % Ret	Weight Ret Grams	Ind % Ret	Cum % Ret	Ind % Ret	Cum % Ret	Average Passing %
25,4	1.292	25,84	25,84	1.102	22,04	22,04	23,94	23,94	76,06
19,0	2.494	49,88	75,72	2.619	52,38	74,42	51,13	75,07	24,93
12,50	820	16,4	92,12	923	18,46	92,88	17,43	92,50	7,5
9,5	165	3,3	95,42	173	3,46	96,34	3,38	95,88	4,12
4,76	153	3,06	98,48	120	2,4	98,74	2,73	98,61	1,39
2,36	42	0,84	99,32	34	0,68	99,42	0,76	99,37	0,63
PAN	34	0,68	100	29	0,58	100	0,63	100	0
TOTAL	5.000			5.000					







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**PENGUJIAN KEAUSAN (ABRASION) UNTUK AGREGAT  
KASAR DENGAN MENGGUNAKAN MESIN LOS ANGELES  
(AASHTO T.96-77)**

Sample : Agregat kasar ringan buatan  
 Source : Limbah botol plastik (HDPE)  
 Date Tested : November, 12<sup>th</sup> 2007

Ukuran Saringan		Ukuran Berat Contoh (gram)		
Lolos	Tertahan	Grading - 1	Grading-2	Grading-3
76,2    3"	63,5    2 1/2"	1.250		
63,5    2 1/2"	50,8    2"			
50,8    2"	37,5    1 1/2"			
37,5    1 1/2"	25,4    1"			
25,4    1"	19,0    3/4"			
19,0    3/4"	12,5    1/2"			
12,5    1/2"	9,5    3/8"			
9,5    3/8"	6,3    1/4"			
6,3    1/4"	4,75    # 4			
4,75    # 4	2,36    # 8			
Berat total contoh sebelum di uji (A)		5.000		
Berat contoh tertahan pada saringan 1,7 mm setelah di uji (B)		3518		
Keausan = $\frac{A - B}{A} \times 100\%$		29,64		

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**KONTROL VOLUME BETON (YIELD CHECK)**

<b>SAMPLE PENGADUKAN LC<sub>15</sub>-P<sub>A</sub></b>		
a) Weight of Container + Concrete	(kg)	19,900
b) Weight of Container	(kg)	5,089
c) Weight of Concrete	(kg)	14,611
d) Volume of Container	(m <sup>3</sup> )	0,009123
e) Unit Weight of Concrete	(kg/m <sup>3</sup> )	1623
$c = a - b$ $e = \frac{c}{d}$		

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**KONTROL VOLUME BETON (YIELD CHECK)**

<b>SAMPLE PENGADUKAN LC<sub>15</sub>-P<sub>B</sub></b>		
a) Weight of Container + Concrete	(kg)	20,000
b) Weight of Container	(kg)	5,089
c) Weight of Concrete	(kg)	14,911
d) Volume of Container	(m <sup>3</sup> )	0,009123
e) Unit Weight of Concrete	(kg/m <sup>3</sup> )	1634
$c = a - b$ $e = \frac{c}{d}$		

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**PENGUJIAN BERAT JENIS AGREGAT KASAR RINGAN PLASTIK  
DENGAN SPESIMEN BERBENTUK KUBUS (15×15×15)**

<b>Sample</b>	<b>Berat SSD spesimen di udara (gr)</b>	<b>Berat Spesimen dalam air (gr)</b>	<b>Bulk Specific Gravity</b>
1	2422	- 88	0,965
2	2508	- 100	0,962
3	2157	- 87	0,961

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**PENGUJIAN BERAT JENIS AGREGAT KASAR RINGAN PLASTIK  
DENGAN SPESIMEN BERBENTUK KUBUS (5 × 5 × 5)**

No.	Sample	Berat SSD spesimen di udara (gr)	Berat Spesimen dalam air (gr)	Bulk Specific Gravity
1	Federal	80	- 5	0,941
2	Federal	93.5	- 5	0,949
3	Federal	90.5	- 4.5	0,953
4	Federal	83	- 5.5	0,938
5	Pertamina	89	- 5.5	0,942
6	Pertamina	86	- 5	0,945
7	Pertamina	91	- 4	0,958
8	Pertamina	92	- 5	0,948
9	Repsol	90	- 6	0,938
10	Repsol	85	- 4.5	0,949
11	Repsol	96	- 5	0,950
12	Repsol	92	- 6	0,939
13	Repsol	87.5	- 4.5	0,948
14	Repsol	92	- 5	0,951
15	Castrol	85.5	- 4	0,955
16	Castrol	91.5	- 4.5	0,953
17	Castrol	90	- 4.5	0,952

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**TEST FOR SPECIFIC GRAVITY  
AND ABSORPTION-TEST OF FINE AGGREGATE**

Sample : Pasir alam  
Source : Cimangkok, Jayamix  
Date Tested : November, 12<sup>th</sup> 2007

Sample	I	II
A) Weight of Oven-Dry Specimen in Air (gram)	497	498
B) Weight of Pycnometer Filled with Water (gram)	658	670
c) Weight of Pycnometer with Specimen and Water to Calibration Mark (gram)	964	980
Bulk Specific Gravity = $\frac{A}{B+500-C}$	2,562	2,621
Average of Above	2,592	
Bulk Specific Gravity (Saturated-Surface-Dry Basis) = $\frac{500}{B+500-C}$	2,577	2,632
Average of Above	2,605	
Apparent Specific Gravity = $\frac{A}{B+A-C}$	2,602	2,649
Average of Above	2,626	
Absorption (%) = $\frac{500-A}{A} \times 100\%$	0,604	0,402
Average of Above (%)	0,503	

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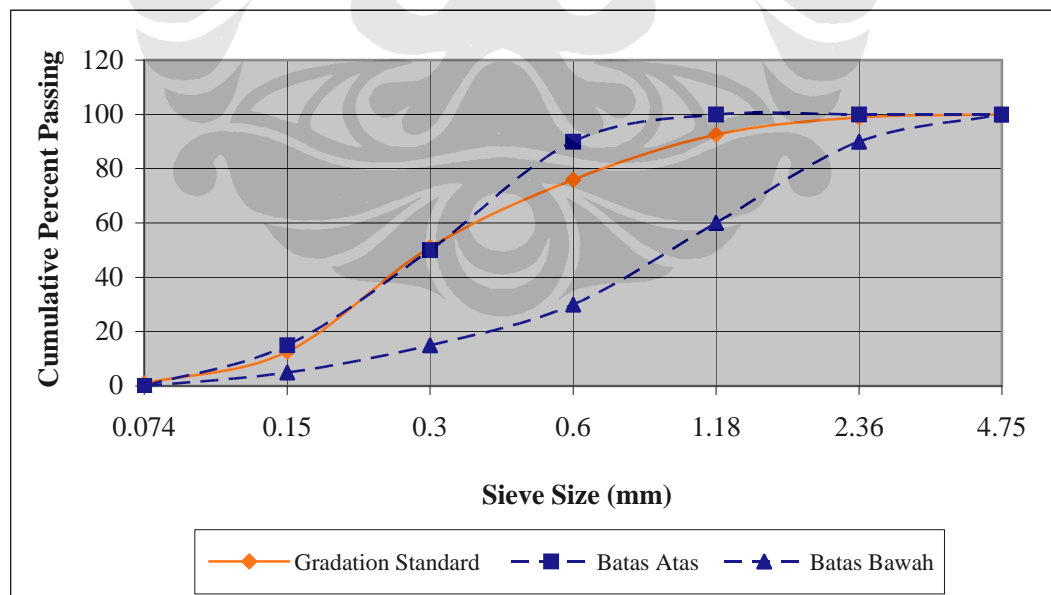
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**SIEVE ANALYSIS OF FINE AGGREGATE**

Sample : Pasir alam  
 Source : Cimangkok, Jayamix  
 Date Tested : November, 12<sup>th</sup> 2007

SIEVE SIZE (mm)	SAMPLE No. 1			SAMPLE No. 2			AVERAGE		
	WEIGHT RET GRAMS	IND % RET	CUM % RET	WEIGHT RET GRAMS	IND % RET	CUM % RET	IND %	CUM %	AVERAGE PASSING (%)
4,75	0	0	0	0	0	0	0	0	0
2,36	5	1	1	6	1,2	1,2	1,1	1,1	98,9
1,18	30	6	7	34	6,8	8	6,4	7,5	92,5
0,60	82	16,40	23,4	84	16,8	24,8	16,6	24,1	75,9
0,30	125	25	48,4	124	24,8	49,6	24,9	49	51
0,15	194	38,80	87,2	190	38	87,6	38,4	87,4	12,6
0,074	59	11,8	99	57	11,4	99	11,6	99	1
PAN	5	1	100	5	1	100	1	100	
FM	2,660			2,702			2,681		

**GRADATION STANDARD**





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**TEST FOR UNIT WEIGHT AND VOLDS IN FINE AGGREGATE**

Sample : Pasir alam  
 Source : Cimangkok, Jayamix  
 Date Tested : November, 12<sup>th</sup> 2007

	I	II
a) Weight of Measure (kg)	1,055	1,055
b) Weight of Measure + Water (kg)	3,055	3,055
c) Weight of Measure and Sample (kg)	4,342	4,380
d) Weight of Sample (kg)	3,287	3,325
e) Volume of Measure (liter)	2	2
f) Unit weight of aggregate (kg/liter)	1,644	1,663
B) Average of above (kg/liter)	1,653	
A) Bulk Spesific Gravity of Aggregate	2,592	
W) Unit Weight of Water (kg/liter)	0,998	
Void (%)	36,10	36,10
Average	36,10	
$d = c - a$ $f = \frac{d}{e}$	$Void (\%) = \frac{(A \times W) - B}{A \times W} \times 100\%$	
$e = b - a$		

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**TEST FOR MATERIALS FINER THAN NO. 200 SIEVE  
IN MINERAL AGGREGATES BY WASHING**

Sample : Pasir alam  
Source : Cimangkok, Jayamix  
Date Tested : November, 12<sup>th</sup> 2007

SAMPLE	I	II
B) Original dry weight of sample (gr)	500	500
C) Dry weight of sample (gr)	492	490
A) Percentage of material finer than a No. 200 sieve by washing (%)	1,6	2
Average of above (%)	1,8	
$A = \frac{B-C}{B} \times 100\%$		

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**TEST FOR ORGANIC IMPURITIES IN FINE AGGREGATE  
(ASTM C 40 – 92)**

Sample : Pasir alam  
Source : Cimangkok, Jayamix  
Date Tested : January, 5<sup>th</sup> 2007

Nearest Color of The Liquid of the Test Sample	Organic Plate Number
Lighter / <u>Equal</u> / Darker Color to	1
	2
	<u>3</u> (standard)
	4
	5

**Determination of Color Value**

Lighter / equal / darker color to that of the reference standard (No.3)

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**DATA TES KUAT TEKAN BETON**

Tanggal		Umur (hari)	Kode	Bentuk & Luas penampang (cm <sup>2</sup> )	Slump (cm)	Berat (kg)	Beban (kg)	Tegangan (kg/cm <sup>2</sup> )
Dicor	Ditest							
26-11-07	03-12-07	7	BR <sub>A</sub> – K <sub>15</sub>	225	6,5	5361	27500	122,22
26-11-07	24-12-07	28	BR <sub>A</sub> – K <sub>15</sub>	225	6,5	5308	27750	123,33
26-11-07	24-12-07	28	BR <sub>A</sub> – K <sub>15</sub>	225	6,5	5437	28000	124,44
26-11-07	24-12-07	28	BR <sub>A</sub> – K <sub>15</sub>	225	6,5	5408	27750	123,33

Tanggal		Umur (hari)	Kode	Bentuk & Luas penampang (cm <sup>2</sup> )	Slump (cm)	Berat (kg)	Beban (kg)	Tegangan (kg/cm <sup>2</sup> )
Dicor	Ditest							
28-11-07	05-12-07	7	BR <sub>B</sub> – K <sub>15</sub>	225	5	5258	24500	108,89
28-11-07	26-12-07	28	BR <sub>B</sub> – K <sub>15</sub>	225	5	5387	27750	123,33
28-11-07	26-12-07	28	BR <sub>B</sub> – K <sub>15</sub>	225	5	5292	26750	118,89
28-11-07	26-12-07	28	BR <sub>B</sub> – K <sub>15</sub>	225	5	5272	27000	120,00

Keterangan data : Benda uji berbentuk kubus (15×15×15) cm dengan luas penampang 225 cm<sup>2</sup>

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**DATA TES KUAT TEKAN BETON**

Tanggal		Umur (hari)	Kode	Bentuk & Luas penampang (cm <sup>2</sup> )	Slump (cm)	Berat (kg)	Beban (kg)	Tegangan (kg/cm <sup>2</sup> )
Dicor	Ditest							
28-11-07	05-12-07	7	BR <sub>C</sub> – K <sub>5</sub>	25	-	197	1700	68,00
28-11-07	26-12-07	28	BR <sub>C</sub> – K <sub>5</sub>	25	-	200	2400	96,00
28-11-07	26-12-07	28	BR <sub>C</sub> – K <sub>5</sub>	25	-	205	2475	99,00
28-11-07	26-12-07	28	BR <sub>C</sub> – K <sub>5</sub>	25	-	204	2575	103,00

Tanggal		Umur (hari)	Kode	Bentuk & Luas penampang (cm <sup>2</sup> )	Slump (cm)	Berat (kg)	Beban (kg)	Tegangan (kg/cm <sup>2</sup> )
Dicor	Ditest							
28-11-07	05-12-07	7	BR <sub>D</sub> – K <sub>5</sub>	25	-	191	1300	52,00
28-11-07	26-12-07	28	BR <sub>D</sub> – K <sub>5</sub>	25	-	196	2025	81,00
28-11-07	26-12-07	28	BR <sub>D</sub> – K <sub>5</sub>	25	-	195	2125	85,00
28-11-07	26-12-07	28	BR <sub>D</sub> – K <sub>5</sub>	25	-	191	2175	87,00

Keterangan data : Benda uji berbentuk kubus (5×5×5) cm dengan luas penampang 25 cm<sup>2</sup>

**LABORATORIUM BAHAN**

Departemen Sipil – Fakultas Teknik

Universitas Indonesia

Kampus Baru UI Depok

Telp. 7874878 – 7270029(Ext.18) – 7270028 (Fax)

**DATA TES KUAT TEKAN BETON**

Tanggal		Umur (hari)	Kode	Bentuk & Luas penampang (cm <sup>2</sup> )	Slump (cm)	Berat (kg)	Beban (kg)	Tegangan (kg/cm <sup>2</sup> )
Dicor	Ditest							
30-11-07	06-12-07	7	BR <sub>E</sub> – K <sub>5</sub>	25	-	201	1950	78,00
30-11-07	27-12-07	28	BR <sub>E</sub> – K <sub>5</sub>	25	-	200	2675	107,00
30-11-07	27-12-07	28	BR <sub>E</sub> – K <sub>5</sub>	25	-	199	3050	122,00
30-11-07	27-12-07	28	BR <sub>E</sub> – K <sub>5</sub>	25	-	207	2700	108,00

Tanggal		Umur (hari)	Kode	Bentuk & Luas penampang (cm <sup>2</sup> )	Slump (cm)	Berat (kg)	Beban (kg)	Tegangan (kg/cm <sup>2</sup> )
Dicor	Ditest							
30-11-07	06-12-07	7	BR <sub>F</sub> – K <sub>5</sub>	25	-	198	1925	77,00
30-11-07	27-12-07	28	BR <sub>F</sub> – K <sub>5</sub>	25	-	198	2300	92,00
30-11-07	27-12-07	28	BR <sub>F</sub> – K <sub>5</sub>	25	-	199	2750	110,00
30-11-07	27-12-07	28	BR <sub>F</sub> – K <sub>5</sub>	25	-	196	3000	120,00

Keterangan data : Benda uji berbentuk kubus (5×5×5) cm dengan luas penampang 25 cm<sup>2</sup>

**LABORATORIUM BAHAN**

Departemen Sipil – Fakultas Teknik

Universitas Indonesia

Kampus Baru UI Depok

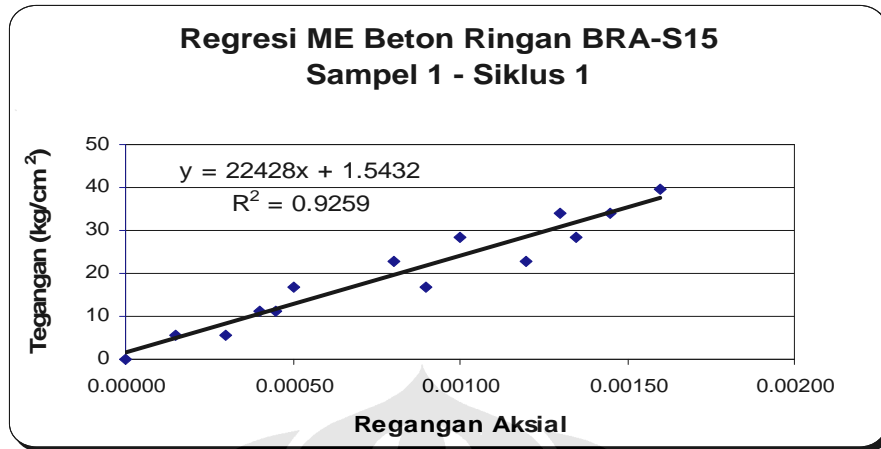
Telp. 7874878 – 7270029(Ext.18) – 7270028 (Fax)

**DATA TES KUAT TEKAN BETON**

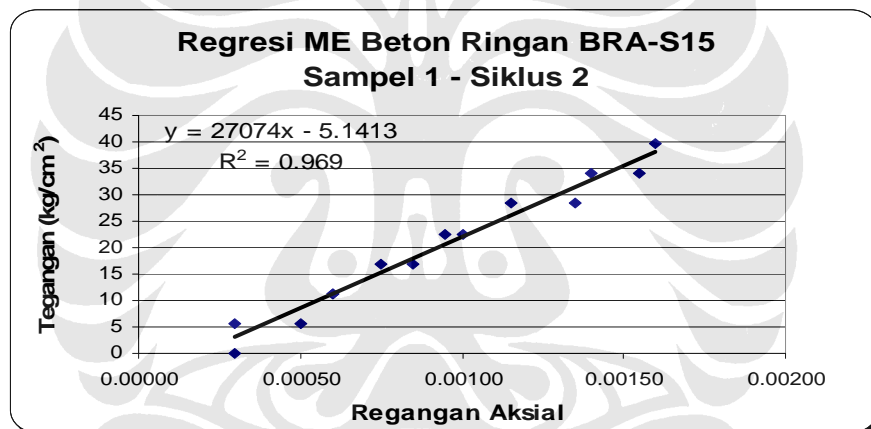
Tanggal		Umur (hari)	Kode	Bentuk & Luas penampang (cm <sup>2</sup> )	Slump (cm)	Berat (kg)	Beban (kg)	Tegangan (kg/cm <sup>2</sup> )
Dicor	Ditest							
11-12-07	17-12-07	7	BR <sub>G</sub> – K <sub>5</sub>	25	-	212	3125	125,00
11-12-07	07-01-08	28	BR <sub>G</sub> – K <sub>5</sub>	25	-	210	3275	131,00
11-12-07	07-01-08	28	BR <sub>G</sub> – K <sub>5</sub>	25	-	208	3400	136,10
11-12-07	07-01-08	28	BR <sub>G</sub> – K <sub>5</sub>	25	-	207	3500	140,00

Tanggal		Umur (hari)	Kode	Bentuk & Luas penampang (cm <sup>2</sup> )	Slump (cm)	Berat (kg)	Beban (kg)	Tegangan (kg/cm <sup>2</sup> )
Dicor	Ditest							
11-12-07	17-12-07	7	BR <sub>H</sub> – K <sub>5</sub>	25	-	205	2750	110,00
11-12-07	07-01-08	28	BR <sub>H</sub> – K <sub>5</sub>	25	-	205	3250	130,00
11-12-07	07-01-08	28	BR <sub>H</sub> – K <sub>5</sub>	25	-	203	3225	129,00
11-12-07	07-01-08	28	BR <sub>H</sub> – K <sub>5</sub>	25	-	207	3000	120,00

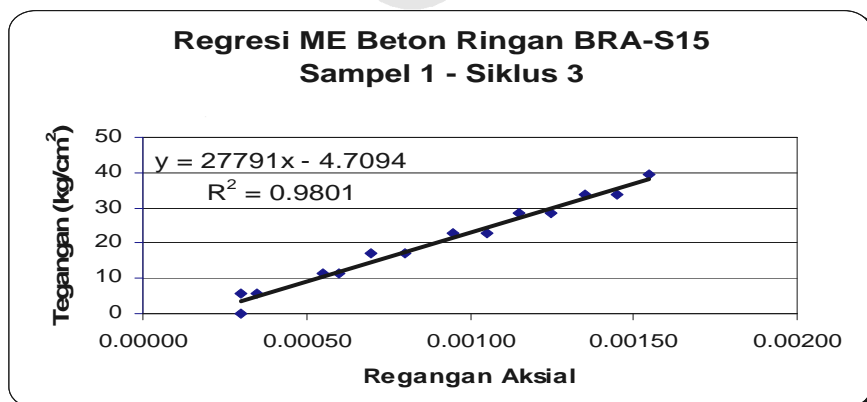
Keterangan data : Benda uji berbentuk kubus (5×5×5) cm dengan luas penampang 25 cm<sup>2</sup>



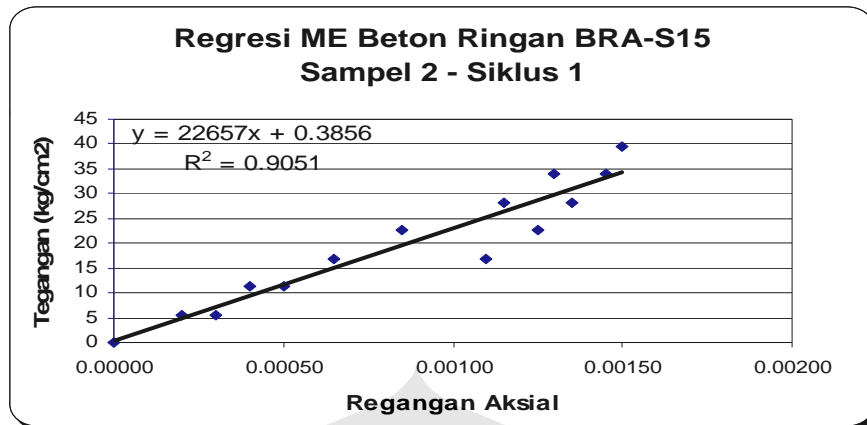
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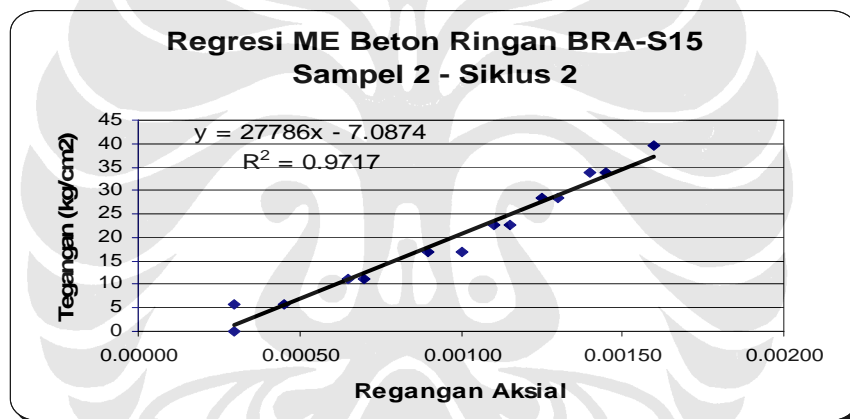
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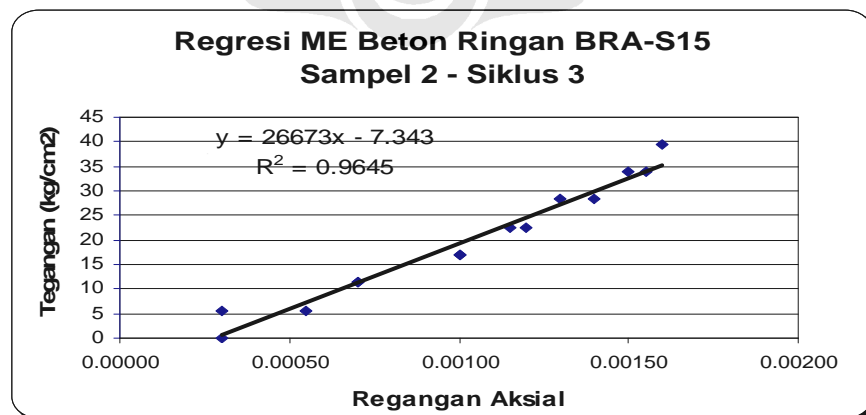
**Grafik Regresi Hubungan Tegangan – Regangan Beton Ringan Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 1 – Siklus 3**



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Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 2 – Siklus 1**

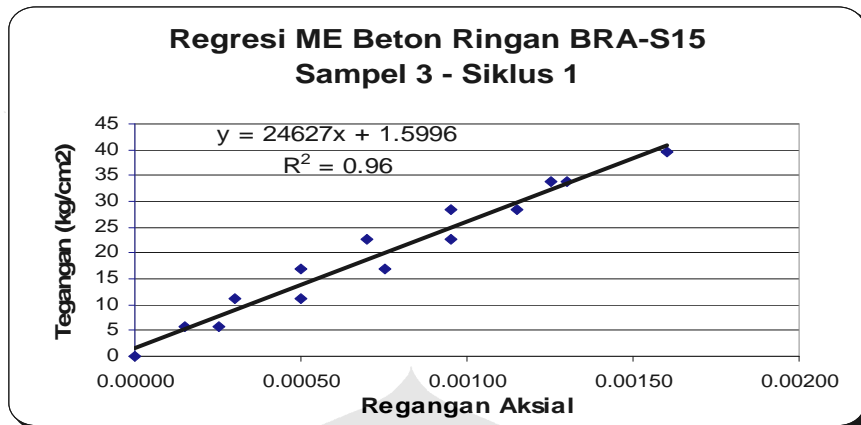


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Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 2 – Siklus 2**

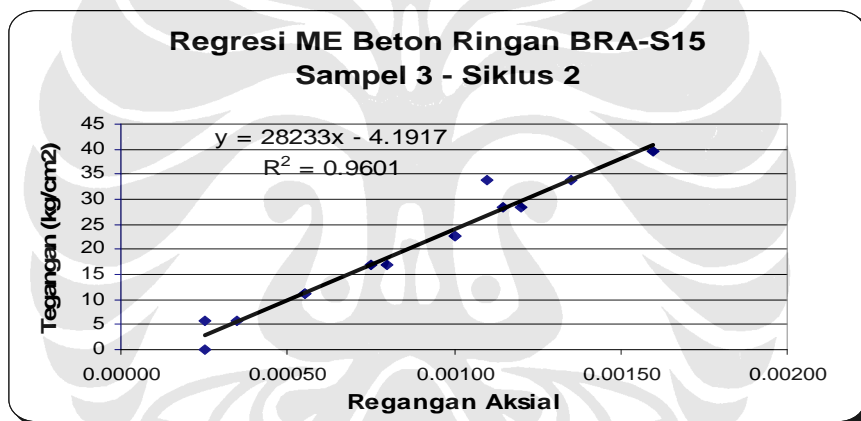


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Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 2 – Siklus 3**

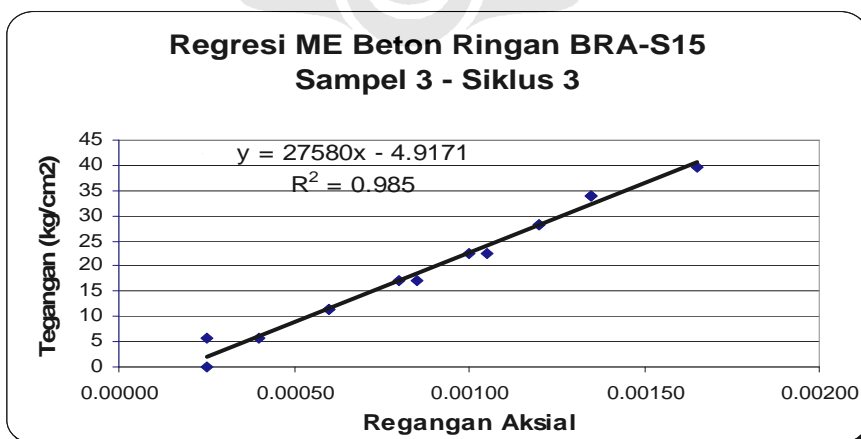




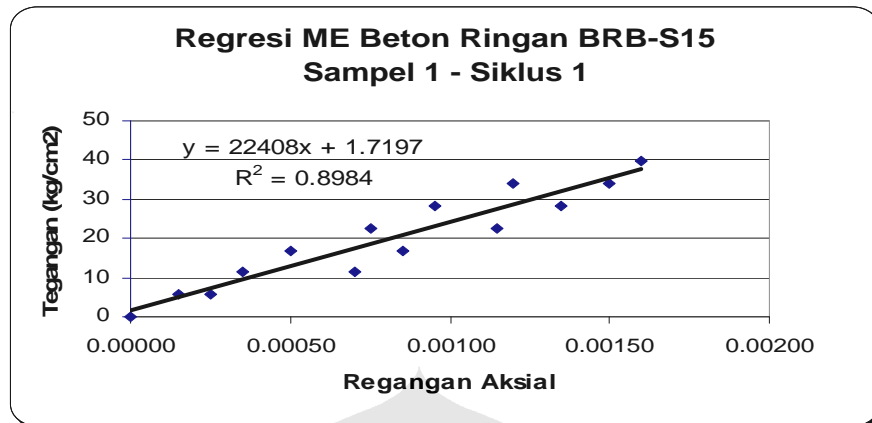
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Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 3 – Siklus 1**



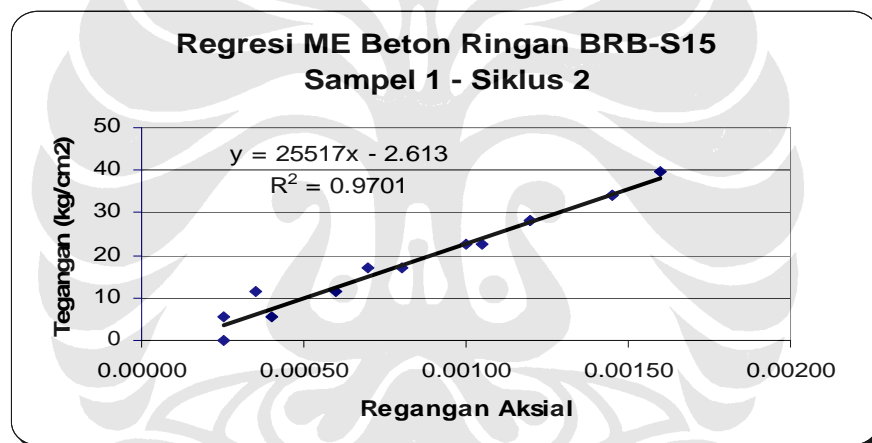
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Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 3 – Siklus 2**



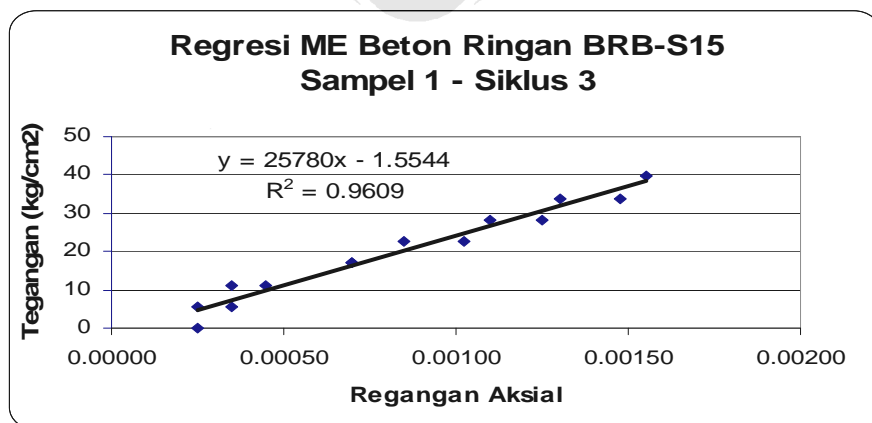
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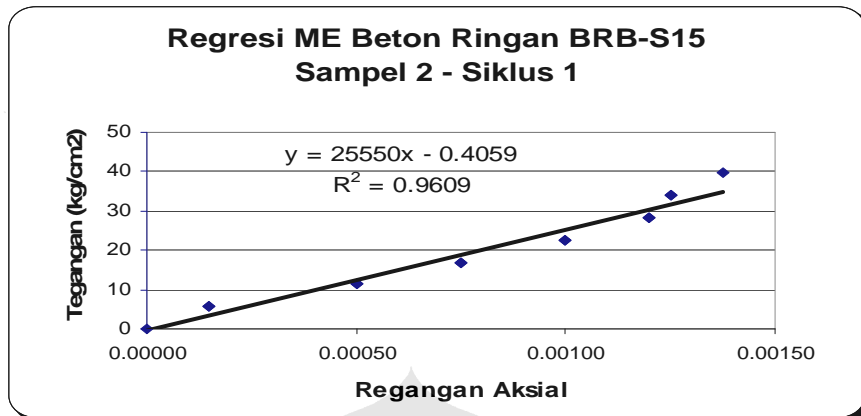
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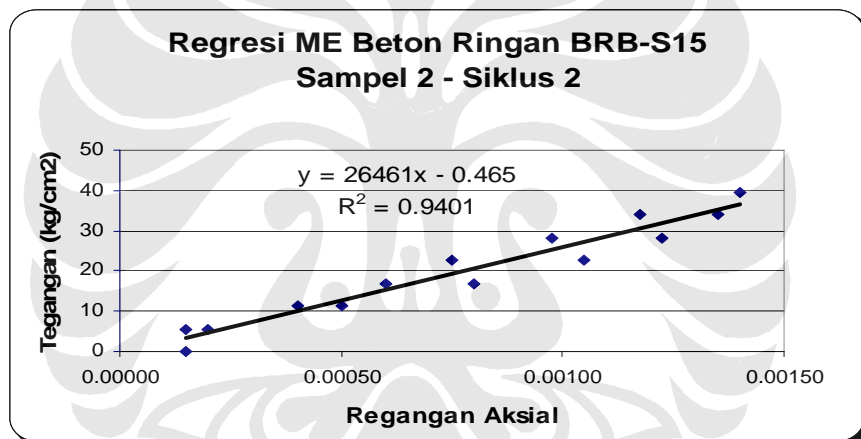
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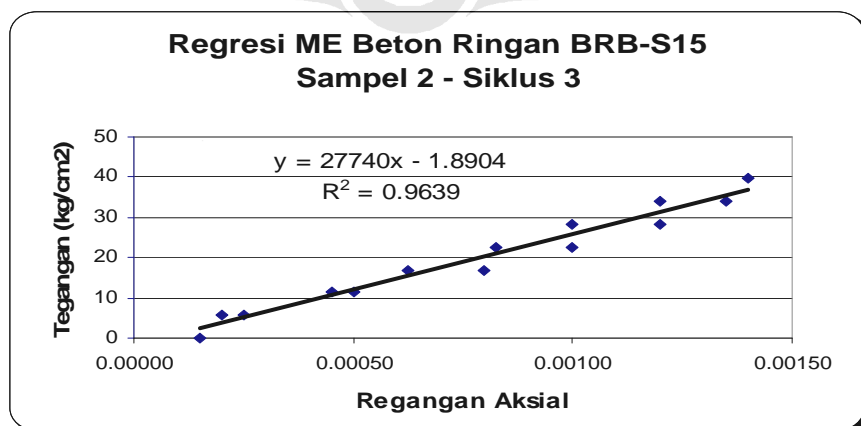
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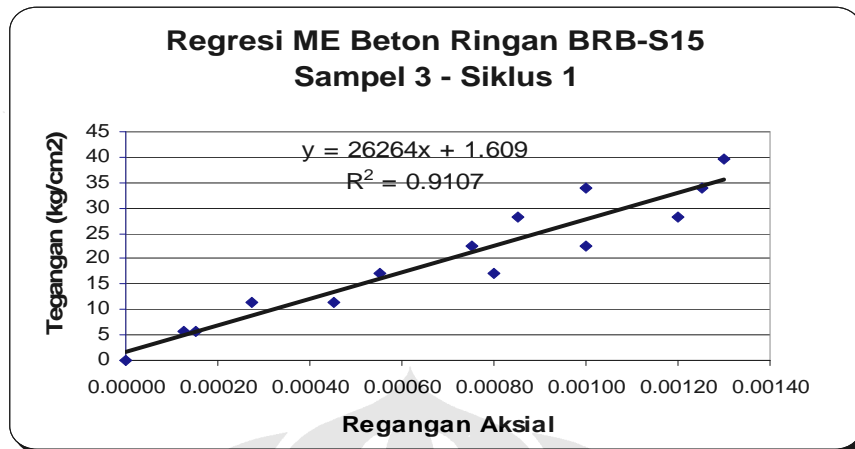
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Tipe BR<sub>B</sub>-S<sub>15</sub> Sampel 2 – Siklus 1**



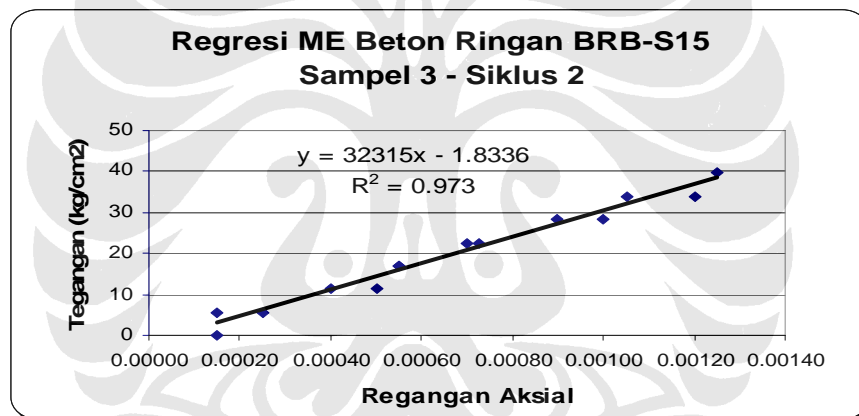
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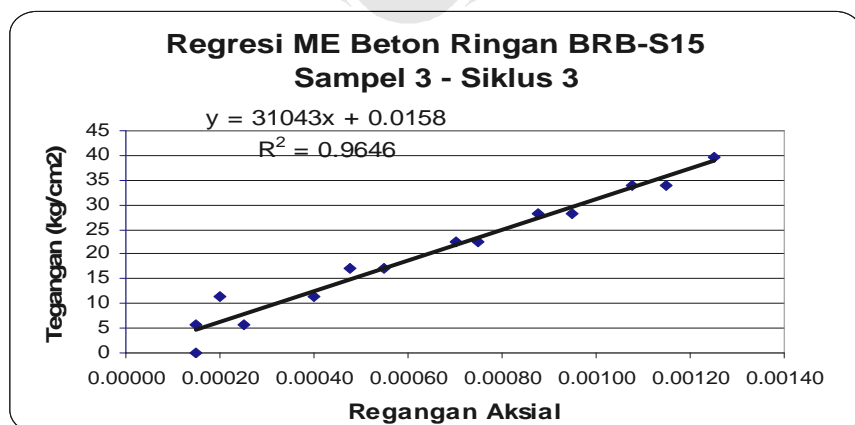
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Tipe BR<sub>B</sub>-S<sub>15</sub> Sampel 2 – Siklus 3**



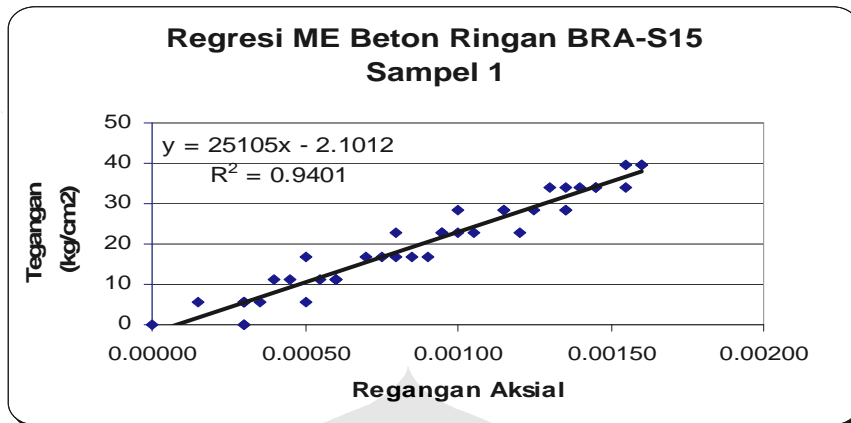
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Tipe BR<sub>B</sub>-S<sub>15</sub> Sampel 3 – Siklus 1**



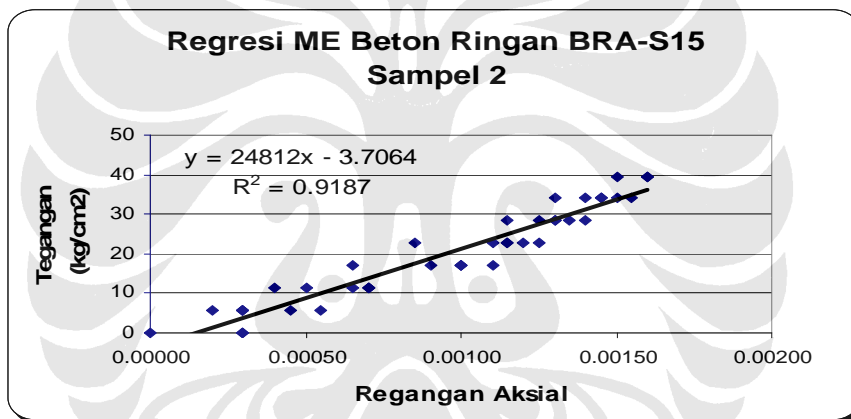
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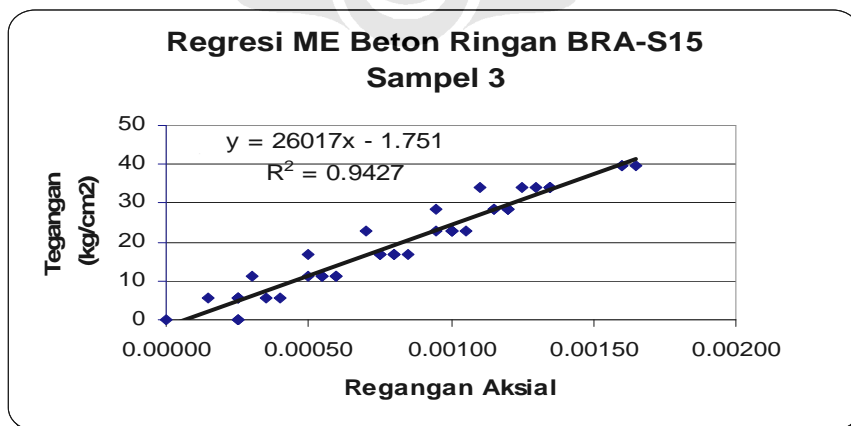
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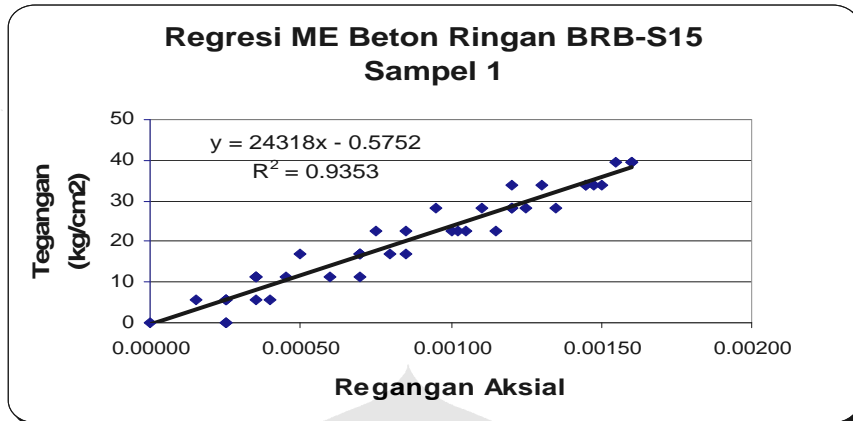
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Beton Ringan Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 1**



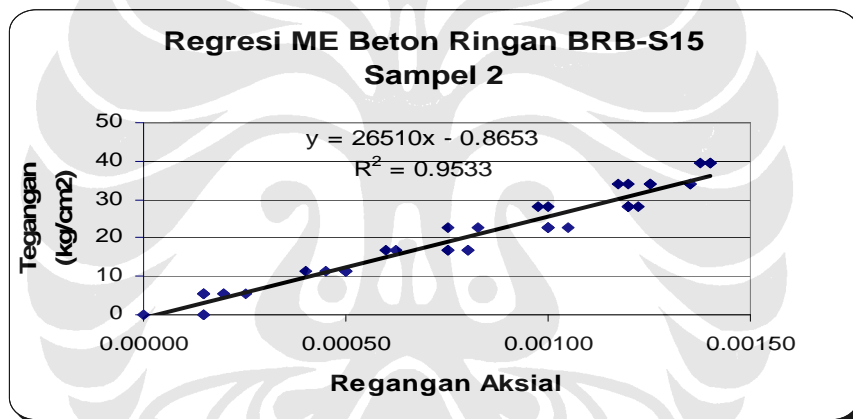
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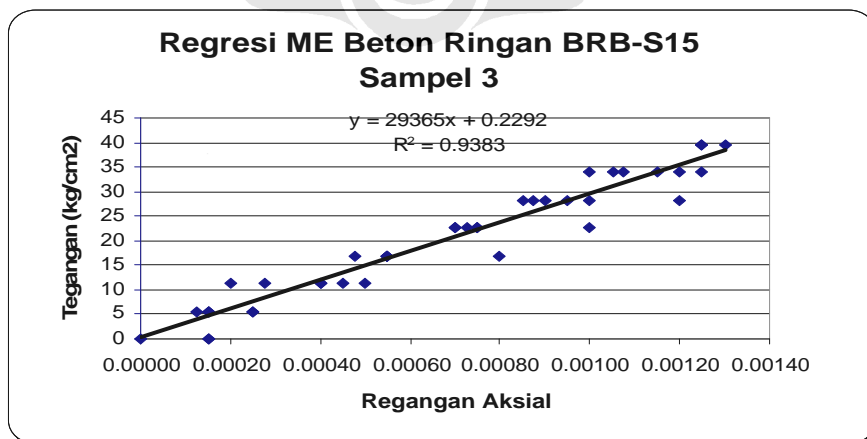
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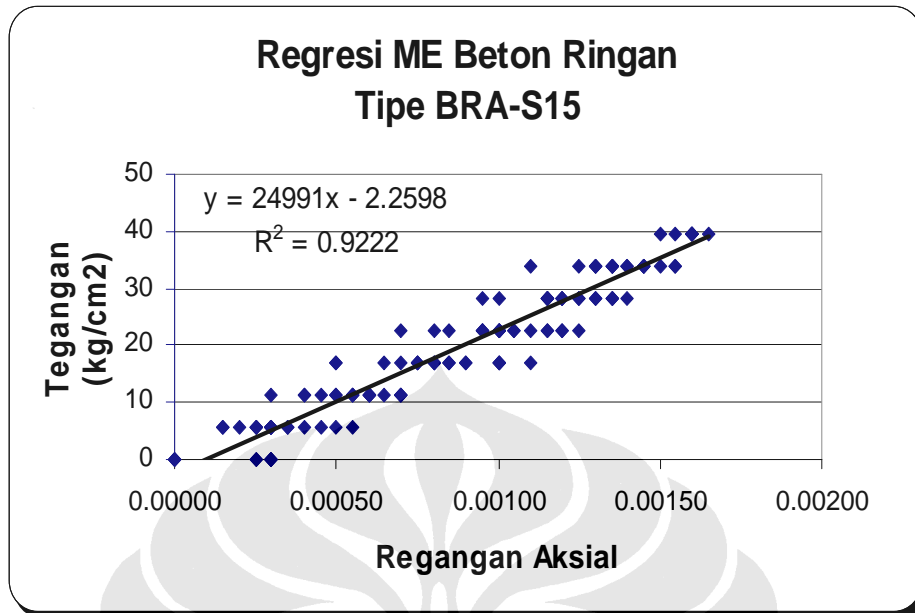
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Beton Ringan Tipe BR<sub>B</sub>-S<sub>15</sub> Sampel 1**



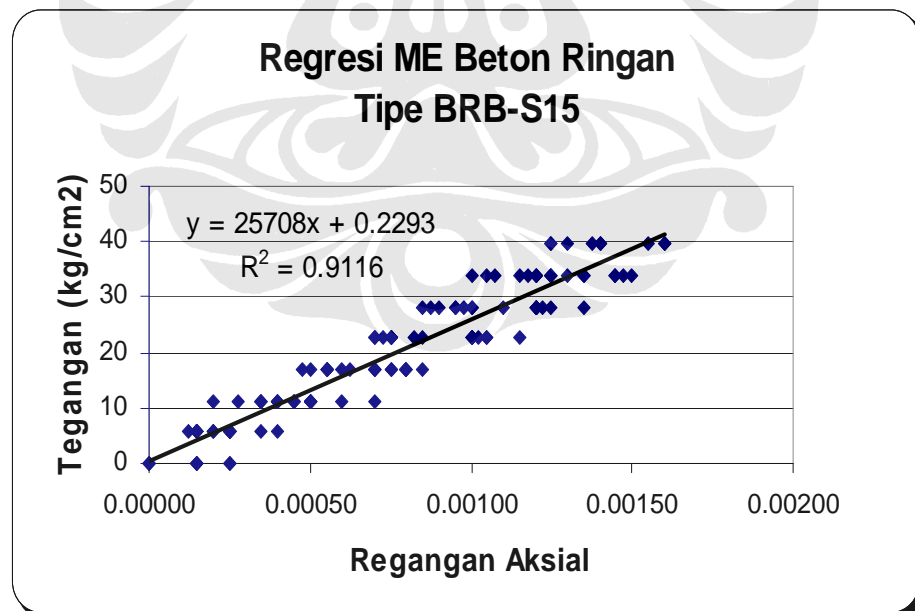
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Beton Ringan Tipe BR<sub>B</sub>-S<sub>15</sub> Sampel 2**



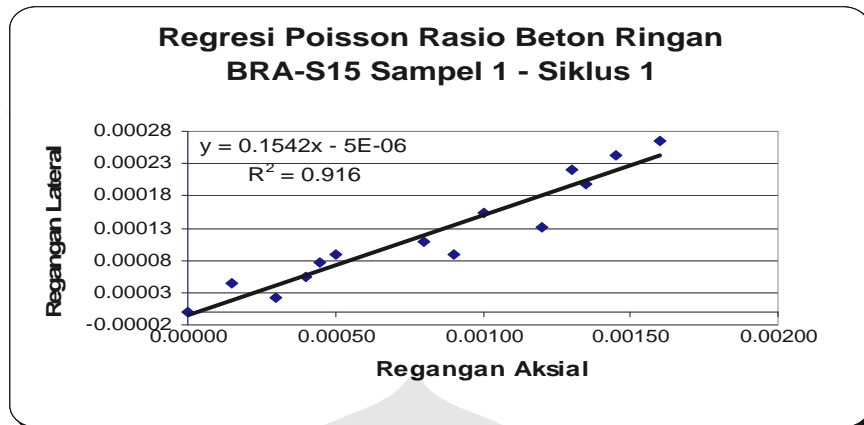
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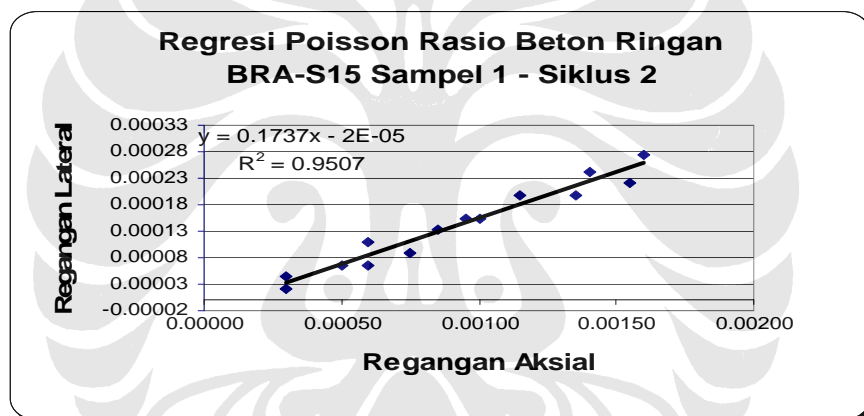
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Beton Ringan Tipe BR<sub>B</sub>-S<sub>15</sub>**



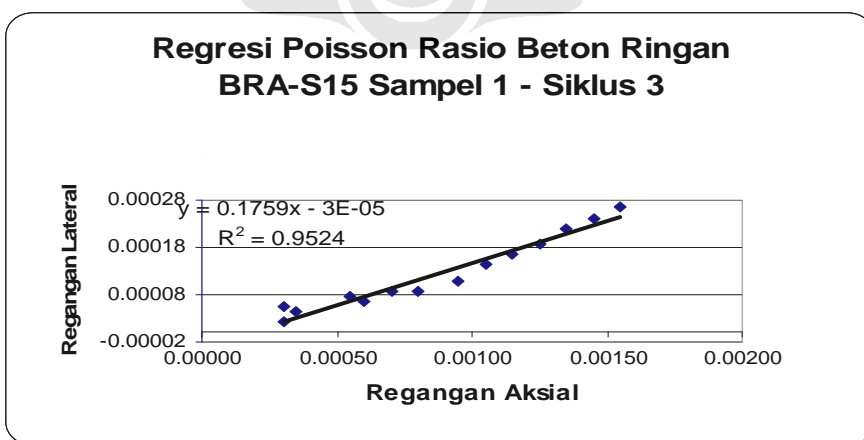
**Grafik Regresi Hubungan Tegangan – Regangan  
Beton Ringan Tipe BR<sub>B</sub>-S<sub>15</sub>**



**Grafik Regresi Hubungan Regangan Lateral-Aksial Beton Ringan  
Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 1 – Siklus 1**

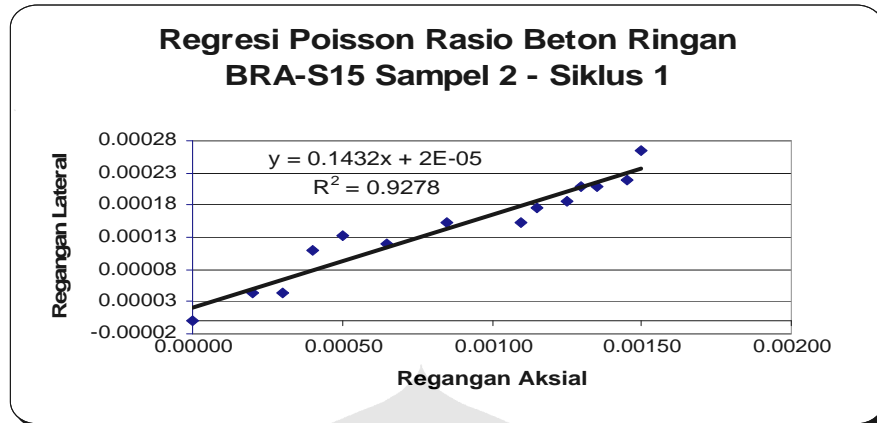


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Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 1 – Siklus 2**

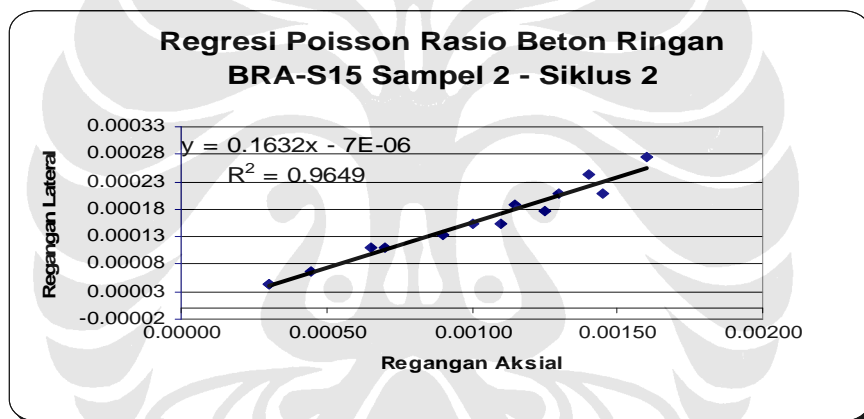


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Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 1 – Siklus 3**

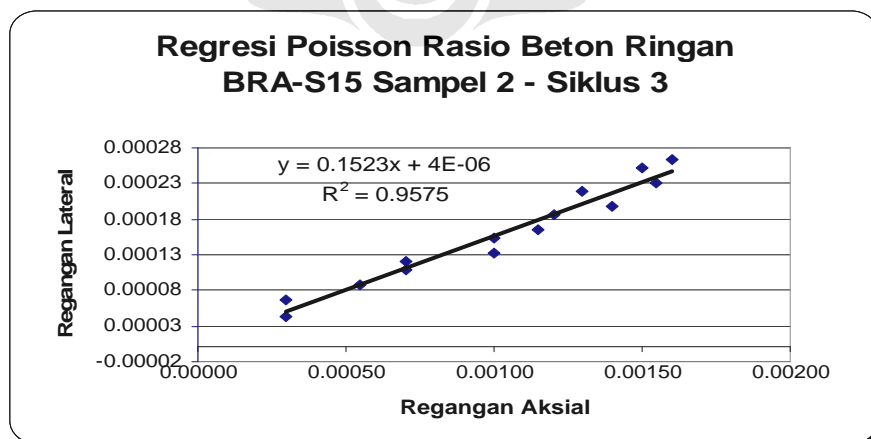




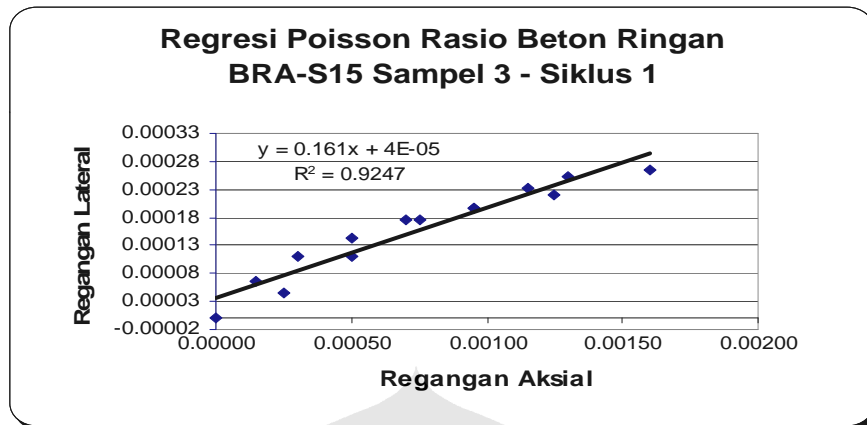
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Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 2 – Siklus 1**



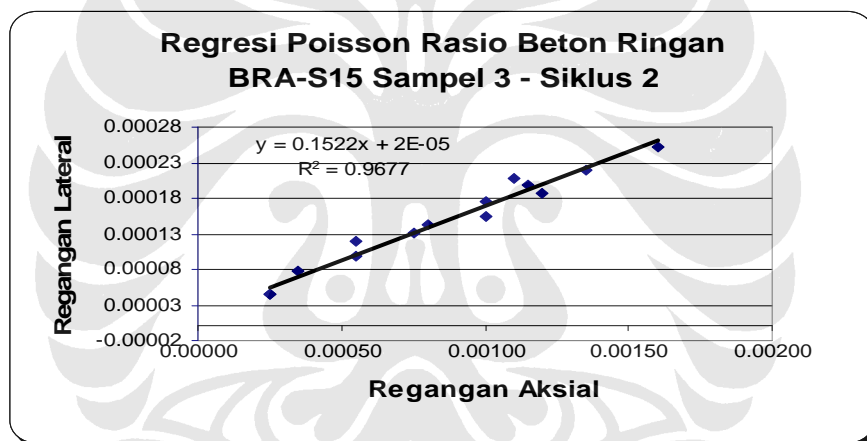
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Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 2 – Siklus 2**



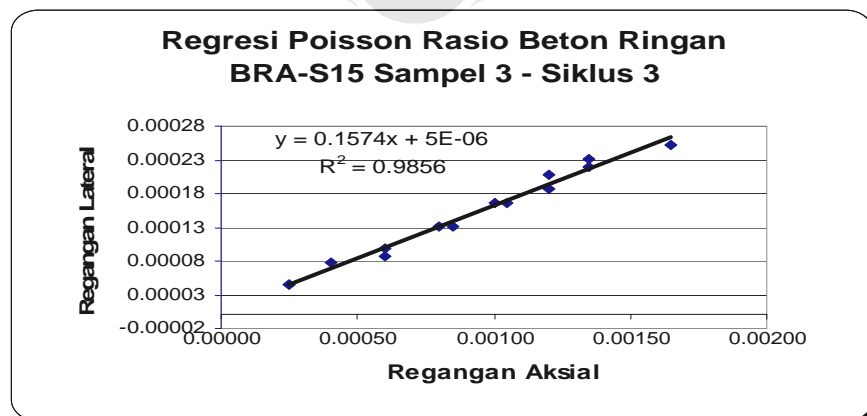
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Tipe BR<sub>A</sub>-S<sub>15</sub> Sampel 2 – Siklus 3**



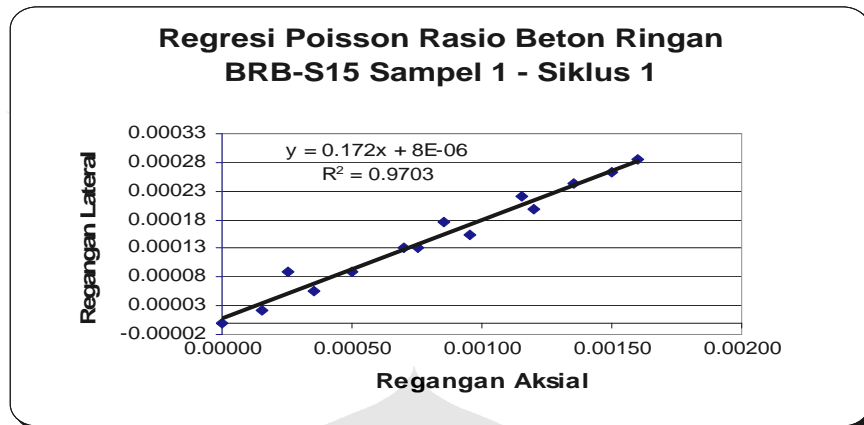
Grafik Regresi Hubungan Regangan Lateral-Aksial Beton Ringan Tipe  $BR_A-S_{15}$  Sampel 3 – Siklus 1



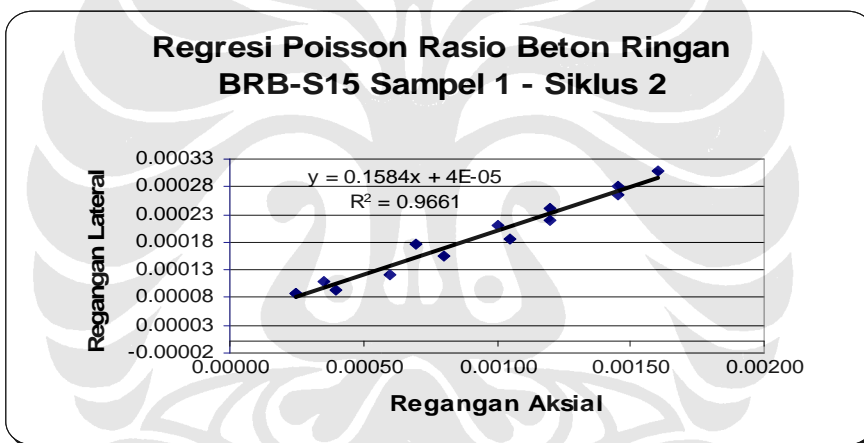
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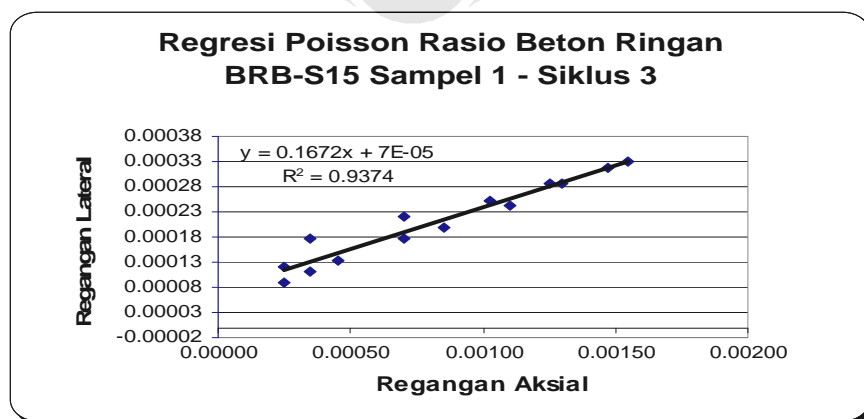
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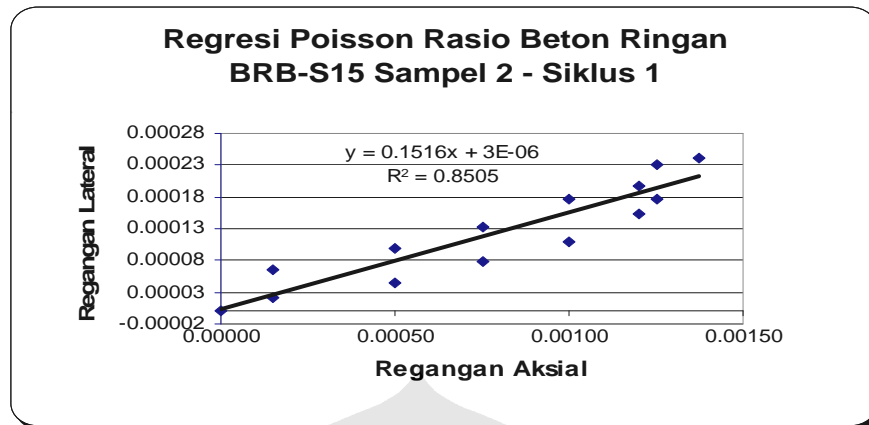
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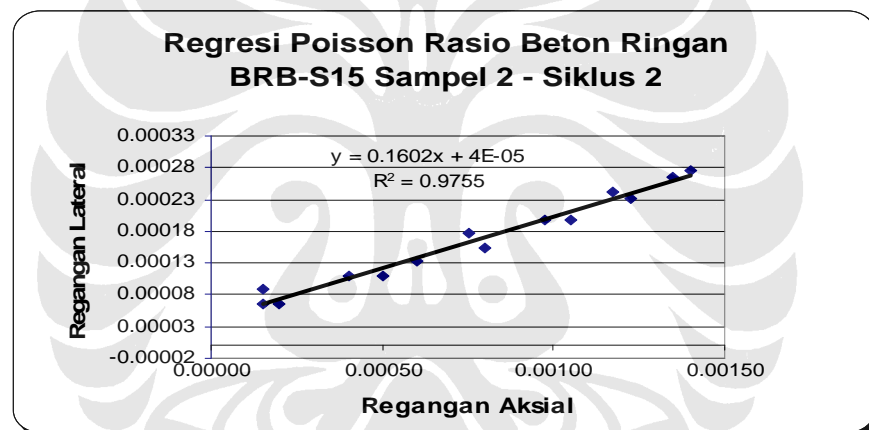
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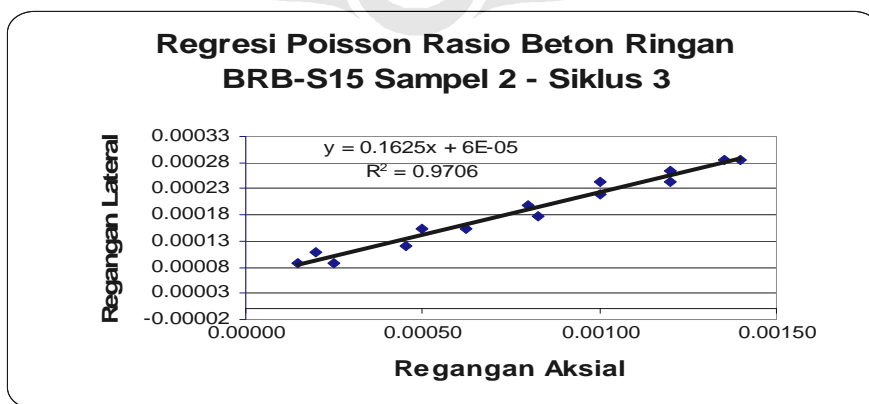
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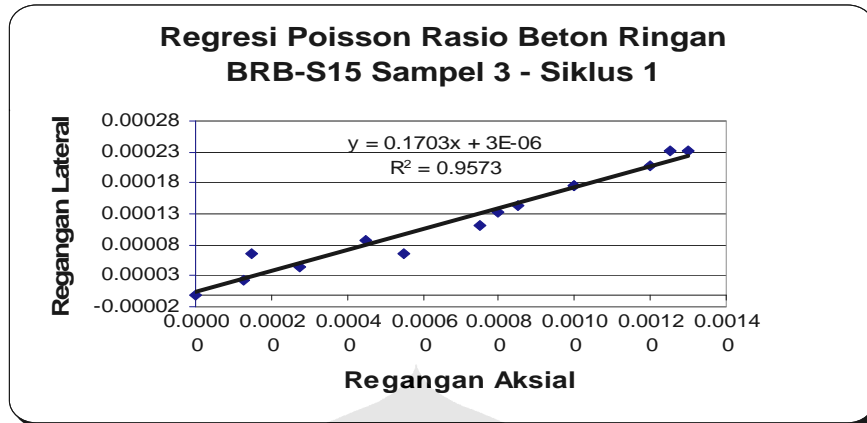
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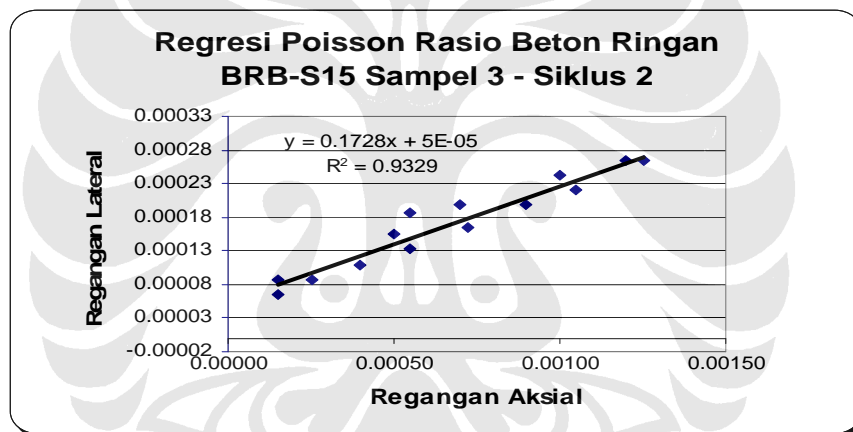
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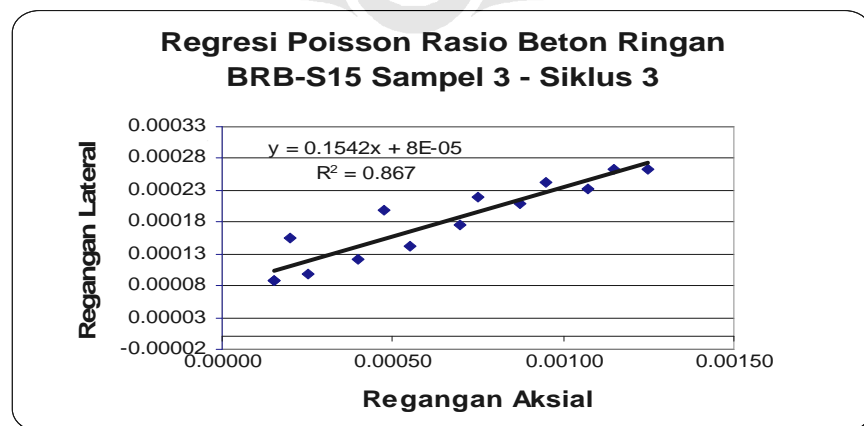
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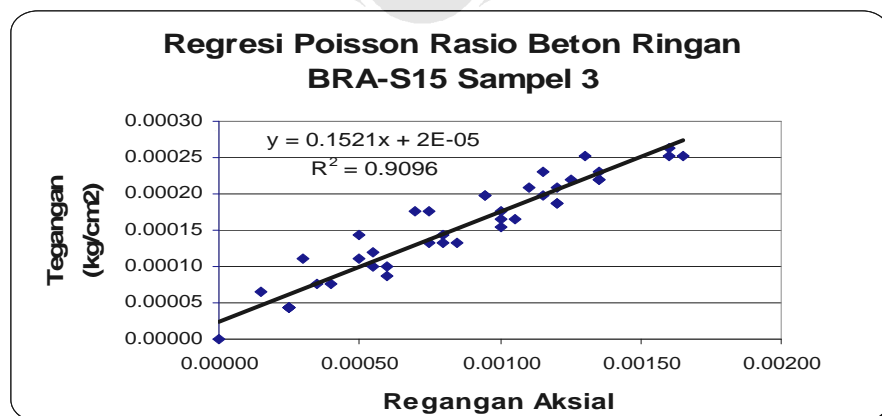
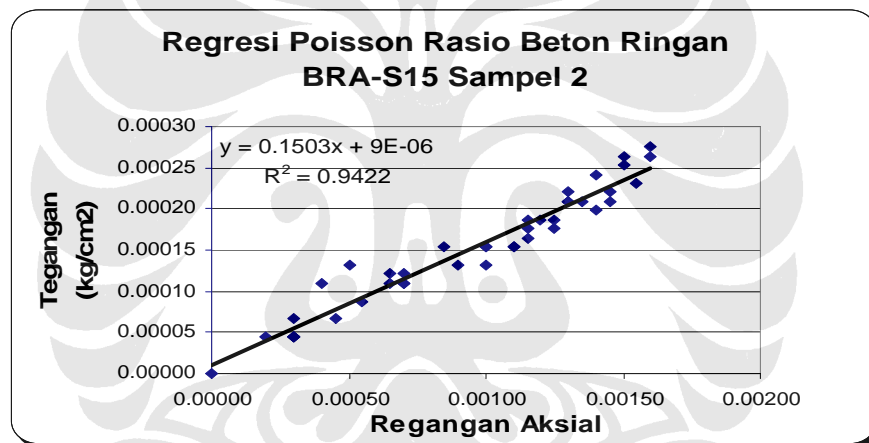
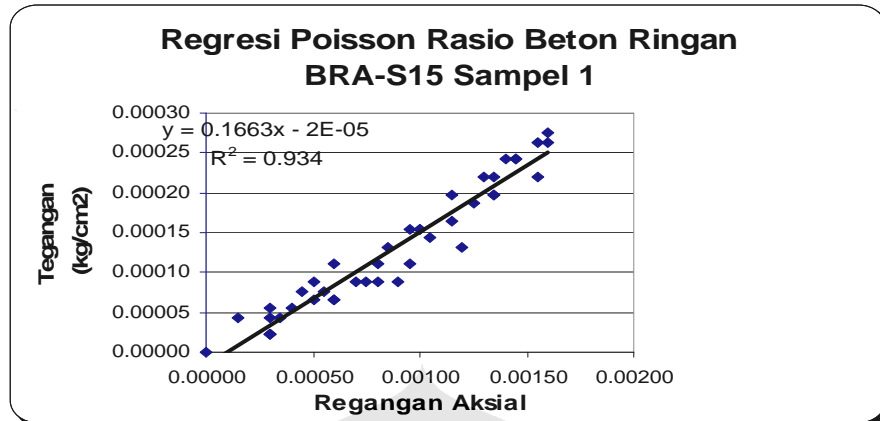
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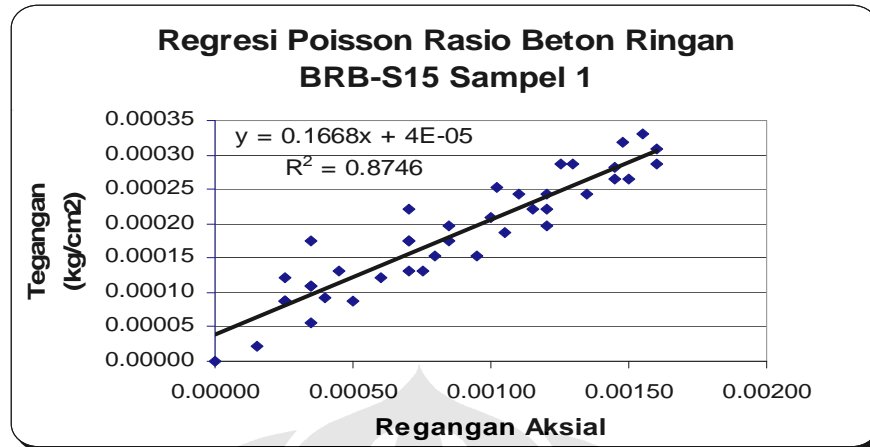


Grafik Regresi Hubungan Regangan Lateral-Aksial Beton Ringan Tipe BR<sub>B</sub>-S<sub>15</sub> Sampel 3 – Siklus 2

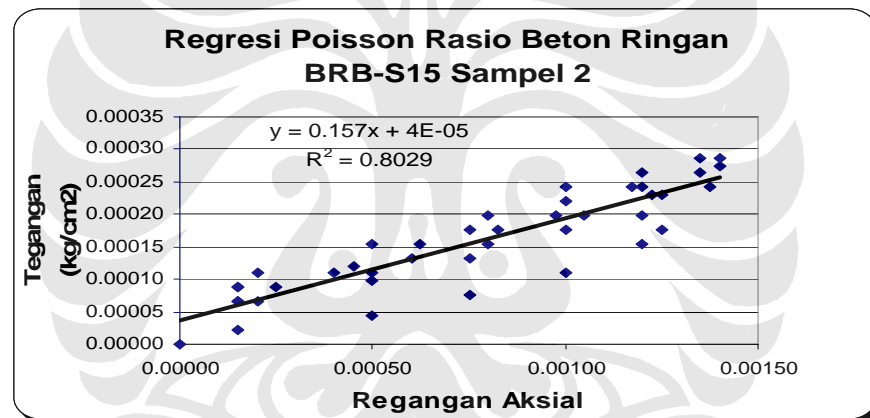


Grafik Regresi Hubungan Regangan Lateral-Aksial Beton Ringan Tipe BR<sub>B</sub>-S<sub>15</sub> Sampel 3 – Siklus 3

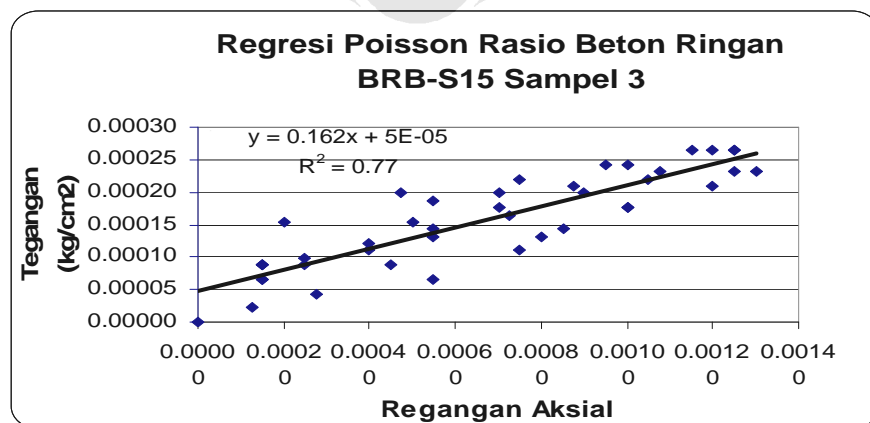




**Grafik Regresi Hubungan Regangan Lateral-Aksial  
Beton Ringan Tipe BR<sub>B</sub>-S<sub>15</sub> Sampel 1**



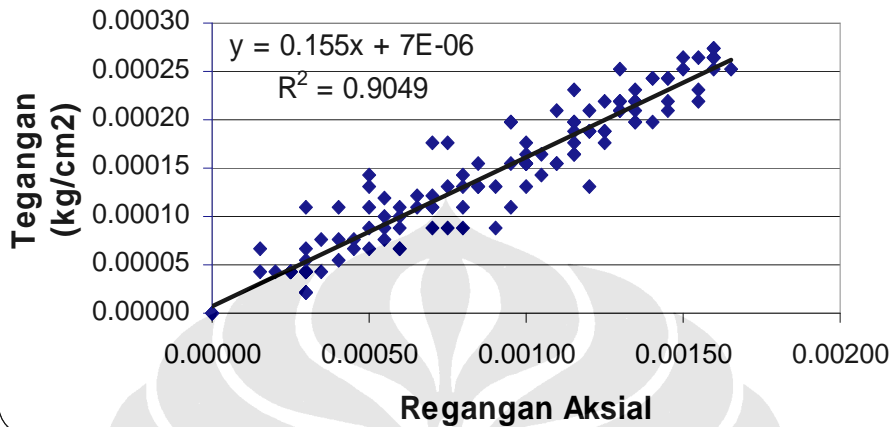
**Grafik Regresi Hubungan Regangan Lateral-Aksial  
Beton Ringan Tipe BR<sub>B</sub>-S<sub>15</sub> Sampel 2**



**Grafik Regresi Hubungan Regangan Lateral-Aksial  
Beton Ringan Tipe BR<sub>B</sub>-S<sub>15</sub> Sampel 3**

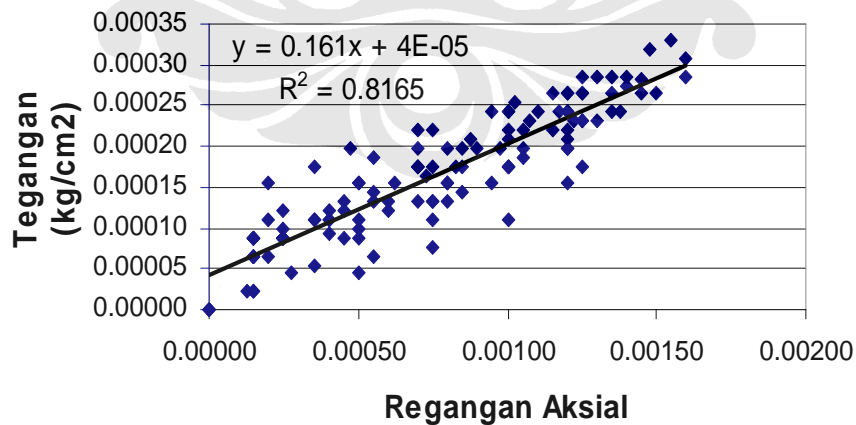


### Regresi Poisson Rasio Beton Ringan Tipe BRA-S15



**Grafik Regresi Hubungan Regangan Lateral-Aksial  
Beton Ringan Tipe BR<sub>A</sub>-S<sub>15</sub>**

### Regresi Poisson Rasio Beton Ringan Tipe BRB-S15



**Grafik Regresi Hubungan Regangan Lateral-Aksial  
Beton Ringan Tipe BR<sub>B</sub>-S<sub>15</sub>**



Tgl Cor 26/11/2007  
Tgl Tes 24/12/2007

Tipe **BR<sub>A</sub> - S<sub>15</sub>**  
Beban 15250

Sampel **1**

Koreksi Lateral (bab IV) 0,33  
Panjang sampel (mm) 300

L aksial (mm) 200  
Diameter sampel (mm) 150

Luas sampel (cm<sup>2</sup>) 176,715

Beban (kg)	Tegangan (kg/cm <sup>2</sup> )	Δ aksial (0.01 mm)	Δ lateral (0.01 mm)	e aksial	e lateral	E <sub>c</sub> (kg/cm <sup>2</sup> )	μ
<b>Siklus 1</b>							
0	0	0,0	0,0	0,00000	0,00000	0,0000	0,00000
1000	5,659	3,0	2,0	0,00015	0,00004	37725,616	0,29333
2000	11,318	8,0	2,5	0,00040	0,00006	28294,212	0,13750
3000	16,977	10,0	4,0	0,00050	0,00009	33953,055	0,17600
4000	22,635	16,0	5,0	0,00080	0,00011	28294,212	0,13750
5000	28,294	20,0	7,0	0,00100	0,00015	28294,212	0,15400
6000	33,953	26,0	10,0	0,00130	0,00022	26117,734	0,16923
7000	39,612	32,0	12,0	0,00160	0,00026	24757,436	0,16500
6000	33,953	29,0	11,0	0,00145	0,00024	23415,900	0,16690
5000	28,294	27,0	9,0	0,00135	0,00020	20958,676	0,14667
4000	22,635	24,0	6,0	0,00120	0,00013	18862,808	0,11000
3000	16,977	18,0	4,0	0,00090	0,00009	18862,808	0,09778
2000	11,318	9,0	3,5	0,00045	0,00008	25150,411	0,17111
1000	5,659	6,0	1,0	0,00030	0,00002	18862,808	0,07333
<b>Siklus 2</b>							
0	0	6,0	1,0	0,00030	0,00002	0,0000	0,00000
1000	5,659	10,0	3,0	0,00050	0,00007	11317,685	0,13200
2000	11,318	12,0	5,0	0,00060	0,00011	18862,808	0,18333
3000	16,977	17,0	6,0	0,00085	0,00013	19972,385	0,15529
4000	22,635	19,0	7,0	0,00095	0,00015	23826,705	0,16211
5000	28,294	23,0	9,0	0,00115	0,00020	24603,663	0,17217
6000	33,953	28,0	11,0	0,00140	0,00024	24252,182	0,17286
7000	39,612	32,0	12,5	0,00160	0,00028	24757,436	0,17188
6000	33,953	31,0	10,0	0,00155	0,00022	21905,196	0,14194
5000	28,294	27,0	9,0	0,00135	0,00020	20958,676	0,14667
4000	22,635	20,0	7,0	0,00100	0,00015	22635,370	0,15400
3000	16,977	15,0	4,0	0,00075	0,00009	22635,370	0,11733
2000	11,318	12,0	3,0	0,00060	0,00007	18862,808	0,11000
1000	5,659	6,0	2,0	0,00030	0,00004	18862,808	0,14667
<b>Siklus 3</b>							
0	0	6,0	1,0	0,00030	0,00002	0,0000	0,00000
1000	5,659	7,0	2,0	0,00035	0,00004	16168,121	0,12571
2000	11,318	11,0	3,5	0,00055	0,00008	20577,609	0,14000
3000	16,977	14,0	4,0	0,00070	0,00009	24252,182	0,12571
4000	22,635	19,0	5,0	0,00095	0,00011	23826,705	0,11579
5000	28,294	23,0	7,5	0,00115	0,00017	24603,663	0,14348
6000	33,953	27,0	10,0	0,00135	0,00022	25150,411	0,16296
7000	39,612	31,0	12,0	0,00155	0,00026	25556,063	0,17032
6000	33,953	29,0	11,0	0,00145	0,00024	23415,900	0,16690
5000	28,294	25,0	8,5	0,00125	0,00019	22635,370	0,14960
4000	22,635	21,0	6,5	0,00105	0,00014	21557,495	0,13619
3000	16,977	16,0	4,0	0,00080	0,00009	21220,659	0,11000
2000	11,318	12,0	3,0	0,00060	0,00007	18862,808	0,11000
1000	5,659	6,0	2,5	0,00030	0,00006	18862,808	0,18333

Tgl Cor 26/11/2007  
Tgl Tes 24/12/2007

Tipe **BR<sub>A</sub> - S<sub>15</sub>**  
Beban 16500

Sampel 2

Koreksi Lateral (bab IV) 0,33 L aksial (mm) 200 Luas sampel (cm<sup>2</sup>) 176,715  
Panjang sampel (mm) 300 Diameter sampel (mm) 150

Beban (kg)	Tegangan (kg/cm <sup>2</sup> )	Δ aksial (0.01 mm)	Δ lateral (0.01 mm)	e aksial	e lateral	E <sub>c</sub> (kg/cm <sup>2</sup> )	μ
<b>Siklus 1</b>							
0	0	0,0	0,0	0,00000	0,00000	0,0000	0,00000
1000	5,659	4,0	2,0	0,00020	0,00004	28294,212	0,22000
2000	11,318	8,0	5,0	0,00040	0,00011	28294,212	0,27500
3000	16,977	13,0	5,5	0,00065	0,00012	26117,734	0,18615
4000	22,635	17,0	7,0	0,00085	0,00015	26629,847	0,18118
5000	28,294	23,0	8,0	0,00115	0,00018	24603,663	0,15304
6000	33,953	26,0	9,5	0,00130	0,00021	26117,734	0,16077
7000	39,612	30,0	12,0	0,00150	0,00026	26407,931	0,17600
6000	33,953	29,0	10,0	0,00145	0,00022	23415,900	0,15172
5000	28,294	27,0	9,5	0,00135	0,00021	20958,676	0,15481
4000	22,635	25,0	8,5	0,00125	0,00019	18108,296	0,14960
3000	16,977	22,0	7,0	0,00110	0,00015	15433,207	0,14000
2000	11,318	10,0	6,0	0,00050	0,00013	22635,370	0,26400
1000	5,659	6,0	2,0	0,00030	0,00004	18862,808	0,14667
<b>Siklus 2</b>							
0	0	6,0	2,0	0,00030	0,00004	0,0000	0,33333
1000	5,659	9,0	3,0	0,00045	0,00007	12575,205	0,14667
2000	11,318	14,0	5,0	0,00070	0,00011	16168,121	0,15714
3000	16,977	18,0	6,0	0,00090	0,00013	18862,808	0,14667
4000	22,635	22,0	7,0	0,00110	0,00015	20577,609	0,14000
5000	28,294	25,0	8,0	0,00125	0,00018	22635,370	0,14080
6000	33,953	29,0	9,5	0,00145	0,00021	23415,900	0,14414
7000	39,612	32,0	12,5	0,00160	0,00028	24757,436	0,17188
6000	33,953	28,0	11,0	0,00140	0,00024	24252,182	0,17286
5000	28,294	26,0	9,5	0,00130	0,00021	21764,779	0,16077
4000	22,635	23,0	8,5	0,00115	0,00019	19682,930	0,16261
3000	16,977	20,0	7,0	0,00100	0,00015	16976,527	0,15400
2000	11,318	13,0	5,0	0,00065	0,00011	17411,823	0,16923
1000	5,659	6,0	2,0	0,00030	0,00004	18862,808	0,14667
<b>Siklus 3</b>							
0	0	6,0	2,0	0,00030	0,00004	0,0000	0,33333
1000	5,659	11,0	4,0	0,00055	0,00009	10288,804	0,16000
2000	11,318	14,0	5,0	0,00070	0,00011	16168,121	0,15714
3000	16,977	20,0	6,0	0,00100	0,00013	16976,527	0,13200
4000	22,635	23,0	7,5	0,00115	0,00017	19682,930	0,14348
5000	28,294	28,0	9,0	0,00140	0,00020	20210,152	0,14143
6000	33,953	31,0	10,5	0,00155	0,00023	21905,196	0,14903
7000	39,612	32,0	12,0	0,00160	0,00026	24757,436	0,16500
6000	33,953	30,0	11,5	0,00150	0,00025	22635,370	0,16867
5000	28,294	26,0	10,0	0,00130	0,00022	21764,779	0,16923
4000	22,635	24,0	8,5	0,00120	0,00019	18862,808	0,15583
3000	16,977	20,0	7,0	0,00100	0,00015	16976,527	0,15400
2000	11,318	14,0	5,5	0,00070	0,00012	16168,121	0,17286
1000	5,659	6,0	3,0	0,00030	0,00007	18862,808	0,22000

Tgl Cor 26/11/2007  
Tgl Tes 24/12/2007

Tipe **BR<sub>A</sub> - S<sub>15</sub>**  
Beban 16500

Sampel 3

Koreksi Lateral (bab IV) 0,33  
Panjang sampel (mm) 300

L aksial (mm) 200  
Diameter sampel (mm) 150

Luas sampel (cm<sup>2</sup>) 176,715

Beban (kg)	Tegangan (kg/cm <sup>2</sup> )	Δ aksial (0.01 mm)	Δ lateral (0.01 mm)	e aksial	e lateral	E <sub>c</sub> (kg/cm <sup>2</sup> )	μ
<b>Siklus 1</b>							
0	0	0	0	0,00000	0,00000	0,0000	0,00000
1000	5,659	3,0	3,0	0,00015	0,00007	37725,616	0,44000
2000	11,318	6,0	5,0	0,00030	0,00011	37725,616	0,36667
3000	16,977	10,0	6,5	0,00050	0,00014	33953,055	0,28600
4000	22,635	14,0	8,0	0,00070	0,00018	32336,242	0,25143
5000	28,294	19,0	9,0	0,00095	0,00020	29783,381	0,20842
6000	33,953	25,0	10,0	0,00125	0,00022	27162,444	0,17600
7000	39,612	32,0	12,0	0,00160	0,00026	24757,436	0,16500
6000	33,953	26,0	11,5	0,00130	0,00025	26117,734	0,19462
5000	28,294	23,0	10,5	0,00115	0,00023	24603,663	0,20087
4000	22,635	19,0	9,0	0,00095	0,00020	23826,705	0,20842
3000	16,977	15,0	8,0	0,00075	0,00018	22635,370	0,23467
2000	11,318	10,0	5,0	0,00050	0,00011	22635,370	0,22000
1000	5,659	5,0	2,0	0,00025	0,00004	22635,370	0,17600
<b>Siklus 2</b>							
0	0	5	2	0,00025	0,00004	0,0000	0,40000
1000	5,659	7,0	3,5	0,00035	0,00008	16168,121	0,22000
2000	11,318	11,0	4,5	0,00055	0,00010	20577,609	0,18000
3000	16,977	15,0	6,0	0,00075	0,00013	22635,370	0,17600
4000	22,635	20,0	7,0	0,00100	0,00015	22635,370	0,15400
5000	28,294	24,0	8,5	0,00120	0,00019	23578,510	0,15583
6000	33,953	22,0	9,5	0,00110	0,00021	30866,413	0,19000
7000	39,612	32,0	11,5	0,00160	0,00025	24757,436	0,15813
6000	33,953	27,0	10,0	0,00135	0,00022	25150,411	0,16296
5000	28,294	23,0	9,0	0,00115	0,00020	24603,663	0,17217
4000	22,635	20,0	8,0	0,00100	0,00018	22635,370	0,17600
3000	16,977	16,0	6,5	0,00080	0,00014	21220,659	0,17875
2000	11,318	11,0	5,4	0,00055	0,00012	20577,609	0,21600
1000	5,659	5,0	2,0	0,00025	0,00004	22635,370	0,17600
<b>Siklus 3</b>							
0	0	5	2	0,00025	0,00004	0,0000	0,40000
1000	5,659	8,0	3,5	0,00040	0,00008	14147,106	0,19250
2000	11,318	12,0	4,5	0,00060	0,00010	18862,808	0,16500
3000	16,977	16,0	6,0	0,00080	0,00013	21220,659	0,16500
4000	22,635	20,0	7,5	0,00100	0,00017	22635,370	0,16500
5000	28,294	24,0	8,5	0,00120	0,00019	23578,510	0,15583
6000	33,953	27,0	10,0	0,00135	0,00022	25150,411	0,16296
7000	39,612	33,0	11,5	0,00165	0,00025	24007,210	0,15333
6000	33,953	27,0	10,5	0,00135	0,00023	25150,411	0,17111
5000	28,294	24,0	9,5	0,00120	0,00021	23578,510	0,17417
4000	22,635	21,0	7,5	0,00105	0,00017	21557,495	0,15714
3000	16,977	17,0	6,0	0,00085	0,00013	19972,385	0,15529
2000	11,318	12,0	4,0	0,00060	0,00009	18862,808	0,14667
1000	5,659	5,0	2,0	0,00025	0,00004	22635,370	0,17600

Tgl Cor 28/11/2007  
Tgl Tes 26/12/2007

Tipe **BR<sub>B</sub> - S<sub>15</sub>**  
Beban 15000

Sampel **1**

Koreksi Lateral (bab IV) 0,33  
Panjang sampel (mm) 300

L aksial (mm) 200  
Diameter sampel (mm) 150

Luas sampel (cm<sup>2</sup>) 176,715

Beban (kg)	Tegangan (kg/cm <sup>2</sup> )	Δ aksial (0.01 mm)	Δ lateral (0.01 mm)	e aksial	e lateral	E <sub>c</sub> (kg/cm <sup>2</sup> )	μ
<b>Siklus 1</b>							
0	0	0	0	0,00000	0,00000	0,0000	0,00000
1000	5,659	3,0	1,0	0,00015	0,00002	37725,616	0,14667
2000	11,318	7,0	2,5	0,00035	0,00006	32336,242	0,15714
3000	16,977	10,0	4,0	0,00050	0,00009	33953,055	0,17600
4000	22,635	15,0	6,0	0,00075	0,00013	30180,493	0,17600
5000	28,294	19,0	7,0	0,00095	0,00015	29783,381	0,16211
6000	33,953	24,0	9,0	0,00120	0,00020	28294,212	0,16500
7000	39,612	32,0	13,0	0,00160	0,00029	24757,436	0,17875
6000	33,953	30,0	12,0	0,00150	0,00026	22635,370	0,17600
5000	28,294	27,0	11,0	0,00135	0,00024	20958,676	0,17926
4000	22,635	23,0	10,0	0,00115	0,00022	19682,930	0,19130
3000	16,977	17,0	8,0	0,00085	0,00018	19972,385	0,20706
2000	11,318	14,0	6,0	0,00070	0,00013	16168,121	0,18857
1000	5,659	5,0	4,0	0,00025	0,00009	22635,370	0,35200
<b>Siklus 2</b>							
0	0	5	4	0,00025	0,00009	0,0000	0,00000
1000	5,659	8,0	4,2	0,00040	0,00009	14147,106	0,23100
2000	11,318	12,0	5,5	0,00060	0,00012	18862,808	0,20167
3000	16,977	16,0	7,0	0,00080	0,00015	21220,659	0,19250
4000	22,635	21,0	8,5	0,00105	0,00019	21557,495	0,17810
5000	28,294	24,0	10,0	0,00120	0,00022	23578,510	0,18333
6000	33,953	29,0	12,0	0,00145	0,00026	23415,900	0,18207
7000	39,612	32,0	14,0	0,00160	0,00031	24757,436	0,19250
6000	33,953	29,0	12,8	0,00145	0,00028	23415,900	0,19421
5000	28,294	24,0	11,0	0,00120	0,00024	23578,510	0,20167
4000	22,635	20,0	9,5	0,00100	0,00021	22635,370	0,20900
3000	16,977	14,0	8,0	0,00070	0,00018	24252,182	0,25143
2000	11,318	7,0	5,0	0,00035	0,00011	32336,242	0,31429
1000	5,659	5,0	4,0	0,00025	0,00009	22635,370	0,35200
<b>Siklus 3</b>							
0	0	5	4	0,00025	0,00009	0,0000	0,00000
1000	5,659	7,0	5,0	0,00035	0,00011	16168,121	0,31429
2000	11,318	9,0	6,0	0,00045	0,00013	25150,411	0,29333
3000	16,977	14,0	8,0	0,00070	0,00018	24252,182	0,25143
4000	22,635	17,0	9,0	0,00085	0,00020	26629,847	0,23294
5000	28,294	22,0	11,0	0,00110	0,00024	25722,011	0,22000
6000	33,953	26,0	13,0	0,00130	0,00029	26117,734	0,22000
7000	39,612	31,0	15,0	0,00155	0,00033	25556,063	0,21290
6000	33,953	29,5	14,5	0,00148	0,00032	23019,020	0,21627
5000	28,294	25,0	13,0	0,00125	0,00029	22635,370	0,22880
4000	22,635	20,5	11,5	0,00103	0,00025	22083,287	0,24683
3000	16,977	14,0	10,0	0,00070	0,00022	24252,182	0,31429
2000	11,318	7,0	8,0	0,00035	0,00018	32336,242	0,50286
1000	5,659	5,0	5,5	0,00025	0,00012	22635,370	0,48400

Tgl Cor 28/11/2007  
Tgl Tes 26/12/2007

Tipe **BR<sub>B</sub> - S<sub>15</sub>**  
Beban 15000

Sampel 2

Koreksi Lateral (bab IV) 0,33  
Panjang sampel (mm) 300

L aksial (mm) 200  
Diameter sampel (mm) 150

Luas sampel (cm<sup>2</sup>) 176,715

Beban (kg)	Tegangan (kg/cm <sup>2</sup> )	Δ aksial (0.01 mm)	Δ lateral (0.01 mm)	e aksial	e lateral	E <sub>c</sub> (kg/cm <sup>2</sup> )	μ
<b>Siklus 1</b>							
0	0	0	0	0,00000	0,00000	0,0000	0,00000
1000	5,659	3,0	1,0	0,00015	0,00002	37725,616	0,14667
2000	11,318	10,0	2,0	0,00050	0,00004	22635,370	0,08800
3000	16,977	15,0	3,5	0,00075	0,00008	22635,370	0,10267
4000	22,635	20,0	5,0	0,00100	0,00011	22635,370	0,11000
5000	28,294	24,0	7,0	0,00120	0,00015	23578,510	0,12833
6000	33,953	25,0	8,0	0,00125	0,00018	27162,444	0,14080
7000	39,612	27,5	11,0	0,00138	0,00024	28808,652	0,17600
6000	33,953	25,0	10,5	0,00125	0,00023	27162,444	0,18480
5000	28,294	24,0	9,0	0,00120	0,00020	23578,510	0,16500
4000	22,635	20,0	8,0	0,00100	0,00018	22635,370	0,17600
3000	16,977	15,0	6,0	0,00075	0,00013	22635,370	0,17600
2000	11,318	10,0	4,5	0,00050	0,00010	22635,370	0,19800
1000	5,659	3,0	3,0	0,00015	0,00007	37725,616	0,44000
<b>Siklus 2</b>							
0	0	3	3	0,00015	0,00007	0,0000	1,00000
1000	5,659	4,0	3,0	0,00020	0,00007	28294,212	0,33000
2000	11,318	8,0	5,0	0,00040	0,00011	28294,212	0,27500
3000	16,977	12,0	6,0	0,00060	0,00013	28294,212	0,22000
4000	22,635	15,0	8,0	0,00075	0,00018	30180,493	0,23467
5000	28,294	19,5	9,0	0,00098	0,00020	29019,705	0,20308
6000	33,953	23,5	11,0	0,00118	0,00024	28896,217	0,20596
7000	39,612	28,0	12,5	0,00140	0,00028	28294,212	0,19643
6000	33,953	27,0	12,0	0,00135	0,00026	25150,411	0,19556
5000	28,294	24,5	10,5	0,00123	0,00023	23097,316	0,18857
4000	22,635	21,0	9,0	0,00105	0,00020	21557,495	0,18857
3000	16,977	16,0	7,0	0,00080	0,00015	21220,659	0,19250
2000	11,318	10,0	5,0	0,00050	0,00011	22635,370	0,22000
1000	5,659	3,0	4,0	0,00015	0,00009	37725,616	0,58667
<b>Siklus 3</b>							
0	0	3	4	0,00015	0,00009	0,0000	1,33333
1000	5,659	5,0	4,0	0,00025	0,00009	22635,370	0,35200
2000	11,318	9,0	5,5	0,00045	0,00012	25150,411	0,26889
3000	16,977	12,5	7,0	0,00063	0,00015	27162,444	0,24640
4000	22,635	16,5	8,0	0,00083	0,00018	27436,812	0,21333
5000	28,294	20,0	10,0	0,00100	0,00022	28294,212	0,22000
6000	33,953	24,0	11,0	0,00120	0,00024	28294,212	0,20167
7000	39,612	28,0	13,0	0,00140	0,00029	28294,212	0,20429
6000	33,953	27,0	13,0	0,00135	0,00029	25150,411	0,21185
5000	28,294	24,0	12,0	0,00120	0,00026	23578,510	0,22000
4000	22,635	20,0	11,0	0,00100	0,00024	22635,370	0,24200
3000	16,977	16,0	9,0	0,00080	0,00020	21220,659	0,24750
2000	11,318	10,0	7,0	0,00050	0,00015	22635,370	0,30800
1000	5,659	4,0	5,0	0,00020	0,00011	28294,212	0,55000

Tgl Cor 28/11/2007  
Tgl Tes 26/12/2007

Tipe **BR<sub>B</sub> - S<sub>15</sub>**  
Beban 15750

Sampel 3

Koreksi Lateral (bab IV) 0,33 L aksial (mm) 200 Luas sampel (cm<sup>2</sup>) 176,715  
Panjang sampel (mm) 300 Diameter sampel (mm) 150

Beban (kg)	Tegangan (kg/cm <sup>2</sup> )	Δ aksial (0.01 mm)	Δ lateral (0.01 mm)	e aksial	e lateral	E <sub>c</sub> (kg/cm <sup>2</sup> )	μ
<b>Siklus 1</b>							
0	0	0	0	0,00000	0,00000	0,0000	0,00000
1000	5,659	2,5	1,0	0,00013	0,00002	45270,739	0,17600
2000	11,318	5,5	2,0	0,00028	0,00004	41155,218	0,16000
3000	16,977	11,0	3,0	0,00055	0,00007	30866,413	0,12000
4000	22,635	15,0	5,0	0,00075	0,00011	30180,493	0,14667
5000	28,294	17,0	6,5	0,00085	0,00014	33287,308	0,16824
6000	33,953	20,0	8,0	0,00100	0,00018	33953,055	0,17600
7000	39,612	26,0	10,5	0,00130	0,00023	30470,690	0,17769
6000	33,953	25,0	10,5	0,00125	0,00023	27162,444	0,18480
5000	28,294	24,0	9,5	0,00120	0,00021	23578,510	0,17417
4000	22,635	20,0	8,0	0,00100	0,00018	22635,370	0,17600
3000	16,977	16,0	6,0	0,00080	0,00013	21220,659	0,16500
2000	11,318	9,0	4,0	0,00045	0,00009	25150,411	0,19556
1000	5,659	3,0	3,0	0,00015	0,00007	37725,616	0,44000
<b>Siklus 2</b>							
0	0	3,0	3,0	0,00015	0,00007	0,0000	1,00000
1000	5,659	5,0	4,0	0,00025	0,00009	22635,370	0,35200
2000	11,318	8,0	5,0	0,00040	0,00011	28294,212	0,27500
3000	16,977	11,0	6,0	0,00055	0,00013	30866,413	0,24000
4000	22,635	14,5	7,5	0,00073	0,00017	31221,200	0,22759
5000	28,294	18,0	9,0	0,00090	0,00020	31438,013	0,22000
6000	33,953	21,0	10,0	0,00105	0,00022	32336,242	0,20952
7000	39,612	25,0	12,0	0,00125	0,00026	31689,518	0,21120
6000	33,953	24,0	12,0	0,00120	0,00026	28294,212	0,22000
5000	28,294	20,0	11,0	0,00100	0,00024	28294,212	0,24200
4000	22,635	14,0	9,0	0,00070	0,00020	32336,242	0,28286
3000	16,977	11,0	8,5	0,00055	0,00019	30866,413	0,34000
2000	11,318	10,0	7,0	0,00050	0,00015	22635,370	0,30800
1000	5,659	3,0	4,0	0,00015	0,00009	37725,616	0,58667
<b>Siklus 3</b>							
0	0	3,0	4,0	0,00015	0,00009	0,0000	1,33333
1000	5,659	5,0	4,5	0,00025	0,00010	22635,370	0,39600
2000	11,318	8,0	5,5	0,00040	0,00012	28294,212	0,30250
3000	16,977	11,0	6,5	0,00055	0,00014	30866,413	0,26000
4000	22,635	14,0	8,0	0,00070	0,00018	32336,242	0,25143
5000	28,294	17,5	9,5	0,00088	0,00021	32336,242	0,23886
6000	33,953	21,5	10,5	0,00108	0,00023	31584,237	0,21488
7000	39,612	25,0	12,0	0,00125	0,00026	31689,518	0,21120
6000	33,953	23,0	12,0	0,00115	0,00026	29524,395	0,22957
5000	28,294	19,0	11,0	0,00095	0,00024	29783,381	0,25474
4000	22,635	15,0	10,0	0,00075	0,00022	30180,493	0,29333
3000	16,977	9,5	9,0	0,00048	0,00020	35740,057	0,41684
2000	11,318	4,0	7,0	0,00020	0,00015	56588,424	0,77000
1000	5,659	3,0	4,0	0,00015	0,00009	37725,616	0,58667



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**Sampel Kubus Plastik Repsol (5x5x5) cm**



**Sampel Kubus Plastik Federal (5x5x5) cm**



**Sampel Kubus Plastik Castrol (5x5x5) cm**





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**Kebutuhan Bahan Untuk Kubus Plastik Pertamina (15x15x15) cm**



**Proses Pembakaran Botol Pelumas Pertamina**



**Kebutuhan Bahan Untuk Kubus Plastik Federal (15x15x15) cm**





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**Proses Pembakaran Bahan Plastik HDPE**



**Proses Pembakaran Botol Pelumas Castrol**



**Proses Pembakaran Botol Pelumas Repsol**



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**Contoh Botol, Potongan dan Kubus (5x5x5) Tipe Repsol**



**Contoh Botol, Potongan dan Kubus (5x5x5) Tipe Castrol**



**Proses Pembersihan, Pemotongan dan Pemilihan Bahan HDPE**



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**Alat-Alat Yang Digunakan**



**Proses Pengayakan Pasir Bergradasi**



**Tes Kubus Plastik Ukuran (5x5x5) cm**





**Pola Retak Kubus Plastik (5x5x5) cm**



**Penimbangan Kubus Plastik (15x15x15) cm Dalam Air Untuk Tes SG**



**Sampel Kubus Plastik (15x15x15) cm**



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**Pengetesan Kuat Tekan Kubus Plastik (15x15x15) cm**



**Pola Retak Kubus Plastik (15x15x15) cm**



**Tes Slump Beton Ringan Dengan Agregat Kasar Ringan Plastik**



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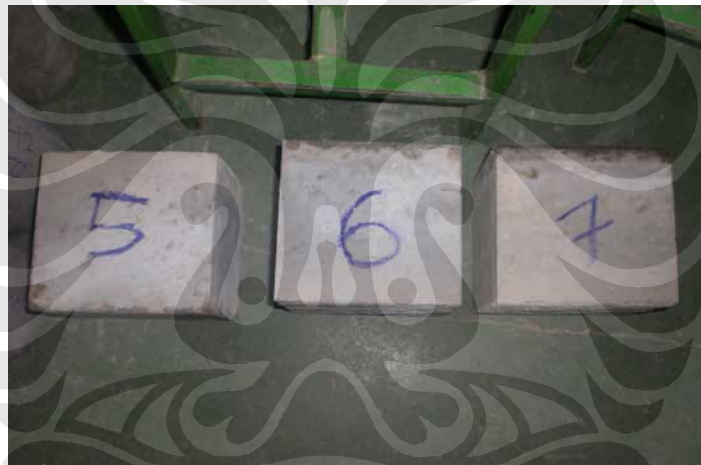
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**Sampel Kubus dan Silinder Beton Ringan Dalam Cetakan**



**Sampel Kubus (15x15x15) cm Beton Ringan**



**Sampel Kubus (5x5x5) cm Beton Ringan**





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**Pengetesan Kubus (15x15x15) cm Beton Ringan**



**Pengetesan dan Pola Retak Kubus (5x5x5) cm Beton Ringan**



**Pola Hancur Kubus (5x5x5) cm Beton Ringan**



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**Pengetesan dan Pola Retak Silinder Beton Ringan**



**Pola Hancur Kubus (15x15x15) cm Beton Ringan**



**Pola Hancur Retak (15x15x15) cm Beton Ringan**





**Contoh Agregat Yang Telah Kering Dalam Wajan**



**Contoh Botol, Potongan dan Kubus (5x5x5) Tipe Shell**



**Pengtesan Modulus Elastisitas dan Poisson Rasio**