

## LAMPIRAN A

### HASILUJI MUTU FISIK GRANUL LUMBRICUS RUBELLUS

Mutu fisik yang diuji	B	Formula Kapsul Lumbricus rubellus				Persyaratan
		F I	F II	F III	F IV	
		Su (derajat)	I	30,03	33,28	
	II	30,25	33,11	30,66	30,60	
	III	30,15	32,94	31,12	30,90	
	$\bar{x}$	30,14	33,11	31,01	30,88	
	SD	0,11	0,17	0,31	0,27	
K (persen)	I	3,45	3,97	5,92	3,70	3-5% (Voigt, 1995)
	II	3,30	3,71	5,32	4,00	
	III	3,30	3,59	5,47	3,85	
	$\bar{x}$	3,35	3,76	5,57	3,85	
	SD	0,09	0,19	0,31	0,15	
HR	I	1,07	1,02	1,03	1,07	<1,25 (Parrott,1971)
	II	1,05	1,02	1,05	1,06	
	III	1,06	1,02	1,04	1,07	
	$\bar{x}$	1,06	1,02	1,04	1,07	
	SD	0,01	0	0,01	0,005	
IK (persen)	I	13,17	14,33	13,33	13	12-16= baik (Siregar,1992)
	II	13,30	14,83	13,17	13,17	
	III	13,17	15	13,17	13	
	$\bar{x}$	13,21	14,72	13,22	13,06	
	SD	0,07	0,35	0,09	0,10	

Ket: Su = Sudut diam                      K = Kerapuhan  
 HR = Housner ratio                      IK = Indeks kompresibilitas  
 B = Batch

## LAMPIRAN B

### HASIL UJI KERAPUHAN GRANUL LUMBRICUS RUBELLUS

F	Replikasi	Berat awal (gram)	Berat akhir (gram)	Kerapuhan (%)	$\bar{x} \pm SD$	SDrel (%)
I	1	10,02	9,55	4,70	3,97	16,20
	2	10,02	9,65	3,70	±	
	3	10,00	9,65	3,50	0,64	
II	1	10,01	9,97	0,40	0,47	24,74
	2	10,01	9,97	0,40	±	
	3	10,00	9,94	0,6	0,11	
III	1	10,02	9,88	1,4	2,13	29,96
	2	10,02	9,76	2,59	±	
	3	10,02	9,78	2,39	0,64	
IV	1	10,03	9,58	4,49	4,43	7,00
	2	10,01	9,60	4,09	±	
	3	10,02	9,55	4,70	0,31	

Ket: F = Formula

## LAMPIRAN C

### HASIL UJI MUTU FISIK GRANUL LUMBRICUS RUBELLUS FORMULA OPTIMUM

Mutu fisik yang diuji	<i>Batch</i>	Formula optimasi	Persyaratan
Sudut diam (derajat)	I	32,51	25-30= baik (Wells, 1988)
	II	32,85	
	III	32,68	
	$\bar{x}$	32,68	
	SD	0,17	
Kelembaban (derajat)	I	3,82	3-5%  (Voigt, 1995)
	II	3,47	
	III	3,88	
	$\bar{x}$	3,72	
	SD	0,22	
<i>Hausner ratio</i>	I	1,02	<1,25 (Parrott,1971)
	II	1,02	
	III	1,02	
	$\bar{x}$	1,02	
	SD	0,00	
<i>Carr's index</i> (persen)	I	15,00	12-16= baik (Siregar, 1992)
	II	15,00	
	III	14,87	
	$\bar{x}$	14,96	
	SD	0,07	

## LAMPIRAN D

### HASIL UJI KERAPUHAN GRANUL FORMULA OPTIMUM

Formula Optimum	R	Berat awal (gram)	Berat akhir (gram)	Kerapuhan (%)	$\bar{X} \pm SD$	SDrel (%)
Optimum	1	10,01	9,97	0,40	0,73	39,36
	2	10,02	9,93	0,90	$\pm$	
	3	10,02	9,93	0,90	0,29	

Ket : R = replikasi

## LAMPIRAN E

### HASIL UJI WAKTU HANCUR KAPSUL OPTIMUM LUMBRICUS RUBELLUS

Replikasi	Waktu hancur (menit)
1	1,24
2	1,29
3	1,22
$\bar{x} \pm SD$	1,25 $\pm$ 0,04

## LAMPIRAN F

### HASIL UJI KESERAGAMAN BOBOT KAPSUL OPTIMUM LUMBRICUS RUBELLUS

No.	Bobot kapsul (mg)	Penyimpangan (persen)
1	575,1	0,3
2	571,3	0,3
3	578,4	0,9
4	578,1	0,8
5	571,8	0,3
6	570,0	0,6
7	570,1	0,6
8	571,2	0,4
9	570,4	0,5
10	572,0	0,2
11	572,3	0,2
12	572,0	0,2
13	571,0	0,4
14	574,5	0,2
15	576,2	0,5
16	572,3	0,2
17	570,8	0,4
18	572,3	0,2
19	576,6	0,6
20	578,1	0,8
$\bar{x}$	573,2	0,43
SD	2,8	0,22
SDrel	0,5	52,33

## LAMPIRAN G

### HASIL UJI STATISTIK SUDUT DIAM ANTAR FORMULA

Anova: Single Factor

#### SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	3	90,43	30,14333	0,012133
Column 2	3	99,33	33,11	0,0289
Column 3	3	93,04	31,01333	0,098533
Column 4	3	92,64	30,88	0,0732

#### ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	14,61553	3	4,871844	91,59037	1,56E-06	4,066181
Within Groups	0,425533	8	0,053192			
Total	15,04107	11				

Keterangan:

Fhitung > Ftabel (3,8) = 4,01 sehingga H<sub>0</sub> ditolak dan ada perbedaan yang bermakna antar formula.

HSD = 0,465879

	FA	FB	FC	FD
Mean	30,14333	33,11	31,01333	30,88
FA	30,14333	0	2,966667 *	0,736667 *
FB	33,11	0	-2,09667 *	-2,23 *
FC	31,01333		0	-0,13333
FD	30,88			0

\* : Perbedaannya signifikan, karena selisihnya > nilai HSD





## LAMPIRAN H

### HASIL UJI STATISTIK *CARR'S INDEX* ANTAR FORMULA

Anova: Single Factors

#### SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	3	39,64	13,21333	0,005633
Column 2	3	44,16	14,72	0,1213
Column 3	3	39,67	13,22333	0,008533
Column 4	3	39,17	13,05667	0,009633

#### ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	5,496867	3	1,832289	50,51107	1,52E-05	4,066181
Within Groups	0,2902	8	0,036275			
Total	5,787067	11				

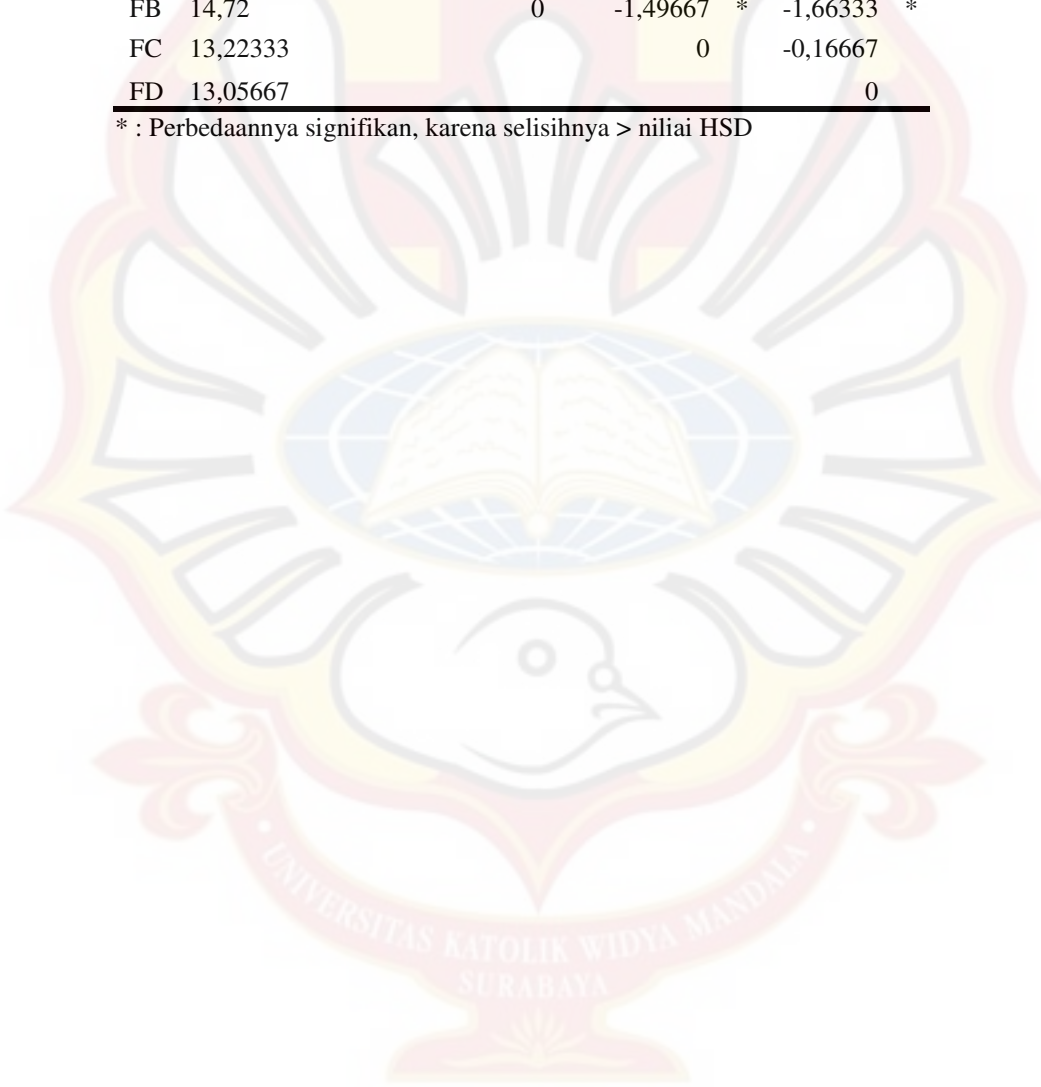
Keterangan:

Fhitung > Ftabel (3,8) = 4,01 sehingga H<sub>0</sub> ditolak dan ada perbedaan yang bermakna antar formula.

HSD = 0,384729

	FA	FB	FC	FD
Mean	13,21333	14,72	13,22333	13,05667
FA	13,21333	0	1,506667 *	0,01
FB	14,72	0	-1,49667 *	-1,66333 *
FC	13,22333		0	-0,16667
FD	13,05667			0

\* : Perbedaannya signifikan, karena selisihnya > nilai HSD



## LAMPIRAN I

### HASIL UJI STATISTIK KERAPUHAN GRANUL ANTAR FORMULA

Anova: Single Factor

#### SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	3	11,9	3,966667	0,413333
Column 2	3	1,4	0,466667	0,013333
Column 3	3	6,38	2,126667	0,406033
Column 4	3	13,28	4,426667	0,096033

#### ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	29,6808	3	9,8936	42,61115	2,89E-05	4,066181
Within Groups	1,857467	8	0,232183			
Total	31,53827	11				

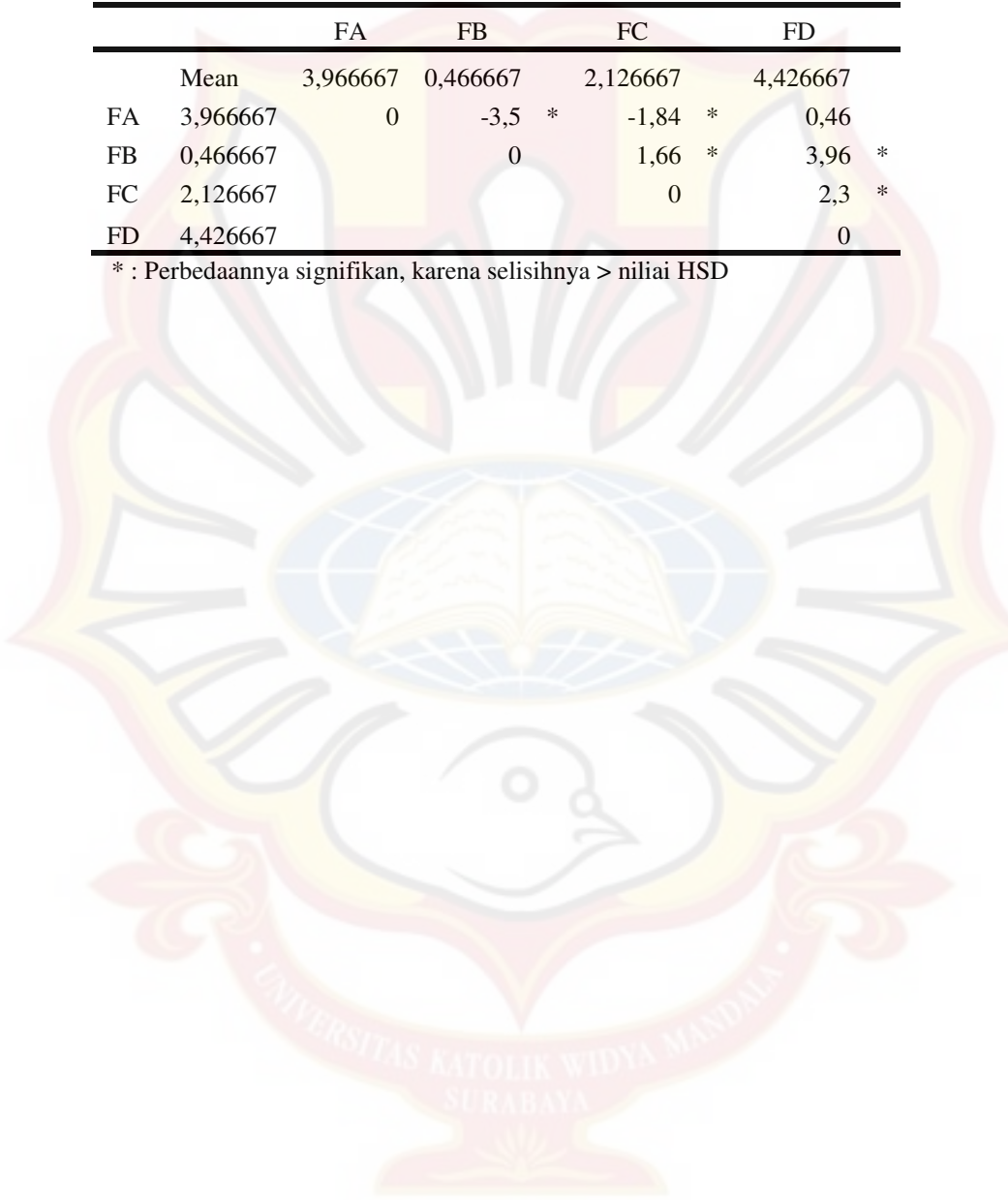
Keterangan:

Fhitung > Ftabel (3,8) = 4,01 sehingga H<sub>0</sub> ditolak dan ada perbedaan yang bermakna antar formula.

HSD = 0,973345

	FA	FB	FC	FD
Mean	3,966667	0,466667	2,126667	4,426667
FA	3,966667	0	-3,5 *	-1,84 *
FB	0,466667	0	1,66 *	3,96 *
FC	2,126667		0	2,3 *
FD	4,426667			0

\* : Perbedaannya signifikan, karena selisihnya > nilai HSD



## LAMPIRAN J

### Contoh Perhitungan

#### Contoh perhitungan sudut diam:

Formula Optimum :

$$W \text{ persegi panjang} = 5,74 \text{ gram}$$

$$W \text{ lingkaran} = 1,30 \text{ gram}$$

$$\text{Luas persegi panjang} = 713,36 \text{ cm}^2$$

$$\text{Luas lingkaran} = \frac{1,30}{5,74} \times 713,36 = 161,56 \text{ cm}^2$$

$$L = \pi \cdot r^2$$

$$r^2 = \frac{L}{\pi}$$

$$= \frac{161,56}{3,14}$$

$$r = 7,17 \text{ cm}$$

$$\text{tg } \alpha = \frac{t}{r} = \frac{4,57}{7,17}$$

$$\alpha = 32,50^\circ$$

#### Contoh perhitungan indeks kompresibilitas:

Formula Optimasi :

$$\text{Berat gelas} = 126,30 \text{ g } (W_1)$$

$$\text{Berat gelas + granul} = 163,50 \text{ g } (W_2)$$

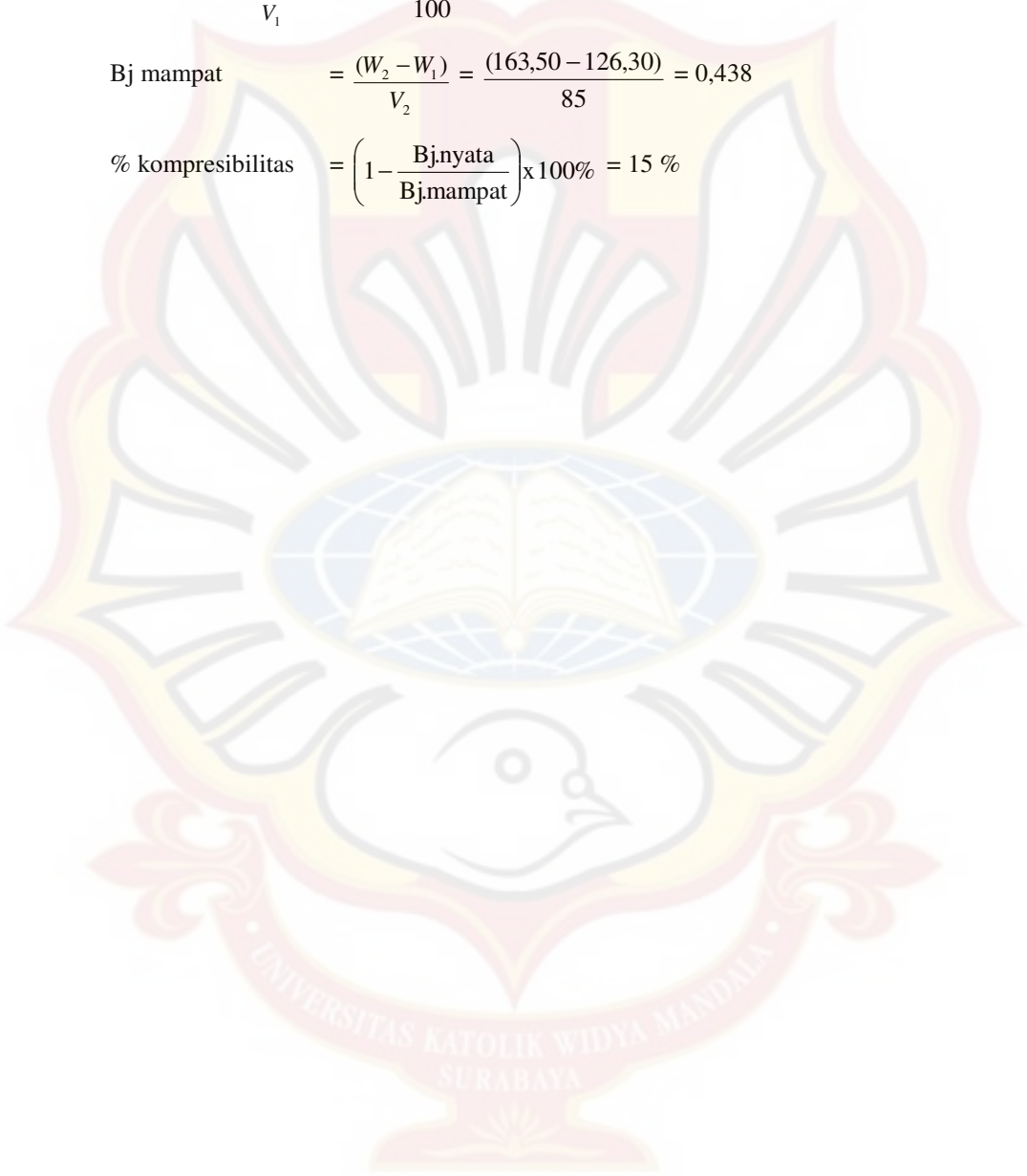
$$V_1 = 100 \text{ ml}$$

$$V_2 = 85 \text{ ml}$$

$$B_j \text{ nyata} = \frac{(W_2 - W_1)}{V_1} = \frac{163,50 - 126,30}{100} = 0,372$$

$$B_j \text{ mampat} = \frac{(W_2 - W_1)}{V_2} = \frac{(163,50 - 126,30)}{85} = 0,438$$

$$\% \text{ kompresibilitas} = \left( 1 - \frac{B_j \text{ nyata}}{B_j \text{ mampat}} \right) \times 100\% = 15 \%$$



# LAMPIRAN K

## SERTIFIKAT ANALISIS PVP K-30

杭州南航化工有限公司  
 NANHANG INDUSTRIAL CO.,LTD  
 地址:中国杭州市西湖区周浦乡姚家坞

### CERTIFICATE OF ANALYSIS

Product	PVP K-30 USP/BP		
Batch No.	20051213	Quantity	2025KGS
Manufacture Date	DEC.,2005	Expiry Date	DEC.,2008
ITEMS	SPECIFICATIONS	TEST RESULTS	
Characteristics	A white, fine powder	Complies	
Identification	Positive	Positive	
Water	5% max	2.8%	
Residue on ignition	0.1% max	0.02%	
K-Value	27-32	30.7	
Heavy metals(Lead)	10ppm max	Complies	
Nitrogen	11.5%-12.8%	12.2%	
Vinylpyrrolidone	0.2% max	0.032%	
Aldehydes	0.05% max	Complies	
Ph Value	3.0-7.0	3.62	
Hydrazine	1ppm max	Complies	
Peroxides	400ppm max	Complies	
Microbial Limits(By annual verification test)	Salmonella	Negative	
	Coli	Negative	
	Coliforms <1CFU/gm	Conform	
	Standard Plate Count<10,000CFU/gm	Conform	
	Mold & Yeast <1,000 CFU/gm	Conform	
<b>Conclusion: IT CONFORMS USP/BP</b>			

Analyst: Wang liu ling

Checker: li ling

Head of Q.C. Dept: Yang xiao fang



**megAsetia**  
 PT. MEGASSETIA AGUNG KEMAH



LAMPIRAN L

SERTIFIKAT ANALISIS TALKUM



SUN PLAN DEVELOPMENT LTD.

CERTIFICATE OF ANALYSIS

INVOICE NO. 1514

TO: PT BRATACO JL. KELENTENG NO. 8  
BANDUNG QQ PT BRATACO JL. MANGGA  
BESAR V/5 JAKARTA, INDONESIA  
NPWP.01.130.689.1-032.001

RE: 48 MT TALC POWDER HAICHEN SHIPPED PER V.SI "HUANDAO" V.3192 FROM BAYUQUAN,  
CHINA SEAPORT TO TG.PRIOK PORT, JAKARTA, INDONESIA ON/ABOUT 18 OCT 2003  
DRAWN UNDER IRREVOCABLE DC NO.02/03U/0645 DD 19SEP03 OF BANK NISP PT (SWIFT  
ADDRESS : NISPIDJA)

COMMODITY : TALC POWDER HAICHEN  
QUANTITY : 48 MT

SiO <sub>2</sub> :	60.1%
MgO :	30.8%
WHITENESS :	92.8%
CaO :	0.4%
Fe <sub>2</sub> O <sub>3</sub> :	0.26%
Al <sub>2</sub> O <sub>3</sub> :	0.3%
LOI :	6.0%
FINENESS :	98.5% PASSING THROUGH 325 MESH
PH :	7.9
MOISTURE :	0.38%
ASBESTOS :	FREE

 **BRATACO**  
IMPORTER  
MANUFACTURER  
DISTRIBUTOR

Produced on behalf of  
SUN PLAN DEVELOPMENT LIMITED  
1514  
18 OCT 2003  
PT BRATACO  
DISTRIBUTOR  
1514



# LAMPIRAN M

## SERTIFIKAT ANALISIS MAGNESIUM STEARAT



Partner der Industrie

### QUALITÄTSMANAGEMENT

#### CERTIFICATE OF ANALYSIS

customer: PT BRATACO  
 contact person:  
 FAX:  
 your order-number: PTB0735/V1104      our order-number: 4011746  
 delivered on: 04.08.2004      quantity: 9000  
 brand: LIGA MAGNESIUM STEARATE MF-2-V VEGETABLE      charge-no. C447176  
 manufacturing date: 2004-07-19      expiry date: 2006-07-19

product is in accordance with the USP27/NF22/BP2003/Ph. Eur 4rd ed./DAB 10/JP 14th ed./FCC 5th ed.

parameter	unit	method	result
identification A	oC	Ph.Eur	59
identification A	metal reaction	USP/NF	passes test
identification B	retention time GC	USP/NF	retentions match
identity or	ml 0,01N HCl	Ph.Eur	<0,5
salinity	ml 0,01 N NaOH	Ph.Eur	<0,5
heavy metals as Pb	ppm	JP	<20
lead	ppm	BAE 300-B	<1
cadmium	ppm	BAE 300-B	<1
nickel	ppm	BAE 300-B	<1
chloride	%	Ph.Eur	<0,1
oil rate	%	Ph.Eur	<0,5
acid value of the fatty acid	mg KOH/g	Ph.Eur	204,8
relative content of stearic acid	%	USP/NF	65,1
rel. cont. of stearic and palmitic acid	%	USP/NF	98,9
microbial count	cfu/g	USP/NF	<10
Molds & Yeasts	cfu/g	USP/NF	105
Escherichia coli	cfu/g	USP/NF	absent
Salmonella Species	cfu/g	USP/NF	absent
organic volatile impurities		USP/NF	meets USP/NF
loss on drying	%	BAE 600	3,9
zinc content	%	BAE 200 c	4,7
free fatty acid	%	BAE 400	0,6
residue at 200 mesh	%	BAE 605	0,2
bulk density tapped	g/ml	BAE 611a	0,32
specific surface area BET	qm/g	USP/NF	10,0
contamination		BAE 601	in accordance

Venlo, 27.08.04

data of the above mentioned delivery are based upon careful test according to the guidelines of our quality assurance system. They do not release the customer from entry control. Besides we do not guarantee special properties for concrete applications.

This certificate was issued by EDV and does not bear a signature.



**BRATACO**  
 PORTLAND  
 MANUFACTURER  
 Since 1928

UNIVERSITAS KATOLIK WIDYA MANDARINA  
 SURABAYA

LAMPIRAN N

TABEL UJI HSD (0,05)

$k$ d. k.	2	3	4	5	6	7	8	9	10	11
5	3.64	4.60	5.22	5.67	6.03	6.33	6.58	6.80	6.99	7.17
6	3.46	4.34	4.90	5.30	5.63	5.90	6.12	6.32	6.49	6.65
7	3.34	4.16	4.68	5.06	5.36	5.61	5.82	6.00	6.16	6.30
8	3.26	4.01	4.53	4.89	5.17	5.40	5.60	5.77	5.92	6.05
9	3.20	3.95	4.41	4.76	5.02	5.24	5.43	5.59	5.74	5.87
10	3.15	3.88	4.33	4.65	4.91	5.12	5.30	5.46	5.60	5.72
11	3.11	3.82	4.26	4.57	4.82	5.03	5.20	5.35	5.49	5.61
12	3.08	3.77	4.20	4.51	4.75	4.95	5.12	5.27	5.39	5.51
13	3.06	3.73	4.15	4.45	4.69	4.88	5.05	5.19	5.32	5.43
14	3.03	3.70	4.11	4.41	4.64	4.83	4.99	5.13	5.25	5.36
15	3.01	3.67	4.08	4.37	4.59	4.78	4.94	5.08	5.20	5.31
16	3.00	3.65	4.05	4.33	4.56	4.74	4.90	5.03	5.15	5.26
17	2.98	3.63	4.02	4.30	4.52	4.71	4.86	4.99	5.11	5.21
18	2.97	3.61	4.00	4.28	4.49	4.67	4.82	4.96	5.07	5.17
19	2.96	3.59	3.98	4.25	4.47	4.65	4.79	4.92	5.04	5.14
20	2.95	3.58	3.96	4.23	4.45	4.62	4.77	4.90	5.01	5.11
24	2.92	3.53	3.90	4.17	4.37	4.54	4.68	4.81	4.92	5.01
30	2.89	3.49	3.85	4.10	4.30	4.46	4.60	4.72	4.82	4.92
40	2.86	3.44	3.79	4.04	4.23	4.39	4.52	4.63	4.73	4.82
60	2.83	3.40	3.74	3.98	4.16	4.31	4.44	4.55	4.65	4.73
120	2.80	3.36	3.68	3.92	4.10	4.24	4.36	4.47	4.56	4.64
$\infty$	2.77	3.31	3.63	3.86	4.03	4.17	4.29	4.39	4.47	4.55

Catatan kaki: Dari *Annals of mathematical statistics*. Diulang cetak seizin penerbit, The Institute of Mathematical Statistics.

Sumber: Scheffler (1987).

## LAMPIRAN O

### HASIL ANOVA SUDUT DIAM PADA PROGRAM DESIGN EXPERT

Response Sudut diam  
ANOVA for selected factorial model  
Analysis of variance table [Partial sum of squares – Type III]

Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F	
Model	14,62	3	4,87	91,59	< 0,0001	S
A-Laktosa	6,02	1	6,02	113,19	< 0,0001	
B-PVP K-30	1,39	1	1,39	26,08	0,0009	
AB	7,21	1	7,21	135,50	< 0,0001	
Pure Error	0,43	8	0,053			
Cor Total	15,04	11				

S = significant

The model F-value of 91,59 implies the model is significant. There is only a 0,01% chance that a “Model F-Value” this large could occur due to noise.

Values of “Prob > F” less than 0.0500 indicate model terms are significant. In this case A, B, AB are significant model terms.

Values greater than 0.1000 indicate the model terms are not significant.

If there are many insignificant model terms (not counting those required to support hierarchy), model reduction may improve your model.

Std. Dev.	0,23	R-Squared	0,9717
Mean	31,29	Adj R-Squared	0,9611
C.V. %	0,74	Pred R-Squared	0,9363
PRESS	0,96	Adeq Precision	22,280

The “Pred R-Squared” of 0,9999 is in reasonable agreement with the “Adj R-Squared” of 0,9611.

“Adeq Precison” measures the signal to noise ratio. A ratio freater than 4 is desirable. Your ratio of 22,280 indicates an adequate signal. This model can be used to navigate the design space.

Factor	Coefficient	Standard	Error	95% CI		VIF
	Estimate	df		Low	High	
Intercept	31,29	1	0,067	31,13	31,44	
A-Laktosa	0,71	1	0,067	0,55	0,86	1
B-PVP K-30	-0,34	1	0,067	-0,49	-0,19	1
AB	-0,77	1	0,067	-0,93	-0,62	1

Final Equation in Terms of Coded Factors:

$$\begin{aligned} \text{Sudut diam} = & \\ 31,29 = & \\ 0,71 & * A \\ -0,34 & * B \\ -0,77 & * A * B \end{aligned}$$

Final Equation in terms of Actual Factors:

$$\begin{aligned} \text{Sudut diam} = & \\ 31,28667 & \\ 0,70833 * \text{Laktosa} & \\ -0,34000 * \text{PVP K-30} & \\ -0,77500 * \text{Laktosa} * \text{PVP K-30} & \end{aligned}$$

The Diagnostics Case Statistics Report has been moved to the Diagnostics Node. In the Diagnostics Node, Select Case Statistics from the View Menu. Proceed to Diagnostic Plots (the next icon in progression). Be sure to look at the:

- 1) Normal probability plot of the studentized residuals to check for normality of residuals.
- 2) Studentized residuals versus predicted values to check for constant error.
- 3) Externally Studentized Residuals to look for outliers, i.e., influential values.
- 4) Box-Cox plot for power transformations.

## LAMPIRAN P

### HASIL ANOVA UJI *CARR'S INDEX* PADA PROGRAM DESIGN EXPERT

Response *2 Carr's index*  
 ANOVA for selected factorial model  
 Analysis of variance table [Partial sum of squares – Type III]

Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F	
Model	5,50	3	1,83	50,51	0,0001	S
A-Laktosa	1,35	1	1,35	37,12	0,0003	
B-PVP K-30	2,05	1	2,05	56,52	0,0001	
AB	2,10	1	2,10	57,89	0,0001	
Pure Error	0,29	8	0,036			
Cor Total	5,79	11				

S = significant

The model F-value of 50,51 implies the model is significant. There is only a 0,01% chance that a “Model F-Value” this large could occur due to noise.

Values of “Prob > F” less than 0.0500 indicate model terms are significant. In this case A, B, AB are significant model terms.

Values greater than 0.1000 indicate the model terms are not significant.

If there are many insignificant model terms (not counting those required to support hierarchy), model reduction may improve your model.

Std. Dev.	19	R-Squared	0,9499
Mean	13,55	Adj R-Squared	0,9310
C.V. %	1,41	Pred R-Squared	0,8872
PRESS	0,65	Adeq Precision	5,126

The “Pred R-Squared” of 0,8872 is in reasonable agreement with the “Adj R-Squared” of 0,9310.

“Adeq Precision” measures the signal to noise ratio. A ratio greater than 4 is desirable. Your ratio of 15,126 indicates an adequate signal. This model can be used to navigate the design space.

Factor	Coefficient Estimate	Standard df	Error	95% CI Low	95% CI High	VIF
Intercept	13,55	1	0.055	13,43	13,68	
A-Laktosa	0,33	1	0.055	0,21	0,46	1
B-PVP K-30	-0,41	1	0.055	-0,54	-0,29	1
AB	-0,42	1	0.055	-0,29	-0,29	1

Final Equation in Terms of Coded Factors:

$$\begin{aligned}
 \text{Carr's index} = & \\
 & 13,55 = \\
 & 0,33 \quad * A \\
 & -0,41 \quad * B \\
 & -0,42 \quad * A * B
 \end{aligned}$$

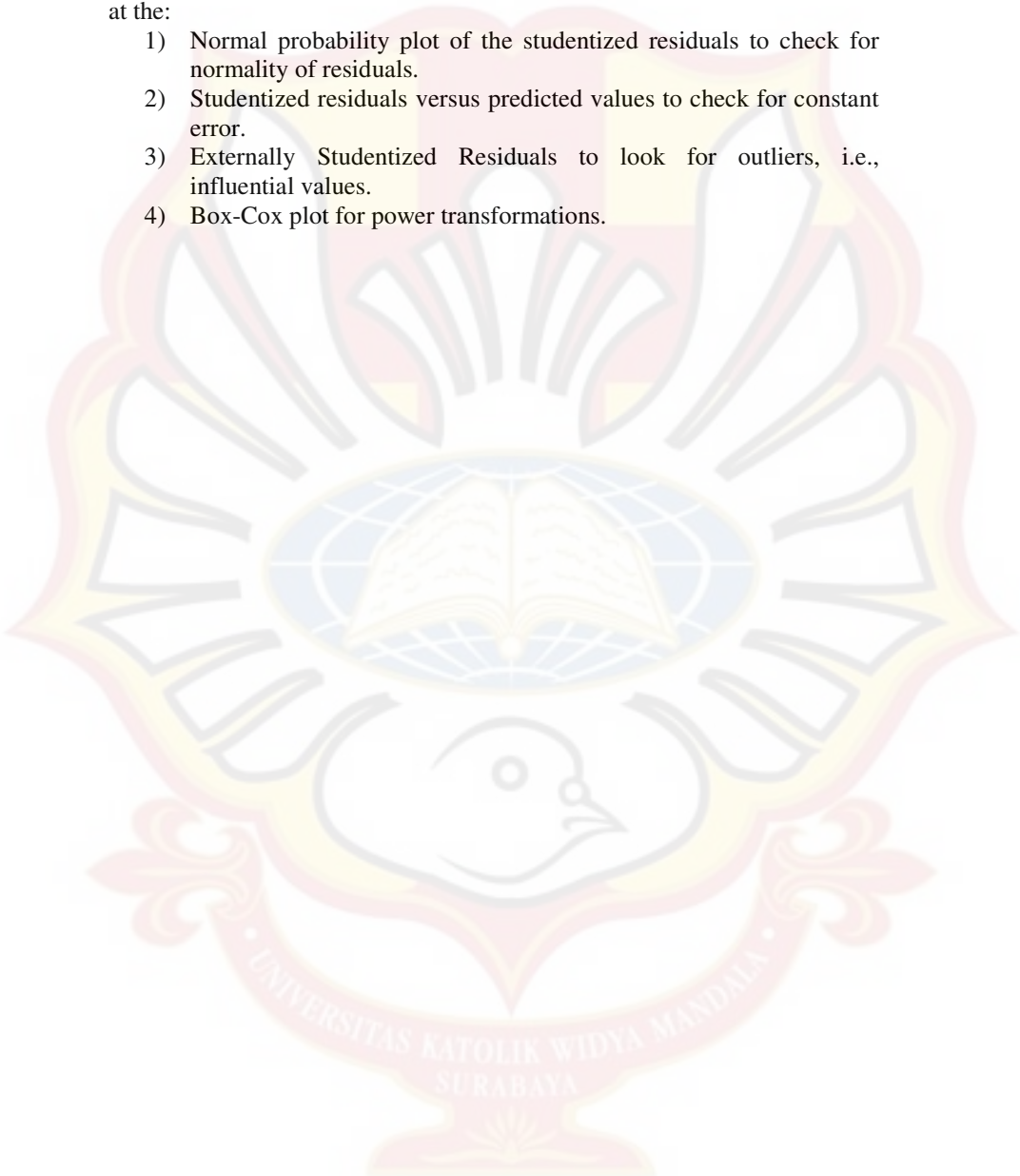
Final Equation in terms of Actual Factors:

$$\begin{aligned}
 \text{Carr's index} = & \\
 & 13,55333 \\
 & 0,33500 \quad * \text{Laktosa} \\
 & -0,41333 \quad * \text{PVP K-30} \\
 & -0,41833 \quad * \text{Laktosa} * \text{PVP K-30}
 \end{aligned}$$

The Diagnostics Case Statistics Report has been moved to the Diagnostics Node. In the Diagnostics Node, Select Case Statistics from the View Menu.

Proceed to Diagnostic Plots (the next icon in progression). Be sure to look at the:

- 1) Normal probability plot of the studentized residuals to check for normality of residuals.
- 2) Studentized residuals versus predicted values to check for constant error.
- 3) Externally Studentized Residuals to look for outliers, i.e., influential values.
- 4) Box-Cox plot for power transformations.



## LAMPIRAN Q

### HASIL ANOVA UJI KERAPUHAN GRANUL PADA PROGRAM DESIGN EXPERT

Source	Sum of Squares	df	Mean Square	F Value	Prob > F	S
Model	29,29	3	9,76	43,17	< 0,0001	S
A-Laktosa	1,00	1	1,00	4,44	0,0683	
B-PVP K-30	2,97	1	2,97	13,13	0,0067	
AB	25,32	1	25,32	111,95	< 0,0001	
Pure Error	1,81	8	0,23			
Cor Total	31,10	11				

S = significant

The model F-value of 43,17 implies the model is significant. There is only a 0,01% chance that a “Model F-Value” this large could occur due to noise.

Values of “Prob > F” less than 0.0500 indicate model terms are significant. In this case A, B, AB are significant model terms.

Values greater than 0.1000 indicate the model terms are not significant.

If there are many insignificant model terms (not counting those required to support hierarchy), model reduction may improve your model.

Std. Dev.	0,48	R-Squared	0,9418
Mean	2,69	Adj R-Squared	0,9200
C.V. %	17,71	Pred R-Squared	0,8691
PRESS	4,07	Adeq Precision	14,205

The “Pred R-Squared” of 0,8691 is in reasonable agreement with the “Adj R-Squared” of 0,9200.



“Adeq Precison” measures the signal to noise ratio. A ratio freater than 4 is desirable. Your ratio of 15,126 indicates an adequate signal. This model can be used to navigate the design space.

Factor	Coefficient Estimate	Standard df	Error	95% CI		VIF
				Low	High	
Intercept	2,69	1	0.14	2,37	3,00	
A-Laktosa	-0,29	1	0.14	-0,61	0,027	1
B-PVP						
K-30	0,50	1	0.14	0,18	0,81	1
AB	1,45	1	0.14	1,14	1,77	1

Final Equation in Terms of Coded Factors:

$$\text{Kerapuhan} = 2,69 - 0,29 * A + 0,50 * B + 1,45 * A * B$$

Final Equation in terms of Actual Factors:

$$\text{Kerapuhan} = 2,68583 - 0,28917 * \text{Laktosa} + 0,49750 * \text{PVP K-30} + 1,45250 * \text{Laktosa} * \text{PVP K-30}$$

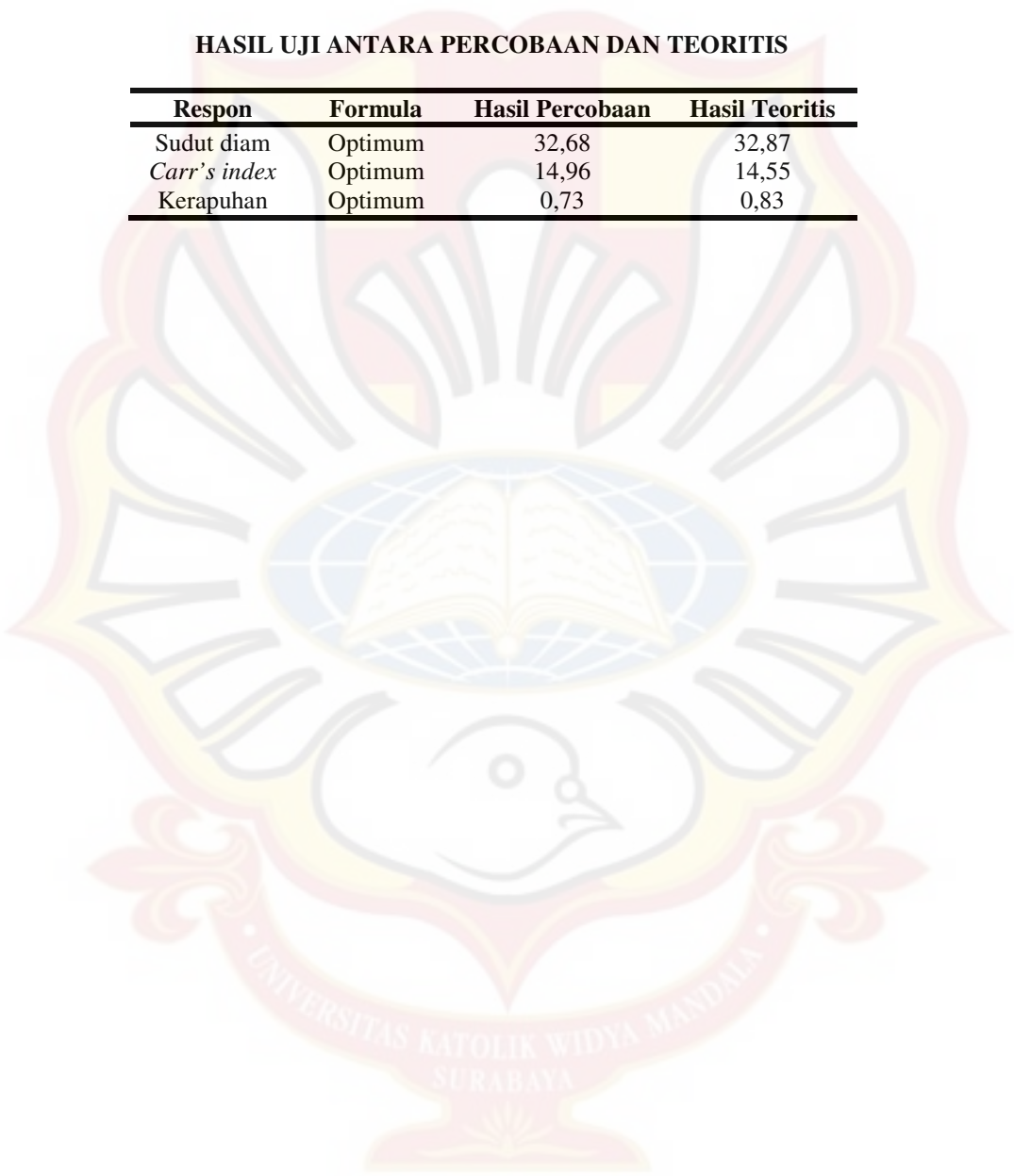
The Diagnostics Case Statistics Report has been moved to the Diagnostics Node. In the Diagnostics Node, Select Case Statistics from the View Menu. Proceed to Diagnostic Plots (the next icon in progression). Be sure to look at the:

- 1) Normal probability plot of the studentized residuals to check for normality of residuals.
- 2) Studentized residuals versus predicted values to check for constant error.
- 3) Externally Studentized Residuals to look for outliers, i.e., influential values.
- 4) Box-Cox plot for power transformations.

## LAMPIRAN R

### HASIL UJI ANTARA PERCOBAAN DAN TEORITIS

<b>Respon</b>	<b>Formula</b>	<b>Hasil Percobaan</b>	<b>Hasil Teoritis</b>
Sudut diam	Optimum	32,68	32,87
<i>Carr's index</i>	Optimum	14,96	14,55
Kerapuhan	Optimum	0,73	0,83



## LAMPIRAN S

### HASIL UJI STATISTIK SUDUT DIAM ANTARA PERCOBAAN DAN TEORITIS

Anova: Single Factor

#### SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	3	98,04	32,68	0,0289
Column 2	3	98,61	32,87	0

#### ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0,05415	1	0,05415	3,747405	0,124976	7,708647
Within Groups	0,0578	4	0,01445			
Total	0,11195	5				

Keterangan:

Fhitung < Ftabel (1,4) = 7,07 sehingga tidak ada perbedaan bermakna antar formula.

## LAMPIRAN T

### HASIL UJI STATISTIK *CARR'S INDEX* ANTARA PERCOBAAN DAN TEORITIS

Anova: Single Factor

#### SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	3	44,87	14,95667	0,005633
Column 2	3	43,65	14,55	4,73E-30

#### ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0,248067	1	0,248067	88,07101	0,000718	7,708647
Within Groups	0,011267	4	0,002817			
Total	0,259333	5				

Keterangan:

Fhitung > Ftabel (1,4) = 7,07 sehingga H ditolak dan ada perbedaan yang bermakna antar formula.

## LAMPIRAN U

### HASIL UJI STATISTIK KERAPUHAN GRANUL ANTARA PERCOBAAN DAN TEORITIS

Anova: Single Factor

#### SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	3	2,2	0,733333	0,083333
Column 2	3	2,49	0,83	0

#### ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0,014017	1	0,014017	0,3364	0,593017	7,708647
Within Groups	0,166667	4	0,041667			
Total	0,180683	5				

Keterangan:

Fhitung < Ftabel (1,4) = 7,07 sehingga tidak ada perbedaan bermakna antar formula.