

LAMPIRAN A
HASIL UJI MUTU FISIK GRANUL

Pegujian	Replikasi	Formula			
		1	2	3	4
Kadar air (%)	I	4,25	3,54	4,12	3,21
	II	3,10	3,20	4,32	3,55
	Rata-rata	3,68	3,37	4,22	3,38
	SD	0,81	0,24	0,14	0,24
Sudut diam (derajat)	I	32,54	32,8	31,58	30,94
	II	33,50	33,42	31,47	31,02
	Rata-rata	33,02	33,11	31,53	30,98
	SD	0,68	0,44	0,08	0,06
Indeks kompersibilitas (%)	I	12	15	11	15
	II	10	13	9	15
	Rata-rata indeks komprebilitas	10	14	10	15
	SD	1,41	1,41	1,41	0
Bobot jenis nyata	I				
	II	0,36	0,32	0,38	0,47
Bobot jenis mampat	I	0,37	0,33	0,39	0,49
	II	0,39	0,39	0,42	0,57
		0,41	0,43	0,46	0,59

LAMPIRAN B
HASIL UJI KERAPUHAN TABLET LEPAS LAMBAT IBUPROFEN

Formula	Replikasi	Berat awal	Berat akhir	Kerapuhan	X Rata	SD	KV
I	1	15,7865	15,7781	0,0084	0,011	0,003	28,82
	2	15,7651	15,7524	0,0127			
II	1	15,9128	15,8973	0,0155	0,013	0,003	26,55
	2	15,9982	15,9876	0,0106			
III	1	16,3188	16,2941	0,0247	0,058	0,047	81,04
	2	16,4527	16,4436	0,091			
IV	1	15,4404	15,4256	0,0148	0,053	0,054	101,85
	2	15,3210	15,3119	0,0910			

LAMPIRAN C
HASIL UJI KEKERASAN TABLET LEPAS LAMBAT IBUPROFEN

REPLIKASI I				
No	Kekerasan tablet formula			
	I	II	III	IV
1	14,4	16,4	14,5	17,7
2	14,1	16,2	13,9	17,3
3	13,5	16,9	14,3	17,2
4	14,3	16,3	14,8	17,0
5	14,5	16,0	14,5	17,0
6	13,8	16,1	14,6	17,0
7	13,9	16,3	14,7	17,5
8	14,5	16,2	14,8	17,6
9	14,8	16,1	14,6	17,2
10	14,7	16,1	13,9	17,5
Xrata	14,25	16,26	14,6	17,3
SD	0,42	0,25	0,33	0,26
%KV	2,93	1,54	2,26	1,5

REPLIKASI II

No	Kekerasan tablet formula			
	I	II	III	IV
1	14,1	18,2	14,6	19,0
2	14,5	19,4	14,7	18,1
3	13,2	18,8	14,8	18,0
4	14,7	18,7	14,6	18,5
5	14,5	18,9	13,9	18,9
6	13,8	19,3	13,9	18,9
7	13,5	19,0	14,3	19,8
8	14,5	18,9	14,8	18,9
9	14,8	19,4	14,5	19,2
10	14,6	18,9	14,6	18,3
Xrata	14,22	18,95	14,47	18,76
SD	0,55	0,36	0,33	0,55
%KV	3,85	1,9	2,28	2,93

LAMPIRAN D
HASIL PENETAPAN KADAR TABLET LEPAS LAMBAT IBIPROFEN

Formula	Replikasi	Absorbansi	C sampel (µg/ ml)	C teoritis	Kadar (percent)	Rata- rata	SD	KV
1	1	0,7165	399,12	400,01	99,78	99,88	0,14	0,14
	2	0,7180	399,93	400,00	99,98			
2	1	0,7173	399,55	400,7	99,71	99,83	0,16	0,16
	2	0,7160	398,85	400,3	99,94			
3	1	0,7163	399,01	400,05	99,74	99,70	0,06	0,06
	2	0,7158	398,74	400,1	99,66			
4	1	0,7149	398,25	400,00	99,56	99,59	0,04	0,04
	2	0,7159	398,79	400,3	99,62			

LAMPIRAN E

CONTOH PERHITUNGAN

Contoh perhitungan sudut diam :

Formula 1:

$$W \text{ persegi panjang} = 4,74 \text{ gram}$$

$$W \text{ lingkaran} = 1,37 \text{ gram}$$

$$\begin{aligned} \text{Luas persegi panjang} &= 21,5 \times 27,9 \\ &= 588,85 \text{ cm} \end{aligned}$$

$$\text{Luas lingkaran} = 1,37 / 4,74 \times 588,85 = 173,37$$

$$A = \pi r^2$$

$$\begin{aligned} r^2 &= A / \pi \\ &= 173,37 / 3,14 = 55,52 \end{aligned}$$

$$r = 7,43 \text{ cm}$$

$$\text{tg} \alpha = t/r = 4,61 / 7,43 = 0,6205$$

$$\alpha = 3,18^\circ$$

Contoh perhitungan indeks kompresibilitas :

$$V1 = 100 \text{ ml}$$

$$V2 = 90 \text{ ml}$$

$$\text{Indeks kompresibilitas} = (1 - V2/V1) \times 100\% = 10\%$$

Contoh perhitungan akurasi dan presisi :

$$\text{Absorbansi} = 0,4221 \rightarrow y = Y = -0,019 + 1,84310^{-3} X$$

$$C \text{ sampel} = 239,39 \text{ ppm}$$

$$C \text{ teoritis} = 240,1 \text{ ppm}$$

$$\begin{aligned} \% \text{ perolehan kembali} &= C_{\text{sampel}} / C_{\text{teoritis}} \times 100\% \\ &= 239,39 / 240,1 \times 100\% \\ &= 99,70\% \end{aligned}$$

$$\begin{aligned} \text{Untuk menghitung \% KV} &= SD / X_{\text{rata-rata}} \times 100\% \\ &= (0,853 / 98,695) \times 100\% \\ &= 0,864\% \end{aligned}$$

Contoh perhitungan AUC pada disolusi :

$$\text{Rumus} = (Wt_n + Wt_{n-1}) / 2 \times (t_n - t_{n-1})$$

Formula 1

$$Wt_n = 109,6413$$

$$Wt_{n-1} = 97,1411$$

$$t_n = 60 \text{ menit}$$

$$t_{n-1} = 30 \text{ menit}$$

$$\begin{aligned} \text{AUC} &= (109,6413 + 97,1411) / 2 \times (60 - 30) \\ &= 3101,74 \end{aligned}$$

Contoh perhitungan % ED₃₆₀ :

Luas ■ = 360 x rata-rata penetapan kadar x dosis

$$= 360 \times 99,88\% \times 400$$

$$= 143827,2$$

$$\% \text{ ED}_{360} = (\sum \text{AUC} / \text{luas} \blacksquare) \times 100\%$$

$$= (38223,98 / 143827,2) \times 100\%$$

$$= 26,58\%$$

Contoh perhitungan % obat terlarut :

Formula 1

$$\text{PK} = 99,78\%$$

$$\% \text{ obat terlarut} = (Wt / (\text{PK} / 100 \times \text{dosis})) \times 100\%$$

$$= (66,9648 / (99,78\% \times 400)) \times 100\%$$

$$= 16,78\%$$

Contoh perhitungan konversi dari bentuk tingkat menjadi bentuk sesungguhnya :

Misal : tingkat perbandingan konsentrasi HPMC K4M : *xanthan gum* = level tinggi 4 ; dan tingkat rendah 1

$$X = X' - \text{rata-rata 2 tingkat} / (0,5 \times \text{perbedaan level})$$

$$1 = X' - ((4+1)/2) / 0,5 \times (4-1)$$

$$X' = 4$$

LAMPIRAN F
HASIL UJI DISOLUSI TABLET LEPAS LAMBAT IBUPROFEN
FORMULA I

Replikasi	t (menit)	Absorbansi	C sampel ($\mu\text{g/ml}$)	Wt (mg)	AUC (mg.menit)
1	30	0,1180	74,4053	66,9648	1004,47
	60	0,1270	79,2882	71,3594	2074,86
	90	0,1366	84,4967	76,0470	2211,10
	120	0,1541	93,9912	84,5921	2409,59
	180	0,2042	121,1726	109,0553	5809,42
	240	0,2129	125,8928	113,3035	6670,76
	300	0,2784	161,4294	145,2867	7757,71
	360	0,3855	219,5358	197,5822	10286,07
					$\Sigma=38223,98$
2	30	0,2035	120,7928	108,7135	1630,70
	60	0,2260	133,0000	119,7000	3426,20
	90	0,2452	143,4169	129,0752	3731,63
	120	0,2640	153,6167	138,2550	4009,95
	180	0,2902	167,8314	151,0483	8679,10
	240	0,3086	177,8142	160,0328	9332,43
	300	0,3397	194,6873	175,2186	10057,54
	360	0,3798	216,4433	194,7990	11100,53
					$\Sigma=51968,09$

LAMPIRAN G
HASIL UJI DISOLUSI TABLET LEPAS LAMBAT IBUPROFEN
FORMULA II

Replikasi	t (menit)	Absorbansi	C sampel ($\mu\text{g/ml}$)	Wt (mg)	AUC (mg.menit)
1	30	0,2117	125,2417	112,7175	1690,76
	60	0,2490	145,4786	130,9307	3654,72
	90	0,2617	152,3688	137,1319	4020,94
	120	0,2817	163,2198	146,8978	4260,45
	180	0,3229	185,5726	167,0153	9417,39
	240	0,3490	199,7330	179,7597	10403,25
	300	0,3560	203,5308	183,1777	10888,12
	360	0,3922	223,1709	200,8538	11520,95
					$\Sigma=55856,58$
2	30	0,2639	153,5625	138,2063	2073,09
	60	0,3196	183,7822	165,4040	4554,15
	90	0,3741	213,3508	192,0157	5361,30
	120	0,3907	222,3570	200,1213	5882,06
	180	0,4208	238,6876	214,8188	12448,20
	240	0,4535	256,4288	230,7859	13368,14
	300	0,5045	284,0985	255,6887	14594,24
	360	0,5298	297,8249	268,0424	15711,93
					$\Sigma=73993,11$

LAMPIRAN H
HASIL UJI DISOLUSI TABLET LEPAS LAMBAT IBUPROFEN
FORMULA III

Replikasi	t (menit)	Absorbansi	C sampel ($\mu\text{g/ml}$)	Wt (mg)	AUC (mg.menit)
1	30	0,1798	107,9346	97,1411	1457,12
	60	0,2054	121,8237	109,6413	3101,74
	90	0,2172	128,2257	115,4031	3375,67
	120	0,2402	140,7042	126,6338	3630,55
	180	0,2808	162,7315	146,4584	8192,77
	240	0,3165	182,1003	163,8903	9310,46
	300	0,3427	196,3149	176,6834	10217,21
	360	0,4820	271,8913	244,7022	12641,57
					$\Sigma=51927,08$
2	30	0,2997	172,9856	155,6870	2335,31
	60	0,3067	176,7834	159,1051	4721,88
	90	0,3158	181,7205	163,5485	4839,80
	120	0,3227	185,4641	166,9177	4956,99
	180	0,3313	190,1299	171,1169	10141,04
	240	0,4404	249,3215	224,3894	11865,19
	300	0,4775	269,4498	242,5048	14006,83
	360	0,4937	278,2391	250,4152	14787,60
					$\Sigma=67654,64$

LAMPIRAN I
HASIL UJI DISOLUSI TABLET LEPAS LAMBAT IBUPROFEN
FORMULA IV

Replikasi	t (menit)	Absorbansi	C sampel ($\mu\text{g/ml}$)	Wt (mg)	AUC (mg.menit)
1	30	0,5371	301,7854	271,6069	4074,10
	60	0,5654	317,1394	285,4255	8355,49
	90	0,5773	323,5957	291,2361	8649,92
	120	0,5880	329,4009	296,4608	8815,45
	180	0,6044	338,2987	304,4688	18027,89
	240	0,6140	343,5070	309,1563	18408,75
	300	0,6221	347,9017	313,1115	18668,03
	360	0,6332	353,9239	318,5315	18949,29
					$\Sigma=103948,93$
2	30	0,6421	358,7526	322,8773	4843,16
	60	0,6602	368,5726	331,7153	9818,89
	90	0,6996	389,9488	350,9539	10240,04
	120	0,7124	396,8934	357,2041	10622,37
	180	0,7303	406,6049	365,9444	21694,46
	240	0,7335	408,3411	367,5070	22003,54
	300	0,7559	420,4940	378,4446	22378,55
	360	0,7593	422,3387	380,1048	22756,48
					$\Sigma=124357,48$

LAMPIRAN J
UJI F KURVA BAKU PENETAPAN KADAR

Uji Kesamaan Regresi ibuprofen

REPLIKASI 1

KONSENTRASI	ABSORBANSI	X ²	Y ²	XY
52,45	0,083	2751,003	0,006889	4,35335
104,9	0,172	11004,01	0,029584	18,0428
209,8	0,377	44016,04	0,142129	79,0946
314,7	0,540	99036,09	0,2916	169,938
419,6	0,747	176064,2	0,558009	313,4412
524,5	0,968	275100,3	0,937024	507,716
629,4	1,136	396144,4	1,290496	714,9984
		Σ 1004116	Σ 3,255731	Σ 1807,584

REPLIKASI 2

KONSENTRASI	ABSORBANSI	X^2	Y^2	XY
53,2	0,172	2830,24	0,029584	9,1504
106,4	0,282	11320,96	0,079524	30,0048
212,8	0,431	45283,84	0,185761	91,7168
319,2	0,627	101888,6	0,393129	200,1384
425,6	0,825	181135,4	0,680625	351,12
532,0	1,033	283024,0	1,067089	549,556
638,4	1,225	407554,6	1,500625	782,04
		$\Sigma 1033038$	$\Sigma 3,936337$	$\Sigma 2013,726$

REPLIKASI 3

KONSENTRASI	ABSORBANSI	X^2	Y^2	XY
51,5	0,082	2652,25	0,006724	4,223
103,0	0,179	10609	0,032041	18,437
206,0	0,352	42436	0,123904	72,512
309,0	0,497	95481	0,247009	153,573
412,0	0,671	169744	0,450241	276,452
515,0	0,871	265225	0,758641	448,565
618,0	1,101	381924	1,212201	680,418
		$\Sigma 968071,3$	$\Sigma 2,830761$	$\Sigma 1654,18$

LAMPIRAN K

HASIL KEKERASAN TABLET LEPAS LAMBAT IBIPROFEN

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	2	28,47	14,235	0,00045
Column 2	2	35,21	17,605	3,61805
Column 3	2	29,07	14,535	0,00845
Column 4	2	36,06	18,03	1,0658

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>
Between Groups	23,83474	3	7,944913	6,772074	0,047863
Within Groups	4,69275	4	1,173188		
Total	28,52749	7			

Karena $F_{hitung} = 6,772 > F_{tabel\ 0,05\ (3,4)} = 6,59$; maka H_0 di tolak dan ada perbedaan bermakna

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
a	2	1.5000	.70711	.50000	-4.8531	7.8531	1.00	2.00
b	2	3.5000	.70711	.50000	-2.8531	9.8531	3.00	4.00
c	2	5.5000	.70711	.50000	-.8531	11.8531	5.00	6.00
d	2	7.5000	.70711	.50000	1.1469	13.8531	7.00	8.00
Total	8	4.5000	2.44949	.86603	2.4522	6.5478	1.00	8.00

Kekerasan
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
a	B	-2.00000	.70711	.146	-4.8785	.8785
	C	-4.00000	.70711	.016	-6.8785	-1.1215
	D	-6.00000	.70711	.004	-8.8785	-3.1215
b	A	2.00000	.70711	.146	-.8785	4.8785
	C	-2.00000	.70711	.146	-4.8785	.8785
	D	-4.00000	.70711	.016	-6.8785	-1.1215
c	A	4.00000	.70711	.016	1.1215	6.8785
	B	2.00000	.70711	.146	-.8785	4.8785
	D	-2.00000	.70711	.146	-4.8785	.8785
d	A	6.00000	.70711	.004	3.1215	8.8785
	b	4.00000	.70711	.016	1.1215	6.8785
	c	2.00000	.70711	.146	-.8785	4.8785

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Kekerasan				
Formula	N	Subset for alpha = 0.05		
		1	2	3
a	2	1.5000		
b	2	3.5000	3.5000	
c	2		5.5000	5.5000
d	2			7.5000
Sig.		.146	.146	.146

Means for groups in homogeneous subsets are displayed.



LAMPIRAN L
HASIL UJI KERAPUHAN TABLET LEPAS LAMBAT IBUPROFEN

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	2	0,0967	0,04835	0,002542
Column 2	2	0,0261	0,01305	1,2E-05
Column 3	2	0,1157	0,05785	0,002198
Column 4	2	0,1058	0,0529	0,002903

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>Df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>
Between Groups	0,002488	3	0,000829	0,433413	0,74095
Within Groups	0,007655	4	0,001914		
Total	0,010143	7			

Karena $F_{hitung} = 0,433 < F_{tabel_{0,05(347)}} = 6,59$; maka H_0 diterima dan tidak ada perbedaan bermakna antar formula

LAMPIRAN M

HASIL PENETAPAN KADAR TABLET LEPAS LAMBAT IBIPROFEN

Anova: Single Factor

Data statistik PK

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Column 1	2	198,3	99,15	1,28
Column 2	2	197,17	98,585	3,78125
Column 3	2	197,47	98,735	0,66125
Column 4	2	197,98	98,99	0,5408

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	0,3843	3	0,1281	0,08181	0,966456	6,591382
Within Groups	6,2633	4	1,565825			
Total	6,6476	7				

Karena $F_{hitung} = 0,08 < F_{tabel\ 0,05\ (3,4)} = 6,59$; maka H_0 diterima dan tidak ada perbedaan bermakna antar formula

LAMPIRAN N
HASIL UJI STATISTIK % DE₃₆₀

ANOVA

Disolusi

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	40.000	3	13.333	26.667	.004
Within Groups	2.000	4	.500		
Total	42.000	7			

Karena $F_{hitung} = 26,667 > F_{tabel\ 0,05(3,4)} = 6,59$; maka H_0 di tolak dan ada perbedaan bermakna antar formula

Multiple Comparisons

disolusi
Tukey HSD

(I) farmula (J) farmula		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
a	b	-2.00000 [*]	.70711	.146	-4.8785	.8785
	c	-4.00000 [*]	.70711	.016	-6.8785	-1.1215
	d	-6.00000 [*]	.70711	.004	-8.8785	-3.1215
b	a	2.00000	.70711	.146	-.8785	4.8785
	c	-2.00000	.70711	.146	-4.8785	.8785
	d	-4.00000 [*]	.70711	.016	-6.8785	-1.1215
c	a	4.00000 [*]	.70711	.016	1.1215	6.8785
	b	2.00000	.70711	.146	-.8785	4.8785
	d	-2.00000	.70711	.146	-4.8785	.8785
d	a	6.00000 [*]	.70711	.004	3.1215	8.8785
	b	4.00000 [*]	.70711	.016	1.1215	6.8785
	c	2.00000	.70711	.146	-.8785	4.8785

*. The mean difference is significant at the 0.05 level.

Disolusi

Tukey HSD^a

formul a	N	Subset for alpha = 0.05		
		1	2	3
A	2	1.5000		
B	2	3.5000	3.5000	
C	2		5.5000	5.5000
D	2			7.5000
Sig.		.146	.146	.146

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 2,000.

LAMPIRAN O

SERTIFIKAT ANALISIS IBU PROFEN



Shasun Chemicals And Drugs Ltd.

IBUPROFEN BP/Ph.Eur. (SN Grade) CERTIFICATE OF ANALYSIS			
Nature of Packing : Sea Worthy Fibre Drum		Analytical Report No. : FPBU060764	
Sample Taken By : S.Sivakumar		Batch Number : IBU060764	
Date of Manufacture : July 2006		Date of Analysis : 25-07-2006	
Expiry Date : June 2011		Date of Report : 25-07-2006	
Batch Volume(Qty) : 3000 Kg.		Manufactured By : Shasun Chemicals And Drugs Limited, Pondicherry.	
S.No	TESTS	RESULTS	LIMITS
1.	Appearance	White crystalline powder	White, crystalline powder or colourless crystals
2.	Solubility	Complies	Freely soluble in acetone, in methanol and in methylene chloride. Dissolves in dilute solutions of alkali hydroxides and carbonates. Practically insoluble in water
3.	Clarity and colour of solution	Complies	10 % w/v solution (5g in 50 ml. of the solution) in methanol should be clear and colourless
4.	Identification		
	a) By IR	Conforms	The IR spectrum of sample should be concordant with the spectrum of Ibuprofen RS
	b) By UV	1.24 1.03	The ratio of absorbance at the max. at 264 nm to that at 258 nm is 1.20 to 1.30 The ratio of absorbance at the max at 272 nm to that at 258 nm is 1.00 to 1.10
	c) By TLC	Complies	Principal spot should be similar in position, colour and size compared to Ibuprofen RS
	d) Melting point	76.1 °C	75.0°C to 78.0 °C
5.	Optical rotation	0.00 °	- 0.05° to +0.05°
6.	Heavy metals	LT 10 PPM	NMT 10 PPM
7.	Related substances (by HPLC)		
	a) 2-(4-Isobutyl Phenyl) Propanoic Acid (Impurity I)	0.06 % (Area %)	NMT 0.20 % (Area %)
	b) 2-(4-Butyl phenyl)propanoic acid (Impurity B)	Not Detected	NMT 0.30 % (w/w)
	c) 4-Isobutylacetophenone (Impurity E)	Not Detected	NMT 0.30 % (Area %)
	d) Any unidentified impurity	0.04 % (Area %)	NMT 0.10 % (Area %)
	e) Total impurities (Apart from impurity B)	0.14 % (Area %)	NMT 0.50 % (Area %)
8.	Sulphated ash	0.04 % (w/w)	NMT 0.10 % (w/w)
9.	Loss on drying	0.10 % (w/w)	NMT 0.50 % (w/w)
10.	Assay (dry basis)	99.8 % (w/w)	98.5 % -101.0 % (w/w)

Page 1/2

Shasun Road, Peniyakalpet, Pondicherry - 605 014. India
 Ph : 91-413-2655202, 2655156, 2655157, 2655441, 2655442
 2655827, 2655828, 2655829, 2655830
 Fax : 091 - 413 - 2655154, e-mail : shapondy@md4.vsnl.net.in
 shapdy@shasun.com

LAMPIRAN P

Sertifikat Analisis Laktosa



DMV INTERNATIONAL

Certificate of analysis

Issue date
18.02.2005
Purchase order
002879/PH/01578
Delivery item
80270238 000020
Order item
231054 000020
Total Quantity Item
16.000 KG

Page 2/2

Lot: 10209286

Manufacture date: 01.2005

Quantity: 16.000 KG

Expiry date: 12.2007

Characteristic	Unit	SPECIFICATION		Value
		Lower Limit	Upper Limit	
Particle size (PSD) $\geq 250 \mu\text{m}$	%	99,0	100,0	100,0
Standard plate count	cfu/g	0	100	<10
Yeasts and Moulds	cfu/g	0	10	<10
Enterobacteriaceae	cfu/g	0	1	0
E. coli in 10 g				negative
Salmonella in 100g				negative

J. Hermans
QA Manager

(This is an electronic document)

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BRATARA
IMPORTER
MANUFACTURER
DISTRIBUTOR

LAMPIRAN Q

Sertifikat Avisel PH 101

TOTAL P.02

2702 / 1207 / X1 / 10



VIVAPUR® Type 101, Microcrystalline Cellulose NF, Ph. Eur., JP CERTIFICATE OF ANALYSIS

Batch No.: 6810104630
 Re-evaluation date: July 2014
 Manufacturing date: July 2010
 Manufacturing Site: Weissenborn, Germany

Description			
Appearance	White or almost white fine or granular powder:		
Solubility	Practically insoluble in water, acetone, anhydrous ethanol and toluene, dilute acids and sodium hydroxide solution (50 g/L)		
Standards	Specification	Batch result	Reference
Bulk density	0.28 - 0.31 g / mL	0.29 g / mL	NF, JP
Particle size	> 250 µm (60 mesh)	max. 1 %	< 1 %
(retained on air jet sieve)	> 75 µm (200 mesh)	max. 30 %	25 %
	> 32 µm (480 mesh)	min. 30 %	69 %
Particle size distribution	d10:	15 - 30 µm	20 µm
(Laser diffraction)	d80:	45 - 80 µm	71 µm
	d90:	100-170 µm	181 µm
Pharmacopoeial test items	Specification	Batch result	Reference
Zinc chloride test (Ident. A (1))	passes	passes*	Ph. Eur., NF, JP
Suspension test (Ident. 2)	passes	passes*	JP
Degree of polymerisation (Ident. 3 (3))	max. 350	231	Ph. Eur., NF, JP
Solubility (Copper tetramine solution)	passes	passes*	Ph. Eur.
pH	5.0 - 7.0	6.5	Ph. Eur., USP
Conductivity	max. 50 µS / cm	16 µS / cm	Ph. Eur., NF, JP
Ether-soluble substances	max. 0.05 %	0.01 %	Ph. Eur., NF, JP
Water-soluble substances	max. 0.24 %	0.11 %	Ph. Eur., NF, JP
Loss on drying	max. 7.0 %	3.3 %	Ph. Eur., USP
Sublimed ash / residue on ignition	max. 0.05 %	< 0.05 %	Ph. Eur., USP
Heavy metals	max. 10 ppm	< 10 ppm*	T262F (MCW)
Total aerobic microbial count	max. 100 CFU / g	< 100 CFU / g*	Ph. Eur., USP
Fungi / molds and yeasts	max. 20 CFU / g	< 20 CFU / g*	Ph. Eur., USP
E. coli, Pseudomonas aeruginosa	absent in 10 g	absent*	Ph. Eur., USP
Staph. aureus, Salmonella spec.	absent in 10 g	absent*	Ph. Eur., USP
Enterobacteriaceae	absent in 10 g	absent*	Ph. Eur.
Additional characteristics**	Test result**	Reference	
Degree of brightness**	tested min. 88 % **	T228F (MCW)	
Dark particles (Process artifacts)**	tested max. 8 / 600 cm² **	T221F (MCW)	
Powder Flow - Angle of repose**	tested max. 45° **	T222F (MCW)	

* Results reported are expected results based on periodic testing.

** Results reported are tested result ranges of the batch for information without claiming a certified status.

The batch described by this certificate meets the requirements of Ph. Eur., NF, and JP monographs for "Microcrystalline Cellulose" current edition, it complies with E 460 monograph and all current EU Food Regulations. It is released on the basis of the results ascertained. The raw materials, manufacturing process, and product do not contain any of the solvents listed in Residual Solvents (Ph. Eur., USP, etc.). USP <475>.

Storage recommendation: Protect from excessive heat and moisture.

Yamp containers closed.

August 05, 2010

Ref.: 0354 / 27734460

QC MICROCELLULOSE WEISSENBOHN

Worldwide headquarters
JRS PHARMA GMBH & CO. KG

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 info@jrs-pharma.com • www.jrs-pharma.com
 Customer Service: + 1 (848) 878 5414

70-4 QJATOC/770

01

INTERVEN NHTD HILTHMO WND4 PR:91 0102-100-11

LAMPIRAN R

SERTIFIKAT MAGNESIUM STEARAT



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./DAB10/JP 14th. ed./FCC 5th. ed.

parameter	unit	method	result
identification A	gC	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
calinity	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
sulfate	%	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
magnesium content	%	BAE 200 o	4,7
free fatty acid	%	BAE 400	0,6
free 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
 LIGA
 MAGNESIUM
 STEARATE
 MANUFACTURER

LAMPIRAN S

SERTIFIKAT TALK



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 "HUANGAO" 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 19SEPT03 OF BANK NISP PT (SWIFT
ADDRESS : NISPIDJA)

COMMODITY : TALC POWDER HAICHEN
QUANTITY : 48 MT

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



BRATACO
IMPORTER
MANUFACTURER
DISTRIBUTOR

For and on behalf of
SUN PLAN DEVELOPMENT LIMITED
18 OCT 2003
KAWUPAKURAN
DISTRIBUTOR

LAMPIRAN T

TABEL UJI R

DEGREES OF FREEDOM (DF)	5 PERCENT	1 PERCENT	DEGREES OF FREEDOM (DF)	5 PERCENT	1 PERCENT
1	.997	1.000	24	.388	.496
2	.950	.990	25	.381	.487
3	.878	.959	26	.374	.478
4	.811	.917	27	.367	.470
5	.754	.874	28	.361	.463
6	.707	.834	29	.355	.456
7	.666	.798	30	.349	.449
8	.632	.765	35	.325	.418
9	.602	.735	40	.304	.393
10	.576	.708	48	.288	.372
11	.553	.684	50	.273	.354
12	.532	.661	60	.250	.325
13	.514	.641	70	.232	.302
14	.497	.623	80	.217	.283
15	.482	.606	90	.205	.267
16	.468	.590	100	.195	.254
17	.456	.575	125	.174	.228
18	.444	.561	150	.159	.208
19	.433	.549	200	.138	.181
20	.423	.537	300	.113	.148
21	.413	.526	400	.098	.128
22	.404	.515	500	.088	.115
23	.396	.505	1000	.062	.081

Dikutip dari: Soedigdo & Soedigdo (1977)

LAMPIRAN U

TABEL UJI HSD (0,05)

$\begin{matrix} k \\ \text{d. k.} \end{matrix}$	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	4.04	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
∞	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 V

TABEL F

Tabel Distribusi F

Denomins for Degrees of Freedom	Numerator Degrees of Freedom								
	1	2	3	4	5	6	7	8	9
1	161.4	199.5	215.7	224.6	230.2	234.0	236.8	238.9	240.5
2	18.81	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38
3	10.73	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04
120	3.92	3.07	2.68	2.45	2.29	2.17	2.09	2.02	1.96
∞	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88

(Sumber: John E., 1992)

Dikutip dari: Gennaro, A.R. (1970)

LAMPIRAN W

ANOVA PERSEN OBAT LARUT 3 JAM

Use your mouse to right click on individual cells for definitions.

Response 1 % obat terlepas 180

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	3148,64	3	1049,55	15,98	0,0108 significant
A-xantan gum	950,92	1	950,92	16,48	0,0190
B-macam pengisi	1775,48	1	1775,48	27,03	0,0065
AB422.24	422,24	1	422,24	6,43	0,0643
Pure Error	262,704	4	65,68		
Cor Total	3411,34	7			

The Model F-value of 15.98 implies the model is significant. There is only a 1.08% 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 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.	8.10		R-Squared	0.9230
Mean	51.08	Adj R-Squared	0.8652	
C.V. %	15.87	Pred R-Squared	0.6920	
PRESS	1050.81	Adeq Precision	9.005	

The "Pred R-Squared" of 0.6920 is in reasonable agreement with the "Adj R-Squared" of 0.8652. "Adeq Precision" measures the signal to noise ratio. A ratio greater than 4 is desirable. Your ratio of 9.005 indicates an adequate signal. This model can be used to navigate the design space.

Factor	Coefficient	Estimate	Standard df	95% CI Error	95% CI	
	VIF				Low	High
Intercept		51.08	1	2.87	43.12	59.04
A-xantan gum		10.90	1	2.87	2.95	18.86
1.00						
B-hpmc		14.90	1	2.87	6.94	22.85
1.00						
AB7.27		-1	2.87	-0.69	15.22	1.00

Final Equation in Terms of Coded Factors:

$$\begin{aligned}
 &\% \text{ obat terlepas } 180 \\
 &+51.08 \\
 &+10.90
 \end{aligned}
 =
 \begin{aligned}
 & \\
 &* A
 \end{aligned}$$

+14.90

* B

+7.27

* A * B

Final Equation in Terms of Actual Factors:

% obat terlepas 180

=

+51.08000

* xantan gum

+10.90250

* hpmc

+14.89750

* xantan gum * hpmc

+7.26500

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.

If all the model statistics and diagnostic plots are OK, finish up with the Model Graphs icon.

LAMPIRAN X

ANOVA PERSENT OBAT LARUT 6 JAM

Use your mouse to right click on individual cells for definitions.

Response 2 % obat terlepas 360

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	1627.89	3	542.63	8.37	0.0338	significant
A-xantan gum	880.11	1	880.11	13.57	0.0211	
B-mcm pengisi	619.70	1	619.70	9.56	0.0365	
AB128.08	128.08	1	1.97	0.2326		
Pure Error	259.42	4	64.85			
Cor Total	1887.31	7				

The Model F-value of 8.37 implies the model is significant. There is only a 3.38% 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 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.	8.05		R-Squared	0.8625
Mean	64.39	Adj R-Squared	0.7595	
C.V. %	12.51	Pred R-Squared	0.4502	
PRESS	1037.68	Adeq Precision	6.775	

The "Pred R-Squared" of 0.4502 is not as close to the "Adj R-Squared" of 0.7595 as one might normally expect. This may indicate a large block effect or a possible problem with your model and/or data. Things to consider are model reduction, response transformation, outliers, etc.

"Adeq Precision" measures the signal to noise ratio. A ratio greater than 4 is desirable. Your ratio of 6.775 indicates an adequate signal. This model can be used to navigate the design space.

Coefficient		Standard	95% CI	95% CI	
Factor	Estimate	df	Error	Low	High
VIF					
Intercept	64.39	1	2.85	56.49	72.30
A-xantan gum	10.49	1	2.85	2.58	18.39
1.00					
B-hpmc	8.80	1	2.85	0.90	16.71
1.00					
AB4.00	1	2.85	-3.90	11.91	1.00

Final Equation in Terms of Coded Factors:

% obat terlepas 360

+64.39

+10.49

* A

+8.80

* B

+4.00

* A * B

Final Equation in Terms of Actual Factors:

% obat terlepas 360

=

+64.39375

+10.48875

+8.80125

+4.00125

* xantan gum

* hpmc

* xantan gum * hpmc

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.

If all the model statistics and diagnostic plots are OK, finish up with the Model Graphs icon.