

LAMPIRAN A
HASIL UJI MUTU FISIK MASSA TABLET

Mutu fisik yang diuji	Replikasi	Formula Tablet Likuisolid Ibuprofen				Persyaratan
		F A	F B	F C	F D	
Sudut Diam (derajat)	I	31,99	30,47	30,7	27,91	25-30 = baik 30-40 = cukup baik (Wells, 1988)
	II	33,34	29,14	28,66	26,65	
	III	32,43	28,58	30,75	28,9	
	Rata-rata	32,59	29,4	30,04	27,82	
	SD	0,69	0,97	1,19	1,13	
Carr's Index (%)	I	17	9	6,99	10	5-10 = sangat baik 16-20= cukup baik (Siregar, 1992)
	II	18	10	7,01	10	
	III	20	9	6,01	10,99	
	Rata-rata	18,33	9,33	6,67	10,33	
	SD	1,53	0,58	0,57	0,57	
Hausner Ratio	I	1,2	1,1	1,08	1,11	< 1,25 (Shervington & shervington, 1998)
	II	1,22	1,11	1,08	1,11	
	III	1,24	1,1	1,06	1,12	
	Rata-rata	1,22	1,1	1,07	1,11	
	SD	0,02	0,01	0,01	0,01	

LAMPIRAN B

HASIL UJI KEKERASAN TABLET LIKUISOLID IBUPROFEN

REPLIKASI I

No	Kekerasan Tablet Likuisolid Ibuprofen (Kp)			
	Formula A	Formula B	Formula C	Formula D
1	13,1	13,6	13,4	13,8
2	13,4	12,9	13,1	14,5
3	13,6	14,1	12,3	13,8
4	13,3	13,5	12,9	14,2
5	14,2	13	13,1	13,6
6	14,2	14,2	12,9	14,8
7	14,2	12,7	12,5	14,4
8	14,3	13,6	12,3	14,7
9	13,6	13,4	13,5	15,1
10	13,3	14	13,1	15
Rata-rata	13,72	13,50	12,91	14,39
SD	0,46	0,51	0,42	0,53
KV	3,35	3,81	3,28	3,67

REPLIKASI II

No	Kekerasan Tablet Likuisolid Ibuprofen (Kp)			
	Formula A	Formula B	Formula C	Formula D
1	13,2	13	13,9	13,3
2	12,5	13,3	13,8	13,6
3	13,2	14	14,2	14,2
4	13,2	13,5	14	14,1
5	12,5	14,1	13,4	13,6
6	12,6	13,4	14,4	14,1
7	12,5	14,2	13	14
8	13	13,8	13,6	13,8
9	13,2	14	13,6	14,5
10	12,5	13,2	14,6	14,2
Rata-rata	12,84	13,65	13,85	13,94
SD	0,34	0,42	0,48	0,36
KV	2,68	3,09	3,46	2,58

REPLIKASI III

No	Kekerasan Tablet Likuisolid Ibuprofen (Kp)			
	Formula A	Formula B	Formula C	Formula D
1	13,4	13,2	12,8	13,4
2	13	13,4	12,6	14,2
3	13,4	13	13	14,4
4	13	12,8	12,9	13,6
5	13,4	13,6	12,5	14,4
6	13,2	12,8	12,6	14,2
7	13,4	13,5	13,1	13,6
8	13,2	14	12,6	14,7
9	12,9	13,2	12,6	13,9
10	13	13	12,4	14,1
Rata-rata	13,19	13,25	12,71	14,05
SD	0,20	0,38	0,23	0,42
KV	1,54	2,87	1,80	2,97

LAMPIRAN C
HASIL UJI KERAPUHAN TABLET LIKUISOLID IBUPROFEN

Formula	Replikasi	Berat awal (gram)	Berat akhir (gram)	Kerapuhan (%)	Rata-rata	SD	KV
A	I	15,9	15,88	0,13	0,10	0,04	34,73
	II	15,94	15,93	0,06			
	III	15,91	15,89	0,13			
B	I	16,02	15,99	0,19	0,14	0,07	49,11
	II	16,06	16,05	0,06			
	III	16,53	16,5	0,18			
C	I	16,36	16,33	0,18	0,17	0,03	21,02
	II	16,02	15,99	0,19			
	III	15,97	15,95	0,13			
D	I	16,01	16	0,06	0,11	0,04	35,34
	II	15,65	15,63	0,13			
	III	15,84	15,82	0,13			

LAMPIRAN D
HASIL UJI WAKTU HANCUR TABLET LIKUISOLID IBUPROFEN

Replikasi	Waktu Hancur (menit)			
	Formula A	Formula B	Formula C	Formula D
I	0,32	2,07	3,8	14,8
II	0,2	2,33	5,63	14,23
III	0,18	1,75	3,97	14,53
Rata-rata	0,23	2,05	4,47	14,52
SD	0,08	0,29	1,01	0,29
KV	32,45	14,17	22,64	1,96

LAMPIRAN E
HASIL UJI KERAGAMAN BOBOT TABLET LIKUISOLID
IBUPROFEN
REPLIKASI I

No	FA		FB		FC		FD	
	Bobot (mg)	Y (%)	Bobot (mg)	Y (%)	Bobot (mg)	Y (%)	Bobot (mg)	Y (%)
1	836,5	101,42	840,1	100,54	817,3	97,07	784,6	99,24
2	829,4	100,56	845,3	101,16	849,1	100,85	789	99,79
3	837,5	101,54	843,5	100,94	843,3	100,16	785,6	99,36
4	836,5	101,42	849,1	101,61	851,5	101,13	800,7	101,27
5	837,9	101,59	848,4	101,53	847,5	100,66	805,2	101,84
6	838,8	101,70	843,2	100,91	850,2	100,98	810,7	102,54
7	842,7	102,17	843,2	100,91	840,2	99,79	804	101,69
8	846,9	102,68	844,8	101,10	847,2	100,62	803,3	101,60
9	835	101,24	844,5	101,06	847,9	100,71	791,9	100,16
10	840,7	101,93	844,5	101,06	843,9	100,23	809,4	102,37
Rata-rata	838,19	101,63	844,66	101,08	843,81	100,22	798,44	100,99
PK (%)	101,63		101,08		100,22		100,99	
SD	0,57		0,31		1,18		1,24	
KV	0,56		0,31		1,18		1,23	

Keterangan: PK = Penetapan Kadar

SD = Standart Deviasi

KV= Koefisien Variasi

REPLIKASI II

No	FA		FB		FC		FD	
	Bobot (mg)	Y (%)	Bobot (mg)	Y (%)	Bobot (mg)	Y (%)	Bobot (mg)	Y (%)
1	829,5	99,40	834,1	102,43	839,8	101,34	778,1	98,88
2	830	99,46	837,5	102,85	844,1	101,86	792	100,64
3	838,2	100,44	837	102,78	838,4	101,17	787,7	100,10
4	835	100,06	836,1	102,67	836	100,88	770,3	97,88
5	839,9	100,65	843,9	103,63	819,2	98,85	784,3	99,66
6	839,5	100,60	838,7	102,99	840,7	101,45	788	100,13
7	834,6	100,01	837,4	102,83	842	101,60	787,6	100,08
8	839,3	100,57	834,8	102,51	827,1	99,80	779,3	99,03
9	833,9	99,93	824,2	101,21	836,8	100,98	792,1	100,65
10	847,8	101,59	830,3	101,96	827,4	99,84	798,4	101,45
Rata-rata	836,77	100,27	835,4	102,59	835,15	100,78	785,78	99,85
PK (%)	100,27		102,59		100,78		99,85	
SD	0,65		0,64		0,96		1,03	
KV	0,64		0,63		0,96		1,03	

REPLIKASI III

No	FA		FB		FC		FD	
	Bobot (mg)	Y (%)	Bobot (mg)	Y(%)	Bobot (mg)	Y(%)	Bobot (mg)	Y(%)
1	834,8	100,11	847	101,94	841,1	101,24	782,3	99,29
2	836	100,25	849,7	102,26	847,6	102,02	798,4	101,33
3	837,4	100,42	846,5	101,88	836,9	100,73	796,7	101,12
4	831,4	99,70	840,8	101,19	844,9	101,70	799,3	101,45
5	830,4	99,58	847,6	102,01	839,2	101,01	791,4	100,44
6	837,8	100,47	848	102,06	840,7	101,19	796,5	101,09
7	833	99,89	849,6	102,25	835,1	100,52	787,3	99,92
8	841,1	100,86	843,2	101,48	839,2	101,01	796,7	101,12
9	835,6	100,20	848,7	102,14	840,6	101,18	798,6	101,36
10	841	100,85	847,7	102,02	836,9	100,73	791	100,39
Rata-rata	835,85	100,23	846,88	101,92	840,22	101,13	793,82	100,75
PK (%)	100,23		101,92		101,13		100,75	
SD	0,44		0,34		0,45		0,72	
KV	0,44		0,33		0,45		0,71	

LAMPIRAN F
HASIL UJI KESERAGAMAN KANDUNGAN TABLET
LIKUISOLID IBUPROFEN

Formula A Replikasi I

Abs	W sampel	C sampel	C teoritis	Kadar (%)
0,569	845,3	318,11	316,99	100,35
0,567	831,1	317,00	311,66	101,71
0,564	843	315,33	316,13	99,75
0,566	836,6	316,44	313,73	100,87
0,565	830,8	315,89	311,55	101,39
0,56	836,7	313,11	313,76	99,79
0,576	843,5	322,00	316,31	101,80
0,573	843,7	320,33	316,39	101,25
0,578	837,9	323,11	314,21	102,83
0,567	837,4	317,00	314,03	100,95
			Rata-rata	101,07
			SD	0,95
			KV	0,94

Formula A Replikasi II

Abs	W sampel	C sampel	C teoritis	Kadar (%)
0,583	842,1	325,89	328,42	99,23
0,572	839,6	319,78	327,44	97,66
0,584	845,1	326,44	329,59	99,05
0,578	841,9	323,11	328,34	98,41
0,591	842,1	330,33	328,42	100,58
0,568	842,7	317,56	328,65	96,62
0,585	845,2	327,00	329,63	99,20
0,587	838,9	328,11	327,17	100,29
0,574	837,8	320,89	326,74	98,21
0,583	843,4	325,89	328,93	99,08
			Rata-rata	98,83
			SD	1,17
			KV	1,19

Formula A Replikasi III

Abs	W sampel	C sampel	C teoritis	Kadar (%)
0,552	836,5	308,67	313,69	98,40
0,573	830,7	320,33	311,51	102,83
0,559	831,6	312,56	311,85	100,23
0,553	839	309,22	314,63	98,28
0,566	836,2	316,44	313,58	100,92
0,563	834,8	314,78	313,05	100,55
0,557	832,7	311,44	312,26	99,74
0,552	833,3	308,67	312,49	98,78
0,56	835,7	313,11	313,39	99,91
0,554	838,4	309,78	314,40	98,53
			Rata-rata	99,82
			SD	1,42
			KV	1,42

Formula B Replikasi I

Abs	W sampel	C sampel	C teoritis	Kadar (%)
0,568	844,6	317,56	316,73	100,26
0,57	838,7	318,67	314,51	101,32
0,575	840,9	321,44	315,34	101,94
0,566	840,5	316,44	315,19	100,40
0,565	840,8	315,89	315,30	100,19
0,563	843,5	314,78	316,31	99,51
0,572	844,7	319,78	316,76	100,95
0,561	837,5	313,67	314,06	99,87
0,573	845,1	320,33	316,91	101,08
0,574	843,4	320,89	316,28	101,46
			Rata-rata	100,70
			SD	0,77
			KV	0,76

Formula B Replikasi II

Abs	W sampel	C sampel	C teoritis	Kadar (%)
0,577	838	322,56	314,25	102,64
0,575	843,6	321,44	316,35	101,61
0,578	834	323,11	312,75	103,31
0,582	845	325,33	316,88	102,67
0,581	836,8	324,78	313,80	103,50
0,565	835,7	315,89	313,39	100,80
0,567	832,4	317,00	312,15	101,55
0,567	839,6	317,00	314,85	100,68
0,569	835,9	318,11	313,46	101,48
0,579	842,6	323,67	315,98	102,43
			Rata-rata	102,07
			SD	0,99
			KV	0,97

Formula B Replikasi III

Abs	W sampel	C sampel	C teoritis	Kadar (%)
0,567	849,5	317,00	318,56	99,51
0,564	845,1	315,33	316,91	99,50
0,569	841,7	318,11	315,64	100,78
0,575	846,9	321,44	317,59	101,21
0,563	846,6	314,78	317,48	99,15
0,572	843,5	319,78	316,31	101,10
0,569	847,8	318,11	317,93	100,06
0,559	844,7	312,56	316,76	98,67
0,564	846,2	315,33	317,33	99,37
0,58	845,3	324,22	316,99	102,28
			Rata-rata	100,16
			SD	1,14
			KV	1,13

Formula C Replikasi I

Abs	W sampel	C sampel	C teoritis	Kadar (%)
0,559	845,3	312,56	316,99	98,60
0,554	847,1	309,78	317,66	97,52
0,564	841,9	315,33	315,71	99,88
0,554	845	309,78	316,88	97,76
0,552	841,2	308,67	315,45	97,85
0,561	848,5	313,67	318,19	98,58
0,554	846,7	309,78	317,51	97,56
0,563	843,5	314,78	316,31	99,51
0,562	851,2	314,22	319,20	98,44
0,557	847,8	311,44	317,93	97,96
			Rata-rata	98,37
			SD	0,81
			KV	0,82

Formula C Replikasi II

Abs	W sampel	C sampel	C teoritis	Kadar (%)
0,563	847,5	314,78	317,81	99,05
0,568	848,4	317,56	318,15	99,81
0,567	837,5	317,00	314,06	100,94
0,554	837,2	309,78	313,95	98,67
0,564	842,4	315,33	315,90	99,82
0,552	845,2	308,67	316,95	97,39
0,558	836,4	312,00	313,65	99,47
0,547	835,8	305,89	313,43	97,60
0,563	838,4	314,78	314,40	100,12
0,568	842,3	317,56	315,86	100,54
			Rata-rata	99,34
			SD	1,18
			KV	1,18

Formula C Replikasi III

Abs	W sampel	C sampel	C teoritis	Kadar (%)
0,565	847	315,89	317,63	99,45
0,577	846,1	322,56	317,29	101,66
0,573	844,5	320,33	316,69	101,15
0,545	842,6	304,78	315,98	96,46
0,552	846,2	308,67	317,33	97,27
0,568	843,5	317,56	316,31	100,39
0,572	837,6	319,78	314,10	101,81
0,562	835,2	314,22	313,20	100,33
0,576	842,1	322,00	315,79	101,97
0,574	847,2	320,89	317,70	101,00
			Rata-rata	100,15
			SD	1,90
			KV	1,90

Formula D Replikasi I

Abs	W sampel	C sampel	C teoritis	Kadar (%)
0,512	802,9	286,44	301,09	95,14
0,519	800,1	290,33	300,04	96,77
0,538	795,9	300,89	298,46	100,81
0,522	793,1	292,00	297,41	98,18
0,523	802,2	292,56	300,83	97,25
0,54	797,4	302,00	299,03	100,99
0,55	804,3	307,56	301,61	101,97
0,527	806,7	294,78	302,51	97,44
0,53	808,5	296,44	303,19	97,78
0,534	794,6	298,67	297,98	100,23
			Rata-rata	98,66
			SD	2,21
			KV	2,24

Formula D Replikasi II

Abs	W sampel	C sampel	C teoritis	Kadar (%)
0,532	790,4	297,56	296,40	100,39
0,523	791,4	292,56	296,78	98,58
0,518	795,6	289,78	298,35	97,13
0,529	796,9	295,89	298,84	99,01
0,504	796	282,00	298,50	94,47
0,517	786,7	289,22	295,01	98,04
0,526	795,2	294,22	298,20	98,67
0,513	794,3	287,00	297,86	96,35
0,527	785,6	294,78	294,60	100,06
0,534	779,7	298,67	292,39	102,15
			Rata-rata	98,48
			SD	2,17
			KV	2,21

Formula D Replikasi III

Abs	W sampel	C sampel	C teoritis	Kadar (%)
0,542	805,1	303,11	301,91	100,40
0,526	800,3	294,22	300,11	98,04
0,543	801	303,67	300,38	101,10
0,523	794,9	292,56	298,09	98,14
0,536	802,1	299,78	300,79	99,66
0,538	792,3	300,89	297,11	101,27
0,529	797,2	295,89	298,95	98,98
0,532	800,8	297,56	300,30	99,09
0,533	804,2	298,11	301,58	98,85
0,548	803,8	306,44	301,43	101,67
			Rata-rata	99,72
			SD	1,32
			KV	1,32

LAMPIRAN G
HASIL PENETAPAN KADAR TABLET LIKUISOLID IBUPROFEN

Formula	Replikasi	Absorbansi	Wsampel (mg)	Csampel (µg/ml)	Cteoritis (µg/ml)	Kadar (%)	Rata-rata	SD	KV
A	I	0,546	801,2	305,33	300,45	101,63	100,71	0,79	0,79
	II	0,538	800,2	300,89	300,08	100,27			
	III	0,538	800,5	300,89	300,19	100,23			
B	I	0,543	801,1	303,67	300,41	101,08	101,87	0,75	0,74
	II	0,551	800,9	308,11	300,34	102,59			
	III	0,547	800,3	305,89	300,11	101,92			
C	I	0,538	800,6	300,89	300,23	100,22	100,71	0,46	0,46
	II	0,541	800,6	302,56	300,23	100,78			
	III	0,543	800,7	303,67	300,26	101,13			
D	I	0,542	800,4	303,11	300,15	100,99	100,53	0,60	0,60
	II	0,536	800,6	299,78	300,23	99,85			
	III	0,541	800,8	302,56	300,30	100,75			

LAMPIRAN H

HASIL UJI DISOLUSI TABLET LIKUISOLID IBUPROFEN FORMULA A

Replikasi	t (menit)	Absorbansi	Csampel ($\mu\text{g/ml}$)	Wt (mg)	% obat terlarut	AUC (mg.menit)
I	10	0,263	148,11	133,30	65,53	666,50
	20	0,291	163,67	147,30	72,41	1403,00
	30	0,331	185,89	167,30	82,24	1573,00
	45	0,346	194,22	174,80	85,93	2565,75
	60	0,347	194,78	175,30	86,18	2625,75
						8834,00
II	10	0,265	149,22	134,30	66,02	671,50
	20	0,293	164,78	148,30	72,90	1413,00
	30	0,333	187,00	168,30	82,74	1583,00
	45	0,34	190,89	171,80	84,46	2550,75
	60	0,348	195,33	175,80	86,42	2607,00
						8825,25
III	10	0,265	149,22	134,30	66,02	671,50
	20	0,294	165,33	148,80	73,15	1415,50
	30	0,332	186,44	167,80	82,49	1583,00
	45	0,347	194,78	175,30	86,18	2573,25
	60	0,349	195,89	176,30	86,67	2637,00
						8880,25

HASIL UJI DISOLUSI TABLET LIKUISOLID IBUPROFEN FORMULA B

Replikasi	t (menit)	Absorbansi	Csampel (µg/ml)	Wt (mg)	% obat terlarut	AUC (mg.menit)
I	10	0,3	168,67	151,80	74,51	759,00
	20	0,326	183,11	164,80	80,89	1583,00
	30	0,34	190,89	171,80	84,32	1683,00
	45	0,35	196,44	176,80	86,78	2614,50
	60	0,377	211,44	190,30	93,40	2753,25
						<u>9392,75</u>
II	10	0,311	174,78	157,30	77,21	786,50
	20	0,331	185,89	167,30	82,11	1623,00
	30	0,343	192,56	173,30	85,06	1703,00
	45	0,351	197,00	177,30	87,02	2629,50
	60	0,381	213,67	192,30	94,39	2772,00
						<u>9514,00</u>
III	10	0,302	169,78	152,80	75,00	764,00
	20	0,329	184,78	166,30	81,62	1595,50
	30	0,342	192,00	172,80	84,81	1695,50
	45	0,351	197,00	177,30	87,02	2625,75
	60	0,379	212,56	191,30	93,89	2764,50
						<u>9445,25</u>

HASIL UJI DISOLUSI TABLET LIKUISOLID IBUPROFEN FORMULA C

Replikasi	t (menit)	Absorbansi	Csampel (µg/ml)	Wt (mg)	% obat terlarut	AUC (mg.menit)
I	10	0,355	199,22	179,30	89,02	896,50
	20	0,361	202,56	182,30	90,51	1808,00
	30	0,374	209,78	188,80	93,73	1855,50
	45	0,382	214,22	192,80	95,72	2862,00
	60	0,391	219,22	197,30	97,95	2925,75
						10347,75
II	10	0,348	195,33	175,80	87,28	879,00
	20	0,368	206,44	185,80	92,25	1808,00
	30	0,371	208,11	187,30	92,99	1865,50
	45	0,381	213,67	192,30	95,47	2847,00
	60	0,391	219,22	197,30	97,95	2922,00
						10321,50
III	10	0,341	191,44	172,30	85,54	861,50
	20	0,375	210,33	189,30	93,98	1808,00
	30	0,379	212,56	191,30	94,98	1903,00
	45	0,384	215,33	193,80	96,22	2888,25
	60	0,389	218,11	196,30	97,46	2925,75
						10386,50

HASIL UJI DISOLUSI TABLET LIKUISOLID IBUPROFEN FORMULA D

Replikasi	t (menit)	Absorbansi	Csampel (µg/ml)	Wt (mg)	% obat terlarut	AUC (mg.menit)
I	10	0,199	112,56	101,30	50,38	506,50
	20	0,288	162,00	145,80	72,52	1235,50
	30	0,311	174,78	157,30	78,24	1515,50
	45	0,327	183,67	165,30	82,21	2419,50
	60	0,337	189,22	170,30	84,70	2517,00
						8194,00
II	10	0,205	115,89	104,30	51,88	521,50
	20	0,29	163,11	146,80	73,01	1255,50
	30	0,312	175,33	157,80	78,48	1523,00
	45	0,328	184,22	165,80	82,46	2427,00
	60	0,339	190,33	171,30	85,20	2528,25
						8255,25
III	10	0,193	109,22	98,30	48,89	491,50
	20	0,286	160,89	144,80	72,02	1215,50
	30	0,309	173,67	156,30	77,74	1505,50
	45	0,325	182,56	164,30	81,72	2404,50
	60	0,336	188,67	169,80	84,45	2505,75
						8122,75

LAMPIRAN I
CONTOH PERHITUNGAN

Contoh perhitungan sudut diam:

Formula A:

$$W \text{ persegi panjang} = 2,38 \text{ gram}$$

$$W \text{ lingkaran} = 0,87 \text{ gram}$$

$$\text{Luas persegi panjang} = 466,1375 \text{ cm}^2$$

$$\text{Luas lingkaran} = \frac{0,87}{2,38} \times 466,1375 = 170,3984 \text{ cm}^2$$

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

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

$$= \frac{170,3984}{3,14}$$

$$r = 7,3647 \text{ cm}$$

$$\text{tg } \alpha = \frac{h}{r} = \frac{4,60}{7,3647}$$

$$\alpha = 31,99^\circ$$

Contoh perhitungan indeks kompresibilitas:

Formula A :

$$\text{Berat gelas} = 112,38 \text{ g } (W_1)$$

$$\text{Berat gelas + granul} = 149,4 \text{ g } (W_2)$$

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

$$V_2 = 83 \text{ ml}$$

$$Bj \text{ nyata} = \frac{(W_2 - W_1)}{V_1} = \frac{(149,4 - 112,38)}{100} = 0,3702$$

$$Bj \text{ mampat} = \frac{(W_2 - W_1)}{V_2} = \frac{(149,4 - 112,38)}{83} = 0,4460$$

$$\% \text{ kompresibilitas} = \left(1 - \frac{Bj.nyata}{Bj.mampat} \right) \times 100\% = 17,0\%$$

Contoh perhitungan Hausner Ratio :

Formula A :

$$HR = \frac{Bj \text{ mampat}}{Bj \text{ nyata}} = 1,20$$

Contoh perhitungan akurasi & presisi:

%	Bahan aktif (mg)	Matriks (mg)	Larutan dapar fosfat pH 7,2 ad	Pipet	Larutan dapar fosfat pH 7,2 ad	Konsentrasi (µg/ml)
100	200	600	100	1,5	10	300

$$\text{Absorbansi} = 0,54 \rightarrow y = -0,0036x + 0,0018$$

Konsentrasi sebenarnya = 302 µg/ml

Konsentrasi teoritis = 301,8 µg/ml

$$\begin{aligned} \% \text{ perolehan kembali} &= (\text{konsentrasi sebenarnya} / \text{konsentrasi teoritis}) \times \\ &100\% \\ &= 100,07\% \end{aligned}$$

$$\begin{aligned} \text{Untuk menghitung \% KV} &= \frac{SD}{\bar{X}} \times 100\% \\ &= \frac{0,74}{99,83} \times 100\% = 0,75\% \end{aligned}$$

Contoh perhitungan % obat terlepas:

$$\% \text{ obat terlepas} = \frac{Wt}{\frac{PK}{100} \times \text{dosis}} \times 100\%$$

Formula A replikasi 1 pada t = 5 menit

$$\% \text{ obat terlepas} = \frac{133,30}{\frac{100,71}{100} \times 200} \times 100\% = 65,53\%$$

Contoh perhitungan AUC pada disolusi:

Rumus:
$$\frac{W_m + W_{m-1}}{2} x (t_n - t_{n-1})$$

Formula A replikasi 1

$$W_{t_{n-1}} = 133,30$$

$$W_{t_n} = 147,30$$

$$t_n = 20 \text{ menit}$$

$$t_{n-1} = 10 \text{ menit}$$

$$\begin{aligned} \text{AUC} &= \frac{147,30 + 133,30}{2} x (20 - 10) \\ &= 666,50 \end{aligned}$$

$$\begin{aligned} \text{Luas } \square &= 60 \times \text{penetapan kadar} \times \text{dosis} \\ &= 60 \times 100,71\% \times 200 \text{ mg} \\ &= 12085,2 \end{aligned}$$

$$\begin{aligned} \% \text{ ED Formula A replikasi 1} &= (\sum \text{AUC} / \text{luas } \square) \times 100\% \\ &= (8834 / 12085,2) \times 100\% \\ &= 73,10 \% \end{aligned}$$

LAMPIRAN J
HASIL UJI F KURVA BAKU

REPLIKASI I

KONSENTRASI	ABSORBANSI	X²	Y²	XY
100,8	0,211	10160,64	0,044521	21,2688
201,6	0,387	40642,56	0,149769	78,0192
302,4	0,558	91445,76	0,311364	168,7392
403,2	0,742	162570,24	0,550564	299,1744
504	0,906	254016	0,820836	456,624

REPLIKASI II

KONSENTRASI	ABSORBANSI	X²	Y²	XY
100,4	0,21	10080,16	0,0441	21,084
200,8	0,385	40320,64	0,148225	77,308
301,2	0,572	90721,44	0,327184	172,2864
401,6	0,747	161282,56	0,558009	299,9952
502	0,908	252004	0,824464	455,816

REPLIKASI III

KONSENTRASI	ABSORBANSI	X²	Y²	XY
100,5	0,183	10100,25	0,033489	18,3915
210	0,379	44100	0,143641	79,59
301,5	0,559	90902,25	0,312481	168,5385
402	0,743	161604	0,552049	298,686
502,5	0,922	252506,25	0,850084	463,305

	ΣX^2	ΣXY	ΣY^2	N	Residual SS	RDF
Replikasi 1	558835,2	1023,8256	1,877054	5	0,0013331	3
Replikasi 2	554408,8	1026,4896	1,901982	5	0,0014333	3
Replikasi 3	559212,75	1028,511	1,891744	5	9,39E-05	3
<i>Pooled regression</i>					0,0028603	9
<i>Common regression</i>	1672456,75	3078,8262	5,67078		0,0029678	11

F hitung = 0,1691 < F tabel_{0,05(2,9)} = 4,26

Karena F hitung lebih kecil dari F tabel maka tidak ada perbedaan bermakna antar persamaan regresi.

LAMPIRAN K
HASIL UJI STATISTIK KEKERASAN TABLET LIKUISOLID IBUPROFEN ANTAR FORMULA

Oneway

Descriptives

Kekerasan

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	3	13.2500	.44306	.25580	12.1494	14.3506	12.84	13.72
2.00	3	13.4667	.20207	.11667	12.9647	13.9686	13.25	13.65
3.00	3	13.1567	.60871	.35144	11.6445	14.6688	12.71	13.85
4.00	3	14.1267	.23459	.13544	13.5439	14.7094	13.94	14.39
Total	12	13.5000	.52639	.15196	13.1655	13.8345	12.71	14.39

Test of Homogeneity of Variances

Kekerasan

Levene Statistic	df1	df2	Sig.
2.161	3	8	.171

ANOVA

Kekerasan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.723	3	.574	3.466	.071
Within Groups	1.325	8	.166		
Total	3.048	11			

Karena $F_{hitung} = 3,466 < F_{tabel_{0,05(3,8)}} = 4,07$; maka H_0 diterima dan tidak ada perbedaan yang bermakna antar formula.

LAMPIRAN L
HASIL UJI STATISTIK KERAPUHAN TABLET LIKUISOLID IBUPROFEN
ANTAR FORMULA

Oneway

Descriptives

Kerapuhan

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	3	.1067	.04041	.02333	.0063	.2071	.06	.13
2.00	3	.1433	.07234	.04177	-.0364	.3230	.06	.19
3.00	3	.1667	.03215	.01856	.0868	.2465	.13	.19
4.00	3	.1067	.04041	.02333	.0063	.2071	.06	.13
Total	12	.1308	.04944	.01427	.0994	.1622	.06	.19

Test of Homogeneity of Variances

Kerapuhan

Levene Statistic	df1	df2	Sig.
2.040	3	8	.187

ANOVA

Kerapuhan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.008	3	.003	1.094	.406
Within Groups	.019	8	.002		
Total	.027	11			

Karena $F_{hitung} = 1,094 < F_{tabel_{0,05(3,8)}} = 4,07$; maka H_0 diterima dan tidak ada perbedaan yang bermakna antar formula.

LAMPIRAN M
HASIL UJI STATISTIK WAKTU HANCUR TABLET LIKUISOLID IBUPROFEN
ANTAR FORMULA

Oneway

Descriptives

WaktuHancur

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	3	.2333	.07572	.04372	.0452	.4214	.18	.32
2.00	3	2.0500	.29052	.16773	1.3283	2.7717	1.75	2.33
3.00	3	4.4667	1.01106	.58373	1.9551	6.9783	3.80	5.63
4.00	3	14.5200	.28513	.16462	13.8117	15.2283	14.23	14.80
Total	12	5.3175	5.78551	1.67013	1.6416	8.9934	.18	14.80

Test of Homogeneity of Variances

WaktuHancur

Levene Statistic	df1	df2	Sig.
7.185	3	8	.012

ANOVA

WaktuHancur

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	365.806	3	121.935	408.607	.000
Within Groups	2.387	8	.298		
Total	368.193	11			

Karena $F_{hitung} = 408,607 > F_{tabel_{0,05(3,8)}} = 4,07$; maka H_0 ditolak dan ada perbedaan yang bermakna antar formula.

Post Hoc Tests

Multiple Comparisons

WaktuHancur
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00	2.00	-1.81667*	.44603	.015	-3.2450	-.3883
	3.00	-4.23333*	.44603	.000	-5.6617	-2.8050
	4.00	-14.28667*	.44603	.000	-15.7150	-12.8583
2.00	1.00	1.81667*	.44603	.015	.3883	3.2450
	3.00	-2.41667*	.44603	.003	-3.8450	-.9883
	4.00	-12.47000*	.44603	.000	-13.8984	-11.0416
3.00	1.00	4.23333*	.44603	.000	2.8050	5.6617
	2.00	2.41667*	.44603	.003	.9883	3.8450
	4.00	-10.05333*	.44603	.000	-11.4817	-8.6250
4.00	1.00	14.28667*	.44603	.000	12.8583	15.7150
	2.00	12.47000*	.44603	.000	11.0416	13.8984
	3.00	10.05333*	.44603	.000	8.6250	11.4817

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

LAMPIRAN N
HASIL UJI STATISTIK PENETAPAN KADAR TABLET LIKUISOLID IBUPROFEN
ANTAR FORMULA

Oneway

Descriptives

PK

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	3	100.7100	.79699	.46014	98.7302	102.6898	100.23	101.63
2.00	3	101.8633	.75659	.43682	99.9839	103.7428	101.08	102.59
3.00	3	100.7100	.45902	.26502	99.5697	101.8503	100.22	101.13
4.00	3	100.5300	.60100	.34699	99.0370	102.0230	99.85	100.99
Total	12	100.9533	.79408	.22923	100.4488	101.4579	99.85	102.59

Test of Homogeneity of Variances

PK

Levene Statistic	df1	df2	Sig.
.518	3	8	.681

ANOVA

PK

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.377	3	1.126	2.530	.131
Within Groups	3.559	8	.445		
Total	6.936	11			

Karena $F_{hitung} = 2,530 < F_{tabel_{0,05(3,8)}} = 4,07$; maka H_0 diterima dan tidak ada perbedaan yang bermakna antar formula.

LAMPIRAN O
HASIL UJI STATISTIK DISOLUSI BERDASARKAN %ED₆₀ TABLET LIKUISOLID IBUPROFEN
ANTAR FORMULA

Oneway

Descriptives

ED

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	3	73.2033	.24214	.13980	72.6018	73.8049	73.03	73.48
2.00	3	77.3133	.49642	.28661	76.0802	78.5465	76.84	77.83
3.00	3	85.6567	.26690	.15409	84.9937	86.3197	85.41	85.94
4.00	3	67.8933	.55048	.31782	66.5259	69.2608	67.33	68.43
Total	12	76.0167	6.78837	1.95963	71.7035	80.3298	67.33	85.94

Test of Homogeneity of Variances

ED

Levene Statistic	df1	df2	Sig.
.659	3	8	.600

ANOVA

ED

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	505.543	3	168.514	992.234	.000
Within Groups	1.359	8	.170		
Total	506.902	11			

Karena $F_{hitung} = 992,234 > F_{tabel}_{0,05(3,8)} = 4,07$; maka H_0 ditolak dan ada perbedaan yang bermakna antar formula.

Post Hoc Tests

Multiple Comparisons

ED

Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00	2.00	-4.11000*	.33649	.000	-5.1875	-3.0325
	3.00	-12.45333*	.33649	.000	-13.5309	-11.3758
	4.00	5.31000*	.33649	.000	4.2325	6.3875
2.00	1.00	4.11000*	.33649	.000	3.0325	5.1875
	3.00	-8.34333*	.33649	.000	-9.4209	-7.2658
	4.00	9.42000*	.33649	.000	8.3425	10.4975
3.00	1.00	12.45333*	.33649	.000	11.3758	13.5309
	2.00	8.34333*	.33649	.000	7.2658	9.4209
	4.00	17.76333*	.33649	.000	16.6858	18.8409
4.00	1.00	-5.31000*	.33649	.000	-6.3875	-4.2325
	2.00	-9.42000*	.33649	.000	-10.4975	-8.3425
	3.00	-17.76333*	.33649	.000	-18.8409	-16.6858

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

LAMPIRAN P
HASIL UJI STATISTIK KONSTANTA LAJU DISOLUSI TABLET LIKUISOLID IBUPROFEN
ANTAR FORMULA

Oneway

Descriptives

LajuDisolusi

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	3	.019167	.0006110	.0003528	.017649	.020684	.0185	.0197
2.00	3	.025267	.0004163	.0002404	.024232	.026301	.0248	.0256
3.00	3	.032700	.0017349	.0010017	.028390	.037010	.0307	.0338
4.00	3	.021500	.0001732	.0001000	.021070	.021930	.0213	.0216
Total	12	.024658	.0054162	.0015635	.021217	.028100	.0185	.0338

Test of Homogeneity of Variances

LajuDisolusi

Levene Statistic	df1	df2	Sig.
7.572	3	8	.010

ANOVA

LajuDisolusi

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.000	3	.000	117.292	.000
Within Groups	.000	8	.000		
Total	.000	11			

Karena $F_{hitung} = 117,292 > F_{tabel_{0,05(3,8)}} = 4,07$; maka H_0 ditolak dan ada perbedaan yang bermakna antar formula.

Post Hoc Tests

Multiple Comparisons

LajuDisolusi
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00	2.00	-.0061000*	.0007732	.000	-.008576	-.003624
	3.00	-.0135333*	.0007732	.000	-.016009	-.011057
	4.00	-.0023333	.0007732	.065	-.004809	.000143
2.00	1.00	.0061000*	.0007732	.000	.003624	.008576
	3.00	-.0074333*	.0007732	.000	-.009909	-.004957
	4.00	.0037667*	.0007732	.005	.001291	.006243
3.00	1.00	.0135333*	.0007732	.000	.011057	.016009
	2.00	.0074333*	.0007732	.000	.004957	.009909
	4.00	.0112000*	.0007732	.000	.008724	.013676
4.00	1.00	.0023333	.0007732	.065	-.000143	.004809
	2.00	-.0037667*	.0007732	.005	-.006243	-.001291
	3.00	-.0112000*	.0007732	.000	-.013676	-.008724

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

LAMPIRAN Q
SERTIFIKAT ANALISIS IBUPROFEN



Shasun Chemicals And Drugs Ltd.

IBUPROFEN BP/Ph.Eur. (SN Grade) CERTIFICATE OF ANALYSIS			
TESTS		RESULTS	LIMITS
Nature of Packing : Sea Worthy Fibre Drum		Analytical Report No. : FPIBU0607674	
Sample Taken By : S Sivakumar		Batch Number : IBU0607674	
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-Isobutylphenyl) Propanoic Acid (Impurity I)	0.06 % (Area %)	NMT 0.20 % (Area %)
	b) 2-(4-Burylphenyl)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)

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Shasun Chemicals And Drugs Ltd.

IBUPROFEN BP/Ph.Eur. (SN Grade) CERTIFICATE OF ANALYSIS			
S.No	TESTS	RESULTS	LIMITS
Nature of Packing : Sea Worthy Fibre Drum Sample Taken By : S.Sivakumar Date of Manufacture : July 2006 Expiry Date : June 2011 Batch Volume(Qty) : 3000 Kg.		Analytical Report No. : FPBU060764 Batch Number : IBU0607674 Date of Analysis : 25-07-2006 Date of Report : 25-07-2006 Manufactured By : Shasun Chemicals And Drugs Limited, Pondicherry.	
ADDITIONAL TESTS			
a.	Bulk Density Untapped Tapped(1250 tappings)	0.45 g/mL 0.64 g/mL	0.35- 0.55 g/mL 0.50- 0.75 g/mL
b.	Mean Particle Size	76.4 microns	60.0 - 130.0 microns
c.	Residual solvents i) Acetone ii) Isopropyl alcohol iii) Hexanes iv) Tri chloro ethylene v) Methanol ϕ	17 PPM LT 0.89 PPM 29 PPM LT 0.19 PPM Not Detected	NMT 100 PPM NMT 250 PPM NMT 290 PPM NMT 80 PPM NMT 500 PPM
OPINION: The Material Complies As Per BP/Ph.Eur. Standard. Note : NMT = Not more than NLT = Not less than LT = Less than ϕ NOT USED IN THE PROCESS, TEST INCLUDED FOR COMPLIANCE WITH CERTIFICATE OF SUITABILITY.			
Compiled by : <i>CS</i> Date : <i>25/07/2006</i> (E.Senthikumar) Senior Chemist		Reviewed by : <i>SR</i> Date : <i>25/07/2006</i> (S.Rajasudalaiimuthu) Senior Chemist	Approved by : <i>NV</i> Date : <i>25/07/2006</i> (N.Vinayagaperumal) Dy.QC-Incharge
SQCC/F-024/F/06			

Page 2/2



_____ Shasun Road, Periyakalpet, 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 _____
 shapody@shasun.com _____

LAMPIRAN R
SERTIFIKAT ANALISIS AVICEL PH 102

ASAHI KASEI CHEMICALS CORPORATION

Date: 21-JUN-20

Issued by manufact

1-105 Kanda Jimbocho, Chiyoda-ku, TOKYO 101-8101, JAPAN
TEL: +81-(0)3-3296-3381 FAX: +81-(0)3-3296-3467
Manufacturing site: 304, Mizushiri-machi, Nobeoka-city, Miyazaki 882-0015, Japan

1701 / 15B / VIL / 10

YOUR NO.: B7ME-10-5298-0060

CERTIFICATE OF ANALYSIS

Compendial name: Microcrystalline Cellulose, NF, Ph. Eur., JP

Trade name : CEOLUS®

Grade : PH-102 **Lot No.** 2034 (20bags)

Manufacturing Date: 22-MAR-2010

Re-evaluation Date: 22-MAR-2013

Organic Solvent: not used in our process

Compendial Standards

	<u>Specifications</u>	<u>Lot Analysis</u>
Description	Passes	Passes
Identification	Passes	Passes
Degree of polymerization	100 - 300	Passes
Loss on drying (%)	2.0 - 5.0	3.8
Water-soluble substances (mg)	NMT 12.5	5.8
Ether-soluble substances (mg)	NMT 5.0	0.8
Conductivity (μ S/cm)	NMT 75	25
Heavy metals (ppm)	NMT 10	NMT 10
Solubility	Passes	Passes
Residue on ignition (%)	NMT 0.1	0.02
Bulk density (g/cm ³)	0.28 - 0.33	0.314
pH	5.0 - 7.5	5.7
Total aerobic microbial count (cfu/g)	NMT 1000	Passes
Total combined molds and yeasts count (cfu/g)	NMT 100	Passes
<i>Escherichia coli</i>	None Present	None Present
<i>Salmonella</i> species	None Present	None Present
<i>Pseudomonas Aeruginosa</i>	None Present	None Present
<i>Staphylococcus Aureus</i>	None Present	None Present

ASAHI Standards

Particle size, wt. % >250 μ m (60 mesh)	LT 8.0	0.4
Particle size, wt. % >150 μ m (100 mesh)	20 - 40	25

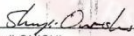
NMT --Not More Than; LT --Less Than

We certify that the product complies with the standards of the NF, Ph. Eur., JP.

Storage conditions: Store at ambient conditions. Keep containers sealed; material is hygroscopic.

Re-evaluation Date: Three years after manufacturing, if stored as recommended.

Asahi Kasei Chemicals recommends that the customer's quality control unit may re-evaluate the quality of this material at the given time e.g. for loss on drying and extend the shelf life of this lot on its own responsibility.


Shuji ONISHI
Manager
Quality Assurance Section
CEOLUS Production Department

LAMPIRAN S

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

parameter	unit	method	result
nitification A	ac	Ph.Eur	59
nitification A	metal reaction	USP/NF	passes test
nitification B	retention time GC	USP/NF	retentions match
idity or	ml 0,01N HCl	Ph.Eur	<0,5
alinity	ml 0,01 N NaOH	Ph.Eur	<0,5
avy metals as Pb	ppm	JP	<20
ad	ppm	BAE 300-B	<1
admlum	ppm	BAE 300-B	<1
ickel	ppm	BAE 300-B	<1
hloride	%	Ph.Eur	<0,1
ulphate	%	Ph.Eur	<0,5
id value of the fatty acid	mg KOH/g	Ph.Eur	204,8
lative content of stearic acid	%	USP/NF	65,1
l. cont. of stearic and palmitic acid	%	USP/NF	98,9
robic microbial count	cfu/g	USP/NF	<10
ilts & Yeasts	cfu/g	USP/NF	105
cherichia coli	cfu/g	USP/NF	absent
Staphylo Species	cfu/g	USP/NF	absent
ganic volatile impurities		USP/NF	meets USP/NF
oss on drying	%	BAE 600	3,9
magnesium content	%	BAE 200 o	4,7
ne fatty acid	%	BAE 400	0,6
ive residue at 200 mesh	%	BAE 605	0,2
lk density tapped	g/ml	BAE 611a	0,32
pecific surface area BET	qm/g	USP/NF	10,0
itamination		BAE 601	in accordance

Veno, 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
 WATER
 MANUFACTURES
 TECHNOLOGIE

LAMPIRAN T
SERTIFIKAT ANALISIS SODIUM STARCH GLYCOLATE

YUNG ZIP CHEMICAL IND. CO., LTD.

59, Yu Shih Road
 Youth Industrial District
 Tachia, Taiwan, 437
 R. O. C.

TEL: 886-4-26818780, 26811344

FAX: 886-4-26812911

CERTIFICATE OF ANALYSIS

D S T

(Sodium Starch Glycolate)

Lot No.: SSG0010162

Mfg. Date: Jun. 20, 2010

Analysis Following: BP2010/EP 6.0

Retest Date: Jun. 19, 2013

ITEMS	SPECIFICATIONS	RESULTS
Appearance	A white or almost white, fine, free-flowing powder, very hygroscopic	A white free-flowing powder
Examined under microscope	Conformed to the test	Conformed
Solubility	Practically insoluble in methylene chloride. A translucent suspension in water	Conformed
Identification		
A. pH	Between 5.5 and 7.5	5.7
B. Suspension test	Suspension forms settles after standing.	Conformed
C. Iodine test	The solution becomes blue to violet.	Conformed
D. Sodium test	A dense white precipitate is formed.	Conformed
Appearance of solution S1		
Clear	The opalescence is not more pronounced than reference suspension I.	Conformed
Colorless	Not more intensely colored than reference solution B ₉ .	Conformed
Sodium chloride	Not more than 7.0 %	6.1 %
Sodium glycolate	Not more than 2.0 %	1.7 %
Iron	Not more than 20 ppm	< 20 ppm
Heavy metals	Not more than 20 ppm	< 20 ppm
Loss on drying	Not more than 10.0 %	2.9 %
Microbial contamination	Absence of <i>Salmonella</i> species and <i>Escherichia Coli</i>	Negative
Assay	2.8 % ~ 4.2 % of sodium	2.9 %

Conclusion : Passed

LAMPIRAN U
TABEL UJI R

Lampiran 1

**TABEL NILAI KOEFISIEN KORELASI
"r" PRODUCT MOMENT TARAF SIGNIFIKAN 5% DAN 1%**

df	TARAF SIGNIFIKAN		df	TARAF SIGNIFIKAN	
	5%	1%		5%	1%
1	0,997	1,000	24	0,388	0,496
2	0,950	0,990	25	0,381	0,487
3	0,878	0,959	26	0,374	0,478
4	0,811	0,917	27	0,367	0,470
5	0,754	0,874	28	0,361	0,463
6	0,707	0,834	29	0,355	0,456
7	0,666	0,798	30	0,349	0,449
8	0,632	0,765	35	0,325	0,418
9	0,602	0,735	40	0,304	0,393
10	0,576	0,708	45	0,288	0,372
11	0,553	0,684	50	0,273	0,354
12	0,532	0,661	60	0,250	0,325
13	0,514	0,641	70	0,232	0,302
14	0,497	0,623	80	0,217	0,283
15	0,482	0,606	90	0,205	0,267
16	0,468	0,590	100	0,195	0,254
17	0,456	0,575	125	0,174	0,226
18	0,444	0,561	150	0,159	0,208
19	0,433	0,549	200	0,138	0,181
20	0,423	0,537	300	0,113	0,148
21	0,413	0,526	400	0,098	0,128
22	0,404	0,515	500	0,088	0,115
23	0,399	0,505	1000	0,062	0,081

Sumber : Hartono, 2004

LAMPIRAN V

TABEL UJI F

TABEL DISTRIBUSI F UNTUK 5% DAN 1%

Baris atas untuk taraf signifikan 5%
Baris bawah untuk taraf signifikan 1%

$V_1 = dk$ penyebut	$V_2 = dk$ pembilang																											
	1	2	3	4	5	6	7	8	9	10	11	12	14	16	20	24	30	40	50	75	100	200	500	∞				
1	161	200	216	225	230	234	237	239	241	242	243	244	245	246	248	249	250	251	252	253	253	254	254	254	254			
2	18.51	19.00	19.16	19.25	19.30	19.33	19.36	19.37	19.38	19.39	19.40	19.41	19.42	19.43	19.44	19.45	19.46	19.47	19.47	19.48	19.49	19.49	19.50	19.50				
3	10.13	9.55	9.28	9.12	9.01	8.94	8.88	8.84	8.81	8.78	8.76	8.74	8.71	8.69	8.66	8.64	8.62	8.60	8.58	8.57	8.56	8.54	8.54	8.53				
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.93	5.91	5.87	5.84	5.80	5.77	5.74	5.71	5.70	5.68	5.66	5.65	5.64	5.63				
5	6.81	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.78	4.74	4.70	4.68	4.64	4.60	4.56	4.53	4.50	4.46	4.44	4.42	4.40	4.38	4.37	4.36				
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.03	4.00	3.96	3.92	3.87	3.84	3.81	3.77	3.75	3.72	3.71	3.69	3.68	3.67				
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.63	3.60	3.57	3.52	3.49	3.44	3.41	3.38	3.34	3.32	3.29	3.28	3.25	3.24	3.23				
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.34	3.31	3.28	3.23	3.20	3.15	3.12	3.08	3.05	3.03	3.00	2.98	2.96	2.94	2.93				
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.13	3.10	3.07	3.02	2.98	2.93	2.90	2.86	2.82	2.80	2.77	2.76	2.73	2.72	2.71				
	10.56	8.02	6.99	6.42	6.06	5.80	5.62	5.47	5.35	5.26	5.18	5.11	5.00	4.92	4.80	4.73	4.61	4.56	4.51	4.45	4.41	4.36	4.33	4.34				

$V_1 = dk$ penyebut	$V_2 = dk$ pembilang																											
	1	2	3	4	5	6	7	8	9	10	11	12	14	16	20	24	30	40	50	75	100	200	500	∞				
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.97	2.94	2.91	2.86	2.82	2.77	2.74	2.70	2.67	2.64	2.61	2.59	2.56	2.55	2.54				
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.86	2.82	2.79	2.74	2.70	2.65	2.61	2.57	2.53	2.50	2.47	2.45	2.42	2.41	2.40				
12	4.75	3.88	3.49	3.26	3.11	3.00	2.92	2.86	2.80	2.76	2.72	2.69	2.64	2.60	2.54	2.50	2.46	2.42	2.38	2.34	2.32	2.29	2.28	2.27				
13	4.67	3.80	3.41	3.18	3.02	2.92	2.84	2.77	2.72	2.67	2.63	2.60	2.55	2.51	2.46	2.42	2.38	2.34	2.32	2.28	2.26	2.24	2.22	2.21				
14	4.60	3.74	3.34	3.11	2.96	2.85	2.77	2.70	2.65	2.60	2.56	2.53	2.48	2.44	2.39	2.35	2.31	2.27	2.24	2.21	2.19	2.16	2.14	2.13				
15	4.54	3.68	3.29	3.06	2.90	2.79	2.70	2.64	2.59	2.55	2.51	2.48	2.43	2.39	2.33	2.29	2.25	2.21	2.18	2.15	2.12	2.10	2.08	2.07				
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.45	2.42	2.37	2.33	2.28	2.24	2.20	2.16	2.13	2.09	2.07	2.04	2.02	2.01				
17	4.45	3.59	3.20	2.96	2.81	2.70	2.62	2.55	2.50	2.45	2.41	2.38	2.33	2.29	2.23	2.19	2.15	2.11	2.08	2.04	2.02	1.99	1.97	1.96				
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.37	2.34	2.29	2.25	2.19	2.15	2.11	2.07	2.04	2.00	1.98	1.96	1.93	1.92				
19	4.38	3.52	3.13	2.90	2.74	2.63	2.55	2.48	2.43	2.38	2.34	2.31	2.26	2.21	2.15	2.11	2.07	2.02	2.00	1.96	1.94	1.91	1.88	1.88				
20	4.35	3.49	3.10	2.87	2.71	2.60	2.52	2.45	2.40	2.35	2.31	2.28	2.23	2.18	2.12	2.08	2.04	1.99	1.96	1.92	1.90	1.87	1.85	1.84				
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.28	2.25	2.20	2.15	2.09	2.05	2.00	1.96	1.93	1.89	1.87	1.84	1.82	1.81				
22	4.30	3.44	3.05	2.82	2.66	2.55	2.47	2.40	2.35	2.30	2.26	2.23	2.18	2.13	2.07	2.03	1.98	1.93	1.91	1.87	1.84	1.81	1.80	1.79				
23	4.28	3.42	3.03	2.80	2.64	2.53	2.45	2.38	2.32	2.28	2.24	2.21	2.16	2.10	2.04	2.00	1.96	1.91	1.88	1.84	1.82	1.79	1.77	1.76				
	7.88	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30	3.21	3.14	3.07	2.97	2.89	2.78	2.70	2.62	2.53	2.48	2.41	2.37	2.32	2.28	2.26				

$V_r = dk$ penyebut	$V_r = dk$ pembilang																							
	1	2	3	4	5	6	7	8	9	10	11	12	14	16	20	24	30	40	50	75	100	200	500	∞
24	4.26	3.40	3.01	2.78	2.62	2.51	2.43	2.36	2.30	2.26	2.22	2.18	2.13	2.09	2.02	1.98	1.94	1.89	1.86	1.82	1.80	1.76	1.74	1.73
25	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.25	3.17	3.09	3.03	2.93	2.85	2.74	2.66	2.58	2.49	2.44	2.36	2.33	2.27	2.23	2.21
26	4.24	3.38	2.99	2.76	2.60	2.49	2.41	2.34	2.28	2.24	2.20	2.16	2.11	2.06	2.00	1.96	1.92	1.87	1.84	1.80	1.77	1.74	1.72	1.71
27	7.77	5.57	4.68	4.18	3.86	3.63	3.46	3.32	3.21	3.13	3.05	2.99	2.89	2.81	2.70	2.62	2.54	2.45	2.40	2.32	2.29	2.23	2.19	2.17
28	4.22	3.37	2.89	2.74	2.59	2.47	2.39	2.32	2.27	2.22	2.18	2.15	2.10	2.05	1.99	1.95	1.90	1.85	1.82	1.78	1.76	1.72	1.70	1.69
29	7.72	5.53	4.64	4.14	3.82	3.59	3.42	3.29	3.17	3.09	3.02	2.96	2.86	2.77	2.66	2.58	2.50	2.41	2.36	2.28	2.25	2.19	2.15	2.13
30	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.30	2.25	2.20	2.16	2.13	2.08	2.03	1.97	1.93	1.88	1.84	1.80	1.76	1.74	1.71	1.68	1.67
31	7.68	5.49	4.60	4.11	3.79	3.56	3.39	3.26	3.14	3.06	2.98	2.93	2.83	2.74	2.63	2.55	2.47	2.38	2.33	2.25	2.21	2.16	2.12	2.10
32	4.20	3.34	2.95	2.71	2.56	2.44	2.36	2.29	2.24	2.19	2.15	2.12	2.06	2.02	1.96	1.91	1.87	1.81	1.78	1.75	1.72	1.69	1.67	1.65
33	7.64	5.45	4.57	4.07	3.76	3.53	3.36	3.23	3.11	3.03	2.95	2.90	2.80	2.71	2.60	2.52	2.44	2.35	2.30	2.22	2.18	2.13	2.09	2.06
34	4.18	3.33	2.93	2.70	2.54	2.43	2.35	2.28	2.22	2.18	2.14	2.10	2.05	2.00	1.94	1.90	1.85	1.80	1.77	1.73	1.71	1.68	1.65	1.64
35	7.60	5.52	4.54	4.04	3.73	3.50	3.33	3.20	3.08	3.00	2.92	2.87	2.77	2.68	2.57	2.49	2.41	2.32	2.27	2.19	2.15	2.10	2.06	2.03
36	4.17	3.32	2.92	2.69	2.53	2.42	2.34	2.27	2.21	2.16	2.12	2.09	2.04	1.99	1.93	1.89	1.84	1.79	1.76	1.72	1.69	1.66	1.64	1.62
37	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.06	2.98	2.90	2.84	2.74	2.66	2.55	2.47	2.38	2.29	2.24	2.16	2.13	2.07	2.03	2.01
38	4.15	3.30	2.90	2.67	2.51	2.40	2.32	2.25	2.19	2.14	2.10	2.07	2.02	1.97	1.91	1.86	1.82	1.76	1.74	1.69	1.67	1.64	1.61	1.59
39	7.50	5.34	4.46	3.97	3.66	3.42	3.25	3.12	3.01	2.94	2.86	2.80	2.70	2.62	2.51	2.42	2.34	2.25	2.20	2.12	2.08	2.02	1.98	1.96
40	4.13	3.28	2.88	2.65	2.49	2.38	2.30	2.23	2.17	2.12	2.08	2.05	2.00	1.95	1.89	1.84	1.80	1.74	1.71	1.67	1.64	1.61	1.59	1.57
41	7.44	5.29	4.42	3.93	3.61	3.38	3.21	3.08	2.97	2.89	2.82	2.75	2.66	2.58	2.47	2.38	2.30	2.21	2.15	2.08	2.04	1.98	1.94	1.91
42	4.11	3.26	2.86	2.63	2.48	2.36	2.28	2.21	2.15	2.10	2.06	2.03	1.99	1.93	1.87	1.82	1.78	1.72	1.69	1.65	1.62	1.59	1.56	1.55
43	7.39	5.25	4.38	3.89	3.58	3.35	3.18	3.04	2.94	2.86	2.78	2.72	2.62	2.54	2.43	2.35	2.26	2.17	2.12	2.04	2.00	1.94	1.90	1.87
44	4.10	3.25	2.85	2.62	2.46	2.35	2.26	2.19	2.14	2.09	2.05	2.02	1.96	1.92	1.85	1.80	1.76	1.71	1.67	1.63	1.60	1.57	1.54	1.53
45	7.35	5.21	4.34	3.86	3.54	3.32	3.15	3.02	2.91	2.82	2.75	2.69	2.59	2.51	2.40	2.32	2.23	2.19	2.12	2.05	1.97	1.94	1.88	1.84
46	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.07	2.04	2.00	1.95	1.90	1.84	1.79	1.74	1.69	1.66	1.61	1.59	1.55	1.53	1.51
47	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.88	2.80	2.73	2.66	2.56	2.49	2.37	2.29	2.20	2.11	2.05	1.97	1.94	1.88	1.84	1.81
48	4.07	3.22	2.83	2.59	2.44	2.32	2.24	2.17	2.11	2.06	2.02	1.99	1.94	1.89	1.82	1.78	1.73	1.68	1.64	1.60	1.57	1.54	1.51	1.49
49	7.27	5.15	4.29	3.80	3.49	3.26	3.10	2.96	2.86	2.77	2.70	2.64	2.54	2.46	2.35	2.26	2.17	2.08	2.02	1.94	1.91	1.85	1.80	1.78
50	4.06	3.21	2.82	2.58	2.43	2.31	2.23	2.16	2.10	2.05	2.01	1.98	1.92	1.88	1.81	1.78	1.72	1.68	1.63	1.58	1.56	1.52	1.50	1.48
51	7.24	5.12	4.26	3.78	3.46	3.24	3.07	2.94	2.84	2.75	2.68	2.62	2.52	2.44	2.32	2.24	2.15	2.06	2.00	1.92	1.89	1.82	1.78	1.75

Sumber : Hartono, 2004