BAB V
SIMPULAN

5.1. *Simpulan*

Konsentrasi HPMC K4M sebagai polimer lepas lambat, konsentrasi bahan eferfesen yang terdiri dari asam sitrat dan natrium bikarbonat sebagai bahan penghasil gas CO_2 yang mampu membantu tablet untuk cepat mengapung, maupun interaksinya antara konsentrasi HPMC K4M dan konsentrasi bahan eferfesen yang berpengaruh secara signifikan terhadap sifat mutu fisik dan disolusi metformin hidroklorida dalam sediaan tablet *floating*. Berdasarkan *Design-Expert*, konsentrasi HPMC K4M dan konsentrasi komponen eferfesen berpengaruh signifikan terhadap kekerasan tablet dan *floating lag time*; sedangkan interaksi antara konsentrasi HPMC K4M dan konsentrasi komponen eferfesen berpengaruh signifikan terhadap konstanta laju disolusi.

Formula optimum tablet *floating* metformin hidroklorida dapat diperoleh dengan menggunakan kombinasi HPMC K4M 18,625 % dan komponen eferfesen 7,125% (dengan perbandingan bobot asam sitrat dan natrium bikarbonat 1:1) yang menghasilkan kekerasan 10,63 Kp, *floating lag time* 2,83 menit, dan k disolusi 0,33 mg/menit.

5.2. *Alur Penelitian*

Sebaiknya dilakukan penelitian lebih lanjut mengenai parameter farmakokinetik sediaan tablet *floating* metformin hidroklorida dan dicari korelasi invivo-invitro yang diharapkan memberikan hasil yang baik serta perlu dilakukan uji kestabilan. Selain itu, dapat juga dilakukan penelitian menggunakan bahan aktif yang sama yaitu metformin hidroklorida dengan menggunakan polimer HPMC K4M yang dikombinasikan dengan

bermacam-macam polimer untuk menghasilkan profil pelepasan yang lebih baik pada saat pelepasan awal.

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LAMPIRAN A

HASIL UJI MUTU FISIK MASSA TABLET

Mutu Fisik yang diuji	*Batch*	Formula Tablet Metfromin Hidroklorida				Persyaratan
		FA	FB	FC	FD	
Kadar Air (%)	1	3,20	3,30	3,50	3,50	3-5 % (Voight,1995)
	2	3,40	3,40	3,30	3,40	
	3	3,10	3,20	3,60	3,60	
	$\bar{X}$	3,23	3,30	3,46	3,50	
	SD	0,15	0,10	0,15	0,10	
Waktu Alir (detik)	1	4,58	4,38	4,23	4,54	Tidak lebih dari 10 detik (Fudholi,1985)
	2	4,46	4,43	4,35	4,61	
	3	4,54	4,46	4,27	4,56	
	$\bar{X}$	4,53	4,42	4,28	4,57	
	SD	0,06	0,04	0,06	0,04	
Sudut Diam (Derajat)	1	28,79	26,46	27,39	27,63	25-30 = kriteria baik (wells, 1988)
	2	27,51	27,83	27,83	29,76	
	3	28,59	28,72	28,85	27,74	
	$\bar{X}$	28,30	27,67	28,02	28,38	
	SD	0,69	1,14	0,75	1,20	
Carr's Index (%)	1	17,07	12,87	14,08	13,05	11-15= kriteria baik 16-20 = kriteria cukup baik (Siregar, 1992)
	2	16,94	12,91	12,92	12,99	
	3	15,99	11,89	12,99	13,97	
	$\bar{X}$	16,67	12,58	13,33	13,34	
	SD	0,59	0,60	0,65	0,55	
Hausner Ratio	1	1,21	1,15	1,16	1,15	< 1,25 = kriteria baik (Forner *et al*, 1981)
	2	1,20	1,15	1,15	1,15	
	3	1,19	1,13	1,15	1,16	
	$\bar{X}$	1,20	1,14	1,15	1,15	
	SD	0,01	0,01	0,01	0,01	

LAMPIRAN B

HASIL UJI KERAGAMAN BOBOT TABLET *FLOATING* METFORMIN HIDROKLORIDA

Hasil Uji Keragaman Bobot Tablet Formula A

No	*Batch I*		*Batch II*		*Batch III*	
	Bobot Tablet (mg)	**Y (%)**	**Bobot Tablet (mg)**	**Y (%)**	**Bobot Tablet (mg)**	**Y (%)**
1	792,6	99,80	796,6	101,99	790,6	98,80
2	794,5	10,03	806,4	103,24	794,1	99,24
3	796,6	100,30	810,3	103,74	794,0	99,22
4	793,5	99,91	810,3	103,74	790,8	98,82
5	790,4	99,52	790,8	101,25	790,5	98,79
6	790,8	99,57	790,6	101,22	790,3	98,76
7	790,9	99,58	790,1	101,16	790,4	98,77
8	800,7	100,82	792,4	101,45	800,2	100,00
9	794,2	100,00	796,4	101,96	791,3	98,89
10	793,3	99,88	791,6	101,35	791,5	98,91
$\bar{X}$	793,75	99,94	797,55	102,11	792,37	99,02
PK (%)	99,94		102,11		99,02	
SD	0,39		1,06		0,39	

Hasil Uji Keragaman Bobot Tablet Formula B

No	*Batch I*		*Batch II*		*Batch III*	
	Bobot Tablet (mg)	**Y (%)**	**Bobot Tablet (mg)**	**Y (%)**	**Bobot Tablet (mg)**	**Y (%)**
1	810,3	101,13	804,3	98,22	803,4	98,69
2	810,8	101,20	800,9	97,80	804,9	98,87
3	810,4	101,15	802,4	97,98	809,2	99,40
4	800,9	99,96	800,5	97,75	806,4	99,06
5	802,3	100,13	798,9	97,56	806,3	99,04
6	805,6	100,55	799,2	97,59	809,1	99,39
7	810,4	101,15	800,3	97,73	807,7	99,22
8	807,5	100,78	810,4	98,96	798,2	98,05
9	800,9	99,96	810,5	98,97	810,2	99,52
10	802,0	100,10	810,2	98,94	807,3	99,17
$\bar{X}$	806,11	100,61	803,76	98,15	806,27	99,04
PK (%)	100,61		98,15		99,04	
SD		0,53		0,59		0,43

Hasil Uji Keragaman Bobot Tablet Formula C

No	*Batch I*		*Batch II*		*Batch III*	
	Bobot Tablet (mg)	**Y (%)**	**Bobot Tablet (mg)**	**Y (%)**	**Bobot Tablet (mg)**	**Y (%)**
1	792,8	97,31	800,3	100,89	803,4	99,28
2	790,9	97,07	798,6	100,68	804,9	99,46
3	800,2	98,21	795,4	100,28	809,2	99,99
4	793,4	97,38	797,4	100,53	806,4	99,65
5	795,6	97,65	798,6	100,68	806,3	99,63
6	795,4	97,62	798,5	100,67	809,1	99,98
7	795,7	97,66	799,0	100,73	807,7	99,81
8	795,7	97,66	792,8	99,95	798,2	98,63
9	796,2	97,72	794,6	100,18	810,2	100,12
10	800,2	98,21	795,7	100,31	807,3	99,76
$\bar{X}$	795,61	97,65	797,09	100,49	806,27	99,63
PK (%)	97,65		100,49		99,63	
SD		0,36		0,30		0,43

Hasil Uji Keragaman Bobot Tablet Formula D

No	*Batch I*		*Batch II*		*Batch III*	
	Bobot Tablet (mg)	**Y (%)**	**Bobot Tablet (mg)**	**Y (%)**	**Bobot Tablet (mg)**	**Y (%)**
1	802,7	99,75	805,6	102,09	803,6	103,20
2	801,4	99,59	805,9	102,12	804,5	103,31
3	801,2	99,56	806,4	102,19	780,4	100,22
4	801,6	99,61	803,0	101,76	792,6	101,78
5	801,3	99,57	802,9	101,74	804,3	103,29
6	802,2	99,68	803,5	101,82	804,7	103,34
7	809,4	100,58	803,5	101,82	802,9	103,11
8	813,4	101,08	802,8	101,73	801,2	102,89
9	810,2	100,68	801,9	101,62	804,3	103,29
10	807,2	100,31	804,3	101,92	805,1	103,39
$\bar{X}$	805,06	100,04	803,98	101,88	800,36	102,78
PK (%)	100,04		101,88		102,78	
SD	0,57		0,19		1,02	

LAMPIRAN C

HASIL UJI KEKERASAN TABLET *FLOATING* METFORMIN HIDROKLORIDA

Batch I

No	Kekerasan Tablet Metformin Hidroklorida (kp)			
	FA	FB	FC	FD
1	10,9	8,9	12,0	10,0
2	10,5	9,0	14,0	11,4
3	10,1	9,2	13,5	11,7
4	10,5	9,2	11,6	12,4
5	10,0	9,4	12,4	11,7
6	10,0	9,4	13,1	11,4
7	10,0	9,4	12,4	10,6
8	10,1	9,3	13,1	10,3
9	10,2	9,6	13,2	12,7
10	10,0	9,4	13,1	10,8
$\bar{X}$ ± SD	10,23 ± 0,31	9,28 ± 0,21	12,86 ± 0,73	11,30 ± 0,88

Batch 2

No	Kekerasan Tablet Metformin Hidroklorida (kp)			
	FA	FB	FC	FD
1	10,4	9,0	13,6	11,5
2	10,8	8,9	12,8	11,2
3	10,8	8,9	13,1	12,2
4	10,5	8,8	13,6	12,0
5	10,5	8,9	13,0	11,5
6	10,6	9,1	13,2	11,7
7	10,5	9,2	13,6	11,0
8	10,4	9,4	13,3	12,8
9	10,5	9,4	13,5	11,9
10	10,4	9,5	13,5	12,5
$\bar{X}$ ± SD	10,54 ± 0,15	9,11 ± 0,25	13,32 ± 0,29	11,83 ± 0,57

Batch 3

No	Kekerasan Tablet Metformin Hidroklorida (kp)			
	FA	**FB**	**FC**	**FD**
1	10,2	9,3	13,2	11,2
2	10,4	8,9	13,6	12,2
3	10,4	9,0	13,5	12,0
4	10,5	9,2	13,3	11,8
5	10,6	9,1	13,0	11,9
6	10,2	9,1	13,6	12,7
7	10,6	9,2	13,2	12,5
8	10,4	9,4	13,4	11,7
9	10,5	9,5	13,8	11,3
10	10,5	9,6	12,9	12,5
$\overline{X} \pm SD$	10,43 ± 0,14	9,23 ± 0,22	13,35 ± 0,28	11,98 ± 0,51

LAMPIRAN D

HASIL UJI KERAPUHAN TABLET *FLOATING* METFORMIN HIDROKLORIDA

Formula	*Batch*	Berat awal (gram)	Berat akhir (gram)	Kerapuhan (%)	$\overline{X}$ ± SD
A	1	15,79	15,74	0,32	0,25 ± 0,06
	2	15,82	15,79	0,19	
	3	15,96	15,92	0,25	
B	1	16,20	16,16	0,25	0,37 ± 0,12
	2	16,15	16,09	0,37	
	3	16,18	16,10	0,49	
C	1	15,98	15,94	0,25	0,31 ± 0,11
	2	16,01	15,97	0,25	
	3	15,92	15,85	0,44	
D	1	16,15	16,10	0,31	0,25 ± 0,06
	2	16,10	16,06	0,25	
	3	16,20	16,22	0,19	

LAMPIRAN E

HASIL PENETAPAN KADAR TABLET *FLOATING* METFORMIN HIDROKLORIDA

Rep	W (mg)	Abs	observasi (µg/ml)	Teoritis (µg/ml)	Kadar (%)	$\overline{X}$ ±SD
A1	800,00	0,671	8,99	9,00	99,94	
A2	800,50	0,686	9,20	9,01	102,11	100,3±1,59
A3	800,20	0,665	8,91	9,00	99,02	
B1	800,60	0,676	9,06	9,01	100,61	
B2	800,00	0,659	8,83	9,00	98,15	99,27±1,24
B3	800,00	0,665	8,91	9,00	99,04	
C1	800,40	0,656	8,79	9,00	97,65	
C2	800,30	0,675	9,05	9,00	100,49	99,26±1,46
C3	800,10	0,669	8,97	9,00	99,63	
D1	800,40	0,672	9,01	9,00	100,03	
D2	799,90	0,684	9,17	9,00	101,88	101,57±1,40
D3	799,90	0,690	9,25	9,00	102,78	

LAMPIRAN F

HASIL UJI DISOLUSI TABLET *FLOATING* METFORMIN HIDROKLORIDA

Formula A

Batch	t (menit)	A	C Sampel (µg/ml)	Wt (mg)	% Obat terlepas	AUC
	0	0	0	0	0	0
	30	0,543	302,91	272,62	54,33	4089,30
	60	0,628	350,25	315,22	62,83	8817,67
	90	0,646	360,27	324,25	64,62	9592,08
	120	0,679	378,65	340,79	67,92	9975,52
	180	0,702	391,46	352,32	70,22	20793,11
I	240	0,718	400,37	360,34	71,82	21379,55
	300	0,745	415,41	373,87	74,51	22026,14
	360	0,704	392,58	353,32	70,42	21815,62
	420	0,758	422,65	380,39	75,81	22011,10
	480	0,771	429,89	386,90	77,11	23018,58
	540	0,762	424,88	382,39	76,21	23078,73
	600	0,769	428,78	385,90	76,91	23048,65
						209646,07
	0	0	0	0	0	0
	30	0,533	297,34	267,61	53,33	4014,12
	60	0,628	350,25	315,22	62,83	8742,49
	90	0,652	363,62	327,25	65,22	9637,19
	120	0,684	381,44	343,29	68,42	10058,22
	180	0,713	397,59	357,83	71,32	21033,70
II	240	0,726	404,83	364,35	72,61	21665,25
	300	0,722	402,60	362,34	72,22	21800,59
	360	0,738	411,51	370,36	73,81	21981,03
	420	0,761	424,32	381,89	76,11	22567,47
	480	0,754	420,42	378,38	75,41	22808,06
	540	0,758	422,65	380,39	75,81	22762,95
	600	0,767	427,66	384,90	76,71	22958,43
						210029,51

Batch	t (menit)	A	C Sampel (µg/ml)	Wt (mg)	% Obat terlepas	AUC
	0	0	0	0	0	0
	30	0,528	294,56	265,10	52,84	3976,52
	60	0,639	356,38	320,74	63,92	8787,60
	90	0,665	370,86	333,77	66,52	9817,63
	120	0,671	374,20	336,78	67,12	10058,22
	180	0,696	388,12	349,31	69,62	20582,59
III	240	0,686	382,55	344,30	68,62	20808,15
	300	0,735	409,84	368,86	73,51	21394,59
	360	0,740	412,63	371,36	74,01	22206,58
	420	0,744	414,85	373,37	74,41	22176,51
	480	0,749	417,64	375,87	74,91	22477,25
	540	0,778	433,79	390,41	77,81	22988,51
	600	0,774	431,56	388,40	77,41	23364,43
						208804,00

Formula B

Batch	t (menit)	A	C Sampel (µg/ml)	Wt (mg)	% Obat terlepas	AUC
	0	0	0	0	0	0
	30	0,533	89,20	80,28	16,18	1204,24
	60	0,861	144,00	129,60	26,11	3148,29
	90	0,519	173,73	156,35	31,50	4289,37
	120	0,624	208,81	187,93	37,86	5164,29
	180	0,789	263,95	237,55	47,86	12764,58
I	240	0,825	275,98	248,38	50,04	14578,03
	300	0,697	310,94	279,85	56,38	15846,85
	360	0,774	345,25	310,72	62,60	17717,15
	420	0,769	343,02	308,72	62,20	18583,28
	480	0,771	343,91	309,52	62,36	18547,19
	540	0,802	357,72	321,95	64,87	18944,17
	600	0,650	362,50	326,25	65,73	19446,10
						150233,53
	0	0	0	0	0	0
	30	0,446	74,67	67,20	13,54	1008,00
	60	0,790	132,14	118,93	23,96	2791,91
	90	0,516	172,72	155,45	31,32	4115,69
	120	0,619	207,14	186,43	37,56	5128,21
	180	0,775	259,27	233,34	47,01	12593,15
II	240	0,775	259,27	233,34	47,01	14000,61
	300	0,661	294,90	265,41	53,48	14962,68
	360	0,723	322,53	290,27	58,48	16670,58
	420	0,735	327,87	295,09	59,45	17560,77
	480	0,763	340,35	306,31	61,72	18041,95
	540	0,797	355,50	319,95	64,46	18787,78
	600	0,642	358,05	322,24	64,93	19265,66
						144926,99

Batch	t (menit)	A	C Sampel (µg/ml)	Wt (mg)	% Obat terlepas	AUC
	0	0	0	0	0	0
	30	0,546	91,37	82,24	16,57	1233,56
	60	0,834	139,49	125,54	25,29	3116,71
	90	0,540	180,74	162,67	32,77	4323,20
	120	0,625	209,15	188,23	37,93	5263,54
	180	0,745	249,25	224,32	45,20	12376,62
III	240	0,765	255,93	230,34	46,41	13639,73
	300	0,658	293,57	264,21	53,23	14836,37
	360	0,756	337,23	303,51	61,15	17031,46
	420	0,772	344,36	309,92	62,44	18402,84
	480	0,767	342,13	307,92	62,04	18535,16
	540	0,815	363,52	327,16	65,92	19052,43
	600	0,662	369,19	332,27	66,95	19782,93
						14759,54

Formula C

Batch	t (menit)	A	C Sampel (µg/ml)	Wt (mg)	% Obat terlepas	AUC
	0	0	0	0	0	0
	30	0,965	322,76	290,48	58,53	4357,26
	60	0,782	348,81	313,93	63,26	9066,24
	90	0,805	359,06	323,15	65,11	9556,29
	120	0,820	365,74	329,17	66,33	9784,85
	180	0,836	372,87	335,58	67,62	19942,62
I	240	0,880	392,48	353,23	71,17	20664,39
	300	0,854	380,89	342,80	69,07	20880,93
	360	0,662	369,19	332,27	66,95	20252,08
	420	0,696	388,12	349,31	70,38	20447,26
	480	0,703	392,02	352,82	71,09	21063,78
	540	0,716	399,26	359,33	72,40	21364,51
	600	0,718	400,37	360,34	72,61	21590,07
						198970,28
	0	0	0	0	0	0
	30	1,000	334,46	301,01	60,65	4515,15
	60	0,812	362,18	325,96	65,68	9404,57
	90	0,838	373,76	336,39	67,78	9935,22
	120	0,869	387,57	348,82	70,29	10278,06
	180	0,875	390,25	351,22	70,77	21001,22
II	240	0,825	367,97	331,17	66,73	20471,92
	300	0,821	366,19	329,57	66,41	19822,32
	360	0,684	381,44	343,29	69,17	20185,92
	420	0,704	392,58	353,32	71,19	20898,37
	480	0,695	387,56	348,81	70,28	21063,78
	540	0,713	397,59	357,83	72,10	21199,11
	600	0,728	405,94	365,35	73,62	21695,33
						200470,97

Batch	t (menit)	A	C Sampel (µg/ml)	Wt (mg)	% Obat terlepas	AUC
	0	0	0	0	0	0
	30	0,982	328,44	295,60	59,56	4433,95
	60	0,798	355,94	320,35	64,55	9239,16
	90	0,796	355,05	319,55	64,39	9598,39
	120	0,830	370,20	333,18	67,13	9790,87
	180	0,842	375,55	337,99	68,10	20135,09
III	240	0,849	378,66	340,80	68,67	20363,65
	300	0,854	380,89	342,80	69,07	20508,01
	360	0,707	394,25	354,82	71,50	20928,74
	420	0,701	390,91	351,81	70,89	21199,11
	480	0,704	392,58	353,32	71,19	21154,00
	540	0,710	395,92	356,33	71,80	21289,33
	600	0,734	409,28	368,36	74,22	21740,44
						200380,75

Formula D

Batch	t (menit)	A	C Sampel (µg/ml)	Wt (mg)	% Obat terlepas	AUC
	0	0	0	0	0	0
	30	0,739	123,62	111,26	21,91	1668,88
	60	0,618	172,34	155,11	30,54	3995,47
	90	0,799	222,74	200,47	39,48	5333,61
	120	0,888	247,53	222,77	43,87	6348,61
	180	0,952	265,35	238,81	47,03	13847,54
I	240	0,727	324,31	291,88	57,48	15920,68
	300	0,756	337,23	303,51	59,77	17861,50
	360	0,834	371,98	334,78	65,92	19148,67
	420	0,848	378,22	340,40	67,03	20255,39
	480	0,887	395,59	356,04	70,11	20892,96
	540	0,882	393,37	354,03	69,71	21301,96
	600	0,884	394,26	354,83	69,87	21265,87
						167841,14
	0	0	0	0	0	0
	30	0,633	105,91	95,32	18,77	1429,79
	60	0,605	168,72	151,85	29,90	3707,51
	90	0,756	210,77	189,69	37,35	5123,09
	120	0,872	243,07	218,76	43,08	6126,81
	180	0,941	262,28	236,06	46,48	13644,54
II	240	0,702	313,17	281,85	55,50	15537,24
	300	0,706	314,95	283,46	55,82	16959,29
	360	0,821	366,19	329,57	64,90	18390,81
	420	0,817	364,41	327,97	64,58	19726,09
	480	0,838	373,76	336,39	66,24	19930,59
	540	0,887	395,59	356,04	70,11	20772,66
	600	0,878	391,58	352,43	69,40	21253,84
						162602,26

Batch	t (menit)	A	C Sampel (µg/ml)	Wt (mg)	% Obat terlepas	AUC
	0	0	0	0	0	0
	30	0,749	125,29	112,76	22,20	1691,43
	60	0,634	176,80	159,12	31,33	4078,17
	90	0,789	219,96	197,96	38, 98	5356,17
	120	0,901	251,15	226,03	44,51	6359,88
	180	0,934	260,33	234,30	46,14	13809,95
III	240	0,745	332,33	299,10	58,90	16001,88
	300	0,734	327,43	294,68	58,03	17813,39
	360	0,839	374,21	336,79	66,32	18944,17
	420	0,842	375,55	337,99	66,56	20243,36
	480	0,857	382,23	344,01	67,74	20459,89
	540	0,869	387,57	348,82	68,69	20784,69
	600	0,870	388,02	349,22	68,77	20941,07
						166484,05

LAMPIRAN G

HASIL UJI DISOLUSI BERDASARKAN K DISOLUSI

Orde 0

Batch	Formula			
	FA	**FB**	**FC**	**FD**
1	**r:** 0,7587	**r:** 0,8549	**r:** 0,6162	**r:** 0,8701
	k: 0,1543	**k:** 0,3977	**k:** 0,1096	**k:** 0,4039
2	**r:** 0,7166	**r:** 0,8680	**r:** 0,5225	**r:** 0,8760
	k: 0,1504	**k:** 0,4008	**k:** 0,0895	**k:** 0,4083
3	**r:** 0,7688	**r:** 0,8991	**r:** 0,8349	**r:** 0,8534
	k: 0,1580	**k:** 0,4063	**k:** 0,0939	**k:** 0,3874
Rata-rata r ± SD	0,7480 ± 0,0277	0,8740 ± 0,0227	0,6579 ± 0,1604	0,8665 ± 0,0118
Rata-rata k ±SD	0,1542 ± 0,0038	0,4016 ± 0,0044	0,0977 ± 0,0105	0,3999 ± 0,0110

Orde 1

Batch	Formula			
	FA	**FB**	**FC**	**FD**
1	**r:** 0,8210	**r:** 0,9127	**r:** 0,6586	**r:** 0,9289
	k: 0,0010	**k:** 0,0015	**k:** 0,0006	**k:** 0,0017
2	**r:** 0,7967	**r:** 0,9355	**r:** 0,5539	**r:** 0,9401
	k: 0,0010	**k:** 0,0015	**k:** 0,0005	**k:** 0,0017
3	**r:** 0,8556	**r:** 0,9511	**r:** 0,8707	**r:** 0,9085
	k: 0,0010	**k:** 0,0016	**k:** 0,0006	**k:** 0,0016
Rata-rata r ± SD	0,8244 ± 0,0296	0,9331 ± 0,0193	0,6944 ± 0,1614	0,9259 ± 0,0160
Rata-rata k ±SD	0,0010 ± 0,0000	0,0015 ± 0,0000	0,0006 ± 0,0001	0,0017 ± 0,0000

Higuchi

Batch	Formula			
	FA	**FB**	**FC**	**FD**
1	**r:** 0,8633	**r:** 0,9475	**r:** 0,7061	**r:** 0,9552
	k: 5,0696	**k:** 12,8939	**k:** 3,6129	**k:** 13,0329
2	**r:** 0,8394	**r:** 0,9551	**r:** 0,5816	**r:** 0,9552
	k: 5,0120	**k:** 12,9466	**k:** 2,9091	**k:** 13,1487
3	**r:** 0,8610	**r:** 0,9702	**r:** 0,9114	**r:** 0,9423
	k: 5,1483	**k:** 12,9991	**k:** 3,0219	**k:** 12,5369
Rata-rata r ± SD	0,8546 ± 0,0132	0,9576 ± 0,0526	0,7330 ± 0,1666	0,9518 ± 0,0083
Rata-rata k ±SD	5,0766 ± 0,0684	12,9465 ± 0,0116	3,1813 ± 0,3780	12,9062 ± 0,3250

Hixon-Crowell

Batch	Formula			
	FA	**FB**	**FC**	**FD**
1	**r:** 0,8022	**r:** 0,8956	**r:** 0,6451	**r:** 0,9122
	k: 0,0010	**k:** 0,0019	**k:** 0,0007	**k:** 0,0020
2	**r:** 0,7714	**r:** 0,9156	**r:** 0,5437	**r:** 0,9223
	k: 0,0010	**k:** 0,0019	**k:** 0,0006	**k:** 0,0020
3	**r:** 0,8295	**r:** 0,9367	**r:** 0,8598	**r:** 0,8926
	k: 0,0011	**k:** 0,0020	**k:** 0,0006	**k:** 0,0019
Rata-rata r ± SD	0,8010 ± 0,0291	0,9160 ± 0,0206	0,6829 ± 0,1614	0,9091 ± 0,0151
Rata-rata k ±SD	0,0010 ± 0,0000	0,0019 ± 0,0000	0,0006 ± 0,0001	0,0020 ± 0,0001

Korsmeyer Peppas

Batch	Formula			
	FA	**FB**	**FC**	**FD**
1	**r:** 0,9318	**r:** 0,9663	**r:** 0,7512	**r:** 0,9757
	k: 0,3982	**k:** 0,0394	**k:** 0,4387	**k:** 0,0638
2	**r:** 0,9238	**r:** 0,9537	**r:** 0,6206	**r:** 0,9663
	k: 0,3956	**k:** 0,0315	**k:** 0,4869	**k:** 0,0532
3	**r:** 0,9118	**r:** 0,9777	**r:** 0,9532	**r:** 0,9690
	k: 0,3927	**k:** 0,0399	**k:** 0,4901	**k:** 0,0677
Rata-rata r ± SD	0,9225 ± 0,0101	0,9659 ± 0,0120	0,775 ± 0,1676	0,9703 ± 0,0004
Rata-rata k ±SD	0,3955 ± 0,0028	0,0369 ± 0,0005	0,4719 ± 0,0288	0,0616 ± 0,0008

Weibull

Batch	Formula			
	FA	**FB**	**FC**	**FD**
1	**r:** 0,9439	**r:** 0,9823	**r:** 0,7682	**r:** 0,9875
	k: 0,1952	**k:** 0,6029	**k:** 0,1386	**k:** 0,5451
2	**r:** 0,9502	**r:** 0,9766	**r:** 0,6293	**r:** 0,7166
	k: 0,1959	**k:** 0,6331	**k:** 0,1113	**k:** 0,5687
3	**r:** 0,9351	**r:** 0,9893	**r:** 0,9536	**r:** 0,9801
	k: 0,1977	**k:** 0,5983	**k:** 0,1139	**k:** 0,5259
Rata-rata r ± SD	0,9431 ± 0,0076	0,9827 ± 0,0063	0,7837 ± 0,1627	0,9840 ± 0,0214
Rata-rata k ±SD	0,1963 ± 0,0013	0,6114 ± 0,0189	0,1213 ± 0,0151	0,5466 ± 0,0037

LAMPIRAN H
CONTOH PERHITUNGAN

Contoh perhitungan indeks kompresibilitas:

Formula A :

Berat gelas = 126,88 g (W_1)

Berat gelas + serbuk = 181,85 g (W_2)

V_1 = 100 ml

V_2 = 83 ml

Bj nyata $= \frac{(W_2 - W_1)}{V_1} = \frac{(181{,}85-126{,}88)}{100} = 0{,}549$

Bj mampat $= \frac{(W_2 - W_1)}{V_2} = \frac{(181{,}85-126{,}88)}{83} = 0{,}662$

% kompresibilitas $= \left(1 - \frac{\text{Bj.nyata}}{\text{Bj.mampat}}\right) x100\% = 17{,}069\%$

Hausner Ratio $= \frac{bjmampat}{bjnyata} = 1{,}205$

Contoh perhitungan akurasi & presisi:

%	Bahan aktif (mg)	Matriks (mg)	Akuades ad	Pipet	Akuades ad	Konst (ppm)
100	500	300	100,0	0,045	25,0	9,0

Absorbansi = 0,682 → Y = 0,0746 -0,0001

Konsentrasi sebenarnya = 9,14 ppm

Konsentrasi teoritis = 9,01 ppm

% Perolehan Kembali = (konsentrasi sebenarnya / konsentrasi teoritis) x 100%

= (9,14/ 9,01) x 100%

= 101,45%

Untuk menghitung % KV = $\frac{SD}{\bar{X}} x100\%$

$=\frac{0,35}{101,13}$ X 100%

= 0,35 %

Contoh perhitungan % obat terlepas:

$$\% \text{ Obat Terlepas} = \frac{Wt}{\frac{PK}{100} \times dosis} \times 100\%$$

Formula A replikasi 1 pada t = 30 menit

$$\% \text{ Obat Terlepas} = \frac{272,62}{\frac{100,35}{100} X\ 500}$$

Contoh perhitungan AUC pada disolusi:

Rumus:

Formula A replikasi 1

Wtn-1 = 272,62

Wtn = 315,22

tn = 60 menit

tn-1 = 30 menit

AUC = $\frac{315,22 + 272,62}{2}$ X (60-30)

= 8817,67

Luas □ = 600 x penetapan kadar x dosis

= 60 x 100,35% x 500 mg

= 301050

% ED Formula A replikasi 1 = (∑ AUC / luas □) x 100%

= (209646,07/301050) x 100%

= 69,64%

LAMPIRAN I

HASIL UJI STATISTIK KERAGAMAN BOBOT TABLET ANTAR FORMULA

Anova: *One Way*

Descriptives

keseragaman bobot

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
a	3	100,3567	1,58668	,91601	96,4154	104,2979	99,02	102,11
b	3	99,2667	1,24557	,71913	96,1725	102,3608	98,15	100,61
c	3	99,2567	1,45634	,84082	95,6389	102,8744	97,65	100,49
d	3	101,5667	1,39661	,80634	98,0973	105,0361	100,04	102,78
Total	12	100,1117	1,57095	,45349	99,1135	101,1098	97,65	102,78

Test of Homogeneity of Variances

keseragaman bobot

Levene Statistic	df1	df2	Sig.
,097	3	8	,960

ANOVA

keseragaman bobot

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10,866	3	3,622	1,780	,229
Within Groups	16,280	8	2,035		
Total	27,147	11			

Multiple Comparisons

keseragaman bobot

LSD

(I) replikasi	(J) replikasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
a	b	1,09000	1,16477	,377	-1,5960	3,7760
	c	1,10000	1,16477	,373	-1,5860	3,7860
	d	-1,21000	1,16477	,329	-3,8960	1,4760
b	a	-1,09000	1,16477	,377	-3,7760	1,5960
	c	,01000	1,16477	,993	-2,6760	2,6960
	d	-2,30000	1,16477	,084	-4,9860	,3860
c	a	-1,10000	1,16477	,373	-3,7860	1,5860
	b	-,01000	1,16477	,993	-2,6960	2,6760
	d	-2,31000	1,16477	,083	-4,9960	,3760
d	a	1,21000	1,16477	,329	-1,4760	3,8960
	b	2,30000	1,16477	,084	-,3860	4,9860
	c	2,31000	1,16477	,083	-,3760	4,9960

LAMPIRAN J

HASIL UJI STATISTIK KEKERASAN TABLET ANTAR FORMULA

Anova: *One Way*

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
a	3	10,4000	,15716	,09074	10,0096	10,7904	10,23	10,54
b	3	9,2067	,08737	,05044	8,9896	9,4237	9,11	9,28
c	3	13,1767	,27465	,15857	12,4944	13,8589	12,86	13,35
d	3	11,7033	,35726	,20626	10,8159	12,5908	11,30	11,98
Total	12	11,1217	1,55852	,44991	10,1314	12,1119	9,11	13,35

Test of Homogeneity of Variances

kekerasan

Levene Statistic	df1	df2	Sig.
2,971	3	8	,097

ANOVA

Kekerasan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26,248	3	8,749	148,673	,000
Within Groups	,471	8	,059		
Total	26,719	11			

POST HOC TESTS **Multiple Comparisons**

(I) replikasi	(J) replikasi	Mean Difference (I-J)	Std, Error	Sig,	95% Confidence Interval	
					Lower Bound	Upper Bound
a	b	1,19333*	,19807	,000	,7366	1,6501
	c	-2,77667*	,19807	,000	-3,2334	-2,3199
	d	-1,30333*	,19807	,000	-1,7601	-,8466
b	a	-1,19333*	,19807	,000	-1,6501	-,7366
	c	-3,97000*	,19807	,000	-4,4268	-3,5132
	d	-2,49667*	,19807	,000	-2,9534	-2,0399
c	a	2,77667*	,19807	,000	2,3199	3,2334
	b	3,97000*	,19807	,000	3,5132	4,4268
	d	1,47333*	,19807	,000	1,0166	1,9301
d	a	1,30333*	,19807	,000	,8466	1,7601
	b	2,49667*	,19807	,000	2,0399	2,9534
	c	-1,47333*	,19807	,000	-1,9301	-1,0166

*, The mean difference is significant at the 0,05 level,

LAMPIRAN K

HASIL UJI STATISTIK KERAPUHAN TABLET ANTAR FORMULA

Anova: *One Way*

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
a	3	,2533	,06506	,03756	,0917	,4150	,19	,32
b	3	,3700	,12000	,06928	,0719	,6681	,25	,49
c	3	,3133	,10970	,06333	,0408	,5858	,25	,44
d	3	,2500	,06000	,03464	,1010	,3990	,19	,31
Total	12	,2967	,09423	,02720	,2368	,3565	,19	,49

Test of Homogeneity of Variances

Kerapuhan

Levene Statistic	df1	df2	Sig.
,753	3	8	,551

ANOVA

Kerapuhan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,029	3	,010	1,134	,392
Within Groups	,069	8	,009		
Total	,098	11			

POST HOC TESTS **Multiple Comparisons**

(I) replikasi	(J) replikasi	Mean Difference (I-J)	Std, Error	Sig,	95% Confidence Interval	
					Lower Bound	Upper Bound
a	b	-,11667	,07557	,161	-,2909	,0576
	c	-,06000	,07557	,450	-,2343	,1143
	d	,00333	,07557	,966	-,1709	,1776
b	a	,11667	,07557	,161	-,0576	,2909
	c	,05667	,07557	,475	-,1176	,2309
	d	,12000	,07557	,151	-,0543	,2943
c	a	,06000	,07557	,450	-,1143	,2343
	b	-,05667	,07557	,475	-,2309	,1176
	d	,06333	,07557	,426	-,1109	,2376
d	a	-,00333	,07557	,966	-,1776	,1709
	b	-,12000	,07557	,151	-,2943	,0543
	c	-,06333	,07557	,426	-,2376	,1109

LAMPIRAN L

HASIL UJI STATISTIK *FLOATING LAG TIME* TABLET ANTAR FORMULA

Anova*: One Way*

Descriptives

Floating lag time

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
a	3	3,7233	,09238	,05333	3,4939	3,9528	3,67	3,83
b	3	2,6667	,08505	,04910	2,4554	2,8779	2,58	2,75
c	3	3,2500	,08000	,04619	3,0513	3,4487	3,17	3,33
d	3	2,4433	,19630	,11333	1,9557	2,9310	2,33	2,67
Total	12	3,0206	,53396	,15414	2,6816	3,3601	2,33	3,83

Test of Homogeneity of Variances

Floatinglag

Levene Statistic	df1	df2	Sig.
2,626	3	8	,122

ANOVA

Floatinglag

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3,015	3	1,005	66,225	,000
Within Groups	,121	8	,015		
Total	3,136	11			

POST HOC TESTS **Multiple Comparisons**

(I) replikasi	(J) replikasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
a	b	1,05667*	,10058	,000	,8247	1,2886
	c	,47333*	,10058	,002	,2414	,7053
	d	1,28000*	,10058	,000	1,0481	1,5119
b	a	-1,05667*	,10058	,000	-1,2886	-,8247
	c	-,58333*	,10058	,000	-,8153	-,3514
	d	,22333	,10058	,057	-,0086	,4553
c	a	-,47333*	,10058	,002	-,7053	-,2414
	b	,58333*	,10058	,000	,3514	,8153
	d	,80667*	,10058	,000	,5747	1,0386
d	a	-1,28000*	,10058	,000	-1,5119	-1,0481
	b	-,22333	,10058	,057	-,4553	,0086
	c	-,80667*	,10058	,000	-1,0386	-,5747

*. The mean difference is significant at the 0,05 level.

LAMPIRAN M

HASIL UJI STATISTIK PENETAPAN KADAR TABLET ANTAR FORMULA

Anova: ***One Way***

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
a	3	100,3567	1,58658	,91601	96,4154	104,2979	99,02	102,11
b	3	99,2667	1,24557	,71913	96,1725	102,3608	98,15	100,61
c	3	99,2567	1,45634	,84082	95,6389	102,8744	97,65	100,49
d	3	101,5633	1,40208	,80949	98,0804	105,0463	100,03	102,78
Total	12	100,1108	1,57099	,45351	99,1127	101,1090	97,65	102,78

Test of Homogeneity of Variances

PK

Levene Statistic	df1	df2	Sig.
,096	3	8	,960

ANOVA

PK

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10,837	3	3,612	1,772	,230
Within Groups	16,311	8	2,039		
Total	27,148	11			

POST HOC TESTS

Multiple Comparisons

(I) replikasi	(J) replikasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
a	b	1,09000	1,16586	,377	-1,5985	3,7785
	c	1,10000	1,16586	,373	-1,5885	3,7885
	d	-1,20667	1,16586	,331	-3,8952	1,4818
b	a	-1,09000	1,16586	,377	-3,7785	1,5985
	c	,01000	1,16586	,993	-2,6785	2,6985
	d	-2,29667	1,16586	,084	-4,9852	,3918
c	a	-1,10000	1,16586	,373	-3,7885	1,5885
	b	-,01000	1,16586	,993	-2,6985	2,6785
	d	-2,30667	1,16586	,083	-4,9952	,3818
d	a	1,20667	1,16586	,331	-1,4818	3,8952
	b	2,29667	1,16586	,084	-,3918	4,9852
	c	2,30667	1,16586	,083	-,3818	4,9952

LAMPIRAN N

HASIL UJI STATISTIK PERSEN EFISIENSI DISOLUSI TABLET ANTAR FORMULA

Anova: ***One Way***

Descriptives

%efisiensiDisolusi

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
a	3	69,5900	,20952	,12097	69,0695	70,1105	69,36	69,77
b	3	49,5600	,89000	,51384	47,3491	51,7709	48,67	50,45
c	3	67,1433	,28042	,16190	66,4467	67,8399	66,82	67,32
d	3	54,3633	,88794	,51265	52,1576	56,5691	53,37	55,06
Total	12	60,1642	8,81304	2,54410	54,5646	65,7637	48,67	69,77

Test of Homogeneity of Variances

%efisiensiDisolusi

Levene Statistic	df1	df2	Sig.
1,949	3	8	,200

ANOVA

%efisiensiDisolusi

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	850,959	3	283,653	666,217	,000
Within Groups	3,406	8	,426		
Total	854,365	11			

POST HOC TESTS **Multiple Comparisons**

(I) replikasi	(J) replikasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
a	b	20,03000*	,53277	,000	18,8014	21,2586
	c	2,44667*	,53277	,002	1,2181	3,6752
	d	15,22667*	,53277	,000	13,9981	16,4552
b	a	-20,03000*	,53277	,000	-21,2586	-18,8014
	c	-17,58333*	,53277	,000	-18,8119	-16,3548
	d	-4,80333*	,53277	,000	-6,0319	-3,5748
c	a	-2,44667*	,53277	,002	-3,6752	-1,2181
	b	17,58333*	,53277	,000	16,3548	18,8119
	d	12,78000*	,53277	,000	11,5514	14,0086
d	a	-15,22667*	,53277	,000	-16,4552	-13,9981
	b	4,80333*	,53277	,000	3,5748	6,0319
	c	-12,78000*	,53277	,000	-14,0086	-11,5514

*, The mean difference is significant at the 0,05 level,

LAMPIRAN O

HASIL UJI STATISTIK KONSTANTA LAJU DISOLUSI TABLET ANTAR FORMULA

Anova: ***One Way***

Descriptives

KDisolusi

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
a	3	,154233	,0038004	,0021942	,144793	,163674	,1504	,1580
b	3	,401600	,0043555	,0025146	,390780	,412420	,3977	,4063
c	3	,097667	,0105661	,0061004	,071419	,123914	,0895	,1096
d	3	,399867	,0110183	,0063614	,372496	,427238	,3874	,4083
Total	12	,263342	,1451816	,0419103	,171098	,355586	,0895	,4083

Test of Homogeneity of Variances

KDisolusi

Levene Statistic	df1	df2	Sig.
2,600	3	8	,124

ANOVA

KDisolusi

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,231	3	,077	1157,506	,000
Within Groups	,001	8	,000		
Total	,232	11			

POST HOC TESTS **Multiple Comparisons**

(I) replikasi	(J) replikasi	Mean Difference (I-J)	Std, Error	Sig,	95% Confidence Interval	
					Lower Bound	Upper Bound
a	b	-,2473667*	,0066641	,000	-,262734	-,231999
	c	,0565667*	,0066641	,000	,041199	,071934
	d	-,2456333*	,0066641	,000	-,261001	-,230266
b	a	,2473667*	,0066641	,000	,231999	,262734
	c	,3039333*	,0066641	,000	,288566	,319301
	d	,0017333	,0066641	,801	-,013634	,017101
c	a	-,0565667*	,0066641	,000	-,071934	-,041199
	b	-,3039333*	,0066641	,000	-,319301	-,288566
	d	-,3022000*	,0066641	,000	-,317567	-,286833
d	a	,2456333*	,0066641	,000	,230266	,261001
	b	-,0017333	,0066641	,801	-,017101	,013634
	c	,3022000*	,0066641	,000	,286833	,317567

*, The mean difference is significant at the 0,05 level,

LAMPIRAN P

DESIGN SUMMARY DARI PROGRAM *DESIGN-EXPERT*

File Version 8.0.7.1

Study Type Factorial **Runs** 12

Design Type 2 Level Factorial **Blocks** No Blocks

Center Point 0

Design Mode 2FI **Build Time (n** 26.31

Factor	Name	Units	Type	Subtype	Minimum	Maximum	Coded	Values	Mean	Std. Dev.
A	Konst. HPMCK		Numeric	Continuous	-1.00	1.00	-1.000=-1.00	1.000=1.00	0.00	1.00
B	Konst. komp Et		Numeric	Continuous	-1.00	1.00	-1.000=-1.00	1.000=1.00	0.00	1.00

Response	Name	Units	Obs	Analysis	Minimum	Maximum	Mean	Std. Dev.	Ratio	Trans	Model
Y1	Kekerasan	Kp	12	Factorial	9.11	13.35	11.1217	1.55852	1.46542	None	2FI
Y2	Floating Lag	tit menit	12	Factorial	2.33	3.83	3.02083	0.533964	1.64378	None	2FI
Y3	K disolusi	mg/menit	12	Factorial	0.0695	0.4083	0.263342	0.145182	4.56201	None	2FI

LAMPIRAN Q

HASIL UJI ANAVA KEKERASAN TABLET DENGAN *DESIGN-EXPERT*

Response 1 Kekerasan

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	26,25	3	8,75	148,67	< 0,0001
significant					
A-Konst, HPMCK4M	*5,33*	*1*	*5,33*	*90,63*	*< 0,0001*
B-Konst, komp Eferfesen	*20,86*	*1*	*20,86*	*354,39*	*< 0,0001*
AB	*0,059*	*1*	*0,059*	*1,00*	*0,3468*
Pure Error	0,47	8	0,059		
Cor Total	26,72	11			

The Model F-value of 148,67 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 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,	0,24	R-Squared	0,9824
Mean	11,12	Adj R-Squared	0,9758
C,V, %	2,18	Pred R-Squared	0,9604
PRESS	1,06	Adeq Precision	28,345

The "Pred R-Squared" of 0,9604 is in reasonable agreement with the "Adj R-Squared" of 0,9758,

"Adeq Precision" measures the signal to noise ratio, A ratio greater than 4 is desirable, Your ratio of 28,345 indicates an adequate signal, This model can be used to navigate the design space,

Factor	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
Intercept	11,12	1	0,070	10,96	11,28	
A-Konst, HPMCK4M	-0,67	1	0,070	-0,83	-0,51	1,00
B-Konst, komp Eferfesen	1,32	1	0,070	1,16	1,48	1,00
AB	-0,070	1	0,070	-0,23	0,091	1,00

Final Equation in Terms of Coded Factors:

Kekerasan =
+11,12
-0,67 * A
+1,32 * B
-0,070 * A * B

Final Equation in Terms of Actual Factors:

Kekerasan =
+11,12167
-0,66667 * Konst, HPMCK4M
+1,31833 * Konst, komp Eferfesen
-0,070000 * Konst, HPMCK4M * Konst, komp Eferfesen
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 R

HASIL UJI ANAVA *FLOATING LAG TIME* TABLET DENGAN *DESIGN-EXPERT*

Response 2 Floating Lag time
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	3,01	3	1,00	66,22	< 0,0001
significant					
A-Konst, HPMCK4M	*2,60*	*1*	*2,60*	*171,60*	*< 0,0001*
B-Konst, komp Eferfesen	*0,36*	*1*	*0,36*	*23,99*	*0,0012*
AB0,047	*1*	*0,047*	*3,09*	*0,1169*	
Pure Error	0,12	8	0,015		
Cor Total	3,14	11			

The Model F-value of 66,22 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 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,	0,12	R-Squared	0,9613
Mean	3,02	Adj R-Squared	0,9468
C,V, %	4,08	Pred R-Squared	0,9129
PRESS	0,27	Adeq Precision	17,997

The "Pred R-Squared" of 0,9129 is in reasonable agreement with the "Adj R-Squared" of 0,9468,

"Adeq Precision" measures the signal to noise ratio, A ratio greater than 4 is desirable, Your ratio of 17,997 indicates an adequate signal, This model can be used to navigate the design space,

Factor	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
Intercept	3,02	1	0,036	2,94	3,10	
A-Konst, HPMCK4M	-0,47	1	0,036	-0,55	-0,38	1,00
B-Konst, komp Eferfesen	-0,17	1	0,036	-0,26	-0,092	1,00
AB	0,063	1	0,036	-0,020	0,14	1,00

Final Equation in Terms of Coded Factors:

Floating Lag time	=	
+3,02		
-0,47	* A	
-0,17	* B	
+0,063	* A * B	

Final Equation in Terms of Actual Factors:

Floating Lag time	=	
+3,02083		
-0,46583	* Konst, HPMCK4M	
-0,17417	* Konst, komp Eferfesen	
+0,062500	* Konst, HPMCK4M * Konst, komp Eferfesen	

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 S

HASIL UJI ANAVA KONSTANTA LAJU DISOLUSI TABLET DENGAN *DESIGN-EXPERT*

Response 3 Konstanta Laju Disolusi
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	0,23	3	0,077	1157,51	< 0,0001
significant					
A-Konst, HPMCK4M	*0,23*	*1*	*0,23*	*3400,40*	*< 0,0001*
B-Konst, komp Eferfesen	*2,549E-003*	*1*	*2,549E-003*	*38,27*	*0,0003*
AB	*2,255E-003*	*1*	*2,255E-003*	*33,85*	*0,0004*
Pure Error	5,329E-004	8	6,661E-005		
Cor Total	0,23	11			

The Model F-value of 1157,51 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,	8,162E-003	R-Squared	0,9977
Mean	0,26	Adj R-Squared	0,9968
C,V, %	3,10	Pred R-Squared	0,9948
PRESS	1,199E-003	Adeq Precision	64,499

The "Pred R-Squared" of 0,9948 is in reasonable agreement with the "Adj R-Squared" of 0,9968,

"Adeq Precision" measures the signal to noise ratio, A ratio greater than 4 is desirable, Your ratio of 64,499 indicates an adequate signal, This model can be used to navigate the design space,

Factor	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
Intercept	0,26	1	2,356E-003	0,26	0,27	
A-Konst, HPMCK4M	0,14	1	2,356E-003	0,13	0,14	1,00
B-Konst, komp Eferfesen	-0,015	1	2,356E-003	-0,020	-9,142E-003	1,00
AB	0,014	1	2,356E-003	8,275E-003	0,019	1,00

Final Equation in Terms of Coded Factors:

K disolusi =
+0,26
+0,14 * A
-0,015 * B
+0,014 * A * B

Final Equation in Terms of Actual Factors:

K disolusi =
+0,26334
+0,13739 * Konst, HPMCK4M
-0,014575 * Konst, komp Eferfesen
+0,013708 * Konst, HPMCK4M * Konst, komp Eferfesen

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 T

HASIL PERBANDINGAN ANTARA HASIL PERCOBAAN DAN HASIL TEORITIS

T-Test

[DataSet0]

Group Statistics

	hasil	N	Mean	Std. Deviation	Std. Error Mean
kekerasan	hasil percobaan	4	11.1200	1.70347	.85173
	hasil teoritis	4	11.1200	1.71122	.85561
floating time	hasil percobaan	4	3.0200	.57787	.28893
	hasil teoritis	4	3.0200	.58126	.29063
k disolusi	hasil percobaan	4	.263350	.1603253	.0801627
	hasil teoritis	4	.260000	.1633860	.0816925

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
kekerasan	Equal variances assumed	.000	.993	.000	6	1.000	.00000	1.20728	-2.95410	2.95410
	Equal variances not assumed			.000	6.000	1.000	.00000	1.20728	-2.95411	2.95411
floating time	Equal variances assumed	.001	.974	.000	6	1.000	.00000	.40982	-1.00279	1.00279
	Equal variances not assumed			.000	6.000	1.000	.00000	.40982	-1.00279	1.00279
k disolusi	Equal variances assumed	.025	.880	.029	6	.978	.0033500	.1144540	-.2767088	.2834088
	Equal variances not assumed			.029	5.998	.978	.0033500	.1144540	-.2767331	.2834331

LAMPIRAN U

HASIL UJI F KURVA BAKU

UJI KESAMAAN ANTAR SLOPE DALAM AKUADES

Kurva Baku 1

	X	y	x2	y2	xy
	2,982	0,164	8,892324	0,026896	0,489048
	5,964	0,490	35,5693	0,2401	2,92236
	8,946	0,711	80,03092	0,505521	6,360606
	11,928	0,901	142,2772	0,811801	10,74713
	14,910	1,071	222,3081	1,147041	15,96861
Σ	44,73	3,337	489,0778	2,731359	36,48775

Kurva Baku 2

	X	y	x2	y2	xy
	2,982	0,168	8,892324	0,028224	0,500976
	5,964	0,501	35,5693	0,251001	2,987964
	8,946	0,705	80,03092	0,497025	6,30693
	11,928	0,878	142,2772	0,770884	10,47278
	14,91	1,063	222,3081	1,129969	15,84933
Σ	44,73	3,315	489,0778	2,677103	36,11798

Kurva Baku 3

	X	y	x2	y2	xy
	2,976	0,168	8,856576	0,028224	0,499968
	5,952	0,512	35,4263	0,262144	3,047424
	8,928	0,707	79,70918	0,499849	6,312096
	11,904	0,860	141,7052	0,7396	10,23744
	14,88	1,052	221,4144	1,106704	15,65376
Σ	44,64	3,299	487,1117	2,636521	35,75069

Kurva Baku	Σx2	Σxy	Σy2	N	Residual SS	Residual DF
baku 1	489,0778	36,48775	2,731359	5	0,009183	3
baku 2	489,0778	36,11798	2,677103	5	0,00982	3
baku 3	487,1117	35,75069	2,636521	5	0,012663	3
Pooled regression					0,031666	9
common regression	1465,267	108,3564	8,044983		0,032032	

Fhitung = 0,0520 < Ftabel 0,05 (2:9) = 4,26

LAMPIRAN V

HASIL UJI F KURVA BAKU

UJI KESAMAAN ANTAR SLOPE DALAM HCl 0,1N

Kurva Baku 1

	X	y	x2	y2	xy
	12,096	0,250	146,3132	0,0625	3,024
	24,192	0,442	585,2529	0,195364	10,69286
	36,288	0,645	1316,819	0,416025	23,40576
	48,384	0,852	2341,011	0,725904	41,22317
	60,48	1,093	3657,83	1,194649	66,10464
Σ	181,44	3,282	8047,227	2,594442	144,4504

Kurva Baku 2

	X	y	x2	y2	xy
	12,168	0,248	148,0602	0,061504	3,017664
	24,336	0,43	592,2409	0,1849	10,46448
	36,504	0,648	1332,542	0,419904	23,65459
	48,672	0,86	2368,964	0,7396	41,85792
	60,84	1,092	3701,506	1,192464	66,43728
Σ	182,52	3,278	8143,312	2,598372	145,4319

Kurva Baku 3

	X	y	x2	y2	xy
	12,024	0,227	144,5766	0,051529	2,729448
	24,048	0,428	578,3063	0,183184	10,29254
	36,072	0,636	1301,189	0,404496	22,94179
	48,096	0,845	2313,225	0,714025	40,64112
	60,12	1,098	3614,414	1,205604	66,01176
Σ	180,36	3,234	7951,712	2,558838	142,6167

Kurva Baku	Σx2	Σxy	Σy2	N	Residual SS	Residual DF
baku 1	8047,227	144,4504	2,594442	5	0,001509	3
baku 2	8143,312	145,4319	2,598372	5	0,001095	3
baku 3	7951,712	142,6167	2,558838	5	0,000958	3
pooled regression					0,003562	9
common regression	24142,25	432,499	7,7516		0,003601	

Fhitung = 0,049031 < Ftabel 0,05 (2:9) = 4,26

LAMPIRAN W

TABEL F

TABEL DISTRIBUSI F UNTUK 5% DAN 1%

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

V_2 = dk penyebut	V_1 = 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
	4052	4999	5403	5625	5764	5859	5928	5961	6022	6056	6082	6106	6142	61,69	6208	6234	6258	6286	6302	6323	6334	6352	6361	6366
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
	98,49	99,01	99,17	99,25	99,30	99,33	99,34	99,36	97,38	99,40	99,41	99,42	99,43	99,44	99,45	99,46	99,47	99,48	99,48	99,49	99,49	99,49	99,50	99,50
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
	34,12	30,81	29,46	28,71	28,24	27,91	27,67	27,49	27,34	27,23	27,13	27,05	26,92	26,83	26,69	26,60	26,50	26,41	26,30	26,27	26,23	26,18	26,14	26,12
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	5,53
	21,20	18,00	16,69	15,98	15,52	15,21	14,98	14,80	14,66	14,54	14,45	14,37	14,24	14,15	14,02	13,93	13,83	13,74	13,69	13,61	13,57	13,52	13,48	13,46
5	6,61	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
	16,26	13,27	12,06	11,39	10,97	10,67	10,45	10,27	10,15	10,05	9,96	9,89	9,77	9,68	9,55	9,47	9,38	9,29	9,24	9,17	9,13	9,07	9,04	9,02
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
	13,74	10,92	9,78	9,15	8,75	8,47	8,26	8,10	7,98	7,87	7,79	7,72	7,60	7,52	7,39	7,31	7,23	7,14	7,09	7,02	6,99	6,94	6,90	6,88
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
	12,25	9,55	8,45	7,85	7,46	7,19	7,00	6,84	6,71	6,62	6,54	6,47	6,35	6,27	6,15	6,07	5,98	5,90	5,85	5,78	5,75	5,70	5,67	5,65
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
	11,26	8,65	7,59	7,01	6,63	6,37	6,19	6,03	5,91	5,82	5,74	5,67	5,56	5,48	5,36	5,28	5,20	5,11	5,06	5,00	4,96	4,91	4,88	4,86
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_2 = dk penyebut	V_1 = 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
	10,04	7,56	6,55	5,99	5,64	5,39	5,21	5,06	4,95	4,85	4,78	4,71	4,60	4,52	4,41	4,33	4,25	4,17	4,12	4,05	4,01	3,96	3,93	3,91
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
	9,65	7,20	6,22	5,67	5,32	5,07	4,88	4,74	4,63	4,54	4,46	4,40	4,29	4,21	4,10	4,02	3,94	3,86	3,80	3,74	3,70	3,66	3,62	3,60
12	4,75	3,88	3,49	3,26	3,11	3,00	2,92	2,85	2,80	2,76	2,72	2,69	2,64	2,60	2,54	2,50	2,46	2,42	2,40	2,36	2,35	2,32	2,31	2,30
	9,33	6,93	5,95	5,41	5,06	4,82	4,65	4,50	4,39	4,30	4,22	4,16	4,05	3,98	3,86	3,78	3,70	3,61	3,56	3,49	3,46	3,41	3,38	3,36
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
	9,07	6,70	5,74	5,20	4,86	4,62	4,44	4,30	4,19	4,10	4,02	3,96	3,85	3,78	3,67	3,59	3,51	3,42	3,37	3,30	3,27	3,21	3,18	3,16
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
	8,86	6,51	5,56	5,03	4,69	4,46	4,28	4,14	4,03	3,94	3,86	3,80	3,70	3,62	3,51	3,43	3,34	3,26	3,21	3,14	3,11	3,06	3,02	3,00
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
	8,68	6,36	5,42	4,89	4,56	4,32	4,14	4,00	3,89	3,80	3,73	3,67	3,56	3,48	3,36	3,29	3,20	3,12	3,07	3,00	2,97	2,92	2,89	2,87
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
	8,53	6,23	5,29	4,77	4,44	4,20	4,03	3,89	3,78	3,69	3,61	3,55	3,45	3,37	3,25	3,18	3,10	3,01	2,96	2,89	2,86	2,80	2,77	2,75
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
	8,40	6,11	5,18	4,67	4,34	4,10	3,93	3,79	3,68	3,59	3,52	3,45	3,35	3,27	3,16	3,08	3,00	2,92	2,86	2,79	2,76	2,70	2,67	2,65
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	1,95	1,93	1,92
	8,28	6,01	5,09	4,58	4,25	4,01	3,85	3,71	3,60	3,51	3,44	3,37	3,27	3,19	3,07	3,00	2,91	2,83	2,78	2,71	2,68	2,62	2,59	2,57
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	1,90	1,88
	8,18	5,93	5,01	4,50	4,17	3,94	3,77	3,63	3,52	3,43	3,36	3,30	3,19	3,12	3,00	2,92	2,84	2,76	2,70	2,63	2,60	2,54	2,51	2,49
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
	8,10	5,85	4,94	4,43	4,10	3,87	3,71	3,56	3,45	3,37	3,30	3,23	3,13	3,05	2,94	2,86	2,77	2,69	2,63	2,56	2,53	2,47	2,44	2,42
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
	8,02	5,78	4,87	4,37	4,04	3,81	3,65	3,51	3,40	3,31	3,24	3,17	3,07	2,99	2,88	2,80	2,72	2,63	2,58	2,51	2,47	2,42	2,38	2,36
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	1,78
	7,94	5,72	4,82	4,31	3,99	3,76	3,59	3,45	3,35	3,26	3,18	3,12	3,02	2,94	2,83	2,75	2,67	2,58	2,53	2,46	2,42	2,37	2,33	2,31
23	4,28	3,42	3,03	2,80	2,64	2,53	2,45	2,38	2,32	2,28	2,24	2,20	2,14	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

LAMPIRAN X

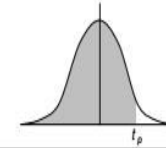
TABEL UJI R

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

LAMPIRAN Y

TABEL UJI T

Sebaran t-Student



Nilai persentil untuk distribusi t
v = dk
(Bilangan dalam badan tabel menyatakan tp)

v	t												
	0.9995	0.995	0.99	0.975	0.95	0.9	0.8	0.75	0.7	0.75	0.6	0.55	0.5
1	636.619	63.657	31.821	12.706	6.314	3.078	1.376	1.000	0.727	1.000	0.325	0.158	0.000
2	31.599	9.925	6.965	4.303	2.920	1.886	1.061	0.816	0.617	0.816	0.289	0.142	0.000
3	12.924	5.841	4.541	3.182	2.353	1.638	0.978	0.765	0.584	0.765	0.277	0.137	0.000
4	8.610	4.604	3.747	2.776	2.132	1.533	0.941	0.741	0.569	0.741	0.271	0.134	0.000
5	6.869	4.032	3.365	2.571	2.015	1.476	0.920	0.727	0.559	0.727	0.267	0.132	0.000
6	5.959	3.707	3.143	2.447	1.943	1.440	0.906	0.718	0.553	0.718	0.265	0.131	0.000
7	5.408	3.499	2.998	2.365	1.895	1.415	0.896	0.711	0.549	0.711	0.263	0.130	0.000
8	5.041	3.355	2.896	2.306	1.860	1.397	0.889	0.706	0.546	0.706	0.262	0.130	0.000
9	4.781	3.250	2.821	2.262	1.833	1.383	0.883	0.703	0.543	0.703	0.261	0.129	0.000
10	4.587	3.169	2.764	2.228	1.812	1.372	0.879	0.700	0.542	0.700	0.260	0.129	0.000
11	4.437	3.106	2.718	2.201	1.796	1.363	0.876	0.697	0.540	0.697	0.260	0.129	0.000
12	4.318	3.055	2.681	2.179	1.782	1.356	0.873	0.695	0.539	0.695	0.259	0.128	0.000
13	4.221	3.012	2.650	2.160	1.771	1.350	0.870	0.694	0.538	0.694	0.259	0.128	0.000
14	4.140	2.977	2.624	2.145	1.761	1.345	0.868	0.692	0.537	0.692	0.258	0.128	0.000
15	4.073	2.947	2.602	2.131	1.753	1.341	0.866	0.691	0.536	0.691	0.258	0.128	0.000
16	4.015	2.921	2.583	2.120	1.746	1.337	0.865	0.690	0.535	0.690	0.258	0.128	0.000
17	3.965	2.898	2.567	2.110	1.740	1.333	0.863	0.689	0.534	0.689	0.257	0.128	0.000
18	3.922	2.878	2.552	2.101	1.734	1.330	0.862	0.688	0.534	0.688	0.257	0.127	0.000
19	3.883	2.861	2.539	2.093	1.729	1.328	0.861	0.688	0.533	0.688	0.257	0.127	0.000
20	3.850	2.845	2.528	2.086	1.725	1.325	0.860	0.687	0.533	0.687	0.257	0.127	0.000
21	3.819	2.831	2.518	2.080	1.721	1.323	0.859	0.686	0.532	0.686	0.257	0.127	0.000
22	3.792	2.819	2.508	2.074	1.717	1.321	0.858	0.686	0.532	0.686	0.256	0.127	0.000
23	3.768	2.807	2.500	2.069	1.714	1.319	0.858	0.685	0.532	0.685	0.256	0.127	0.000
24	3.745	2.797	2.492	2.064	1.711	1.318	0.857	0.685	0.531	0.685	0.256	0.127	0.000
25	3.725	2.787	2.485	2.060	1.708	1.316	0.856	0.684	0.531	0.684	0.256	0.127	0.000
26	3.707	2.779	2.479	2.056	1.706	1.315	0.856	0.684	0.531	0.684	0.256	0.127	0.000
27	3.690	2.771	2.473	2.052	1.703	1.314	0.855	0.684	0.531	0.684	0.256	0.127	0.000
28	3.674	2.763	2.467	2.048	1.701	1.313	0.855	0.683	0.530	0.683	0.256	0.127	0.000
29	3.659	2.756	2.462	2.045	1.699	1.311	0.854	0.683	0.530	0.683	0.256	0.127	0.000
30	3.646	2.750	2.457	2.042	1.697	1.310	0.854	0.683	0.530	0.683	0.256	0.127	0.000
40	3.551	2.704	2.423	2.021	1.684	1.303	0.851	0.681	0.529	0.681	0.255	0.126	0.000
60	3.460	2.660	2.390	2.000	1.671	1.296	0.848	0.679	0.527	0.679	0.254	0.126	0.000
120	3.373	2.617	2.358	1.980	1.658	1.289	0.845	0.677	0.526	0.677	0.254	0.126	0.000
∞	2.581	2.330	1.962	1.646	1.282	1.282	1.282	1.282	0.842	0.675	0.525	0.253	0.126

LAMPIRAN Z

SERTIFIKAT BAHAN

HPMC K4M

J. RETTENMAIER & SÖHNE GMBH + CO KG

JRS

Fasern aus der Natur
Fibers designed by Nature

Original

CERTIFICATE OF ANALYSIS

Product:	VIVAPUR
Type:	HPMC K 4M
Item number:	HPMC-K4M-06204
Lot number:	10260-12
Manufacturing date:	January 2012
Shelf life:	at least 36 month from manufacturing date

Test item	Specification	Test-result	Test method
pH-value	5.0 -8.0	7.03	DZE-102
Moisture	max. 5 %	4.58 %	DZE-100
Sulphate ash	max. 1.5 %	0.94 %	DZE-114
Methoxy Content	19 % – 24 %	22.78 %	DZE-110
Hydroxypropoxy Content	4 % – 12 %	6.8 %	DZE-110
Viscosity Brookfield Sol. of 2 % dry basis	3.000 mPas – 5.600 mPas	3.990 mPas	DZE-106

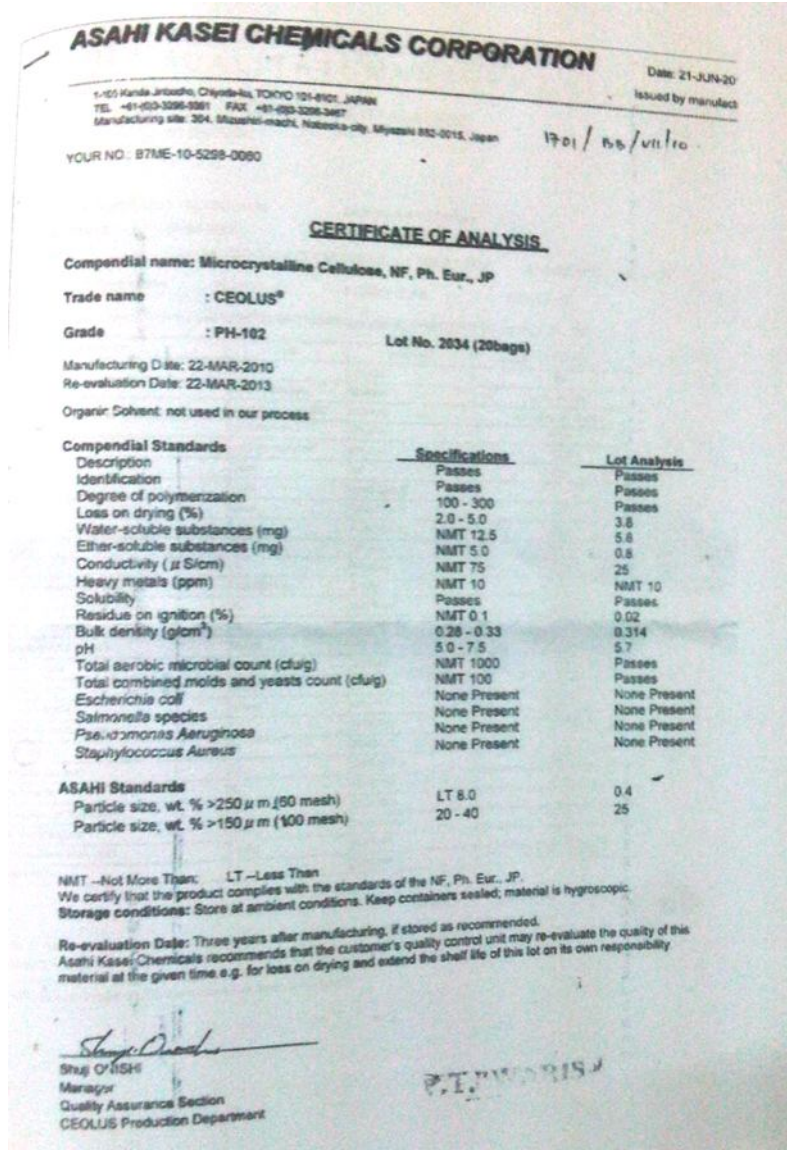
Microbiological analysis

Total plate count	max. 1×10^3 cfu/g	< 1×10^3 cfu/g	NOM-113-SSA1-1994
Yeasts	max. 1×10^2 cfu/g	< 1×10^2 cfu/g	NOM-113-SSA1-1994
Moulds	max. 1×10^2 cfu/g	< 1×10^2 cfu/g	NOM-113-SSA1-1994

Holzmühle, 2012-11-20

Elke Voss
QUALITY CONTROL

Avicel PH 102



ASAHI KASEI CHEMICALS CORPORATION

Date: 21-JUN-20
Issued by manufact

1-105 Kanda Jinbocho, Chiyoda-ku, TOKYO 101-8101, JAPAN
TEL +81-(0)3-3296-3961 FAX +81-(0)3-3296-3467
Manufacturing site: 304, Mizushiri-machi, Nobeoka-city, Miyazaki 882-0015, Japan

1701 / 88 / VIII/10

YOUR NO.: B7ME-10-5298-0080

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

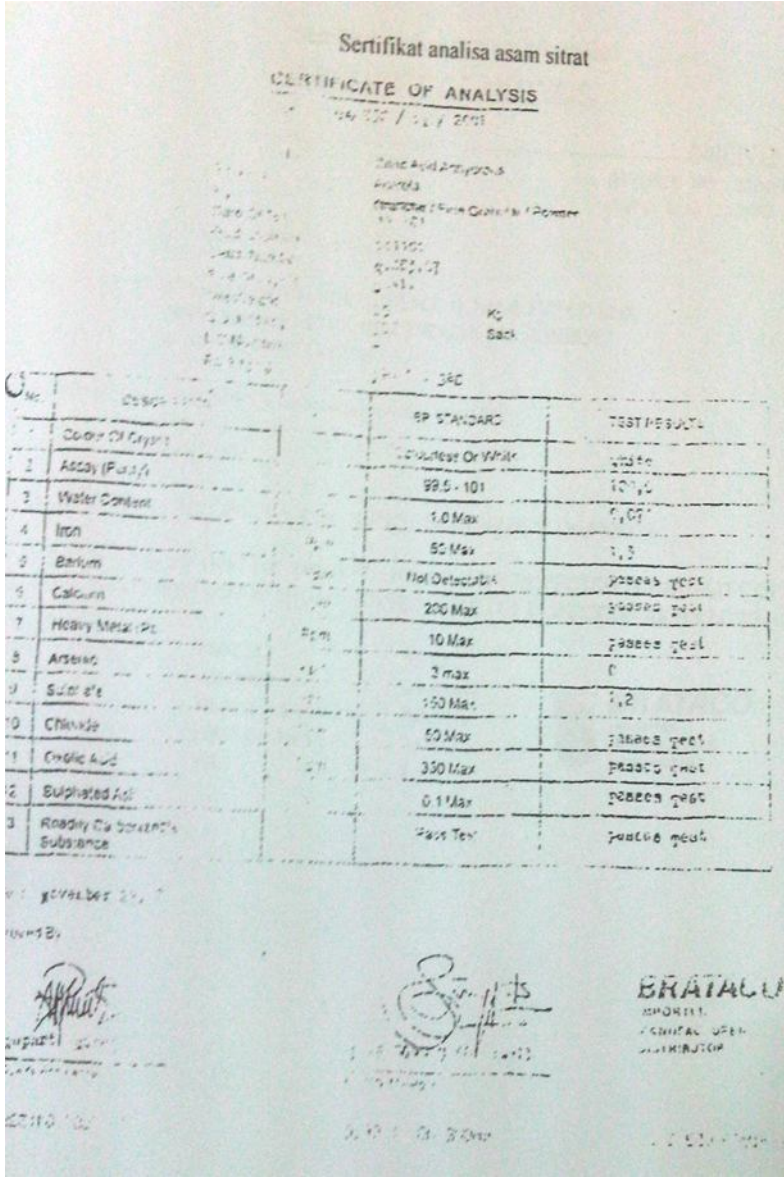
Compendial Standards	Specifications	Lot Analysis
Description	Passes	Passes
Identification	Passes	Passes
Degree of polymerization	100 - 300	Passes
Loss on drying (%)	2.0 - 5.0	3.8
Water-soluble substances (mg)	NMT 12.5	5.6
Ether-soluble substances (mg)	NMT 5.0	0.8
Conductivity (μ S/cm)	NMT 75	25
Heavy 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
Escherichia coli	None Present	None Present
Salmonella species	None Present	None Present
Pseudomonas Aeruginosa	None Present	None Present
Staphylococcus Aureus	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 OHSHI
Manager
Quality Assurance Section
CEOLUS Production Department

Asam Sitrat

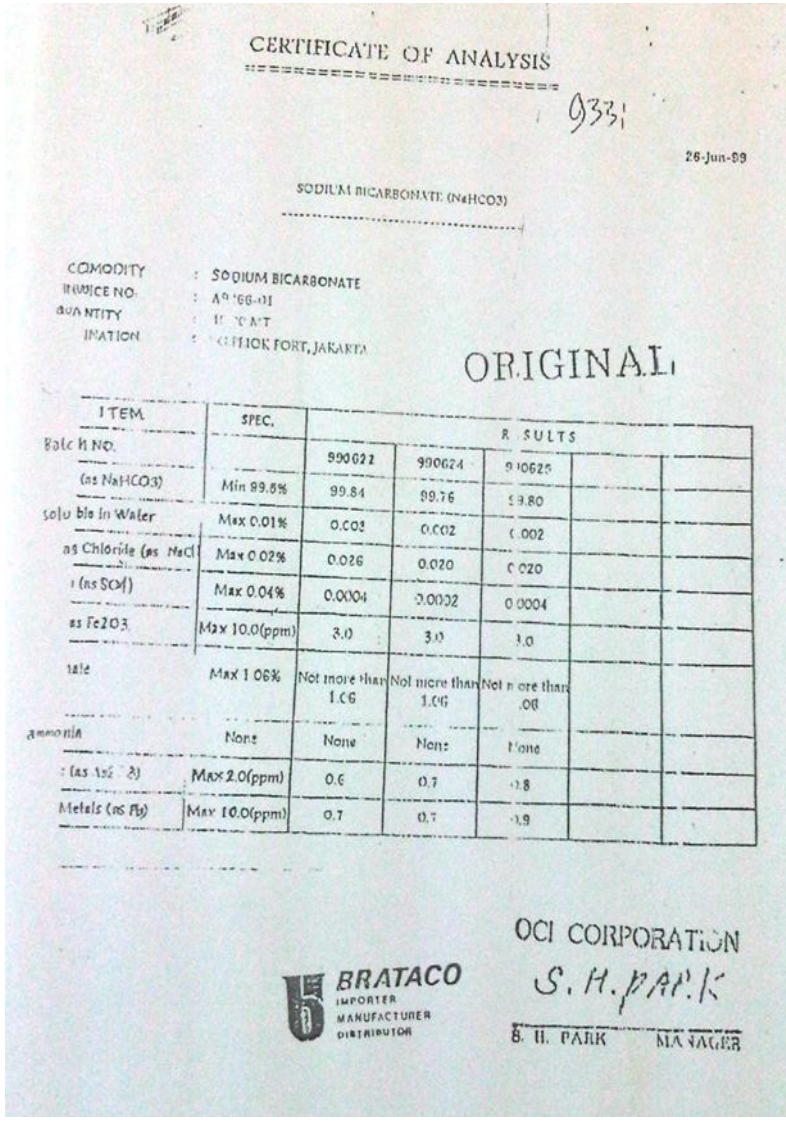


Sertifikat analisa asam sitrat

CERTIFICATE OF ANALYSIS

		SP STANDARD	TEST RESULTS
1	Assay (Purity)	99.5 - 101	100,0
3	Water Content	1.0 Max	0,01
4	Iron	5% Max	1,3
5	Barium	Not Detectable	passes test
6	Calcium	200 Max	passes test
7	Heavy Metal (Pb)	10 Max	passes test
8	Arsenic	3 max	0
9	Sulfate	150 Max	1,2
10	Chloride	50 Max	passes test
11	Oxalic Acid	350 Max	passes test
12	Sulphated Ash	0.1 Max	passes test
13	Readily Carbonized Substance	Pass Test	passes test

Natrium Bikarbonat



CERTIFICATE OF ANALYSIS

9331

26-Jun-99

SODIUM BICARBONATE (NaHCO3)

COMODITY : SODIUM BICARBONATE
INVOICE NO. : AP'66-01
QUANTITY : [illegible] MT
DESTINATION : CILINCING PORT, JAKARTA

ORIGINAL

ITEM	SPEC.	RESULTS				
Batch NO.		990622	990624	990625		
(as NaHCO3)	Min 99.5%	99.84	99.76	99.80		
soluble in Water	Max 0.01%	0.005	0.002	0.002		
as Chloride (as NaCl	Max 0.02%	0.026	0.020	0.020		
(as SO4)	Max 0.04%	0.0004	0.0002	0.0004		
as Fe2O3	Max 10.0(ppm)	3.0	3.0	3.0		
tate	Max 1.06%	Not more than 1.06	Not more than 1.06	Not more than .06		
ammonia	None	None	None	None		
(as NaCO3)	Max 2.0(ppm)	0.6	0.7	0.8		
Metals (as Pb)	Max 10.0(ppm)	0.7	0.7	0.9		

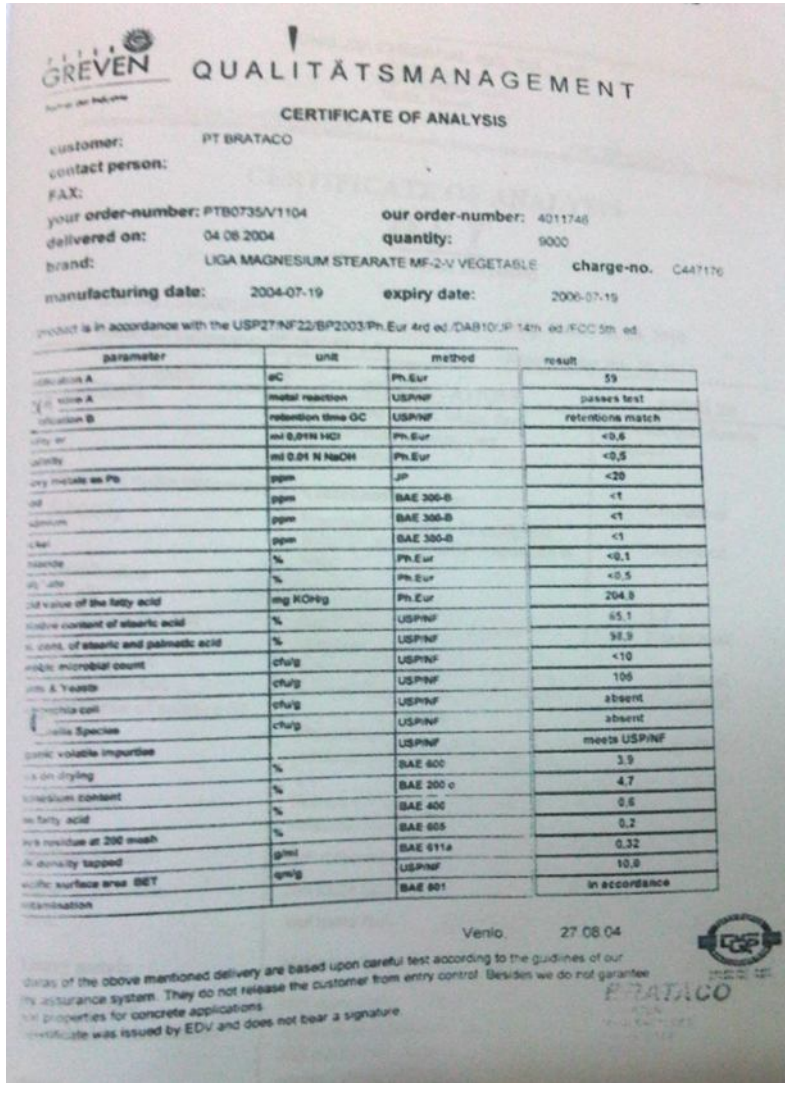
OCI CORPORATION

S. H. PARK

S. H. PARK MANAGER

BRATACO
IMPORTER
MANUFACTURER
DISTRIBUTOR

Magnesium Stearat



GREVEN

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	oC	Ph.Eur	59
identification A	metal reaction	USP/NF	passes test
identification B	retention time GC	USP/NF	retentions match
acidity	ml 0,01N HCl	Ph.Eur	<0,6
alkalinity	ml 0.01 N NaOH	Ph.Eur	<0,5
heavy metals as Pb	ppm	JP	<20
iron	ppm	BAE 300-B	<1
cadmium	ppm	BAE 300-B	<1
nickel	ppm	BAE 300-B	<1
chloride	%	Ph.Eur	<0,1
sulphate	%	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 palmatic acid	%	USP/NF	98,9
aerobic microbial count	cfu/g	USP/NF	<10
Molds & Yeasts	cfu/g	USP/NF	100
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 c	4,7
free fatty acid	%	BAE 400	0,6
sieve 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 801	in accordance

Venlo, 27.08.04

data of the above mentioned delivery are based upon careful test according to the guidlines of our ity assurance system. They do not release the customer from entry control. Besides we do not garantee ical properties for concrete applications.
certificate was issued by EDV and does not bear a signature.

P.T. BRATACO