

LAMPIRAN A

HASIL UJI MUTU FISIK GRANUL PEMBAWA

SUDUT DIAM

Pengujian	Formula 1	Formula 2	Formula 3	Formula 4
Replikasi 1	32,15	32,90	32,56	32,55
Replikasi 2	32,01	33,08	31,82	32,81
Replikasi 3	31,58	32,36	32,42	32,36
Rata-rata ± SD	31,91 ± 0,29	32,67 ± 0,37	32,26 ± 0,39	32,57 ± 0,23

CARR'S INDEX

Pengujian	Formula 1	Formula 2	Formula 3	Formula 4
Replikasi 1	15,07	15,73	14,01	16,90
Replikasi 2	15,96	15,99	15,99	15,89
Replikasi 3	15,95	14,98	16,99	16,90
Rata-rata ± SD	15,66 ± 0,51	15,57 ± 0,52	15,66 ± 1,51	16,56 ± 0,58

HAUSNER RATIO

Pengujian	Formula 1	Formula 2	Formula 3	Formula 4
Replikasi 1	1,17	1,20	1,17	1,20
Replikasi 2	1,18	1,19	1,19	1,18
Replikasi 3	1,18	1,16	1,20	1,20
Rata-rata ± SD	1,17 ± 0,01	1,18 ± 0,02	1,18 ± 0,01	1,19 ± 0,01

UKURAN PARTIKEL

Pengujian	Formula 1	Formula 2	Formula 3	Formula 4
Replikasi 1	393,25	295,05	337,3	299,05
Replikasi 2	383,37	276,57	387,57	380,57
Replikasi 3	323,73	264,93	360,92	287,93
Rata-rata ±	366,78 ±	278,85 ±	328,59 ±	322,73 ±
SD	37,61	15,19	37,44	50,43

UKURAN PARTIKEL FORMULA A REPLIKASI 1

Nomor ayakan	Diameter (µm)	Berat tertinggal (gram)	% berat	FKA	FKB	Z	dg (µm)	σ _g
20	850	6,71	13,46	13,46	86,57	1,1	dg _{50%}	2,04
40	425	17,38	34,86	48,32	51,68	0,04	=	
60	250	11,61	23,29	71,61	28,39	-0,57	393,25	
80	180	7,36	14,76	86,37	13,63	-1,10		
100	150	2,24	4,49	90,86	9,14	-1,13	dg _{84%}	
120	125	2,05	4,11	94,97	5,03	-1,64	=	
Pan	0	2,51	5,03	100	0	-3,31	802,37	

REPLIKASI 2

Nomor ayakan	Diameter (µm)	Berat tertinggal (gram)	% berat	FKA	FKB	Z	dg (µm)	σ _g
20	850	6,43	12,88	12,89	87,11	1,13	dg _{50%}	2,01
40	425	16,16	32,38	45,27	54,73	0,11	=	
60	250	12,25	24,55	69,82	30,18	-0,52	383,37	
80	180	8,03	16,09	85,91	14,09	-1,08		
100	150	2,40	4,81	90,72	9,28	-1,33	dg _{84%}	
120	125	2,25	4,51	95,23	4,77	-1,67	= 770,0	
Pan	0	2,38	4,77	100	0	-3,31		

REPLIKASI 3

Nomor ayakan	Diameter (μm)	Berat tertinggal (gram)	% berat	FKA	FKB	Z	dg (μm)	σ_g
20	850	1,18	2,37	2,37	97,63	1,98	dg _{50%}	
40	425	22,29	44,73	47,1	52,9	0,07	=	
60	250	12,09	24,26	71,36	28,64	-0,57	323,73	
80	180	6,76	13,57	84,93	15,07	-1,04		1,77
100	150	2,15	4,32	89,25	10,75	-1,24	dg _{84%}	
120	125	2,11	4,23	93,48	6,52	-1,52	=	
Pan	0	3,25	6,52	100	0	-3,31	574,04	

Rata-rata \pm SD = 366,78 \pm 37,61

UKURAN PARTIKEL FORMULA B REPLIKASI 1

Nomor ayakan	Diameter (μm)	Berat tertinggal (gram)	% berat	FKA	FKB	Z	dg (μm)	σ_g
20	850	1,23	2,46	2,46	97,54	1,96		
40	425	19,06	38,2	40,66	59,34	0,23	dg _{50%} =	
60	250	11,21	22,47	63,13	36,87	-0,34	278,85	
80	180	7,70	15,43	78,56	21,44	-0,80		1,86
100	150	2,75	5,51	84,07	15,93	-1,00	dg _{84%} =	
120	125	3,12	6,25	90,32	9,68	-1,30	547,25	
Pan	0	4,83	9,68	100	0	-3,31		

REPLIKASI 2

Nomor ayakan	Diameter (µm)	Berat tertinggal (gram)	% berat	FKA	FKB	Z	dg (µm)	σ _g
20	850	0,67	1,34	1,34	98,66	2,21		
40	425	15,21	30,35	31,69	68,31	0,47	dg _{50%} =	
60	250	13,05	26,04	57,73	42,27	-0,20	276,57	
80	180	10,00	19,96	77,69	22,31	-0,77		1,75
100	150	3,56	7,10	84,79	15,21	-1,03	dg _{84%} =	
120	125	3,31	6,61	91,40	8,60	-1,37	482,51	
Pan	0	4,31	8,60	100	0	-3,31		

REPLIKASI 3

Nomor ayakan	Diameter (µm)	Berat tertinggal (gram)	% berat	FKA	FKB	Z	dg (µm)	σ _g
20	850	0,88	1,76	1,76	98,24	2,01		
40	425	15,96	31,96	33,72	66,28	0,42	dg _{50%} =	
60	250	11,16	22,35	56,07	43,93	-0,16	264,93	
80	180	9,51	19,04	75,11	24,89	-0,68		1,8
100	150	3,69	7,39	82,50	17,50	-0,94	dg _{84%} =	9
120	125	3,86	7,73	90,23	9,77	-1,30	497,73	
Pan	0	4,88	9,77	100	0	-3,31		

Rata-rata ± SD = 278,85 ± 15,19

**UKURAN PARTIKEL FORMULA C
REPLIKASI 1**

Nomor ayakan	Diameter (µm)	Berat tertinggal (gram)	% berat	FKA	FKB	Z	dg (µm)	σ _g
20	850	2,06	4,14	4,14	95,86	1,73	dg _{50%}	1,87
40	425	23,74	47,68	51,82	48,18	0,05	=	
60	250	10,61	21,30	73,12	26,88	-0,62	337,30	
80	180	5,77	11,59	87,41	15,29	-1,03		
100	150	1,89	3,80	88,51	11,49	-1,21	dg _{84%}	
120	125	1,96	3,94	92,45	7,55	-1,44	=	
Pan	0	3,76	7,55	100	0	-3,31	680,28	

REPLIKASI 2

Nomor ayakan	Diameter (µm)	Berat tertinggal (gram)	% berat	FKA	FKB	Z	dg (µm)	σ _g
20	850	0,81	1,62	1,62	98,38	2,14	dg _{50%}	1,81
40	425	12,83	25,64	27,26	72,74	0,66	=	
60	250	12,09	24,16	51,42	48,58	0,01	287,57	
80	180	10,61	21,20	72,62	27,38	-0,55		
100	150	4,5	9,00	81,62	18,38	-0,83	dg _{84%}	
120	125	4,58	9,15	90,77	9,23	-1,22	=	
Pan	0	4,62	9,23	100	0	-3,31	520,50	

REPLIKASI 3

Nomor ayakan	Diameter (µm)	Berat tertinggal (gram)	% berat	FKA	FKB	Z	dg (µm)	σ _g
20	850	9,12	18,33	18,33	81,76	0,90	dg _{50%}	2,32
40	425	15,99	32,13	50,46	49,54	0,02	=	
60	250	9,31	18,71	69,17	30,83	-0,50	360,92	
80	180	6,60	13,26	82,43	17,57	-0,94		
100	150	2,48	4,98	87,41	12,59	-1,15	dg _{84%}	
120	125	2,50	5,03	92,44	7,56	-1,44	=	
Pan	0	3,76	7,56	100	0	-3,31	837,33	

Rata-rata ± SD = 328,59 ± 37,44

**UKURAN PARTIKEL FORMULA D
REPLIKASI 1**

Nomor ayakan	Diameter (µm)	Berat tertinggal (gram)	% berat	FKA	FKB	Z	dg (µm)	σ _g
20	850	3,78	3,78	7,58	92,42	1,43	dg _{50%}	2,02
40	425	11,10	22,25	29,83	70,17	0,53	=	
60	250	11,91	23,88	53,71	46,29	-0,09	299,05	
80	180	10,61	21,27	74,98	25,02	-0,68		
100	150	4,24	8,50	83,48	16,52	-0,98	dg _{84%}	
120	125	3,90	7,82	91,30	8,7	-1,36	=	
Pan	0	4,34	8,70	100	0	-3,31	604,08	

REPLIKASI 2

Nomor ayakan	Diameter (µm)	Berat tertinggal (gram)	% berat	FKA	FKB	Z	dg (µm)	σ _g
20	850	8,05	16,10	16,10	83,9	0,99	dg _{50%}	2,13
40	425	15,19	30,39	46,49	53,51	0,09	=	
60	250	10,97	21,95	68,44	31,56	-0,48	380,57	
80	180	8,03	16,06	84,50	15,50	-1,02		
100	150	2,59	5,18	89,68	10,32	-1,26	dg _{84%}	
120	125	2,33	4,66	94,34	5,66	-1,59	=	
Pan	0	2,83	5,66	100	0	-3,31	810,61	

REPLIKASI 3

Nomor ayakan	Diameter (µm)	Berat tertinggal (gram)	% berat	FKA	FKB	Z	dg (µm)	σ _g
20	850	3,00	6,04	6,04	93,96	1,55	dg _{50%}	2,06
40	425	12,05	24,28	30,32	69,68	0,51	=	
60	250	10,44	21,03	51,35	48,65	-0,04	287,93	
80	180	9,94	20,02	71,37	28,63	-0,57		
100	150	4,10	8,26	79,63	20,37	-0,83	dg _{84%}	
120	125	4,18	8,42	88,05	11,95	-1,18	=	
Pan	0	5,93	11,95	100	0	-3,31	593,13	

Rata-rata ± SD = 322,73 ± 50,43

LAMPIRAN B
HASIL PENETAPAN KADAR DAN DISOLUSI

HASIL PENETAPAN KADAR DAN HOMOGENITAS

1. Campuran Interaktif dengan Granul Pembawa

Replikasi 1

No.	Absorbansi	Kadar Piroksikam (%)
1	0,665	102,508
2	0,655	99,49
3	0,660	101,22
4	0,659	101,57
5	0,654	100,29
6	0,658	101,41
Rata-rata ± SD		101,16 ± 0,93
KV		0,91

Replikasi 2

No.	Absorbansi	Kadar Piroksikam (%)
1	0,651	100,33
2	0,655	100,95
3	0,650	100,17
4	0,671	103,44
5	0,665	102,51
6	0,657	101,26
Rata-rata ± SD		101,44 ± 1,29
KV		1,27

Replikasi 3

No.	Absorbansi	Kadar Piroksikam (%)
1	0,656	101,10
2	0,665	102,51
3	0,654	100,79
4	0,652	100,48
5	0,670	103,29
6	0,659	101,57
Rata-rata ± SD		101,63 ± 1,08
KV		1,06

2. Campuran Interaktif Tanpa Granul Pembawa

Replikasi 1

No.	Absorbansi	Kadar Piroksikam (%)
1	0,588	90,50
2	0,589	90,65
3	0,603	92,84
4	0,576	88,62
5	0,600	92,34
6	0,568	87,38
Rata-rata \pm SD		90,40 \pm 2,11
KV		2,33

Replikasi 2

No.	Absorbansi	Kadar Piroksikam (%)
1	0,593	91,28
2	0,581	89,41
3	0,585	90,03
4	0,601	92,53
5	0,577	88,78
6	0,611	94,09
Rata-rata \pm SD		91,02 \pm 2,02
KV		2,22

Replikasi 3

No.	Absorbansi	Kadar Piroksikam (%)
1	0,546	83,95
2	0,600	92,37
3	0,579	89,09
4	0,551	84,72
5	0,614	94,55
6	0,566	87,07
Rata-rata \pm SD		88,62 \pm 4,22
KV		4,75

3. Campuran Interaktif dengan Metode Granulasi Basah
Replikasi 1

No.	Absorbansi	Kadar Piroksikam (%)
1	0,621	95,65
2	0,589	90,65
3	0,630	97,05
4	0,618	95,18
5	0,627	96,58
6	0,577	88,78
Rata-rata ± SD		93,98 ± 3,42
KV		3,64

Replikasi 2

No.	Absorbansi	Kadar Piroksikam (%)
1	0,599	92,53
2	0,613	94,40
3	0,609	93,77
4	0,620	95,49
5	0,632	97,36
6	0,588	90,50
Rata-rata ± SD		93,95 ± 2,42
KV		2,57

Replikasi 3

No.	Absorbansi	Kadar Piroksikam (%)
1	0,601	92,53
2	0,595	91,59
3	0,633	97,52
4	0,625	96,27
5	0,587	90,34
6	0,615	94,71
Rata-rata ± SD		93,83 ± 2,80
KV		2,98

4. Kapsul Konvensional (Paten)

Replikasi 1

No.	Absorbansi	Kadar Piroksikam (%)
1	0,588	90,50
2	0,589	90,65
3	0,603	92,84
4	0,576	88,63
5	0,600	92,37
6	0,568	87,38
Rata-rata \pm SD		90,40 \pm 2,11
KV		2,33

Replikasi 2

No.	Absorbansi	Kadar Piroksikam (%)
1	0,593	91,28
2	0,581	89,41
3	0,585	90,03
4	0,601	92,53
5	0,577	88,78
6	0,611	94,09
Rata-rata \pm SD		91,02 \pm 2,02
KV		2,22

Replikasi 3

No.	Absorbansi	Kadar Piroksikam (%)
1	0,546	83,95
2	0,600	92,37
3	0,579	89,09
4	0,551	84,73
5	0,614	94,55
6	0,566	87,07
Rata-rata \pm SD		88,62 \pm 4,22
KV		4,76

HASIL UJI DISOLUSI CAMPURAN INTERAKTIF PIROKSIKAM DENGAN GRANUL PEMBAWA

Replikasi 1

No	Waktu (menit)	Abs.	Kons. ($\mu\text{g/mL}$)	Jumlah obat lepas (mg)	% Obat terlepas
1	2	0,678	20,907	18,817	94,083
2	5	0,683	21,063	18,957	94,785
3	10	0,681	21,001	18,900	94,505
4	15	0,680	20,970	18,873	94,364
5	30	0,673	20,751	18,676	93,381
6	45	0,678	20,907	18,817	94,083
7	60	0,669	20,627	18,564	92,820

Replikasi 2

No	Waktu (menit)	Abs.	Kons. ($\mu\text{g/mL}$)	Jumlah obat lepas (mg)	% Obat terlepas
1	2	0,708	21,843	19,659	98,295
2	5	0,696	21,469	19,322	96,610
3	10	0,677	20,876	18,788	93,943
4	15	0,687	21,188	19,069	95,347
5	30	0,669	20,627	18,564	92,820
6	45	0,671	20,689	18,620	93,101
7	60	0,676	20,845	18,761	93,803

Replikasi 3

No	Waktu (menit)	Abs.	Kons. ($\mu\text{g/mL}$)	Jumlah obat lepas (mg)	% Obat terlepas
1	2	0,693	21,375	19,238	96,189
2	5	0,696	21,469	19,322	96,610
3	10	0,687	21,188	19,069	95,347
4	15	0,685	21,126	19,013	95,066
5	30	0,688	21,219	19,097	95,487
6	45	0,669	20,627	18,564	92,820
7	60	0,671	20,689	18,620	93,101

**HASIL UJI DISOLUSI CAMPURAN INTERAKTIF PIROKSIKAM
TANPA GRANUL PEMBAWA**

REPLIKASI 1

No	Waktu (menit)	Abs.	Kons. ($\mu\text{g/mL}$)	Jumlah obat lepas (mg)	% Obat terlepas
1	2	0,578	17,789	16,009	80,045
2	5	0,544	16,727	15,055	75,272
3	10	0,505	15,511	13,960	69,798
4	15	0,519	15,947	14,353	71,763
5	30	0,533	16,384	14,746	73,728
6	45	0,569	17,507	15,756	78,782
7	60	0,585	18,006	16,206	81,028

REPLIKASI 2

No	Waktu (menit)	Abs.	Kons. ($\mu\text{g/mL}$)	Jumlah obat lepas (mg)	% Obat terlepas
1	2	0,582	17,913	16,121	80,607
2	5	0,576	17,725	15,953	79,765
3	10	0,573	17,632	15,869	79,343
4	15	0,554	17,039	15,335	76,676
5	30	0,521	16,010	14,409	72,044
6	45	0,535	16,446	14,802	74,009
7	60	0,579	17,820	16,037	80,186

REPLIKASI 3

No	Waktu (menit)	Abs.	Kons. ($\mu\text{g/mL}$)	Jumlah obat lepas (mg)	% Obat terlepas
1	2	0,577	17,757	15,981	79,905
2	5	0,559	17,195	15,576	77,378
3	10	0,560	17,226	15,504	77,518
4	15	0,537	16,509	14,858	74,290
5	30	0,579	17,819	16,037	80,186
6	45	0,523	16,072	14,465	72,324
7	60	0,539	16,571	14,914	74,570

HASIL UJI DISOLUSI PIROKSIKAM METODE GRANULASI BASAH

REPLIKASI 1

No	Waktu (menit)	Abs.	Kons. ($\mu\text{g/mL}$)	Jumlah obat lepas (mg)	% Obat terlepas
1	2	0,676	20,845	18,761	93,803
2	5	0,652	20,096	18,087	90,433
3	10	0,642	19,784	17,806	89,030
4	15	0,656	20,221	18,199	90,995
5	30	0,649	20,003	18,003	90,012
6	45	0,628	19,348	17,413	87,064
7	60	0,620	19,098	17,188	85,941

REPLIKASI 2

No	Waktu (menit)	Abs.	Kons. ($\mu\text{g/mL}$)	Jumlah obat lepas (mg)	% Obat terlepas
1	2	0,658	20,284	18,255	91,276
2	5	0,633	19,504	17,553	87,766
3	10	0,648	19,972	17,974	89,872
4	15	0,653	20,128	18,115	90,574
5	30	0,612	18,849	16,964	84,818
6	45	0,622	19,161	17,244	86,222
7	60	0,668	20,596	18,536	92,680

REPLIKASI 3

No	Waktu (menit)	Abs.	Kons. ($\mu\text{g/mL}$)	Jumlah obat lepas (mg)	% Obat terlepas
1	2	0,628	19,348	17,413	87,064
2	5	0,620	19,098	17,188	85,941
3	10	0,616	18,973	17,076	85,380
4	15	0,635	19,566	17,609	88,047
5	30	0,643	19,816	17,834	89,170
6	45	0,657	20,252	18,227	91,135
7	60	0,647	19,940	17,946	89,732

HASIL UJI DISOLUSI PIROKSIKAM DARI SERBUK KAPSUL KONVENSIONAL
REPLIKASI 1

No	Waktu (menit)	Abs.	Kons. ($\mu\text{g/mL}$)	Jumlah obat lepas (mg)	% Obat terlepas
1	2	0,264	7,992	7,193	35,966
2	5	0,362	11,050	9,945	49,723
3	10	0,455	13,951	12,556	62,779
4	15	0,484	14,855	13,370	66,850
5	30	0,520	15,976	14,381	71,903
6	45	0,540	16,602	14,942	74,710
7	60	0,531	16,322	14,690	73,447

REPLIKASI 2

No	Waktu (menit)	Abs.	Kons. ($\mu\text{g/mL}$)	Jumlah obat lepas (mg)	% Obat terlepas
1	2	0,271	8,211	7,390	36,948
2	5	0,243	7,337	6,604	33,018
3	10	0,358	10,925	9,832	49,162
4	15	0,429	13,140	11,826	59,129
5	30	0,484	14,855	13,370	66,850
6	45	0,509	15,635	14,071	70,360
7	60	0,513	15,760	14,184	70,921

REPLIKASI 3

No	Waktu (menit)	Abs.	Kons. ($\mu\text{g/mL}$)	Jumlah obat lepas (mg)	% Obat terlepas
1	2	0,314	9,552	8,597	42,984
2	5	0,354	10,800	9,720	48,600
3	10	0,423	12,953	11,657	58,286
4	15	0,461	13,138	12,724	63,621
5	30	0,506	15,542	13,988	69,698
6	45	0,515	15,823	14,240	71,201
7	60	0,510	15,666	14,100	70,500

LAMPIRAN C

CARA PERHITUNGAN

MUTU FISIK GRANUL PEMBAWA

Misalnya formula A replikasi 1.

1. Sudut diam

Luas kertas A4 = 623,7 cm², berat kertas A4= 4,57 gram

Tinggi puncak gundukan granul yang dialirkan lewat corong adalah 4,4 cm; kemudian dibuat lingkaran berdasarkan lingkaran yang terbentuk dari gundukan granul tersebut dan digunting mengikuti bentuk lingkaran tersebut, lalu kertas yang berbentuk lingkaran ditimbang.

Luas lingkaran = (berat kertas lingkaran : berat kertas A4) X luas kertas A4 = (1,13 : 4,57) X 623,7 = 157,67 cm²

Jari-jari lingkaran = (luas / π)^{1/2} = 7,08 cm.

tan α = tinggi : jari-jari = 4,4 : 7,08 = 0,621

inv. tan α = 32,26°.

Pada pengujian sudut diam dilakukan sebanyak 3 replikasi dengan hasil replikasi 1 = 32,26; 32,70; dan 31,48. rata-rata dari ketiga data tersebut adalah 32,15°.

2. *Carr's index*

Berat gelas ukur 100 mL kosong = 147,56 gram.

Berat gelas ukur 100 mL + granul pembawa = 187,90 gram.

Berat granul pembawa = 40,34 gram.

Setelah di *tapped* diperoleh hasil pemampatan granul pembawa pada 85 mL.

$$\rho_{\text{bulk}} = 40,34 : 100 = 0,403 \text{ g/mL}$$

$$\rho_{\text{tapped}} = 40,34 : 85 = 0,475 \text{ g/mL}$$

$$\text{Carr's Index} = (\rho_{\text{tapped}} - \rho_{\text{bulk}}) : \rho_{\text{tapped}} \times 100\% = (0,475 - 0,403) : 0,475 \times 100\% = 15,07\%$$

3. Hausner Ratio

$$\text{Hausner ratio} = \rho_{\text{tapped}} : \rho_{\text{bulk}} = 0,475 : 0,403 = 1,17.$$

4. Ukuran Partikel

Ditimbang berat granul yang tertinggal di masing-masing pengayak, lalu dijumlahkan beratnya. Dihitung % berat, contoh (6,71 : 49,86) X 100% = 13,46 %.

FKA dihitung dengan cara % berat dikumulatifkan, contoh 13,46; 13,46 + 34,86 = 48,32; 48,32 + 23,29 = 71,61; dan seterusnya.

FKB dihitung dengan cara 100 kurang masing-masing nilai FKA.

Nilai FKB masing-masing kemudian dibagi 100, dan dilihat di tabel Z. Contoh : 86,54 : 100 = 0,8654; angka ini dilihat di tabel Z dengan nilai yang sama atau mendekati nilai tersebut. Carilah angka 0,8645 pada deretan angka. Apabila tidak dapat menemukan angkayang persis sebesar 0,8645, maka carilah angka yang paling mendekati angka 0,8645. Angka yang paling mendekati 0.05 pada tabel adalah 0,8645. Dari angka 0,864, tariklah garis ke kiri terlebih dahulu hingga mencapai deretan angka pada kolom paling kiri dan catatlah angkanya. Dalam kasus ini adalah 1,1. Kemudian kembali ke posisi angka 0,8645, tariklah garis ke atas hingga mencapai deretanujung kolom bagian atas dan catatlah angkanya, dalam kasus ini adalah 0,0.

Nilai Z yang dicari adalah $1,1 + 0,0 = 1,1$.

Di regresikan antara diameter dan nilai z, dengan diameter sebagai sumbu x dan nilai z sebagai sumbu y, lalu akan diperoleh persamaan $y = a + bx$.

$dg_{50\%}$ diperoleh dari : angka 0 dimasukkan kedalam persamaan $y = a + bx$.

$dg_{84\%}$ diperoleh dari : angka 1 dimasukkan ke dalam persamaan $y = a + bx$.

σ_g diperoleh dari $dg_{84\%}$ dibagi $dg_{50\%}$.

CARA PERHITUNGAN F_{HITUNG}

Baku	No	Kons. ($\mu\text{g/mL}$)	Abs.	X^2	XY	Y^2	n	Residual SS	Residual DF
I	1	4,05	0,163	16,40	0,66	0,03	5	$4,03 \times 10^{-3}$	3
	2	12,14	0,422	147,38	5,12	0,18			
	3	20,24	0,685	409,66	13,86	0,47			
	4	28,34	0,902	803,16	25,26	0,81			
	5	36,43	1,145	1327,14	41,71	1,31			
	Total				2703,74	86,92			
II	1	4,03	0,155	16,24	0,62	0,024	5	$5,68 \times 10^{-3}$	3
	2	12,09	0,438	146,17	5,30	0,192			
	3	20,16	0,689	406,43	13,89	0,475			
	4	28,22	0,875	796,37	24,69	0,766			
	5	36,29	1,165	1316,96	42,28	1,357			
	Total				2682,17	86,78			
III	1	4,10	0,141	16,81	0,58	0,020	5	$2,3 \times 10^{-4}$	3
	2	12,10	0,398	146,41	4,82	0,158			
	3	20,20	0,645	408,04	13,03	0,416			
	4	28,10	0,915	789,61	25,71	0,837			
	5	36,20	1,168	1310,44	42,28	1,364			
	Total				2671,31	86,42			
<i>Pooled Regression</i>								$9,94 \times 10^{-3}$	9
<i>Common Regression</i>								$1,23 \times 10^{-3}$	11

$$SS = \sum Y^2 - (\sum XY^2 / \sum X^2)$$

$$Pooled\ Regression = SS_1 + SS_2 + SS_3$$

$$Common\ Regression = total\ \sum Y^2 - (total\ (\sum XY)^2 / total\ \sum X^2)$$

$$F_{hitung} = \{(Common\ Regression - Pooled\ Regression) / 3-1\} : (Pooled\ Regression / 9)$$

$$= \{(1,23 \times 10^{-2} - 9,94 \times 10^{-3}) / 2\} : (9,94 \times 10^{-3} / 9) = 1,07 < F_{tabel} \\ 0,05 (2;9) = 4,26.$$

CARA PERHITUNGAN AKURASI PRESISI

Dari hasil pembacaan absorbansi terhadap larutan sampel akurasi presisi kemudian di ekstrapolasikan ke dalam persamaan kurva baku sehingga diperoleh konsentrasi obat. Untuk mendapatkan % perolehan kembali maka konsentrasi obat yang diperoleh di bagi dengan konsentrasi teoritis dari penimbangan bahan aktif.

Contoh : akurasi presisi pada penetapan kadar (Tabel 4.6)

Rep	Kons	Penimbang an bahan aktif (mg)	Abs	Kons. (µg/mL)	Teoritis (µg/mL)	Perolehan Kembali (%)	Rata-rata	SD	KV (%)
I	80%	16,1	0,520	15,98	16,1	99,24			
II	80%	16,3	0,531	16,32	16,3	100,13	99,66	0,45	0,45
III	80%	16,2	0,525	16,13	16,2	99,59			

$$Y = 0,0320 X + 0,0078$$

$$0,520 = 0,0317X - 0,0078$$

$$X = 15,98 \mu\text{g/mL}.$$

Konsentrasi teoritis = 16,1 µg/mL.

$$\% \text{ perolehan kembali} = (15,98 / 16,1) \times 100\% = 99,24\%.$$

Masing-masing replikasi dihiitung % perolehan kembali, kemudian cari rata-rata, standar deviasi, dan koefisien variasi (KV).

CARA PERHITUNGAN PERSEN EFISIENSI DISOLUSI (% ED)

$$\%ED = \{AUC_{total} / (\text{waktu} \times \text{dosis})\} \times 100\%$$

dimana AUC_{total} adalah total jumlah obat yang terlepas (Wt).

Contoh pada uji disolusi campuran interaktif dengan granul pembawa replikasi 1 :

$$\%ED = \{1107,727 / (60 \times 20)\} \times 100\% = 92,31\%.$$

LAMPIRAN D

HASIL UJI STATISTIK

UJI STATISTIK DENGAN ONEWAY ANOVA

1. Hasil *Oneway* ANOVA untuk sudut diam

Oneway

[DataSet1]

Descriptives

Sudut Diam		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
A	3	31,9133	,29704	,17150	31,1754	32,6512	31,58	32,15	
B	3	32,7133	,36019	,20795	31,8186	33,6081	32,36	33,08	
C	3	32,2667	,39311	,22696	31,2901	33,2432	31,82	32,56	
D	3	32,5733	,22591	,13043	32,0122	33,1345	32,36	32,81	
Total	12	32,3667	,42451	,12254	32,0969	32,6364	31,58	33,08	

Test of Homogeneity of Variances

Sudut Diam				
Levene Statistic	df1	df2	Sig.	
,450	3	8	,724	

ANOVA

Sudut Diam					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1,135	3	,378	3,574	,066
Within Groups	,847	8	,106		
Total	1,982	11			

2. Hasil *Oneway* ANOVA untuk *Carr's Index*

Oneway

[DataSet1]

Descriptives

Carrs Index		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
A	3	15,6600	,51098	,29501	14,3907	16,9293	15,07	15,96	
B	3	15,5667	1,42304	,82159	12,0316	19,1017	13,98	16,73	
C	3	14,9867	2,65142	1,63080	8,4002	21,5732	11,98	16,99	
D	3	16,5933	,61076	,35263	15,0761	18,1106	15,89	16,99	
Total	12	15,7017	1,45718	,42065	14,7758	16,6275	11,98	16,99	

Test of Homogeneity of Variances

Carrs Index				
Levene Statistic	df1	df2	Sig.	
4,671	3	8	,036	

ANOVA

Carrs Index					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3,979	3	1,326	,548	,664
Within Groups	19,378	8	2,422		
Total	23,357	11			

3. Hasil Oneway ANOVA untuk Hausner Ratio

Oneway

[DataSet1]

Descriptives

Hausner_Ratio									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
A	3	1.1767	.00577	.00333	1.1623	1.1910	1.17	1.18	
B	3	1.1833	.02082	.01202	1.1316	1.2350	1.16	1.20	
C	3	1.1600	.03464	.02000	1.0739	1.2461	1.14	1.20	
D	3	1.1933	.01155	.00667	1.1646	1.2220	1.18	1.20	
Total	12	1.1783	.02209	.00638	1.1643	1.1924	1.14	1.20	

Test of Homogeneity of Variances

Hausner_Ratio				
Levene Statistic	df1	df2	Sig.	
5.044	3	8	.030	

ANOVA

Hausner_Ratio					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.002	3	.001	1.309	.337
Within Groups	.004	8	.000		
Total	.005	11			

4. Hasil Oneway ANOVA untuk ukuran partikel

Oneway

[DataSet1]

Descriptives

Ukuran Partikel									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
A	3	366.7833	37.61111	21.71479	273.3522	460.2145	323.73	393.25	
B	3	278.8500	15.18889	8.76931	241.1187	316.5813	264.93	295.05	
C	3	330.7400	73.59959	42.49274	147.9085	513.5715	254.08	400.84	
D	3	322.0633	61.24912	35.36220	169.9121	474.2146	277.57	391.92	
Total	12	324.6092	55.08439	15.90149	289.6102	359.6081	254.08	400.84	

Test of Homogeneity of Variances

Ukuran Partikel				
Levene Statistic	df1	df2	Sig.	
1.822	3	8	.221	

ANOVA

Ukuran Partikel					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11749.890	3	3916.630	1.449	.299
Within Groups	21627.305	8	2703.413		
Total	33377.195	11			

UJI STATISTIK ONE-SAMPLE T TEST

1. Hasil *one-sample t test* sudut diam

T-Test

[DataSet2]

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Sudut_diam	3	31.9133	.29704	.17150

One-Sample Test

	Test Value = 31.965					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Sudut_diam	-.301	2	.792	-.05167	-.7896	.6862

2. Hasil *one-sample t test Carr's Index*

T-Test

[DataSet2]

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Carrs_index	3	15.6600	.51098	.29501

One-Sample Test

	Test Value = 15.604					
	t	df	Sig. (2-tailed)	Mean Difference	31.965% Confidence Interval of the Difference	
					Lower	Upper
Carrs_index	.190	2	.867	.05600	-.0847	.1967

3. Hasil *one-sample t test Hausner Ratio*

T-Test

[DataSet2]

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Hausner_ratio	3	1.1767	.00577	.00333

One-Sample Test

	Test Value = 1.177					
	t	df	Sig. (2-tailed)	Mean Difference	31.965% Confidence Interval of the Difference	
					Lower	Upper
Hausner_ratio	-.100	2	.929	-.00033	-.0019	.0013

4. Hasil *one-sample t test ukuran partikel*

T-Test

[DataSet2]

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Ukuran_partikel	3	366.7833	37.61111	21.71479

One-Sample Test

	Test Value = 361.614					
	t	df	Sig. (2-tailed)	Mean Difference	31.965% Confidence Interval of the Difference	
					Lower	Upper
Ukuran_partikel	.238	2	.834	5.16933	-5.1904	15.5291

UJI ANOVA GRANUL PEMBAWA OPTIMUM

1. Sudut Diam

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

Response 1 Sudut diam

ANOVA for selected factorial model

Analysis of variance table [Partial sum of squares - Type III]

Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F
Model	1.28	3	0.43	3.94	0.0536 not significant
<i>A-Crospovidk</i>	1.03	1	1.03	9.51	0.0150
<i>B-Manitol</i>	0.016	1	0.016	0.15	0.7099
AB	0.24	1	0.24	2.17	0.1792
Pure Error	0.87	8	0.11		
Cor Total	2.15	11			

The Model F-value of 3.94 implies there is a 5.36% chance that an 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 is a significant model term.

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.	0.33	R-Squared	0.5965
Mean	32.38	Adj R-Squared	0.4452
C.V. %	1.02	Pred R-Square	0.0922
PRESS	1.95	Adeq Precisor	4.556

2. Carr's index

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

Response 3 Carr's index

ANOVA for selected factorial model

Analysis of variance table [Partial sum of squares - Type III]

Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F
Model	3.98	3	1.33	0.55	0.6636 not significant
<i>A-Crospovidk</i>	1.72	1	1.72	0.71	0.4242
<i>B-Manitol</i>	0.094	1	0.094	0.039	0.8490
AB	2.17	1	2.17	0.89	0.3719
Pure Error	19.38	8	2.42		
Cor Total	23.36	11			

The Model F-value of 0.55 implies the model is not significant relative to the noise. There is a 66.36 % chance that a 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 there are no 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.	1.56	R-Squared	0.1703
Mean	15.70	Adj R-Squared	-0.1408
C.V. %	9.91	Pred R-Square	-0.8667
PRESS	43.60	Adeq Precisor	1.788

3. Hausner ratio

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

Response 2 Hausner ratio

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
Model	5.583E-004	3	1.861E-004	0.46	0.7205 not significant
A-Crospovidol	4.083E-004	1	4.083E-004	1.00	0.3466
B-Manitol	7.500E-005	1	7.500E-005	0.18	0.6795
AB	7.500E-005	1	7.500E-005	0.18	0.6795
Pure Error	3.267E-003	8	4.083E-004		
Cor Total	3.825E-003	11			

The Model F-value of 0.46 implies the model is not significant relative to the noise. There is a 72.05 % chance that a 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 there are no 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.	0.020	R-Squared	0.1460
Mean	1.18	Adj R-Squared	-0.1743
C.V. %	1.71	Pred R-Square	-0.9216
PRESS	7.350E-003	Adeq Precisor	1.429

4. Ukuran partikel

Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F
Model	11749.89	3	3916.63	1.45	0.2994 not significant
<i>A-Crospovidol</i>	7000.12	1	7000.12	2.59	0.1462
<i>B-Manitol</i>	38.56	1	38.56	0.014	0.9079
AB	4711.21	1	4711.21	1.74	0.2233
Pure Error	21627.30	8	2703.41		
Cor Total	33377.19	11			

The Model F-value of 1.45 implies the model is not significant relative to the noise. There is a 29.94 % chance that a 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 there are no 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.	51.99	R-Squared	0.3520
Mean	324.61	Adj R-Squared	0.1090
C.V. %	16.02	Pred R-Square	-0.4579
PRESS	48661.44	Adeq Precisor	2.929

A negative "Pred R-Squared" implies that the overall mean is a better predictor of your response than the current model.

"Adeq Precision" measures the signal to noise ratio. A ratio of 2.93 indicates an inadequate

LAMPIRAN E

GAMBAR DAN TABEL

南通精华制药股份有限公司检验报告

NANTONG JINGHUA PHARMACEUTICAL CO. LTD.
- CERTIFICATE OF ANALYSIS

APIs.ADD:43 Yaogang Road,Nantong Jiangsu China
Tel:86-513-85609405/85609406

吡罗昔康

PIROXICAM

MICRONIZED

Batch No.	PRX2011045M	Manufacture Date	2011.11.7
Total Quantity	200.0KG	Report Date	2011.11.8
Commercial Quantity	200.0KG	Re-test Date	2014.11.6
Inspection No.	110300298		

TEST	SPECIFICATIONS (USP)	RESULTS
Characteristics	off-white to light tan or light yellow odorless powder	Complies
Identification	A. IR B. UV C. TLC	Complies
Water	≤0.5%	0.27%
Residue on ignition	≤0.3%	0.13%
Heavy metals	≤0.005%	<0.005%
Particle size	D(0.98) ≤13um	11.1 um
Assay	97.0-103.0%	99.62%

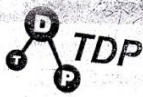
Conclusion The product meets the requirements of USP 34 and the additional items defined by customer

Analyst *李松* 2011.11.8

Supervisor *杨林林* 2011.11.8

Chief of Laboratory *李松* 2011.11.8

QA Release Date *李松* 2011.11.8



DUPLICATA



LC 1 EEJ5 CERTIFICATE OF ANALYSIS / COMPLIANCE

PAGE 1

PT SIGNA HUSADA
JALAN DAAN MOGOT KM 17
JAKARTA 11840
INDONESIA

PEARLITOL 160 C

CUSTOMER.... SIGNA HUSADA/INDONES

450001 D

INVOICE..... PPY60E1
TONNAGE..... 13.000 KG
CONTRACT.... P92365G
ORDER..... RQP-15/12
BATCH..... E664R
MANUF&TESTED 15 MARCH 2012

EXPIRY DATE.

15 MAR 2017

E.P./U.S.P.

DESCRIPTION

WHITE CRYSTALLINE POWDER
ODOURLESS, SWEET TASTE

MEANING TESTED = ANALYZED
MONITORED = MONITORING PLAN
GUARANTEED = COMPLIANCE DATA

APPEARANCE		CONFORM	TESTED
APPEARANCE IN SOLUTION		CONFORM	TESTED
LOSS ON DRYING	%	0,08	TESTED
INFRA-RED		CONFORM	TESTED
MELTING POINT	DEG	166	TESTED
START OF MELTING	DEG	166	TESTED
END OF MELTING	DEG	167	TESTED
SPECIFIC ROTATION(BORATE)	DEG.	+ 23,5	TESTED
SPECIFIC ROT.MOLYBDATE	DEG	+ 140,1	TESTED
CONDUCTIVITY	MICROS/C	0,8	TESTED
REDUCING SUGARS	*(USP)	CONFORM	TESTED
D-MANNITOL BY HPLC	%	99,1	TESTED

Please note that the certificate of analysis are also conveniently available online and around the clock at www.worldaccount.basf.com

Fax No 00620247627001

PT. BAHTERA ADI JAYA
JL. BETENG NO.108, KRANGGAN
50137 SEMARANG
SEMARANG TENGAH - JAWA TENGAH
Indonesia

2012-11-02
Quality Control
A. Muklis
0218711096
Certificate No 1191
Page 2 of 2

Certificate of Analysis according to DIN 55350-18-4.2.2

Texapon® OC-P / *Sod. Lauryl Sulfa*

20KG Paper Bags
Purchase Order/Customer Product#
P685/BAJ/SBY/XI/2012

Material 50210676
Order 6000547404 000030
Delivery 6200491467 000030
Lot 0008901774
Lot/Qty 140.000 KG
Total 200.000 KG
Transport N 9546 UG

PARAMETER	RESULTS	STANDARD
Appearance; -	Pass	white to slightly yellow
Anionic Surfactant (MM 299); % DIN ISO 2271 mod	95.4	Min. 95.0
pH-Value (5%); - ISO 4316	9.3	7.0 - 10.5
Water Content; % ISO 4317	1.0	Max. 1.2
Sodium Sulphate; % Method 949022-01	2.1	Max. 2.5
Sodium Chloride; % Method 930106-01	0.65	Max. 0.2
Bulk Density; g/L Method 920037-01	502	350 - 600
Color APHA (5%); - ASTM D 1209	16	Max. 25
Alkalinity; - GCI A-13	0.10	Max. 0.5
Unsulphated Substance; % HPLC	1.4	Max. 1.5

Manufacturing Date : 13.10.2012
Expiry Date : 12.10.2013

The aforementioned data shall constitute the agreed contractual quality of the product at the time of passing of risk. The data are controlled at regular intervals as part of our quality assurance program. Neither these data nor the properties of product specimens shall imply any legally binding guarantee of certain properties or of fitness for a specific purpose. No liability of cure can be derived therefrom.

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PT MEDASATA AGING ONIR

SUMBER ALUMI PEDONOKO TALLANG PRICIC

1402 JAKARTA UTARA

Indonesia

File No: 000002140008

2011-01-13

BASF CORPORATION

Certificate No: 2025
Page 4 of 4

Certificate of Analysis according to DIN 58340-18-43.3

Purchase No: LSP

QSD File No: 01

Purchase Order/Contract No: 0115/5/2011

0000/07

Material

Order 59962707

Delivery 120700000-000703

Lot 802780102-000002

Lot 181216000

Lot/Qty 4410-000-00

Total 9999-000-00

THIS CERTIFICATE OF ANALYSIS HAS BEEN PRODUCED ELECTRONICALLY
AND IS VALID VIRTUALLY & ELECTRONICALLY.

This certificate of analysis shall describe the identity, composition, quality, of the substance in line to quantity of lot. The value and essential data are determined on the basis of the quality management system. However, these data are the properties of product specified in the BASF Safety Data Sheet (SDS) and are not intended to be used for a health and/or safety assessment.

Product Name: **PERMETHYL METHYL DIETHYL AMINE** (as certified) (Methylamine) (MDEA) (certified) (MDEA)

Part No: 000000164203

PT MEGASITA ADIRI MASA

28/11/2010

SUTERA RAZING POONGCHO YIKJANA PROJE

SARF CORPORATION

FASE: JARAKTA UTARA

Certificate No: 2025

Sekeloa

Page 1 of 4

Certificate of Analysis covering to DIN EN50016-4-22

Revisi: K2010P

Material: 00001727

4402 Pindolan

Order: 102703004 000013

Pertamax Clean/Customs Product

Delivery: 802281183 000001

S1E520211

Lot: 01010000

000X107

LotQty: 4010.000 KG

Total: 8000.000 KG

Parameter/Property	Unit	Result	Specification
Appearance	eye	Clear	Clear
Refractive	20°C	1.41	1.41
Density	g/cm ³	0.705	0.705-0.710
Flash	20°C	< 20	< 20
Relative Density		0.705	
W.D. (g)	Weight %	10.0	10.0 ± 0.1
W.D. (g) (water)		0.0	0.0 ± 0.0
Residual Amine - Sulphuric		0.01000000	0.01000000
Residual Amine - Toluene		0.00000000	0.00000000
PPM CO - Sulphuric		0.00000000	0.00000000
PHOSPHORUS	Weight %	0.1	0.1
Chloride Ion / Nitrate Ion (g/L)	Weight %	0.1	0.1
Iron			
Ammonium Nitrate (Wt)	eye	< 1	< 1
Water	Weight %	0.4	0.5

Neutralizing Data: 31.87 (20)

Permanently test with the requirements of the current version of the protocol to ISO.

Analyst: **WYK Corporation**
 3007 Ghee Road,
 Singapore, S 10754

Product: **Permet Data to 20 weeks from Date of Manufacture**

The above information is provided as a guide only and does not constitute a guarantee of quality. The data is representative of typical results of a single test. Quality assurance programs, however, may require the application of similar systems and may vary significantly. Procedures of such programs may vary from a specific process to other processes in the same laboratory.

Critical Values of t

n	2-tailed testing			1-tailed testing		
	$\alpha = .1$	$\alpha = .05$	$\alpha = .01$	$\alpha = .1$	$\alpha = .05$	$\alpha = .01$
5	0.805	0.878	0.959	0.687	0.805	0.934
6	0.729	0.811	0.917	0.608	0.729	0.882
7	0.669	0.754	0.875	0.551	0.669	0.833
8	0.621	0.707	0.834	0.507	0.621	0.789
9	0.582	0.666	0.798	0.472	0.582	0.750
10	0.549	0.632	0.765	0.443	0.549	0.715
11	0.521	0.602	0.735	0.419	0.521	0.685
12	0.497	0.576	0.708	0.398	0.497	0.658
13	0.476	0.553	0.684	0.380	0.476	0.634
14	0.458	0.532	0.661	0.365	0.458	0.612
15	0.441	0.514	0.641	0.351	0.441	0.592
16	0.426	0.497	0.623	0.338	0.426	0.574
17	0.412	0.482	0.606	0.327	0.412	0.558
18	0.400	0.468	0.590	0.317	0.400	0.543
19	0.389	0.456	0.575	0.308	0.389	0.529
20	0.378	0.444	0.561	0.299	0.378	0.516
21	0.369	0.433	0.549	0.291	0.369	0.503
22	0.360	0.423	0.537	0.284	0.360	0.492
23	0.352	0.413	0.526	0.277	0.352	0.482
24	0.344	0.404	0.515	0.271	0.344	0.472
25	0.337	0.396	0.505	0.265	0.337	0.462
26	0.330	0.388	0.496	0.260	0.330	0.453
27	0.323	0.381	0.487	0.255	0.323	0.445
28	0.317	0.374	0.479	0.250	0.317	0.437
29	0.311	0.367	0.471	0.245	0.311	0.430
30	0.306	0.361	0.463	0.241	0.306	0.423
40	0.264	0.312	0.403	0.207	0.264	0.367
50	0.235	0.279	0.361	0.184	0.235	0.328
60	0.214	0.254	0.330	0.168	0.214	0.300
80	0.185	0.220	0.286	0.145	0.185	0.260
100	0.165	0.197	0.256	0.129	0.165	0.232
120	0.151	0.179	0.234	0.118	0.151	0.212
140	0.140	0.166	0.217	0.109	0.140	0.196
160	0.130	0.155	0.203	0.102	0.130	0.184
180	0.123	0.146	0.192	0.096	0.123	0.173
200	0.117	0.139	0.182	0.091	0.117	0.164
300	0.095	0.113	0.149	0.074	0.095	0.134
400	0.082	0.098	0.129	0.064	0.082	0.116
500	0.074	0.088	0.115	0.057	0.074	0.104

Standard Normal Probabilities

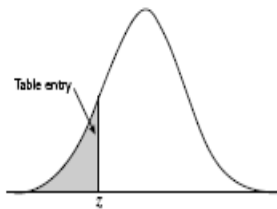


Table entry for z is the area under the standard normal curve to the left of z .

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
-3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
-3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
-3.2	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
-3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
-3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
-2.9	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
-2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
-2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
-2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
-2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
-2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
-2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
-2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
-2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
-2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
-1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
-1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
-1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
-1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
-1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
-1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
-1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
-1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
-1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
-1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
-0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
-0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
-0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
-0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
-0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
-0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
-0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
-0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
-0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
-0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641

Tabel Titik Kritis Distribusi t

Titik Persentase Distribusi t (df = 1 – 40)

Pr df	0.25 0.50	0.10 0.20	0.05 0.10	0.025 0.050	0.01 0.02	0.005 0.010	0.001 0.002
1	1.00000	3.07768	6.31375	12.70620	31.82052	63.65674	318.30884
2	0.81650	1.88562	2.91999	4.30265	6.96456	9.92484	22.32712
3	0.76489	1.63774	2.35336	3.18245	4.54070	5.84091	10.21453
4	0.74070	1.53321	2.13185	2.77645	3.74695	4.60409	7.17318
5	0.72669	1.47588	2.01505	2.57058	3.36493	4.03214	5.89343
6	0.71756	1.43976	1.94318	2.44691	3.14267	3.70743	5.20763
7	0.71114	1.41492	1.89458	2.36462	2.99795	3.49948	4.78529
8	0.70639	1.39682	1.85955	2.30600	2.89646	3.35539	4.50079
9	0.70272	1.38303	1.83311	2.26216	2.82144	3.24984	4.29681
10	0.69981	1.37218	1.81246	2.22814	2.76377	3.16927	4.14370
11	0.69745	1.36343	1.79588	2.20099	2.71808	3.10581	4.02470
12	0.69548	1.35622	1.78229	2.17881	2.68100	3.05454	3.92983
13	0.69383	1.35017	1.77093	2.16037	2.65031	3.01228	3.85198
14	0.69242	1.34503	1.76131	2.14479	2.62449	2.97684	3.78739
15	0.69120	1.34081	1.75305	2.13145	2.60248	2.94671	3.73283
16	0.69013	1.33676	1.74588	2.11991	2.58349	2.92078	3.68615
17	0.68920	1.33338	1.73961	2.10982	2.56693	2.89823	3.64577
18	0.68836	1.33039	1.73406	2.10092	2.55238	2.87844	3.61048
19	0.68762	1.32773	1.72913	2.09302	2.53948	2.86093	3.57940
20	0.68695	1.32534	1.72472	2.08596	2.52798	2.84534	3.55181
21	0.68635	1.32319	1.72074	2.07961	2.51765	2.83136	3.52715
22	0.68581	1.32124	1.71714	2.07387	2.50832	2.81876	3.50499
23	0.68531	1.31946	1.71387	2.06866	2.49987	2.80734	3.48496
24	0.68485	1.31784	1.71088	2.06390	2.49218	2.79694	3.46678
25	0.68443	1.31635	1.70814	2.05954	2.48511	2.78744	3.45019
26	0.68404	1.31497	1.70562	2.05553	2.47863	2.77871	3.43500
27	0.68368	1.31370	1.70329	2.05183	2.47266	2.77068	3.42103
28	0.68335	1.31253	1.70113	2.04841	2.46714	2.76326	3.40816
29	0.68304	1.31143	1.69913	2.04523	2.46202	2.75639	3.39624
30	0.68276	1.31042	1.69726	2.04227	2.45726	2.75000	3.38518
31	0.68249	1.30946	1.69552	2.03951	2.45282	2.74404	3.37490
32	0.68223	1.30857	1.69389	2.03693	2.44868	2.73848	3.36531
33	0.68200	1.30774	1.69236	2.03452	2.44479	2.73328	3.35634
34	0.68177	1.30695	1.69092	2.03224	2.44115	2.72839	3.34793
35	0.68156	1.30621	1.68957	2.03011	2.43772	2.72381	3.34005
36	0.68137	1.30551	1.68830	2.02809	2.43449	2.71948	3.33262
37	0.68118	1.30485	1.68709	2.02619	2.43145	2.71541	3.32563
38	0.68100	1.30423	1.68595	2.02439	2.42857	2.71156	3.31903
39	0.68083	1.30364	1.68488	2.02269	2.42584	2.70791	3.31279
40	0.68067	1.30308	1.68385	2.02108	2.42326	2.70446	3.30688

F Values for $\alpha = 0.05$

d_2	d_1								
	1	2	3	4	5	6	7	8	9
1	161.4	199.5	215.7	224.6	230.2	234.0	236.8	238.9	240.5
2	18.51	19.00	19.16	19.25	19.3	19.33	19.35	19.37	19.38
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04
120	3.92	3.07	2.68	2.45	2.29	2.17	2.09	2.02	1.96
inf	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88

