
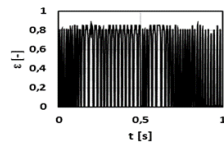
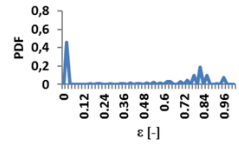


## LAMPIRAN

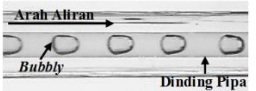
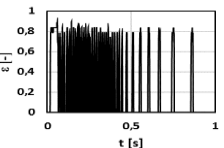
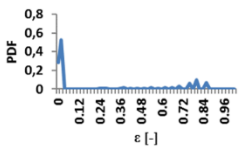
### Lampiran 1

Data pola aliran, time average fraksi hampa, dan PDF fraksi hampa pola aliran *bubbly*  $J_G = 0,025$  m/s gliserin 10%

$J_G$ (m/s)	$J_L$ (m/s)	Image	<i>Time-Average</i>	PDF
0,025	0,879			

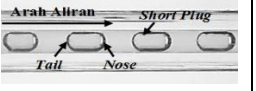
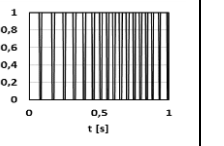
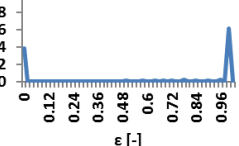
### Lampiran 2

Data pola aliran, time average fraksi hampa, dan PDF fraksi hampa pola aliran *bubbly*  $J_G = 0,066$  m/s gliserin 10%

$J_G$ (m/s)	$J_L$ (m/s)	Image	<i>Time-Average</i>	PDF
0,066	0,879			

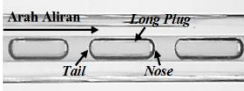
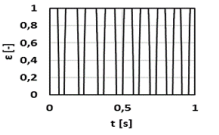
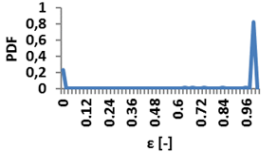
### Lampiran 3

Data pola aliran, time average fraksi hampa, dan PDF fraksi hampa pola aliran *plug*  $J_L = 0,033$  m/s gliserin 10%

$J_G$ (m/s)	$J_L$ (m/s)	Image	<i>Time-Average</i>	PDF
0,025	0,033			

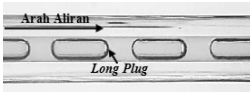
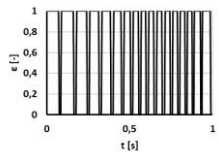
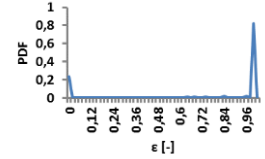
## Lampiran 4

Data pola aliran, time average fraksi hampa, dan PDF fraksi hampa pola aliran *plug*  $J_L = 0,232$  m/s gliserin 10%

$J_G$ (m/s)	$J_L$ (m/s)	Image	<i>Time-Average</i>	PDF
0,025	0,232			


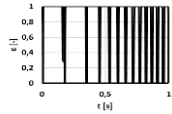
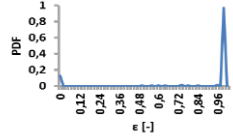
## Lampiran 5

Data pola aliran, time average fraksi hampa, dan PDF fraksi hampa pola aliran *plug*  $J_L = 0,033$  m/s gliserin 10%

$J_G$ (m/s)	$J_L$ (m/s)	Image	<i>Time-Average</i>	PDF
0,116	0,033			

## Lampiran 6

Data pola aliran, time average fraksi hampa, dan PDF fraksi hampa pola aliran *plug*  $J_L = 0,232$  m/s gliserin 10%

$J_G$ (m/s)	$J_L$ (m/s)	Image	<i>Time-Average</i>	PDF
0,116	0,232			

## Lampiran 7

Matriks Perhitungan Kecepatan *bubbly* dan *Plug*

No.	Jenis Aliran	$J_G$	$J_L$	$J_T$	Us
1	Bubble	0,025	0,879	0,904	0,32
2	Bubble	0,066	0,879	0,945	0,4
3	Plug	0,025	0,033	0,058	0,032
4	Plug	0,025	0,232	0,257	0,14
5	Plug	0,116	0,033	0,149	0,094
6	Plug	0,116	0,232	0,348	0,12

## Lampiran 8

Matriks Perhitungan Panjang *bubbly* dan *Plug*

No.	Jenis Aliran	$J_G$	$J_L$	$J_T$	$L_G$	Homogenous / $\beta$
1	Bubble	0,025	0,879	0,904	0,002107	0,027654867
2	Bubble	0,066	0,879	0,945	0,00103	0,06984127
3	Plug	0,025	0,033	0,058	0,002385	0,431034483
4	Plug	0,025	0,232	0,257	0,006259	0,097276265
5	Plug	0,116	0,033	0,149	0,004354	0,77852349
6	Plug	0,116	0,232	0,348	0,008131	0,333333333

## Lampiran 9

Matriks Perhitungan Frekuensi *bubbly* dan *Plug*

No.	Jenis Aliran	$J_G$	$J_L$	$J_T$	Frekuensi
1	Bubble	0,025	0,879	0,904	31
2	Bubble	0,066	0,879	0,945	47
3	Plug	0,025	0,033	0,058	9
4	Plug	0,025	0,232	0,257	18
5	Plug	0,116	0,033	0,149	13
6	Plug	0,116	0,232	0,348	27

## Lampiran 10

## Hasil Pengujian Tegangan Permukaan

No.	Kode Sampel	Uji 1 (N/cm <sup>2</sup> )	Uji 2 (N/cm <sup>2</sup> )	Uji 3 (N/cm <sup>2</sup> )
1	GL 0	70,5	71,3	71,3
2	GL 10	67,4	68,5	68
3	GL 20	61,3	61,5	61,9
4	GL 30	61,1	60,6	60,9
5	GL 40	56,9	56,5	58,6
6	GL 50	56	55,8	57,5
7	GL 60	55,3	52,6	56,4
8	GL 70	53,5	53,3	53,9
9	GL 80	44,8	46,4	47
10	GL 90	41,1	42,4	43,5
11	GL 100	42,6	39,9	41,8

## Lampiran 11

## Tabel Pengujian Viskositas

No.	Kode Sampel	Hasil Pemeriksaan Larutan Aquades + Gliserin	
		<i>Specific Gravity at 60/60 °F</i> ASTM D 1298	<i>Kinematic Viskosity at 27 °C,</i> (mm <sup>2</sup> /s) ASTM D 445
1	G 0	1,0021	0,842
2	G 10	1,0358	1,331
3	G 20	1,0619	2,315
4	G 30	1,0839	2,361
5	G 40	1,1114	3,320
6	G 50	1,1421	5,505
7	G 60	1,1671	9,393
8	G 70	1,1896	16,98
9	G 80	1,2128	38,42
10	G 90	1,2408	86,22
11	G 100	1,2715	319,5

## Lampiran 12

Hasil Kalibrasi *Flowmeter* Air 1

No.	Skala	Debit Aktual (ml/menit)
1	5	5
2	10	10
3	20	20
4	30	30
5	40	40
6	50	50
7	65	65
8	85	85

## Lampiran 13

Hasil Kalibrasi *Flowmeter* Air 2

No.	Skala	Debit Aktual (ml/menit)
1	80	105
2	360	275

## Lampiran 14

Hasil Kalibrasi *Flowmeter* Air 3

No.	Skala (GPM)	Debit Aktual (ml/menit)
1	0,1	400
2	0,12	450
3	0,14	550
4	0,16	650
5	0,18	700
6	0,2	800