

## Lampiran 1. Lembar Data Hasil Pengujian

lubang 5 mm dan polos	t (sekon)	Tegangan (V)	Arus (A)	Kenaikan	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	η (%)
	10	19.33	9.60	100	0.1964	25.83	25.67	26.92	185.600	0.0196	68.877
	20	19.07	9.63	193	0.3798	25.83	25.67	27.58	183.676	0.0190	67.278
	30	18.87	9.60	290	0.5696	25.83	25.67	28.08	181.120	0.0190	68.228
	40	18.83	9.60	383	0.7530	26.00	25.67	28.33	180.800	0.0188	67.759
	50	18.77	9.50	477	0.9363	26.00	25.67	28.58	178.283	0.0187	68.357
	60	18.73	9.50	567	1.1131	26.00	25.67	28.75	177.967	0.0186	67.840
	70	18.70	9.50	660	1.2964	26.08	25.75	29.00	177.650	0.0185	67.847
	80	18.73	9.47	757	1.4863	26.08	25.92	29.25	177.342	0.0186	68.179
	90										
	100										
Rata-rata	18.88	9.55	428	0.8414	25.96	25.71	28.31	180.305	0.0189	68.046	

lubang 8 mm dan polos	t (sekon)	Tegangan	Arus (A)	Kenaikan (m)	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	η (%)
	10	18.87	9.80	100	0.1964	27.58	26.00	27.92	184.89	0.0196	69.14
	20	18.67	9.80	200	0.3929	27.58	26.00	28.58	182.93	0.0196	69.88
	30	18.40	9.70	293	0.5762	27.50	26.00	28.92	178.48	0.0192	70.03
	40	18.23	9.70	387	0.7595	27.50	26.00	29.17	176.86	0.0190	69.87
	50	18.10	9.60	490	0.9625	27.58	26.00	29.33	173.76	0.0193	72.10
	60	18.07	9.60	580	1.1393	27.50	26.08	29.50	173.44	0.0190	71.25
	70	18.10	9.57	670	1.3161	27.58	26.08	29.58	173.16	0.0188	70.66
	80	18.13	9.57	763	1.4994	27.58	26.08	29.67	173.48	0.0187	70.31
	90										
	100										
Rata-rata	18.32	9.67	435	0.8553	27.55	26.03	29.08	177.13	0.0192	70.41	

lubang 10 mm dan polos	t (sekon)	Tegangan	Arus (A)	Kenaikan (mm)	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	η (%)
	10	17.93	9.53	110	0.2161	29.33	28.92	26.50	170.964	0.0216	82.250
	20	17.93	9.37	200	0.3929	29.33	28.92	27.00	167.976	0.0196	76.103
	30	17.87	9.43	290	0.5696	29.33	29.00	27.33	168.542	0.0190	73.319
	40	17.90	9.30	380	0.7464	29.33	29.00	27.58	166.470	0.0187	72.952
	50	18.00	9.23	473	0.9298	29.33	29.08	27.92	166.200	0.0186	72.814
	60	17.93	9.33	563	1.1065	29.42	29.17	28.25	167.378	0.0184	71.708
	70	18.00	9.30	650	1.2768	29.50	29.33	28.50	167.400	0.0182	70.910
	80	18.07	9.27	737	1.4470	29.50	29.42	28.67	167.418	0.0181	70.312
	90										
	100										
Rata-rata	17.95	9.35	425	0.8356	29.39	29.10	27.72	167.793	0.0190	73.796	

lubang 12 mm dan polos	t (sekon)	Tegangan	Arus (A)	Kenaikan	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	η (%)
	10	18.00	9.43	100	0.1964	28.17	27.58	26.25	169.800	0.0196	75.286
	20	17.90	9.47	193	0.3798	28.17	27.58	26.58	169.453	0.0190	72.925
	30	17.83	9.43	287	0.5631	28.33	27.58	27.17	168.228	0.0188	72.612
	40	17.83	9.40	380	0.7464	28.33	27.58	27.25	167.633	0.0187	72.446
	50	17.90	9.37	467	0.9167	28.33	27.67	27.58	167.663	0.0183	71.162
	60	17.93	9.33	560	1.1000	28.42	27.75	27.50	167.378	0.0183	71.283
	70	18.00	9.27	660	1.2964	28.42	27.83	27.58	166.800	0.0185	72.260
	80	17.93	9.30	753	1.4798	28.50	27.92	27.67	166.780	0.0185	72.178
	90										
	100										
Rata-rata	17.92	9.38	425	0.8348	28.33	27.69	27.20	167.967	0.0187	72.519	

lubang 5 mm dan persegi	t (sekon)	Tegangan (V)	Arus (A)	Kenaikan	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	$\eta$ (%)
	10	19.70	9.80	100	0.1964	25.33	26.50	27.33	193.060	0.0196	66.215
	20	19.47	9.73	200	0.3929	25.33	26.50	27.83	189.476	0.0196	67.468
	30	19.40	9.70	303	0.5958	25.33	26.42	28.17	188.180	0.0199	68.687
	40	19.13	9.73	410	0.8054	25.33	26.50	28.50	186.231	0.0201	70.359
	50	19.10	9.67	503	0.9887	25.42	26.67	28.67	184.633	0.0198	69.699
	60	19.00	9.70	600	1.1786	25.50	26.83	28.83	184.300	0.0196	69.362
	70	19.07	9.67	703	1.3815	25.50	26.92	29.00	184.311	0.0197	69.689
	80										
	90										
	100										
Rata-rata	19.27	9.71	403	0.7913	25.39	26.62	28.33	187.170	0.0198	68.783	

lubang 8 mm dan persegi	t (sekon)	Tegangan	Arus (A)	Kenaikan (m)	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	$\eta$ (%)
	10	20.17	9.27	110	0.2161	27.58	26.92	29.00	186.88	0.0216	75.25
	20	20.00	9.33	200	0.3929	27.67	26.92	29.42	186.67	0.0196	68.48
	30	20.13	9.30	307	0.6024	27.67	26.92	29.83	187.24	0.0201	69.79
	40	20.10	9.30	407	0.7988	27.67	27.00	30.08	186.93	0.0200	69.53
	50	20.07	9.27	503	0.9887	27.67	27.08	30.25	185.95	0.0198	69.20
	60	19.83	9.23	603	1.1851	27.67	27.17	30.33	183.13	0.0198	70.19
	70	19.87	9.23	703	1.3815	27.75	27.25	30.50	183.44	0.0197	70.02
	80	19.83	9.23	787	1.5452	27.75	27.33	30.58	183.13	0.0193	68.64
	90										
	100										
Rata-rata	20.00	9.27	453	0.8888	27.68	27.07	30.00	185.42	0.0200	70.14	

lubang 10 mm dan persegi	t (sekon)	Tegangan	Arus (A)	Kenaikan (mm)	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	$\eta$ (%)
	10	18.47	9.77	103	0.2030	28.17	27.58	29.33	180.358	0.0203	73.241
	20	18.40	9.67	207	0.4060	28.17	27.58	29.83	177.867	0.0203	74.267
	30	18.30	9.70	303	0.5958	28.17	27.58	30.08	177.510	0.0199	72.816
	40	18.27	9.63	400	0.7857	28.17	27.75	30.33	175.969	0.0196	72.646
	50	18.33	9.63	500	0.9821	28.17	27.83	30.58	176.611	0.0196	72.382
	60	18.40	9.60	600	1.1786	28.25	27.83	30.75	176.640	0.0196	72.370
	70	18.47	9.57	700	1.3750	28.25	27.83	30.75	176.664	0.0196	72.360
	80	18.43	9.57	790	1.5518	28.42	27.92	30.92	176.346	0.0194	71.585
	90										
	100										
Rata-rata	18.38	9.64	450	0.8847	28.22	27.74	30.32	177.246	0.0198	72.709	

lubang 12 mm dan persegi	t (sekon)	Tegangan	Arus (A)	Kenaikan	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	$\eta$ (%)
	10	18.90	9.60	107	0.2095	24.42	22.83	26.33	181.440	0.0210	75.153
	20	18.83	9.60	197	0.3863	24.50	22.92	26.92	180.800	0.0193	69.527
	30	18.80	9.50	293	0.5762	24.50	22.83	27.33	178.600	0.0192	69.986
	40	18.73	9.50	393	0.7726	24.67	22.83	27.58	177.967	0.0193	70.634
	50	18.71	9.50	483	0.9494	24.67	22.92	27.83	177.745	0.0190	69.523
	60	18.60	9.50	580	1.1393	24.67	22.92	28.08	176.700	0.0190	69.934
	70	18.60	9.50	653	1.2833	24.92	22.92	28.17	176.700	0.0183	67.523
	80	18.63	9.50	760	1.4929	24.92	23.00	28.33	177.017	0.0187	68.606
	90										
	100										
Rata-rata	18.73	9.53	433	0.8512	24.66	22.90	27.57	178.371	0.0192	70.111	

	t (sekon)	Tegangan (V)	Arus (A)	Kenaikan	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	η (%)
lubang 5 mm dan lingkaran	10	19.93	9.57	100	0.1964	28.17	27.08	28.58	190.70	0.0196	67.04
	20	19.53	9.57	200	0.3929	28.17	27.08	29.17	186.87	0.0196	68.41
	30	19.33	9.53	307	0.6024	28.17	27.08	29.42	184.31	0.0201	70.90
	40	19.17	9.50	407	0.7988	28.17	27.08	29.67	182.08	0.0200	71.38
	50	19.07	9.47	500	0.9821	28.25	27.17	29.75	180.50	0.0196	70.82
	60	19.10	9.43	593	1.1655	28.42	27.25	30.00	180.18	0.0194	70.16
	70	19.00	9.43	693	1.3619	28.42	27.33	30.00	179.23	0.0195	70.64
	80	19.03	9.43	787	1.5452	28.58	27.33	30.17	179.55	0.0193	70.01
	90										
	100										
Rata-rata	19.27	9.49	448	0.8807	28.29	27.18	29.59	182.93	0.0196	69.92	

	t (sekon)	Tegangan	Arus (A)	Kenaikan (m)	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	η (%)
lubang 8 mm dan lingkaran	10	19.10	9.73	103	0.2030	28.58	28.08	28.58	185.91	0.0203	71.06
	20	18.93	9.77	203	0.3994	28.58	28.08	29.08	184.92	0.0200	70.28
	30	18.83	9.70	307	0.6024	28.58	28.17	29.33	182.68	0.0201	71.53
	40	18.80	9.70	403	0.7923	28.58	28.25	29.58	182.36	0.0198	70.68
	50	18.83	9.70	500	0.9821	28.58	28.33	29.83	182.68	0.0196	69.98
	60	18.80	9.67	597	1.1720	28.67	28.42	29.92	181.73	0.0195	69.95
	70	18.77	9.63	697	1.3685	28.75	28.50	30.08	180.79	0.0195	70.37
	80	18.75	9.60	790	1.5518	28.83	28.50	30.08	180.00	0.0194	70.13
	90										
	100										
Rata-rata	18.85	9.69	450	0.8839	28.65	28.29	29.56	182.63	0.0198	70.50	

	t (sekon)	Tegangan	Arus (A)	Kenaikan (mm)	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	η (%)
lubang 10 mm dan lingkaran	10	19.00	9.70	103	0.2030	24.92	26.17	27.17	184.300	0.0203	71.675
	20	18.93	9.70	203	0.3994	24.92	26.17	27.92	183.653	0.0200	70.767
	30	18.87	9.67	307	0.6024	24.92	26.17	28.25	182.378	0.0201	71.651
	40	18.77	9.63	403	0.7923	24.92	26.25	28.42	180.786	0.0198	71.300
	50	18.77	9.60	500	0.9821	24.92	26.33	28.50	180.160	0.0196	70.956
	60	18.77	9.60	597	1.1720	25.00	26.33	28.75	180.160	0.0195	70.562
	70	18.70	9.60	697	1.3685	25.00	26.50	28.75	179.520	0.0195	70.870
	80	18.70	9.60	790	1.5518	25.00	26.50	28.83	179.520	0.0194	70.319
	90										
	100										
Rata-rata	18.81	9.64	450	0.8839	24.95	26.30	28.32	181.310	0.0198	71.013	

	t (sekon)	Tegangan	Arus (A)	Kenaikan	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	η (%)
lubang 12 mm dan lingkaran	10	19.10	9.77	100	0.1964	25.08	24.50	27.25	186.543	0.0196	68.528
	20	18.97	9.77	197	0.3863	25.08	24.50	27.67	185.241	0.0193	67.860
	30	18.83	9.73	293	0.5762	25.17	24.50	27.92	183.311	0.0192	68.187
	40	18.77	9.70	390	0.7661	25.25	24.50	28.17	182.037	0.0192	68.469
	50	18.70	9.70	480	0.9429	25.25	24.50	28.25	181.390	0.0189	67.656
	60	18.60	9.63	573	1.1262	25.25	24.58	28.25	179.180	0.0188	68.174
	70	18.60	9.63	673	1.3226	25.25	24.67	28.42	179.180	0.0189	68.627
	80	18.53	9.60	767	1.5060	25.33	24.67	28.42	177.920	0.0188	68.856
	90										
	100										
Rata-rata	18.76	9.69	434	0.8528	25.21	24.55	28.04	181.850	0.0191	68.295	

	t (sekon)	Tegangan (V)	Arus (A)	Kenaikan	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	η (%)
lubang 5 mm dan silang	10	20.50	9.63	107	0.2095	27.33	26.42	28.00	197.48	0.0210	69.05
	20	20.40	9.63	210	0.4125	27.33	26.42	28.58	196.52	0.0206	68.30
	30	20.17	9.63	303	0.5958	27.33	26.42	28.83	194.27	0.0199	66.53
	40	20.03	9.57	407	0.7988	27.33	26.50	29.17	191.65	0.0200	67.81
	50	19.97	9.57	503	0.9887	27.33	26.58	29.33	191.01	0.0198	67.37
	60	19.83	9.47	603	1.1851	27.50	26.58	29.42	187.76	0.0198	68.46
	70	19.83	9.53	703	1.3815	27.58	26.67	29.50	189.08	0.0197	67.93
	80	19.80	9.50	790	1.5518	27.58	26.75	29.67	188.10	0.0194	67.11
	90										
	100										
Rata-rata	20.07	9.57	453	0.8905	27.42	26.54	29.06	191.98	0.0200	67.82	

	t (sekon)	Tegangan	Arus (A)	Kenaikan (m)	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	η (%)
lubang 8 mm dan silang	10	20.53	9.50	110	0.2161	27.00	27.67	28.50	195.07	0.0216	72.09
	20	20.30	9.47	210	0.4125	27.00	27.75	28.92	192.17	0.0206	69.85
	30	20.20	9.43	303	0.5958	27.00	27.83	29.08	190.55	0.0199	67.83
	40	20.13	9.37	407	0.7988	27.00	27.83	29.25	188.58	0.0200	68.92
	50	20.07	9.37	500	0.9821	27.08	28.00	29.33	187.96	0.0196	68.01
	60	20.07	9.37	593	1.1655	27.17	28.00	29.42	187.96	0.0194	67.26
	70	20.13	9.37	690	1.3554	27.17	28.00	29.50	188.58	0.0194	66.82
	80	20.17	9.30	790	1.5518	27.25	28.08	29.58	187.55	0.0194	67.31
	90										
	100										
Rata-rata	20.20	9.40	450	0.8847	27.08	27.90	29.20	189.80	0.0200	68.51	

	t (sekon)	Tegangan	Arus (A)	Kenaikan (mm)	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	η (%)
lubang 10 mm dan silang	10	19.13	9.80	100	0.1964	25.83	25.33	27.58	187.507	0.0196	68.176
	20	19.03	9.80	203	0.3994	25.92	25.42	28.08	186.527	0.0200	69.677
	30	18.80	9.70	297	0.5827	25.92	25.42	28.58	182.360	0.0194	69.321
	40	18.63	9.70	397	0.7792	26.00	25.42	28.92	180.743	0.0195	70.138
	50	18.47	9.70	493	0.9690	26.08	25.42	29.00	179.127	0.0194	70.414
	60	18.27	9.67	587	1.1524	26.17	25.50	29.25	176.578	0.0192	70.787
	70	18.23	9.60	687	1.3488	26.25	25.50	29.42	175.040	0.0193	71.641
	80	18.20	9.60	780	1.5321	26.42	25.50	29.58	174.720	0.0192	71.336
	90										
	100										
Rata-rata	18.60	9.70	443	0.8700	26.07	25.44	28.80	180.325	0.0194	70.186	

	t (sekon)	Tegangan	Arus (A)	Kenaikan	Volume (mm <sup>3</sup> )	T1 (C)	T2 (C)	T3 (C)	Daya (W)	Q (l/s)	η (%)
lubang 12 mm dan silang	10	17.57	10.43	110	0.2161	24.50	24.50	26.75	183.279	0.0216	76.724
	20	17.40	10.40	200	0.3929	24.50	24.50	27.08	180.960	0.0196	70.643
	30	17.40	10.33	290	0.5696	24.50	24.50	27.33	179.800	0.0190	68.728
	40	17.28	10.33	380	0.7464	24.50	24.58	27.42	178.594	0.0187	67.999
	50	17.27	10.30	460	0.9036	24.67	24.58	27.50	177.847	0.0181	66.129
	60	17.27	10.27	550	1.0797	24.67	24.58	27.58	177.271	0.0180	66.063
	70	17.27	10.23	637	1.2506	24.67	24.58	27.67	176.696	0.0179	65.802
	80	17.43	10.23	720	1.4143	24.67	24.58	27.67	178.401	0.0177	64.490
	90										
	100										
Rata-rata	17.36	10.32	418	0.8216	24.58	24.55	27.38	179.106	0.0188	68.322	

## Lampiran 2. Dokumentasi Penelitian



Instalasi Alat



Bentuk Elektroda yang dipakai



Tabung Ukur



Larutan Elektrolis Sebelum Proses dan Sesudah



Pembuktian bentuk permukaan dapat dialiri listrik