

Keterangan :

	Aliran Massa ; kg/jam	CW	Cooling Water
	Tekanan ; atm	CWR	Cooling Water Return
	Temperatur ; °C	SC	Steam Condensate
	Steam	WWTP	Waste Water Treatment Plant

NO	KODE	NAMA ALAT
1	F-110	PFAD STORAGE TANK
2	L-111	CENTRIFUGAL PUMP
3	H-112	CARTRIDGE FILTER
4	E-113	HEATER I
5	E-114	HEATER II
6	L-115	RECIPROCATING PUMP
7	F-120	HYDROGEN STORAGE TANK
8	G-121	EXPANDER I
9	E-122	HEAT EXCHANGER I
10	E-123	HEATER III
11	R-210	HYDRODEOXYGENATION REACTOR
12	G-124	EXPANDER II
13	E-125	HEAT EXCHANGER II
14	E-126	HEATER IV
15	K-211	PRESSURE VALVE
16	E-212	COOLER I
17	H-213	THREE-PHASE SEPARATOR
18	L-214	CENTRIFUGAL PUMP
19	E-215	HEATER V
20	K-220	HYDROCRACKING REACTOR
21	E-221	COOLER II
22	E-222	COOLER III
23	H-310	FLASH DRUM
24	K-311	PRESSURE VALVE
25	E-312	HEATER VI
26	D-320	DISTILLATION COLUMN
27	E-321	CONDENSER
28	F-322	ACCUMULATOR
29	L-323	CENTRIFUGAL PUMP
30	F-324	NAPHTHA STORAGE TANK
31	H-325	REBOILER
32	L-326	CENTRIFUGAL PUMP
33	E-327	COOLER IV
34	F-328	BIOAVTUR STORAGE TANK

ALIRAN MASSA

Komponen	Masa (Kg/jam)																																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	
C ₁₆ H ₃₂ O ₂	10355,982	10355,98	10,35598	10345,626	10345,63	10345,63	10345,63							36,94866	36,94866	36,94866		36,94866		36,94866	0,0000014	36,94865		36,94865	36,94865	36,94865	36,94865	0,0000000	36,94865	36,94865	36,94865	0,000381	0,000381	0,000381	0,000381	0,0000011	0,000369	36,94866	0,000381	36,94828	36,94828	36,94828			
C ₁₆ H ₃₂ O ₂	7238,0298	7238,03	7,23803	7230,7918	7230,792	7230,792	7230,792							25,82426	25,82426	25,82426		25,82426		25,82426	0,0000002	25,82425		25,82425	25,82425	25,82425	25,82425	0,0000000	25,82425	25,82425	25,82425	0,000266	0,000266	0,000266	0,0000008	0,000258	25,82426	0,000266	25,824	25,824	25,824				
C ₁₆ H ₃₂ O ₂	944,27052	944,2705	0,944271	943,32625	943,3263	943,3263	943,3263							3,369022	3,369022	3,369022		3,369022		3,369022	0,0000000	3,369022		3,369022	3,369022	3,369022	3,369022	0,0000000	3,369022	3,369022	3,369022	0,00003	0,00003	0,00003	0,0000001	0,000034	3,369023	3,47E-05	3,368988	3,368988	3,368988				
C ₁₆ H ₃₂ O ₂	1535,2144	1535,214	1,535214	1533,6792	1533,679	1533,679	1533,679							5,477426	5,477426	5,477426		5,477426		5,477426	0,0000001	5,477425		5,477425	5,477425	5,477425	5,477425	0,0000000	5,477425	5,477425	5,477425	0,000006	0,000006	0,000006	0,0000006	0,0000002	0,000055	5,477427	5,64E-05	5,47737	5,47737	5,47737			
C ₁₆ H ₃₂ O ₂	289,27324	289,2732	0,289273	288,98397	288,984	288,984	288,984							1,032086	1,032086	1,032086		1,032086		1,032086	0,0000001	1,032085		1,032085	1,032085	1,032085	1,032085	0,0000000	1,032085	1,032085	1,032085	0,000001	0,000001	0,000001	0,0000000	0,0000010	1,032085	1,06E-05	1,032075	1,032075	1,032075				
C ₁₆ H ₃₂ O ₂	293,40572	293,4057	0,293406	293,11231	293,1123	293,1123	293,1123							1,04683	1,04683	1,04683		1,046828		1,046828	0,0000002	1,046828		1,046828	1,046828	1,046828	1,046828	0,0000000	1,046828	1,046828	1,046828	0,000001	0,000001	0,000001	0,0000000	0,0000010	1,046828	1,08E-05	1,046818	1,046818	1,046818				
C ₁₆ H ₃₈														8711,692	8711,692	8711,692		8711,692		8711,692	0,0000002	8711,692	0,0000052	8711,692	8711,692	8711,692	8711,692	0,0000000	8711,692	8711,692	8711,692	0,000359	0,000359	0,000359	0,0000010	0,000348	34,84678	0,000359	34,84642	34,84642	34,84642				
C ₁₆ H ₃₄														9103,305	9103,305	9103,305		9103,305		9103,305	0,0000007	9103,305	0,0000000	9103,305	9103,305	9103,305	9103,305	0,0000000	9103,305	9103,305	9103,305	0,000375	0,000375	0,000375	0,0000011	0,000364	36,41323	0,000375	36,41285	36,41285	36,41285				
C ₁₆ H ₃₉														250,1463	250,1463	250,1463		250,1463		250,1463	0,0000006	250,1463	0,0000000	250,1463	250,1463	250,1463	250,1463	0,0000000	250,1463	250,1463	250,1463	0,002577	0,002577	0,002577	0,0000010	0,002501	250,1463	0,002577	250,1438	250,1438	250,1438				
C ₁₆ H ₃₉														250,1463	250,1463	250,1463		250,1463		250,1463	0,0000006	250,1463	0,0000000	250,1463	250,1463	250,1463	250,1463	0,0000000	250,1463	250,1463	250,1463	0,002577	0,002577	0,002577	0,0000010	0,002501	250,1463	0,002577	250,1438	250,1438	250,1438				
C ₁₆ H ₃₉														2891,423	2891,423	2891,423		2891,423		2891,423	0,0000349	2891,423	2891,423	2891,423	2891,423	2891,423	2891,423	0,0000000	2891,423	2891,423	2891,423	0,029783	0,029783	0,029783	0,029783	0,000869	0,028914	2891,423	0,029783	2891,394	2891,394	2891,394			
C ₁₆ H ₃₆														248,3497	248,3497	248,3497		248,3497		248,3497	0,0000005	248,3497	0,0000001	248,3497	248,3497	248,3497	248,3497	0,0000000	248,3497	248,3497	248,3497	0,034861	0,034861	0,034861	0,001017	0,033844	3384,385	0,034861	3384,35	3384,35	3384,35				
C ₁₆ H ₃₄														2879,007	2879,007	2879,007		2879,007		2879,007	0,0001334	2879,005	2879,005	2879,005	2879,005	2879,005	2879,005	0,029656	0,029656	0,029656	0,029656	0,029656	0,029656	0,000866	0,028790	2879,006	0,029656	2878,976	2878,976	2878,976					
C ₁₆ H ₃₂														3076,421	3076,421	3076,421		3076,421		3076,421	0,0071626	3076,413	3076,413	3076,413	3076,413	3076,413	3076,413	0,031689	0,031689	0,031689	0,031689	0,031689	0,031689	0,000925	0,030764	3076,414	0,031689	3076,383	3076,383	3076,383					
H ₂								691,8011	536,4699	155,3312	536,4699	536,4699	536,4699	4,967072	4,967072	4,967072		4,967072		4,967072	155,3312	4,967072	155,3312	4,967072	4,967072	4,967072	4,967072		155,3312																
CO ₂								0,069187	0,053652	0,015535	0,053652	0,053652	0,053652	0,053652	0,053652	0,053652		0,053652		0,053652	0,015535	0,053652	0,015535	0,053652	0,053652	0,053652		0,015535	0,015535	0,015535	0,0155347														
H ₂ O														2779,831	2779,831	2779,831		2779,831		2779,831		2779,831	0,001382		2779,830																				
C ₆ H ₁₄																																													
C ₆ H ₁₂																																													
Impurities	208,64824	208,6482	207,605	1,0432412	1,043241	1,043241	1,043241							1,043241	1,043241	1,043241		1,043241		1,043241		1,043241		1,0432																					
Total	20864,824	20864,82	228,2612	20636,563	20636,56	20636,56	20636,56	691,87029	536,5235	155,3468	536,5235	536,5235	536,5235	21173,09	21173,09	21173,09	155,3468	21173,09	155,3468	21173,09	5,0221465	18387,19	2780,873	18387,19	18387,19	18387,19	155,3468	18542,54	18542,54	18542,54	8,14227	18534,4	18534,4	18534,4	6085,754	6085,754	6085,754	6085,754	177,6211	5908,133	18712,02	6085,754	12626,26	12626,26	12626,26

Dosen Pembimbing:
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Disetujui dan Disahkan Oleh:

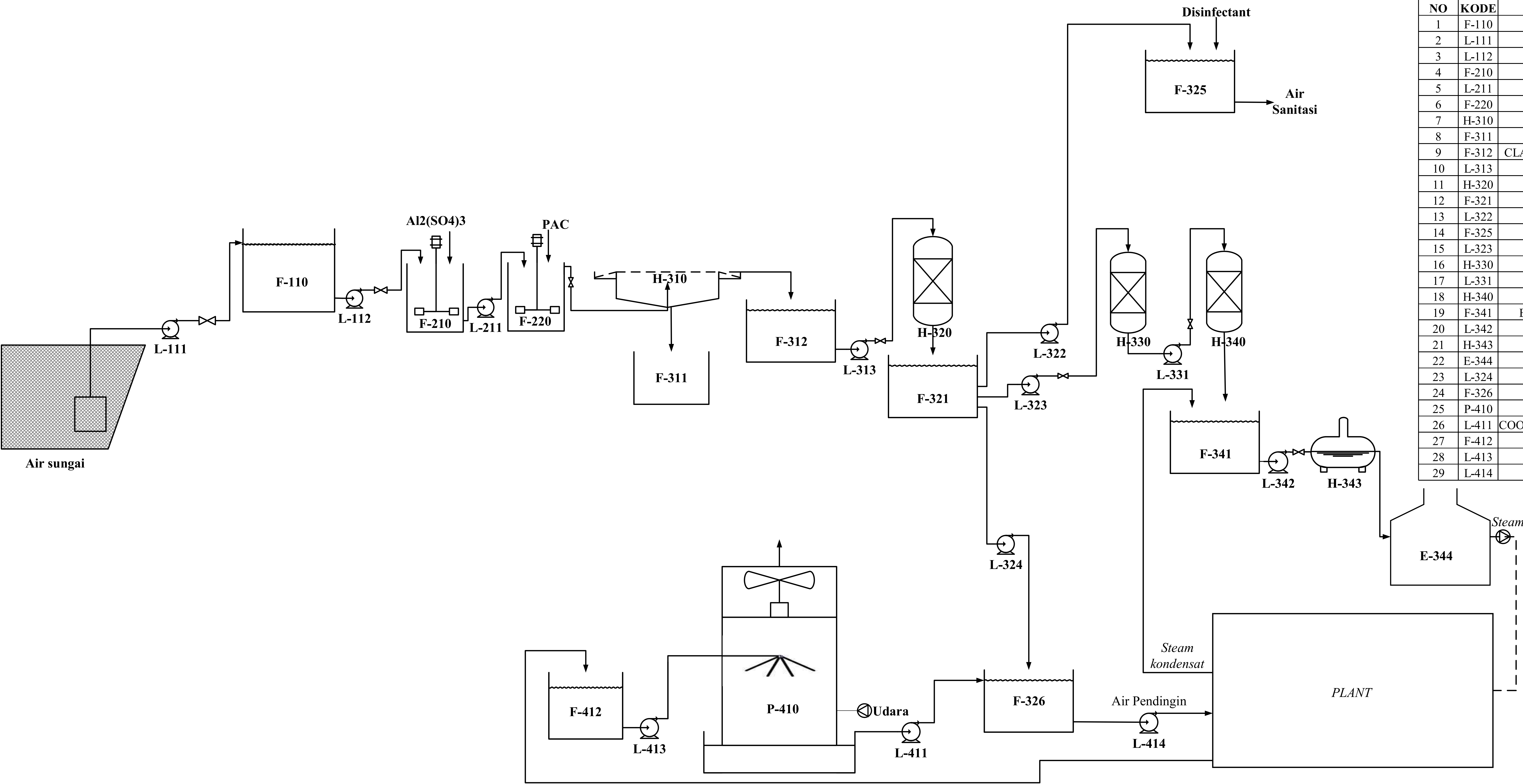
Erwan Adi Saputro, S.T., M.T., Ph.D

**FLWSHEET PRA RANCANGAN PABRIK BIOAVTUR DARI
PALM FATTY ACID DISTILLATE
MENGGUNAKAN PROSES HYDROPROCESS ESTER AND FATTY ACID**



**PROGRAM STUDI TEKNIK KIMIA
FAKULTAS TEKNIK DAN SAINS
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NASIONAL
“VETERAN” JAWA TIMUR
2026**

FLOWSHEET UTILITAS PRA RANCANGAN PABRIK BIOAVTUR DARI PALM FATTY ACID DISTILLATE
 MENGGUNAKAN PROSES *HYDROPROCESSED ESTERS AND FATTY ACID* DENGAN KAPASITAS 100.000 TON/TAHUN



NO	KODE	NAMA ALAT
1	F-110	EQUALIZATION TANK
2	L-111	EQUALIZATION PUMP
3	L-112	COAGULATION TANK PUMP
4	F-210	COAGULATION TANK
5	L-211	FLOCCULATION TANK PUMP
6	F-220	FLOCCULATION TANK
7	H-310	CLARIFIER
8	F-311	FLOC COLLECTION TANK
9	F-312	CLARIFIED CLEAN WATER STORAGE TANK
10	L-313	SAND FILTER PUMP
11	H-320	SAND FILTER
12	F-321	CLEAN WATER STORAGE TANK
13	L-322	SANITARY WATER PUMP
14	F-325	SANITARY WATER STORAGE TANK
15	L-323	CATION EXCHANGER PUMP
16	H-330	CATION EXCHANGER
17	L-331	ANION EXCHANGER PUMP
18	H-340	ANION EXCHANGER
19	F-341	BOILER FEED WATER STORAGE TANK
20	L-342	DEAERATOR PUMP
21	H-343	DEAERATOR
22	E-344	BOILER
23	L-324	COOLING WATER STORAGE PUMP
24	F-326	COOLING WATER STORAGE TANK
25	P-410	COOLING TOWER
26	L-411	COOLING TOWER TO COOLING WATER PUMP
27	F-412	COOLING WATER RECYCLE TANK
28	L-413	COOLING TOWER PUMP
29	L-414	COOLING WATER PUMP TO PLANT

Disusun Oleh:
1.Ayu Rosyida Zam Zam (22031010132)

Dosen Pembimbing:
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 MENGGUNAKAN PROSES *HYDROPROCESS ESTER AND FATTY ACID*



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