

BAB V

NERACA MASSA

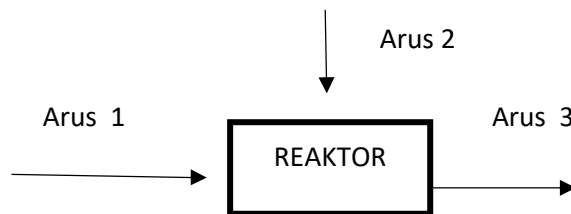
5.1 Neraca Massa Keseluruhan

Kapasitas produk	: 70.000 Ton Per Tahun
	: 8.838,384 kg/jam
Diambil dalam satu tahun kerja	: 330 hari kerja
1 hari kerja	: 24 jam
Basis perhitungan	: 100 kg/jam HDPE
Kapasitas produksi	: 70.000 Ton Per Tahun
Faktor pengali	$= \frac{\text{Produksi perjam}}{\text{Produksi berdasarkan basis perhitungan}}$ $= \frac{8.838,384}{362,400} \text{ kg/jam} = 243,884941$

5.2 Neraca Massa

5.2.1 Neraca Massa Reaktor

Fungsi : Mereaksikan HDPE dengan N₂



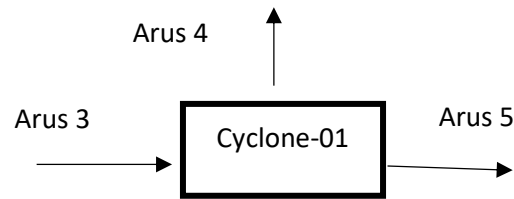
Tabel 5. 1 Neraca Massa di Reaktor

No	Komponen	Input (kg /jam)		Output (kg /jam)
		Arus 1	Arus 2	Arus 3
1	HDPE	24.388,494		
2	N ₂		2,439	2,439
3	Char			11.633,313
4	LPG			2.396,699

5	Gasoline			9.244,955
6	Gas Oil			1.113,527
Jumlah		24.388,494	2,439	24.390,933
Total		24.390,933		24.390,933

5.2.2 Neraca Massa Cyclone-01

Fungsi : Mengeluarkan 95% char yang ada

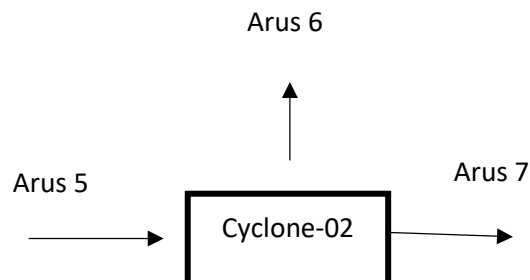


Tabel 5. 2 Neraca Massa di Cyclone-01

No	Komponen	Input (kg / jam)	Output (kg /jam)	
		Arus 3	Arus 4	Arus 5
1	N ₂	2,439		2,439
2	Char	11.633,313	11.051,647	581,666
3	LPG	2.396,699		2.396,699
4	Gasoline	2761,788		9.244,955
5	Gas Oil	332,649		1.113,527
Jumlah		24.390,933	11.051,647	13.339,286
Total		24.390,933		

5.2.3 Neraca Massa Cyclone-02

Fungsi : Mengeluarkan 100% char yang ada

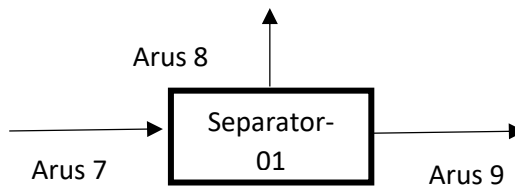


Tabel 5. 3 Neraca Massa di Cyclone-02

No	Komponen	Input (kg / Jam)	Output (kg / Jam)	
		Arus 5	Arus 6	Arus 7
1	N ₂	2,439		2,439
2	Char	581,666		
3	LPG	2.396,699		2.396,699
4	Gasoline	9.244,955		9.244,955
5	Gas Oil	1.113,527		1.113,527
Jumlah		13.339,286	581,666	12.757,620
Total		13.339,286	13.339,286	

5.2.4 Neraca Massa Separator-01

Fungsi : Memisahkan komponen fase gas dan fase cair

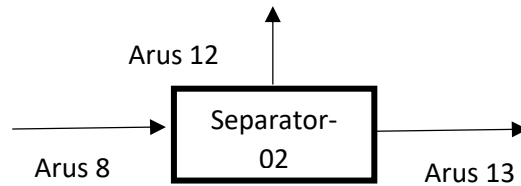


Tabel 5. 4 Neraca Massa di Sparator-01

No	Komponen	Input (kg / Jam)	Output (kg / Jam)	
		Arus 7	Arus 8	Arus 9
1	N ₂	2,439	2,439	
2	LPG	2.396,699	2.396,699	
3	Gasoline	9.244,955		9.244,955
4	Gas Oil	1.113,527		1.113,527
Jumlah		12.757,620	2.396,699	10.358,482
Total		12.757,620	12.757,620	

5.2.5 Neraca Massa Separator-02

Fungsi : Memisahkan N₂ dan LPG yang keluar dari separator-01

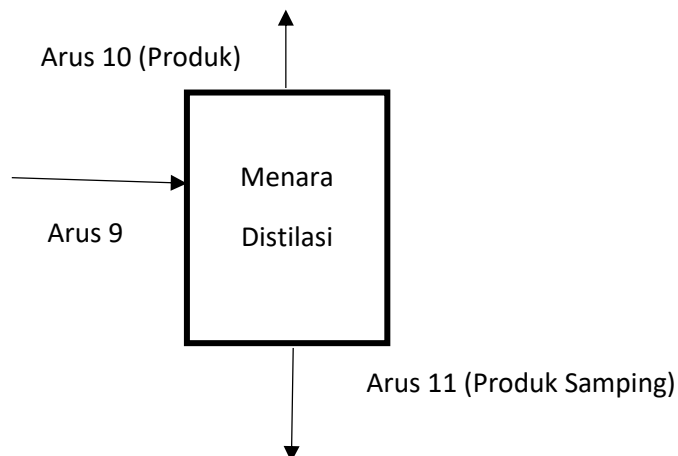


Tabel 5. 5 Neraca Massa di Sparator-02

No	Komponen	Input (kg /jam)	Output (kg /jam)	
		Arus 8	Arus 12	Arus 13
1	N ₂	2,439	2,439	
2	LPG	2.396,699		2.396,699
Total		2.396,699	2.396,699	

5.2.6 Neraca Massa Menara Distilasi (M DST 1)

Fungsi : Memurnikan *Gasoline*



Tabel 5. 6 Neraca Massa di Menara Distilasi

No	Komponen	Input (kg /jam)	Output (kg /jam)	
		Arus 9	Arus 10	Arus 11
1	N ₂	9.244,955	8.782,707	462,248

2	LPG	1.113,527	55,676	1.057,851
Total		10.358,482	8.838,384	1.520,098
			10.358,482	

Neraca Massa Total :

Reflux = 0,749913218

Sistem Kondensor = $V = L_0 + D$

$R = L_0 / D$

$L_0 = R \times D = 5,063 \text{ kg/jam}$

$V_0 = L_0 + D = 5,063 + 3,617 = 8,680 \text{ kg/jam}$

No	Komponen	Input (kg /jam)	Output (kg /jam)	Prosentase
		Arus 10	Arus 12	
1	Gasoline	8.782,707	8.782,707	99%
2	Gas Oil	55,676	55,676	1%
Jumlah		8.838,384	8.838,384	100%

Sistem Reboiler :

$L = L_0 + F = 507,4457 \text{ kg/jam}$

$L = VB + B$

$VB = L - B = 416,6244 \text{ kg/jam}$

No	Komponen	Input (kg /jam)	Output (kg /jam)	Prosentase
		Arus 11	Arus 11	
1	Gasoline	462,248	462,248	30%
2	Gas Oil	1.057,851	1.057,851	70%
Jumlah		1.520,098	1.520,098	100%