

**BAB V**  
**NERACA MASSA**

5.1 Neraca Massa Keseluruhan

Basis perhitungan neraca massa :

- a. Kapasitas rancangan/tahun : 100.000 Ton/Tahun
- b. Waktu Operasi : 330 Hari
- c. Satu Hari Kerja : 24 Jam
- d. Produk yang diinginkan : 100.000Ton/Tahun

$$100.000 \frac{\text{Ton}}{\text{Tahun}} \times \frac{1000 \text{ Kg}}{1 \text{ Tahun}} \times \frac{1 \text{ Th}}{330 \text{ Hr}} \times \frac{1 \text{ Hari}}{24 \text{ Jam}}$$

: 12626,263 Kg/Jam

- e. Proses yang terjadi : Kontinyu

5.2 Neraca Massa Tiap Alat

**NM : (Massa masuk) + (Produksi) = (Massa Keluar) + (Akumulasi)**

5.2.1 Neraca Massa *Cooler*

Tabel 5.1 Neraca Massa *Cooler*

<b>Komponen</b>	<b>Arus 1</b>	<b>Arus 2</b>
	<b>Input (Kg/jam)</b>	<b>Output (Kg/jam)</b>
CO <sub>2</sub>	4020,88182	4020,88182
H <sub>2</sub> O	483,2971822	483,2971822
O <sub>2</sub>	753,6798163	753,6798163
N <sub>2</sub>	9190,37168	9190,37168
SO <sub>2</sub>	45,22078898	45,22078898
NO <sub>x</sub>	1,300097683	1,300097683
Fly Ash	0,004710499	0,004710499
<b>Total</b>	<b>14494,7561</b>	<b>14494,7561</b>

### 5.2.2 Neraca Massa *Evaporator*

Tabel 5.2 Neraca Massa *Evaporator*

<b>Komponen</b>	<b>Arus 3</b>	<b>Arus 4</b>
	<b>Input (Kg/jam)</b>	<b>Output (Kg/jam)</b>
NH <sub>4</sub> OH	14503,89355	
NH <sub>3</sub>		14431,37408
H <sub>2</sub> O		72,51946774
<b>Total</b>	<b>14503,89355</b>	<b>14503,89355</b>

### 5.2.3 Neraca Massa *Reaktor*

Tabel 5.3 Neraca Massa *Reaktor*

<b>Komponen</b>	<b>Arus 2</b>	<b>Arus 4</b>	<b>Arus 5</b>
	<b>Input (Kg/Jam)</b>		<b>Output (Kg/Jam)</b>
CO <sub>2</sub>	4020,88182		4020,88182
H <sub>2</sub> O	483,2971822	72,51946774	543,35267
O <sub>2</sub>	753,6798163		742,8223049
N <sub>2</sub>	9190,37168		9190,37168
SO <sub>2</sub>	45,22078898		0,90441578
NO <sub>x</sub>	1,300097683		1,300097683
Fly Ash	0,004710499		0,004710499
NH <sub>3</sub>		14431,37408	120,7706675
(NH <sub>4</sub> ) <sub>2</sub> SO <sub>3</sub>			2173,145878
(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>			12205,02642
<b>Total</b>	14494,7561	14503,89355	<b>28998,6</b>
	<b>28998,6</b>		

### 5.2.4 Neraca Massa ESP

Tabel 5.4 Neraca Massa ESP

Komponen	Arus 5	Arus 6	Arus 7
	Input (Kg/Jam)	Output (Kg/Jam)	
CO <sub>2</sub>	4020,88182		4020,88182
H <sub>2</sub> O	543,35267		543,35267
O <sub>2</sub>	742,8223049		742,8223049
N <sub>2</sub>	9190,37168		9190,37168
SO <sub>2</sub>	0,90441578		0,90441578
NO <sub>x</sub>	1,300097683		1,300097683
Fly Ash	0,004710499		0,004710499
NH <sub>3</sub>	120,7706675		120,7706675
(NH <sub>4</sub> ) <sub>2</sub> SO <sub>3</sub>	2173,145878	543,2864694	1629,859408
(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	12205,02642	12082,97616	122,0502642
<b>Total</b>	<b>28998,6</b>	<b>12626,3</b>	<b>16372,3</b>
		<b>28998,6</b>	