

LAMPIRAN I

Tabel 1. Specific Gravity and Concentration of Caustic Soda Solution

$d^{20^{\circ}\text{C}}$	Bé	NaOH %	NaOH g/ℓ	$d^{20^{\circ}\text{C}}$	Bé	NaOH %	NaOH g/ℓ
1.007	1	0.59	6.0	1.220	26	19.65	239.7
1.014	2	1.20	12.0	1.231	27	20.60	253.6
1.022	3	1.85	18.9	1.241	28	21.55	267.4
1.029	4	2.50	25.7	1.252	29	22.50	281.7
1.036	5	3.15	32.6	1.263	30	23.50	295.8
1.045	6	3.79	39.9	1.274	31	24.48	311.9
1.052	7	4.56	47.3	1.285	32	25.50	327.7
1.060	8	5.20	55.0	1.297	33	26.58	344.7
1.067	9	5.86	62.5	1.308	34	27.65	361.7
1.075	10	6.58	70.7	1.320	35	28.83	380.6
1.083	11	7.30	79.1	1.332	36	30.00	399.6
1.091	12	8.07	88.0	1.345	37	31.20	419.6
1.100	13	8.78	96.6	1.357	38	32.50	441.0
1.108	14	9.50	105.3	1.370	39	33.73	462.1
1.116	15	10.30	114.9	1.383	40	35.00	484.1
1.125	16	11.06	124.4	1.397	41	36.36	507.9
1.134	17	11.90	134.9	1.410	42	37.65	530.9
1.142	18	12.69	145.0	1.424	43	39.06	556.2
1.152	19	13.50	155.5	1.438	44	40.47	582.0
1.162	20	14.35	166.7	1.453	45	42.02	610.6
1.171	21	15.15	177.4	1.468	46	43.58	639.8
1.180	22	16.00	188.8	1.483	47	45.16	669.7
1.190	23	16.91	201.2	1.498	48	46.73	700.0
1.200	24	17.81	213.7	1.514	49	48.41	732.9
1.210	25	18.71	226.4	1.530	50	50.10	766.5

LAMPIRAN II

Tabel 2. Kecepatan Standar Tiap Jenis Kain pada Mesin *Amonia Treatment* Range

No.	Jenis kain	Kode kain	Kecepatan mesin
1	Cotton Dobby (kain katun anyaman dobby)	CD9565	40 m/menit
2		CD9569	40 m/menit
3		CD9593	40 m/menit
4		CD9450	40 m/menit
5		CD9453	40 m/menit
6		CD9454	40 m/menit
7		CD9425	40 m/menit
8		CD9441	40 m/menit
9		CD82210	32 m/menit
10		CD9557	40 m/menit
11		CD9558	40 m/menit
12		CD9445	40 m/menit
13		CD9597	39 m/menit
14		CD8221	35 m/menit
15		CD10230	36 m/menit
16		CD9589	37 m/menit
17	Cotton Plain (kain katun anyaman polos)	CA80203	36 m/menit
18		CA50210	35 m/menit
19		CA10224	35 m/menit
20		CA40200	35 m/menit
21		CA50402	35 m/menit
22		CA40191	35 m/menit
23		CA5042	35 m/menit
24		CA40195	33 m/menit
25		CA3636	35 m/menit
26		CA40185	33 m/menit
27		CA40195	33 m/menit
28		CA50220	32 m/menit
29		CA47180	30 m/menit
30		CA20129	28 m/menit

Tabel 2. Kecepatan Standar Tiap jenis Kain Pada Mesin *Amonia Treatment* Range (Lanjutan)

No.	Jenis kain	Kode kain	Kecepatan mesin
31	Cotton Twill (kain katun anyaman kepper)	CA40201	25 m/menit
32		CB5056	28 m/menit
33		CB30205	25 m/menit
34		CB22165	16 m/menit
35		CB20170	15 m/menit
36	T/C dan CVC (kain polyester kapas, dan kain campuran polyester kapas 55% dan kapas 45%)	VA50222	40 m/menit
37		VA50214	40 m/menit
38		VA4422	40 m/menit
39		VA4411	40 m/menit
40		SA8208	40 m/menit
41		TA4420	40 m/menit
42		VA40454	37 m/menit
43		VA30186	33 m/menit
44		VA2126	29 m/menit
45		VA2121	29 m/menit
46		VA20135	27 m/menit
47		VB20165	20 m/menit
48		VB2020	18 m/menit

LAMPIRAN III

Table 3. Saturation Table of Ammonia

Temperature - t_s - (°C)	Saturated Properties						Superheated Properties ($t - t_s$)			
	Pressure - p_s - (bar)	Specific Volume - v_f - (m ³ /kg)	Specific Enthalpy		Specific Entropy		50 K		100 K	
			saturated liquid - h_f - (kJ/kg)	saturated vapor - h_g - (kJ/kg)	saturated liquid - s_f - (kJ/kgK)	saturated vapor - s_g - (kJ/kgK)	Specific Enthalpy - h - (kJ/kg)	Specific Entropy - s - (kJ/kgK)	Specific Enthalpy - h - (kJ/kg)	Specific Entropy - s - (kJ/kgK)
-50	0.4089	2.625	-44.4	1373.3	-0.194	6.159	1479.8	6.592	1585.9	6.948
-45	0.5454	2.005	-22.3	1381.6	-0.096	6.057	1489.3	6.486	1596.1	6.839
-40	0.7177	1.552	0	1390.0	0	5.962	1498.6	6.387	1606.3	6.736
-35	0.9322	1.216	22.3	1397.9	0.095	5.872	1507.9	6.293	1616.3	6.639
-30	1.196	0.9633	44.7	1405.6	0.188	5.785	1517.0	6.203	1626.3	6.547
-28	1.317	0.8809	53.6	1408.5	0.224	5.751	1520.7	6.169	1630.3	6.512
-26	1.447	0.8058	62.6	1411.4	0.261	5.718	1524.3	6.135	1634.2	6.477
-24	1.588	0.7389	71.7	1414.3	0.297	5.686	1527.9	6.103	1638.2	6.444
-22	1.740	0.6783	80.8	1417.3	0.333	5.655	1531.4	6.071	1642.2	6.411
-20	1.902	0.6237	89.8	1420.0	0.368	5.623	1534.8	6.039	1646.0	6.379
-18	2.077	0.5743	98.8	1422.7	0.404	5.593	1538.2	6.008	1650.0	6.347
-16	2.265	0.5296	107.9	1425.3	0.440	5.563	1541.7	5.978	1653.8	6.316
-14	2.465	0.4890	117.0	1427.9	0.475	5.533	1545.1	5.948	1657.7	6.286
-12	2.680	0.4521	126.2	1430.5	0.510	5.504	1548.5	5.919	1661.5	6.256
-10	2.908	0.4185	135.4	1433.0	0.544	5.475	1551.7	5.891	1665.3	6.227
-8	3.153	0.3879	144.5	1435.3	0.579	5.447	1554.9	5.863	1669.0	6.199
-6	3.413	0.3599	153.6	1437.6	0.613	5.419	1558.2	5.836	1672.8	6.171
-4	3.691	0.3344	162.8	1439.9	0.647	5.392	1561.4	5.808	1676.4	6.143
-2	3.983	0.3110	172.0	1442.2	0.681	5.365	1564.6	5.782	1680.1	6.116
0	4.295	0.2895	181.2	1444.4	0.715	5.340	1567.8	5.756	1683.9	6.090
2	4.625	0.2699	190.4	1446.5	0.749	5.314	1570.9	5.731	1687.5	6.065
4	4.975	0.2517	199.7	1448.5	0.782	5.288	1574.0	5.706	1691.2	6.040
6	5.346	0.2351	209.1	1450.6	0.816	5.263	1577.0	5.682	1694.9	6.015
8	5.736	0.2198	218.5	1452.5	0.849	5.238	1580.1	5.658	1698.4	5.991
10	6.149	0.2056	227.8	1454.3	0.881	5.213	1583.1	5.634	1702.2	5.967
12	6.585	0.1926	237.2	1456.1	0.914	5.189	1586.0	5.611	1705.7	5.943
14	7.045	0.1805	246.6	1457.8	0.947	5.165	1588.9	5.588	1709.1	5.920
16	7.529	0.1693	256.0	1459.5	0.979	5.141	1591.7	5.565	1712.5	5.898
18	8.035	0.1590	265.5	1461.1	1.012	5.118	1594.4	5.543	1715.9	5.876
20	8.570	0.1494	275.1	1462.6	1.044	5.095	1597.2	5.521	1719.3	5.854
22	9.134	0.1405	284.6	1463.9	1.076	5.072	1600.0	5.499	1722.8	5.832
24	9.722	0.1322	294.1	1465.2	1.108	5.049	1602.7	5.478	1726.3	5.811
26	10.34	0.1245	303.7	1466.5	1.140	5.027	1605.3	5.458	1729.6	5.790
28	10.99	0.1173	313.4	1467.8	1.172	5.005	1608.0	5.437	1732.7	5.770
30	11.67	0.1106	323.1	1468.9	1.204	4.984	1610.5	5.417	1735.9	5.750
32	12.37	0.1044	332.8	1469.9	1.235	4.962	1613.0	5.397	1739.3	5.731
34	13.11	0.0986	342.5	1470.8	1.267	4.940	1615.4	5.378	1742.6	5.711
36	13.89	0.0931	352.3	1471.8	1.298	4.919	1617.8	5.358	1745.7	5.692
38	14.70	0.0880	362.1	1472.6	1.329	4.898	1620.1	5.340	1748.7	5.674
40	15.54	0.0833	371.9	1473.3	1.360	4.877	1622.4	5.321	1751.9	5.655
42	16.42	0.0788	381.8	1473.8	1.391	4.856	1624.6	5.302	1755.0	5.637
44	17.34	0.0746	391.8	1474.2	1.422	4.835	1626.8	5.284	1758.0	5.619
46	18.30	0.0706	401.8	1474.5	1.453	4.814	1629.0	5.266	1761.0	5.602
48	19.29	0.0670	411.9	1474.7	1.484	4.793	1631.1	5.248	1764.0	5.584
50	20.33	0.0635	421.9	1474.7	1.515	4.773	1633.1	5.230	1766.8	5.567

- Ammonia Molecular weight : 17.03 g/mol
- Ammonia Melting point : -78°C
- Ammonia Latent heat of fusion (1,013 bar, at triple point) : 331.37 kJ/kg
- Ammonia Liquid [Density](#) (1.013 bar at boiling point) : 682 kg/m³ (250 K : 669 kg/m³) (300 K : 600 kg/m³) (400 K : 346 kg/m³)
- Ammonia Liquid [Specific Heat](#) (c_p) (250 K : 4.52 kJ/kg.K) (300 K : 4.75 kJ/kg.K) (400 K : 6.91 kJ/kg.K)
- Ammonia Liquid/gas equivalent (1.013 bar and 15°C (59°F)) : 947 vol/vol
- Ammonia Liquid [Dynamic \(Absolute\) Viscosity](#) (223K (-50°C): 3.061 10⁻⁴ Ns/m²) (273K (0°C): 2.388 10⁻⁴ Ns/m²) (323K (50°C): 1.862 10⁻⁴ Ns/m²)
- Ammonia Liquid Thermal Conductivity (250 K : 592 10⁶ kW/m.K) (300 K : 477 10⁶ kW/m.K) (400 K : 207 10⁶ kW/m.K)
- Ammonia Boiling point (1.013 bar) : -33.5°C
- Ammonia Latent heat of vaporization (1.013 bar at boiling point) : 1371.2 kJ/kg
- Ammonia Vapor pressure (at 21°C or 70°F) : 8.88 bar
- Ammonia Critical point - Critical temperature : 132.4°C - Critical pressure : 112.8 bar
- Ammonia [Gas Density](#) (1.013 bar at boiling point) : 0.86 kg/m³
- Ammonia [Gas Density](#) (1.013 bar and 15°C (59°F)) : 0.73 kg/m³
- Ammonia Gas Compressibility Factor (Z) (the ratio of the actual volume of the gas to the volume determined according to the perfect gas law) (1.013 bar and 15°C (59°F)) : 0.9929
- Ammonia Gas [Specific Gravity](#) (air = 1) (1.013 bar and 21°C (70°F)) : 0.597
- Ammonia Gas Specific volume (1.013 bar and 21°C (70°F)) : 1.411 m³/kg
- Ammonia Gas [Specific Heat](#) at constant pressure (c_p) (1.013 bar and 15°C (59°F)) : 0.037 kJ/(mol.K)
- Ammonia Gas [Specific Heat](#) at constant volume (c_v) (1.013 bar and 15°C (59°F)) : 0.028 kJ/(mol.K)
- Ammonia Gas [Ratio of Specific Heats](#) (Gamma: c_p/c_v) (1.013 bar and 15°C (59°F)) : 1.309623
- Ammonia Gas [Dynamic Viscosity](#) (1.013 bar and 0°C (32°F)) : 0.000098 Poise
- Ammonia Gas Thermal conductivity (1.013 bar and 0°C (32°F)) : 22.19 mW/(m.K)
- Ammonia Gas Solubility in water (1.013 bar and 0°C (32°F)) : 862 vol/vol
- Ammonia Gas Auto ignition temperature : 630°C



LAMPIRAN IV

Kode Pada Diagram Alir *Ammonia Recovery System*

Kode Pada Diagram Alir *Ammonia Recovery System* diantaranya :

1. PT-0001 menunjukkan keadaan pada silinder palmer
2. PT-0002 menunjukkan keadaan pada *box steamer*
3. PT-0003 menunjukkan keadaan pada *seal box*
4. AB-0301 menunjukkan Absorber 1
5. AB-0302 menunjukkan Absorber 2
6. AB-0303 menunjukkan Absorber 3
7. SC-0701 menunjukkan *scrubber*
8. E-0401 menunjukkan *pre-heater*
9. E-0402 menunjukkan *heat exchanger*
10. PC-0401 menunjukkan parsial kondensor 1
11. PC-0402 menunjukkan parsial kondensor 2 (brine kondensor)
12. MS-0401 menunjukkan mis separator
13. OS-0101 menunjukkan separator 1
14. OS-0101 menunjukkan separator 2
15. CD-0201 menunjukkan kondesor
16. HR-0201 menunjukkan tanki penerima tekanan tinggi
17. FT-0101 menunjukkan *flush tank 1*
18. FT-0001 menunjukkan *flush tank 2*
19. CT-0502-1 dan CT-0502-2 menunjukkan Cooling tower

Ketentuan tiap kode :

1. LCV-0001 = 50%
2. LCV-0101 = 40%
3. LCV-0002 = 75%
4. PCV-0101 = 0,3 %
5. PCV-0201 = 15 kPa
6. PCV-0301 = -100 Pa
7. PCV-0302 = -120 Pa
8. PCV-0303 = -150 Pa