

ภาคผนวก ข

ตารางแสดงคุณสมบัติความดันไอของแอมโมเนียที่อุณหภูมิต่างๆ

Table A.25. Properties of ammonia saturated liquid and vapor in SI units*

Temp., °C	Press., kPa	Enthalpy, kJ/kg		Entropy, kJ/kg·K		Liquid, ρ_f kg/m ³	Vapor, v_g L/kg
		h_f	h_g	s_f	s_g		
-78	5.90	-149.12	1342.19	-0.5008	7.1410	734.3	16084.
-76	6.92	-140.37	1345.93	-0.4549	7.0828	732.1	13853.
-74	8.08	-130.44	1349.65	-0.4055	7.0260	729.8	11974.
-72	9.41	-121.44	1353.35	-0.3603	6.9708	727.5	10385.
-70	10.91	-112.18	1357.02	-0.3156	6.9169	725.4	9036.2
-68	12.61	-103.16	1360.67	-0.2719	6.8644	723.2	7887.6
-66	14.54	-94.37	1364.29	-0.2282	6.8131	720.9	6906.2
-64	16.70	-85.57	1367.88	-0.1870	6.7632	718.5	6064.7
-62	19.13	-76.40	1371.45	-0.1435	6.7144	716.3	5341.1
-60	21.85	-67.95	1374.98	-0.1036	6.6668	714.0	4716.9
-59	23.32	-63.58	1376.74	-0.0832	6.6434	712.8	4437.2
-58	24.88	-59.06	1378.48	-0.0624	6.6203	711.5	4176.8
-57	26.53	-54.68	1380.22	-0.0419	6.5975	710.4	3934.3
-56	28.26	-50.46	1381.95	-0.0222	6.5749	709.3	3708.2
-55	30.09	-46.08	1383.68	-0.0021	6.5526	708.1	3497.3
-54	32.01	-41.96	1385.39	0.0165	6.5306	706.9	3300.4
-53	34.03	-37.49	1387.10	0.0372	6.5088	705.7	3116.5
-52	36.16	-32.95	1388.79	0.0578	6.4872	704.5	2944.6
-51	38.40	-28.68	1390.48	0.0772	6.4659	703.3	2783.9
-50	40.76	-24.54	1392.16	0.0955	6.4449	702.1	2633.4
-49	43.23	-20.19	1393.83	0.1150	6.4240	700.8	2492.5
-48	45.82	-15.67	1395.49	0.1348	6.4034	699.6	2360.4
-47	48.54	-11.25	1397.14	0.1541	6.3830	698.4	2236.6
-46	51.39	-6.94	1398.78	0.1736	6.3629	697.2	2120.5
-45	54.38	-2.42	1400.41	0.1936	6.3429	696.0	2011.4
-44	57.51	1.85	1402.03	0.2117	6.3232	694.8	1909.0
-43	60.78	6.13	1403.64	0.2304	6.3037	693.6	1812.7
-42	64.21	10.56	1405.24	0.2500	6.2844	692.4	1722.1
-41	67.79	15.14	1406.83	0.2695	6.2653	691.1	1636.9
-40	71.54	19.50	1408.41	0.2881	6.2464	689.9	1556.7
-39	75.45	23.92	1409.98	0.3072	6.2277	688.7	1481.1
-38	79.54	28.43	1411.54	0.3262	6.2092	687.4	1409.9
-37	83.80	32.59	1413.09	0.3442	6.1908	686.2	1342.7
-36	88.25	37.13	1414.62	0.3629	6.1727	685.0	1279.4
-35	92.89	41.42	1416.15	0.3818	6.1547	683.7	1219.5
-34	97.72	46.02	1417.67	0.4005	6.1370	682.5	1163.0
-33	102.76	50.34	1419.17	0.4184	6.1194	681.2	1109.7
-32	108.01	54.85	1420.66	0.4370	6.1019	680.0	1059.2
-31	113.47	59.25	1422.15	0.4553	6.0847	678.8	1011.4

*From equations of Haar and Gallagher, "Thermodynamic Properties of Ammonia," *Journal of Phys. and Chem. Reference Data*, v. 7, no. 3, 1978.

Table A.25. (cont.) Properties of ammonia saturated liquid and vapor in SI units.

Temp., °C	Press., kPa	Enthalpy, kJ/kg		Entropy, kJ/kg·K		Liquid, ρ_f kg/m ³	Vapor, v_g L/kg
		h_f	h_g	s_f	s_g		
-30	119.15	63.95	1423.62	0.4745	6.0676	677.5	966.25
-29	125.06	68.13	1425.08	0.4920	6.0507	676.2	923.47
-28	131.20	72.83	1426.52	0.5108	6.0339	675.0	882.94
-27	137.58	77.09	1427.96	0.5285	6.0174	673.7	844.54
-26	144.21	81.64	1429.38	0.5464	6.0009	672.5	808.12
-25	151.10	86.19	1430.79	0.5648	5.9846	671.2	773.58
-24	158.25	90.60	1432.20	0.5825	5.9685	670.0	740.81
-23	165.66	95.15	1433.58	0.6009	5.9525	668.7	709.69
-22	173.35	99.51	1434.96	0.6181	5.9367	667.4	680.13
-21	181.33	104.12	1436.32	0.6363	5.9210	666.2	652.05
-20	189.59	108.61	1437.67	0.6541	5.9055	664.9	625.35
-19	198.16	113.11	1439.01	0.6717	5.8901	663.6	599.96
-18	207.02	117.58	1440.34	0.6892	5.8748	662.3	575.80
-17	216.21	122.20	1441.65	0.7073	5.8597	661.0	552.91
-16	225.71	126.73	1442.95	0.7248	5.8447	659.8	530.92
-15	235.54	131.16	1444.24	0.7421	5.8298	658.5	510.06
-14	245.71	135.78	1445.51	0.7597	5.8151	657.2	490.19
-13	256.23	140.28	1446.77	0.7770	5.8005	655.9	471.24
-12	267.10	144.85	1448.02	0.7945	5.7860	654.6	453.18
-11	278.33	149.46	1449.25	0.8120	5.7716	653.3	435.94
-10	289.93	153.98	1450.47	0.8292	5.7574	652.0	419.49
-9	301.90	158.57	1451.68	0.8466	5.7433	650.7	403.79
-8	314.27	163.16	1452.87	0.8638	5.7293	649.3	388.79
-7	327.03	167.77	1454.05	0.8811	5.7154	648.0	374.45
-6	340.20	172.37	1455.21	0.8983	5.7016	646.7	360.76
-5	353.77	176.98	1456.36	0.9153	5.6879	645.4	347.66
-4	367.77	181.54	1457.50	0.9323	5.6744	644.0	335.14
-3	382.21	186.18	1458.62	0.9494	5.6609	642.7	323.15
-2	397.08	190.70	1459.72	0.9660	5.6476	641.3	311.68
-1	412.40	195.30	1460.81	0.9828	5.6343	640.0	300.70
0	428.18	200.00	1461.89	1.0000	5.6212	638.6	290.19
1	444.43	204.60	1462.95	1.0167	5.6081	637.3	280.11
2	461.15	209.26	1463.99	1.0336	5.5951	635.9	270.46
3	478.36	213.88	1465.02	1.0503	5.5823	634.5	261.20
4	496.07	218.57	1466.03	1.0671	5.5695	633.2	252.33
5	514.29	223.19	1467.03	1.0837	5.5568	631.8	243.81
6	533.02	227.90	1468.01	1.1004	5.5442	630.4	235.64
7	552.27	232.56	1468.98	1.1170	5.5317	629.0	227.80
8	572.06	237.20	1469.92	1.1334	5.5193	627.6	220.27
9	592.40	241.88	1470.85	1.1500	5.5070	626.2	213.04

Table A.25. (cont.) Properties of ammonia saturated liquid and vapor in SI units.

Temp., °C	Press., kPa	Enthalpy, kJ/kg		Entropy, kJ/kg·K		Liquid, ρ_f kg/m ³	Vapor, v_g L/kg
		h_f	h_g	s_f	s_g		
10	613.29	246.56	1471.77	1.1663	5.4947	624.8	206.10
11	634.75	251.26	1472.67	1.1828	5.4826	623.4	199.42
12	656.78	256.00	1473.54	1.1993	5.4705	622.0	193.01
13	679.40	260.64	1474.41	1.2155	5.4584	620.6	186.84
14	702.61	265.43	1475.25	1.2320	5.4465	619.1	180.91
15	726.43	270.11	1476.08	1.2482	5.4346	617.7	175.20
16	750.87	274.89	1476.88	1.2646	5.4228	616.3	169.71
17	775.94	279.64	1477.67	1.2809	5.4111	614.8	164.42
18	801.64	284.39	1478.44	1.2971	5.3994	613.3	159.33
19	828.00	289.15	1479.19	1.3132	5.3878	611.9	154.43
20	855.01	293.91	1479.93	1.3293	5.3763	610.4	149.71
21	882.69	298.68	1480.64	1.3454	5.3648	608.9	145.16
22	911.06	303.47	1481.33	1.3615	5.3534	607.5	140.77
23	940.11	308.26	1482.00	1.3776	5.3421	606.0	136.54
24	969.87	313.05	1482.65	1.3935	5.3308	604.5	132.47
25	1000.35	317.87	1483.29	1.4095	5.3195	603.0	128.53
26	1031.55	322.68	1483.90	1.4255	5.3083	601.5	124.74
27	1063.48	327.51	1484.48	1.4414	5.2972	600.0	121.08
28	1096.17	332.33	1485.05	1.4573	5.2861	598.4	117.55
29	1129.61	337.18	1485.60	1.4732	5.2751	596.9	114.13
30	1163.83	342.04	1486.12	1.4890	5.2641	595.4	110.84
31	1198.82	346.90	1486.62	1.5048	5.2532	593.8	107.66
32	1234.61	351.77	1487.10	1.5206	5.2423	592.3	104.58
33	1271.21	356.63	1487.56	1.5363	5.2314	590.7	101.61
34	1308.62	361.52	1487.99	1.5521	5.2206	589.1	98.74
35	1346.86	366.42	1488.40	1.5678	5.2099	587.6	95.96
36	1385.94	371.34	1488.78	1.5835	5.1991	586.0	93.28
37	1425.88	376.26	1489.14	1.5992	5.1884	584.4	90.68
38	1466.67	381.17	1489.48	1.6148	5.1778	582.8	88.17
39	1508.35	386.11	1489.79	1.6304	5.1671	581.2	85.74
40	1550.91	391.06	1490.07	1.6460	5.1565	579.6	83.39
41	1594.37	396.01	1490.33	1.6615	5.1459	577.9	81.11
42	1638.75	400.97	1490.56	1.6770	5.1354	576.3	78.91
43	1684.05	405.95	1490.77	1.6926	5.1249	574.7	76.77
44	1730.28	410.93	1490.94	1.7081	5.1144	573.0	74.70
45	1777.47	415.93	1491.10	1.7235	5.1039	571.3	72.70
46	1825.62	420.94	1491.22	1.7390	5.0935	569.7	70.76
47	1874.74	425.97	1491.31	1.7545	5.0830	568.0	68.88
48	1924.85	431.00	1491.38	1.7698	5.0726	566.3	67.05
49	1975.96	436.04	1491.42	1.7852	5.0622	564.6	65.28

Table A.25. (concl.) Properties of ammonia saturated liquid and vapor in SI units.

Temp., °C	Press., kPa	Enthalpy, kJ/kg		Entropy, kJ/kg·K		Liquid, ρ_f kg/m ³	Vapor, v_g L/kg
		h_f	h_g	s_f	s_g		
50	2028.08	441.11	1491.42	1.8007	5.0518	562.9	63.57
51	2081.22	446.17	1491.40	1.8160	5.0415	561.2	61.90
52	2135.41	451.26	1491.35	1.8314	5.0311	559.4	60.29
53	2190.65	456.35	1491.26	1.8467	5.0207	557.7	58.72
54	2246.95	461.46	1491.14	1.8620	5.0104	555.9	57.20
55	2304.32	466.58	1491.00	1.8774	5.0001	554.2	55.73
56	2362.79	471.72	1490.81	1.8927	4.9897	552.4	54.29
57	2422.36	476.86	1490.60	1.9079	4.9794	550.6	52.90
58	2483.05	482.03	1490.35	1.9232	4.9691	548.8	51.55
59	2544.87	487.21	1490.07	1.9385	4.9587	547.0	50.21
60	2607.83	492.41	1489.75	1.9538	4.9484	545.2	48.96
62	2737.25	502.85	1489.01	1.9843	4.9277	541.5	46.52
64	2871.40	513.35	1488.12	2.0148	4.9069	537.8	44.21
66	3010.41	523.93	1487.08	2.0453	4.8861	534.0	42.03
68	3154.39	534.58	1485.88	2.0759	4.8652	530.1	39.96
70	3303.44	545.31	1484.51	2.1064	4.8443	526.2	38.01
72	3457.70	556.13	1482.98	2.1370	4.8232	522.2	36.15
74	3617.28	567.02	1481.26	2.1676	4.8020	518.2	34.39
76	3782.30	578.02	1479.36	2.1982	4.7806	514.1	32.72
78	3952.88	589.12	1477.27	2.2290	4.7591	509.9	31.14
80	4129.15	600.32	1474.97	2.2598	4.7374	505.6	29.63
82	4311.25	611.64	1472.46	2.2907	4.7154	501.3	28.20
84	4499.29	623.08	1469.73	2.3218	4.6932	496.8	26.84
86	4693.43	634.65	1466.76	2.3530	4.6708	492.3	25.54
88	4893.79	646.37	1463.54	2.3844	4.6480	487.6	24.30
90	5100.52	658.23	1460.06	2.4160	4.6248	482.8	23.12
92	5313.77	670.26	1456.30	2.4478	4.6013	477.9	21.99
94	5533.69	682.47	1452.23	2.4799	4.5773	472.9	20.91
96	5760.43	694.87	1447.84	2.5123	4.5528	467.7	19.88
98	5994.16	707.48	1443.11	2.5450	4.5278	462.4	18.89
100	6235.05	720.32	1438.00	2.5781	4.5022	456.9	17.95
105	6869.77	753.59	1423.37	2.6629	4.4348	442.2	15.74
110	7553.34	788.91	1405.48	2.7515	4.3614	425.9	13.73
115	8289.24	827.06	1383.24	2.8459	4.2793	407.5	11.88
120	9081.61	869.39	1354.73	2.9491	4.1841	385.8	10.14
125	9935.83	918.91	1316.13	3.0684	4.0665	358.5	8.456
130	10860.18	986.36	1257.57	3.2299	3.9029	317.4	6.701

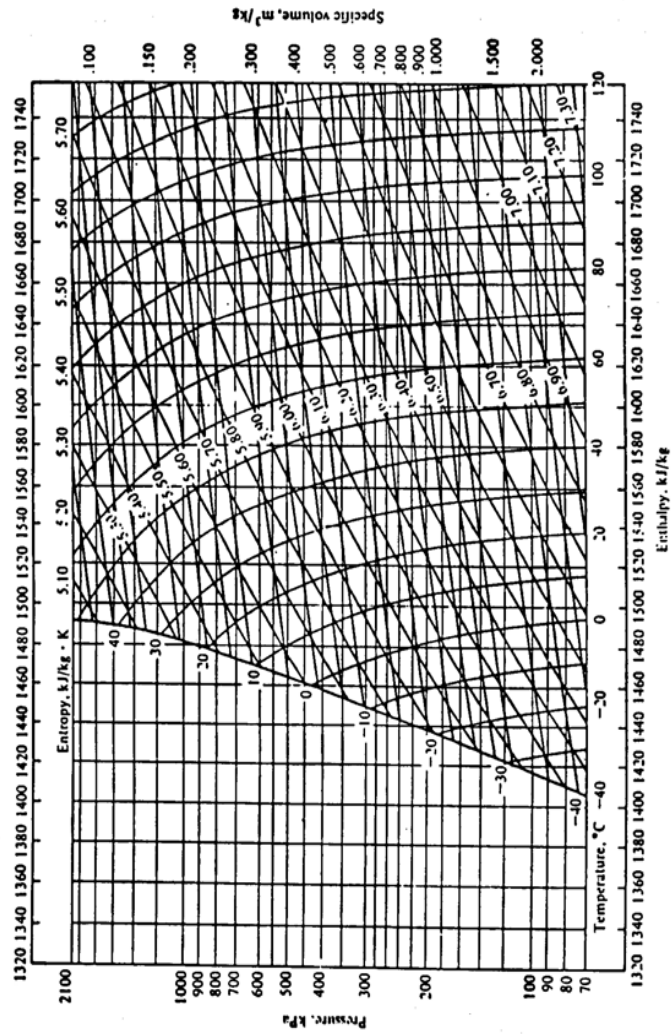


Fig. A.13. Pressure-enthalpy diagram for ammonia in SI units. (Courtesy Refrigeration Laboratory of the University of Denmark.)

Table A.26. Properties of superheated ammonia in SI units.

Saturation, $t = -50^{\circ}\text{C}$, $p = 40.76 \text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
-50	1392.2	6.4449	2633.4
-45	1402.7	6.4914	2696.2
-40	1413.2	6.5370	2758.8
-35	1423.7	6.5816	2821.1
-30	1434.2	6.6252	2883.2
-25	1444.7	6.6680	2945.1
-20	1455.2	6.7099	3006.8
-15	1465.7	6.7509	3068.4
-10	1476.2	6.7912	3129.7
-5	1486.7	6.8308	3191.0
0	1497.2	6.8697	3252.1

Saturation, $t = -45^{\circ}\text{C}$, $p = 54.38 \text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
-45	1400.4	6.3429	2011.4
-40	1411.1	6.3892	2059.0
-35	1421.7	6.4345	2106.4
-30	1432.4	6.4787	2153.5
-25	1443.0	6.5220	2200.4
-20	1453.6	6.5644	2247.1
-15	1464.3	6.6059	2293.6
-10	1474.9	6.6466	2340.0
-5	1485.5	6.6865	2386.5
0	1496.1	6.7257	2432.4
5	1506.7	6.7642	2478.4

Saturation, $t = -40^{\circ}\text{C}$, $p = 71.54 \text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
-40	1408.4	6.2464	1556.7
-35	1419.3	6.2925	1593.3
-30	1430.1	6.3375	1629.7
-25	1440.9	6.3815	1665.9
-20	1451.7	6.4245	1701.8
-15	1462.4	6.4665	1737.6
-10	1473.2	6.5077	1773.3
-5	1483.9	6.5481	1808.8
0	1494.6	6.5877	1844.1
5	1505.3	6.6265	1879.4
10	1516.0	6.6647	1914.5

Saturation, $t = -35^{\circ}\text{C}$, $p = 92.89 \text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
-35	1416.1	6.1547	1219.5
-30	1427.2	6.2007	1248.1
-25	1438.2	6.2456	1276.5
-20	1449.2	6.2894	1304.6
-15	1460.2	6.3322	1332.6
-10	1471.1	6.3740	1360.4
-5	1481.9	6.4150	1388.1
0	1492.8	6.4551	1415.6
5	1503.6	6.4944	1443.1
10	1514.4	6.5329	1470.4
15	1525.3	6.5708	1497.6

Saturation, $t = -30^{\circ}\text{C}$, $p = 119.15 \text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
-30	1423.6	6.0676	966.2
-25	1434.9	6.1136	988.9
-20	1446.1	6.1584	1011.2
-15	1457.3	6.2021	1033.5
-10	1468.4	6.2448	1055.5
-5	1479.5	6.2864	1077.4
0	1490.5	6.3272	1099.2
5	1501.5	6.3670	1120.8
10	1512.5	6.4061	1142.4
15	1523.4	6.4444	1163.8
20	1534.4	6.4820	1185.2

Saturation, $t = -25^{\circ}\text{C}$, $p = 151.10 \text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
-25	1430.8	5.9846	773.6
-20	1442.3	6.0307	791.7
-15	1453.8	6.0756	809.6
-10	1465.2	6.1192	827.4
-5	1476.5	6.1618	844.9
0	1487.7	6.2033	862.4
5	1498.9	6.2439	879.7
10	1510.1	6.2836	897.0
15	1521.2	6.3222	914.1
20	1532.2	6.3606	931.2
25	1543.3	6.3980	948.1

Table A.26. (cont.) Properties of superheated ammonia in SI units.

Saturation, $t = -20^{\circ}\text{C}$, $p = 189.59\text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
-20	1437.7	5.9055	625.3
-15	1449.5	5.9517	640.0
-10	1461.2	5.9967	654.5
-5	1472.8	6.0404	668.9
0	1484.3	6.0829	683.1
5	1495.8	6.1244	697.2
10	1507.1	6.1649	711.1
15	1518.4	6.2044	725.0
20	1529.7	6.2432	738.8
25	1540.9	6.2811	752.48
30	1552.1	6.3183	766.11

Saturation, $t = -15^{\circ}\text{C}$, $p = 235.54\text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
-15	1444.2	5.8298	510.1
-10	1456.4	5.8764	522.1
-5	1468.3	5.9214	534.0
0	1480.2	5.9652	545.7
5	1491.9	6.0078	557.3
10	1503.6	6.0493	568.8
15	1515.1	6.0897	580.1
20	1526.6	6.1292	591.4
25	1538.0	6.1678	602.6
30	1549.4	6.2056	613.8
35	1560.7	6.2427	624.8

Saturation, $t = -10^{\circ}\text{C}$, $p = 289.93\text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
-10	1450.5	5.7574	419.5
-5	1462.9	5.8043	429.5
0	1475.2	5.8496	439.3
5	1487.3	5.8935	449.0
10	1499.3	5.9362	458.5
15	1511.1	5.9777	468.0
20	1522.9	6.0181	477.3
25	1534.5	6.0575	486.6
30	1546.1	6.0961	495.8
35	1557.6	6.1338	505.0
40	1569.1	6.1707	514.1

Saturation, $t = -5^{\circ}\text{C}$, $p = 353.77\text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
-5	1456.4	5.6879	347.7
0	1469.1	5.7352	356.0
5	1481.7	5.7808	364.2
10	1494.1	5.8249	372.3
15	1506.3	5.8677	380.3
20	1518.4	5.9093	388.1
25	1530.4	5.9497	395.9
30	1542.2	5.9892	403.6
35	1554.0	6.0277	411.2
40	1565.7	6.0653	418.8
45	1577.3	6.1022	426.332

Saturation, $t = 0^{\circ}\text{C}$, $p = 428.18\text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
0	1461.9	5.6212	290.2
5	1475.0	5.6689	297.2
10	1487.9	5.7148	304.2
15	1500.6	5.7592	311.0
20	1513.1	5.8022	317.7
25	1525.4	5.8439	324.3
30	1537.6	5.8844	330.8
35	1549.7	5.9239	337.2
40	1561.6	5.9624	343.6
45	1573.5	6.0000	350.0
50	1585.3	6.0368	356.2

Saturation, $t = 5^{\circ}\text{C}$, $p = 514.29\text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
5	1467.0	5.5568	243.8
10	1480.6	5.6051	249.8
15	1493.8	5.6515	255.7
20	1506.8	5.6962	261.5
25	1519.6	5.7394	267.2
30	1532.2	5.7812	272.8
35	1544.6	5.8219	278.3
40	1556.9	5.8614	283.7
45	1569.0	5.9000	289.1
50	1581.1	5.9376	294.5
55	1593.1	5.9744	300.0

Table A.36. (cont.) Properties of superheated ammonia in SI units.

Saturation, $t = 10^{\circ}\text{C}$, $p = 613.29\text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
10	1471.8	5.4947	206.1
15	1485.7	5.5436	211.3
20	1499.3	5.5904	216.3
25	1512.7	5.6355	221.3
30	1525.7	5.6790	226.1
35	1538.6	5.7211	230.9
40	1551.3	5.7619	235.6
45	1563.8	5.8015	240.3
50	1576.2	5.8401	244.9
55	1588.4	5.8778	249.4
60	1600.6	5.9145	253.9

Saturation, $t = 15^{\circ}\text{C}$, $p = 726.45\text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
15	1476.1	5.4346	175.2
20	1490.5	5.4842	173.7
25	1504.5	5.5316	184.1
30	1518.2	5.5771	188.3
35	1531.6	5.6209	192.5
40	1544.7	5.6632	196.6
45	1557.6	5.7042	200.7
50	1570.4	5.7440	204.7
55	1583.0	5.7827	208.6
60	1595.5	5.8204	212.5
65	1607.8	5.8572	216.4

Saturation, $t = 20^{\circ}\text{C}$, $p = 855.01\text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
20	1479.9	5.3763	149.7
25	1494.8	5.4266	153.6
30	1509.2	5.4746	157.5
35	1523.3	5.5206	161.2
40	1537.0	5.5648	164.8
45	1550.5	5.6074	168.4
50	1563.7	5.6486	171.9
55	1576.7	5.6886	175.3
60	1589.5	5.7274	178.7
65	1602.2	5.7652	182.1
70	1614.8	5.8021	185.4

Saturation, $t = 25^{\circ}\text{C}$, $p = 1000.3\text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
25	1483.3	5.3195	128.5
30	1498.7	5.3707	132.0
35	1513.5	5.4193	135.4
40	1528.0	5.4659	138.6
45	1542.1	5.5105	141.9
50	1555.8	5.5535	144.9
55	1569.4	5.5949	148.0
60	1582.6	5.6351	151.0
65	1595.7	5.6741	154.0
70	1608.7	5.7120	156.9
75	1621.4	5.7490	159.9

Saturation, $t = 30^{\circ}\text{C}$, $p = 1163.8\text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
30	1486.1	5.2641	110.8
35	1502.0	5.3162	113.9
40	1517.4	5.3656	116.9
45	1532.3	5.4127	119.8
50	1546.7	5.4579	122.6
55	1560.8	5.5012	125.3
60	1574.7	5.5430	128.0
65	1588.2	5.5834	130.7
70	1601.6	5.6227	133.3
75	1614.8	5.6607	135.8
80	1627.8	5.6979	138.3

Saturation, $t = 35^{\circ}\text{C}$, $p = 1346.9\text{ kPa}$			
Temp. $^{\circ}\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
35	1488.4	5.2099	95.96
40	1504.9	5.2630	98.72
45	1520.8	5.3132	101.37
50	1536.1	5.3610	103.93
55	1551.0	5.4067	106.43
60	1565.4	5.4505	108.86
65	1579.6	5.4927	111.24
70	1593.5	5.5334	113.57
75	1607.1	5.5728	115.86
80	1620.5	5.6111	118.17
85	1633.8	5.6484	120.34

Table A.26. (cont.) Properties of superheated ammonia in SI units.

Saturation $t = 40^\circ\text{C}$, $p = 1550.9\text{ kPa}$

Temp. $^\circ\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
40	1490.1	5.1565	83.389
45	1507.2	5.2108	85.867
50	1523.6	5.2620	88.247
55	1539.4	5.3106	90.545
60	1554.7	5.3568	92.774
65	1569.6	5.4011	94.943
70	1584.1	5.4437	97.061
75	1598.3	5.4848	99.135
80	1612.2	5.5245	101.17
85	1625.9	5.5630	103.17
90	1639.4	5.6005	105.14

Saturation $t = 45^\circ\text{C}$, $p = 1777.5\text{ kPa}$

Temp. $^\circ\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
45	1491.1	5.1039	72.699
50	1508.9	5.1595	74.948
55	1526.9	5.2118	77.100
60	1542.3	5.2611	79.172
65	1558.0	5.3081	81.176
70	1573.3	5.3530	83.122
75	1588.2	5.3960	85.019
80	1602.7	5.4375	86.873
85	1617.0	5.4775	88.689
90	1631.0	5.5163	90.473
95	1644.7	5.5540	92.227

Saturation $t = 50^\circ\text{C}$, $p = 2028.1\text{ kPa}$

Temp. $^\circ\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
50	1491.4	5.0518	63.567
55	1510.0	5.1089	65.622
60	1527.7	5.1623	67.581
65	1544.6	5.2126	69.460
70	1560.8	5.2604	71.273
75	1576.5	5.3059	73.030
80	1591.8	5.3494	74.738
85	1606.7	5.3913	76.405
90	1621.3	5.4318	78.036
95	1635.6	5.4709	79.635
100	1649.7	5.5088	81.206

Saturation $t = 55^\circ\text{C}$, $p = 2304.3\text{ kPa}$

Temp. $^\circ\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
55	1491.0	5.0001	55.727
60	1510.4	5.0588	57.618
65	1528.8	5.1135	59.412
70	1546.3	5.1649	61.127
75	1563.1	5.2135	62.777
80	1579.3	5.2597	64.372
85	1595.0	5.3038	65.919
90	1610.3	5.3462	67.427
95	1625.2	5.3871	68.899
100	1639.8	5.4266	70.340
105	1654.2	5.4648	71.754

Saturation $t = 60^\circ\text{C}$, $p = 2607.8\text{ kPa}$

Temp. $^\circ\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
60	1489.8	4.9484	48.965
65	1510.1	5.0090	50.716
70	1529.2	5.0652	52.370
75	1547.4	5.1177	53.945
80	1564.8	5.1672	55.455
85	1581.5	5.2142	56.911
90	1597.6	5.2591	58.320
95	1613.3	5.3020	59.690
100	1628.7	5.3433	61.025
105	1643.6	5.3832	62.331
110	1658.3	5.4218	63.611

Saturation $t = 65^\circ\text{C}$, $p = 2849.3\text{ kPa}$

Temp. $^\circ\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
65	1487.6	4.8965	43.105
70	1509.0	4.9593	44.739
75	1529.0	5.0171	46.273
80	1547.9	5.0710	47.728
85	1565.9	5.1216	49.117
90	1583.1	5.1695	50.453
95	1599.8	5.2150	51.743
100	1615.9	5.2586	52.994
105	1631.6	5.3004	54.212
110	1647.0	5.3408	55.401
115	1662.0	5.3798	56.564

Table A.26. (concl.) Properties of superheated ammonia in SI units.

Saturation $t = 70^\circ\text{C}$, $p = 3303.4\text{ kPa}$

Temp. $^\circ\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
70	1484.5	4.8443	38.006
75	1507.1	4.9095	39.540
80	1528.0	4.9692	40.972
85	1547.7	5.0245	42.323
90	1566.3	5.0763	43.609
95	1584.2	5.1252	44.841
100	1601.4	5.1716	46.028
105	1618.0	5.2158	47.176
110	1634.2	5.2582	48.292
115	1649.9	5.2991	49.379
120	1665.3	5.3385	50.441

Saturation $t = 75^\circ\text{C}$, $p = 3699.1\text{ kPa}$

Temp. $^\circ\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
75	1480.3	4.7913	33.547
80	1504.2	4.8594	35.000
85	1526.2	4.9213	36.344
90	1546.8	4.9783	37.606
95	1566.2	5.0314	38.802
100	1584.7	5.0813	39.944
105	1602.4	5.1286	41.041
110	1619.6	5.1736	42.100
115	1636.2	5.2167	43.127
120	1652.4	5.2581	44.125
125	1668.2	5.2980	45.100

Saturation $t = 80^\circ\text{C}$, $p = 4129.2\text{ kPa}$

Temp. $^\circ\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
80	1475.0	4.7374	29.632
85	1500.4	4.8088	31.017
90	1523.5	4.8731	32.289
95	1545.1	4.9320	33.474
100	1565.3	4.9866	34.592
105	1584.5	5.0377	35.656
110	1602.9	5.0860	36.674
115	1620.6	5.1318	37.655
120	1637.7	5.1756	38.604
125	1654.3	5.2176	39.525
130	1670.5	5.2581	40.422

Saturation $t = 85^\circ\text{C}$, $p = 4595.6\text{ kPa}$

Temp. $^\circ\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
85	1468.3	4.6820	26.179
90	1495.4	4.7574	27.510
95	1520.0	4.8245	28.720
100	1542.6	4.8855	29.840
105	1563.7	4.9418	30.891
110	1583.7	4.9942	31.886
115	1602.7	5.0436	32.836
120	1621.0	5.0904	33.749
125	1638.6	5.1350	34.629
130	1655.8	5.1777	35.482
135	1672.4	5.2187	36.312

Saturation $t = 90^\circ\text{C}$, $p = 5100.5\text{ kPa}$

Temp. $^\circ\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
90	1460.1	4.6248	23.118
95	1489.3	4.7048	24.410
100	1515.4	4.7752	25.569
105	1539.2	4.8387	26.633
110	1561.4	4.8968	27.626
115	1582.2	4.9508	28.561
120	1601.9	5.0014	29.451
125	1620.8	5.0492	30.303
130	1639.1	5.0946	31.123
135	1656.7	5.1381	31.917
140	1673.8	5.1798	32.686

Saturation $t = 95^\circ\text{C}$, $p = 5640.2\text{ kPa}$

Temp. $^\circ\text{C}$	Enthalpy kJ/kg	Entropy $\text{kJ/(kg}\cdot\text{K)}$	Sp. Vol. L/kg
95	1450.1	4.5651	20.392
100	1481.9	4.6509	21.658
105	1509.7	4.7251	22.776
110	1534.9	4.7913	23.773
115	1558.2	4.8516	24.735
120	1579.9	4.9077	25.619
125	1600.5	4.9592	26.456
130	1620.1	5.0081	27.255
135	1638.9	5.0545	28.022
140	1657.1	5.0987	28.762
145	1674.7	5.1417	29.479
150	1691.9	5.1820	30.175