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Ammonia - Vapour Pressure at Gas-Liquid Equilibrium

Figures and table with ammonia saturation pressure at boiling points, SI and Imperial units.

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Anhydrous ammonia, NH₃: Thermophysical properties

- a colorless non-flammable liquefied gas
- vapor is lighter than air - 0.6 compared to air 1.0
- ignition temperature 1204°F (651 °C)(vapor concentration between 15% and 28%)
- corrodes galvanized metals, cast iron, copper, brass or copper alloys
- weight of liquid ammonia 5.15 *pounds per gallon* (water weight 8.33 *pounds per gallon*)
- boiling point liquid ammonia at atmospheric pressure -28°F (-33.3 °C)
- liquid ammonia expands to 850 *times* its liquid volume at atmospheric pressure

The **vapour pressure of ammonia** is the pressure at which ammonia gas is in *thermodynamic equilibrium with its condensed state*. At higher pressures ammonia would condense. At this equilibrium condition the vapor pressure is the **saturation pressure**.

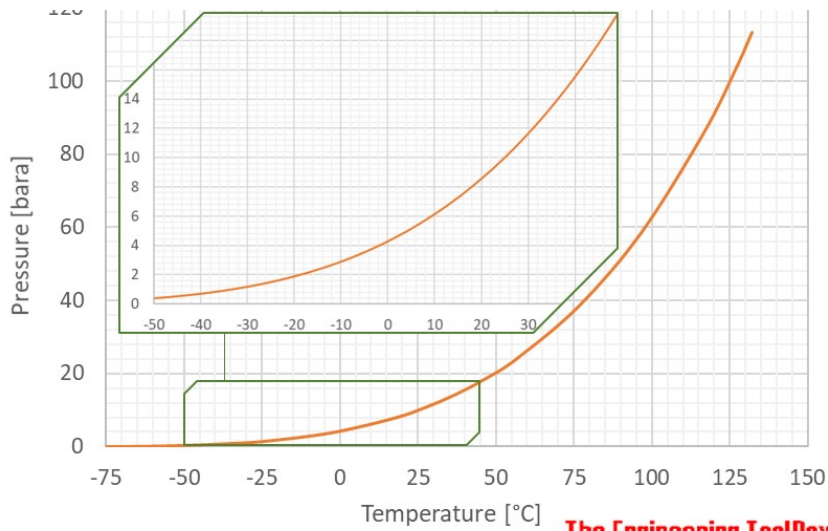
Pressure units converter

See also properties of **Ammonia** at **varying temperature and pressure**: [Density and specific weight](#) , [Dynamic and kinematic viscosity](#) , [Prandtl Number](#) , [Specific Heat \(Heat Capacity\)](#) and [Thermal Conductivity](#) , and [Thermophysical properties at standard conditions](#).

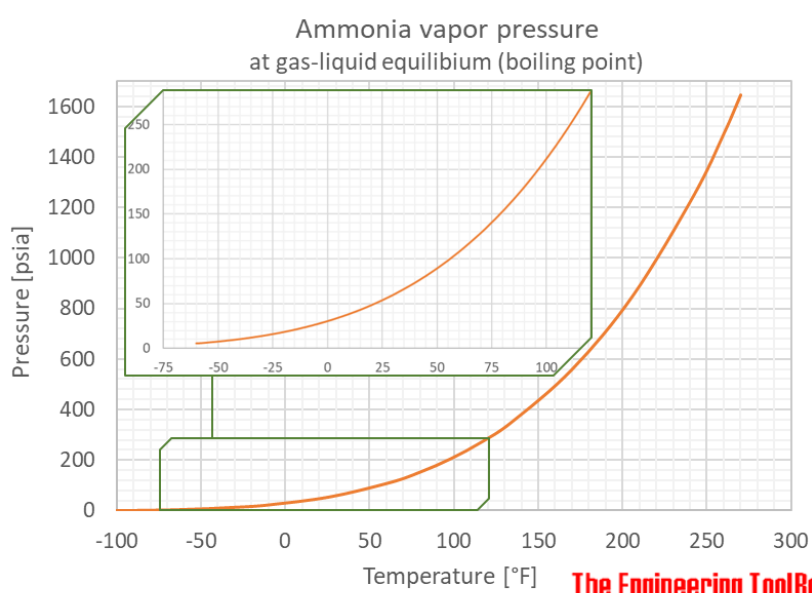
Ammonia Temperature Pressure Diagram

Saturation (boiling pressures) of liquid ammonia at different temperatures are indicated in the figures below. An ammonia phase diagram is also included:

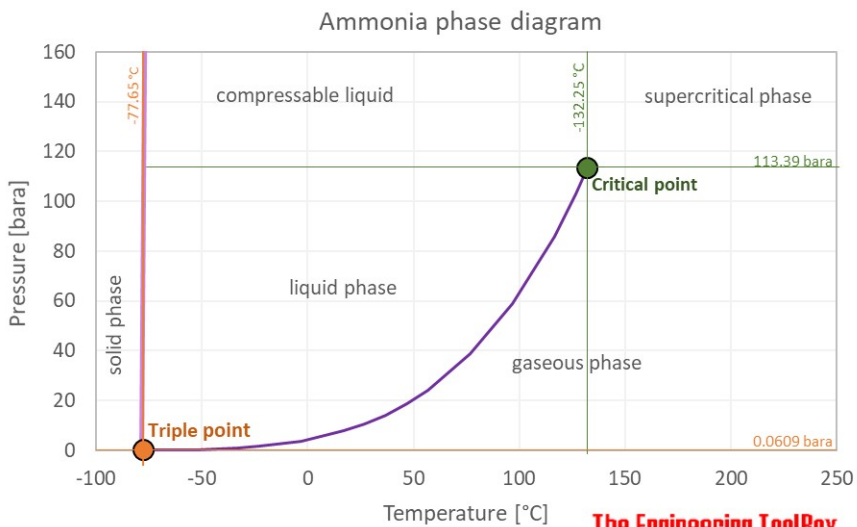
Ammonia vapor pressure at gas-liquid equilibrium (boiling point)



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Temperature			Pressure			Vacuum ¹⁾	
[K]	[°C]	[°F]	[MPa]	[bara]	[psia]	[mm Hg], [torr]	[in Hg]
222	-51.1	-60	0.0386	0.39	5.6	460	18.1
223	-50.0	-58	0.0407	0.41	5.9	445	17.5
224	-49.4	-57	0.0421	0.42	6.1	435	17.1
224	-48.9	-56	0.0434	0.43	6.3	424	16.7
225	-48.3	-55	0.0448	0.45	6.5	414	16.3
225	-47.8	-54	0.0469	0.47	6.8	398	15.7
226	-47.2	-53	0.0483	0.48	7.0	388	15.3
226	-46.7	-52	0.0496	0.50	7.2	378	14.9
227	-46.1	-51	0.0510	0.51	7.4	367	14.5
228	-45.6	-50	0.0531	0.53	7.7	352	13.9
228	-45.0	-49	0.0545	0.54	7.9	342	13.4
229	-44.4	-48	0.0565	0.57	8.2	326	12.8
229	-43.9	-47	0.0579	0.58	8.4	316	12.4
230	-43.3	-46	0.0600	0.60	8.7	300	11.8
230	-42.8	-45	0.0621	0.62	9.0	285	11.2
231	-42.2	-44	0.0634	0.63	9.2	274	10.8
231	-41.7	-43	0.0655	0.66	9.5	259	10.2
232	-41.1	-42	0.0676	0.68	9.8	243	9.6
233	-40.6	-41	0.0696	0.70	10.1	228	9.0
233	-40.0	-40	0.0717	0.72	10.4	212	8.4
234	-39.4	-39	0.0738	0.74	10.7	197	7.7
234	-38.9	-38	0.0758	0.76	11.0	181	7.1
235	-38.3	-37	0.0786	0.79	11.4	161	6.3
235	-37.8	-36	0.0807	0.81	11.7	145	5.7
236	-37.2	-35	0.0834	0.83	12.1	124	4.9
236	-36.7	-34	0.0855	0.85	12.4	109	4.3
237	-36.1	-33	0.0883	0.88	12.8	88	3.5
238	-35.6	-32	0.0903	0.90	13.1	73	2.9
238	-35.0	-31	0.0931	0.93	13.5	52	2.0
239	-34.4	-30	0.0958	0.96	13.9	31	1.2
239	-33.9	-29	0.0986	0.99	14.3	11	0.4
						Gauge pressure²⁾	
						[psig]	
240	-33.3	-28	0.1014	1.01	14.7	0	
240	-32.8	-27	0.1041	1.04	15.1	0.4	
241	-32.2	-26	0.1076	1.08	15.6	0.9	
241	-31.7	-25	0.1103	1.10	16.0	1.3	
242	-31.1	-24	0.1131	1.13	16.4	1.7	
243	-30.6	-23	0.1165	1.17	16.9	2.2	
243	-30.0	-22	0.1193	1.19	17.3	2.6	
244	-29.4	-21	0.1227	1.23	17.8	3.1	
244	-28.9	-20	0.1262	1.26	18.3	3.6	
245	-28.3	-19	0.1296	1.30	18.8	4.1	
245	-27.8	-18	0.1331	1.33	19.3	4.6	
246	-27.2	-17	0.1365	1.37	19.8	5.1	
246	-26.7	-16	0.1400	1.40	20.3	5.6	
247	-26.1	-15	0.1441	1.44	20.9	6.2	
248	-25.6	-14	0.1475	1.48	21.4	6.7	
248	-25.0	-13	0.1517	1.52	22.0	7.3	
249	-24.4	-12	0.1558	1.56	22.6	7.9	
249	-23.9	-11	0.1600	1.60	23.2	8.5	
250	-23.3	-10	0.1634	1.63	23.7	9	
250	-22.8	-9	0.1682	1.68	24.4	9.7	
251	-22.2	-8	0.1724	1.72	25.0	10.3	

Temperature			Pressure			Vacuum ¹⁾	
[K]	[°C]	[°F]	[MPa]	[bara]	[psia]	[mm Hg], [torr]	[in Hg]
251	-21.7	-7	0.1765	1.77	25.6	10.9	
252	-21.1	-6	0.1813	1.81	26.3	11.6	
253	-20.6	-5	0.1855	1.85	26.9	12.2	
253	-20.0	-4	0.1903	1.90	27.6	12.9	
254	-19.4	-3	0.1951	1.95	28.3	13.6	
254	-18.9	-2	0.1999	2.00	29.0	14.3	
255	-18.3	-1	0.2048	2.05	29.7	15	
255	-17.8	0	0.2096	2.10	30.4	15.7	
256	-17.2	1	0.2151	2.15	31.2	16.5	
256	-16.7	2	0.2199	2.20	31.9	17.2	
257	-16.1	3	0.2255	2.25	32.7	18	
258	-15.6	4	0.2310	2.31	33.5	18.8	
258	-15.0	5	0.2365	2.36	34.3	19.6	
259	-14.4	6	0.2420	2.42	35.1	20.4	
259	-13.9	7	0.2475	2.48	35.9	21.2	
260	-13.3	8	0.2537	2.54	36.8	22.1	
260	-12.8	9	0.2592	2.59	37.6	22.9	
261	-12.2	10	0.2654	2.65	38.5	23.8	
261	-11.7	11	0.2717	2.72	39.4	24.7	
262	-11.1	12	0.2779	2.78	40.3	25.6	
263	-10.6	13	0.2841	2.84	41.2	26.5	
263	-10.0	14	0.2910	2.91	42.2	27.5	
264	-9.4	15	0.2972	2.97	43.1	28.4	
264	-8.9	16	0.3041	3.04	44.1	29.4	
265	-8.3	17	0.3110	3.11	45.1	30.4	
265	-7.8	18	0.3178	3.18	46.1	31.4	
266	-7.2	19	0.3254	3.25	47.2	32.5	
266	-6.7	20	0.3323	3.32	48.2	33.5	
267	-6.1	21	0.3399	3.40	49.3	34.6	
268	-5.6	22	0.3475	3.47	50.4	35.7	
268	-5.0	23	0.3551	3.55	51.5	36.8	
269	-4.4	24	0.3627	3.63	52.6	37.9	
269	-3.9	25	0.3702	3.70	53.7	39	
270	-3.3	26	0.3785	3.79	54.9	40.2	
270	-2.8	27	0.3868	3.87	56.1	41.4	
271	-2.2	28	0.3951	3.95	57.3	42.6	
271	-1.7	29	0.4033	4.03	58.5	43.8	
272	-1.1	30	0.4116	4.12	59.7	45	
278	4.4	40	0.5054	5.05	73.3	58.6	
283	10.0	50	0.6150	6.15	89.2	74.5	
289	15.6	60	0.7419	7.42	107.6	92.9	
294	21.1	70	0.8880	8.88	128.8	114.1	
298	24.4	76	0.9860	9.86	143.0	128.3	
298	25.0	77	1.00	10.0	145.4	130.7	
299	25.6	78	1.02	10.2	147.9	133.2	
299	26.1	79	1.04	10.4	150.5	135.8	
300	26.7	80	1.05	10.5	153.0	138.3	
300	27.2	81	1.07	10.7	155.6	140.9	
301	27.8	82	1.09	10.9	158.3	143.6	
301	28.3	83	1.11	11.1	161.0	146.3	
302	28.9	84	1.13	11.3	163.7	149.0	
303	29.4	85	1.15	11.5	166.4	151.7	
303	30.0	86	1.17	11.7	169.2	154.5	
304	30.6	87	1.19	11.9	172.0	157.3	
304	31.1	88	1.21	12.1	174.8	160.1	
305	31.7	89	1.23	12.3	177.7	163.0	
305	32.2	90	1.25	12.5	180.6	165.9	

Temperature			Pressure			Vacuum ¹⁾	
[K]	[°C]	[°F]	[MPa]	[bara]	[psia]	[mm Hg], [torr]	[in Hg]
306	32.8	91	1.27	12.7	183.6	168.9	
306	33.3	92	1.29	12.9	186.6	171.9	
307	33.9	93	1.31	13.1	189.6	174.9	
308	34.4	94	1.33	13.3	192.7	178.0	
308	35.0	95	1.35	13.5	195.8	181.1	
309	35.6	96	1.37	13.7	198.9	184.2	
309	36.1	97	1.39	13.9	202.1	187.4	
310	36.7	98	1.42	14.2	205.3	190.6	
310	37.2	99	1.44	14.4	208.6	193.9	
311	37.8	100	1.46	14.6	211.9	197.2	
311	38.3	101	1.48	14.8	215.2	200.5	
312	38.9	102	1.51	15.1	218.6	203.9	
313	39.4	103	1.53	15.3	222.0	207.3	
313	40.0	104	1.55	15.5	225.4	210.7	
314	40.6	105	1.58	15.8	228.9	214.2	
314	41.1	106	1.60	16.0	232.5	217.8	
315	41.7	107	1.63	16.3	236.0	221.3	
315	42.2	108	1.65	16.5	239.7	225.0	
316	42.8	109	1.68	16.8	243.3	228.6	
316	43.3	110	1.70	17.0	247.0	232.3	
317	43.9	111	1.73	17.3	250.8	236.1	
318	44.4	112	1.75	17.5	254.5	239.8	
318	45.0	113	1.78	17.8	258.4	243.7	
319	45.6	114	1.81	18.1	262.2	247.5	
319	46.1	115	1.84	18.4	266.2	251.5	
320	46.7	116	1.86	18.6	270.1	255.4	
320	47.2	117	1.89	18.9	274.1	259.4	
321	47.8	118	1.92	19.2	278.2	263.5	
321	48.3	119	1.95	19.5	282.3	267.6	
322	48.9	120	1.97	19.7	286.4	271.7	
330	56.9	134	2.42	24.2	351.1	336.4	
350	76.9	170	3.87	38.7	560.7	546.0	
370	96.9	206	5.88	58.8	852.5	837.8	
390	117	242	8.60	86.0	1248	1233	
400	127	260	10.3	103	1495	1480	
405	132	270	11.3	113	1645	1630	

1) Between -60°F (-51°C) to -28°F (-33°C) the vacuum pressure values in the seventh and eighth column are represented in mm and inches Mercury

2) The gauge numbers shown in that seventh column all are vs atmospheric pressure at sea level (14.7 psia)

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- **Air Conditioning** - Air Conditioning systems - heating, cooling and dehumidification of indoor air for thermal comfort.
- **Boiling Points** - Boiling points of elements, products and chemical species at varying conditions.
- **Material Properties** - Material properties of gases, fluids and solids - densities, specific heats, viscosities and more.
- **Thermodynamics** - Work, heat and energy systems.

Related Documents

- **Ammonia - NH_3 - Concentration in Air and Health Effects** - Ammonia and health symptoms - smell and threat to life.
- **Ammonia - NH_3 - Thermodynamic Properties** - Thermodynamic properties of saturated and superheated ammonia R-717 like specific volume, enthalpy and entropy.
- **Ammonia - Dynamic and Kinematic Viscosity vs. Temperature and Pressure** - Online calculator, figures and tables showing dynamic (absolute) and kinematic viscosity of gaseous and liquid ammonia at temperatures ranging from -73 to 425°C (-100 to 800°F) at pressure ranging from 1 to 1000 bara (14.5 - 14500 psia) - SI and Imperial Units.
- **Ammonia - Prandtl Number vs. Temperature and Pressure** - Figures and table with changes in Prandtl number for ammonia with changes in temperature and pressure.
- **Ammonia - Properties at Gas-Liquid Equilibrium Conditions** - Figures and tables showing how the properties of liquid and gaseous ammonia changes along the boiling/condensation curve (temperature and pressure between triple point and critical point conditions). An ammonia phase diagram are included.
- **Ammonia - Specific Heat vs. Temperature and Pressure** - Online calculator, figures and tables showing specific heat, C_P and C_V , of gaseous and liquid ammonia at temperatures ranging from -73 to 425°C (-100 to 800°F) at pressure ranging from 1 to 100 bara (14.5 - 1450 psia) - SI and Imperial Units.
- **Ammonia - Thermal Conductivity vs. Temperature and Pressure** - Online calculator, figures and tables showing thermal conductivity of liquid and gaseous ammonia at temperatures ranging -70 to 425 °C (-100 to 800 °F) at atmospheric and higher pressure - Imperial and SI Units.
- **Ammonia - Thermophysical Properties** - Chemical, Physical and Thermal Properties of Ammonia. Phase diagram included.
- **Ammonia Gas - Density vs. Temperature and Pressure** - Online calculator with figures and tables showing density and specific weight of ammonia for temperatures ranging -50 to 425 °C (-50 to 800 °F) at atmospheric and higher pressure - Imperial and SI Units.
- **Critical Temperatures and Pressures for some Common Substances** - Critical temperatures and pressures for some common substances like air, alcohol, ether, oxygen and more.
- **Density Converter** - Online density converter with commonly used units.
- **Hydrocarbons, Alcohols and Acids - Boiling points** - Boiling temperatures (°C and °F)

with varying carbon numbers up to C33.

- **Liquid Ammonia - Thermal Properties at Saturation Pressure** - Density, specific heat, thermal conductivity, viscosity and Prandtl's no. of liquid ammonia at saturation pressure.
- **Liquids and Fluids - Specific Heats** - Specific heats for some common liquids and fluids - acetone, oil, paraffin, water and many more.
- **Liquids and Gases - Boiling Points** - Boiling temperatures for common liquids and gases - acetone, butane, propane and more.
- **Pressure Units - Online Converter** - Convert between pressure units like *Pa*, *bar*, *atmosphere*, *pound square feet*, *psi* and more.
- **Solubility of Gases in Water vs. Temperature** - Solubility of Ammonia, Argon, Carbon Dioxide, Carbon Monoxide, Chlorine, Ethane, Ethylene, Helium, Hydrogen, Hydrogen Sulfide, Methane, Nitrogen, Oxygen and Sulfur Dioxide in water.
- **Unit Converter with commonly used Units** - Common converting units for Acceleration, Area, Density, Energy, Energy per unit mass, Force, Heat flow rate, Heat flux, Heat generation per unit volume and many more.

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Unit Converter

Temperature

0.0

°C

°F

Convert!

Length

1.0

m

km

in

ft

- yards
- miles
- naut miles

Convert!

Area

1.0

- m²
- km²
- in²
- ft²
- miles²
- acres

Convert!

Volume

1.0

- m³
- liters
- in³
- ft³
- us gal

Convert!

Weight

1.0

- kg_f
- N
- lb_f

Convert!

Velocity

1.0

- m/s
- km/h

ft/min
 ft/s
 mph
 knots

Convert!

Pressure

1.0

Pa (N/m²)
 bar
 mm H₂O
 kg/cm²
 psi
 inches H₂O

Convert!

Flow

1.0

m³/s
 m³/h
 US gpm
 cfm

Convert!

Scientific Online Calculator



2 17

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