

# STEAM TABLE

## Saturated Condition

### Everest Blower Systems Private Limited

P mbar	P Torr	t °C	v <sup>m</sup> m <sup>3</sup> /kg	P mbar	P Torr	t °C	v <sup>m</sup> m <sup>3</sup> /kg
0.001	0.00075	-76.26	908600	40	30.00	28.97	34.82
0.005	0.00375	-65.55	191600	42	31.50	29.82	33.25
				44	33.00	30.63	31.82
0.01	0.0075	-60.56	98110	46	34.50	31.41	30.51
0.02	0.0150	-55.34	50260	48	36.00	32.17	29.31
0.03	0.0225	-52.17	33990				
0.04	0.0300	-49.87	25760	50	37.50	32.89	28.20
				55	41.25	34.60	25.78
0.05	0.0375	-48.04	20780	60	45.00	36.18	23.74
0.06	0.0450	-46.53	17430	65	48.75	37.65	22.02
0.07	0.0525	-45.23	15030	70	52.50	39.02	20.53
0.08	0.0600	-44.11	13210				
0.09	0.0675	-43.08	11800	75	56.25	40.32	19.24
				80	60.00	41.54	18.10
0.1	0.075	-42.18	10660	85	63.75	42.69	17.10
0.2	0.150	-36.03	5472	90	67.51	43.79	16.20
0.3	0.225	-32.24	3706	95	71.26	44.84	15.40
0.4	0.300	-29.51	2811				
				100	75.01	45.84	14.67
0.5	0.375	-27.31	2269	110	82.51	47.71	13.41
0.6	0.450	-25.51	1905	120	90.01	49.45	12.36
0.7	0.525	-23.99	1643	130	97.51	51.07	11.46
0.8	0.600	-22.63	1445	140	105.00	52.58	10.69
0.9	0.675	-21.40	1291				
1	0.75	-20.33	1167	150	112.50	54.00	10.02
2	1.50	-12.91	600.5	160	120.00	55.34	9.433
3	2.25	-8.37	407.3	170	127.50	56.62	8.911
4	3.00	-5.05	309.3	180	135.00	57.83	8.445
				190	142.50	58.98	8.027
5	3.75	-2.41	249.9	200	150.00	60.09	7.650
6	4.50	-0.21	209.9	210	157.50	61.14	7.308
7	5.25	1.89	181.32	220	165.00	62.16	6.996
8	6.00	3.77	159.74	230	172.50	63.14	6.710
9	6.75	5.45	142.82	240	180.00	64.08	6.448
10	7.50	6.98	129.21	250	187.50	64.99	6.206
11	8.25	8.38	118.02	260	195.00	65.87	5.982
12	9.00	9.67	108.67	270	202.50	66.72	5.774
13	9.75	10.87	100.73	280	210.00	67.54	5.580
14	10.50	11.99	93.90	290	217.50	68.34	5.400
15	11.25	13.04	87.96	300	225.00	69.12	5.231
16	12.00	14.03	82.75	320	240.00	70.61	4.924
17	12.75	14.97	78.14	340	255.00	72.02	4.652
18	13.50	15.86	74.03	360	270.00	73.37	4.409
19	14.25	16.70	70.34	380	285.00	74.65	4.191
20	15.00	17.51	67.01	400	300.00	75.88	3.995
21	15.75	18.28	64.00	420	315.00	77.06	3.816
22	16.50	19.03	61.24	440	330.00	78.19	3.653
23	17.25	19.74	58.72	460	345.00	79.27	3.504
24	18.00	20.43	56.41	480	360.00	80.32	3.367
25	18.75	21.09	54.28	500	375.00	81.34	3.241
26	19.50	21.73	52.30	550	412.50	83.73	2.964
27	20.25	22.35	50.47	600	450.00	85.95	2.732
28	21.00	22.95	48.77	650	487.50	88.02	2.535
29	21.75	23.53	47.18	700	525.00	89.96	2.365
30	22.50	24.09	45.69	750	562.50	91.78	2.217
32	24.00	25.17	42.99	800	600.00	93.51	2.087
34	25.50	26.19	40.59	850	637.50	95.15	1.972
36	27.00	27.16	38.46	900	675.00	96.71	1.869
38	28.50	28.09	36.55	950	712.50	98.20	1.777
				1000	750.00	99.63	1.694

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P Bar	t °C	v <sup>m</sup> m <sup>3</sup> /kg	h <sup>g</sup> kJ/kg	kJ/kg	P Bar	t °C	v <sup>m</sup> m <sup>3</sup> /kg	h <sup>g</sup> kJ/kg	kJ/kg
1.0	99.6	1.694	2675	2258	7.5	167.8	0.2555	2765	2056
1.1	102.3	1.549	2680	2251	8.0	170.4	0.2403	2768	2047
1.2	104.8	1.428	2683	2244	8.5	172.9	0.2268	2770	2038
1.3	107.1	1.325	2687	2238	9.0	175.4	0.2148	2772	2030
1.4	109.3	1.236	2690	2232	9.5	177.7	0.2040	2774	2021
1.5	111.4	1.159	2693	2226	10	179.9	0.1943	2776	2014
1.6	113.3	1.091	2696	2221	11	184.8	0.1774	2780	1999
1.7	115.2	1.031	2699	2216	12	188.0	0.1632	2783	1984
1.8	116.9	0.9771	2702	2211	13	191.6	0.1511	2785	1971
1.9	118.6	0.9288	2704	2206	14	195.0	0.1407	2788	1958
2.0	120.2	0.8853	2706	2202	15	198.3	0.1316	2790	1945
2.1	121.8	0.8458	2709	2197	16	201.4	0.1237	2792	1933
2.2	123.3	0.8097	2711	2193	17	204.3	0.1166	2793	1921
2.3	124.7	0.7767	2713	2189	18	207.1	0.1103	2795	1910
2.4	126.1	0.7464	2715	2185	19	209.8	0.1046	2796	1899
2.5	127.4	0.7184	2716	2181	20	212.4	0.09952	2797	1889
2.6	128.7	0.6925	2718	2177	21	214.9	0.09488	2798	1878
2.7	130.0	0.6684	2720	2174	22	217.3	0.09064	2799	1868
2.8	131.2	0.6460	2722	2170	23	219.6	0.08678	2800	1858
2.9	132.4	0.6251	2723	2167	24	221.8	0.08319	2800	1849
3.0	133.5	0.6056	2725	2163	25	223.9	0.07990	2801	1839
3.2	135.8	0.5700	2728	2157	26	226.0	0.07685	2801	1830
3.4	137.9	0.5385	2730	2151	27	228.1	0.07402	2802	1821
3.6	139.9	0.5104	2733	2144	28	230.1	0.07139	2802	1812
3.8	141.8	0.4851	2735	2139	29	232.0	0.06893	2802	1803
4.0	143.5	0.4623	2738	2133	30	233.8	0.06663	2802	1794
4.2	145.4	0.4416	2740	2128	32	237.4	0.06244	2802	1777
4.4	147.1	0.4227	2742	2122	34	240.9	0.05873	2802	1760
4.6	148.7	0.4053	2744	2117	36	244.2	0.05542	2802	1744
4.8	150.3	0.3894	2746	2112	38	247.3	0.05244	2801	1729
5.0	151.8	0.3747	2748	2108	40	250.3	0.04975	2800	1713
6.0	158.8	0.3155	2756	2085	42	253.2	0.04731	2800	1698
6.5	162.0	0.2925	2759	2075	44	256.0	0.04508	2798	1683
7.0	164.9	0.2727	2762	2065	46	258.7	0.04304	2797	1668
					48	261.4	0.04116	2796	1654
					50	263.9	0.03943	2794	1640

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### PRESSURE P (BAR) IS ABSOLUTE

Torr	mbar
1	1.333
2	2.666
3	4.000
4	5.333
5	6.666
6	7.999
7	9.332
8	10.666
9	11.999
10	13.332

$$1 \frac{N}{m^2} = 1 \text{ Pa}$$

$$1 \text{ bar} = 1.10^5 \frac{N}{m^2}$$

$$1 \frac{N}{m^2} = 0.102 \frac{kp}{m^2}$$

$$1 \text{ bar} = 1.020 \text{ at}$$

$$1 \text{ mbar} = 0.750 \text{ Torr}$$

$$1 \text{ kJ} = 0.2388 \text{ kcal}$$

$$1 \text{ W} = 0.8598 \frac{\text{kcal}}{\text{h}}$$

$$1 \text{ Pa} = 1 \frac{N}{m^2}$$

$$1 \frac{N}{m^2} = 1.10^5 \text{ bar}$$

$$1 \frac{kp}{m^2} = 9.807 \frac{N}{m^2}$$

$$1 \text{ at} = 0.981 \text{ bar}$$

$$1 \text{ Torr} = 1.333 \text{ mbar}$$

$$1 \text{ kcal} = 4.1868 \text{ kJ}$$

$$1 \frac{\text{kcal}}{\text{h}} = 1.1630 \text{ W}$$

Everest Mechanical Booster Application	VACUUM PUMP	PRESSURE RANGE	PRESSURE RANGE WITH BOOSTER COMBINATION
	Single Stage Ejector Water Ejector Water Ring Pump Liquid Ring Pump Piston Pumps Rotary Piston Pumps Rotary Vane Pump	150 Torr 100 Torr 40-60 Torr 20-30 Torr 20-30 Torr 0.1 Torr 0.01-0.001 Torr	15-30 Torr 10-20 Torr 5-10 Torr 2-5 Torr 0.01 Torr 0.001-0.0001 Torr

### PRESSURE AT VARIOUS ALTITUDES

Altitude (Feet)	Pressure (Torr)
Sea Level	760.00
500	746.37
1,000	732.93
1,500	719.70
2,000	706.66
2,500	693.81
3,000	681.15
3,500	668.69
4,000	656.40
4,500	644.30
5,000	632.38
5,500	620.65
6,000	609.09
6,500	597.70
7,000	586.49
7,500	575.45
8,000	564.58
8,500	553.88
9,000	543.34
9,500	532.97
10,000	522.75

### VACUUM AND TERMS USED IN VACUUM TECHNOLOGY

**What is Vacuum?**  
Vacuum is simply a pressure below atmosphere. To create vacuum in system, a pump is required to remove mass (gas/vapor) from the system. The more mass is removed, lower is the pressure that exists inside the system. Various vacuum levels are defined depending upon the ultimate vacuum.

**Range Absolute pressure range**  
Coarse Vacuum 10<sup>-3</sup>-10<sup>-2</sup> Torr  
Medium Vacuum 0.001-10 Torr  
Fine Vacuum 10<sup>-3</sup>-10<sup>-7</sup> Torr  
Ultra High Vacuum <10<sup>-7</sup>

**Booster Pump** A vapour pump or a specially designed mechanical pump used between a vapour pump and a forepump to increase the maximum gas throughput which can be handled. The limiting or breaking forepressure of the booster at this maximum throughput must be appreciably greater than that of the vapour pump which it backs.

**Free Air Displacement** (for mechanical pumps)  
(a) **Measured value:** the volume of air passed per unit time through a mechanical pump when the pressure on the intake and exhaust sides is equal to atmospheric pressure. Also called free air capacity.  
(b) **Calculated value:** product of the geometric volume of the compression chamber X atmospheric pressure X revs/min of the pump.

**Speed of a Pump** The pumping speed for a given gas is the ratio of the throughput of that gas to the partial pressure of that gas at a specified point near the mouth (or inlet port) of a pump.

**Throughput** Under conditions of steady-state conservative flow the throughput at the exist. In this case the throughput can be defined as the quantity of gas flowing through a pipe in pressure X volume units per unit time at room temperature.

**Ultimate Pressure** The limiting pressure approached in the vacuum system after sufficient pumping time to establish that further reductions in pressure will be negligible.

### PARTIAL PRESSURES OF GASSES IN AIR (For Dry Air)

Gas	Symbol	Percent by volume	Partial Pressure Torr
Nitrogen	N <sub>2</sub>	78	593
Oxygen	O <sub>2</sub>	21	159
Argon	Ar	0.93	7.1
Carbondioxide	CO <sub>2</sub>	0.03	0.25
Neon	Ne	0.0018	1.4 x 10 <sup>-2</sup>
Helium	He	0.0005	4.0 x 10 <sup>-3</sup>
Krypton	Kr	0.0001	8.7 x 10 <sup>-4</sup>
Hydrogen	H <sub>2</sub>	0.00005	4.0 x 10 <sup>-4</sup>
Xenon	Xe	0.0000087	6.6 x 10 <sup>-5</sup>
Water Vapour	H <sub>2</sub> O	Variable	

At standard conditions (760 torr, 0°C), each gas exerts a pressure relative to its percent of the total volume; for example, N<sub>2</sub> = 0.78X760 = 593 torr.

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Exploring Heights  
Setting Benchmarks  
To Become World Class



**EVEREST PRODUCT RANGE**  
Roots Blowers, Mechanical Vacuum Boosters,  
Dry Screw Vacuum Pumps,  
Acoustic Hoods, Industrial Vacuum Systems

