

**Standards**

	English System	SI-Metric System
Gravity (g)	32.174 ft/s <sup>2</sup>	9.806 65 m/s <sup>2</sup>
Absolute zero	-459.7°F	-273.1°C
Horsepower	550 ft-lb/s	76.04 kg-m/s 746W
π (pi)	3.141 59	
Density (ρ <sub>0</sub> )	0.002 37 slug/ft <sup>3</sup> 1.221 kg/m <sup>3</sup>	
STANDARD ATMOSPHERE AT SEA LEVEL:		
Temperature	59°F	15°C
Absolute temperature	518.4°R	288.2°K
Specific weight (gρ <sub>0</sub> )	0.076 51 lb/ft <sup>3</sup>	1.2255 kg/m <sup>3</sup>
Pressure (P <sub>0</sub> )	29.92 inHg 2 116 lb/ft <sup>2</sup>	760 mmHg 10 332 kg/m <sup>2</sup> 101.33 kPa
STANDARD VALUES AT ALTITUDE:		
Isothermal level (Z <sub>i</sub> )	35 332 ft	10 769 m
Isothermal temperature (t <sub>i</sub> )	-69.7°F	-56.5°C
Temperature gradient (a)	0.003 566°F/ft	0.0065°C/m

**Laws of Gases**

BOYLE'S LAW: When the temperature of a given mass of gas remains constant, the volume of the gas varies inversely at its pressure.

$$\frac{V_1}{V_2} = \frac{P_2}{P_1}$$

CHARLES' LAW: When the pressure of a given mass of gas is kept constant, the volume of the gas is approximately proportional to its absolute temperature.

$$\frac{V_1}{V_2} = \frac{T_1}{T_2}$$

GENERAL LAW

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

**Standard Atmosphere**

Altitude, ft	Temperature <i>t</i>		Pressure <i>P</i>			Density	
	°F	°C	inHg	cmHg	kPa	ρ	ρ/ρ <sub>0</sub>
0	59.0	15.0	29.920	76.00	101.33	0.002 378	1.0000
1 000	55.4	13.0	38.860	73.30	97.74	0.002 309	0.9710
2 000	51.9	11.0	27.820	70.66	94.22	0.002 242	0.9428
3 000	48.3	9.1	26.810	68.10	90.80	0.002 176	0.9151
4 000	44.7	7.1	25.840	65.63	87.51	0.002 112	0.8881
5 000	41.2	5.1	24.890	63.22	84.29	0.002 049	0.8616
6 000	37.6	3.1	23.980	60.91	81.21	0.001 988	0.8358
7 000	34.0	1.1	23.090	58.65	78.20	0.001 928	0.8106
8 000	30.5	-0.8	22.220	56.44	75.25	0.001 869	0.7859
9 000	26.9	-2.8	21.380	54.31	72.41	0.001 812	0.7619
10 000	23.3	-4.8	20.580	52.27	69.70	0.001 756	0.7384
11 000	19.8	-6.8	19.790	50.27	67.02	0.001 702	0.7154
12 000	16.2	-8.8	19.030	48.34	64.45	0.001 648	0.6931
13 000	12.6	-10.8	18.290	46.46	61.94	0.001 596	0.6712
14 000	9.1	-12.7	17.570	44.63	59.50	0.001 545	0.6499
15 000	5.5	-14.7	16.880	42.88	57.17	0.001 496	0.6291