

<u>Density of Substances</u>	
Substance	Density ( $\rho$ ) ( $\text{kg/m}^3$ )
<i>Solids</i>	
Aluminum	$2.70 \times 10^3$
Concrete	$2.3 \times 10^3$
Copper	$8.92 \times 10^3$
Ice	$0.917 \times 10^3$
Iron and Steel	$7.85 \times 10^3$
Lead	$11.30 \times 10^3$
<i>Liquids</i>	
Water	$1.00 \times 10^3$
Blood, plasma	$1.03 \times 10^3$
Blood, whole	$1.05 \times 10^3$
Ethyl Alcohol	$0.79 \times 10^3$
Gasoline	$0.68 \times 10^3$
Mercury	$13.6 \times 10^3$
Sea Water	$1.025 \times 10^3$
<i>Gases</i>	
Air	1.29
Carbon Dioxide	1.98
Helium	0.179
Steam (100°C)	0.598

<u>Coefficients of Expansion at 20°C</u>		
Material	Coefficient of Linear Expansion, $\alpha$ [( $^\circ\text{C}$ ) <sup>-1</sup> ]	Coefficient of Volume Expansion, $\beta$ [( $^\circ\text{C}$ ) <sup>-1</sup> ]
<i>Solids</i>		
Aluminum	$25 \times 10^{-6}$	$75 \times 10^{-6}$
Brass	$19 \times 10^{-6}$	$56 \times 10^{-6}$
Iron and Steel	$12 \times 10^{-6}$	$35 \times 10^{-6}$
Copper	$16.8 \times 10^{-6}$	
Lead	$29 \times 10^{-6}$	$87 \times 10^{-6}$
Glass (Pyrex)	$3 \times 10^{-6}$	$9 \times 10^{-6}$
Glass (ordinary)	$9 \times 10^{-6}$	$27 \times 10^{-6}$
Quartz	$0.4 \times 10^{-6}$	$1 \times 10^{-6}$
Concrete/brick	$12 \times 10^{-6}$	$36 \times 10^{-6}$
<i>Liquids</i>		
Water		$210 \times 10^{-6}$
Mercury		$180 \times 10^{-6}$
Ethyl Alcohol		$1100 \times 10^{-6}$
Gasoline		$950 \times 10^{-6}$
<i>Gases</i>		
Air (and most other gases at atmospheric pressure)		$3400 \times 10^{-6}$

<u>Saturated Vapor Pressure of Water</u>		
Temperature ( $^\circ\text{C}$ )	Saturated Vapor Pressure torr	Pa
-50	0.030	4.0
-10	1.95	$2.60 \times 10^2$
0	4.58	$6.11 \times 10^2$
5	6.54	$8.72 \times 10^2$
10	9.21	$1.23 \times 10^3$
15	12.8	$1.71 \times 10^3$
20	17.5	$2.33 \times 10^3$
25	23.8	$3.17 \times 10^3$
30	31.8	$4.24 \times 10^3$
40	55.3	$7.37 \times 10^3$
50	92.5	$1.23 \times 10^4$
60	149	$1.99 \times 10^4$
70	234	$3.12 \times 10^4$
80	355	$4.73 \times 10^4$
90	526	$7.01 \times 10^4$
100	760	$1.01 \times 10^5$
110	1489	$1.99 \times 10^5$
120	3570	$4.76 \times 10^5$

<u>IMPORTANT CONSTANTS</u>
Boltzmann's Constant, $k = 1.38 \times 10^{-23}$ J/K
Ideal Gas Constant, $R = 8.31$ J/mol $\cdot$ K = 0.0821 L $\cdot$ atm/mol $\cdot$ K
Avagadro's Number, $N_a = 6.02 \times 10^{23}$ particles/mole
1 atm = $1.01 \times 10^5$ Pa = 760 mm of Hg = 760 torr
1 amu = $1.66 \times 10^{-27}$ kg