

# Tables

Coefficients of Thermal Expansion at 20°C		
Material	Coefficient of Linear Expansion, $\alpha$ (°C) <sup>-1</sup>	Coefficient of Volume Expansion, $\beta$ (°C) <sup>-1</sup>
<b>Solids</b>		
Aluminum	$25 \times 10^{-6}$	$75 \times 10^{-6}$
Brass	$19 \times 10^{-6}$	$56 \times 10^{-6}$
Concrete	$12 \times 10^{-6}$	$36 \times 10^{-6}$
Copper	$17 \times 10^{-6}$	$48 \times 10^{-6}$
Glass (soft)	$9 \times 10^{-6}$	$27 \times 10^{-6}$
Glass (ovenproof)	$3 \times 10^{-6}$	$9 \times 10^{-6}$
Iron, steel	$12 \times 10^{-6}$	$35 \times 10^{-6}$
Platinum	$9 \times 10^{-6}$	$27 \times 10^{-6}$
<b>Liquids</b>		
Gasoline		$950 \times 10^{-6}$
Mercury		$180 \times 10^{-6}$
Methanol		$1100 \times 10^{-6}$
Water		$210 \times 10^{-6}$
<b>Gases</b>		
Air (and most other gases)		$3400 \times 10^{-6}$

Speed of Sound in Various Media	
Medium	m/s
Air (0°)	331
Air (20°)	343
Helium (0°)	972
Hydrogen (0°)	1286
Water (25°)	1493
Seawater (0°)	1533
Rubber	1600
Copper (25°)	3560
Iron (25°)	5130
Ovenproof glass	5640
Diamond	12,000

Wavelengths of Visible Light	
Color	Wavelength in Nanometers (nm)
Violet light	380–430 nm
Indigo light	430–450 nm
Blue light	450–500 nm
Cyan light	500–520 nm
Green light	520–565 nm
Yellow light	565–590 nm
Orange light	590–625 nm
Red light	625–740 nm

Dielectric Constants, $K$ (20°C)	
Vacuum	1.0000
Air (1 atm)	1.00059
Neon (1 atm)	1.00013
Glass	4–7
Quartz	4.3
Fused quartz	3.75
Water	80

**Densities of Some Common Substances**

Substance	Density (g/cm <sup>3</sup> )
Aluminum	2.702
Cadmium	8.642
Copper	8.92
Germanium	5.35
Gold	19.31
Hydrogen	$8.99 \times 10^{-5}$
Indium	7.30
Iron	7.86
Lead	11.34
Mercury	13.546
Oxygen	$1.429 \times 10^{-3}$
Silicon	2.33
Silver	10.5
Water (4°C)	1.000
Zinc	7.14

**Melting and Boiling Points of Some Substances**

Substance	Melting point (°C)	Boiling point (°C)
Aluminum	660.37	2467
Copper	1083	2567
Germanium	937.4	2830
Gold	1064.43	2808
Indium	156.61	2080
Iron	1535	2750
Lead	327.5	1740
Silicon	1410	2355
Silver	961.93	2212
Water	0.000	100.000
Zinc	419.58	907

**Specific Heats of Some Common Substances**

Material	Specific Heat (J/kg·K)	Material	Specific Heat (J/kg·K)
Aluminum	897	Lead	130
Brass	376	Methanol	2450
Carbon	710	Silver	235
Copper	385	Steam	2020
Glass	840	Water	4180
Ice	2060	Zinc	388
Iron	450		

**Heats of Fusion and Vaporization of Some Common Substances**

Material	Heat of Fusion, $H_f$ (J/kg)	Heat of Vaporization, $H_v$ (J/kg)
Copper	$2.05 \times 10^5$	$5.07 \times 10^6$
Gold	$6.30 \times 10^4$	$1.64 \times 10^6$
Iron	$2.66 \times 10^5$	$6.29 \times 10^6$
Lead	$2.04 \times 10^4$	$8.64 \times 10^5$
Mercury	$1.15 \times 10^4$	$2.72 \times 10^5$
Methanol	$1.09 \times 10^5$	$8.78 \times 10^5$
Silver	$1.04 \times 10^5$	$2.36 \times 10^6$
Water (ice)	$3.34 \times 10^5$	$2.26 \times 10^6$