

PhyzReference: Thermal Properties Constants

NOTE: 1 Celsius degree = 1 Kelvin (Careful: 1°C ≠ 1K)

Coefficient of Thermal Expansion (linear) [α or a]

Material	$\alpha \times 10^{-5} 1/^\circ\text{C}$
Aluminum	2.4
Brass	1.8
Concrete	0.7–1.2
Copper	1.7
Glass (lime)	0.9
Glass (Pyrex)	0.32
Ice	5.1
Invar (Fe-Ni-C)	0.07
Iron	1.2
Lead	3.0
Lucite	6.0
Quartz	0.05
Silver	2.0
Steel	1.2

Coefficient of Volume Expansion [β or b]

Material	$\beta \times 10^{-4} 1/^\circ\text{C}$
Ethyl Alcohol	7.5
Glass (lime)	0.2
Glass (Pyrex)	0.09
Glycerine	5.1
Ice	0.5
Mercury	1.8
Water	2.1

Specific Heat Capacity [c]

Material	c (J/kg $^\circ\text{C}$)
Alcohol (ethyl)	2430
Aluminum	920
Concrete	2900
Copper	390
Glass	840
Gold	130
Granite	800
Human body	3470
Ice	2090
Iron	460
Lead	130
Mercury	140
Silver	230
Steam	2010
Water	4190
Wood	1760

Thermal Conductivity [k]

Material	k (W/m $\cdot^\circ\text{C}$)
Aluminum	205
Brass	109
Copper	385
Iron (Steel)	50
Silver	406
Body Fat	0.17
Brick	0.6
Concrete	0.8
Glass	0.80
Ice	1.6
Wood (pine)	0.13
Snow	0.8
Cork	0.04
Glass wool	0.04
Down	0.02
Kapok	0.03
Hydrogen	0.13
Air	0.024

Melting Point [T_m], Boiling Point [T_b], Heat of Fusion [L_f] and Vaporization [L_v]

Material	T_m ($^\circ\text{C}$)	L_f (J/kg)	Material	T_b ($^\circ\text{C}$)	L_v (J/kg)
Alcohol	-114	105,000	Alcohol	78	854,000
Lead	330	25,000	Lead	1170	870,000
Mercury	-39	12,000	Mercury	358	297,000
Nitrogen	-210	26,000	Nitrogen	-196	201,000
Oxygen	-219	14,000	Oxygen	-183	213,000
Silver	961	88,000	Silver	2193	2,335,000
Tungsten	3410	184,000	Tungsten	5900	4,813,000
Water	0	335,000	Water	100	2,260,000