

## Thermal Properties of Selected Materials

Table 1: Thermal conductivity

Material	$k$ (W/m <sup>2</sup> -°K)	Material	$k$ (W/m <sup>2</sup> -°K)
Acetone	0.20	Lead	34.7
Air	0.024	Linen	0.088
Alcohol, ethyl	0.17	Mercury	8.3-8.7
Aluminum	205-210	Nitrogen	0.026
Asbestos	0.08-0.16	Oil, engine	0.15
Brass	109.0	Oxygen	0.023
Brick, red	0.6	Paper	0.13
Brick,insulating	0.15	Platinum	70
CO <sub>2</sub>	0.017	Polyurethane	0.02
Cardboard	0.21	Red Brick	0.63
Cement	0.30	Rock wool	0.04
Concrete	0.8	Rubber, soft	0.14
Copper	386	Sand, dry	0.39
Cork board	0.04	Silica aerogel	0.003
Diamond	1000	Silk	0.04
Earth's crust	1.7	Silver	406
Felt	0.036	Snow, compact	0.21
Fiberglass	0.04	Soil, dry	0.14
Glass	0.8	Steel	46-50.2
Gold	293-314	Styrofoam	0.01-0.033
Granite	2.1	Vaseline	0.18
Helium	0.14	Water	0.58
Hydrogen	0.172	Wood	0.13
Ice	1.6-2.2	Wool felt	0.04
Iron	73-79.5	Yellow Brass	85

Table 2: Mass density

Material	$\rho$ (kg/m <sup>3</sup> )	Material	$\rho$ (kg/m <sup>3</sup> )
Air	1.293	Mercury	13600
Aluminum	2700	Milk	1030
Antimony	6620	Molybdenum	10200
Arsenic	5730	Nickel	8910
Beryllium	1850	Niobium	8570
Boron	2540	Nitrogen	1.251
Cadmium	8640	Osmium	22500
Cadmium Sulfide	4830	Palladium	12000
Cadmium Telluride	5850	Platinum	21400
Calcium Fluoride	3180	Potassium Chloride	1980
Carbon (graphite)	2250	Selenium	4820
Carbon dioxide	1.977	Silicon	2320
Carbon monoxide	1.250	Fused quartz	2200
Chromium	7200	Silver	10500
Cobalt	8710	Silver Bromide	6470
Copper	8930	Silver Chloride	5560
Gallium	5930	Sodium Chloride	2170
Gallium Arsenide	5310	Tantalum	16600
Gasoline	700	Tellurium	6250
Germanium	5350	Tin	7300
Gold	19300	Titanium	4500
Helium	0.178	Titanium Dioxide	4300
Hydrogen	0.090	Titanium Oxide	4900
Ice at 0°C	920	Tungsten	19300
Indium	7300	Tungsten Carbide	15600
Indium Antimonide	5760	Uranium	18700
Iridium	22400	Vanadium	5960
Iron	7860	Water	1000
Lead	11300	Yttrium	4340
Lead Sulfide	7500	Zinc	7040
Lithium Fluoride	2640	Zinc Oxide	5610
Magnesium	1740	Zinc Selenide	5260
Magnesium Oxide	3580	Zinc Sulfide	4090
Manganese	7200		

Table 3: **Specific heat**

<b>Material</b>	$C_p$ (J/kg-°K)	<b>Material</b>	$C_p$ (J/kg-°K)
Air, dry	1005	Iron/Steel	452
Aluminum	900	Lead	128
Ammonia	4700	Lithium	3580
Antimony	207	Magnesium	1020
Argon	520	Marble	858
Arsenic	328	Mercury	138
Asphalt	920	Methyl Alcohol	2549
Benzene	1750	Neon	1030
Beryllium	1820	Nitrogen	1040
Bone	440	Oxygen	918
Copper	387	Paraffin wax	2500
Diamond	509	Quartz sand	830
Ethanol	2440	Sandy clay	1381
Gasoline	2220	Silica (fused)	703
Glass (typical)	837	Silver	236
Gold	130	Soil (typical)	1046
Granite	790	Steam (100 °C)	2009
Graphite	710	Uranium	116
Helium	5193	Water	4186
Hydrogen	14300	Wet mud	2512
Ice	2093	Wood	1700