Richard Greene Company, Inc.
INDUSTRIAL CONTROLS FOR FACTORY AUTOMATION
Since 1958
RGreene.com

St. Louis
Richard Greene Company
10742 Kahlmeyer Drive
St Louis, MO 63132
(314) 423-8989

Kansas City
Richard Greene Company
8200 Marshall Drive
Lenexa, KS 66214
(913) 492-6886

WATLOW® Powered by Possibility

Properties of Non-Metallic Solids

Application Guide

Reference Data

Physical Properties of Solids, Liquids and Gases

Properties of Non-Metallic Solids—Ref. 132

Material	*Density lb./ft³	Specific Heat Btu / lb.-°F	*Thermal Conductivity Btu-in / hr.-ft²-°F	Melting Point °F (Lowest)	Latent Heat of Fusion Btu/lb.
Allyl, Cast	82.5	0.55	12.1		
Alumina 96%	232	0.20	110.9	3812	
Alumina 99.9%	249	0.20	270	3812	
Aluminum Silicate (Lava Grade A)	149	0.2	9.1	3690	
Aluminum Nitride	199	0.19	1179	3992	
Amber	65.6				
Asbestos	36	0.25	0.44		
Ashes	40-45	0.2	0.49		
Asphalt	65	0.4	1.2	250±	40
Bakelite Resin, Pure	74-81	0.3-0.4			
Barium Chloride	240	0.10		1697	
Beeswax	60		1.67	144	75
Boron Nitride (Compacted)	142	0.33	125	5430	
Brick, Common Clay	100	0.23	5		
Brick, Facing/Building & Mortors	140	0.22	8		
Calcium Chloride	157	0.17		1422	72
Carbon	138	0.20	165	6700	
Carnauba Wax	62.4	0.8			
Cement, Portland Loose	94	0.19	2.04		
Cerafelt Insulation	3	0.25 @ 1000°	1.22		
Ceramic Fiber	10-15	0.27	***		
Chalk	112-175	0.215	5.76		
Charcoal Wood	17.5-36	0.242	0.612		
Chrome Brick		0.17	9.6		
Clay	90±10	0.224	9	3160	
Coal (Course Anthercite)	80	0.32	11		
Coal Tars	78	0.35-0.45			
Coke	62-88	0.265			
Concrete (Cinder)	100	0.16	5.3		
Concrete (Stone)	144	0.156	9.5		
Cordierite (AISI Mag 202)	131	0.35	9.12	2680	
Cork	13.5	0.5	0.36		
Cotton (Flax, Hemp)	92.4	0.31	0.41		
Delrin	88	0.35	1.56		
Diamond	219	0.147	13872		
Earth, Dry & Packed	94	0.44	0.9		
Ethyl Cellulose	67-74	0.32-0.46			
Fiberglass Microlite Duct Insulation	0.75		0.28		
Fiberglass Spin-Glas 1000 Insulation	3		0.26		

CONTINUED

* At or near room temperature
** Thermal conductivity will decrease with age and use

To convert to kg/m³ multiply lb/ft³ by 16.02
To convert to kJ/kg multiply Btu/lb by 2.326
To convert to kJ/kg-°C multiply Btu/lb-°F by 4.187
To convert to W/m-°C multiply Btu -in/hr-ft²-°F by 0.1442

Reference Data

Physical Properties of Solids, Liquids and Gases

Continued

Material	*Density lb./ft³	Specific Heat Btu / lb.-°F	*Thermal Conductivity Btu-in / hr.-ft²-°F	Melting Point °F (Lowest)	Latent Heat of Fusion Btu/lb.
Firebrick, Fireclay	137-150	0.243	6.6	2900	
Firebrick, Silica	144-162	0.258	7.2	3000	
Flourspar		0.21			
Forsterite (AISI Mag 243)	175		25.5	3470	
Garnet		0.176			
Glass	165	0.20	5.4	2200	
Granite	160-175	0.192	13-28		
Graphite	130	0.20	1.25	1202 (sublimination)	
Ice	57	0.46	15.36	32	
Isoprene (Nat'l Rubber)	58	0.48	1.0		
Limestone	130-175	0.217	3.6-9	1472	
Litharge		0.055		1627	
Magnesia	225	0.234	0.48	5070	
Magnesite Brick	159	0.222	10.8-30		
Magnesium Oxide					
Before Compaction	147	0.21	3.6	5165	
After Compaction	190	0.21	14.4	5165	
Magnesium Silicate	175		15.6		
Marble	150-175	0.21	14.4		
Marinite I @ 400°F	46	0.29	0.89		
Melamine Formaldehyde	93	0.4	3		
Mica	185	0.20	3		
Nylon Fibers	72	0.4-0.5			
Paper	58	0.45	0.82		
Paraffin	56	0.70	1.56	133	63
Phenolic Resin, Cast	84	0.3-0.4	1.1		
Phenolic Formaldehyde	78-92	0.38-0.42			
Phenolic, Sheet or Tube					
Laminated	78	0.3-0.5	2.4		
Pitch, Hard	83			300±	
Plastics:					
ABS	69-76	0.35 2.28	1.32		
Acrylic	69-74	0.34	1.0		
Cellulose Acetate	76-83	0.3-0.5	1.2-2.3		
Cellulose Acetate Butyrate	74	0.3-0.4	1.2-2.3		
Epoxy	66-88	0.25-0.3	1.2-2.4		
Fluoroplastics	131-150	0.28	1.68		
Nylon	67-72	0.3-0.5	1.68		
Phenolic	85-124	0.35	1.02		
Polycarbonate	74-78	0.3	1.38		
Polyester	66-92	0.2-0.35	3.96-5		
Polyethylene	57-60 3.48	0.54	2.28		
Polyimides	90	0.27-0.31	2.5-6.8		
Polypropylene	55-57	0.46	1.72		

CONTINUED

* At or near room temperature
** Thermal conductivity will decrease with age and use

To convert to kg/m³ multiply lb/ft³ by 16.02
To convert to kJ/kg multiply Btu/lb by 2.326
To convert to kJ/kg-°C multiply Btu/lb-°F by 4.187
To convert to W/m-°C multiply Btu-in/hr-ft²-°F by 0.1442

Reference Data

Physical Properties of Solids, Liquids and Gases

Continued

Material	*Density lb./ft³	Specific Heat Btu / lb.-°F	*Thermal Conductivity Btu-in / hr.-ft²-°F	Melting Point °F (Lowest)	Latent Heat of Fusion Btu/lb.
Plastics:					
Polystyrene	66	0.32	0.36-0.96		
Polyvinyl Chloride Acetate	72-99	0.2-0.3	0.84-1.2		
Porcelain	145-155	0.26	6-10		
Potassium Chloride	124	0.17		1454	
Potassium Nitrate	132	0.26		633	
Quartz	138	0.26	9.6	3137	
Rock Salt		0.219		1495	
Rubber Synthetics	58	0.40	1.0		
Sand, Dry	88-100	0.191	2.26		
Silica (fused)	124	0.316	10.0	3137	
Silicon Carbide	112-125	0.20-0.23	866	4892 (sublimination)	
Silicone Nitride	197	0.16	208	3452 (sublimination)	
Silicone Rubber	78	0.45	1.5		
Soapstone	162-174	0.22	11.3		
Sodium Carbonate	135	0.30		520	
Sodium Chloride	135	0.22		1474	
Sodium Cyanide	94	0.30		1047	
Sodium Hydroxide Bath (75% NaOH and Mixed Salts)	110	0.28		550	72
Sodium Nitrate	141	0.29		584	
Sodium Nitrite	135	0.30		520	
Sodium/Potassium					
Nitrate Baths:					
Draw Temp 275					
Solid	132	0.32		275	94
Liquid	110	0.37	2.4± @ 600°F		
Draw Temp 430					
Solid	130	0.29		430	49
Liquid	115	0.38	2.4± @ 600°F		
Soil, Dry Including Stones	127	0.40	3.6		
Steatite	162	0.20	17.4	2500	
Stone		0.20			
Stone, Sandstone	130-150	0.22			
Sugar	105	0.30		320	
Sulphur	125	0.203	1.8	230	17
Tallow	60			90±	
Teflon®	135	0.25	1.7		
Urea, Formaldehyde	97	0.4			
Vinylidene	107	0.32			
Vinylite	73	0.29			
Wood, Oak	50	0.57	1.2		
Wood, Pine	34	0.67	0.9		
Zirconia	368	0.12	17.3	4892	

* At or near room temperature
** Thermal conductivity will decrease with age and use

To convert to kg/m³ multiply lb/ft³ by 16.02
To convert to kJ/kg multiply Btu/lb by 2.326
To convert to kJ/kg-°C multiply Btu/lb-°F by 4.187
To convert to W/m-°C multiply Btu-in/hr-ft²-°F by 0.1442

Teflon® is a registered trademark of E.I. du Pont de Nemours & Company.