

TABLE 8. PROPERTIES OF DRY AIR^a

Barometric Pressure 29.921 In.

TEMPERATURE, DEG. FAHR.	WEIGHT PER CUBIC FOOT, POUND	RATIO OF VOLUME TO VOLUME AT 70 DEG. FAHR.	B.T.U. ABSORBED BY 1 Cu. Ft. DRY AIR PER DEG. FAHR.	CUBIC FEET DRY AIR WARMED 1 DEG. PER B.T.U.
-50	0.09690	0.7735	0.02335	42.82
-45	0.09573	0.7829	0.02307	43.34
-40	0.09459	0.7924	0.02280	43.87
-35	0.09348	0.8018	0.02253	44.39
-30	0.09239	0.8112	0.02226	44.91
-25	0.09133	0.8206	0.02201	45.43
-20	0.09029	0.8301	0.02176	45.96
-15	0.08927	0.8396	0.02151	46.48
-10	0.08828	0.8490	0.02127	47.00
-5	0.08731	0.8585	0.02104	47.52
0	0.08636	0.8680	0.02080	48.08
5	0.08544	0.8772	0.02060	48.55
10	0.08453	0.8867	0.02039	49.05
15	0.08363	0.8962	0.02018	49.56
20	0.08276	0.9057	0.01998	50.05
25	0.08190	0.9152	0.01977	50.58
30	0.08107	0.9246	0.01957	51.10
35	0.08025	0.9340	0.01938	51.60
40	0.07945	0.9434	0.01919	52.11
45	0.07866	0.9530	0.01900	52.64
50	0.07788	0.9624	0.01881	53.17
55	0.07713	0.9718	0.01863	53.68
60	0.07640	0.9811	0.01846	54.18
65	0.07567	0.9905	0.01829	54.68
70	0.07495	1.0000	0.01812	55.19
75	0.07424	1.0095	0.01795	55.72
80	0.07356	1.0190	0.01779	56.21
85	0.07289	1.0283	0.01763	56.72
90	0.07222	1.0380	0.01747	57.25
95	0.07157	1.0472	0.01732	57.74
100	0.07093	1.0570	0.01716	58.28
105	0.07030	1.0660	0.01702	58.76
110	0.06968	1.0756	0.01687	59.28
115	0.06908	1.0850	0.01673	59.78
120	0.06848	1.0945	0.01659	60.28
125	0.06790	1.1040	0.01645	60.79
130	0.06732	1.1133	0.01631	61.32
135	0.06675	1.1230	0.01618	61.81
140	0.06620	1.1320	0.01605	62.31
145	0.06565	1.1417	0.01592	62.82
150	0.06510	1.1512	0.01578	63.37
160	0.06406	1.1700	0.01554	64.35
170	0.06304	1.1890	0.01530	65.36
180	0.06205	1.2080	0.01506	66.40
190	0.06110	1.2270	0.01484	67.40
200	0.06018	1.2455	0.01462	68.41
220	0.05840	1.2833	0.01419	70.48
240	0.05673	1.3212	0.01380	72.46
260	0.05516	1.3590	0.01343	74.46
280	0.05367	1.3967	0.01308	76.46
300	0.05225	1.4345	0.01274	78.50
350	0.04903	1.5288	0.01197	83.55
400	0.04618	1.6230	0.01130	88.50
450	0.04364	1.7177	0.01070	93.46
500	0.04138	1.8113	0.01018	98.24
550	0.03932	1.9060	0.00967	103.42
600	0.03746	2.0010	0.00923	108.35
700	0.03423	2.1900	0.00847	118.07
800	0.03151	2.3785	0.00782	127.88
900	0.02920	2.5670	0.00728	137.37
1000	0.02720	2.7560	0.00680	147.07
1200	0.02392	3.1335	0.00603	165.83

^aFrom *Mechanical Equipment of Buildings*, Vol. 1, by Harding and Willard, second edition, 1929.TABLE 9. SPECIFIC HEAT OF VARIOUS SOLIDS AND LIQUIDS
BETWEEN 32 AND 212 DEG. FAHR.^a

SOLIDS	SOLIDS	SOLIDS
Alloys:	Glass:	Tufa..... 0.33
Bismuth-tin..... 0.040-0.045	Normal..... 0.199	Vulcanite..... 0.331
Bell metal..... 0.086	Crown..... 0.16	Wood:
Brass, yellow..... 0.0883	Flint..... 0.12	Fir..... 0.65
Brass, red..... 0.104	Gneiss..... 0.18	Oak..... 0.57
Bronze..... 0.098	Granite..... 0.195	Pine..... 0.67
Constantan..... 0.050	Graphite..... 0.201	
D'Arceet's metal..... 0.095	Gypsum..... 0.259	LIQUIDS
German silver..... 0.040	Hornblende..... 0.195	Acetic acid..... 0.51
Lipowitz's metal..... 0.109	Humus (soil)..... 0.44	Alcohol (absolute)..... 0.70
Nickel steel..... 0.050	Ice..... 0.504	Alcohol (absolute)..... 0.514
Rose's metal..... 0.040-0.045	India rubber (Para)..... 0.27-0.48	Aniline..... 0.43
Solders (Pb and Sn)..... 0.040-0.045	Kaolin..... 0.224	Benzol..... 0.23
Type metal..... 0.0388	Limestone..... 0.217	Chloroform..... 0.503
Wood's metal..... 0.040	Marble..... 0.210	Ether..... 0.56
40 Pb + 60 Bi..... 0.0317	Oxides:	Fusel oil..... 0.70
25 Pb + 75 Bi..... 0.030	Alumina (Al ₂ O ₃)..... 0.183	Gasoline..... 0.576
Asbestos..... 0.20	CuO..... 0.111	Glycerine..... 0.60
Ashes..... 0.20	Lead oxide (PbO)..... 0.055	Hydrochloric acid..... 0.50
Basalt (lava)..... 0.229	Lodestone..... 0.222	Kerosene..... 0.31
Borax..... 0.22	Magnesia..... 0.168	Naphthalene..... 0.40
Brick..... 0.203	Magnetite (Fe ₃ O ₄)..... 0.191	Machine oil..... 0.033
Carbon-coke..... 0.215	Silica..... 0.231	Mercury..... 0.35
Chalk..... 0.20	Soda..... 0.125	Olive oil..... 0.52
Charcoal..... 0.18	Zinc oxide (ZnO)..... 0.69	Paraffin oil..... 0.498
Cinders..... 0.314	Paraffin wax..... 0.255	Petroleum..... 0.336
Coal..... 0.27	Porcelain..... 0.17-0.28	Sulphuric acid..... 0.94
Concrete..... 0.485	Quartz..... 0.217	Sea water..... 0.40
Cork..... 0.198	Quicklime..... 0.21	Toluene..... 0.472
Corundum..... 0.222	Salt, rock..... 0.195	Turpentine..... 0.472
Dolomite..... 0.33	Sand..... 0.22	Molten metals:
Ebonite..... 0.33	Sandstone..... 0.25	Bismuth (535-725 deg. Fahr.)..... 0.036
	Serpentine..... 0.180	Lead (590-680 deg. Fahr.)..... 0.041
	Sulphur..... 0.209	Sulphur (246-297 deg. Fahr.)..... 0.235
		Tin (460-660 deg. Fahr.)..... 0.058

^aFrom Marks' *Mechanical Engineers' Handbook*.

TABLE 10. METRIC UNITS

1 cm.	= 0.3937 in.	1 cu. cm.	= 0.061 cu. in.
1 in.	= 2.54 cm.	1 cu. in.	= 16.38 cu. cm.
1 meter	= 3.281 ft.	1 cu. meter	= 35.32 cu. ft.
1 ft.	= 0.3048 meters	1 cu. ft.	= 0.0283 cu. meter
1 sq. cm.	= 0.155 sq. in.	1 liter	= 1000 cu. cm. = 0.264 gal.
1 sq. in.	= 6.45 sq. cm.	1 kilogram	= 2.2046 lb.
1 sq. meter	= 10.765 sq. ft.	1 lb.	= 0.4536 kilograms
1 sq. ft.	= 0.0929 sq. meter	1 met. ton	= 2205 lb. (avoir.)
		1 gram	= 980.59 dynes
1 kilometer per hour	= 0.6214 mile per hour.		
1 gram per square centimeter	= 0.2896 in. mercury (at 0 deg. cent.)		
1 kg. per square centimeter (metric atmosphere)	= 0.394 in. water (at 15 deg. cent.)		
1 gram per cubic centimeter	= 14.22 lb. per square inch		
1 dyne	= 0.03613 lb. per cubic inch = 62.43 lb. per cubic foot		
1 joule	= 0.00007233 poundals		
1 metric hp. (force de cheval)	= 10,000,000 ergs = 0.73767 ft. lb.		
1 kilogram-calorie (large calorie)	= 75 kg.-meters per second = 0.986 hp. (U. S.)		
1 kilogram-calorie	= 1,000 gram-calories (small calorie)		
1 kg. calorie per kilogram	= 3.97 B.t.u.		
1 gram-calorie per square centimeter	= 1.8 B.t.u. per pound		
1 gram-calorie per square centimeter per centimeter	= 3.687 B.t.u. per sq. ft.		
1 gram-calorie per second per square centimeter for a tempera-	= 1.451 B.t.u. per square foot per inch		
ture graduation of 1 deg. cent. per centimeter of thickness,	= 2.903 B.t.u. per hour per square foot for a temperature graduation of 1 deg. Fahr. per inch of thickness.		

TABLE 11. DENSITY OF LIQUIDS (WATER = 1)

Alcohol..... 0.789	Oils (mineral lubricants)..... 0.90-0.93
Draft gage oil (ellison)..... 0.834	Turpentine..... 0.861-0.867
Gasoline..... 0.66-0.67	Water, 39.1 deg. Fahr..... 1.000
Hydrochloric acid..... 1.20	Water, 212 deg. Fahr..... 0.958
Kerosene..... 0.75-0.86	Water (ice)..... 0.88-0.92
Nitric acid..... 1.50	Water (fresh fallen snow)..... 1.025
Sulphuric acid..... 1.80	Water (sea)..... 1.02-1.93