TABLE 2. CONDUCTIVITIES (k) AND CONDUCTANCES (C) OF BUILDING AND INSULATING MATERIALS—Continued

These constants are expressed in Btu per (hour) (square foot) (Fahrenheit degrees temperature difference.) Conductivities (k) are per inch thickness and conductances (C) are for thickness or construction stated, not per inch thickness.

MATERIAL	DESCRIPTION	DENSITY (LB PER CU FT)	MEAN TEMP (FAHR DEG)	CONDUCTIVITY OR CONDUCTANCE		RESISTANCE		AUTHORITY
				(k)	(C)	Per Inch Thickness ($\frac{1}{k}$)	For Thickness Listed ($\frac{1}{C}$)	
WOODS—(continued)	Soft maple, 0 % moisture[a]	42.0	75	0.95	—	1.05	—	(4)
	Sugar pine, 0 % moisture[a]	28.0	75	0.64	—	1.56	—	(4)
	Virginia pine	34.3	86	0.96	—	1.04	—	(1)
	West coast hemlock, 0 % moisture[a]	30.0	75	0.79	—	1.27	—	(4)
	White pine	31.2	86	0.78	—	1.28	—	(1)
	Yellow pine	—	—	1.00	—	1.00	—	(3)
	Sawdust, various	12.0	90	0.41	—	2.44	—	(1)
	Shavings, various from planer	8.8	90	0.41	—	2.44	—	(1)
	Shavings, from maple, beech and birch (coarse)	13.2	90	0.36	—	2.78	—	(1)
INSULATING MATERIALS								
BLANKET AND BAT INSULATIONS	Chemically treated wood fibers held between layers of strong paper	3.62	70	0.25	—	4.00	—	(3)
	Flax fibers between strong paper	4.90	90	0.28	—	3.57	—	(1)
	Chemically treated hog hair between kraft paper	5.76	71	0.26	—	3.85	—	(3)
	Chemically treated hog hair between kraft paper and asbestos paper	7.70	71	0.28	—	3.57	—	(3)
	Hair felt between layers of paper	11.00	75	0.25	—	4.00	—	(3)
	Kapok between burlap or paper	1.00	90	0.24	—	4.17	—	(1)
	Stitched and creped expanding fibrous blanket	1.50	70	0.27	—	3.70	—	(3)
	Paper and asbestos fiber with emulsified asphalt binder	4.2	94	0.28	—	3.57	—	(1)
	Cotton insulating bat	0.875	72	0.24	—	4.17	—	(3)
	Cotton fibers Short Staple Linters, Fireproofed	6.25	90	0.25	—	4.00	—	(1)
		4.50	90	0.24	—	4.17	—	(1)
		2.45	90	0.24	—	4.17	—	(1)
		1.60	90	0.26	—	3.85	—	(1)
		0.85	90	0.29	—	3.45	—	(1)
		0.65	90	0.30	—	3.33	—	(1)
	Felted cattle hair	13.00	90	0.26	—	3.84	—	(1)
	Felted cattle hair	11.00	90	0.26	—	3.84	—	(1)
	Felted hair and asbestos	7.80	90	0.28	—	3.57	—	(1)
	Ground paper between two layers, each $\frac{1}{8}$ in. thick made up of two layers of kraft paper (sample $\frac{1}{4}$ in. thick)	12.1	75	—	0.40	—	2.50	(4)
	Mineral Wool	4.5	—	0.27	—	3.70	—	
REFLECTIVE	See Table 1, Section C	—	—	—	—	—	—	
INSULATING BOARD	Made from sugar cane fiber	13.5	70	0.33	—	3.03	—	(3)
	Made from hard wood fibers	15.20	70	0.32	—	3.12	—	(3)
	Made from wood fiber	15.90	72	0.33	—	3.03	—	(3)
	Made from wood fiber	15.00	70	0.33	—	3.03	—	(3)
	Made from wood fiber	—	52	0.33	—	3.03	—	(6)
	Made from wood fiber	15.20	—	0.33	—	3.03	—	(3)
	Made from licorice root	16.90	90	0.34	—	2.94	—	(1)
	$\frac{1}{2}$ in. insulating boards without special finish (eleven samples)	16.1	81	0.34	—	2.94	—	(3)
		16.5 to 21.8	90	0.33 to 0.40	—	3.03 to 2.50	—	(1)
	1 in. insulating board[a]	13.2	—	0.34	—	2.94	—	(4)

See footnotes on first page of Table 2.

TABLE 2. CONDUCTIVITIES (k) AND CONDUCTANCES (C) OF BUILDING AND INSULATING MATERIALS—Concluded

These constants are expressed in Btu per (hour) (square foot) (Fahrenheit degree temperature differences.) Conductivities (k) are per inch thickness and conductances (C) are for thickness or construction stated, not per inch thickness.

MATERIAL	DESCRIPTION	DENSITY (LB PER CU FT)	MEAN TEMP (FAHR DEG)	CONDUCTIVITY OR CONDUCTANCE		RESISTANCE		AUTHORITY
				(k)	(C)	Per Inch Thickness ($\frac{1}{k}$)	For Thickness Listed ($\frac{1}{C}$)	
INSULATING MATERIALS—(Continued)	Made from ceiba fibers	1.90	75	0.23	—	4.35	—	(3)
	Made from ceiba fibers	1.60	75	0.24	—	4.17	—	(3)
LOOSE FILL TYPE	Chemically treated wood fibers	4.0	75	0.28	—	3.57	—	(4)
	Fibrous material made from dolomite and silica	1.50	75	0.27	—	3.70	—	(3)
	Fibrous material made from slag	9.40	103	0.27	—	3.70	—	(1)
	Redwood bark	3.00	90	0.31	—	3.22	—	(1)
	Redwood bark	5.00	75	0.26	—	3.84	—	(3)
	Glass wool fibers 0.0003 in. to 0.006 in. in diameter	1.50	75	0.27	—	3.70	—	(3)
	Granular insulation made from combined silicate of lime and alumina	4.20	72	0.24	—	4.17	—	(3)
	Expanded vermiculite	7.0	70	0.48	—	2.08	—	(1)
	Regranulated cork about $\frac{1}{8}$ in. particles	8.10	90	0.31	—	3.22	—	(1)
	Hand applied granular mineral wool 2 in. to 6 in. thick, horizontal position[b]. No covering	6.05 to 7.13	—	to 0.33	—	to 3.03	—	(4)
	4 in. machine blown granular mineral wool, horizontal position[b]. No covering	5.74	—	0.30	—	3.33	—	(4)
	Rock wool	10.0	90	0.27	—	3.70	—	(1)
SLAB INSULATIONS	Corkboard, no added binder	14.0	90	0.34	—	2.94	—	(1)
	Corkboard, no added binder	10.6	90	0.30	—	3.33	—	(1)
	Corkboard, no added binder	7.0	90	0.27	—	3.70	—	(1)
	Corkboard, no added binder	5.4	90	0.25	—	4.00	—	(1)
	Corkboard[a]	8.7	—	0.29	—	3.45	—	(4)
	Corkboard, asphaltic binder	14.5	90	0.32	—	3.12	—	(1)
	Chemically treated hog hair with film of asphalt	10.0	75	0.28	—	3.57	—	(3)
	Sugar cane fiber insulation blocks encased in asphalt membrane	13.8	70	0.30	—	3.33	—	(3)
	Made from shredded wood and cement	24.2	72	0.46	—	2.17	—	(3)
	Made from shredded wood and cement[a]	29.8	—	0.77	—	1.30	—	(4)
	Cellular glass	9.0	75	0.42	—	2.38	—	(1)
	Cellular glass	9.0	50	0.40	—	2.50	—	(1)

See footnotes on first page of Table 2.

ing. For increases of moisture content exceeding about 6 to 12 percent, the conductivity of frozen soil becomes progressively greater than that of the unfrozen soil.

Effect of Density. Density affects the thermal conductivity of a soil in about the same manner for all soils, at any moisture content, and for either the frozen or unfrozen condition. On the average, each one pound per cubic foot increase in dry density increases the thermal conductivity by about 3 percent.

Effect of Moisture. An increase in moisture content, up to the point of saturation, causes an increase in thermal conductivity. The rate of increase in typical soils was as follows: average conductivities, in Btu per (square foot) (hour) (Fahrenheit degree per inch), of four sands at a density of 110 lb per cu ft were: 6.8 at 2.5 percent moisture, 8.9 at 5 percent moisture, 11.2 at 10 percent moisture. Five soils of a fine texture at a density of 100 lb per cu ft, gave average conductivities of 6.7 at 10 percent moisture, and 9.5 at 20 percent. Thus, the doubling of moisture con-