TABLE 4. CONDUCTIVITIES (k), CONDUCTANCES (C) AND RESISTANCES (R) OF BUILDING AND INSULATING MATERIALS (*Continued*)

(Design Values)[a]

MATERIAL	DESCRIPTION	DENSITY (LB. PER CU FT)	CONDUCTIVITY OR CONDUCTANCE		RESISTANCE (R)	
			(k)	(C)	Per Inch Thickness $\left(\frac{1}{k}\right)$	For Thickness Listed $\left(\frac{1}{C}\right)$
INSULATING MATERIALS BOARD	Glass fiber	9.5	0.25	—	4.00	—
	Wood or cane fiber					
	Acoustical tile[f] ½ in.	—	—	0.84	—	1.19
	Acoustical tile[f] ¾ in.	—	—	0.56	—	1.78
	Interior finish (plank, tile, lath)	15.0	0.35	—	2.86	—
	Interior finish (plank, tile, lath) ½ in.	15.0	—	0.70	—	1.43
	Roof deck slab					
	Approx. 1½ in.	—	—	0.24	—	4.17
	Approx. 2 in.	—	—	0.18	—	5.56
	Approx. 3 in.	—	—	0.12	—	8.33
	Sheathing (impreg. or coated)	20.0	0.38	—	2.63	—
	Sheathing (impreg. or coated) ½ in.	20.0	—	0.76	—	1.32
	Sheathing (impreg. or coated) 25/32 in.	20.0	—	0.49	—	2.06
BOARD AND SLABS	Cellular glass	9.0	0.40	—	2.50	—
	Corkboard (without added binder)	6.5–8.0	0.27	—	3.70	—
	Hog hair (with asphalt binder)	8.5	0.33	—	3.00	—
	Plastic (foamed)	1.62	0.29	—	3.45	—
	Wood shredded (cemented in preformed slabs)	22.0	0.55	—	1.82	—
LOOSE FILL	Macerated paper or pulp products	2.5–3.5	0.28	—	3.57	—
	Mineral wool (glass, slag, or rock)	2.0–5.0	0.30	—	3.33	—
	Sawdust or shavings	8.0–15.0	0.45	—	2.22	—
	Vermiculite (expanded)	7.0	0.48	—	2.08	—
	Wood fiber: redwood, hemlock, or fir	2.0–3.5	0.30	—	3.33	—
ROOF INSULATION	All types[e]					
	Preformed, for use above deck.					
	Approx. ½ in.	—	—	0.72	—	1.39
	Approx. 1 in.	—	—	0.36	—	2.78
	Approx. 1½ in.	—	—	0.24	—	4.17
	Approx. 2 in.	—	—	0.19	—	5.26
	Approx. 2½ in.	—	—	0.15	—	6.67
	Approx. 3 in.	—	—	0.12	—	8.33
MASONRY MATERIALS CONCRETES	Cement mortar	116	5.0	—	0.20	—
	Gypsum-fiber concrete 87½% gypsum, 12½% wood chips	51	1.66	—	0.60	—
	Lightweight aggregates including expanded shale, clay or slate; expanded slags; cinders; pumice; perlite; vermiculite; also cellular concretes	120	5.2	—	0.19	—
		100	3.6	—	0.28	—
		80	2.5	—	0.40	—
		60	1.7	—	0.59	—
		40	1.15	—	0.86	—
		30	0.90	—	1.11	—
		20	0.70	—	1.43	—
	Sand and gravel or stone aggregate (oven dried)	140	9.0	—	0.11	—
	Sand and gravel or stone aggregate (not dried)	140	12.0	—	0.08	—
	Stucco	116	5.0	—	0.20	—
MASONRY UNITS	Brick, common	120	5.0	—	0.20	—
	Brick, face	130	9.0	—	0.11	—
	Clay tile, hollow:					
	1 cell deep 3 in.	—	—	1.25	—	0.80
	1 cell deep 4 in.	—	—	0.90	—	1.11
	2 cells deep 6 in.	—	—	0.66	—	1.52
	2 cells deep 8 in.	—	—	0.54	—	1.85
	2 cells deep 10 in.	—	—	0.45	—	2.22
	3 cells deep 12 in.	—	—	0.40	—	2.50
	Concrete blocks, three oval core:					
	Sand & gravel aggregate 4 in.	—	—	1.40	—	0.71
	8 in.	—	—	0.90	—	1.11
	12 in.	—	—	0.78	—	1.28
	Cinder aggregate 3 in.	—	—	1.16	—	0.86
	4 in.	—	—	0.90	—	1.11
	8 in.	—	—	0.58	—	1.72
	12 in.	—	—	0.53	—	1.89
	Gypsum partition tile:					
	3 x 12 x 30 in. solid	—	—	0.79	—	1.26
	3 x 12 x 30 in. 4-cell	—	—	0.74	—	1.35
	4 x 12 x 30 in. 3-cell	—	—	0.60	—	1.67

TABLE 4. CONDUCTIVITIES (k), CONDUCTANCES (C) AND RESISTANCES (R) OF BUILDING AND INSULATING MATERIALS (*Concluded*)

(Design Values)[a]

MATERIAL	DESCRIPTION	DENSITY (LB. PER CU FT)	CONDUCTIVITY OR CONDUCTANCE		RESISTANCE (R)	
			(k)	(C)	Per Inch Thickness $\left(\frac{1}{k}\right)$	For Thickness Listed $\left(\frac{1}{C}\right)$
MASONRY UNITS (*Continued*)	Lightweight aggregate (expanded shale, clay, slate or slag; pumice) 3 in.	—	—	0.79	—	1.27
	4 in.	—	—	0.67	—	1.50
	8 in.	—	—	0.50	—	2.00
	12 in.	—	—	0.44	—	2.27
	Stone, lime or sand	—	12.50	—	0.08	—
METALS	(See Chapter 5, Table 1)					
PLASTERING MATERIALS	Cement plaster, sand aggregate	116	5.0	—	0.20	—
	Sand aggregate ½ in.	—	—	10.00	—	0.10
	Sand aggregate ¾ in.	—	—	6.66	—	0.15
	Gypsum plaster:					
	Lightweight aggregate ½ in.	45	—	3.12	—	0.32
	Lightweight aggregate ⅝ in.	45	—	2.67	—	0.39
	Lightweight agg. on metal lath ¾ in.	—	—	2.13	—	0.47
	Perlite aggregate	45	1.5	—	0.67	—
	Sand aggregate	105	5.6	—	0.18	—
	Sand aggregate ½ in.	105	—	11.10	—	0.09
	Sand aggregate ⅝ in.	105	—	9.10	—	0.11
	Sand aggregate on metal lath ¾ in.	—	—	7.70	—	0.13
	Sand aggregate on wood lath	—	—	2.50	—	0.40
	Vermiculate aggregate	45	1.7	—	0.59	—
ROOFING	Asbestos-cement shingles	120	—	4.76	—	0.21
	Asphalt roll roofing	70	—	6.50	—	0.15
	Asphalt shingles	70	—	2.27	—	0.44
	Built-up roofing ⅜ in.	70	—	3.00	—	0.33
	Slate ½ in.	—	—	20.00	—	0.05
	Sheet metal	—	400+	—	Negl	
	Wood shingles	—	—	1.06	—	0.94
SIDING MATERIALS (ON FLAT SURFACE)	Shingles					
	Wood, 16-in. 7½-in. exposure	—	—	1.15	—	0.87
	Wood, double, 16-in., 12-in. exposure	—	—	0.84	—	1.19
	Wood, plus insul. backer board 5/16 in.	—	—	0.71	—	1.40
	Siding					
	Asbestos-cement, ¼ in., lapped	—	—	4.76	—	0.21
	Asphalt Roll Siding	—	—	6.50	—	0.15
	Asphalt Insulating Siding (½ in. bd.)	—	—	0.69	—	1.45
	Wood, Drop, 1 x 8 in.	—	—	1.27	—	0.79
	Wood, Bevel, ½ x 8 in., lapped	—	—	1.23	—	0.81
	Wood, Bevel, ¾ x 10 in., lapped	—	—	0.95	—	1.05
	Wood, Plywood, ⅜ in., lapped	—	—	1.59	—	0.59
	Structural glass			10.00		0.10
WOODS	Maple, oak, and similar hardwoods	45	1.10	—	0.91	—
	Fir, pine, and similar softwoods	32	0.80	—	1.25	—

[a] Representative values for dry materials at 75 F mean temperature, selected by the A.S.H.A.E. Technical Advisory Committee on Insulation. They are intended as design (not specification) values for materials of building construction in normal use. For conductivity of a particular product, the user may obtain the value supplied by the manufacturer or secure the results of unbiased tests.

[b] Air space resistance values shown here are for spaces faced both sides with ordinary *non-reflective* materials ($\epsilon = 0.90$ and $E = 0.82$) and are based on following conditions: Winter—50 F mean temperature and 20 deg temperature difference, Summer—90 F mean temperature and 10 deg temperature difference except for horizontal air space with heat flow downward which is based on 20 deg temperature difference.

[c] Surface resistance values shown here are for ordinary *non-reflective* materials ($\epsilon = 0.90$).

[d] See also Insulating Materials, Board.

[e] Includes paper backing and facing if any. In cases where the insulation forms a boundary (highly reflective or otherwise) of an air space, refer to Table 3, Sections B and C, to obtain the insulating value of the air space for the appropriate effective emissivity and temperature conditions of the space.

[f] Insulating values of acoustical tile vary depending on density of the board and on the type, size and depth of the perforations. An average conductivity k value is 0.42.

[g] The *U. S. Department of Commerce*, Simplified Practice Recommendation for Thermal Conductance Factors for Preformed Above-Deck Roof Insulation, No. R 257-55, recognizes the specification of roof insulation on the basis of the C values shown. Roof insulation is made in thicknesses to meet these values. Therefore, thickness supplied by different manufacturers may vary depending on the conductivity k value of the particular material.

[h] Not oven dried—conductivity k prior to drying, approximately 1 to 3 years.