

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

These constants are expressed in Btu per hour per square foot per degree Fahrenheit 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 (DEG FAHR)	CONDUCTIVITY OR CONDUCTANCE		RESISTANCE		AUTHORITY
				(k)	(C)	Per Inch Thickness	For Thickness Listed	
						($\frac{1}{k}$)	($\frac{1}{C}$)	
BUILDING BOARDS (Non-Insulating)	Compressed cement and asbestos sheets	123	86	2.70	---	0.37	---	(1)
	Corrugated asbestos board	20.4	110	0.48	---	2.08	---	(2)
	Pressed asbestos mill board	60.5	86	0.84	---	1.19	---	(3)
	Gypsum board—gypsum between layers of heavy paper	62.8	70	1.41	---	0.71*	---	(3)
	$\frac{3}{4}$ in. gypsum board	---	---	---	---	3.73	0.27*	(3)
	$\frac{1}{2}$ in. gypsum board	---	---	---	---	2.82	0.35	(3)
FRAME CONSTRUCTION COMBINATIONS	$\frac{1}{2}$ in. gypsum board	53.5	90	2.60	---	0.38	---	(1)
	1 in. fir sheathing and building paper	---	30	---	0.86	---	1.16*	(4)
	1 in. fir sheathing, building paper and yellow pine lap siding	---	20	---	0.50	---	2.00*	(4)
	1 in. fir sheathing, building paper and stucco	---	20	---	0.82	---	1.22	(4)
	Pine lap siding and building paper, siding 4 in. wide	---	16	---	0.85	---	1.18*	(4)
	Yellow pine lap siding	---	---	---	1.28	---	0.78*	(4)
MASONRY MATERIALS BRICK	Damp or wet	---	---	5.0*	---	0.20*	---	(2)
	Common yellow clay brick*	---	---	4.8	---	0.21	---	(4)
	One tier yellow common clay brick, one tier face brick, approx. 8 in. thick*	---	---	---	0.77	---	1.30	(4)
CLAY TILE, HOLLOW	2 in. Tile, $\frac{1}{2}$ in. plaster both sides	120.0	110	---	1.00	---	1.00	(2)
	4 in. Tile, $\frac{1}{2}$ in. plaster both sides	137.0	100	---	0.60	---	1.67	(2)
	6 in. Tile, $\frac{1}{2}$ in. plaster both sides	124.3	105	---	0.47	---	2.13	(2)
	8 in. Tile, average of 8 types (Walls No. 59, 63, 64, 66, 67, 90, 91, 92*)	---	---	---	0.52	---	1.92	(4)
	12 in. Clay tile wall: 8 in. x 5 in. x 12 in. and 4 in. x 5 in. x 12 in.*	---	---	---	0.26	---	3.84	(4)
	---	---	---	---	---	---	---	---
CONCRETE	Sand and gravel aggregate, various ages and mixes	---	---	11.35 to 16.36	---	0.09 to 0.06	---	(5)
	Sand and gravel aggregate	142	75	12.5	---	0.08	---	(4)
	Limestone aggregate	132	75	10.8	---	0.09	---	(4)
	Cinder aggregate	97	75	4.9	---	0.22	---	(4)
	Steam treated limestone slag aggregate*	74.8	75	2.27	---	0.44	---	(4)
	Pumice (Mined in California) aggregate*	65.0	75	2.42	---	0.41	---	(4)
	Expanded burned clay aggregate*	59.9	75	2.28	---	0.44	---	(4)
	Burned clay aggregate*	67.1	75	2.86	---	0.35	---	(4)
	Blast furnace slag aggregate	76.0	70	1.6	---	0.63	---	(3)
	Expanded vermiculite aggregate	20	90	0.68	---	1.47	---	(3)
	Expanded vermiculite aggregate	26.7	90	0.76	---	1.32	---	(3)
	---	---	---	---	---	---	---	---
	---	---	---	---	---	---	---	---
	---	---	---	---	---	---	---	---
	---	---	---	---	---	---	---	---

AUTHORITIES:

*U. S. Bureau of Standards, tests based on samples submitted by manufacturers.

*A. C. Willard, L. C. Lichty and L. A. Harding, tests conducted at the University of Illinois.

*J. C. Peebles, tests conducted at Armour Institute of Technology, based on samples submitted by manufacturers.

*F. B. Rowley, et al, tests conducted at the University of Minnesota.

*A.S.H.V.E. Research Laboratory.

*E. A. Allcut, tests conducted at the University of Toronto.

*See Thermal Conductivity of Building Materials, by F. B. Rowley and A. B. Algren (University of Minnesota Engineering Experiment Station Bulletin No. 12).

*Heat Transmission Through Insulation as Affected by Orientation of Wall, by F. B. Rowley and C. E. Lund (A.S.H.V.E. TRANSACTIONS, Vol. 49, 1943, p. 331).

*The Effect of Convection in Ceiling Insulation, by G. B. Wilkes and L. R. Vianey (A.S.H.V.E. TRANSACTIONS, Vol. 49, 1943, p. 198).

*See A.S.H.V.E. RESEARCH REPORT NO. 915—Conductivity of Concrete, by F. C. Houghten and Carl Gutberlet (A.S.H.V.E. TRANSACTIONS, Vol. 38, 1932, p. 47).

*Recommended value. (See Heating, Ventilating and Air Conditioning, by Harding and Willard, revised edition, 1932).

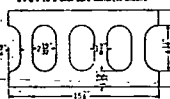
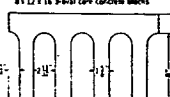
*See BMS13, U. S. Department of Commerce, National Bureau of Standards, Washington, D. C.

*Roofing, 0.15 in. thick (1.34 lb per square foot), covered with gravel (0.83 lb per square foot), combined thickness assumed 0.25.

*Recommended Value for computing heat transmission coefficients. See also Table 3.

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

These constants are expressed in Btu per hour per square foot per degree Fahrenheit 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 (DEG FAHR)	CONDUCTIVITY OR CONDUCTANCE		RESISTANCE		AUTHORITY
				(k)	(C)	Per Inch Thickness	For Thickness Listed	
						($\frac{1}{k}$)	($\frac{1}{C}$)	
MASONRY MATERIALS (Continued) CONCRETE—(Continued)	Expanded vermiculite aggregate	35	90	0.86	---	1.16	---	(3)
	Expanded vermiculite aggregate	50	90	1.10	---	0.91	---	(3)
	Concrete plank	76	75	2.5	---	0.40	---	(3)
	Cellular concrete	40.0	75	1.06	---	0.94	---	(3)
	Cellular concrete	50.0	75	1.44	---	0.69	---	(3)
	Cellular concrete	60.0	75	1.80	---	0.56	---	(3)
	Cellular concrete	70.0	75	2.18	---	0.46	---	(3)
	---	---	---	---	---	---	---	---
	---	---	---	---	---	---	---	---
	---	---	---	---	---	---	---	---
8 In. Concrete Blocks 	8 in. three oval core, sand and gravel aggregate*	126.4	40	---	0.90	---	1.11	(4)
	8 in. three oval core, crushed limestone aggregate*	134.3	40	---	0.86	---	1.16	(4)
	8 in. three oval core, cinder aggregate*	86.2	40	---	0.58	---	1.73	(4)
	8 in. three oval core, burned clay aggregate*	67.7	40	---	0.50	---	2.00	(4)
	8 in. three oval core, expanded blast furnace slag aggregate*	---	40	---	0.49	---	2.04	(4)
	---	---	---	---	---	---	---	---
12 In. Concrete Blocks 	12 in. three oval core, sand and gravel aggregate*	124.9	40	---	0.78	---	1.28	(4)
	12 in. three oval core, cinder aggregate*	86.2	40	---	0.53	---	1.88	(4)
	12 in. three oval core, burned clay aggregate*	76.7	40	---	0.47	---	2.13	(4)
	---	---	---	---	---	---	---	---
	---	---	---	---	---	---	---	---
	---	---	---	---	---	---	---	---
GYPSUM	3 in. solid gypsum partition tile*	---	---	2.41	---	0.42	---	(4)
	3 in. three cell gypsum partition tile*	---	---	---	0.74	---	1.35	(4)
	4 in. three cell gypsum partition tile*	---	---	---	0.60	---	1.67	(4)
	87 1/2 per cent gypsum, 12 1/4 per cent wood chips	51.2	74	1.66	---	0.60	---	(4)
	Gypsum plaster	---	---	3.30	---	0.30	---	---
PLASTERING MATERIALS	Gypsum plaster, $\frac{3}{4}$ in. thick	---	73	---	8.80	---	0.11	(4)
	Cement plaster	---	---	8.00	---	0.13	---	(2)
	Wood, lath and plaster, total thickness $\frac{3}{4}$ in.	---	70	---	2.50	---	0.40*	(4)
	Gypsum plaster and expanded vermiculite, 4 to 1 mix	39.9	75	0.85	---	1.18	---	(3)
	Insulating plaster 0.9 in. thick applied to $\frac{3}{4}$ in. gypsum board	54.0	75	---	1.07	---	0.93	(3)
ROOFING	Asbestos shingles	65.0	75	---	6.0	---	0.17*	(3)
	Asphalt, composition or prepared	70.0	75	---	6.5	---	0.15*	(3)
	Asphalt shingles	70.0	75	---	6.5	---	0.15*	(3)
	Built-up roofing, bitumen or felt, gravel or slag surfaced*	---	---	1.33	---	0.75	---	(2)
	Slate	---	---	10.00	---	0.10*	---	---
	Wood shingles	---	---	---	1.28	---	0.78*	---
WOODS	Balsa	20.0	90	0.58	---	1.72	---	(1)
	Balsa	8.3	90	0.38	---	2.63	---	(1)
	Balsa	7.3	90	0.33	---	3.03	---	(1)
	California redwood, 0 per cent moisture*	28.0	75	0.70	---	1.43	---	(4)
	Cypress	28.7	86	0.67	---	1.49	---	(1)
	Douglas fir, 0 per cent moisture*	34.0	75	0.67	---	1.49	---	(4)
	Eastern hemlock, 0 per cent moisture*	30.0	75	0.76	---	1.32	---	(4)
	Long leaf yellow pine, 0 per cent moisture*	40.0	75	0.86	---	1.16	---	(4)
	Mahogany	34.3	86	0.90	---	1.11	---	(1)
	---	---	---	---	---	---	---	---

See notes on Page 88.