

HEATING VENTILATING AIR CONDITIONING GUIDE 1940

TABLE 2. CONDUCTIVITIES (*k*) AND CONDUCTANCES (*C*) OF BUILDING MATERIALS AND INSULATORS^a—Continued

The coefficients are expressed in Btu per hour per square foot per degree Fahrenheit per 1 in. thickness unless otherwise indicated.

Material	Description	DENSITY (Lb per Cu Ft)	MEAN TEMP (DEG FAH)	CONDUCTIVITY (<i>k</i>) OR CONDUCTANCE (<i>C</i>)	RESISTIVITY OR RESISTANCE ($\frac{1}{k}$ or $\frac{1}{C}$)	AUTHORITY
BUILDING CONSTRUCTIONS						
FRAME	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)
	Five lap siding and building paper—siding 4 in. wide	—	16	0.85†*	1.18	(4)
	Yellow pine lap siding	—	—	1.28†*	0.78	(3)
FLOORING	Maple—across grain	40.00	75	1.20	0.83	(3)
	Battleship linoleum ($\frac{1}{4}$ in.)	—	—	1.36†*	0.74	—
AIR SPACE AND SURFACE COEFFICIENTS						
AIR SPACES	Over $\frac{1}{4}$ in. faced ordinary building materials	—	40	1.10†*	0.91	(4)
	$\frac{3}{4}$ in. faced ordinary building materials	—	—	1.32	0.76	(8)
	Horizontal, heat flow upward, $\epsilon = 0.83^a$	—	—	1.17	0.86	(8)
	Vertical, $\epsilon = 0.83^a$	—	—	0.94	1.06	(8)
	Horizontal, heat flow downward, $\epsilon = 0.83^a$	—	—	—	—	—
	$\frac{3}{4}$ in. faced reflective building materials	—	—	0.56	1.79	(8)
	Horizontal, heat flow upward, $\epsilon = 0.05^c$	—	—	0.41	2.44	(8)
	Vertical, $\epsilon = 0.05^c$	—	—	0.17	5.88	(8)
	Horizontal, heat flow downward, $\epsilon = 0.05^c$	—	—	1.65†*	0.61	(4)
SURFACES, ORDINARY	Still air (<i>f</i>), Avg.	—	—	1.95†*	0.51	(8)
	Horizontal, heat flow upward, $\epsilon = 0.83(f)^a$	—	—	1.52†*	0.66	(8)
	Vertical, $\epsilon = 0.83(f)^a$	—	—	—	—	—
	Horizontal, heat flow downward, $\epsilon = 0.83(f)^a$	—	—	1.21†	0.83	(8)
	15 mph—(<i>f</i>)	—	—	6.00†*	0.17	(4)
SURFACES, ROUGH STUCCO	15 mph—(<i>f</i>)	—	—	9.00†*	0.11	(4)
SURFACE, REFLECTIVE	Still air (<i>f</i>), Avg.	—	—	0.80†*	1.25	(8)
	Horizontal, heat flow upward, $\epsilon = 0.05(f)^c$	—	—	1.16†	0.86	(8)
	Vertical, $\epsilon = 0.05(f)^c$	—	—	0.74†	1.35	(8)
	Horizontal, heat flow downward, $\epsilon = 0.05(f)^c$	—	—	0.44†	2.27	(8)
AIR SPACES FACED WITH BRIGHT ALUMINUM FOIL	Air space, faced one side with bright aluminum foil, over $\frac{1}{4}$ in. wide	—	50	0.46†*	2.17	(4)
	Air space, faced one side with bright aluminum foil, $\frac{1}{4}$ in. wide	—	50	0.62†	1.61	(4)
	Air space, faced both sides with bright aluminum foil, over $\frac{1}{4}$ in. wide	—	50	0.41†*	2.44	(4)
	Air space, faced both sides with bright aluminum foil, $\frac{1}{4}$ in. wide	—	50	0.57†	1.75	(4)
	Air space divided in two with single curtain of bright aluminum foil (both sides bright) each space over $\frac{1}{4}$ in. wide	—	50	0.23†*	4.35	(4)
	each space $\frac{1}{4}$ in. wide	—	50	0.31†	3.23	(4)
	Air space with multiple curtains of bright aluminum foil, bright on both sides, curtains more than $\frac{1}{4}$ in. apart, air circulation between spaces prevented:	—	—	—	—	—
	2 curtains, forming 3 spaces	—	50	0.15†*	6.78	(4)
	3 curtains, forming 4 spaces	—	50	0.11†*	9.22	(4)
	4 curtains, forming 5 spaces	—	50	0.09†*	11.66	(4)
SPACES FACED WITH NON-METALLIC PAINT SURFACE	Fabric with non-metallic reflective surface ($\frac{1}{4}$ in. thick) placed in center of a $1\frac{1}{4}$ in. air space	—	70	0.33†	3.03	(3)
	Core of fiber board coated two sides with non-metallic reflective surface ($\frac{1}{4}$ in. thick) placed in space having approximately $\frac{1}{4}$ in. air space on each side	23.4	70	0.27†	3.70	(3)
	Fiber board coated one side with non-metallic reflective surface ($\frac{1}{4}$ in. thick) placed in space having approximately $\frac{1}{4}$ in. air space on each side	—	75	0.49†	2.04	(3)

For notes see Page 94.

CHAPTER 5. HEAT TRANSMISSION COEFFICIENTS AND TABLES

TABLE 2. CONDUCTIVITIES (*k*) AND CONDUCTANCES (*C*) OF BUILDING MATERIALS AND INSULATORS^a—Continued

The coefficients are expressed in Btu per hour per square foot per degree Fahrenheit per 1 in. thickness unless otherwise indicated.

Material	Description	DENSITY (Lb per Cu Ft)	MEAN TEMP (DEG FAH)	CONDUCTIVITY (<i>k</i>) OR CONDUCTANCE (<i>C</i>)	RESISTIVITY OR RESISTANCE ($\frac{1}{k}$ or $\frac{1}{C}$)	AUTHORITY
SPACES FACED WITH NON-METALLIC PAINT SURFACE—(Continued)	Air space divided in two with fabric faced both sides with non-metallic reflective surface, each space over $\frac{1}{4}$ in. wide	—	40	0.33†	3.03	(4)
	Air space over $\frac{1}{4}$ in. wide faced one side with non-metallic reflective surface	—	40	0.67†	1.49	(4)
WOODS (Across Grain)						
BALSA		20.0	90	0.58	1.72	(1)
		8.8	90	0.38	2.63	(1)
		7.3	90	0.33	3.03	(1)
CALIFORNIA REDWOOD	0% moisture	22.0	75	0.66	1.53	(4)
	16% " "	28.0	75	0.70	1.43	(4)
	16% " "	22.0	75	0.74	1.35	(4)
	16% " "	28.0	75	0.80	1.25	(4)
CYPRESS	0% moisture	28.7	86	0.67	1.49	(1)
DOUGLAS FIR	0% moisture	26.0	75	0.61	1.64	(4)
	16% " "	34.0	75	0.67	1.49	(4)
	16% " "	26.0	75	0.76	1.32	(4)
	16% " "	34.0	75	0.82	1.22	(4)
EASTERN HEMLOCK	0% moisture	22.0	75	0.60	1.67	(4)
	16% " "	30.0	75	0.76	1.32	(4)
	16% " "	22.0	75	0.67	1.49	(4)
	16% " "	30.0	75	0.85	1.18	(4)
HARD MAPLE	0% moisture	40.0	75	1.01	0.99	(4)
	16% " "	46.0	75	1.05	0.95	(4)
	16% " "	40.0	75	1.15	0.87	(4)
	16% " "	46.0	75	1.21	0.83	(4)
LONGLEAF YELLOW PINE	0% moisture	30.0	75	0.76	1.32	(4)
	16% " "	40.0	75	0.86	1.16	(4)
	16% " "	30.0	75	0.89	1.12	(4)
	16% " "	40.0	75	1.03	0.97	(4)
MAHOGANY	0% moisture	34.3	86	0.90	1.11	(1)
MAPLE OR OAK	0% moisture	44.3	86	1.10	0.91	(1)
NORWAY PINE	0% moisture	22.0	75	0.62	1.61	(4)
	16% " "	32.0	75	0.74	1.35	(4)
	16% " "	22.0	75	0.74	1.35	(4)
	16% " "	32.0	75	0.91	1.10	(4)
RED CYPRESS	0% moisture	22.0	75	0.67	1.49	(4)
	16% " "	32.0	75	0.79	1.27	(4)
	16% " "	22.0	75	0.74	1.35	(4)
	16% " "	32.0	75	0.90	1.11	(4)
RED OAK	0% moisture	38.0	75	0.98	1.02	(4)
	16% " "	48.0	75	1.18	0.85	(4)
	16% " "	38.0	75	1.07	0.94	(4)
	16% " "	48.0	75	1.29	0.78	(4)
SHORTLEAF YELLOW PINE	0% moisture	26.0	75	0.74	1.35	(4)
	16% " "	36.0	75	0.91	1.10	(4)
	16% " "	26.0	75	0.84	1.19	(4)
	16% " "	36.0	75	1.04	0.96	(4)
SOFT ELM	0% moisture	28.0	75	0.73	1.37	(4)
	16% " "	34.0	75	0.88	1.14	(4)
	16% " "	28.0	75	0.81	1.24	(4)
	16% " "	34.0	75	0.97	1.03	(4)
SOFT MAPLE	0% moisture	36.0	75	0.89	1.12	(4)
	16% " "	42.0	75	0.95	1.05	(4)
	16% " "	36.0	75	1.01	0.99	(4)
	16% " "	42.0	75	1.09	0.92	(4)
SUGAR PINE	0% moisture	22.0	75	0.54	1.85	(4)
	16% " "	28.0	75	0.54	1.56	(4)
	16% " "	22.0	75	0.65	1.54	(4)
	16% " "	28.0	75	0.78	1.28	(4)
VIRGINIA PINE	0% moisture	34.3	86	0.96	1.04	(1)
WEST COAST HEMLOCK	0% moisture	22.0	75	0.68	1.47	(4)
	16% " "	30.0	75	0.79	1.27	(4)
	16% " "	22.0	75	0.78	1.28	(4)
	16% " "	30.0	75	0.91	1.10	(4)
WHITE PINE	0% moisture	31.2	86	0.78	1.28	(1)
YELLOW PINE	0% moisture	—	—	1.00	1.00	(3)
YELLOW PINE OR FIR	0% moisture	—	—	0.80*	1.25	—

For notes see Page 94.