TABLE 3. CONDUCTIVITIES (k) AND CONDUCTANCES (C) USED IN CALCULATING HEAT LOSS COEFFICIENTS (U) IN TABLES 4 TO 16

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	CONDUCTIVITY OR CONDUCTANCE (k)	CONDUCTIVITY OR CONDUCTANCE (C)	RESISTANCE Per Inch Thickness $\left(\frac{1}{k}\right)$	RESISTANCE For Thickness Listed $\left(\frac{1}{C}\right)$
AIR SPACES					
Bounded by ordinary materials	Vertical[a], ¾ in. or more in width	......	1.10	......	0.91
Bounded by aluminum foil	Vertical[a], ¾ in. or more in width	......	0.46	......	2.17
EXTERIOR FINISHES (Frame Walls)					
Brick Veneer	4 in. thick (nominal)	......	2.27	......	0.44
Stucco (1 in.)		12.50	......	0.08	......
Wood Shingles		......	1.28	......	0.78
Yellow Pine Lap Siding		......	1.28	......	0.78
INSULATING MATERIALS					
Aluminum Foil	See Air Spaces	......	......	......	......
Bats	Enclosed both sides	0.27	......	3.70	......
Blankets	Made from mineral or vegetable fibers or animal hair	0.27	......	3.70	......
Corkboard	Pure, no added binder	0.30	......	3.33	......
Insulating Board		0.33	......	3.03	......
Mineral Wool		0.27	......	3.70	......
Vermiculite		0.48	......	2.08	......
INTERIOR FINISHES					
Composition Wallboard	5/16 in. to ⅜ in. thick	0.50	......	2.00	......
Gypsum Plaster		3.30	......	0.30	......
Gypsum Board (⅜ in.)	Plain or decorated	......	3.70	......	0.27
Gypsum Lath (⅜ in.) and Plaster	Plaster thickness assumed ½ in.	......	2.4	......	0.42
Insulating Board (½ in.)	Plain or decorated	......	0.66	......	1.52
Insulating Board Lath (½ in.) and Plaster	Plaster thickness assumed ½ in.	......	0.60	......	1.67
Insulating Board Lath (1 in.) and Plaster	Plaster thickness assumed ½ in.	......	0.31	......	3.18
Metal Lath and Plaster	Plaster thickness assumed ¾ in.	......	4.40	......	0.23
Plywood (⅜ in.)	Plain or decorated	......	2.12	......	0.47
Wood Lath and Plaster		......	2.50	......	0.40
MASONRY MATERIALS					
Brick	Adobe	3.56	......	0.28	......
Brick	Common	5.00	......	0.20	......
Brick	Face	9.20	......	0.11	......
Cement Mortar		12.00	......	0.08	......
3 in. Clay tile (hollow)		......	1.28	......	0.78
4 in. Clay tile (hollow)		......	1.00	......	1.00
6 in. Clay tile (hollow)		......	0.64	......	1.57
8 in. Clay tile (hollow)		......	0.60	......	1.67
10 in. Clay tile (hollow)		......	0.58	......	1.72
12 in. Clay tile (hollow)		......	0.40	......	2.50
16 in. Clay tile (hollow)		......	0.31	......	3.23
Concrete	Light weight aggregate[b]	2.50	......	0.40	......
Concrete	Sand and gravel aggregate	12.00	......	0.08	......
3 in. Concrete blocks	Hollow, cinder aggregate	......	1.28	......	0.78
4 in. Concrete blocks	Hollow, cinder aggregate	......	1.00	......	1.00
8 in. Concrete blocks	Hollow, gravel aggregate	......	1.00	......	1.00
12 in. Concrete blocks	Hollow, gravel aggregate	......	0.80	......	1.25
8 in. Concrete blocks	Hollow, cinder aggregate	......	0.60	......	1.66
12 in. Concrete blocks	Hollow, cinder aggregate	......	0.53	......	1.88
8 in. Concrete blocks	Hollow, light weight aggregate[b]	......	0.50	......	2.00
12 in. Concrete blocks	Hollow, light weight aggregate[b]	......	0.47	......	2.13
Gypsum fiber concrete	87½ per cent gypsum and 12½ per cent wood chips	1.66	......	0.60	......
3 in. Gypsum tile	Hollow	......	0.61	......	1.04
4 in. Gypsum tile	Hollow	......	0.46	......	2.18
Stucco		12.50	......	0.08	......
Tile and Terrazzo	For flooring	12.00	......	0.08	......

[a]Conductance values for horizontal air spaces depend on whether the heat flow is upward or downward, but in most cases it is sufficiently accurate to use the same values for horizontal as for vertical air spaces.

[b]Expanded slag, burned clay or pumice.

TABLE 3. CONDUCTIVITIES (k) AND CONDUCTANCES (C) USED IN CALCULATING HEAT LOSS COEFFICIENTS (U) IN TABLES 4 TO 16—Concluded

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	CONDUCTIVITY OR CONDUCTANCE (k)	CONDUCTIVITY OR CONDUCTANCE (C)	RESISTANCE Per Inch Thickness $\left(\frac{1}{k}\right)$	RESISTANCE For Thickness Listed $\left(\frac{1}{C}\right)$
ROOFING MATERIALS					
Asbestos Shingles		......	6.00	......	0.17
Asphalt Shingles		......	6.50	......	0.15
Built-up roofing	Assumed thickness ⅜ in.	......	3.53	......	0.28
Heavy Roll roofing		......	6.50	......	0.15
Slate		10.00	......	0.10	......
Wood Shingles		......	1.28	......	0.78
SHEATHING					
Gypsum (½ in.)		......	2.82	......	0.35
Insulating Board (25/32 in.)		......	0.42	......	2.37
Plywood (5/16 in.)		......	2.56	......	0.39
Fir or Yellow Pine (1 in.)	Actual thickness 25/32 in.	......	1.02	......	0.98
Fir, plus building paper	Actual thickness 25/32 in.	......	0.86	......	1.16
SURFACES					
Still air	Ordinary non-reflective materials, vertical	......	1.65	......	0.61
15 mph wind velocity	Ordinary non-reflective materials, vertical	......	6.00	......	0.17
WOODS					
Fir sheathing (1 in.) building paper and Yellow Pine lap siding		......	0.50	......	2.00
Maple or Oak		1.15	......	0.87	......
Yellow Pine or Fir		0.80	......	1.25	......

building constructions. Lack of good judgment in the intelligent choice of an insulating material, or its improper installation, frequently represents the difference between good or unsatisfactory results.

Computed Transmission Coefficients

Computed heat transmission coefficients of many common types of building construction are given in Tables 4 to 16, inclusive, each construction being identified by a serial number. For example, the coefficient of transmission (U) of an 8-in. brick wall and ½ in. of plaster is 0.46, and the number assigned to a wall of this construction is *67-B*, Table 6.

Example 1. Calculate the coefficient of transmission (U) of an 8-in. brick wall with ½ in. of plaster applied directly to the interior surface, based on an outside wind exposure of 15 mph. It is assumed that the outside course is of hard (high density) brick having a conductivity of 9.20, and that the inside course is of common (low density) brick having a conductivity of 5.0, the thicknesses each being 4 in. The conductivity of the plaster is assumed to be 3.3, and the inside and outside surface coefficients are assumed to average 1.65 and 6.00, respectively, for still air and a 15 mph wind velocity.

Solution. k (hard high density brick) = 9.20; x = 4.0 in.; k (common low density brick) = 5.0; x = 4.0 in.; k (plaster) = 3.3; x = ½ in.; f_i = 1.65; f_o = 6.0. Therefore,

$$U = \frac{1}{\frac{1}{6.0} + \frac{4.0}{9.20} + \frac{4.0}{5.0} + \frac{0.5}{3.3} + \frac{1}{1.65}} = \frac{1}{0.167 + 0.435 + 0.80 + 0.152 + 0.606}$$

= 0.46 Btu per hour per square foot per degree Fahrenheit difference in temperature between the air on the two sides.

The coefficients in the tables were determined by calculations similar to those shown in *Example 1*, using fundamental Formulas 1, 2 and 3 and the values of k (or C), f_i, f_o and a in Table 3.

Actual thicknesses of lumber are used in the computations rather than