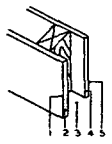
Table 9 .... Coefficients of Transmission (U) of Frame Partitions or Interior Walls[a]

Coefficients are expressed in Btu per (hour) (square foot) (Fahrenheit degree difference in temperature between the air on the two sides), and are based on still air (no wind) conditions on both sides



Example—Wall B 1

Resistances used are given below in this table or in Table 3 or 4

Construction	Resistance (*R*)
1. Surface (still air)	*0.68*
2. Gypsum bd. (⅜ in.)	*0.32*
3. Air space[b]	*0.97*
4. Gypsum wall board (⅜ in.)	*0.32*
5. Surface (still air)	*0.68*
Total resistance	*2.97*
$U = 1/R = 1/2.97$	0.34

See value 0.34 in boldface type in table below.

Example of Substitution

Resistances used are given below in this table or in Table 3 or 4

Replace item 2 with wood fiber hardboard (¼ in.).	
Total resistance	*2.97*
Deduct 2. Gypsum wall board (⅜ in.)	*0.32*
Difference	*2.65*
Add 2. Hardboard (¼ in.)	*0.18*
Total resistance	*2.83*
$U = 1/R = 1/2.83 =$	0.35

To Adjust U Values for Construction with Added Insulation between Members, See Table 16

Type of Interior Finish — Material	R	Single Partition (Finish on Only One Side of Studs) U A	Double Partition (Finish on Both Sides of Studs) U B	Number
Gypsum bd. (⅜ in.)	*0.32*	0.60	0.34	1
Gypsum lath (⅜ in.) and ½ in. plas. (lt. wt. agg.)	*0.64*	0.50	0.28	2
Gypsum lath (⅜ in.) and ½ in. plas. (sand agg.)	*0.41*	0.56	0.32	3
Metal lath and ¾ in. plas. (lt. wt. agg.)	*0.47*	0.55	0.31	4
Metal lath and ¾ in. plas. (sand agg.)	*0.15*	0.67	0.39	5
Insul. bd. (½ in.)	*1.43*	0.36	0.19	6
Insul. bd. lath (½ in.) and ½ plas. (sand agg.)	*1.52*	0.35	0.19	7
Plywood: (¼ in.)	*0.31*	0.60	0.34	8
(⅜ in.)	*0.47*	0.55	0.31	9
(½ in.)	*0.63*	0.50	0.28	10
Wood panels (¾ in.)	*0.94*	0.43	0.24	11
Wood-lath and ½ in. plas. (sand agg.)	*0.40*	0.57	0.32	12
Sheet-metal panels	*0*	0.74	0.43	13
Glass and glass blocks	See Table 21			

[a] See text section Calculating Overall Coefficients for basis of calculations.
[b] To adjust *U* values for the effect of added insulation between framing members, see Table 16.

flow through 2 x 4 in. (nominal) studs, 16 in. on centers, the framing covering 15 percent of wall area, as shown in Fig. 6.

Thermal resistance for gypsum board and insulating board apply equally to plain material and to those which may be decorated at the factory or on the job.

In order to condense the tables an average resistance value (Av.*R*) has been used in some tables for types of materials having approximately the same thermal resistance values. The difference between the average value and the exact value for any given material usually causes no significant change in the resulting *U* value.

Actual thicknesses of lumber assumed to be as follows:

Nominal	*Actual*	*Nominal*	*Actual*
1 in. (S-2-S)	$^{25}/_{32}$ in.	3 in. (S-2-S)	2⅝ in.
1½ in. (S-2-S)	1$^{5}/_{16}$ in.	4 in. (S-2-S)	3⅝ in.
2 in. (S-2-S)	1⅝ in.	Finish flooring,	
2½ in. (S-2-S)	2⅛ in.	(maple or oak)	¾ in.

It should be noted that the effects of poor workmanship in construction and installation have an increasingly greater percentage effect on heat transmission as the coefficient becomes numerically smaller. Failure to meet design estimates may be caused by lack of proper attention to exact compliance with specifications. A factor of safety may be employed as a precaution when it is judged desirable.

Insulating Materials

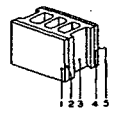
In order to determine the benefit derived from the addition of insulating materials to a given construction, the overall coefficient of heat transmission U_i of the insulated construction may be compared with the corresponding coefficient *U* without insulation. Table 16 (Part A to Part E) and Fig. 6 may be used for determining the coefficients of transmission of constructions with any combination of fibrous, bulk, or mass insulation and air spaces of various effective emissivities.

Example 2: Find the coefficient of transmission of a frame wall consisting of ½ x 8-in. bevel lap wood siding, building pa-

(Continued on p. 111.)

Table 10 .... Coefficients of Transmission (U) of Masonry Partitions[a]

Coefficients are expressed in Btu per (hour) (square foot) (Fahrenheit degree difference in temperature between the air on the two sides), and are based on still air (no wind) conditions on both sides



Example—Wall C 2

Resistances used are given below in this table or in Table 3 or 4

Construction	Resistance (*R*)
1. Inside surface (still air)	*0.68*
2. Plas. (lt. wt. agg.) ⅝ in.	*0.39*
3. Cement block (cinder agg.) (4 in.)	*1.11*
4. Plas. (lt. wt. agg.) ⅝ in.	*0.39*
5. Inside surface (still air)	*0.68*
Total resistance	*3.25*
$U = 1/R = 1/3.25 =$	0.31

See value 0.31 in boldface type in table below.

Example of Substitution

Resistances used are given below in this table or in Table 3 or 4

Replace item 3 with gypsum tile (4 in.)	
Total resistance	*3.25*
Deduct 3. Cement block (cinder agg.) (4 in.)	*1.11*
Difference	*2.14*
Add 3. Gypsum tile (4 in.)	*1.67*
Total resistance	*3.81*
$U = 1/R = 1/3.81 =$	0.26

Type of Partition — Material	R	Surface Finish: None U A	Plas. (lt. wt. agg.) ⅝ in. One side 0.39 U B	Plas. (lt. wt. agg.) ⅝ in. Two sides 0.78 U C	Plas. (sand agg.) ⅝ in. One side 0.11 U D	Plas. (sand agg.) ⅝ in. Two sides 0.22 U E	Number
Hollow concrete block							
(Cinder agg.)							
(3 in.)	*0.88*	0.45	0.38	0.33	0.43	0.41	1
(4 in.)	*1.11*	0.40	0.35	0.31	0.39	0.37	2
(8 in.)	*1.72*	0.32	0.29	0.26	0.31	0.30	3
(12 in.)	*1.89*	0.31	0.27	0.25	0.30	0.29	4
(Lt. wt. agg.)							
(3 in.)	*1.27*	0.38	0.33	0.30	0.36	0.35	5
(4 in.)	*1.60*	0.35	0.31	0.27	0.34	0.32	6
(8 in.)	*2.00*	0.30	0.27	0.24	0.29	0.28	7
(12 in.)	*2.27*	0.28	0.25	0.23	0.27	0.26	8
(Gravel agg.)							
(8 in.)	*1.11*	0.40	0.35	0.31	0.39	0.37	9
(12 in.)	*1.28*	0.38	0.33	0.29	0.36	0.35	10
Hollow clay tile							
(3 in.)	*0.80*	0.46	0.39	0.34	0.44	0.42	11
(4 in.)	*1.11*	0.40	0.35	0.31	0.39	0.37	12
(6 in.)	*1.52*	0.35	0.31	0.27	0.33	0.32	13
(8 in.)	*1.85*	0.31	0.28	0.25	0.30	0.29	14
Hollow gypsum tile							
(3 in.)	*1.36*	0.37	0.32	0.29	0.35	0.34	15
(4 in.)	*1.67*	0.33	0.29	0.26	0.32	0.31	16
Solid plaster walls							
Gypsum lath (½ in.) and plas. ¾ in. each side							
(Lt. wt. agg.)	*1.59*	0.36	—	—	—	—	17
(Sand agg.)	*0.71*	0.48	—	—	—	—	18
1 in. each side							
(Lt. wt. agg.)	*1.78*	0.32	—	—	—	—	19
(Sand agg.)	*0.81*	0.46	—	—	—	—	20
Metal lath and plas.[b] 2 in. total thickness							
(Lt. wt. agg.)	*1.28*	0.38	—	—	—	—	21
(Sand agg.)	*0.56*	0.58	—	—	—	—	22
2½ in. total thickness							
(Lt. wt. agg.)	*1.60*	0.34	—	—	—	—	23
(Sand agg.)	*0.45*	0.55	—	—	—	—	24
Glass and glass blocks	See Table 21						

[a] See text section Calculating Overall Coefficients for basis of calculations.
[b] Metal core and supports disregarded. Plaster troweled smooth both sides.