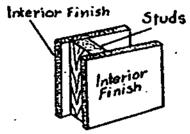
TABLE 8. COEFFICIENTS OF TRANSMISSION (U) OF FRAME PARTITIONS OR INTERIOR WALLS[a]

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



INTERIOR FINISH	SINGLE PARTITION (Finish on one side only of studs)	DOUBLE PARTITION (Finish on both sides of studs)		PARTITION NUMBER
		NO INSULATION BETWEEN STUDS	1 IN. BLANKET BETWEEN STUDS. ONE AIR SPACE.	
	A	B	C	
Metal Lath and Plaster[b]	0.69	0.39	0.16	1
Gypsum Board (⅜ in.) Decorated	0.67	0.37	0.16	2
Wood Lath and Plaster	0.62	0.34	0.15	3
Gypsum Lath (⅜ in.) Plastered[c]	0.61	0.34	0.15	4
Plywood (⅜ in.) Plain or Decorated	0.59	0.33	0.15	5
Insulating Board (½ in.) Plain or Decorated	0.36	0.19	0.11	6
Insulating Board Lath (½ in.) Plastered[c]	0.35	0.18	0.11	7
Insulating Board Lath (1 in.) Plastered[c]	0.19	0.12	0.082	8

[a]Coefficients not weighted; effect of studding neglected.
[b]Plaster assumed ¾ in. thick.
[c]Plaster assumed ½ in. thick.
[d]For partitions with other insulations between studs refer to Table 5, using values in Column B of above table in left hand column of Table 5. *Example:* What is the coefficient of transmission (U) of a partition consisting of gypsum lath and plaster on both sides of studs with 2 in. blanket between studs? *Solution:* According to above table, this partition with no insulation between studs (No. 4B) has a coefficient of 0.34. Referring to Table 5, it will be found that a wall having a coefficient of 0.34 with no insulation between studs, will have a coefficient of 0.11 with 2 in. of blanket insulation between studs (No. 56B).

nominal thicknesses. The computations for wood shingle roofs applied over wood stripping are based on 1 by 4 in. wood strips, spaced 2 in. apart. Since no reliable figures are available concerning the conductivity of Spanish and French clay roofing tile, of which there are many varieties, the figures for such types of roofs were taken the same as for slate roofs, as it is probable that the values of U for these two types of roofs will compare favorably.

The thicknesses upon which the coefficients in Tables 4 to 17 inclusive, are based are:

Brick veneer	4 in.	1-in. lumber (S-2-S)	25/32 in.
Plaster and metal lath	¾ in.	1½-in. lumber (S-2-S)	1 5/16 in.
Plaster (on wood lath, gypsum lath or insulating board)	½ in.	2-in. lumber (S-2-S)	1⅝ in.
Slate (roofing)	½ in.	2½-in. lumber (S-2-S)	2⅛ in.
Stucco on wire mesh reinforcing	1 in.	3-in. lumber (S-2-S)	2⅝ in.
Tar and gravel or slag-surfaced built-up roofing	⅜ in.	4-in. lumber (S-2-S)	3⅝ in.
		Finish flooring (maple or oak)	13/16 in.

Solid brick walls are based on 4 in. hard brick (high density) and the remainder common brick (low density). Stucco is assumed to be 1 in. thick on masonry walls. Where metal lath and plaster are specified, the metal lath is neglected.

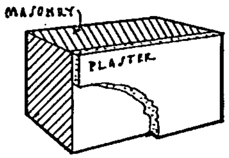
The coefficients of transmission of the pitched roofs in Table 15 apply where the roof is over a heated attic or top floor so the heat passes directly through the roof structure including whatever finish is applied to the underside of the roof rafters.

Coefficients for frame construction were corrected for the effect of the framing where such correction would *increase* the coefficients, but not where the correction would *decrease* the coefficient[8]. In the latter case,

[8]Effect of Studs and Joists on Heat Flow Through Frame Walls and Ceilings, by Paul D. Close (*Heating, Piping and Air Conditioning*, October, 1943, p. 529).

TABLE 9. COEFFICIENTS OF TRANSMISSION (U) OF MASONRY PARTITIONS

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



TYPE OF PARTITION		THICKNESS OF MASONRY (INCHES)	TYPE OF FINISH			PARTITION NUMBER
			NO FINISH (Plain walls)	PLASTER ONE SIDE	PLASTER BOTH SIDES[a]	
			A	B	C	
HOLLOW CLAY TILE		3	0.50	0.47	0.43	9
		4	0.45	0.42	0.40	10
HOLLOW GYPSUM TILE		3	0.35	0.33	0.32	11
		4	0.29	0.28	0.27	12
HOLLOW CONCRETE TILE OR BLOCKS	Cinder Aggregate	3	0.50	0.47	0.43	13
		4	0.45	0.42	0.40	14
	Light Weight Aggregate	3	0.41	0.39	0.37	15
		4	0.36	0.34	0.32	16
COMMON BRICK		4	0.50	0.46	0.43	17

[a]2 in. solid plaster partition. $U = 0.53$.
[b]Expanded slag, burned clay or pumice.

the correction is generally small and the uncorrected coefficient is on the side of safety. Although theoretical coefficients below 0.10 are included in the tables, a minimum coefficient of 0.10 is generally recommended to allow for possible defects in workmanship, poor construction and other factors which would increase the heat loss. The lower the theoretical wall or roof coefficient the greater will be the percentage of error due to construction defects or failure of the insulation to perform as rated.

Combined Coefficients of Transmission

If the attic is unheated, the roof structure and ceiling of the top floor must both be taken into consideration, and the combined coefficient of transmission determined. The formula for calculating the combined coefficient of transmission of a top floor ceiling, unheated attic space, and pitched roof per square foot of ceiling area is:

$$U = \frac{U_r \times U_{ce}}{U_r + \frac{U_{ce}}{n}} \tag{4}$$

where

U = combined coefficient to be used with ceiling area.
U_r = coefficient of transmission of the roof.
U_{ce} = coefficient of transmission of the ceiling.
n = the ratio of the area of the roof to the area of the ceiling.

In selecting the values to be used for U_r and U_{ce} it should be noted that the under surface of the roof and the upper surface of the ceiling are more nearly equivalent to the boundary surfaces of an internal air space than they are to the external surfaces of a wall. It would be more nearly correct to use a value of 2.2 rather than the usual value of 1.65 as coefficients for these surfaces. In most cases this would make only a minor change in U. It should be noted that the over-all coefficient should be multiplied by the ceiling and not the roof area.

If the unheated attic space between the roof and ceiling has no dormers, windows or vertical wall spaces the combined coefficient may be used for