Table 12B . . . . Coefficients of Transmission (U) of Concrete Floor-Ceiling Constructions[a] (Summer Conditions, Downward Flow)

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—Floor X 2

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

Construction (heat flow down)	Resistance (R)
1. Top surface (still air)	0.92
2. Linoleum or tile (av. R)	0.05
3. Concrete slab 4 in. (av. R)	0.40
4. Air space[b] (8 in.)	0.99
5. Metal lath and ¾ in. plas. (sand agg.)	0.13
6. Bottom surface (still air)	0.92
Total resistance	5.41
$U = 1/R = 1/5.41 =$	0.29

See value 0.29 in bold face 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 subfloor (25/32 in.), felt and hardwood (¾ in.) (Floor on sleepers)

Total resistance	5.41
Deduct 2. Linoleum or tile	0.05
Difference	5.36
Add 2. Hardwood (¾ in.)	0.68
2a. Felt	0.06
2b. Wood subfloor (25/32 in.)	0.98
2c. Air space (¾ in.)	0.85
	2.57
Total resistance	5.93
$U = 1/R = 1/5.93$	0.17

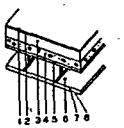
To Adjust U Values for Construction with Added Insulation in Air Space above Suspended Ceiling, See Table 16

Type of Deck	Material	R	Av. R	Type of Finish Floor	Material	Av. R	Type of Ceiling: Ceiling Applied Directly to Slab: None	Plas.: (Lt. wt. agg.) ½ in.	Plas.: (Sand agg.) ½ in.	Acoustical tile—glued: ½ in.	Acoustical tile—glued: ¾ in.	Suspended Ceiling: Gypsum bd. (⅜ in.) and Plas: No plas.	Gypsum bd. (⅜ in.) and Plas: (Lt. wt. agg.) ½ in.	Gypsum bd. (⅜ in.) and Plas: (Sand agg.) ½ in.	Metal lath and plas.: (Lt. wt. agg.) ¾ in.	Metal lath and plas.: (Sand agg.) ¾ in.	Acoustical tile: On furring or channels: ½ in.	Acoustical tile: On furring or channels: ¾ in.	Acoustical tile: On gypsum bd. (⅜ in.): ½ in.	Acoustical tile: On gypsum bd. (⅜ in.): ¾ in.	Number
				Resistance →			—	0.08	0.02	1.19	1.78	0.32	0.64	0.41	0.47	0.13	1.19	1.78	1.51	2.10	
							U	U	U	U	U	U	U	U	U	U	U	U	U	U	
							O	P	Q	R	S	T	U	V	W	X	Y	Z	Z′	Z″	
				None	—	0.45	0.43	0.44	0.29	0.25	0.28	0.26	0.27	0.27	0.30	0.23	0.20	0.21	0.19	1
				Floor tile[e] or linoleum (⅛ in.)	0.05	0.44	0.42	0.43	0.29	0.25	0.28	0.26	0.27	0.27	0.29	0.22	0.20	0.21	0.19	2
				Wood block (13/16 in.) on slab	0.74	0.34	0.33	0.33	0.24	0.21	0.23	0.22	0.23	0.23	0.24	0.19	0.17	0.18	0.17	3
Concrete[d] (sand agg.) (4 in.) 0.32 (6 in.) 0.48			0.40	Floor on sleepers Plywood subfloor (⅝ in.), felt and floor tile[e] or linoleum (⅛ in.)	0.89	0.23	0.23	0.23	0.18	0.17	0.19	0.18	0.19	0.18	0.20	0.16	0.15	0.15	0.14	4
				Wood subfloor (25/32 in.), felt and hardwood (¾ in.)	1.78	0.20	0.19	0.20	0.16	0.15	0.16	0.15	0.16	0.16	0.17	0.14	0.13	0.14	0.13	5
				None	—	0.39	0.38	0.39	0.27	0.23	0.26	0.24	0.25	0.25	0.27	0.21	0.19	0.20	0.18	6
				Floor tile[e] or linoleum (⅛ in.)	0.05	0.38	0.37	0.38	0.26	0.23	0.26	0.24	0.25	0.25	0.27	0.21	0.19	0.20	0.18	7
Concrete[d] (sand agg.) (8 in.) 0.64 (10 in.) 0.80			0.72	Wood block (13/16 in.) on slab	0.74	0.30	0.30	0.30	0.22	0.20	0.22	0.20	0.21	0.21	0.23	0.18	0.16	0.17	0.16	8
				Floor on sleepers Plywood subfloor (⅝ in.), felt and floor tile[e] or linoleum (⅛ in.)	0.89	0.22	0.21	0.22	0.17	0.16	0.18	0.17	0.18	0.17	0.18	0.15	0.14	0.15	0.14	9
				Wood subfloor (25/32 in.), felt and hardwood (¾ in.)	1.78	0.19	0.18	0.18	0.15	0.14	0.16	0.15	0.15	0.15	0.16	0.14	0.13	0.13	0.12	10

a,b,d,e See corresponding footnotes under Table 12A.

Table 13A . . . . Coefficients of Transmission (U) of Flat Masonry Roofs with Built-up Roofing, with and without Suspended Ceilings[a] (Winter Conditions, Upward Flow)

These 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 an outside wind velocity of 15 mph



Example—K 4

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

Construction (heat flow up)	Resistance (R)
1. Outside surface (15 mph wind)	0.17
2. Built-up roofing—⅜ in.	0.33
3. Roof insulation (none)	—
4. Concrete slab (lt. wt. agg.) (2 in.)	2.22
5. Corrugated metal	0
6. Air space[b]	0.85
7. Metal lath and ¾ in. plas. (lt. wt. agg.)	0.47
8. Inside surface (still air)	0.61
Total resistance	4.65
$U = 1/R = 1/4.65 =$	0.22

See value 0.22 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 4 with 4 in. concrete slab (gravel agg.) and roof insulation ($C = 0.36$) on top of slab.

Total resistance	4.65
Deduct 4. Concrete slab (lt. wt. agg.) (2 in.)	2.22
	2.43
Difference	2.78
Add 3. Roof insulation ($C = 0.36$)	2.78
4. Concrete slab (gravel agg.) 4 in.	0.44
	5.22
Total resistance	5.65
$U = 1/R = 1/5.65 =$	0.18

To Adjust U Values for Construction with Added Insulation in Air Space, See Table 16

Type of Deck	Material	R	Type of Form	Roof Insulation No Ceiling: C value of roof insulation: None	0.72	0.36	0.24	0.19	0.15	0.12	Suspended Ceiling[b]: Gypsum bd. (⅜ in.) and plas.: No plas.	Gypsum bd. (⅜ in.) and plas.: (Lt. wt. agg.) ½ in.	Gypsum bd. (⅜ in.) and plas.: (Sand agg.) ½ in.	Metal lath and plas.: (Lt. wt. agg.) ¾ in.	Metal lath and plas.: (Sand agg.) ¾ in.	Acoustical tile: On furring or channels: ½ in.	Acoustical tile: On furring or channels: ¾ in.	Acoustical tile: On gypsum bd. (⅜ in.): ½ in.	Acoustical tile: On gypsum bd. (⅜ in.): ¾ in.	Number
			Resistance →	—	1.39	2.78	4.17	5.26	6.67	8.33	0.32	0.64	0.41	0.47	0.13	1.19	1.75	1.51	2.10	
				U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	
				A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
Concrete slab[d] Gravel agg. (4 in.) 0.32 (6 in.) 0.48 (8 in.) 0.64			Temporary	—	0.70	0.35	0.24	0.18	0.15	0.12	0.10	0.38	0.34	0.37	0.36	0.41	0.29	0.25	0.26	0.23	1
			Temporary	—	0.63	0.34	0.23	0.17	0.15	0.12	0.10	0.36	0.32	0.35	0.34	0.39	0.27	0.24	0.25	0.22	2
			Temporary	—	0.57	0.32	0.22	0.17	0.14	0.12	0.10	0.34	0.31	0.33	0.33	0.37	0.26	0.23	0.24	0.21	3
Lt. wt. agg.[c] (2 in.).. 2.22	Corrugated metal[e]	0		0.30	0.21	0.16	0.13	0.12	0.10	0.09	0.22	0.21	0.22	0.23	0.23	0.19	0.17	0.18	0.16	4
	Insulation bd. (1 in.)	2.78		0.16	0.13	0.11	0.10	0.09	0.08	0.07	0.14	0.13	0.14	0.13	0.14	0.12	0.11	0.12	0.10	5
	Insulation bd. (1½ in.)	4.17		0.13	0.11	0.10	0.09	0.08	0.07	0.06	0.12	0.11	0.11	0.12	0.12	0.10	0.10	0.10	0.10	6
	Glass fiber bd. (1 in.)	4.00		0.14	0.11	0.10	0.09	0.08	0.07	0.06	0.12	0.11	0.12	0.12	0.12	0.11	0.10	0.10	0.10	7
(3 in.).. 3.55	Corrugated metal[e]	0		0.23	0.17	0.14	0.12	0.10	0.09	0.08	0.18	0.17	0.18	0.17	0.18	0.15	0.14	0.15	0.14	8
	Insulation bd. (1 in.)	2.78		0.14	0.12	0.10	0.09	0.08	0.07	0.06	0.12	0.11	0.12	0.12	0.12	0.11	0.10	0.10	0.10	9
	Insulation bd. (1½ in.)	4.17		0.12	0.10	0.09	0.08	0.07	0.07	0.06	0.10	0.10	0.10	0.10	0.11	0.10	0.09	0.09	0.09	10
	Glass fiber bd. (1 in.)	4.00		0.12	0.10	0.09	0.08	0.07	0.07	0.06	0.10	0.10	0.10	0.10	0.11	0.10	0.09	0.09	0.09	11
(4 in.).. 4.44	Corrugated metal[e]	0		0.18	0.14	0.12	0.10	0.09	0.08	0.07	0.15	0.14	0.15	0.15	0.15	0.13	0.12	0.13	0.12	12
	Insulation bd. (1 in.)	2.78		0.12	0.10	0.09	0.08	0.07	0.07	0.06	0.11	0.10	0.10	0.10	0.11	0.10	0.09	0.09	0.09	13
	Insulation bd. (1½ in.)	4.17		0.10	0.09	0.08	0.07	0.07	0.06	0.06	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	14
	Glass fiber bd. (1 in.)	4.00		0.10	0.09	0.08	0.07	0.07	0.06	0.06	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	15
Gypsum slab[f] (2 in.).. 1.60	Gypsum bd. (½ in.)	0.45		0.36	0.24	0.18	0.14	0.12	0.11	0.09	0.25	0.24	0.25	0.25	0.27	0.21	0.19	0.20	0.18	16
	Insulation bd. (1 in.)	2.78		0.20	0.15	0.13	0.11	0.10	0.09	0.07	0.16	0.15	0.16	0.16	0.16	0.14	0.13	0.13	0.12	17
	Insulation bd. (1½ in.)	4.17		0.15	0.13	0.11	0.09	0.09	0.08	0.07	0.13	0.13	0.13	0.13	0.13	0.12	0.11	0.11	0.11	18
	Asbestos-cement bd.[g] (¼ in.)	0.06		0.40	0.26	0.19	0.15	0.13	0.11	0.09	0.27	0.25	0.28	0.26	0.29	0.22	0.19	0.20	0.18	19
	Glass fiber bd. (1 in.)	4.00		0.16	0.13	0.11	0.10	0.09	0.08	0.07	0.13	0.13	0.13	0.13	0.14	0.12	0.11	0.12	0.11	20
(3 in.).. 1.80	Gypsum bd. (½ in.)	0.45		0.30	0.21	0.16	0.13	0.12	0.10	0.09	0.22	0.21	0.22	0.21	0.23	0.19	0.17	0.17	0.16	21
	Insulation bd. (1 in.)	2.78		0.18	0.14	0.12	0.10	0.09	0.08	0.07	0.15	0.14	0.14	0.15	0.15	0.13	0.12	0.12	0.12	22
	Insulation bd. (1½ in.)	4.17		0.14	0.12	0.10	0.09	0.08	0.07	0.06	0.12	0.12	0.12	0.12	0.12	0.11	0.10	0.11	0.10	23
	Asbestos-cement bd. (¼ in.)	0.06		0.34	0.23	0.17	0.14	0.12	0.10	0.09	0.24	0.22	0.24	0.23	0.25	0.20	0.18	0.19	0.17	24
	Glass fiber bd. (1 in.)	4.00		0.14	0.12	0.10	0.09	0.08	0.07	0.07	0.12	0.12	0.12	0.12	0.13	0.11	0.10	0.11	0.10	25
(4 in.).. 2.40	Gypsum bd. (½ in.)	0.45		0.25	0.19	0.15	0.12	0.11	0.09	0.08	0.19	0.18	0.19	0.19	0.20	0.17	0.15	0.16	0.14	26
	Insulation bd. (1 in.)	2.78		0.16	0.13	0.11	0.10	0.09	0.08	0.07	0.13	0.13	0.13	0.13	0.14	0.12	0.11	0.12	0.11	27
	Insulation bd. (1½ in.)	4.17		0.13	0.11	0.10	0.08	0.08	0.07	0.06	0.11	0.11	0.11	0.11	0.12	0.10	0.10	0.10	0.09	28
	Asbestos-cement bd. (¼ in.)	0.06		0.28	0.20	0.16	0.13	0.11	0.10	0.08	0.21	0.20	0.21	0.20	0.22	0.18	0.16	0.17	0.15	29
	Glass fiber bd. (1 in.)	4.00		0.13	0.11	0.10	0.09	0.08	0.07	0.06	0.12	0.11	0.11	0.11	0.12	0.10	0.10	0.10	0.10	30

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.

c U values would also apply if slab were poured on metal lath, paper-backed wire, fabric, or asbestos-cement board (¼ in.).

d Concrete assumed to have a thermal conductivity k of 12.0 and a density of 140 lb per cu ft.

e Concrete assumed to have a thermal conductivity k of 0.90 and a density of 80 lb per cu ft.

f Gypsum slab 3¼ in. thick since this is recommended practice.

g Gypsum fiber concrete with 12½ percent wood chips (thermal conductivity k = 1.66).

h See Table 16 E for U value of roof and ceiling construction with roof insulation added to roof deck.