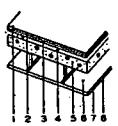
Table 12A .... Coefficients of Transmission (U) of Concrete Floor-Ceiling Constructions[a] (Winter Conditions, Upward Flow)

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 3 4

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

Heated room below unheated space Construction (heat flow up)	Resistance (*R*)
1. Top surface (still air)	*0.61*
2. Asphalt tile and felt	*0.11*
3. Plywood (⅜ in.)	*0.78*
4. Air space[a]	*0.85*
5. Concrete slab 4 in. (av. *R*)	*0.40*
6. Air space[b] (8 in.)	*0.85*
7. Metal lath and ½ plas. (sand agg.)	*0.13*
8. Bottom surface (still air)	*0.61*
Total resistance	*4.34*
$U = 1/R = 1/4.34 =$	0.23

See value 0.23 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 items 2, 3, and 4 with hard wood block (1 13/16 in.) on slab		
Total resistance		*4.34*
Deduct 2. Asphalt tile and felt	*0.11*	
3. Plywood (⅜ in.)	*0.78*	
4. Air space	*0.85*	*1.74*
Difference		*2.60*
Add 2. Wood block (1 13/16 in.)		*0.74*
Total resistance		*3.34*
$U = 1/R = 1/3.34 =$		0.30

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: None	Ceiling Applied Directly to Slab: Plas. (Lt. wt. agg.) ½ in.	Ceiling Applied Directly to Slab: Plas. (Sand agg.) ⅜ in.	Ceiling Applied Directly to Slab: Acoustical tile—glued ½ in.	Ceiling Applied Directly to Slab: Acoustical tile—glued ¾ in.	Suspended Ceiling: Gypsum bd. (½ in.) and Plas. No plas.	Gypsum bd. (½ in.) and Plas. (Lt. wt. agg.) ½ in.	Gypsum bd. (½ in.) and Plas. (Sand agg.) ¾ in.	Metal lath and plas. (Lt. wt. agg.) ½ in.	Metal lath and plas. (Sand agg.) ¾ in.	Acoustical tile: On furring or channels ¼ in.	Acoustical tile: On furring or channels ¾ in.	Acoustical tile: On gypsum bd. (⅜ in.) ¼ 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	
							A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Concrete[d] (sand agg.) (4 in.) 0.52 (6 in.) 0.48			0.40		None	—	0.62	0.59	0.61	0.36	0.29	0.36	0.32	0.35	0.34	0.38	0.27	0.24	0.25	0.22	1
					Floor tile[e] or linoleum (⅛ in.)	0.05	0.60	0.57	0.59	0.35	0.29	0.35	0.32	0.34	0.33	0.38	0.27	0.23	0.25	0.22	2
					Wood block (1 3/16 in.) on slab	0.74	0.42	0.41	0.42	0.28	0.24	0.28	0.26	0.28	0.27	0.30	0.23	0.20	0.21	0.19	3
					Floor on sleepers Plywood subfloor (⅜ in.), felt and floor tile[e] or linoleum (⅛ in.)	0.89	0.30	0.29	0.30	0.22	0.19	0.22	0.21	0.22	0.21	0.23	0.19	0.17	0.17	0.16	4
					Wood subfloor (2 5/32 in.), felt and hardwood (¾ in.)	1.72	0.24	0.24	0.24	0.19	0.17	0.19	0.18	0.18	0.18	0.19	0.16	0.15	0.15	0.14	5
					None	—	0.52	0.50	0.51	0.32	0.27	0.32	0.29	0.31	0.31	0.34	0.25	0.22	0.23	0.20	6
					Floor tile[e] or linoleum (⅛ in.)	0.05	0.50	0.48	0.50	0.31	0.26	0.32	0.29	0.31	0.30	0.34	0.25	0.22	0.23	0.20	7
					Wood block (1 3/16 in.) on slab	0.74	0.37	0.36	0.37	0.26	0.22	0.26	0.24	0.25	0.25	0.27	0.21	0.19	0.20	0.18	8
Concrete[d] (sand agg.) (8 in.) 0.64 (10 in.) 0.80			0.72		Floor on sleepers Plywood subfloor (⅜ in.), felt and floor tile[e] or linoleum (⅛ in.)	0.89	0.27	0.27	0.27	0.21	0.18	0.21	0.19	0.20	0.20	0.21	0.17	0.16	0.17	0.15	9
					Wood subfloor (2 5/32 in.), felt and hardwood (¾ in.)	1.72	0.22	0.22	0.22	0.18	0.16	0.18	0.17	0.17	0.17	0.18	0.16	0.14	0.15	0.13	10

[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] Table 16 can be used only if sleeper space is non-reflective. The sleeper air space is not to be counted in using Table 16.
[d] Concrete is assumed to have a thermal conductivity *k* of 12.0 as given in Table 4.
[e] Includes asphalt, rubber, and plastic tile (⅛ in.), ceramic tile on terrazzo (1 in.).

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

Type of Deck	Material	R	Av. R	Type of Finish Floor	Material	Av. R	TYPE OF CEILING: None	Ceiling Applied Directly to Slab: Plas. (Lt. wt. agg.) ⅝ in.	Ceiling Applied Directly to Slab: Plas. (Sand agg.) ⅝ in.	Ceiling Applied Directly to Slab: Acoustical tile—glued ½ in.	Ceiling Applied Directly to Slab: 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″	
Concrete[d] (sand agg.) (4 in.) 0.52 (6 in.) 0.48			0.40		None	—	0.45	0.43	0.44	0.29	0.25	0.26	0.24	0.26	0.25	0.28	0.21	0.19	0.20	0.18	1
					Floor tile[e] or linoleum (⅛ in.)	0.05	0.44	0.42	0.43	0.29	0.25	0.26	0.24	0.25	0.25	0.27	0.21	0.19	0.20	0.18	2
					Wood block (1 3/16 in.) on slab	0.74	0.34	0.33	0.33	0.24	0.21	0.22	0.21	0.22	0.21	0.23	0.19	0.17	0.17	0.16	3
					Floor on sleepers Plywood subfloor (⅜ in.), felt and floor tile[e] or linoleum (⅛ in.)	0.89	0.23	0.23	0.23	0.18	0.17	0.17	0.16	0.17	0.17	0.18	0.15	0.14	0.14	0.13	4
					Wood subfloor (2 5/32 in.), felt and hardwood (¾ in.)	1.72	0.20	0.19	0.20	0.16	0.15	0.15	0.14	0.15	0.15	0.16	0.13	0.12	0.13	0.12	5
					None	—	0.39	0.38	0.39	0.27	0.23	0.24	0.23	0.24	0.23	0.26	0.20	0.18	0.19	0.17	6
					Floor tile[e] or linoleum (⅛ in.)	0.05	0.38	0.37	0.38	0.26	0.23	0.24	0.22	0.24	0.23	0.25	0.20	0.18	0.19	0.17	7
					Wood block (1 3/16 in.) on slab	0.74	0.30	0.30	0.30	0.22	0.20	0.21	0.19	0.20	0.20	0.21	0.17	0.16	0.17	0.15	8
Concrete[d] (sand agg.) (8 in.) 0.64 (10 in.) 0.80			0.72		Floor on sleepers Plywood-subfloor (⅜ in.), felt and floor tile[e] or linoleum (⅛ in.)	0.89	0.22	0.21	0.22	0.17	0.16	0.16	0.15	0.16	0.16	0.17	0.14	0.13	0.14	0.13	9
					Wood subfloor (2 5/32 in.), felt and hardwood (¾ in.)	1.72	0.19	0.18	0.18	0.15	0.14	0.14	0.14	0.14	0.14	0.15	0.13	0.12	0.12	0.11	10

[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] Table 16 can be used only if sleeper space is nonreflective. The sleeper air space is not to be counted in using Table 16.
[d] Concrete is assumed to have a thermal conductivity *k* of 12.0 as given in Table 4.
[e] Includes asphalt, rubber, and plastic tile (⅛ in.), ceramic tile on terrazzo (1 in.).

leaving equal air spaces on the two sides. The coefficient U_i is desired for two cases in which

(*a*) the blanket has non-reflective surfaces on both sides, so that both air spaces are non-reflective (E = 0.82) and,

(*b*) the blanket has one highly reflective surface, so that one of the air spaces is highly reflective (E = 0.05).

Solution:

(*a*) In Table 16, Part A, when *U* without added insulation is 0.24, U_i for one inch of fibrous insulation and one non-reflective air space, is 0.127 in Column 3. To add the second non-reflective air space, enter Column 6 at 0.127, and by interpolating find U_i = 0.112 in Column 9. Use 0.11.

(*b*) U_i for one inch of fibrous insulation and one non-reflective air space is 0.127 as in (*a*). To add one E = 0.05 air space, enter Column 8 at 0.127 and by interpolating find U_i = 0.092 in Column 11. Use 0.09.

(*Continued on p. 121.*)