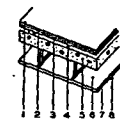


Table 12A.... Coefficients of Transmission (U) of Concrete Floor-Ceiling Constructions\* (Winter Conditions, Upward Flow)  
Coefficients are expressed in Btu per (hour) (square foot) (Fahrenheit degree difference in temperature between the air on the two sides), and are based on still air (no wind) conditions on both sides.

| Example—Floor J 4                                                 |      | Example of Substitution                                           |      |
|-------------------------------------------------------------------|------|-------------------------------------------------------------------|------|
| Resistances used are given below in this table or in Table 3 or 4 |      | Resistances used are given below in this table or in Table 3 or 4 |      |
| Heated room below unheated space                                  |      | Replace items 2, 3, and 4 with hard wood block (1½ in.) on slab   |      |
| Construction (heat flow up)                                       |      | Total resistance                                                  |      |
| 1. Top surface (still air).....                                   | 0.61 | Deduct 2. Asphalt tile and felt.....                              | 0.11 |
| 2. Asphalt tile and felt.....                                     | 0.11 | 3. Plywood (¾ in.).....                                           | 0.78 |
| 3. Plywood (¾ in.).....                                           | 0.78 | 4. Air space.....                                                 | 0.85 |
| 4. Air space.....                                                 | 0.85 |                                                                   |      |
| 5. Concrete slab 4 in. (av. R).....                               | 0.40 |                                                                   |      |
| 6. Air space* (8 in.).....                                        | 0.85 | Difference.....                                                   | 4.60 |
| 7. Metal lath and ¾ plas. (sand agg.).....                        | 0.15 | Add 2. Wood block (1½ in.).....                                   | 0.74 |
| 8. Bottom surface (still air).....                                | 0.61 |                                                                   |      |
| Total resistance.....                                             | 4.34 | Total resistance.....                                             | 5.54 |
| U = 1/R = 1/4.34 =                                                | 0.23 | U = 1/R = 1/5.54 =                                                | 0.30 |
| See value 0.23 in bold face type in table below.                  |      |                                                                   |      |



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

| Type of Deck                                     |      | Type of Finish Floor                                                                    |          | Type of Ceiling |                                  |                      |                   |                      |       |                   |                               |                   |                      |                   |                        |      |                        |    |   |   | Number |
|--------------------------------------------------|------|-----------------------------------------------------------------------------------------|----------|-----------------|----------------------------------|----------------------|-------------------|----------------------|-------|-------------------|-------------------------------|-------------------|----------------------|-------------------|------------------------|------|------------------------|----|---|---|--------|
|                                                  |      |                                                                                         |          | Resistance      | Ceiling Applied Directly to Slab |                      |                   |                      |       | Suspended Ceiling |                               |                   |                      |                   |                        |      |                        |    |   |   |        |
|                                                  |      |                                                                                         |          |                 | None                             | Plas.                |                   | Acoustical tile—gled |       | No plas.          | Gypsum b.d. (½ in.) and Plas. |                   | Metal lath and plas. |                   | Acoustical tile        |      |                        |    |   |   |        |
|                                                  |      |                                                                                         |          |                 |                                  | (Lt. wt. agg.) ½ in. | (Sand agg.) ½ in. | ½ in.                | ¾ in. |                   | (Lt. wt. agg.) ½ in.          | (Sand agg.) ½ in. | (Lt. wt. agg.) ½ in. | (Sand agg.) ½ in. | On furring or channels |      | On gypsum b.d. (½ in.) |    |   |   |        |
| Material                                         | R    | Av. R                                                                                   | Material | Av. R           | 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  |   |   |        |
| Concrete* (sand agg.) (4 in.) 0.32 (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* or linoleum (½ 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 (1½ 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<br>Plywood subfloor (¾ in.), felt and floor tile* or linoleum (¾ 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                   | 0.16 |                        | 4  |   |   |        |
|                                                  |      | Wood subfloor (¾ in.), felt and hard-wood (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  |   |   |        |
| Concrete* (sand agg.) (8 in.) 0.64 (10 in.) 0.80 | 0.72 | 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* or linoleum (½ 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 (1½ 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  |   |   |        |
|                                                  |      | Floor on sleepers<br>Plywood subfloor (¾ in.), felt and floor tile* or linoleum (¾ 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 (¾ in.), felt and hard-wood (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 |   |   |        |

\* See text section Calculating Overall Coefficients for basis of calculations.

<sup>b</sup> To adjust U values for the effect of added insulation between framing members, see Table 16.

<sup>c</sup> 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.

<sup>d</sup> Concrete is assumed to have a thermal conductivity k of 12.0 as given in Table 4.

<sup>e</sup> Includes asphalt, rubber, and plastic tile (¾ in.), ceramic tile on terrazzo (1 in.).

Table 12B.... Coefficients of Transmission (U) of Concrete Floor-Ceiling Constructions\* (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                                     |      |                                                                                           | Type of Finish Floor |       |       | TYPE OF CEILING                  |      |                        |      |                              |      |                      |      |                      |      |                      |      |                   |  |                        |  | Number |                       |  |
|--------------------------------------------------|------|-------------------------------------------------------------------------------------------|----------------------|-------|-------|----------------------------------|------|------------------------|------|------------------------------|------|----------------------|------|----------------------|------|----------------------|------|-------------------|--|------------------------|--|--------|-----------------------|--|
|                                                  |      |                                                                                           |                      |       |       | Ceiling Applied Directly to Slab |      |                        |      | Suspended Ceiling            |      |                      |      |                      |      |                      |      |                   |  |                        |  |        |                       |  |
|                                                  |      |                                                                                           |                      |       |       |                                  |      |                        |      | Gypsum bd. (½ in.) and Plas. |      |                      |      | Metal lath and plas. |      |                      |      | Acoustical tile   |  |                        |  |        |                       |  |
|                                                  |      |                                                                                           |                      |       |       | Plas.                            |      | Acoustical tile—gypsum |      | No plas.                     |      | (lt. wt. egg.) ½ in. |      | (Sand egg.) ½ in.    |      | (lt. wt. egg.) ½ in. |      | (Sand egg.) ½ in. |  | On furring or channels |  |        | On gypsum bd. (½ in.) |  |
|                                                  |      |                                                                                           |                      |       |       |                                  |      |                        |      |                              |      |                      |      |                      |      |                      |      |                   |  |                        |  |        |                       |  |
| None                                             |      | (lt. wt. egg.) ½ in.                                                                      | (Sand egg.) ½ in.    | ½ in. | ¾ in. | 0.32                             | 0.64 | 0.41                   | 0.47 | 0.13                         | 1.19 | 1.78                 | 1.51 | 2.10                 |      |                      |      |                   |  |                        |  |        |                       |  |
| Material                                         | R    | Av. R                                                                                     | U                    | U     | 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* (sand agg.) (4 in.) 0.32 (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* or linoleum (½ in.).....                                                      | 0.06                 | 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 (1½ 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 (¾ in.), felt and floor tile* or linoleum (½ 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 (2½ in.), felt and hard-wood (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                 |  |                        |  |        |                       |  |
| Concrete* (sand agg.) (8 in.) 0.64 (10 in.) 0.80 | 0.72 | 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* or linoleum (½ in.).....                                                      | 0.06                 | 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 (1½ 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                 |  |                        |  |        |                       |  |
|                                                  |      | Floor on sleepers Plywood subfloor (¾ in.), felt and floor tile* or linoleum (½ 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 (2½ in.), felt and hard-wood (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                |  |                        |  |        |                       |  |

\* See text section Calculating Overall Coefficients for basis of calculations.

<sup>b</sup> To adjust U values for the effect of added insulation between framing members, see Table 16.

<sup>c</sup> 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.

<sup>d</sup> Concrete is assumed to have a thermal conductivity k of 12.0 as given in Table 4.

<sup>e</sup> Includes asphalt, rubber, and plastic tile (¾ in.), ceramic tile on terrazzo (1 in.).

leaving equal air spaces on the two sides. The coefficient  $U_1$  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 ( $R = 0.82$ ) and,

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

Solution:

(a) In Table 16, Part A, when U without added insulation

is 0.24,  $U_1$  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  $U_2 = 0.112$  in Column 9. Use 0.11.

(b)  $U_1$  for one inch of fibrous insulation and one non-reflective air space is 0.127 as in (a). To add one  $R = 0.05$  air space, enter Column 8 at 0.127 and by interpolating find  $U_2 = 0.092$  in Column 11. Use 0.09.

(Continued on p. 121)