

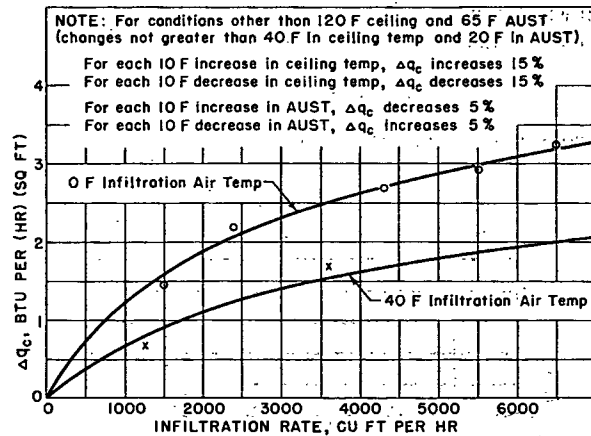


FIG. 11. ADDITIONAL HEAT FLOW FROM CEILING DUE TO INFILTRATION AIR⁶
Ceiling at 120 F, all other surfaces at 65 F (24½ x 12 x 8 ft high room)

Natural convection from heated floor

$$q_c = 0.32 (t_p - t_a)^{1.31} \quad (8)$$

Natural convection from heated wall

$$q_c = 0.26 (t_p - t_a)^{1.22} \quad (9)$$

Fig. 10 shows panel convection outputs calculated from these equations.

Infiltration and ventilation increase the convection from panels. Figs. 11 and 12 show the amount of increase Δq_c observed in the ASHAE Environment Laboratory.^{6,7} Equations 7 and 8 and Figs. 11 and 12 were used in the development of the design data for this chapter.

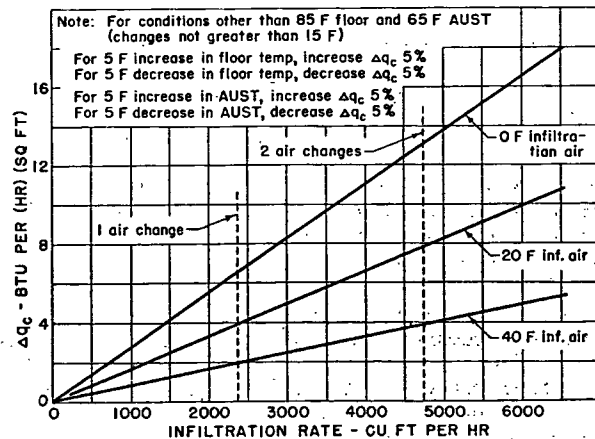


FIG. 12. ADDITIONAL HEAT OUTPUT FROM FLOOR DUE TO INFILTRATION AIR
(Floor 85 F, all other surfaces 65 F; 24½ x 12 x 8 ft high room)

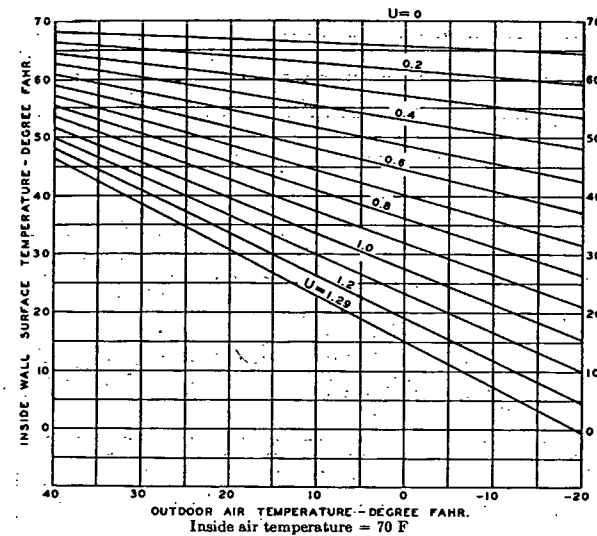


FIG. 13. RELATION OF INSIDE SURFACE TEMPERATURE
TO OVERALL COEFFICIENT OF HEAT TRANSFER

Combined Heat Transfer

The heat transfer from a panel to a room can be determined by adding the radiant heat transfer from Fig. 9 to the convective heat transfer from Fig. 10.

Use of Fig. 9 requires the calculation of the AUST, the area-weighted average surface temperature of the unheated surfaces in the room. In

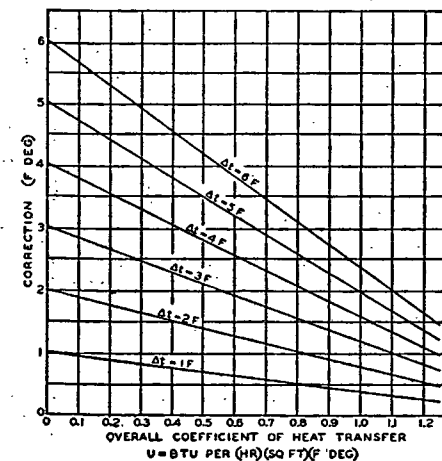


FIG. 14. INSIDE WALL SURFACE TEMPERATURE CORRECTION FOR INSIDE
AIR TEMPERATURES OTHER THAN 70 F

$\Delta t = t_a - 70$
If Δt is positive: $t_w' = t_w + \text{correction}$
If Δt is negative: $t_w' = t_w - \text{correction}$

t_a = inside air temperature
 t_w = inside wall surface temperature based on $t_a = 70$ F
 t_w' = actual inside wall surface temperature