
Example

The wall of a 6-m tall building is made of red brick, for which the emissivity, ε , is 0.93 and the *solar* absorptivity, α_s , is 0.63. On a sunny day, it is observed that the direct and diffuse components of solar radiation are $G_D = 900 \text{ W/m}^2$ and $G_d = 500 \text{ W/m}^2$, respectively, and that the sun makes a 48.2° angle with a normal to the surface of the wall. The outside temperature of the brick is 54°C , and the ambient air temperature is 20°C .

- (a) Calculate the heat flux, in W/m^2 , from the wall due to convection.
(b) If the heat flux through the brick due to conduction is 154 W/m^2 (into the building), what is the effective sky temperature?

