

CHG 2314

HEAT TRANSFER

Professor: B. Kruczek

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Assignment No. 1

1. The hot combustion gases of a furnace are separated from the ambient air and its surroundings, which are at 25°C , by a brick wall 0.15 m thick. The brick has a thermal conductivity of 1.2 W/m K and a surface emissivity of 0.7. Under the steady-state conditions an inner surface is at 350°C . Free convection heat transfer to the air adjoining the outer surface is $20 \text{ W/m}^2 \text{ K}$. What is the brick outer surface temperature?

To reduce the risk of burn injuries to operating personnel, the outer surface should be maintained at or below 65°C . What should be the minimum thickness of the brick wall to accomplish this goal?

2. Problem 1.38.
3. Problem 1.70.

Due Date: Jan 21, 2005 at 4:00 p.m. in the assignment box.