**37.27** $400\frac{lbm}{hr}$ **of** $62°F$**, 60% relative humidity air is heated to** $96°F$ **without changing the moisture content. How much heat is needed?**

A. $3300\frac{Btu}{hr}$

B. $6700\frac{Btu}{hr}$

C. $10,100\frac{Btu}{hr}$

D. $13,600\frac{Btu}{hr}$

Since the moisture content is not changing, the heat transfer depends on the the mass flow rate, specific heat capacity of air, and the dry bulb temperature differential only. There is no need to account for humidity ratio or enthalpy.

$$\dot{Q} = \dot{m} c_p \Delta T$$

$$\dot{Q} = \left(400\frac{lb}{hr}\right)\left(0.24\frac{Btu}{lb°F}\right)(96°F - 62°F) = 3624\frac{Btu}{hr}$$

**Answer A**