

Homework Set #5 Solution
Thermodynamics II
Due: 4-8-97

A heater is used to heat humid air from 20°C, 40% RH to 40°C. Calculate the size of the heater (kW) and the relative humidity at the heater exit. Also calculate the entropy generated during this process if the heating coil is 800K. The volumetric flow rate through the heater is 10 SCFM.

A heater in the first problem is now fitted with a humidifier that results in an exit RH of 50%. Calculate the heat transfer and the mass flow rate of water (the water enters as saturated steam at 100°C). Again, calculate the availability at each of the inlets, and also at the exit.