

MET 466 – Thermal Processes Lab

LAB #5

Energy Recovery Heat Wheel

Assigned: 3/26/09

Due: 4/09/09

Equipment:

1. AirXchange ERC 2509-02 Heat Wheel.
2. Two 208/230V GE Blowers.
3. 10kW at 480V Heater
4. Four Dwyer Series RH Sensors.
5. Alnor 6050P-1 Anemometer.

Procedure:

1. Turn on the four sensors, heater and two blowers.
2. Record exit velocities, dry bulb temperatures, and humidity after steady-state temperatures are achieved.
3. Decrease the two blower speeds.
4. Record exit velocities, dry bulb temperatures, and humidity after steady-state temperatures are achieved.
5. Shut down sensors, heater and blowers.
6. Measure the cross-sectional area of the two exits

Results:

1. Plot all points on a Psychrometric chart.
2. Calculate the Effectiveness of the following:
 - A) Sensible Energy Transfer
 - B) Latent Energy Transfer
 - C) Total Energy Transfer
3. Compare and contrast the Sensible, Latent, and Total Effectiveness to the published values as shown in Figure 5-1.

NOTE:

-Blowers are not protected by any screens; therefore any touching of the blowers from any persons other than the instructor is not permitted and may result in bodily harm.

Series 25
CFM: 500 to 1150
Size: 29" by 29"

SCFM	ERC-2509				
	Effectiveness (%)				ΔP (in.w.c.)
	S	L	T Clg	T Htg	
500	79.9	73.7	76.5	77.7	0.56
550	78.9	72.5	75.4	76.6	0.61
600	78.0	71.3	74.3	75.6	0.67
650	77.0	70.1	73.2	74.5	0.72
700	76.0	68.9	72.1	73.5	0.78
750	75.0	67.7	71.0	72.4	0.83
800	74.1	66.5	69.9	71.4	0.89
850	73.1	65.3	68.8	70.3	0.94
900	72.1	64.1	67.7	69.2	1.00
950	71.1	62.9	66.6	68.2	1.06
1000	70.1	61.7	65.4	67.1	1.11
1050	69.1	60.5	64.3	66.0	1.17
1100	68.1	59.2	63.2	65.0	1.22
1150	67.1	58.0	62.1	63.9	1.28

Figure 5-1: Heat Wheel Data