2/27/23	MAE 3524	William Van Dyke

a) ~~V = 600 CFM~~ $V_1 = 600$ cfm
~~$T_1 = 80F$ 70°F~~

① Dry Temp = 80F, Wet Bulb = 70F ⇒ $h_1 = 34$, $V_1 = 13.4$, ~~HR~~ rel. $v_1 = 60\%$, HR = .0135

$$\dot{m} = \frac{\dot{V}}{v} = \frac{600}{13.9} = 43.165$$

$$\dot{m}_{ODA} = 43.165 \frac{lbm}{min}$$

b) $\dot{V}_{RA} = 1200$

$$\dot{m} = \frac{\dot{V}}{v} = \frac{1200}{13.3} = 90.226 \frac{lbm}{min}$$

② WB = 50, HR = 0.0039, h = 20, v = 13.3

$$\dot{m}_{RA} = 90.226 \frac{lbm}{min}$$

c) $\dot{m}_m = 90.226 + 43.165 = 133.391 \frac{lbm}{min}$

$$h_m = \frac{34(43.165) + 26(96.226)}{133.391} = 24.53 \frac{BTU}{lbm}$$

WB = 56 °F
HR = 0.0074

d) DT = 50, WB = 45 ⇒ RH = 69%, h = 18 BTU/lbm, HR = 0.005

$\dot{m} = 133.391 \frac{lbm}{min}$

e) $\dot{Q}_{sens} = \dot{m}\Delta t = 133.391(18 - 24.53)\frac{60}{1} \Rightarrow \dot{Q}_{sens} = -52262 \frac{BTU}{hr}$

$\dot{Q}_{Latent} = 133.391(24.53 - 21)(\frac{60}{1}) \Rightarrow \dot{Q}_{Latent} = 28252 \frac{BTU}{hr}$

f) ~~$\dot{m}_{cond} = \dot{m}_m$ (133.3~~

$\dot{m}_{cond} = 133.391(0.0135 - 0.0039)$

$\dot{m}_{cond} = 76.834 \frac{lb}{hr}$

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PSYCHROMETRIC CHART

Normal Temperature

I-P Units

SEA LEVEL