

15-8

$\dot{m}_A = 240 \text{ kg/h}$

50 km%  $\rightarrow$  20 km%

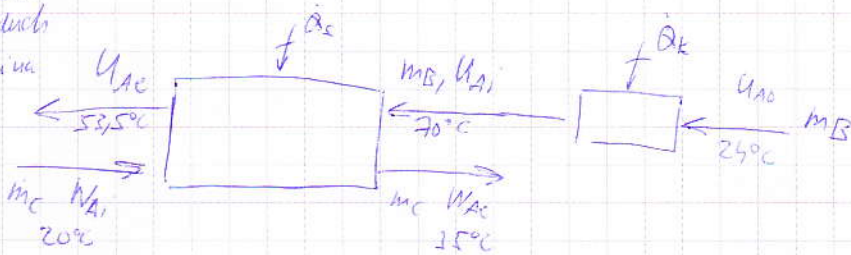
$t_m = 20^\circ\text{C}$

$t_{out} = 35^\circ\text{C}$

$c_{pc} = 836 \frac{\text{J}}{\text{kg}\cdot\text{K}}$

$t = 24^\circ\text{C}, u_{A0} = 0,01 \rightarrow 70^\circ\text{C} \xrightarrow{\text{suš.}} 53,5^\circ\text{C} \quad u_{Ac} = 0,038$

A = voda  
B = vzduch  
C = sušina



$$W_{A1} = \frac{m_A}{m_C} = \frac{240 \cdot 0,5}{240 \cdot (1-0,5)} = 1$$

$$\dot{m}_C = 240 \cdot 0,5 = 120 \text{ kg/h}$$

$$W_{Ac} = \frac{240 \cdot 0,2}{240 \cdot (1-0,2)} = 0,25$$

$$I_m = (W_A \cdot c_{pA}^2 + c_{pc}) \cdot t$$

$$c_{pA}^0 = 4,18 \text{ kJ/kg}\cdot\text{K}$$

$$I_m^m = (1 \cdot 4,18 + 0,836) \cdot 20 = 100,32 \frac{\text{kJ}}{\text{kg}\cdot\text{C}}$$

$$\left( \frac{\text{kg}\cdot\text{A}}{\text{kg}\cdot\text{C}} \frac{\text{kJ}}{\text{kg}\cdot\text{K}} + \frac{\text{kJ}}{\text{kg}\cdot\text{C}} \right) \cdot \text{C}$$

$$I_m^{\text{out}} = (0,25 \cdot 4,18 + 0,836) \cdot 35 = 65,835 \frac{\text{kJ}}{\text{kg}\cdot\text{C}}$$

$$I_0 = 2500 \cdot u_{A0} + (1,91 u_{A0} + 1,01) t_0 = 49,698 \frac{\text{kJ}}{\text{kg}\cdot\text{B}}$$

$$I_e = 2500 u_{Ac} + (1,91 u_{Ac} + 1,01) t_c = 152,92 \frac{\text{kJ}}{\text{kg}\cdot\text{B}}$$

bilance vody (A)

$$\dot{m}_C (W_{A1} - W_{Ac}) = \dot{m}_B (u_{Ac} - u_{A1})$$

$$\dot{m}_B = \dot{m}_C \frac{W_{A1} - W_{Ac}}{u_{Ac} - u_{A1}} = 3214 \text{ kg-B/hod}$$

ent. bilance

$$\dot{m}_C I_m^m + \dot{m}_B I_0 + \dot{Q} = \dot{m}_C I_m^{\text{out}} + \dot{m}_B I_e$$

$$\dot{Q} = \dot{m}_C (I_m^{\text{out}} - I_m^m) + \dot{m}_B (I_e - I_0) = 120 \cdot (65,835 - 100,32) + 3214 \cdot (152,92 - 49,698)$$

$$= 327 617$$

$$\text{www.oerlikon.com/balzers/cz/} = 337 260 \text{ kJ/hod}$$

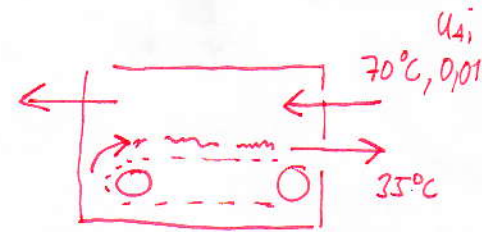
49,698  
46,698

15-8) pruklárenění

$$Q = \frac{327 \cdot 617}{337 \cdot 260} \text{ kJ/mol}$$

mávní spotřeba (spotřeba na 1 kg ~~suchého~~ <sup>odparené vody</sup> ~~materialu~~)

$$Q_m = \frac{\frac{327 \cdot 617}{337 \cdot 260}}{120 \cdot (1 + 0,25)} = \frac{3640 \text{ W/kg}}{3747 \text{ kg}} = 3,7 \text{ MJ}$$



Kritická vlhkost

material  
35°C

vzduch  
~~53,5%~~ 70°C  
0,038 0,01

→  $t_w = 29°C$

~~$t_w = 38,39$~~  teplota vlhkého teplotního

material <sup>větší</sup> ~~mávní~~ teplota než  $t_w$  → pod kritickou vlhkost  
na výstupu

EXP = 4,4528

$$\text{EXP} \left( \frac{h_1}{w_c - w^*} \left( T_2 - \frac{w_1 - w_c}{w_c - w^*} \right) \right) \cdot (w_c - w^*) = w_c - w^*$$

$$(w_c - w^*) = \frac{w_c - w^*}{\text{EXP}}$$

$w_c = 0,076$

~~$P_A = 5,655 \text{ kPa}$~~

$P_A^0(T_w)$

~~$U_A = 0,038$~~

~~$U_A = \frac{P_A}{P - P_A} \frac{M_A}{M_B}$~~

~~$U_A P - U_A P_A = P_A \frac{M_A}{M_B}$~~

~~$P_A \frac{M_A}{M_B} + U_A P_A = U_A \cdot P$~~

~~$P_A \cdot \left( \frac{M_A}{M_B} + U_A \right) = U_A \cdot P$~~

$P_A = \frac{U_A \cdot P}{\frac{M_A}{M_B} + U_A}$