

16-8

40% km netanol
60% km voda

$M_A = 32,04$
 $M_B = 18$

$q =$ kapalina bod vaku ($q=1$)

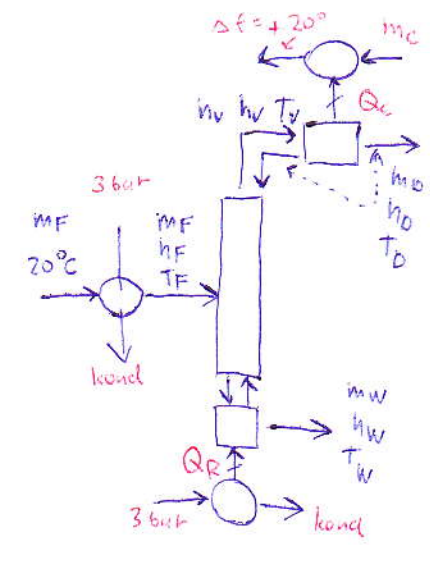
$w_F = 0,4$
 $w_D = 0,96$
 $w_W = 0,02$

$P_{nas} = 3 \text{ bar}$ ($T = 200^\circ\text{C}$)

$R = 1,5$ bod. vaku
 $p = \text{vaku}$

$m_F = 2500 \text{ kg}$

$c_{p, \text{net}} = 2,59 \text{ kJ/kg}\cdot\text{K}$
 $c_{p, \text{vod}} = 4,18 \text{ kJ/kg}\cdot\text{K}$



$$m_F = m_D + m_W$$

$$w_F m_F = w_D m_D + w_W m_W$$

$$w_F m_F = w_D (m_F - m_W) + w_W m_W$$

$$w_F m_F - w_D m_F = m_W (w_W - w_D)$$

$$m_W = m_F \cdot \frac{w_F - w_D}{w_W - w_D} = 2500 \cdot \frac{0,4 - 0,96}{0,02 - 0,96} = \underline{\underline{1489,4 \text{ kg}}}$$

$$m_D = \underline{\underline{1010,6 \text{ kg}}}$$

$w_D = 0,96 \rightarrow$

0,95	65,82
0,97	65,30

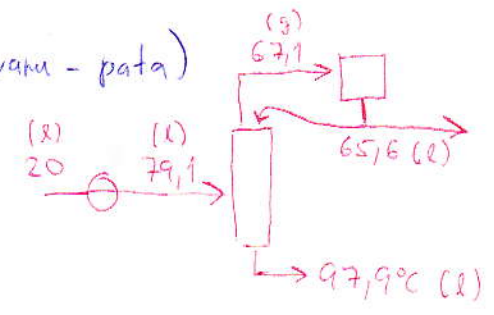
65,6°C (bod vaku - hlava)

$w_W = 0,02 \rightarrow$

0,01	97,88
0,02	96,84

97,9°C (bod vaku - pata)

$w_F = 0,4 \rightarrow$ 79,1°C (bod vaku - västrik)



Totální kondenzátor:

$$\dot{Q}_c = (R+1) m_D \cdot (h_{v1} - h_D)$$

$w_D = 0,96 \rightarrow T = \underline{\underline{67,1^\circ\text{C}}}$ destilát (100% bod)

$h_D = 0$

$$h_{v1} = h_D + \int_{65,6}^{67,1} \bar{c}_p dT + \Delta h_{vyp}|_{67^\circ\text{C}}$$

$\Delta h_{vyp, \text{net}} = 1105,4 \text{ kJ/kg}$
 $\text{vod} = 2341,6 \text{ kJ/kg}$

$$= (0,96 \cdot 2,59 + 0,04 \cdot 4,18) (67,1 - 65,6) + (0,96 \cdot 1105,4 + 0,04 \cdot 2341,6) = 3,9804 + 1154,8 = 1158,8 \text{ kJ/kg}$$

$$\dot{Q}_c = (1,5+1) \cdot 1010,6 \cdot 1158,8 = 2927780 \text{ kJ}$$

$\Delta h_{chl. \text{ voda}} = 4,18 \cdot 20 = 83,6 \text{ kJ/kg}$ $m_{cw} = \dot{Q}_c / \Delta h_{chl. \text{ w}} = \underline{\underline{35021 \text{ kg chl. vody}}}$

8 (2. část)

$$m_F h_F + Q_R = m_D h_D + m_W h_W + Q_C$$

$$t_{\text{ref}} = t_F$$

$$h_F = 0$$

$$h_D = h_F + \int_{79,1}^{65,6} \bar{c}_p dT = (0,96 \cdot 2,59 + 0,04 \cdot 4,18) (65,6 - 79,1) = -35,82 \text{ kJ/kg}$$

$$h_W = \int_{79,1}^{97,9} \bar{c}_p dT = (0,02 \cdot 2,59 + 0,98 \cdot 4,18) \cdot (97,9 - 79,1) = 77,99 \text{ kJ/kg}$$

$$m_F h_F + Q_R = Q_C + m_D h_D + m_W h_W$$

$$\begin{aligned} Q_R &= 2927,780 + 1010,6 \cdot (-35,82) + 1489,4 \cdot (77,99) = \\ &= 2927,780 - 36199,7 + 116158 \quad [\text{kJ}] \\ &= 30077,38 = \underline{\underline{3007,738 \text{ MJ}}} \quad (\text{vářák}) \end{aligned}$$

Přehřívání: $20^\circ\text{C} \rightarrow 79,1^\circ\text{C}$

$$\Delta h = \int_{20}^{79,1} \bar{c}_p dT = (0,4 \cdot 2,59 + 0,6 \cdot 4,18) \cdot (79,1 - 20) = 209,45 \text{ kJ/kg}$$

$$Q_{\text{nástrik}} = 209,45 \cdot 2500 = 523626 \text{ kJ} = 523,626 \text{ MJ}$$

$$\text{Celkem spotřebovaná pára pro } Q = 523 + 3007 = 3531,364 \text{ MJ}$$

p/kPa	$h_v/\text{kJ/kg}$	
295,15	2165,3	
303,93	2162,4	$-\frac{\Delta h}{\Delta x} = 0,33$

$$h_v = 2163,7 \text{ kJ/kg}$$

$$m_{\text{pára}} = \frac{3531,364}{2163,7} = \underline{\underline{1632 \text{ kg}}}$$

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