

10-7 Protiproud

$$\dot{m}_A = 1.7 \text{ kg/s (olej)}$$

$$\bar{c}_{p,A} = 2.5 \cdot 10^3 \text{ J/kg}\cdot\text{K}$$

$$t_{Ai} = 90^\circ\text{C}$$

$$t_{Ae} = 20^\circ\text{C}$$

A - mezitrubkový
prostor

B - voda

$$t_{Bi} = 15^\circ\text{C}$$

$$\dot{m}_B = 2 \text{ kg/s}$$

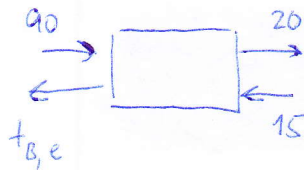
$$h = 37$$

25/32 mm → nejsem potřeбен

$$L = 6 \text{ m}$$

$$K_L = ?$$

B - trubky



$$\dot{Q} = \dot{m}_A \cdot c_{p,A} \cdot (t_{Ai} - t_{Ae})$$

$$\dot{Q} = \dot{m}_B \cdot c_{p,B} \cdot (t_{Be} - t_{Bi})$$

$$c_{p,B} = 4.2 \cdot 10^3 \text{ J/kg}\cdot\text{K (tabulky)}$$

$$\dot{Q} = 1.7 \cdot 2.5 \cdot 10^3 \cdot (90 - 20) = \underline{\underline{297 \cdot 10^3 \text{ W}}}$$

$$t_{Be} - t_{Bi} = \frac{\dot{Q}}{\dot{m}_B \cdot c_{p,B}} = \frac{297 \cdot 10^3}{2 \cdot 4.2 \cdot 10^3} = 35.42^\circ\text{C}$$

$$t_{Be} = 15 + 35.42 = \underline{\underline{50.42^\circ\text{C}}}$$

$$\Delta T_{LS} = \frac{(90 - 50.42) - (20 - 15)}{\ln \frac{90 - 50.42}{20 - 15}} = \underline{\underline{16.71^\circ\text{C}}}$$

$$\dot{Q} = K_L \cdot L \cdot \Delta T_{LS}$$

$$K_L = \frac{\dot{Q}}{L \cdot \Delta T_{LS}} = \frac{297 \cdot 10^3}{37 \cdot 6 \cdot 16.71} = \underline{\underline{80.06 \text{ W/m}^2\text{K}}}$$