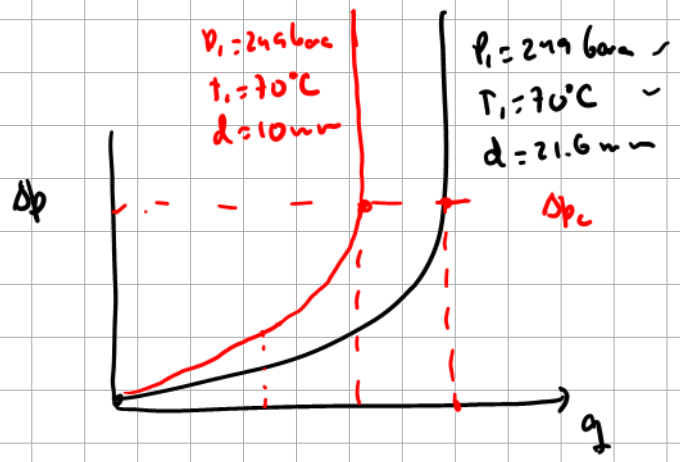
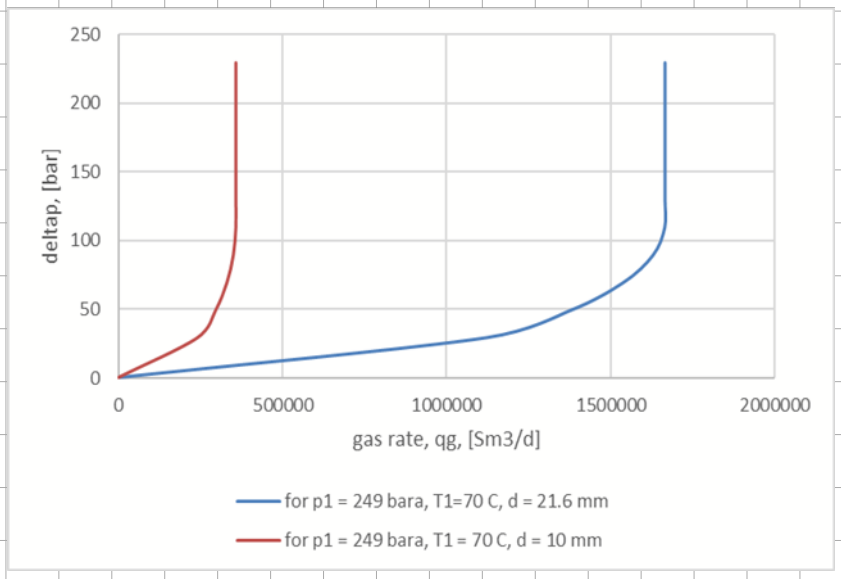
Δp $\quad y = \frac{p_2}{p_1}$ $\quad y_c = 0.546$

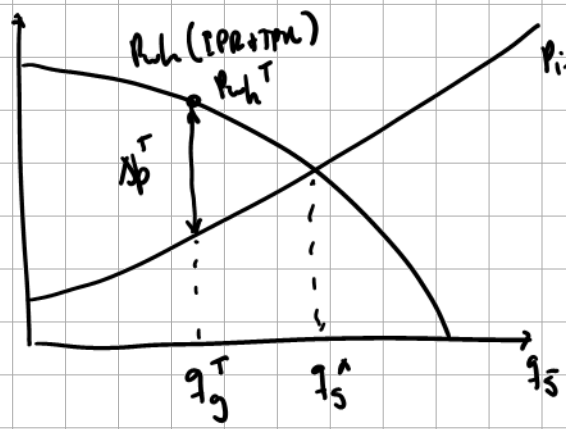


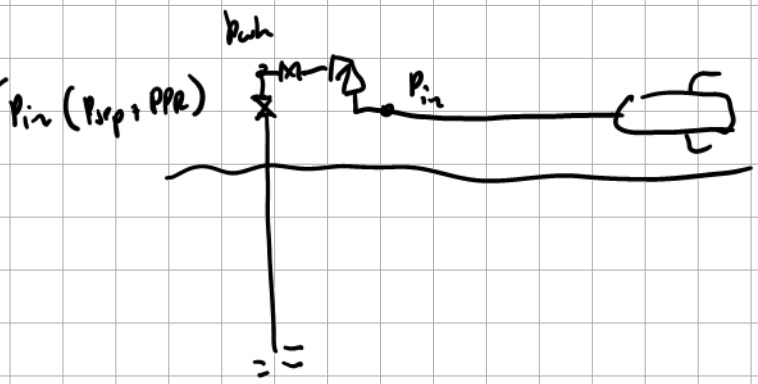
Δp_c ?

$\Delta p = p_1 - p_2 = p_1 (1 - y)$

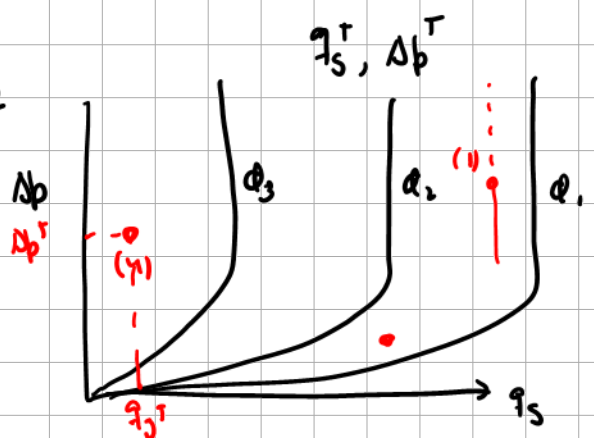
$\Delta p_c = p_1 (1 - y_c)$







Choke performance



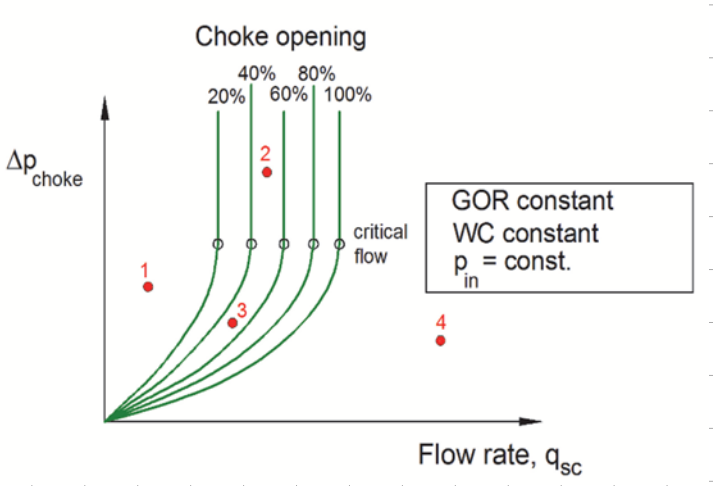
(1) critical
(2) subcritical

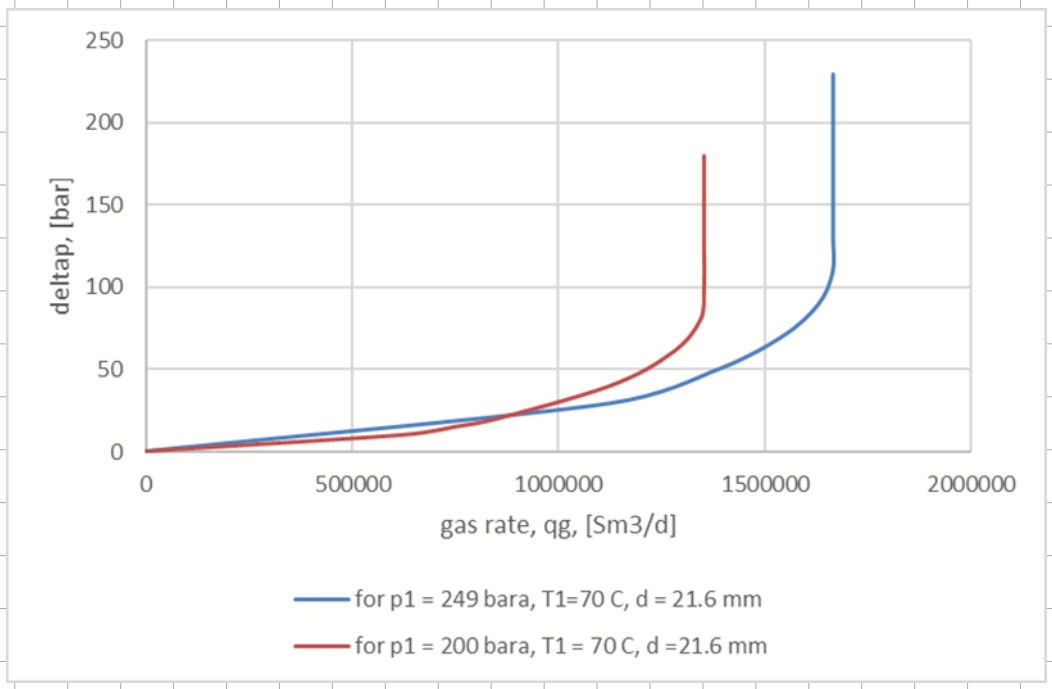
for $p_1 = p_{wh}^T$

$q_1 > q_2 > q_3$

(3) too small choke

(4) too large choke





temperature change in choke

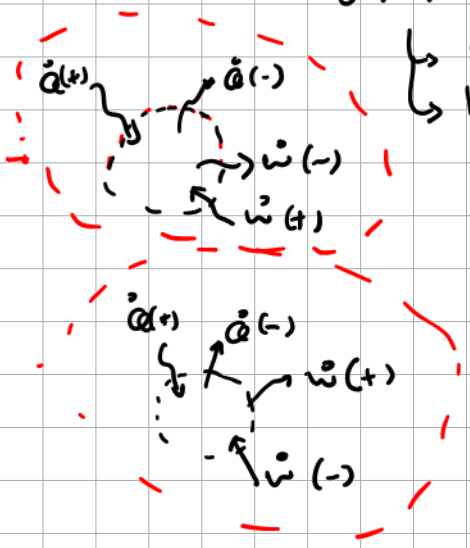
low GOR, high WC → expansion leads to an increase in temperature (modest)

high GOR → " " " a significant decrease in temperature
- ice formation → plug
- hydrate formation

$\dot{Q} + \dot{W} + E_{in} - E_{out} = 0$

mech eng

$\dot{Q} - \dot{W} + E_{in} - E_{out} = 0$



In the above $\dot{Q} = 0$

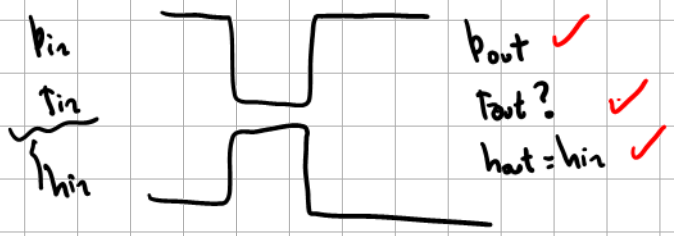
$\dot{W} = 0$

$V_{in} \simeq V_{out}$

$$E_{in} = E_{out}$$

$$\dot{m}\left(h_{in} + \frac{v_{in}^2}{2} + \dots\right) = \dot{m}\left(h_{out} + \frac{v_{out}^2}{2} + \dots\right)$$

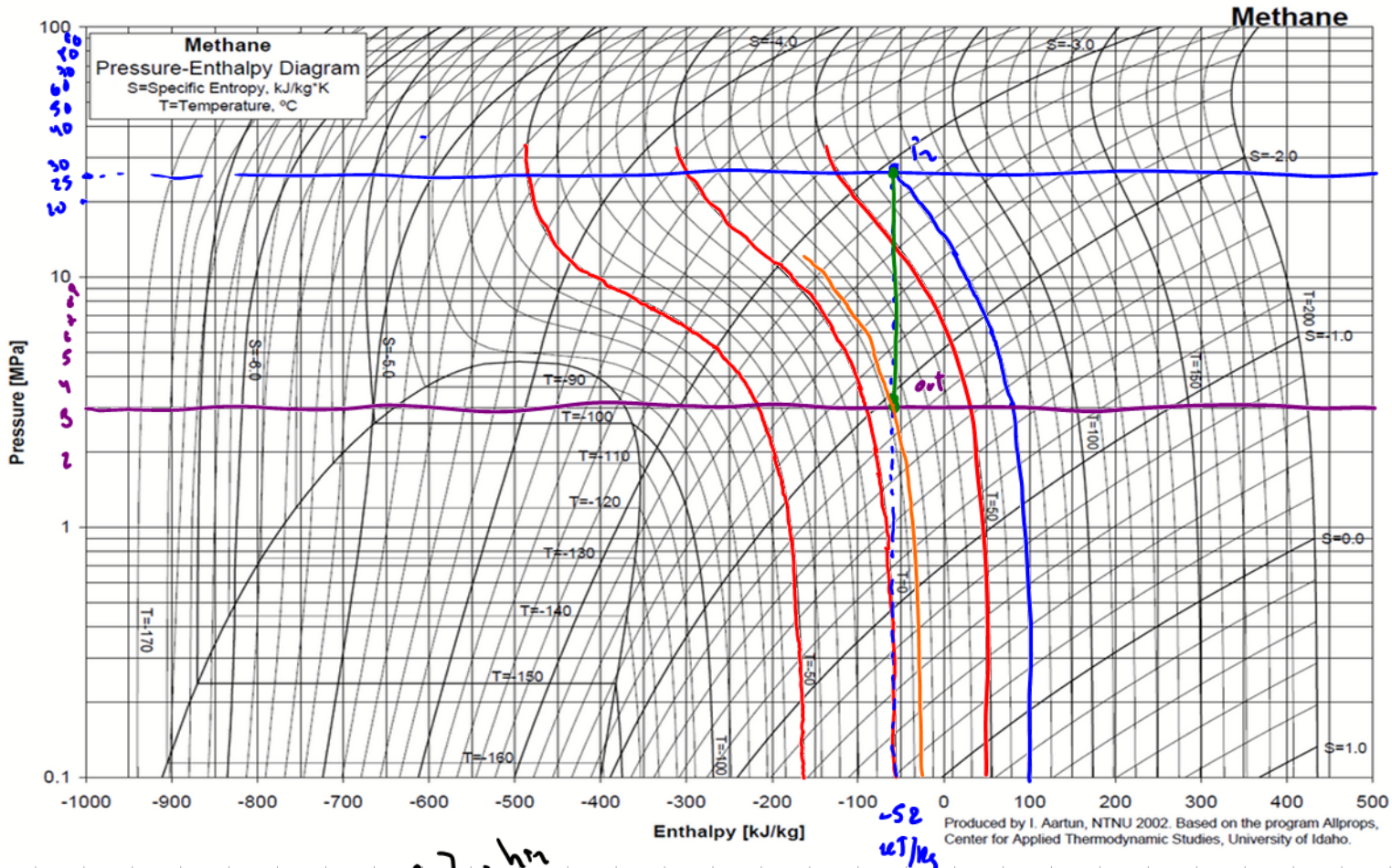
$h_{in} = h_{out}$ isenthalpic expansion



p_{out} ✓

T_{out}? ✓

$h_{out} = h_{in}$ ✓



$p_{in} = 250\,\text{bara} = 25\,\text{MPa}$ → h_{in} -52 kJ/kg

$T_{in} = 70°C$

$p_{out} = 30\,\text{bara} = 3\,\text{MPa}$

$T_{out} = ?$

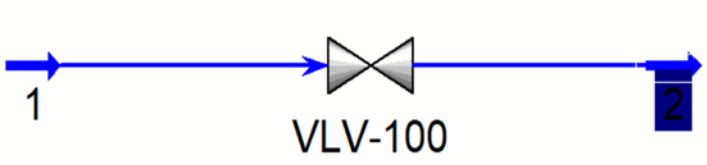
$h_{out} = -52$ kJ/kg

$T_{out} = 12°C$

1 MPa → 10 bara

1 E6 Pa → 1E05 Pa

$T_{in} = 70°C$ → $T_{out} = 12°C$



HYSYS Process simulator