

Individual homework assignment #4.

1. Define a state of system (water, saturated steam, superheated steam) using following parameters:
 - a. $T=(95+N/10) ^\circ\text{C}$, $p=0,08 \text{ MPa}$;
 - b. $T=(100+N) ^\circ\text{C}$; $v=1 \text{ m}^3/\text{kg}$;
 - c. $p=(60+N) \text{ kPa}$; $T=70 ^\circ\text{C}$;
 - d. $p=(2,3+N/100) \text{ bar}$; $s=(1+N/10) \text{ kJ}/(\text{kg K})$;
 - e. $T=(200+N) ^\circ\text{C}$; $h=2000 \text{ kJ}/\text{kg}$.
2. The enclosed cylinder with boiling water at atmospheric pressure is heated until it explodes as critical pressure $(1+N/10) \text{ MPa}$ is reached. Define amount of heat supplied to cylinder.
3. The water at $N \text{ l}$ open pot is boiling at atmospheric pressure. Define time needed for it to completely evaporate if power of stove is $(500+N*100) \text{ W}$.
4. Household steam generator produces saturated steam at $(80+N) \text{ g}$ per minute rate from water at ambient conditions. Define quality of produced steam if its power is $(200+N) \text{ kW}$.
5. Steam turbine is working on saturated dry steam at its inlet. Define final quality of steam outlet and produced power if pressure on inlet and outlet are 10 MPa and 0.05 MPa , respectively. Consider process to be adiabatic.
6. Steam from turbine exhaust enters condenser at $0.5 \text{ m}^3/\text{s}$ rate with pressure 100 kPa and quality 0.9 . Define flow speed in tube on the outlet of condenser if its diameter is 50 mm .