

2. Seminar Rankine cycle: superheated steam

Calculate the thermal efficiency, the steam moisture at turbine outlet as well as the specific work and heat for a superheated rankine cycle with $p_{\max} = 20 \text{ MPa}$, $T_{\max} = 600^\circ\text{C}$ and $p_{\min} = 0.005 \text{ MPa}$. Use the given T,s–diagram and also ThermoFluids software (or a steam table).

Assume a turbine efficiency of 92 % and calculate the moisture, specific work, entropy increase and thermal efficiency.

Reheating of steam: The expansion is interrupted at an intermediate pressure of 10 MPa for a reheating of steam to $T_{\max} = 600^\circ\text{C}$. Calculate the moisture at turbine outlet, specific work and thermal efficiency. Assume a isentropic expansion.

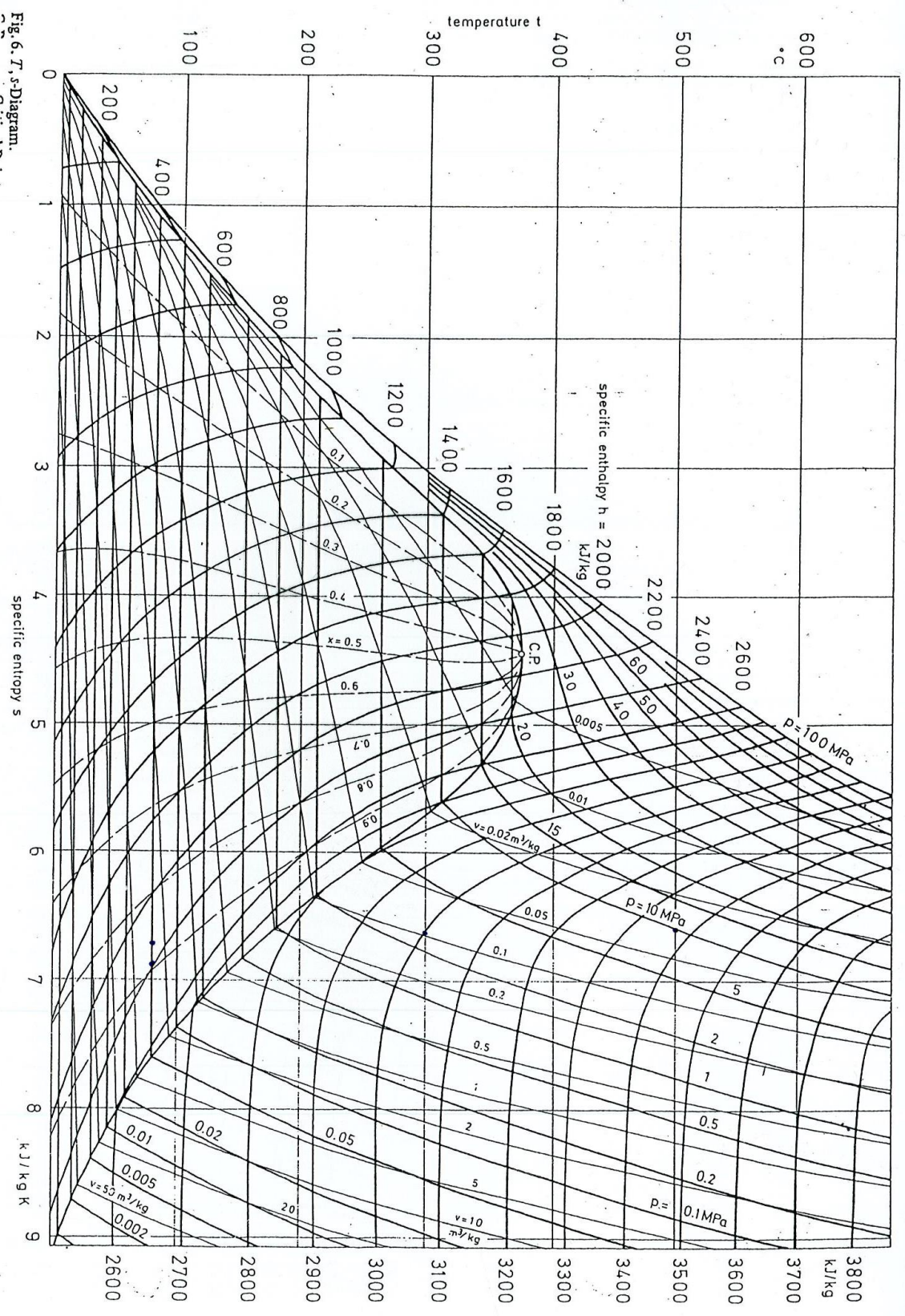


Fig. 6.7. T - s Diagram.

Source: <http://www.mechassis.com>