

1) Moist air. Given the relative humidity of 50% and the dry-bulb temperature of 27°C, compute:

- the specific humidity  $x = m_v/m_{as}$  of the air
- the specific enthalpy  $h$  of the air

The saturation pressure of water in mbar is given by:

$$P_{acqua}^o = 6,11 \cdot 10^{\frac{7,5 \cdot T}{237,7+T}}$$

where T denotes temperature in °C.

2) Compute the overall thermal transmittance U [W/mq K] of a single-layer wall of thickness  $s=30\text{cm}$ , made of a material with thermal conductivity  $k = 0.4 \text{ W/m K}$ . The convective thermal resistance on the exposed surfaces of the wall is:

- \*  $R_{si} = 0.13 \text{ mq K /W}$
- \*  $R_{se} = 0.04 \text{ mq K /W}$

3) What is a "storage tank" for hot water? What's the key idea behind its design? [With "design", I mean the calculation of the volume of the storage tank]

4) Explain the calculation method for both the distributed and the concentrated head losses.