

Task 1. Use a weather forecast website, and utilize the psychrometric chart and the formula we went through in the class to determine the absolute humidity, the wet-bulb temperature and the mass of water vapour in the air in Classroom A (Aula A) of Piacenza campus in the moment that you are solving this exercise (provide the inputs that you utilized)

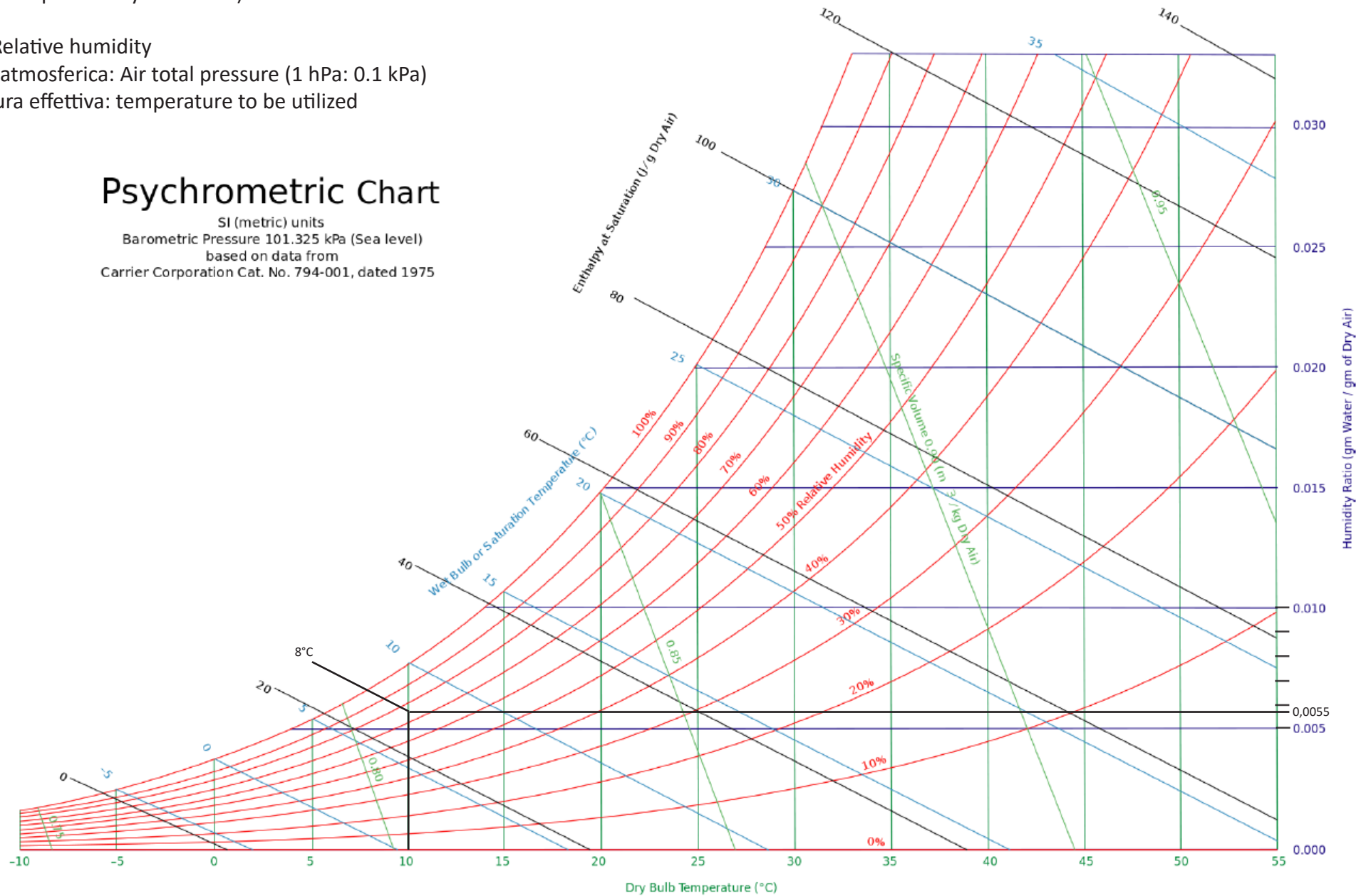
Umidità: Relative humidity

Pressione atmosferica: Air total pressure (1 hPa: 0.1 kPa)

Temperatura effettiva: temperature to be utilized

Psychrometric Chart

SI (metric) units
Barometric Pressure 101.325 kPa (Sea level)
based on data from
Carrier Corporation Cat. No. 794-001, dated 1975



a) Wet-bulb temperature

From the psychrometric chart we can obtain that the Wet-bulb temperature is equal to 8°C.

b) Absolute humidity

Info obtaining from the suggested weather webpage:

$$T = 10^{\circ}\text{C}$$

$$P = 1025 \text{ Hpa} = 102,5 \text{ Kpa}$$

$$\phi = 65\% = 0,65$$

$$P_v = \phi \cdot P_g$$

$$P_v = 0,65 \cdot 1,227 \text{ Kpa}$$

$$P_v = 0,79 \text{ Kpa}$$

$$P_a = P - P_v$$

$$P_a = 102,5 \text{ Kpa} - 0,79 \text{ Kpa}$$

$$P_a = 101,71 \text{ Kpa}$$

$$\omega = 0,622 (P_v / P_a)$$

$$\omega = 0,622 (0,79 \text{ Kpa} / 101,71 \text{ Kpa})$$

$$\omega = 0,622 \cdot 0,007$$

$$\omega = 0,0043 \text{ Kg}_{\text{vapour}} / \text{Kg}_{\text{dryair}}$$

The absolute humidity is equal to 0,0043 Kg_{vapour}/Kg_{dryair}

c) Mass of water

$$M_a = \frac{P_a \cdot (\text{Volume})}{R_a \cdot T}$$















$$M_a = \frac{101,71 \text{ Kpa} \cdot (5\text{m} \cdot 15\text{m} \cdot 3\text{m})}{0,287 \cdot (275 + 10)}$$

$$M_a = \frac{101,71 \text{ Kpa} \cdot 225 \text{ m}^3}{81,795}$$

$$M_a = \frac{22884,75}{81,795}$$

$$M_a = 279,78 \text{ Kg}$$

The mass of water vapour in the air, on the classroom is equal to 279,78 Kg

Il tempo oggi in Piacenza Martedì, 03 Dicembre 2019							
	13:00	14:00	16:00	18:00	20:00	21:00	22:00
							
Temperatura effettiva	9°C	10°C	8°C	6°C	4°C	2°C	2°C
Temperatura percepita	7°C	10°C	6°C	4°C	2°C	0°C	0°C
Precipitazioni	0 mm	0 mm	0 mm	0 mm	0 mm	0 mm	0 mm
Umidità	67 %	65 %	69 %	70 %	75 %	83 %	87 %
Pressione atmosferica	1025 hPa	1025 hPa	1025 hPa	1026 hPa	1027 hPa	1027 hPa	1028 hPa
Intensità del vento	15 km/h	14 km/h	9 km/h	9 km/h	7 km/h	8 km/h	8 km/h
Direzione del vento							
Probabilità di nebbia	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Punto di rugiada	3°C	3°C	3°C	1°C	-1°C	0°C	-1°C
Nuvole	21 %	13 %	42 %	15 %	2 %	3 %	3 %
Nuvole basse	11 %	7 %	42 %	15 %	2 %	3 %	3 %
Nuvole medie	18 %	12 %	2 %	0 %	1 %	0 %	0 %
Nuvole alte	0 %	0 %	0 %	0 %	0 %	0 %	0 %