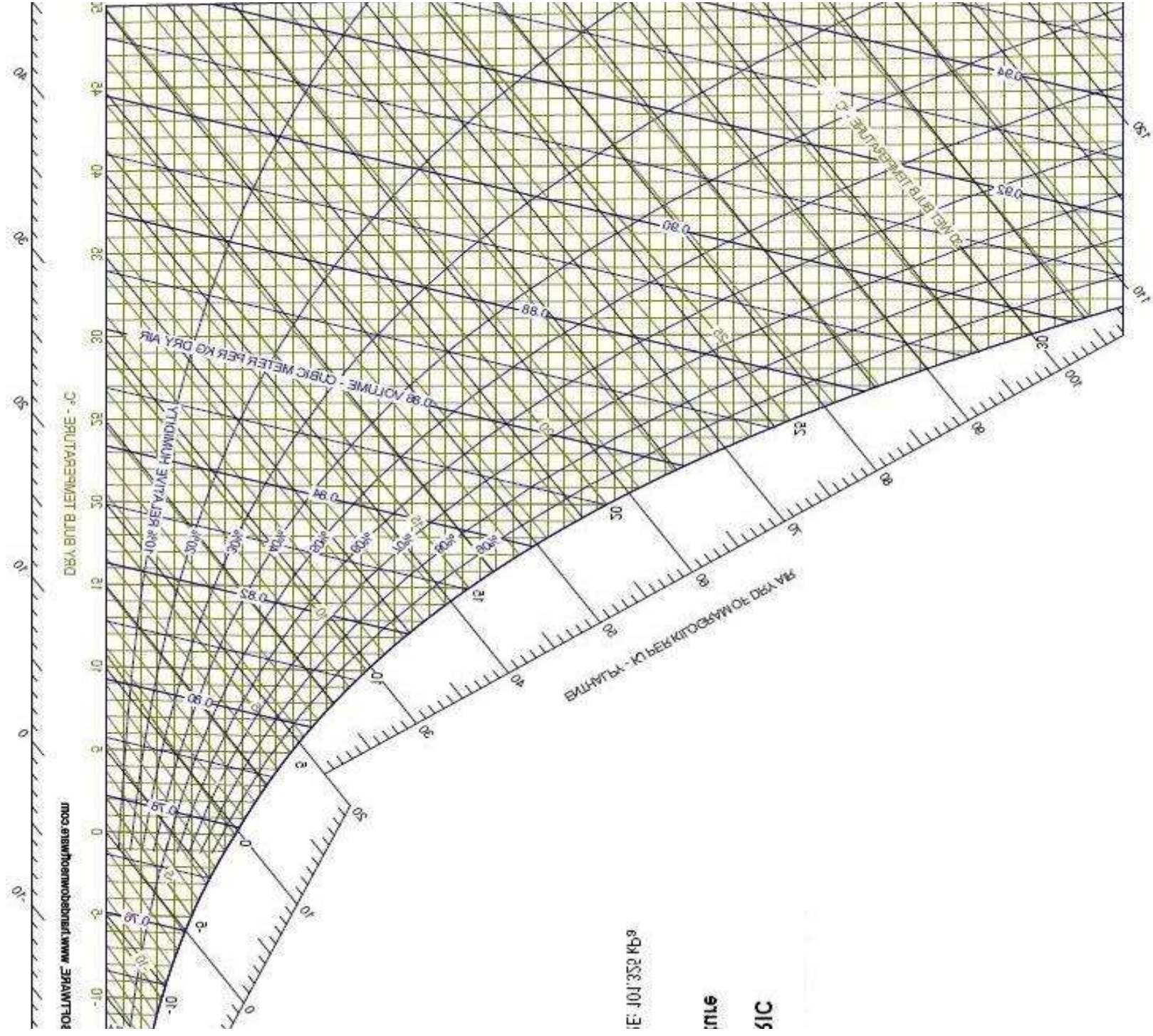


# Psychrometric diagram

Thermodynamic process





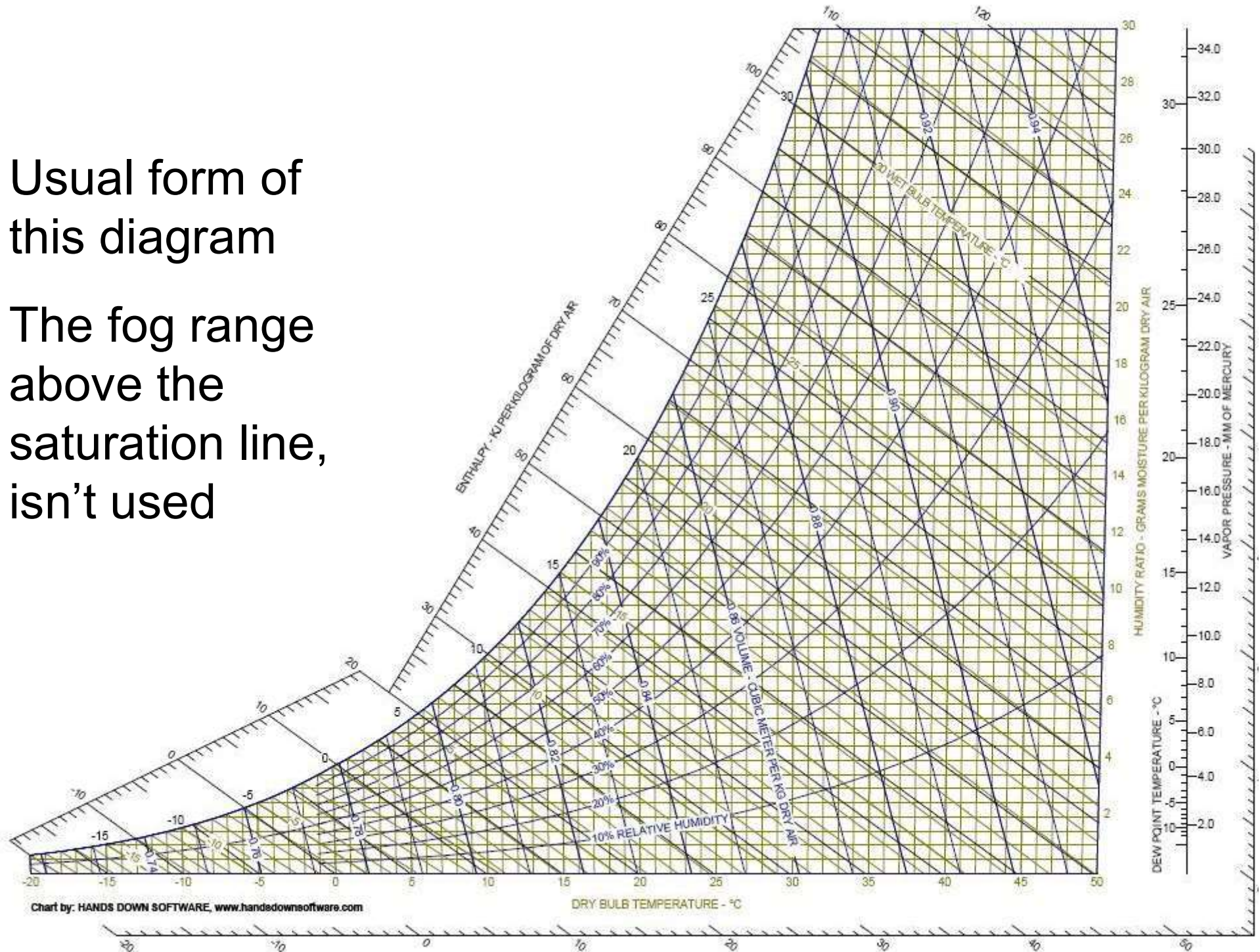
ГЭ 101 352 КБ 9

1116

51С

Usual form of this diagram

The fog range above the saturation line, isn't used

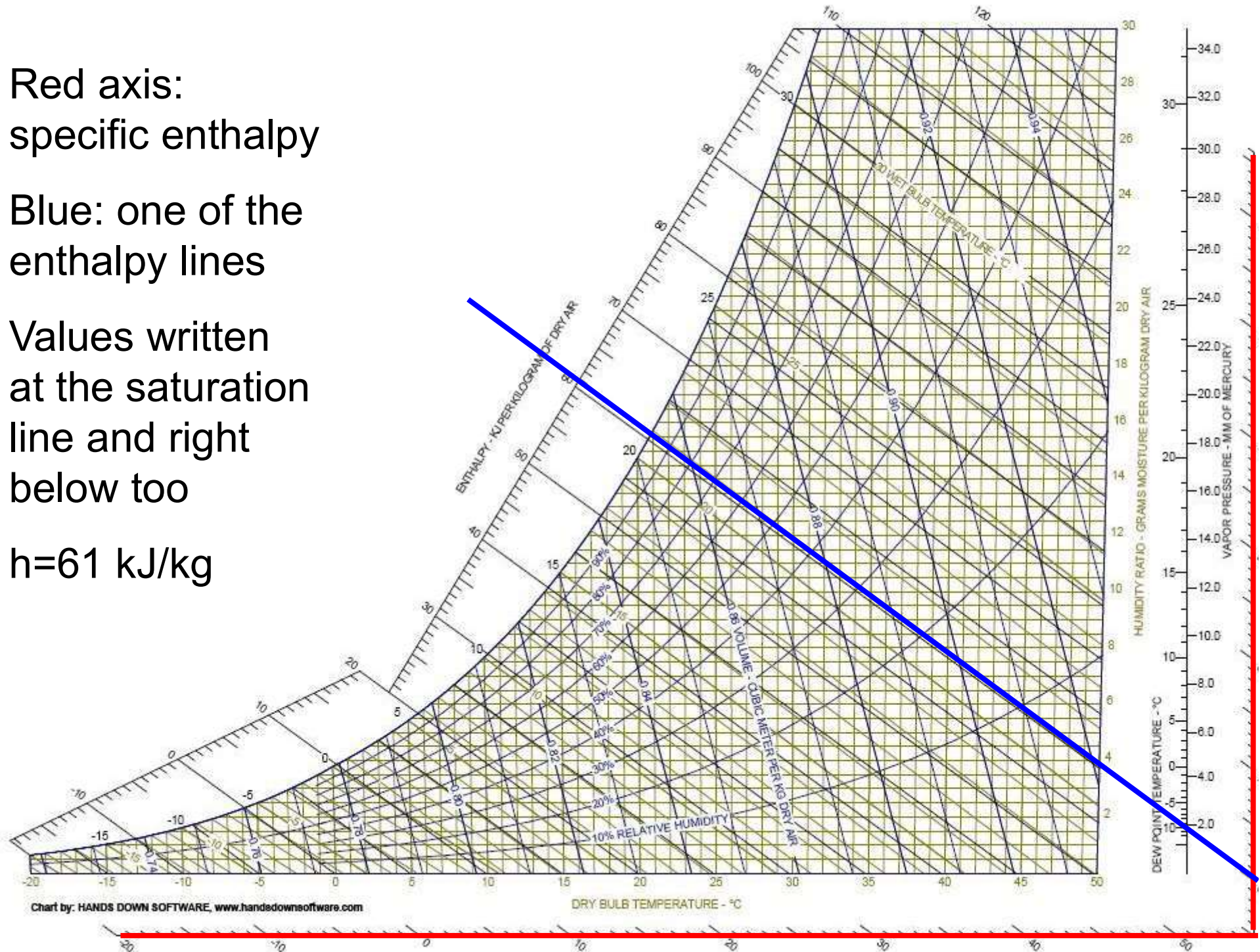


Red axis:  
specific enthalpy

Blue: one of the  
enthalpy lines

Values written  
at the saturation  
line and right  
below too

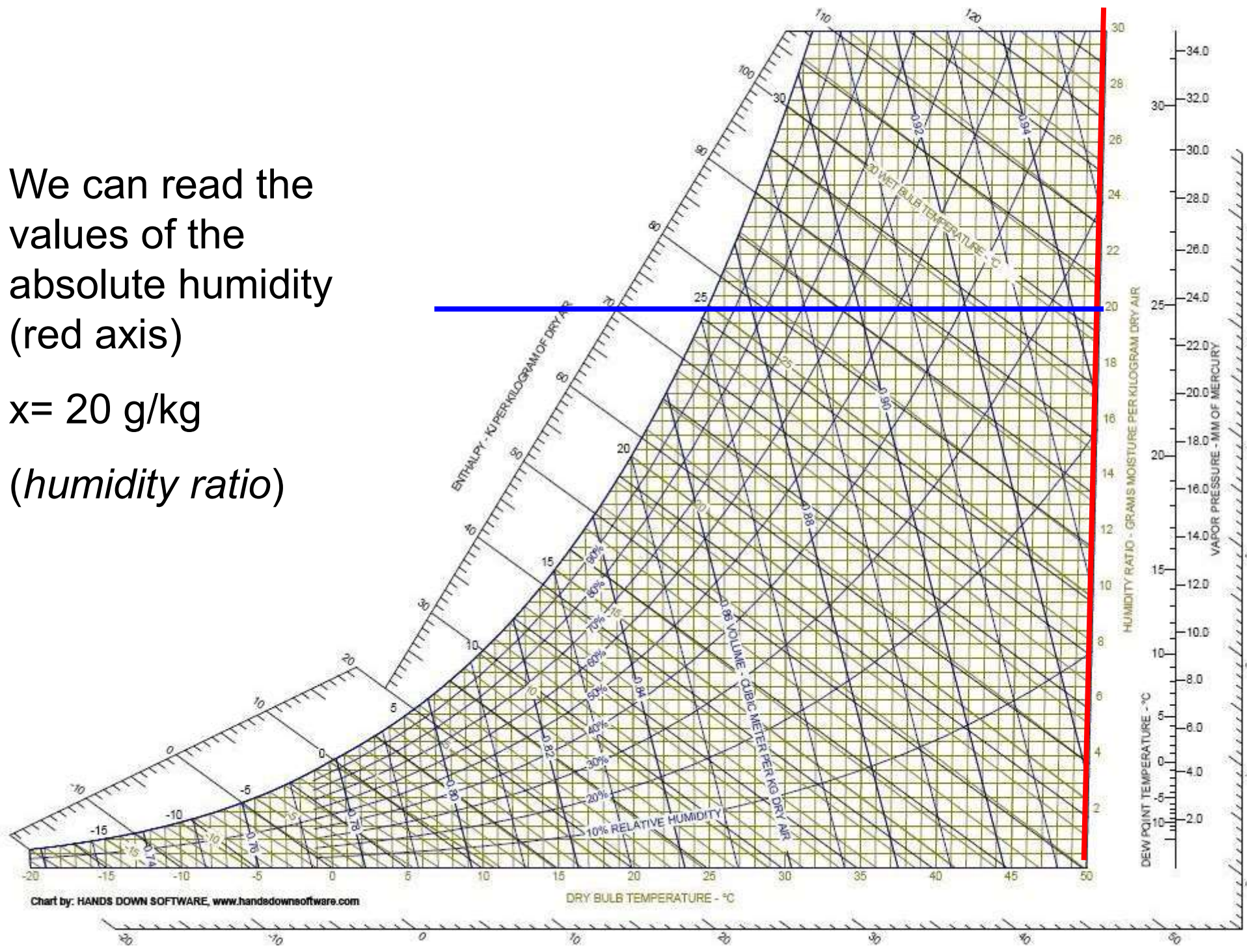
$h=61$  kJ/kg



We can read the values of the absolute humidity (red axis)

$x = 20 \text{ g/kg}$

(humidity ratio)

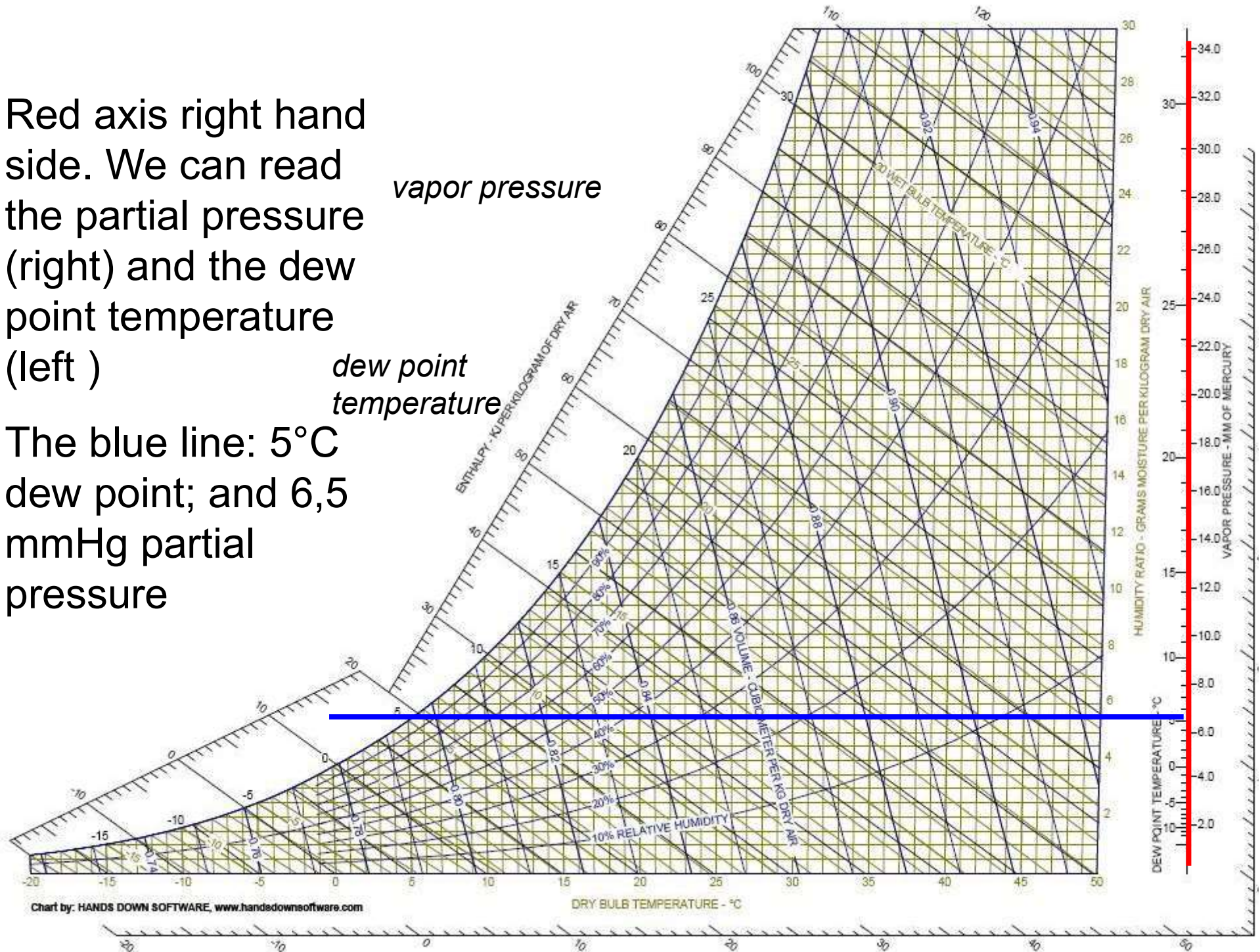


Red axis right hand side. We can read the partial pressure (right) and the dew point temperature (left )

The blue line: 5°C dew point; and 6,5 mmHg partial pressure

vapor pressure

dew point temperature



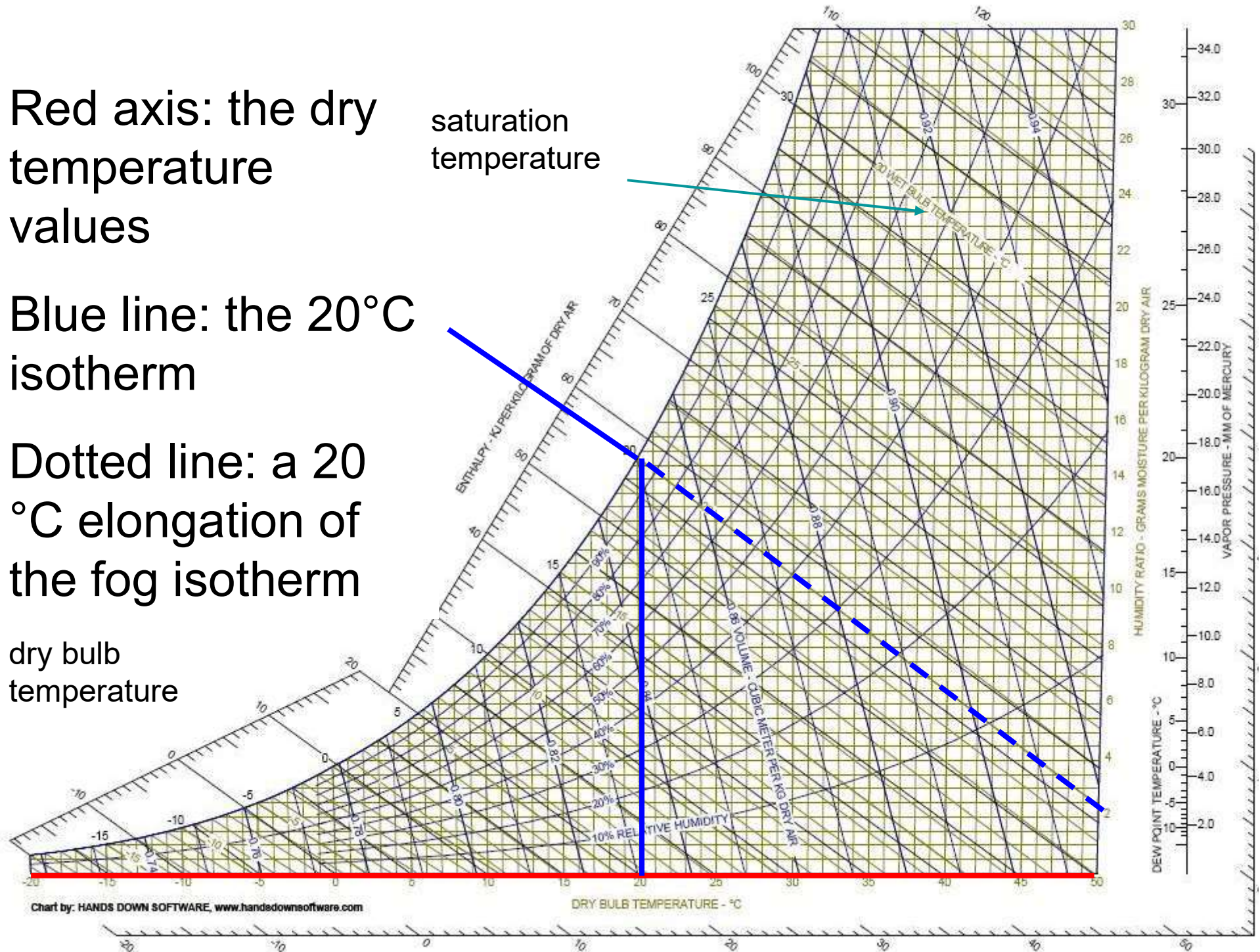
Red axis: the dry temperature values

Blue line: the 20°C isotherm

Dotted line: a 20°C elongation of the fog isotherm

dry bulb temperature

saturation temperature

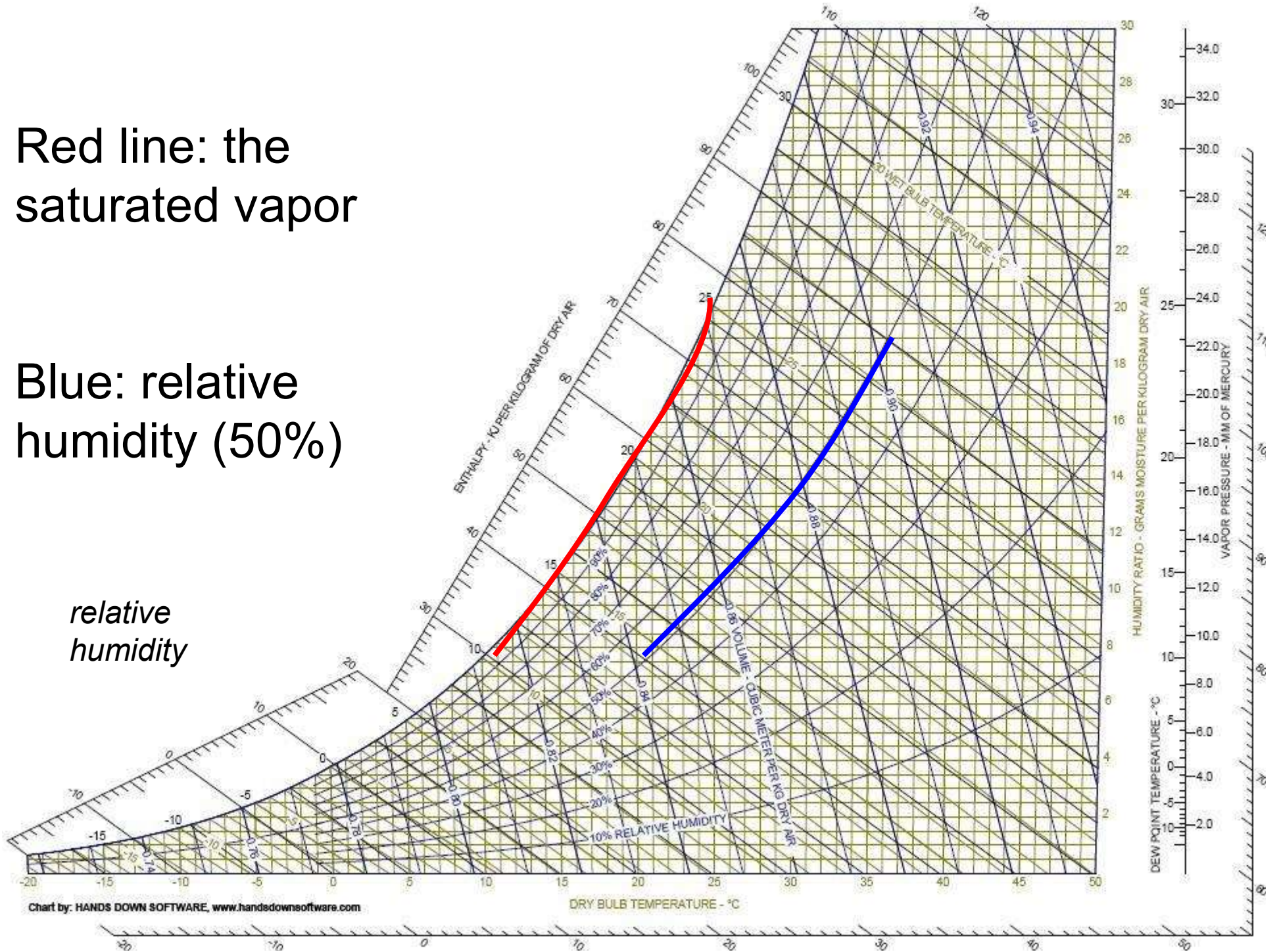




Red line: the saturated vapor

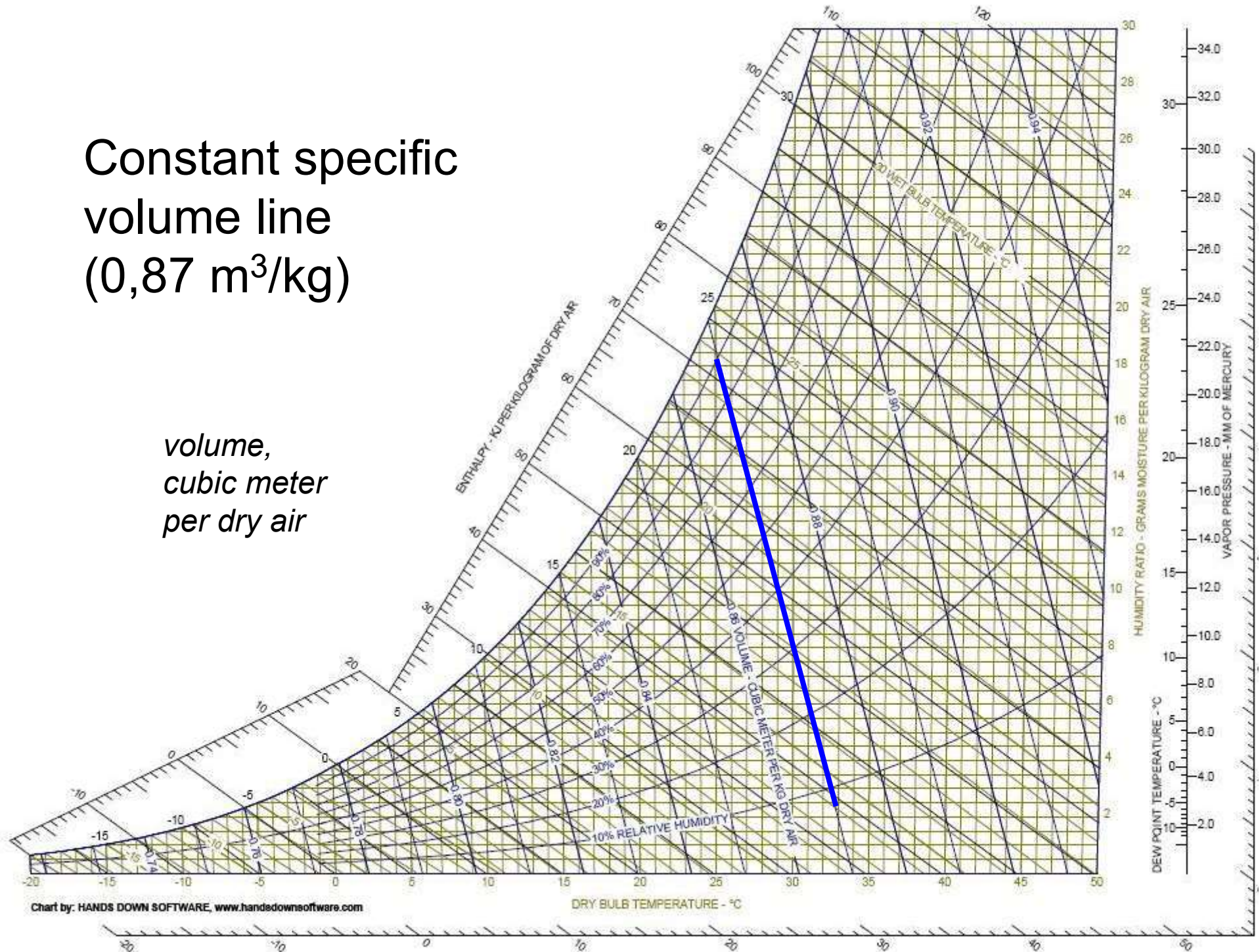
Blue: relative humidity (50%)

*relative humidity*

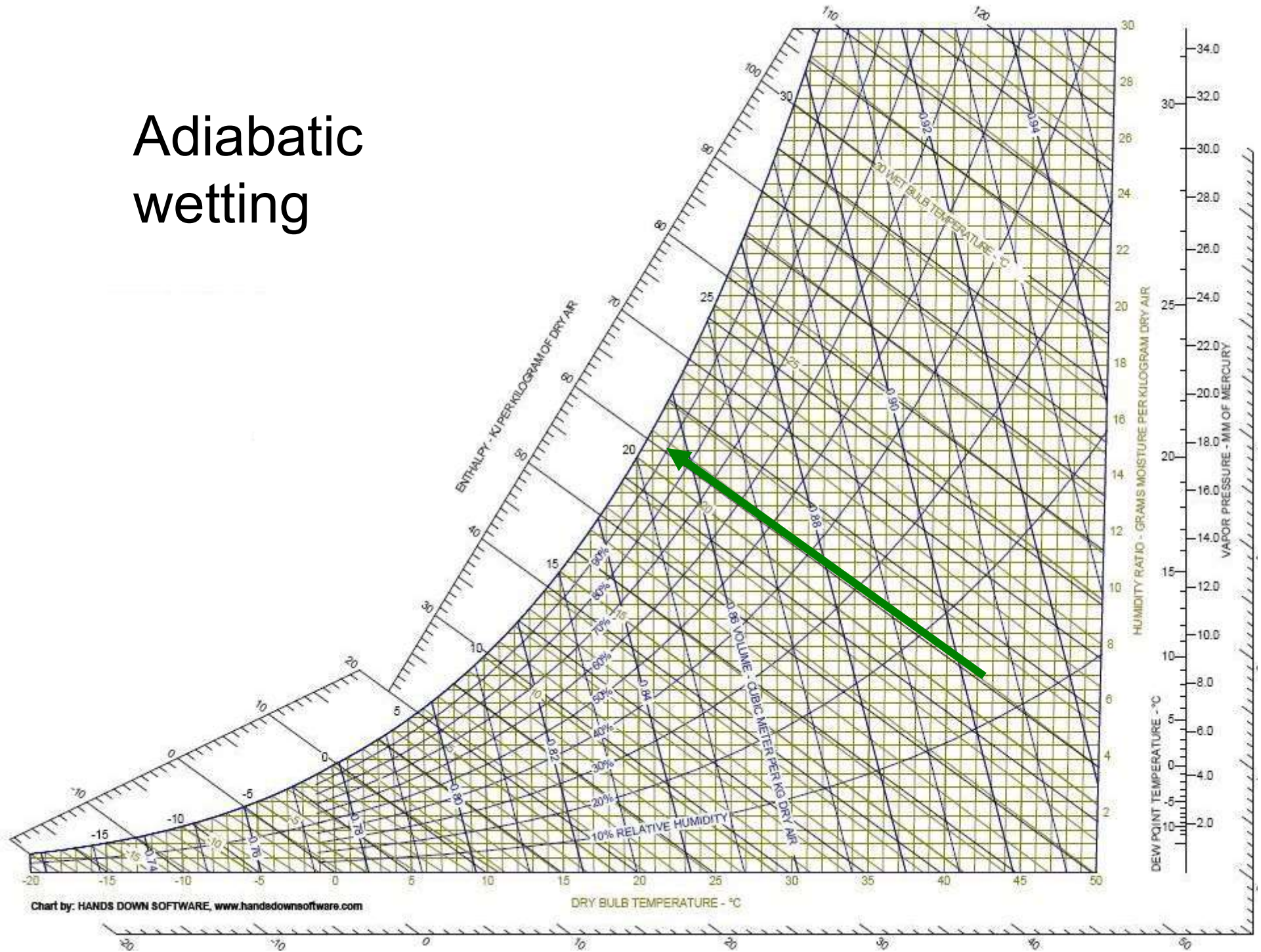


# Constant specific volume line (0,87 m<sup>3</sup>/kg)

*volume, cubic meter per dry air*

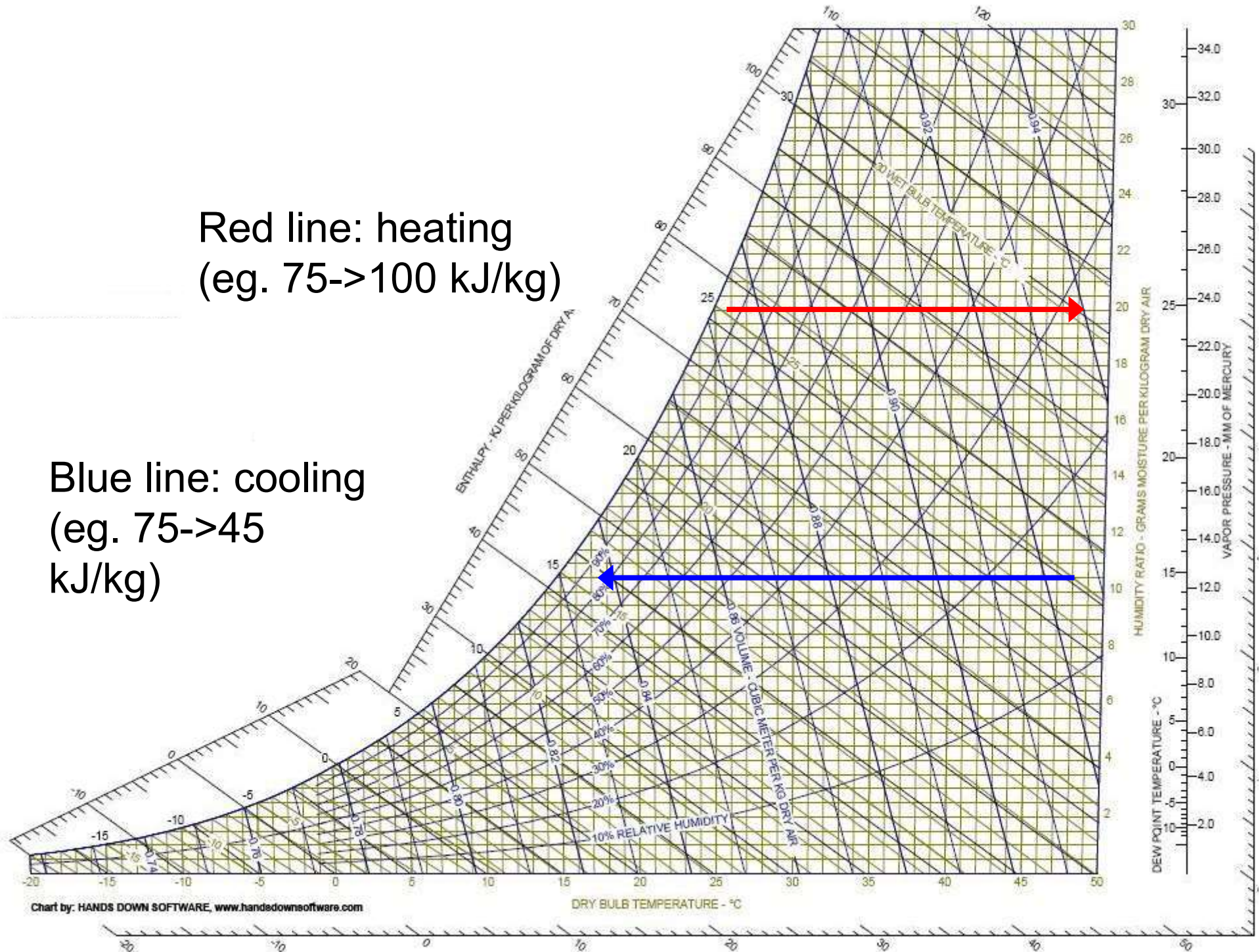


# Adiabatic wetting



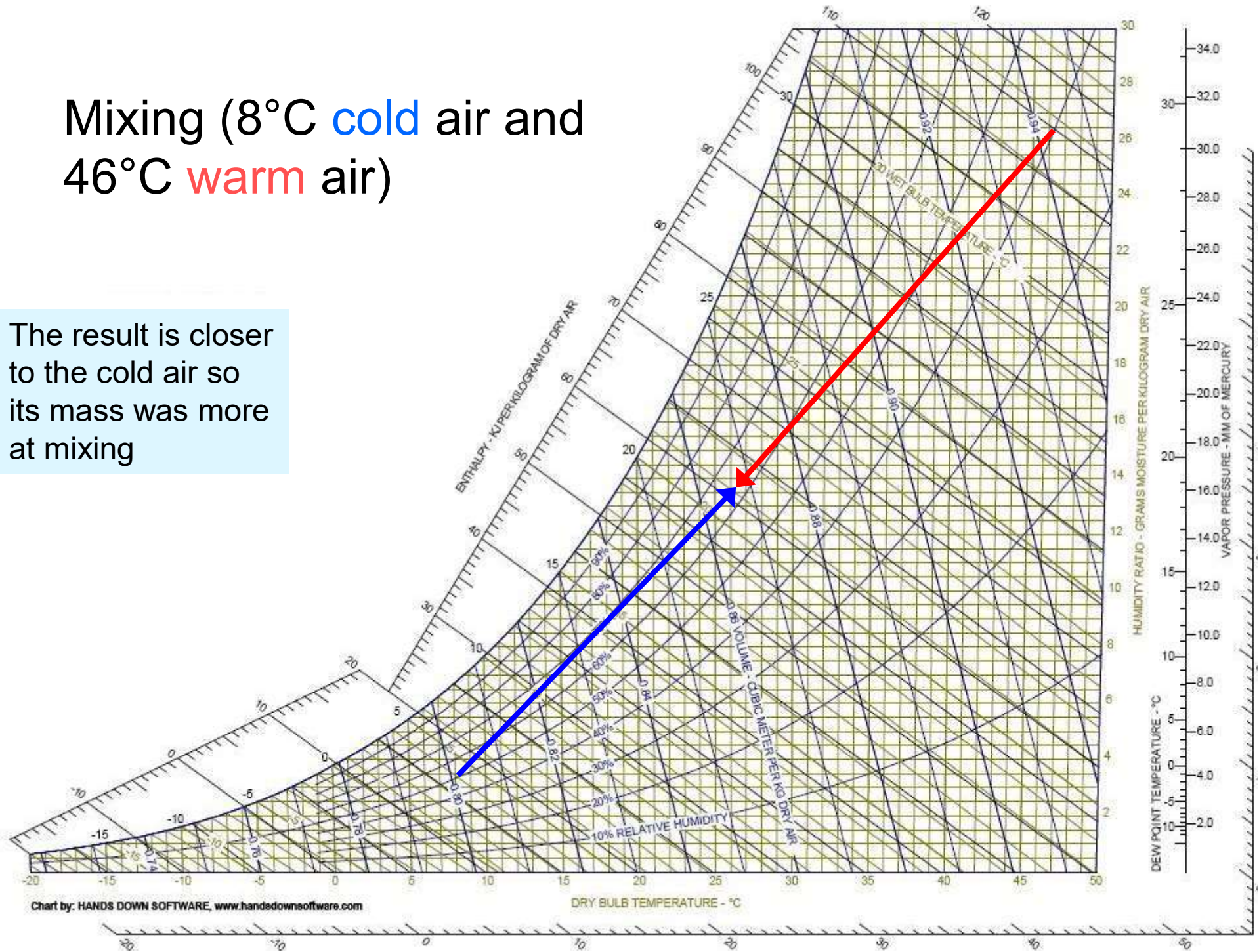
Red line: heating  
(eg. 75->100 kJ/kg)

Blue line: cooling  
(eg. 75->45  
kJ/kg)



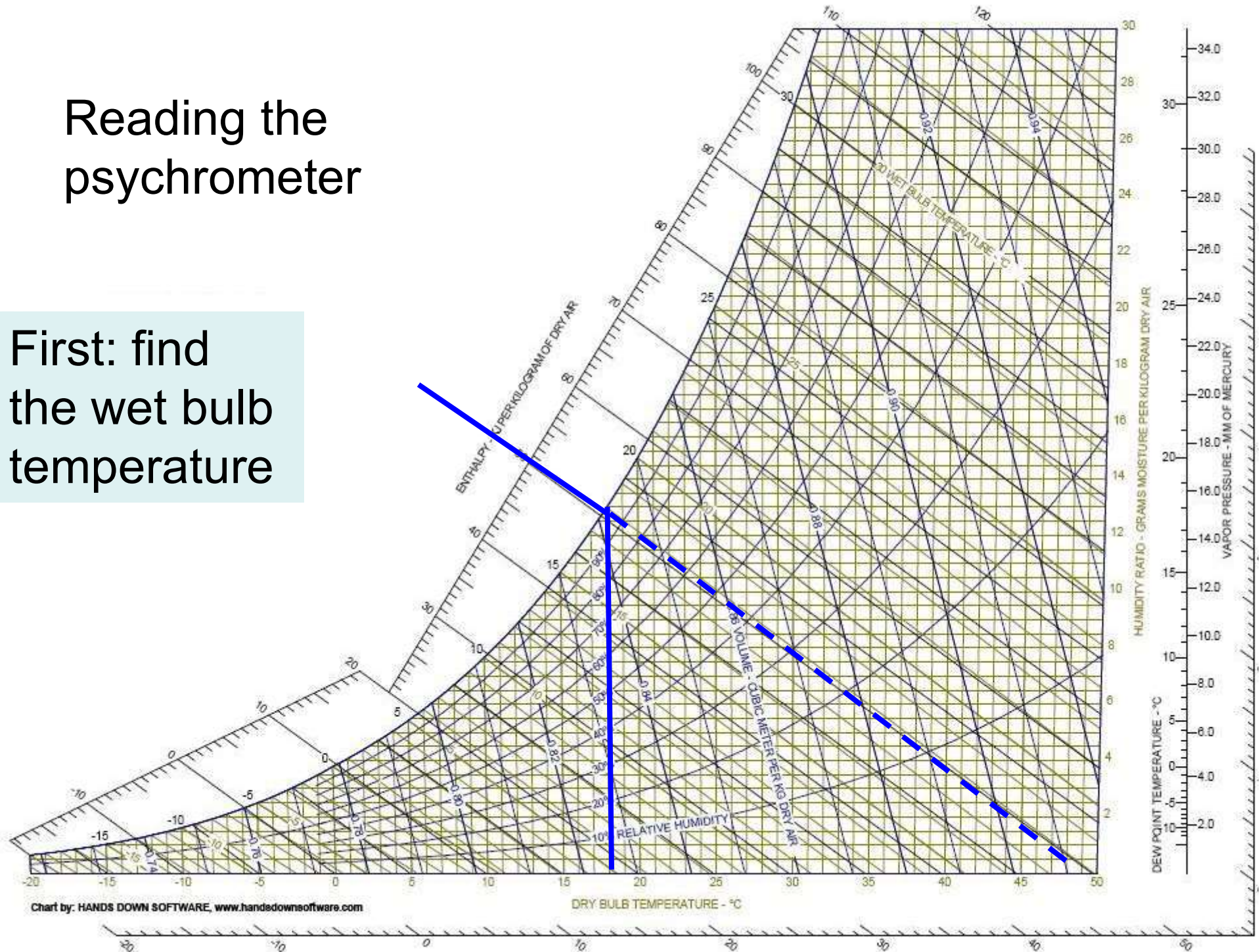
# Mixing (8°C cold air and 46°C warm air)

The result is closer to the cold air so its mass was more at mixing



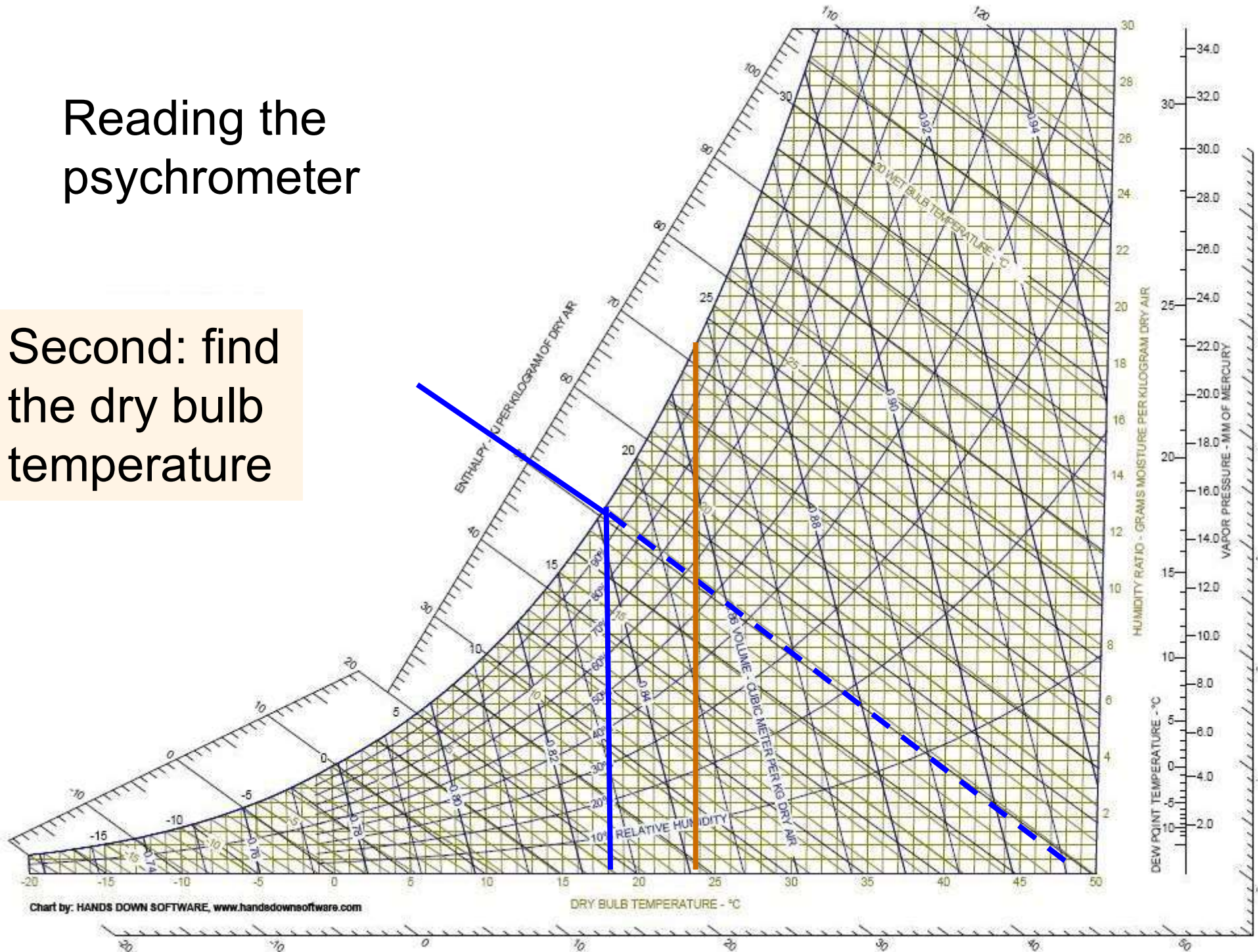
# Reading the psychrometer

First: find the wet bulb temperature



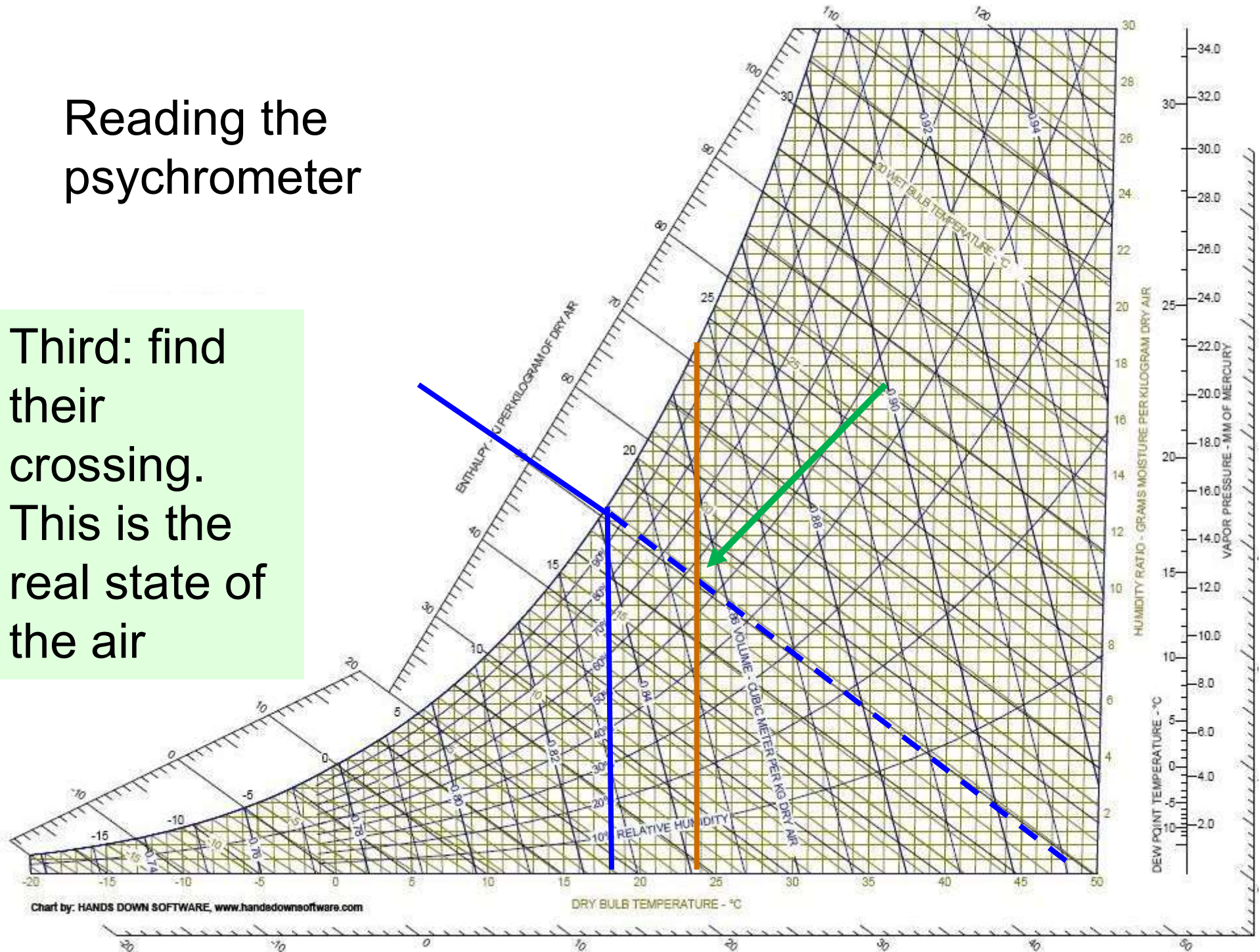
# Reading the psychrometer

Second: find the dry bulb temperature



# Reading the psychrometer

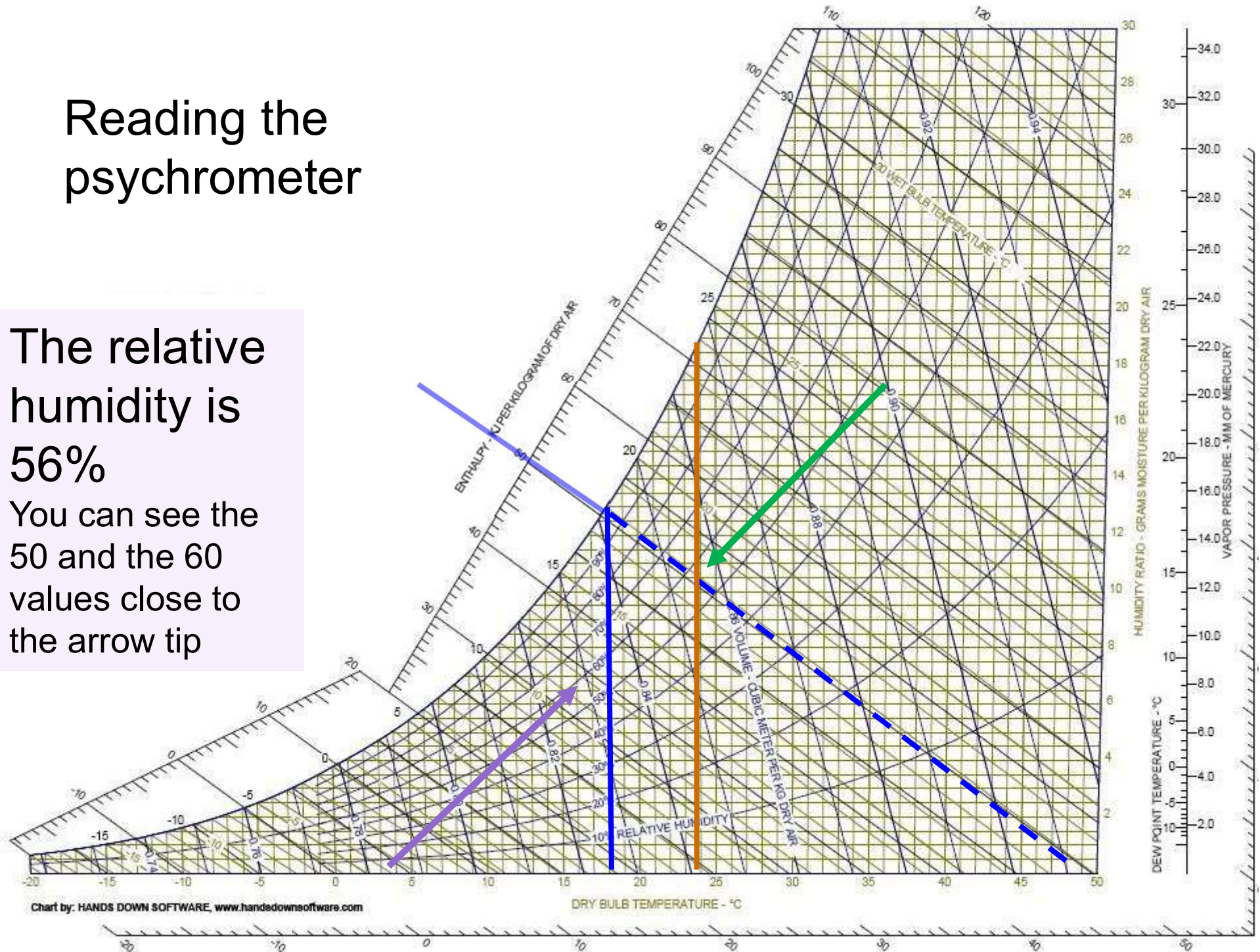
Third: find their crossing. This is the real state of the air





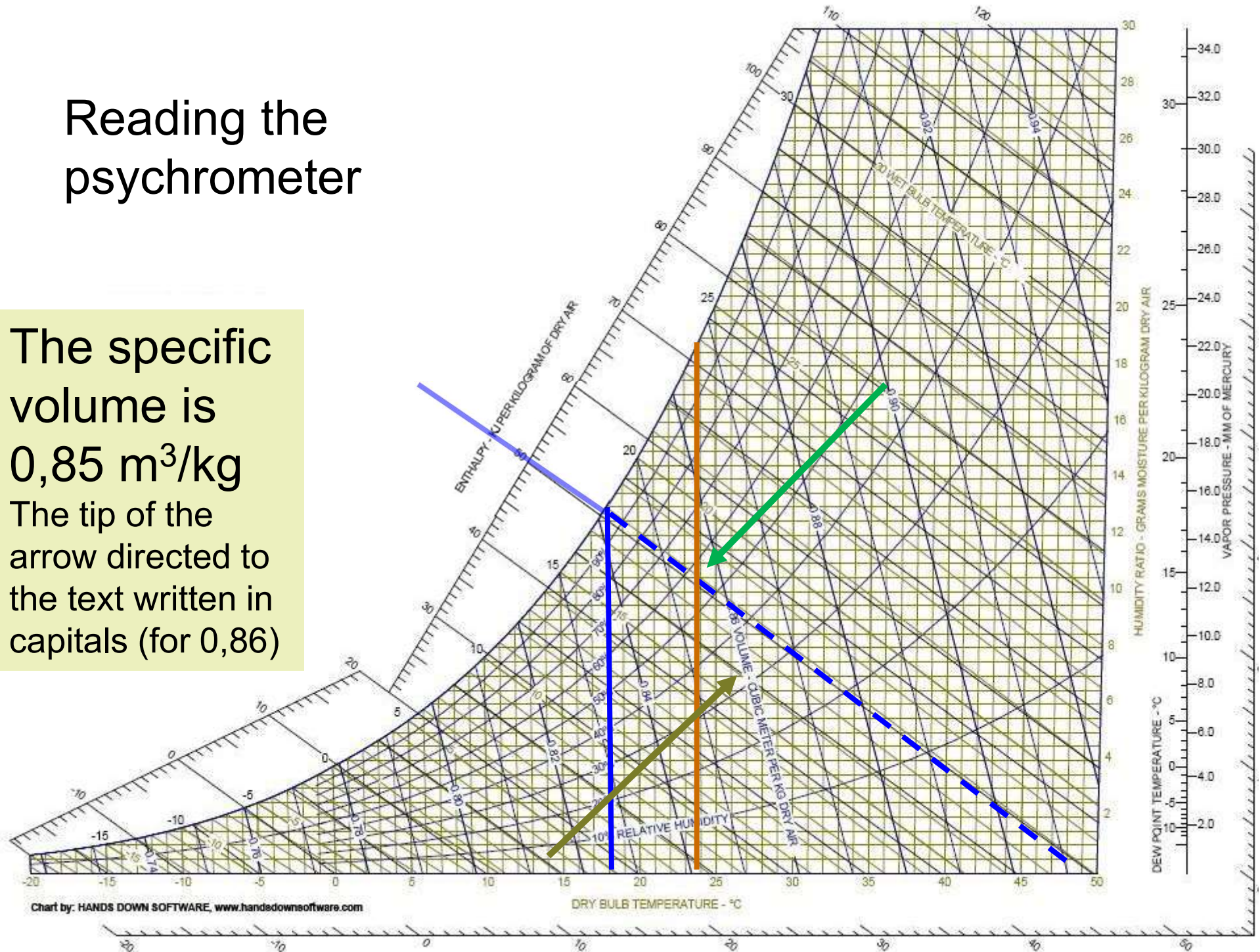
# Reading the psychrometer

The relative humidity is 56%  
You can see the 50 and the 60 values close to the arrow tip



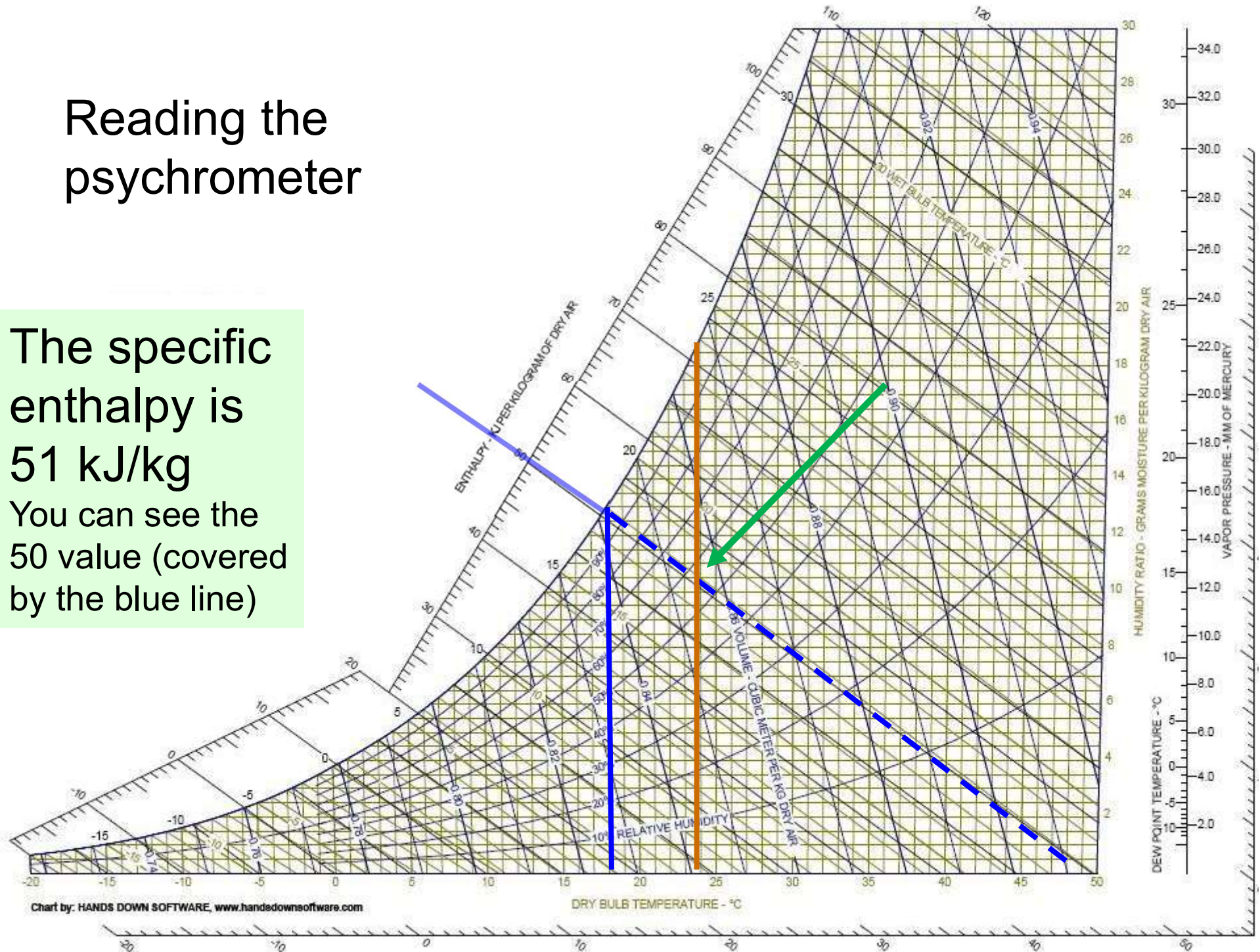
# Reading the psychrometer

The specific volume is  $0,85 \text{ m}^3/\text{kg}$   
The tip of the arrow directed to the text written in capitals (for 0,86)



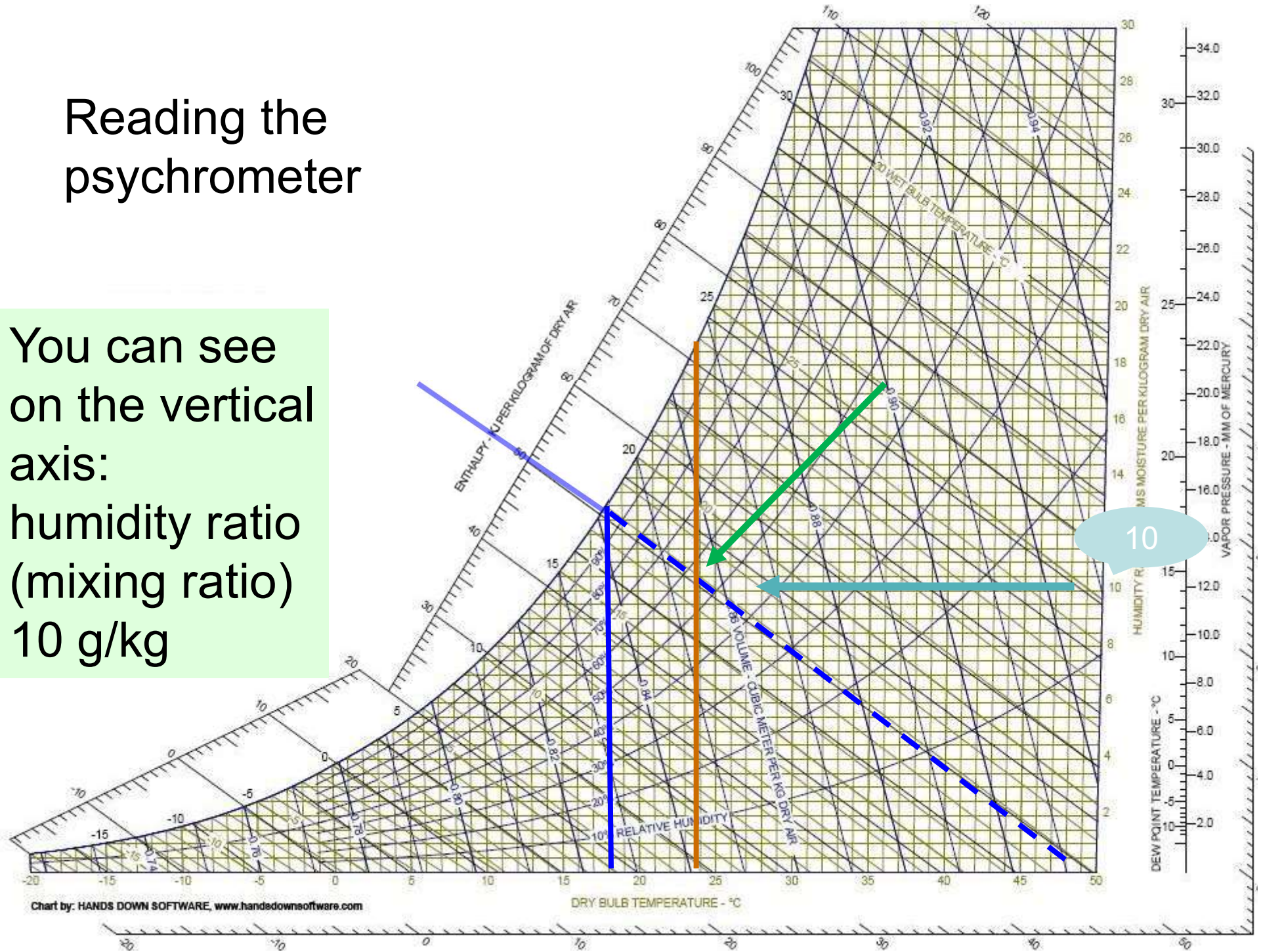
# Reading the psychrometer

The specific enthalpy is 51 kJ/kg  
You can see the 50 value (covered by the blue line)



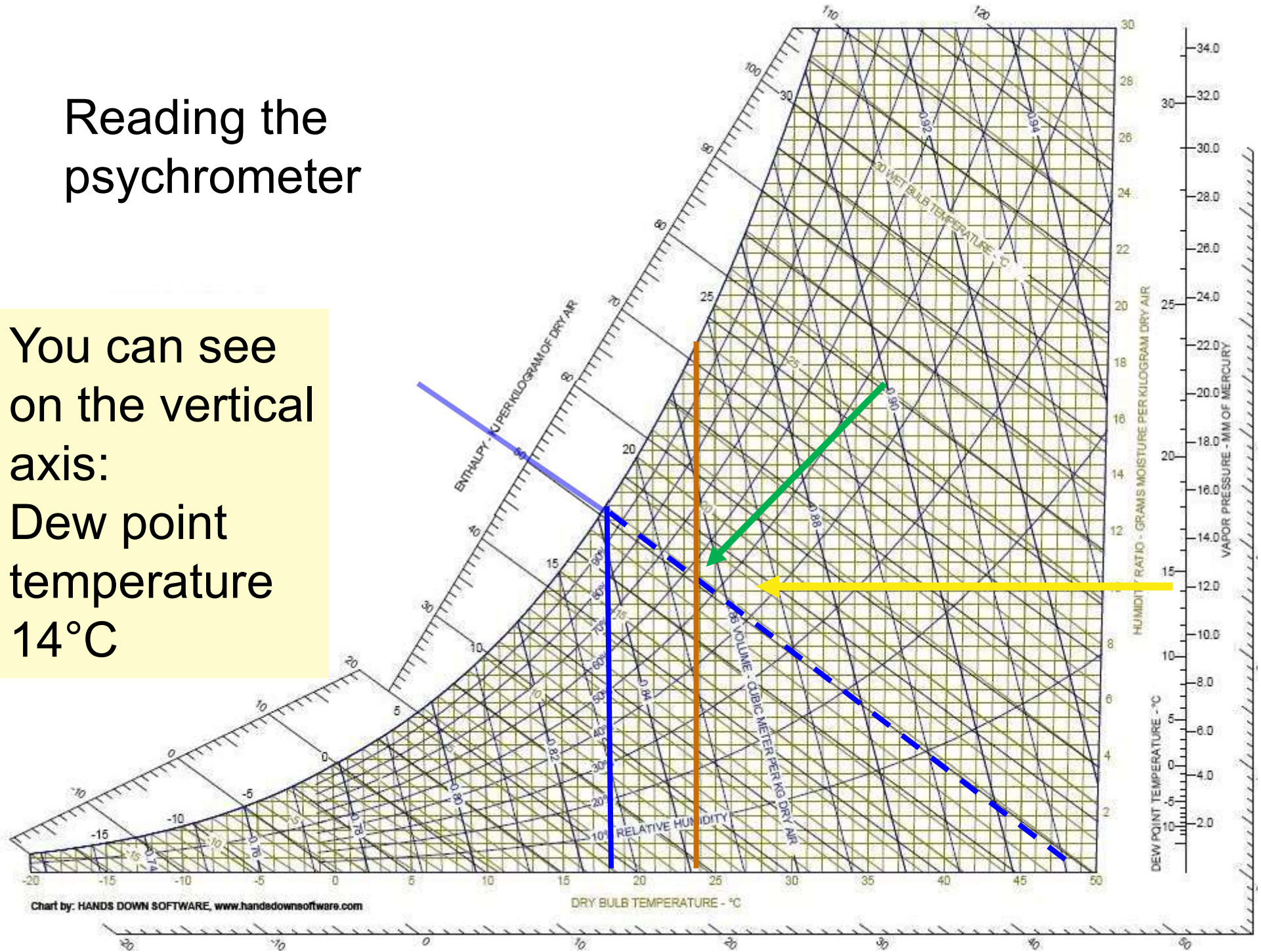
# Reading the psychrometer

You can see on the vertical axis: humidity ratio (mixing ratio) 10 g/kg



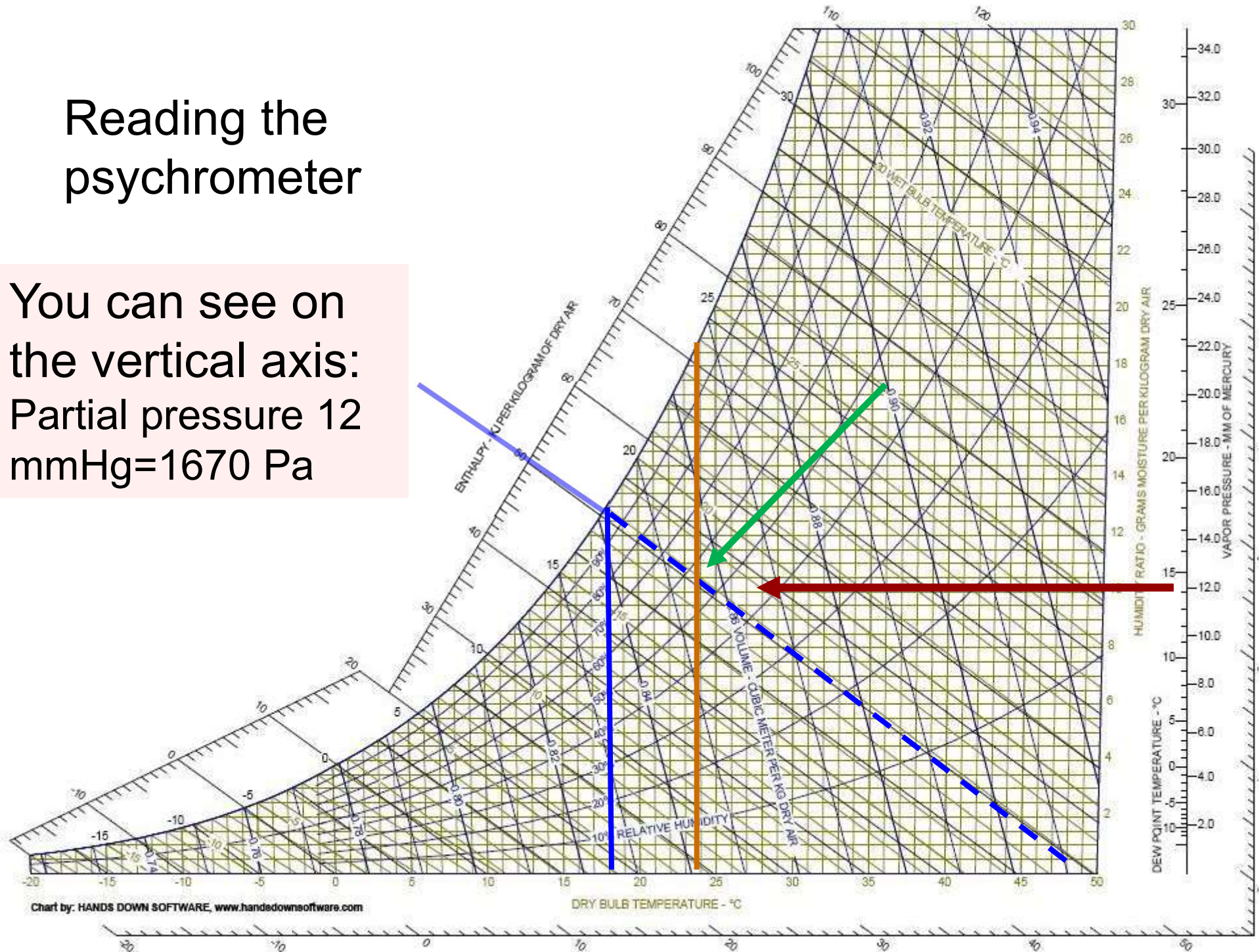
# Reading the psychrometer

You can see on the vertical axis: Dew point temperature 14°C



# Reading the psychrometer

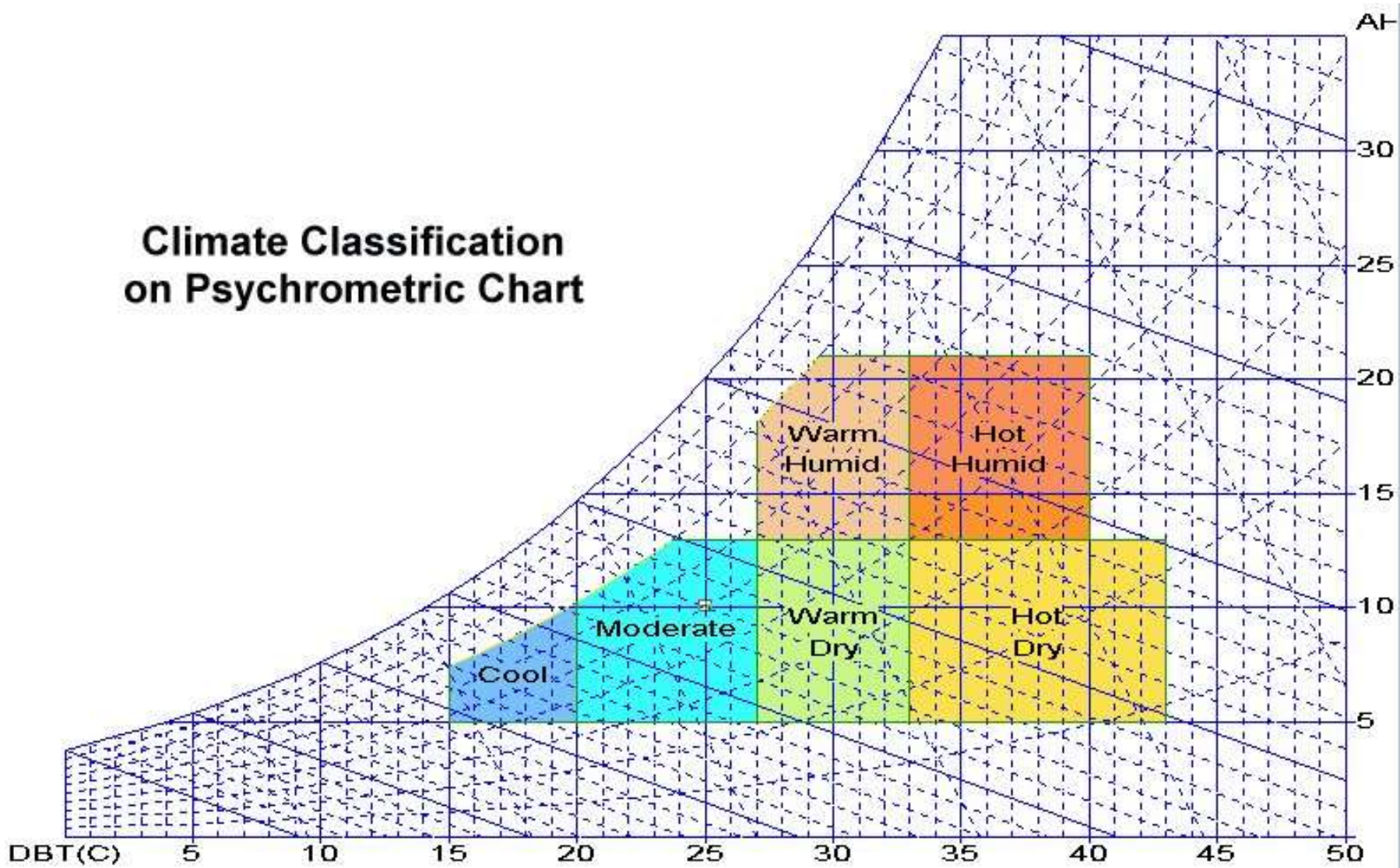
You can see on the vertical axis: Partial pressure 12 mmHg=1670 Pa



AH = absolute humidity

# Comfort zones

**Climate Classification  
on Psychrometric Chart**



DBT = dry bulb temperature

