

PRESSURE CONVERSION

As the total pressure of a gas sample changes, all of the partial pressures comprising the total pressure change in the same ratio.

Example 1. (Metric Units)

If frost point = -60°C and system total pressure is 1013 mb (1.033 kg/cm^2), what is the dew point at 21 kg/cm^2 ?

$$\frac{\text{Vapor Pressure at } -60^{\circ}\text{C}}{1.033 \text{ kg/cm}^2} = \frac{\text{Vapor Pressure at New Dew Point}}{21 \text{ kg/cm}^2}$$

$$\text{Vapor Pressure at New Dew Point} = 10.80 \times 10^{-3} \text{ mb} \times \frac{21}{1.033} = .2195 \text{ mb partial pressure}$$

From the Vapor Pressure Tables (over ice), the Frost Point = -35.2°C

Example 2. (English Units)

If frost point = -70°F and system total pressure is 14.7 PSIA, what is the dew point at 70 PSIG (84.7 PSIA)?

$$\frac{\text{Vapor Pressure at } -70^{\circ}\text{F}}{14.7 \text{ PSIA}} = \frac{\text{Vapor Pressure at New Dew Point}}{84.7 \text{ PSIA}}$$

$$\text{Vapor Pressure at New Dew Point} = 4.974 \times 10^{-4} \text{ Hg} \times \frac{84.7}{14.7} = 2.87 \times 10^{-3} \text{ Hg partial pressure}$$

From the Vapor Pressure Tables (over ice), the Frost Point = -44.5°F

DEW POINT/PRESSURE CONVERSION CHART

