

Aim: To determine the Reid vapor pressure of given sample.

Experimental procedure: Take 100 ml of sample precooled to 0 to 5°C and put it in the gasoline chamber, also precooled to 0 to 5°C. Then put some silicon grease on the threads of gasoline chamber and attach it tightly with the air chamber. Put the vapor pressure bomb assembly in the preheated water bath at 40°C. After 5 minutes take out the vapor pressure bomb and turn it upside down for 3 to 4 times. Again put back the bomb in the water bath and after two minutes note down the pressure gauge reading. Now repeat the whole procedure at 43 and 46°C.

Correct the value of the vapor pressure for the change in air pressure and water vapor pressure in the bomb caused by the change in temperature from the initial air temperature to the water bath temperature by applying the following correction factor.

Correction factor
$$\frac{(P_a - P_t)(t - T)}{(273 + t)} - (P_t - P_t)$$

T is the initial air temperature in °C.

t is the temperature at which determination is made, °C.

P_t is vapor pressure of water in psia at t °C.

P_T is the vapor pressure of water in psia at T °C.

P_a is barometric pressure in psia = 14.7 psia

Given vapor pressure of water at

20°C is 0.34 psia
25°C is 0.45 psia
30°C is 0.62 psia
40°C is 1.1 psia
50°C is 1.8 psia

Use interpolation to determine vapor pressure at other temperatures.

Results:

Temperature (°C)	Pressure gauge reading (psia)	Correction factor (psia)	Vapor pressure (psia)

psig = Pounds/in² gauge ✓

psia = Pounds/in² absolute ✓

$$h_{pg} = 76 \text{ cm} \times 13.6 \text{ g/cm}^3 \times 980$$