

Absolute Temperature

518.4 F Abs

Gravity

32.1740 ft per (sec) (sec)

Density

0.07651 lb per cu ft

Values of pressure and temperature are listed in Table 6 for altitudes in the standard atmosphere from -1000 to 50,000 ft above sea level. For further explanation, References 9 and 10 should be consulted.

LETTER SYMBOLS USED IN CHAPTER 3

- μ = degree of saturation (decimal).
- ρ = density of fluid, pounds per cubic foot.
- ϕ = relative humidity (decimal).
- a = ratio of apparent molecular weight of dry air (28.966) to the molecular weight of water (18.016) = 1.6078.
- A = coefficient from Table 5 for use in Equation 30 (obtained from Table 5).
- B = coefficient to be used in Equation 31 (obtained from Table 5).
- C = coefficient for use in Equation 32 (obtained from Table 5).
- f_s = factor accounting for effect of mixing air and water, dimensionless.
- G = flow rate of dry air, pounds per hour.
- G_1 = flow rate of dry air, pounds per minute.
- G_w = rate of evaporation of water, pounds per minute.
- H = enthalpy of the system.
- H = enthalpy of the flowing medium, Btu per pound of dry air.
- h = enthalpy of moist air, Btu per pound of dry air.
- $\bar{h}$ = enthalpy correction term to be added above 150 F, to enthalpy.
- h_a = specific enthalpy of dry air, Btu per pound.
- h_{sa} = $h_a - h_a^*$ = the difference between the enthalpy of moist air at saturation per pound of dry air, and the specific enthalpy of the dry air itself, Btu per pound of dry air.
- h = enthalpy of saturated water vapor, Btu per pound.
- h_s = enthalpy of moist air at saturation per pound of dry air, Btu per pound of dry air.
- h_s^* = enthalpy of moist air at saturation at thermodynamic wet-bulb temperature, Btu per pound of dry air.
- h_w = specific enthalpy of condensed water (liquid or solid) at standard pressure, Btu per pound of water.
- h_w^* = specific enthalpy of water as added at the thermodynamic wet-bulb temperature t^* , Btu per pound of dry air.
- h_{w1} = enthalpy of liquid water, Btu per pound.
- h_{ws} = enthalpy of solid water, Btu per pound.
- KE = average kinetic energy, Btu per pound.
- $\overline{KE}$ = average kinetic energy, Btu per pound.
- L = flow rate of liquid water, pounds per hour.
- m = weight of dry air crossing any duct section, pounds per minute.
- n_a = mols dry air.
- n_s = mols of water vapor at saturation.
- n_w = mols of water vapor.
- P = absolute pressure.
- P_a = atmospheric pressure, inches Hg.

LETTER SYMBOLS (Continued)

- P_o = standard atmospheric pressure by definition 29.921 in. Hg.
- P_s = saturation pressure of pure water at prevailing temperature.
- p = total pressure of a mixture of air and water vapor, pounds per square inch or inches Hg.
- p_a = partial pressure of dry air, pounds per square inch or inches Hg.
- p_s = saturation pressure of pure water vapor, pounds per square inch or inches Hg.
- p_w = partial pressure of water vapor in mixture of air and water vapor, pounds per square inch or inches Hg.
- PE = potential energy, Btu per pound dry air.
- $\overline{PE}$ = average potential energy, Btu per pound dry air.
- Q = total heat added or subtracted, between sections, Btu per minute.
- q = ratio of energy added (or removed) to water added (or removed), Btu per pound. Also called specific enthalpy of water added.
- q_1 = energy added between points 1 and 2.
- q_2 = heat added between sections 1 and 2, Btu per pound dry air.
- R = universal gas constant, 1545 foot-pounds per (Fahrenheit degree) (mol).
- R_a = gas constant for dry air.
- R_w = gas constant for water vapor.
- S = flow rate of solid water, pounds per hour.
- s = entropy of moist air per pound of dry air, Btu per (pound) (Fahrenheit degree).
- $\bar{s}$ = correction to be added to entropy of moist air obtained from Table 2.
- $\bar{s}$ = additional correction to be added to entropy because of "mixing entropy" (obtained from Table 5). Correction to be added to value of s obtained from Table 2.
- s_a = specific entropy of dry air, Btu per (pound) (Fahrenheit degree, absolute).
- s_{sa} = the difference between the entropy of moist air at saturation per pound of dry air, and the specific entropy of the dry air itself, Btu per (pound of dry air) (Fahrenheit degree, absolute).
- s_s = entropy of moist air at saturation per pound of dry air, Btu per (pound of dry air) (Fahrenheit degree, absolute).
- s_w = specific entropy of condensed water (liquid or solid) at standard atmospheric pressure, Btu per (pound of water) (Fahrenheit degree, absolute).
- T = absolute temperature, Fahrenheit degrees.
- T_o = standard atmospheric temperature, by definition 518.4 F absolute.
- t = temperature, Fahrenheit degrees.
- t^* = thermodynamic wet-bulb temperature, Fahrenheit degrees.
- U = internal energy of system.
- U = internal energy.
- V = volume.
- $\bar{V}$ = average velocity, feet per minute.
- v = volume of moist air per pound of dry air, cubic feet per pound.
- $\bar{v}$ = correction to be added to volume of moist air per pound of dry air, above 150 F.
- v_a = specific volume of dry air, cubic feet per pound.