

Absolute Temperature
Gravity
Density

518.4 F Abs
32.1740 ft per (sec) (sec)
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).
 α = 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_a = 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_{a_s} = $h_a - h_a$ = 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_a = enthalpy of moist air at saturation per pound of dry air, Btu per pound of dry air.
 h_a^* = enthalpy of moist air at saturation at *thermodynamic wet-bulb temperature*, t^* Btu per pound of dry air.
 h_w = specific enthalpy of condensed water (liquid or solid) at standard pressure, Btu per pound water.
 h_w^* = specific enthalpy of water as added at the *thermodynamic wet-bulb temperature* t^* , Btu per pound of dry air.
 $h_{w,l}$ = enthalpy of liquid water, Btu per pound.
 $h_{w,s}$ = 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.
 $\bar{n}_a$ = 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*.
 iq_1 = energy added between points 1 and 2.
 iq_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_{a_s} = 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_a = 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.