The ASHRAE Library of Humid Air Psychrometric & Transport Property Functions

For Real Moist Air, Dry Air, Steam, and Ice

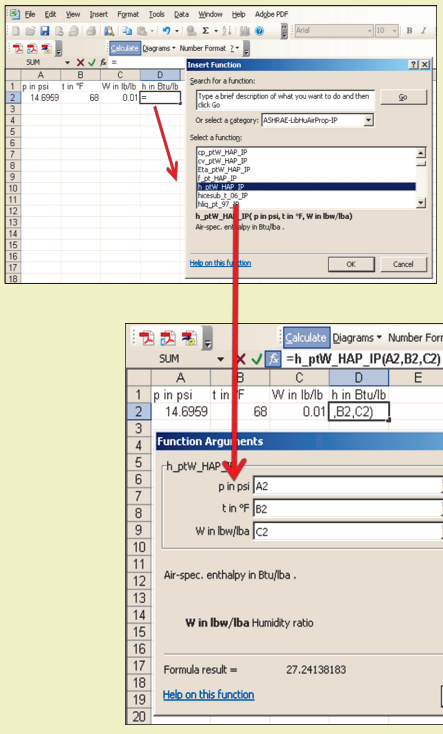
60 Functions In Both I-P & SI Units!

Accurate

- '**Real**' Versus '**Ideal**' Air
- Update of the ASHRAE Hyland-Wexler and Nelson-Sauer Models
- Properties of Liquid and Ice Fog Can Be Calculated
- All Latest IAPWS Standards and NIST Reference Equations Are Used
- Wide Range of Validity
  - Pressure: 0.01 ≤ ***P*** ≤ 10,000 kPa
  - Temperature: -143.15 ≤ ***t*** ≤ 350 °C
  - Humidity Ratio: 0 ≤ ***W*** ≤ 10 kg_w/kg_a

Easy to Use!

Works *within* Microsoft Excel®



Minimum System Requirements:

Intel® Pentium® III Processor • Microsoft Windows® 2000/XP/Vista/7 • 256 MB of RAM • Microsoft Excel® • 100 MB of hard disk space.

Powerful and Flexible

Thermodynamic Properties

$c = f(p,t,W)$	Speed of sound
$c_p = f(p,t,W)$	Specific isobaric heat capacity
$c_v = f(p,t,W)$	Specific isochoric heat capacity
$h = f(p,t,W)$	Air-specific enthalpy
$\kappa = f(p,t,W)$	Isentropic exponent
$p_{H2O} = f(p,t,W)$	Partial pressure of water vapor in moist air
$p_{H2Os} = f(p,t)$	Partial saturation pressure of water vapor
$\rho = f(p,t,W)$	Density
$s = f(p,t,W)$	Air-specific entropy
$u = f(p,t,W)$	Air-specific internal energy
$v = f(p,t,W)$	Air-specific volume
$Z = f(p,t,W)$	Compressibility factor (decimal ratio)

Transport Properties

$a = f(p,t,W)$	Thermal diffusivity
$\eta = f(p,t,W)$	Dynamic viscosity
$\lambda = f(p,t,W)$	Thermal conductivity
$\nu = f(p,t,W)$	Kinematic viscosity
$Pr = f(p,t,W)$	PRANDTL number

Water Content Functions

$\varphi = f(p,t,W)$	Relative humidity (decimal ratio)
$W = f(p,t,p_{H2O})$	Humidity ratio from total pressure, temperature, and partial pressure of water vapor
$W = f(p,t,\varphi)$	Humidity ratio from total pressure, temperature, and relative humidity

Saturation Properties

$f = f(p,t)$	Saturation pressure enhancement factor of water (decimal ratio)
$t_d = f(p,W)$	Dew-point temperature
$t_{wb} = f(p,t,W)$	Wet-bulb temperature
$W = f(p,t_d)$	Humidity ratio from total pressure and dew-point temperature
$W = f(p,t,t_{wb})$	Humidity ratio from total pressure, (dry bulb) temperature and wet-bulb temperature
$W_s = f(p,t)$	Saturation humidity ratio
$t = f(p,t_{wb},W)$	Backward function: temperature from total pressure, wet-bulb temperature and humidity ratio
$t_s = f(p,p_{H2O})$	Backward function: saturation temperature of water vapor from total pressure and partial pressure of water vapor

Backward Functions

$t = f(p,h,\varphi)$	Backward function: temperature from total pressure, air-specific enthalpy and relative humidity
$t = f(p,h,W)$	Backward function: temperature from total pressure, air-specific enthalpy and humidity ratio
$t = f(p,s,W)$	Backward function: temperature from total pressure, air-specific entropy and humidity ratio

Special Introductory Price: $179 (ASHRAE Members: $149)

To Order This Downloadable Product, Visit: WWW.ASHRAE.ORG/BOOKSTORE

Kretzschmar Consulting Engineers
www.kretzschmar-consulting-engineers.com
Hans-Joachim Kretzschmar
E-mail: info@kretzschmar-consulting-engineers.com
Phone: +49 -172-7914607