

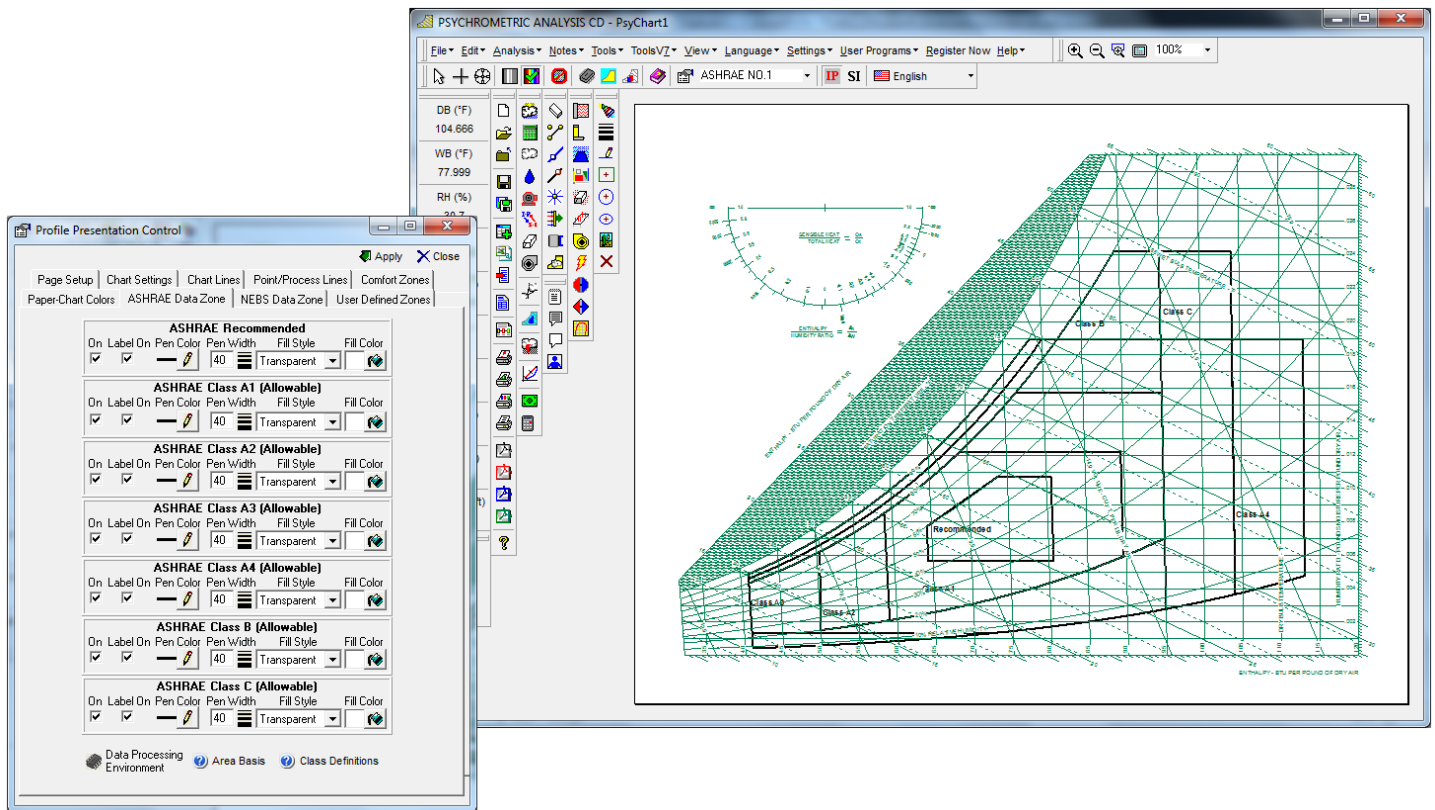


PROGRAM FEATURES

NEW VERSION 7 FEATURES!

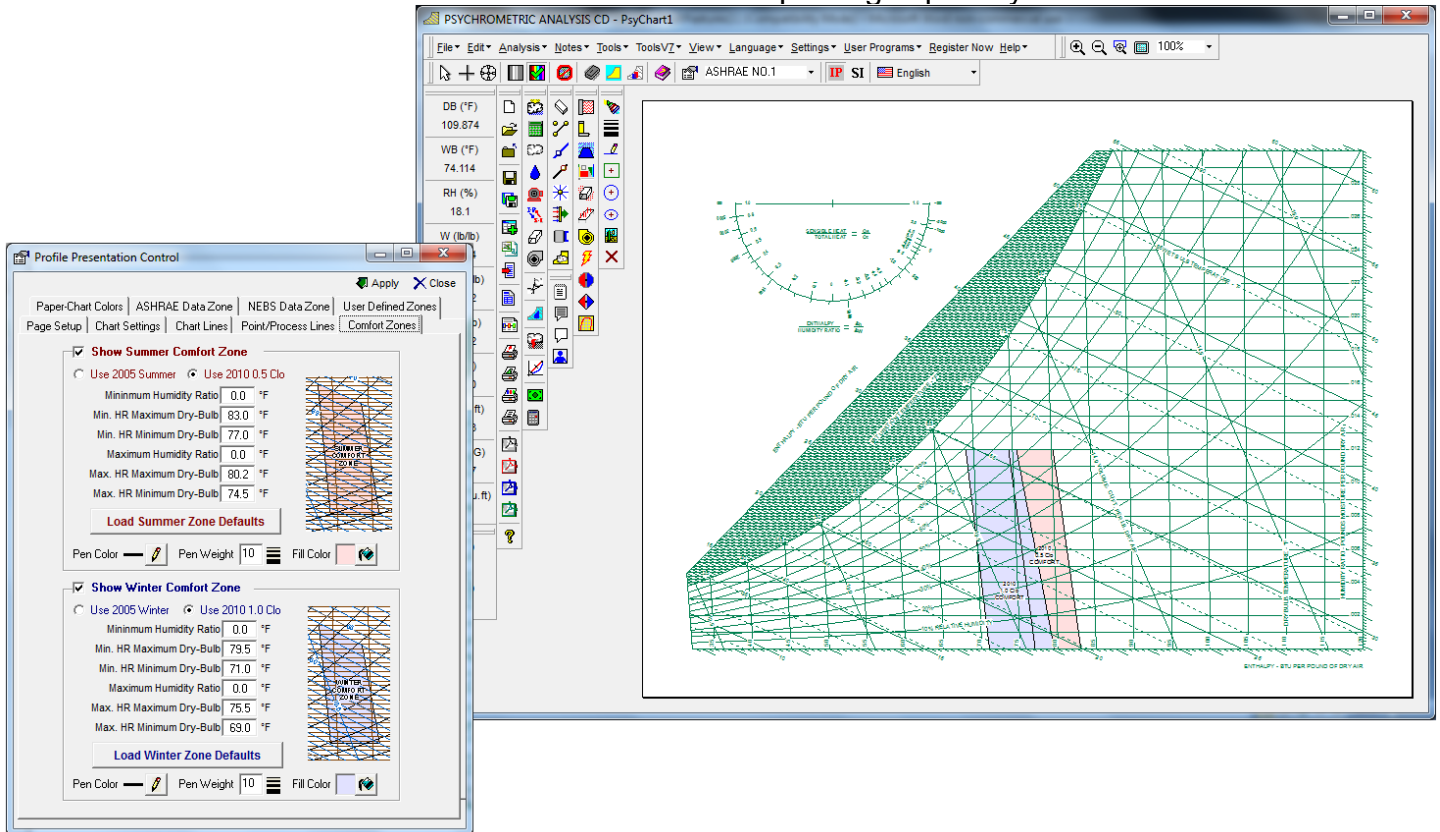
NEW!! Updated ASHRAE Datacenter Zones to 2011 Thermal Guidelines!!

Now with ASHRAE Class A1, Class A2, Class A3, Class A4, Class B & Class C!



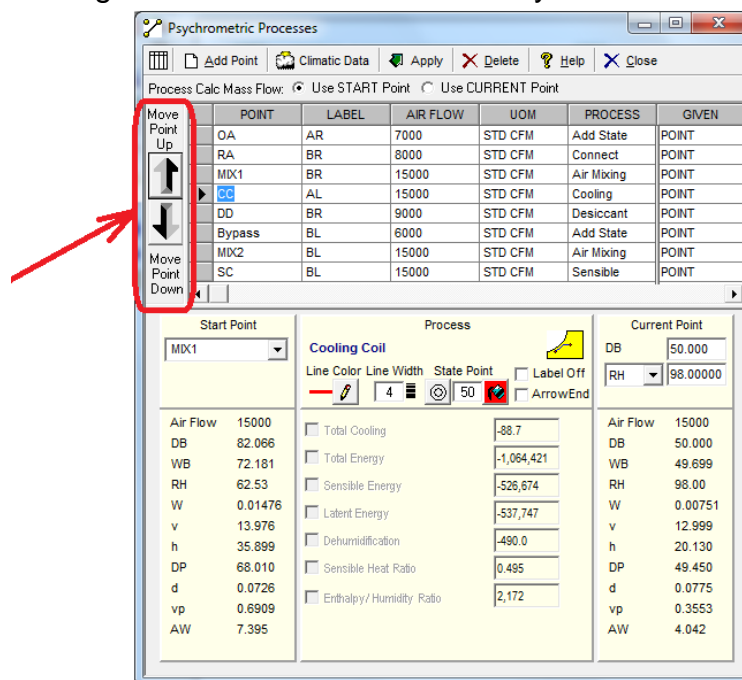
NEW !! Updated ASHRAE 2010 Comfort Zones!!

Now with the new ASHRAE 2010 Comfort Zone plotting capability!!



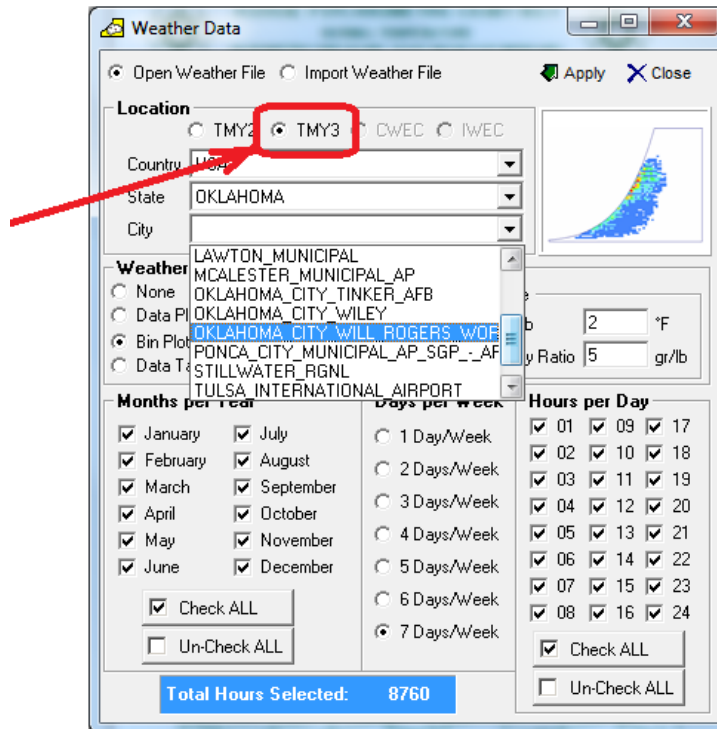
NEW !! Re-arrange or Re-order Points on the Fly with One Button Click!!

Now You Can Re-arrange or Re-order Points on the Fly with One Button Click!!



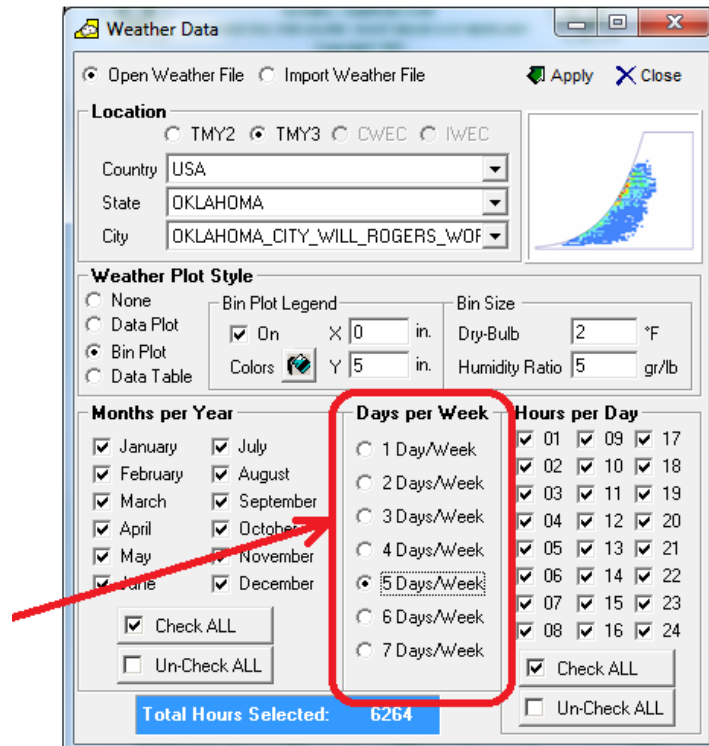
NEW !! TMY2 & TMY3 Bin Weather USA Locations Added!!

TMY2 & TMY3 Bin Weather USA Locations Added!!



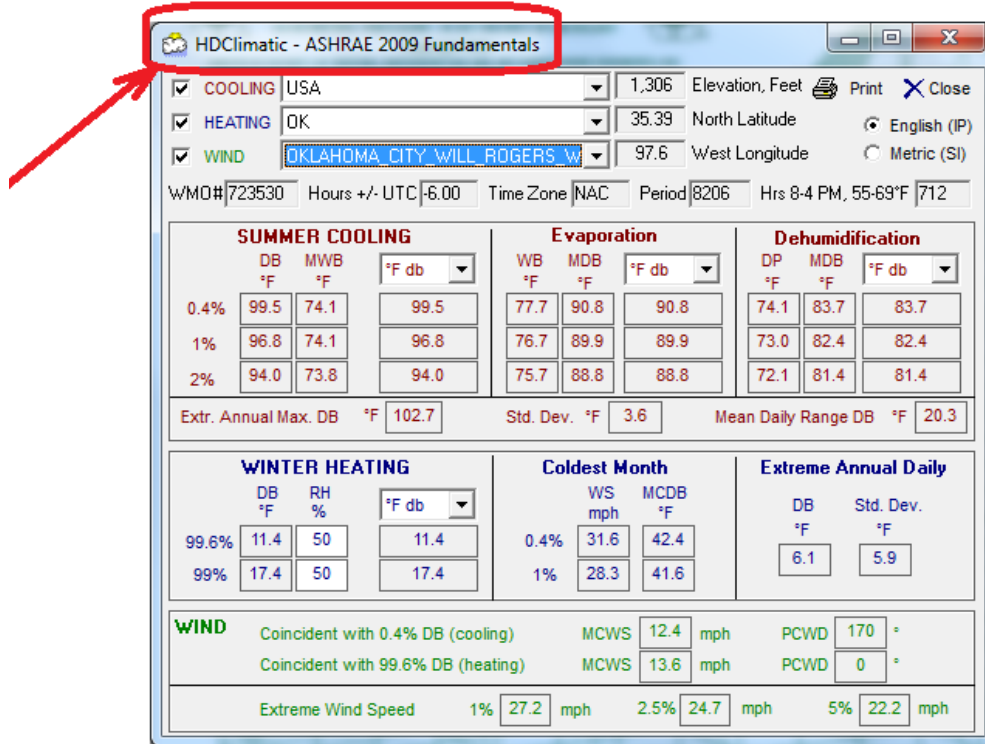
NEW !! Ability to Select Days Per Week for Bin Weather Data & Plots!!

Ability to Select Days Per Week for Bin Weather Data & Plots!!



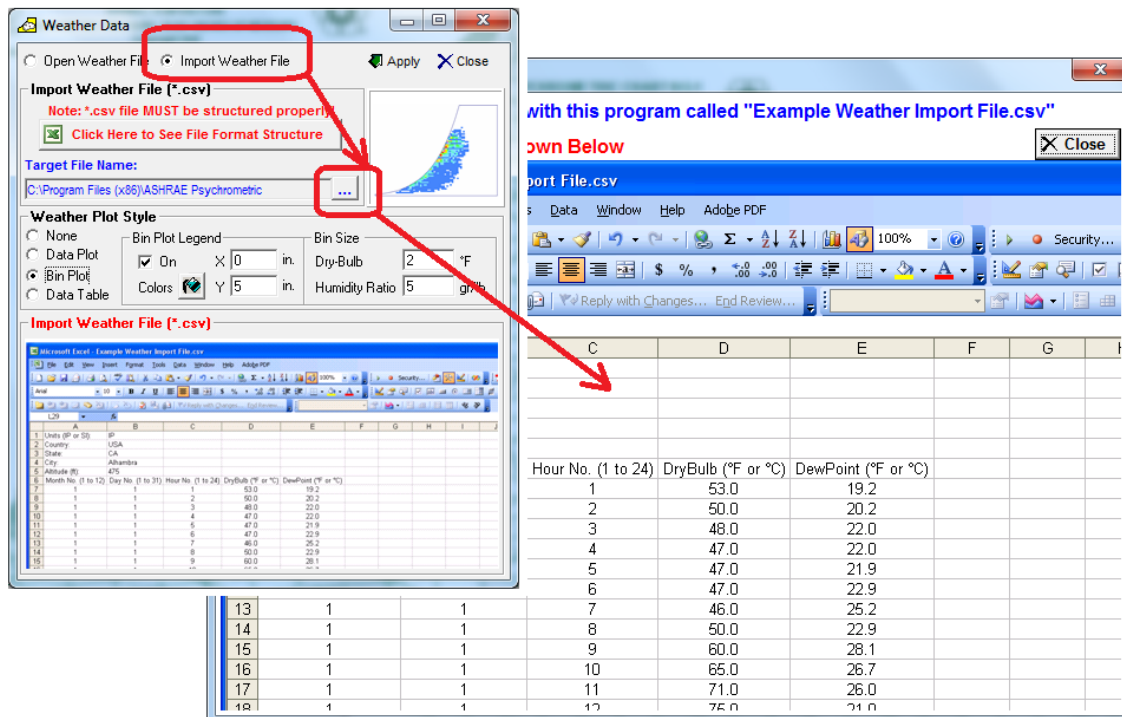
NEW !! World-Wide Climatic Data Updated to 2009 ASHRAE Fundamentals!!

World-Wide Climatic Data Updated to 2009 ASHRAE Fundamentals!!



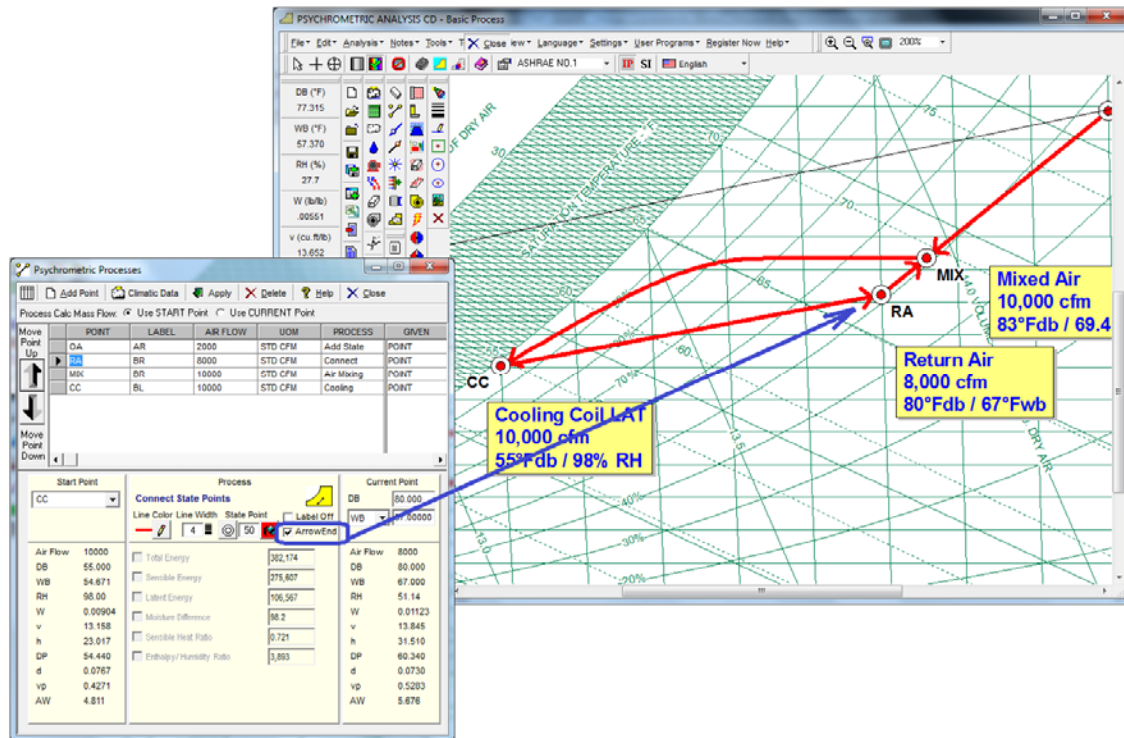
NEW !! Import Your Own Weather Data File Locations into the Chart!!

Import Your Own Weather Data File Locations into the Chart!!



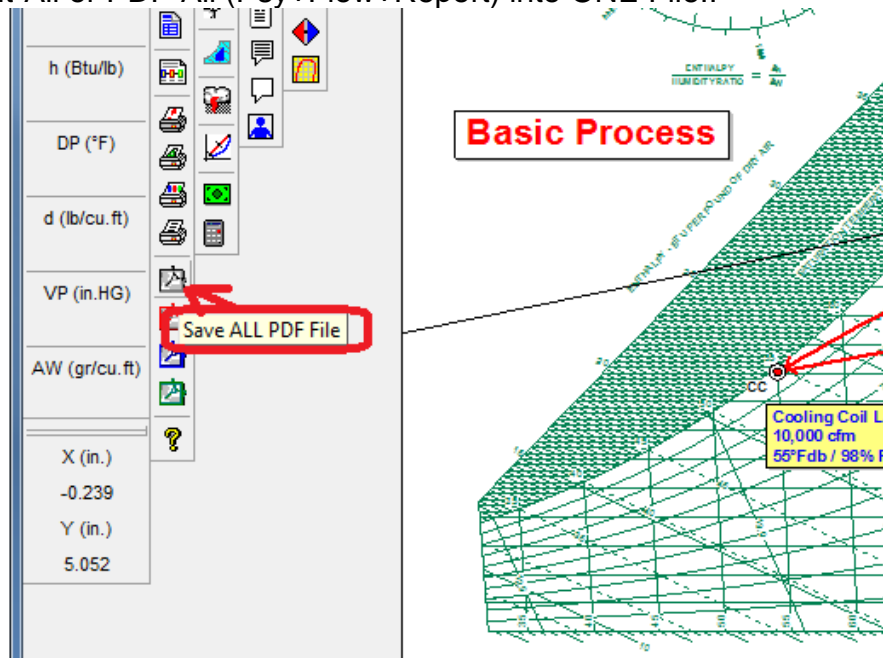
NEW !! Optional Process Directional Arrowheads on Process Lines!!

Optional Process Directional Arrowheads on Process Lines!!



NEW !! Ability to Print-All or PDF-All (Psy+Flow+Report) into ONE File!!

Ability to Print-All or PDF-All (Psy+Flow+Report) into ONE File!!

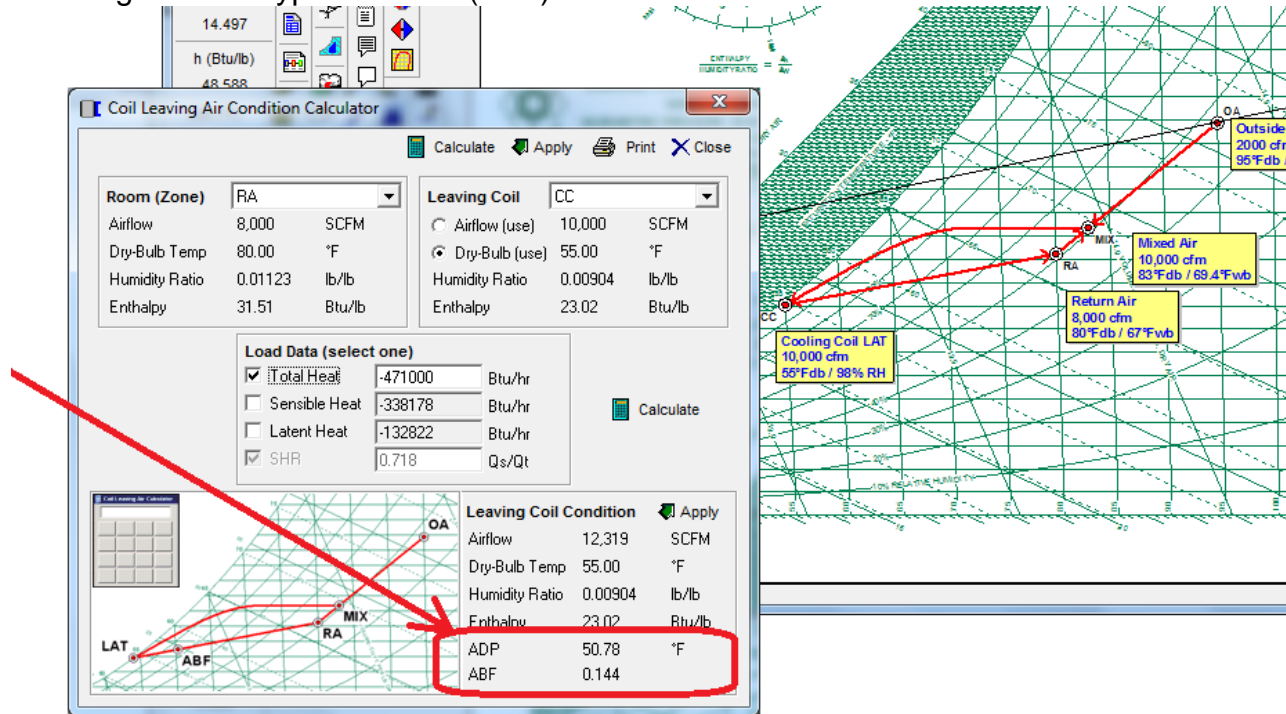


NEW !! Cooling Coil Apparatus Dew Point (ADP) Calculator!!

Cooling Coil Apparatus Dew Point (ADP) Calculator!!

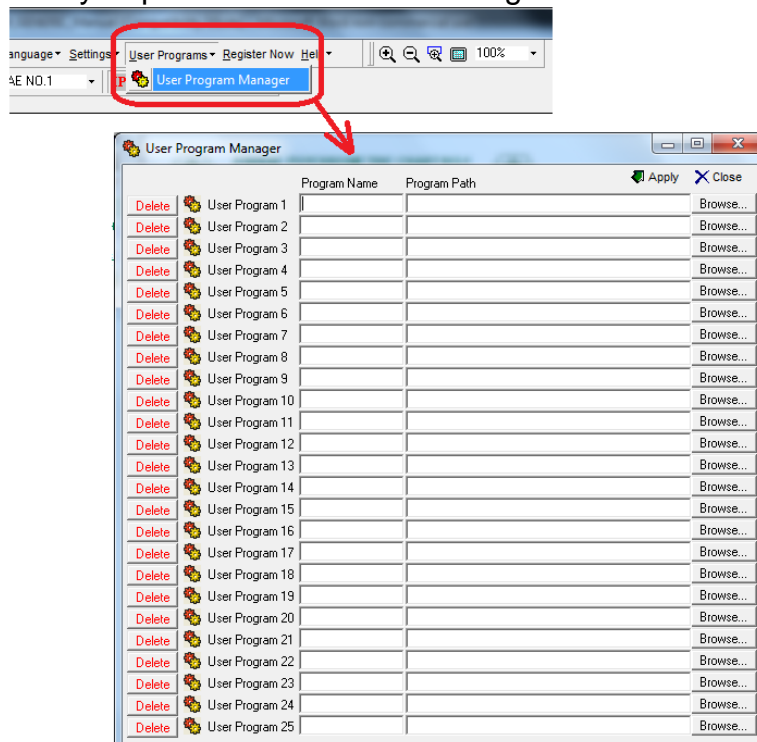
NEW !! Cooling Coil Air Bypass Factor (ABF) Calculator!!

Cooling Coil Air Bypass Factor (ABF) Calculator!!



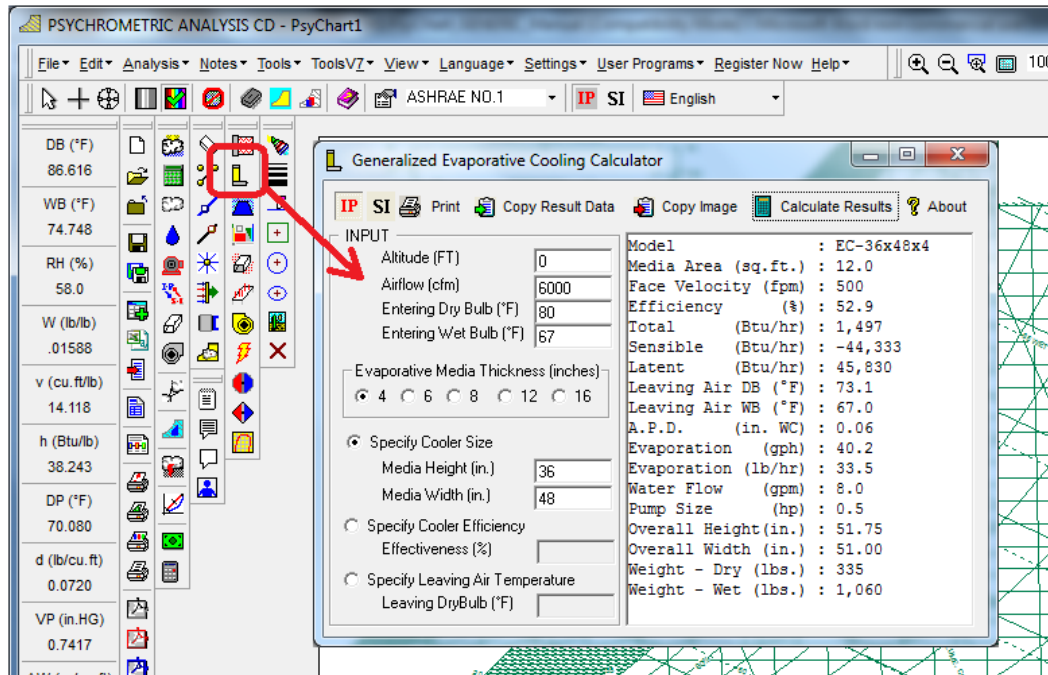
NEW !! User Program Quantity Expanded from 15 to 25 Programs!!

User Program Quantity Expanded from 15 to 25 Programs!!



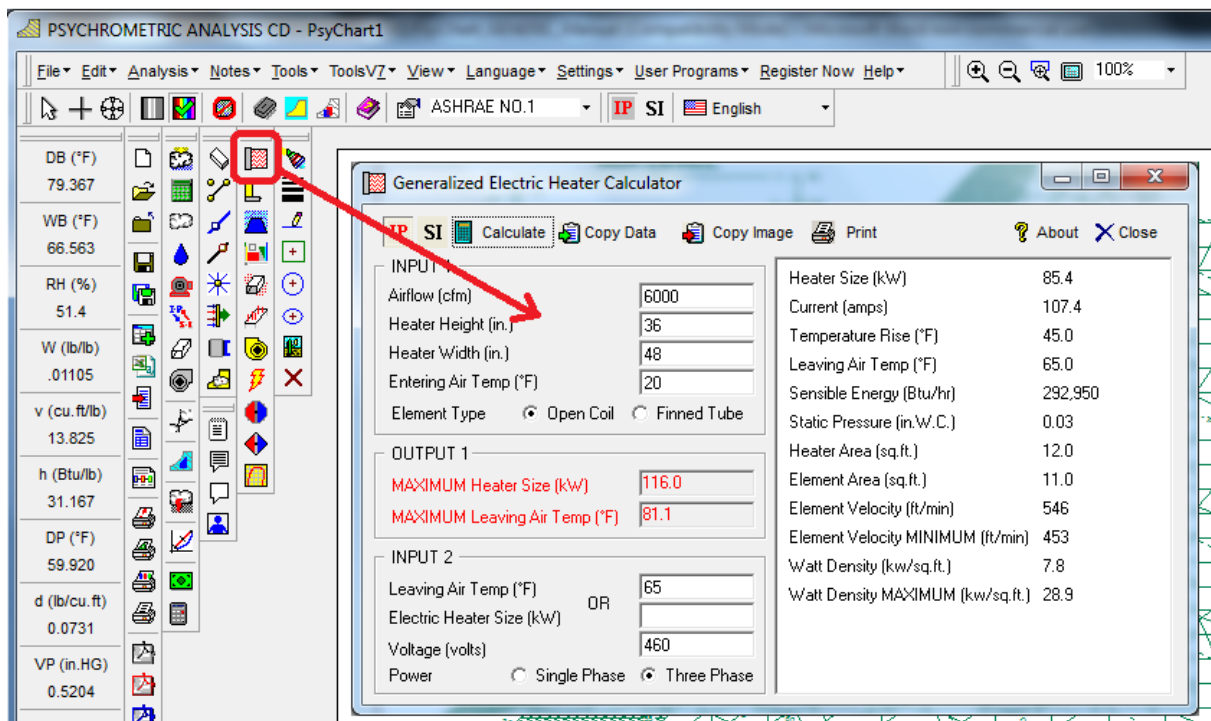
NEW !! Evaporative Cooling Detailed Performance Calculator!!

Evaporative Cooling Detailed Performance Calculator!!



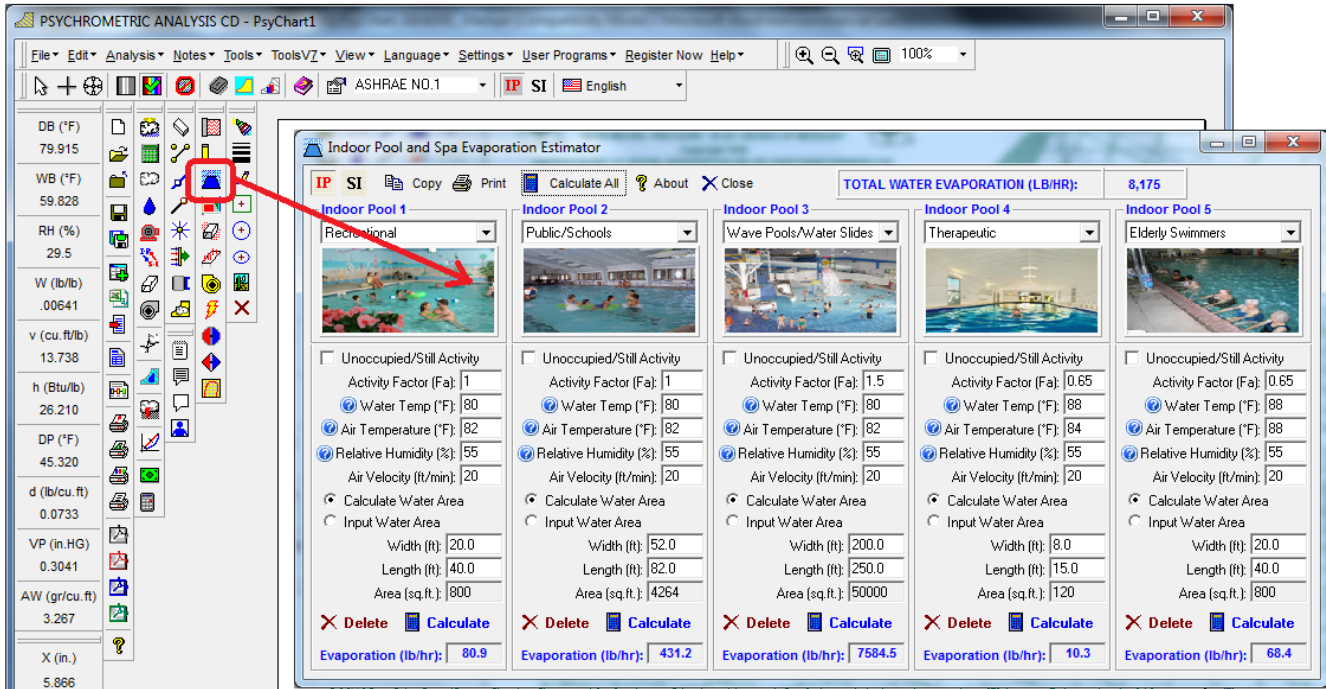
NEW !! Electric Heater Detailed Performance Calculator!!

Electric Heater Detailed Performance Calculator!!



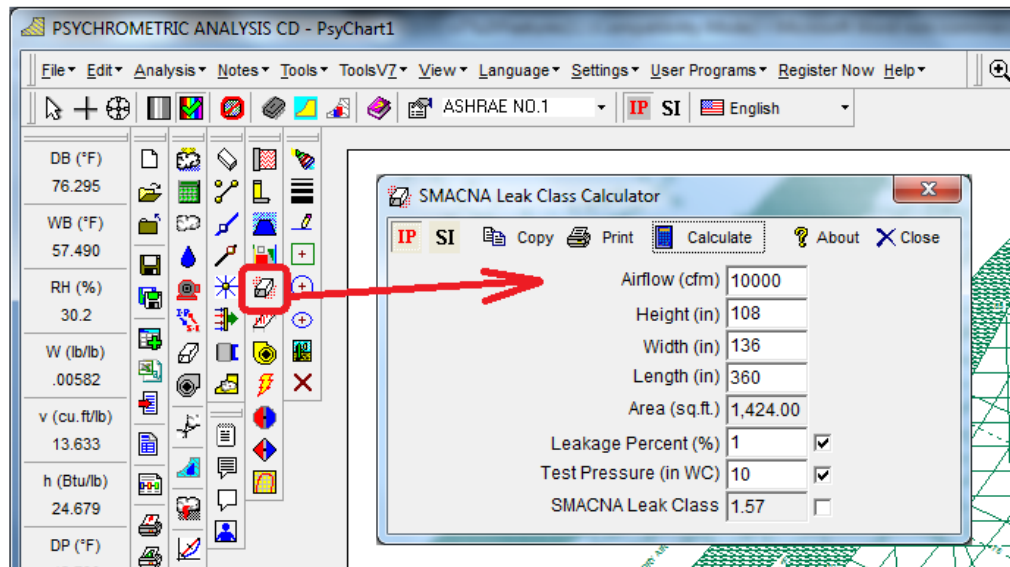
NEW !! Indoor Pool & Spa Evaporation Calculator!!

Indoor Pool & Spa Evaporation Calculator!!



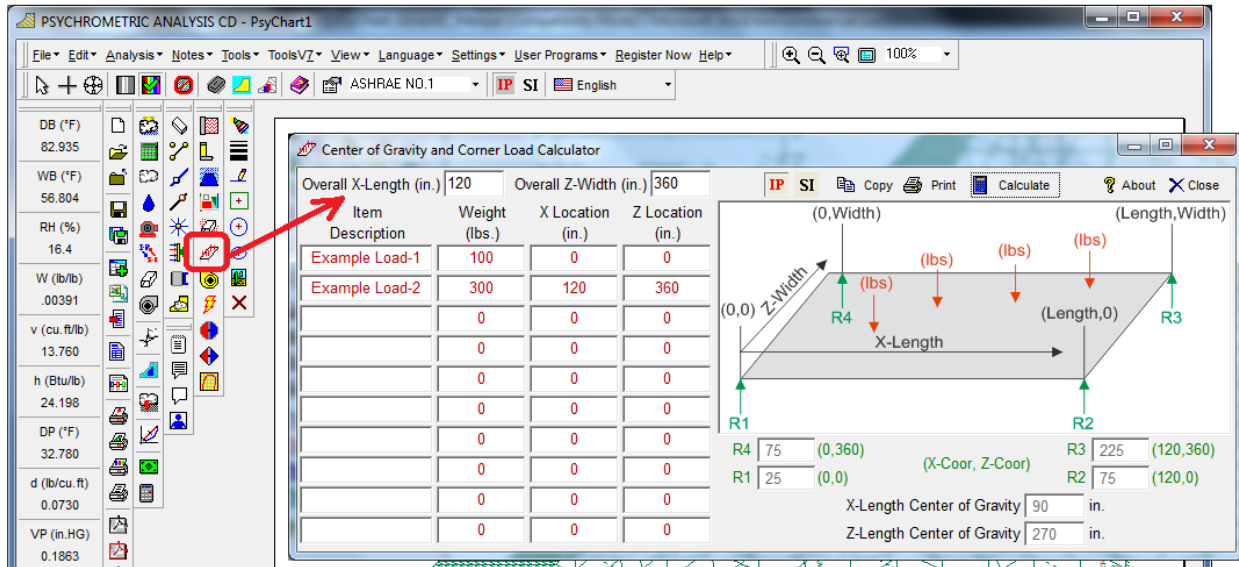
NEW !! SMACNA Air Leak Class Calculator!!

SMACNA Air Leak Class Calculator!!



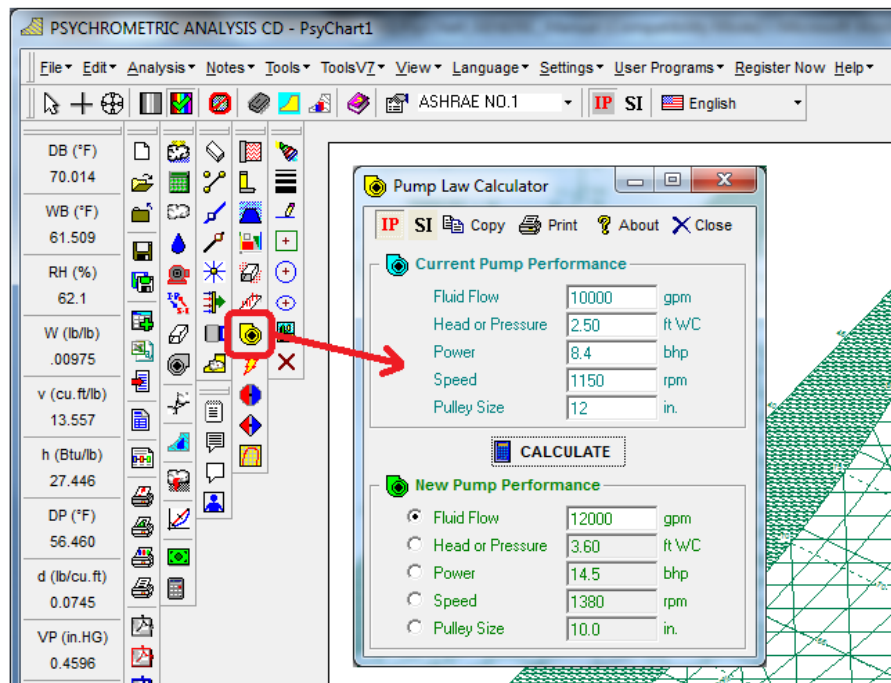
NEW !! Center of Gravity - Corner Load Calculator!!

Center of Gravity - Corner Load Calculator!!



NEW !! Pump Law Calculator!!

Pump Law Calculator!!



NEW !! Complete Inter-Active Element Periodic Chart!!

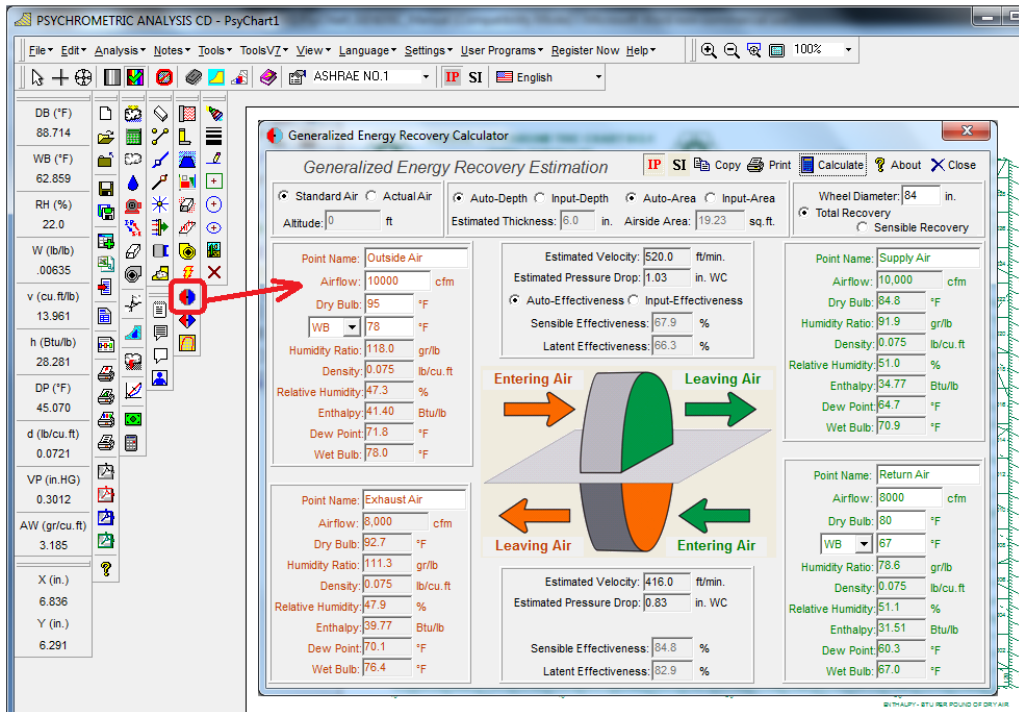
Complete Inter-Active Element Periodic Chart!!

NEW !! System Efficiency COP-EER-kW/ton Calculator!!

System Efficiency COP-EER-kW/ton Calculator!!

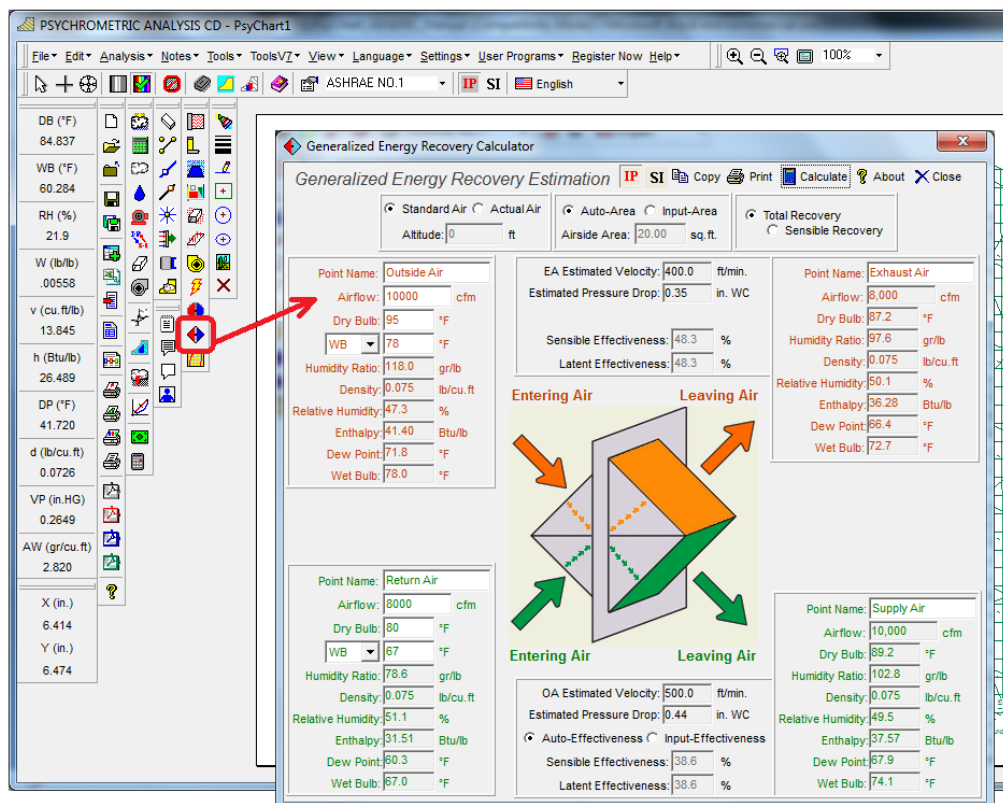
NEW !! Total & Sensible Wheel Energy Recovery Performance Calculator!!

Total & Sensible Wheel Energy Recovery Performance Calculator!!



NEW !! Plate Heat Exchanger Energy Recovery Performance Calculator!!

Plate Heat Exchanger Energy Recovery Performance Calculator!!



NEW !! Fluid & Mixture Thermo-Physical Property Calculator!!

Fluid & Mixture Thermo-Physical Property Calculator!!

PSYCHROMETRIC ANALYSIS CD - PsyChart1

File Edit Analysis Notes Tools ToolsVZ View Language Settings User Programs Register Now Help

ASHRAE NO.1 IP SI English

DB (°F) 80.285
WB (°F) 59.675
RH (%) 28.4
W (lb/lb) .00623
v (cu. ft/lb) 13.743
h (Btu/lb) 26.104
DP (°F) 44.580
d (lb/cu. ft) 0.0732
VP (in. HG) 0.2957
AW (gr/cu. ft) 3.175
X (in.)

NIST Fluid Properties

Fluid Name: **Ammonia**
Temperature: 300 °F
Pressure: 10 psia

Calculate

Density: 0.020930 lbm/cu.ft
Enthalpy: 845.94 BTU/lbm
Entropy: 1.9203 BTU/lbm·R
Cv: 0.43648 BTU/lbm·R
Cp: 0.55437 BTU/lbm·R
Cp/Cv: 1.2701
Critical Point: 270.05 °F
Triple Point: -107.78 °F
Quality: Superheated lbm/lbm
Thermal Conduct: 0.023415 BTU/h-ft·F
Viscosity: 0.0000099661 lbm/ft-s
Volume: 47.778 cu.ft/lbm
Int. Energy: 757.47 BTU/lbm
Sound Speed: 1675.1 ft/s

Ammonia R23 RC318 R405A R414B
Argon R32 R227ea R406A R416A
Butane R41 R236ea R407A R417A
Carbon dioxide R113 R236fa R407B R500
Ethane R114 R245ca R407C R501
Isobutene R115 R245fa R407D R502
Methane R116 Water R407E R503
Nitrogen R123 Air R408A R504
Oxygen R124 R401A R409A R507A
Propane R125 R401B R409B R508A
Propylene R134a R401C R410A R508B
R11 R141b R402A R410B R509A
R12 R142b R402B R411A
R13 R143a R403A R411B
R14 R152a R403B R412A
R22 R218 R404A R413A

NEW !! Rectangle & Round Duct Fittings added to HDDuctDesigner!!

Rectangle & Round Duct Fittings added to HDDuctDesigner!!

PSYCHROMETRIC ANALYSIS CD - PsyChart1

File Edit Analysis Notes Tools ToolsVZ View Language Settings User Programs Register Now Help

ASHRAE NO.1 IP SI English

Duct Design Tool

Air Condition: Airflow 2000 cfm
STD Air ACTUAL Air
Density 0.0750 lb/cu.ft

Duct Material: Uncoated Carbon Steel, Clean
Roughness Factor 0.00015 ft

Rectangular Duct
Side 1 12 in. Side 2 12 in. Duct Length 100 ft
Equal Diameter 13.1 in. Area 1.0 sq.ft. Velocity 2000 ft/min
Velocity Pressure 0.25 in.WC
Static Pressure 0.415 in.WC/100ft Total Static Pressure 0.41 in.WC

Round Duct
Diameter 12 in. Duct Length 100 ft
Area 0.8 sq.ft. Velocity 2546 ft/min
Velocity Pressure 0.40 in.WC
Pressure Drop 0.638 in.WC/100ft Total Pressure Drop 0.64 in.WC

Oval Duct
Side 1 12 in. Side 2 12 in. Duct Length 100 ft
Equal Diameter 12.0 in. Area 0.8 sq.ft. Velocity 2546 ft/min
Velocity Pressure 0.40 in.WC
Pressure Drop 0.638 in.WC/100ft Total Pressure Drop 0.64 in.WC

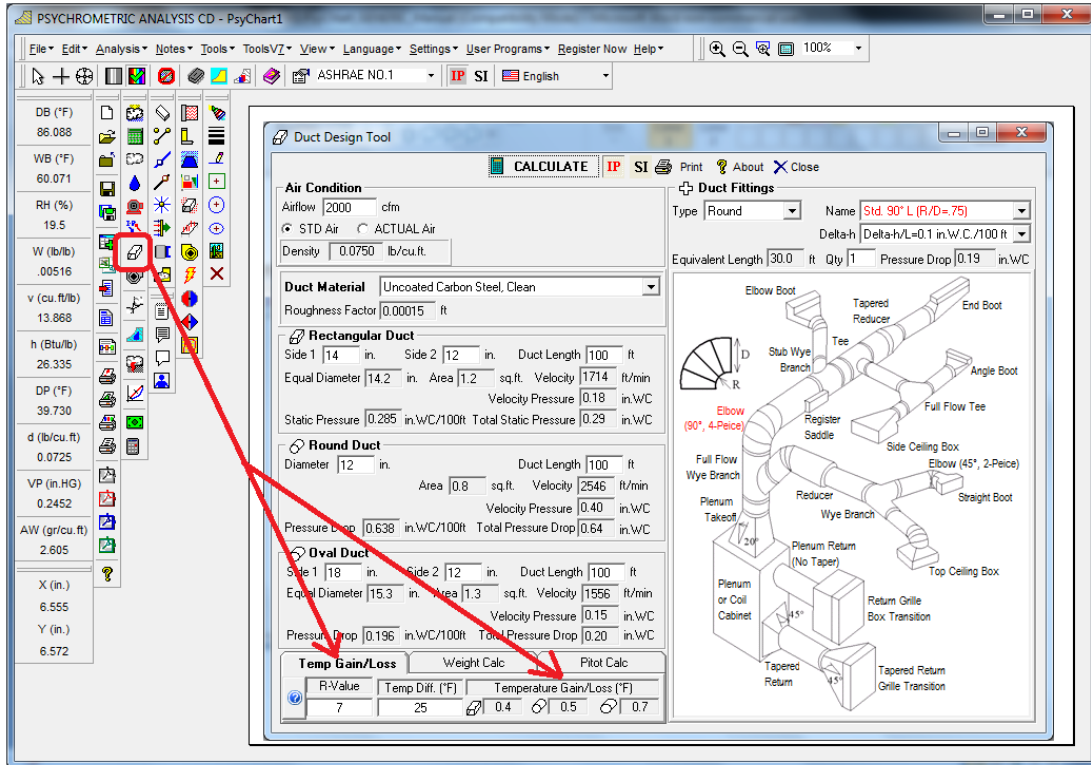
Temp Gain/Loss Weight Calc Pitot Calc

Duct Fittings
Type: Round Name: Std. 90° L (R/D=75)
Delta-h: Delta-h/L=0.1 in.W.C./100 ft
Equivalent Length 30.0 ft Qty 1 Pressure Drop 0.19 in.WC

Elbow Boot Tapered Reducer End Boot
Stub Wye Branch Tee Angle Boot
Register Saddle Full Flow Tee
Side Ceiling Box Elbow (45°, 2-Piece)
Straight Boot
Plenum Takeoff Wye Branch
Plenum Return (No Taper) Top Ceiling Box
Plenum or Coil Cabinet Tapered Return
Return Grille Box Transition
Tapered Return Grille Transition

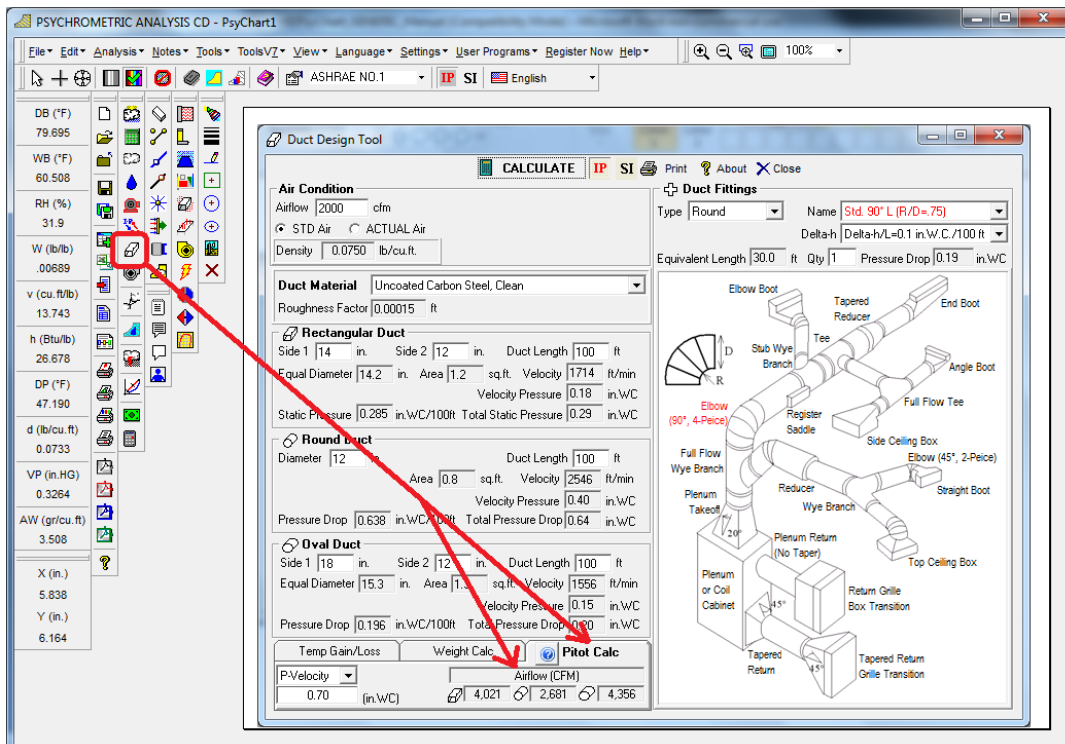
NEW !! Duct Temp Gain/Loss Calculator added to HDDuctDesigner!!

Duct Temp Gain/Loss Calculator added to HDDuctDesigner!!



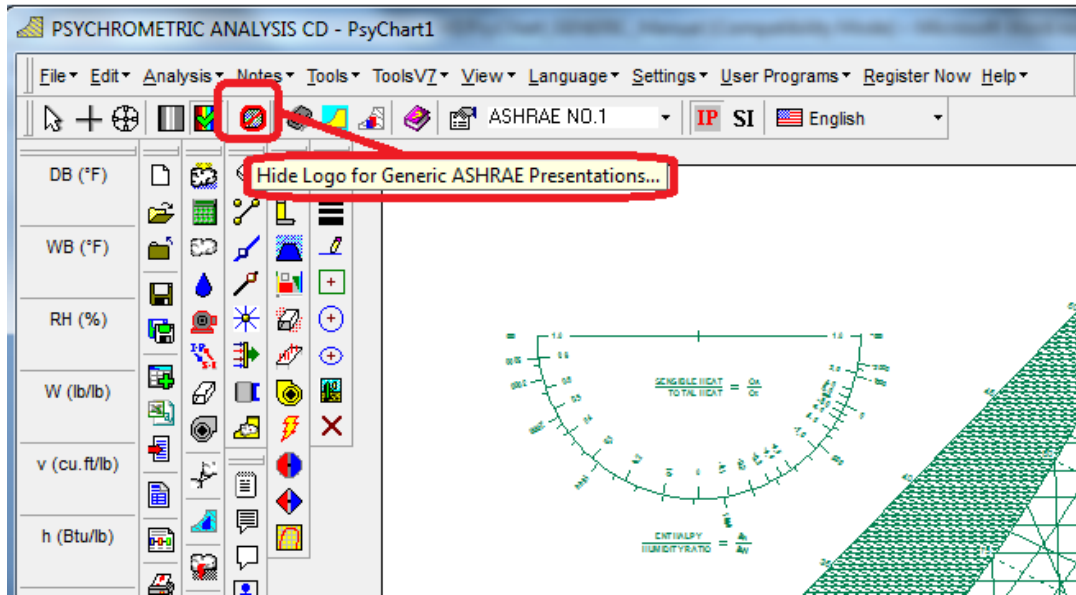
NEW !! Duct Pitot Airflow Calculator added to HDDuctDesigner!!

Duct Pitot Airflow Calculator added to HDDuctDesigner!!



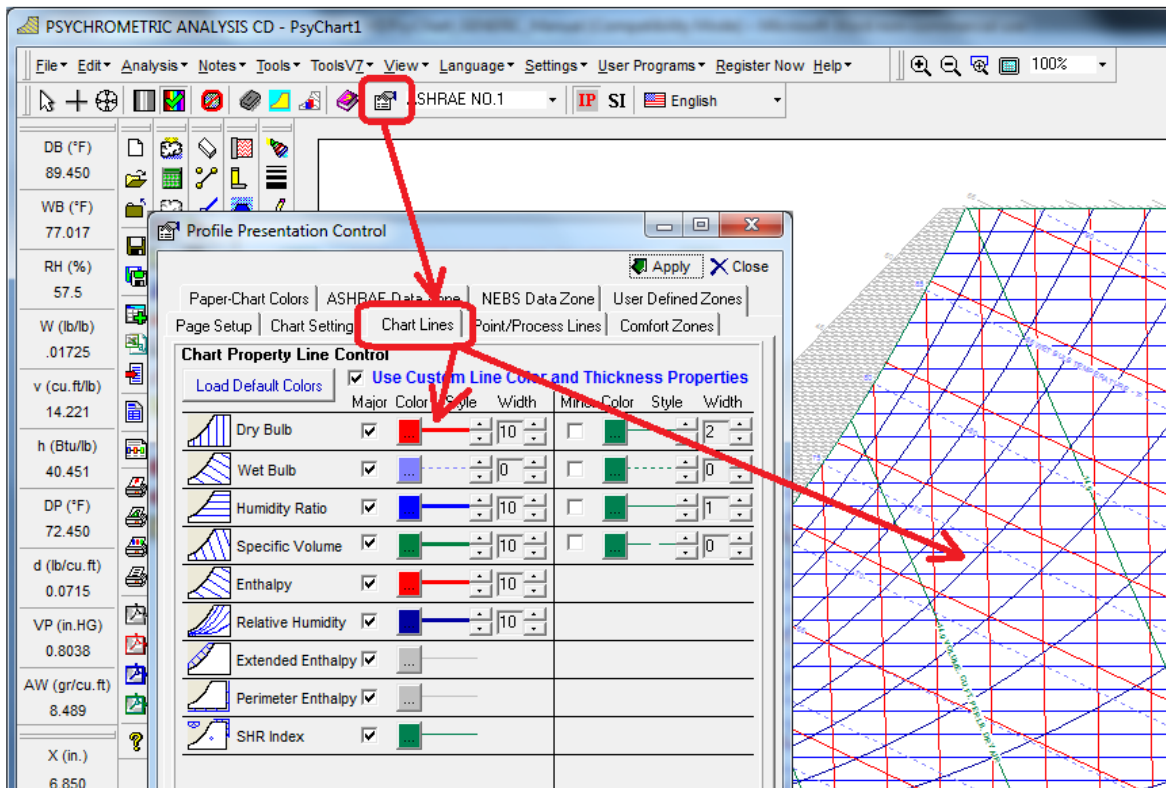
NEW !! Ability to Turn Logo On & Off, for ASHRAE Meeting “Generic” Presentations!!

Ability to Turn Logo On & Off, for ASHRAE Meeting “Generic” Presentations!!



NEW !! Customize Psychrometric Charts with your own Colors!!

Customize Psychrometric Charts with your own Colors!!



NEW !! Change Any Chart Property Lines to Any COLOR You Choose!!

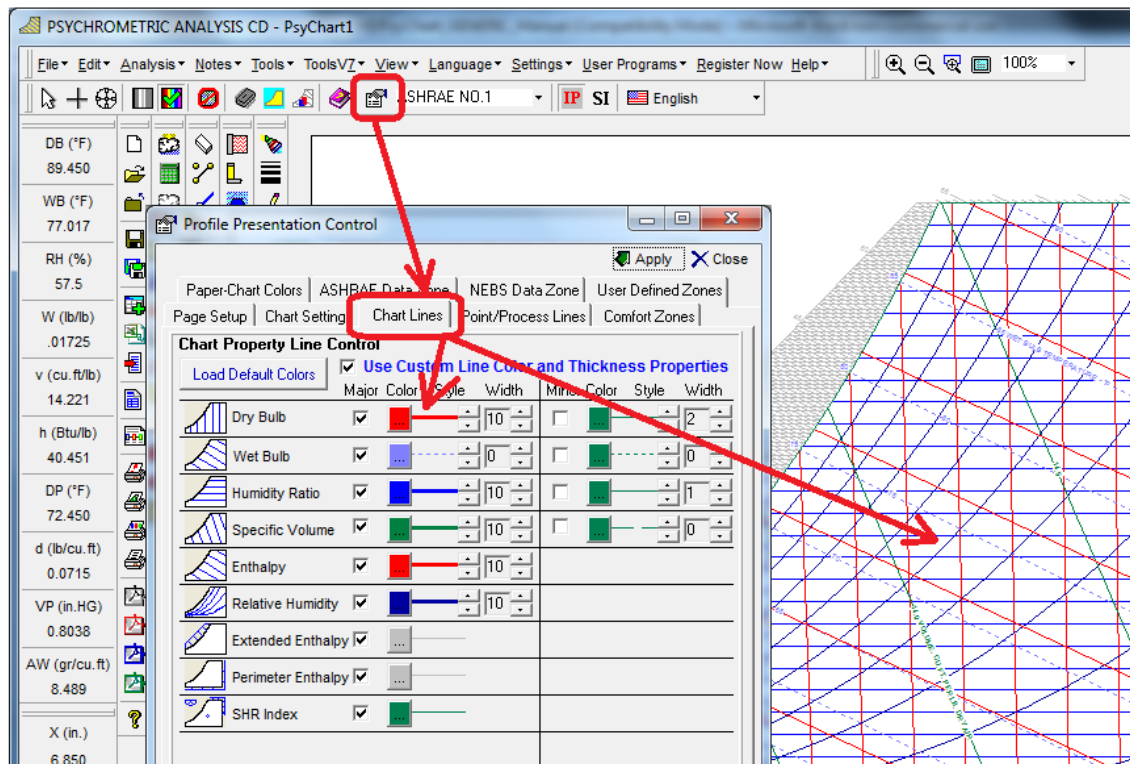
Change Any Chart Property Lines to Any COLOR You Choose!!

NEW !! Change Any Chart Property Lines to Any LINE TYPE You Choose!!

Change Any Chart Property Lines to Any LINE TYPE You Choose!!

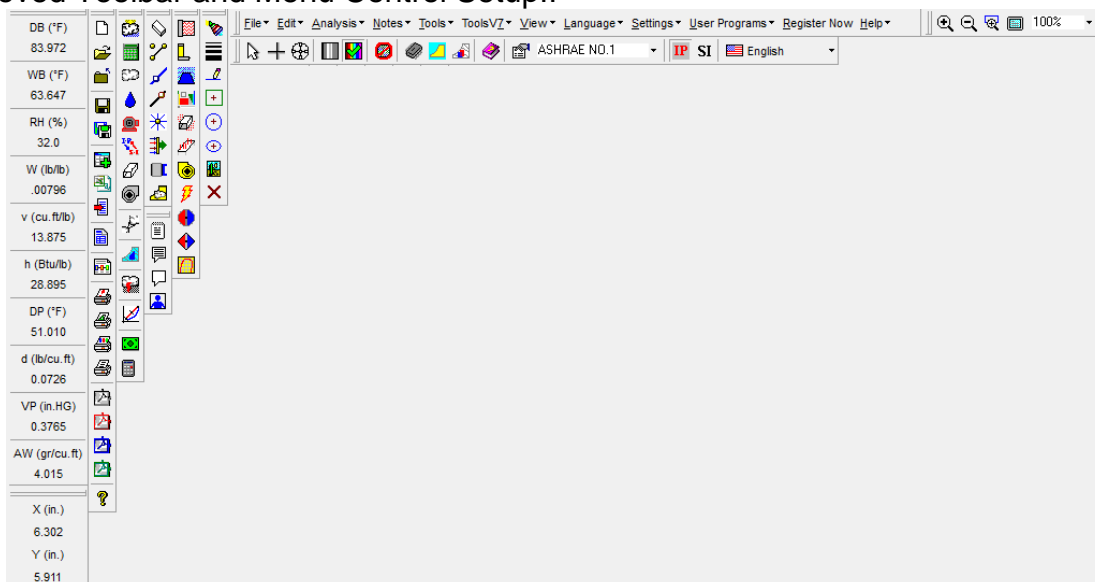
NEW !! Change Any Chart Property Lines to Any LINE THICKNESS You Choose!!

Change Any Chart Property Lines to Any LINE THICKNESS You Choose!!



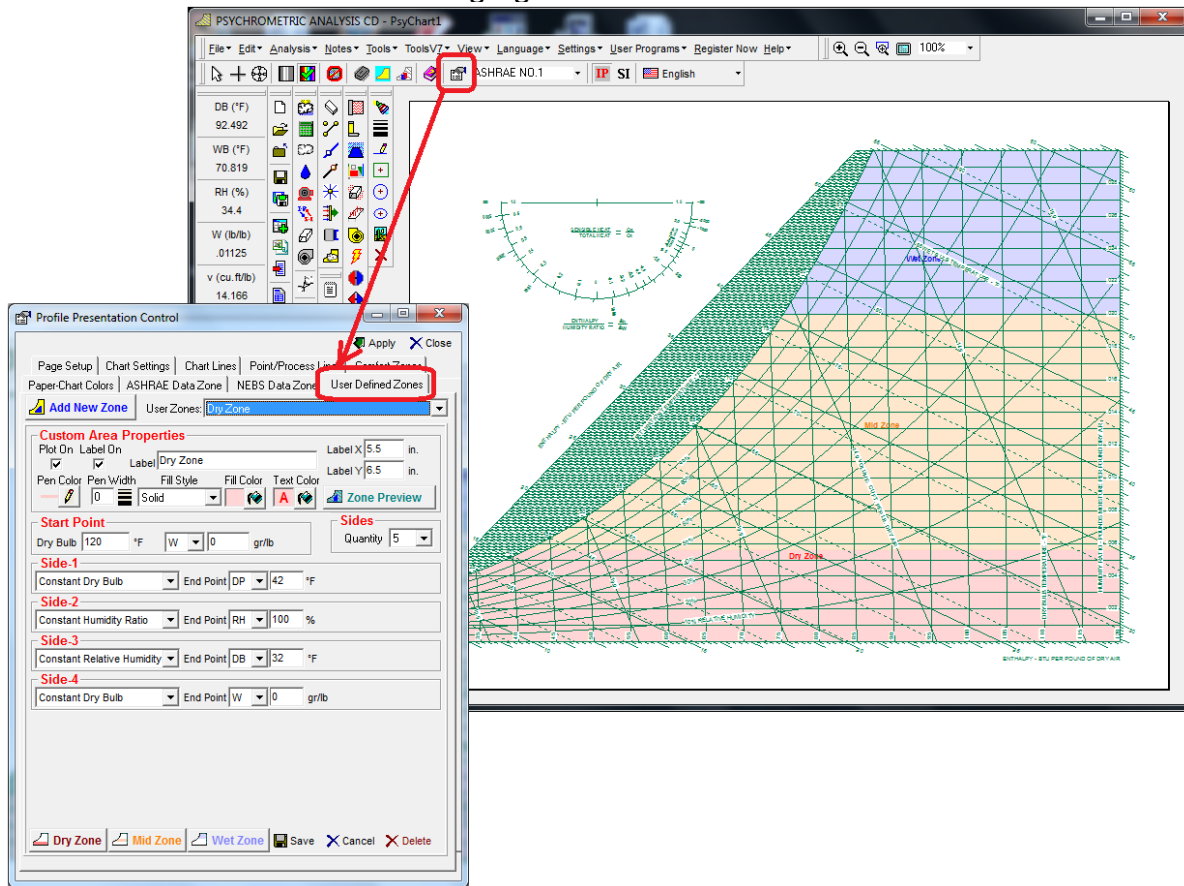
NEW !! Improved Toolbar and Menu Control Setup!!

Improved Toolbar and Menu Control Setup!!



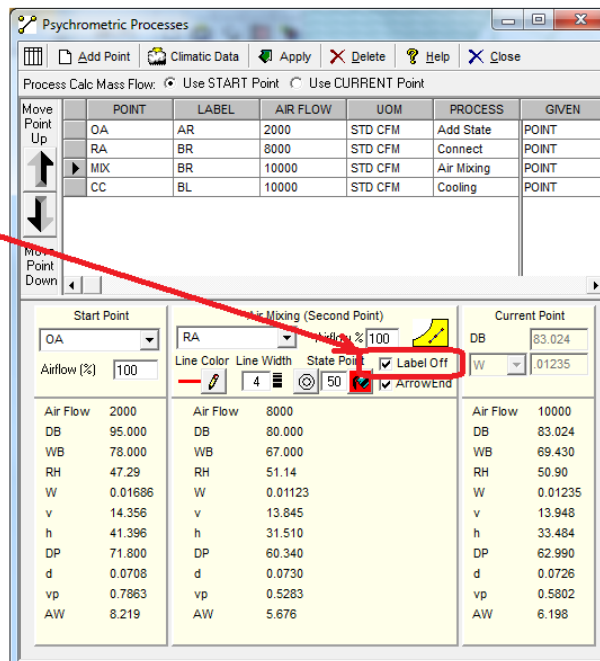
NEW !! User-Defined Custom Area Shading right on the Chart!!

User-Defined Custom Area Shading right on the Chart!!



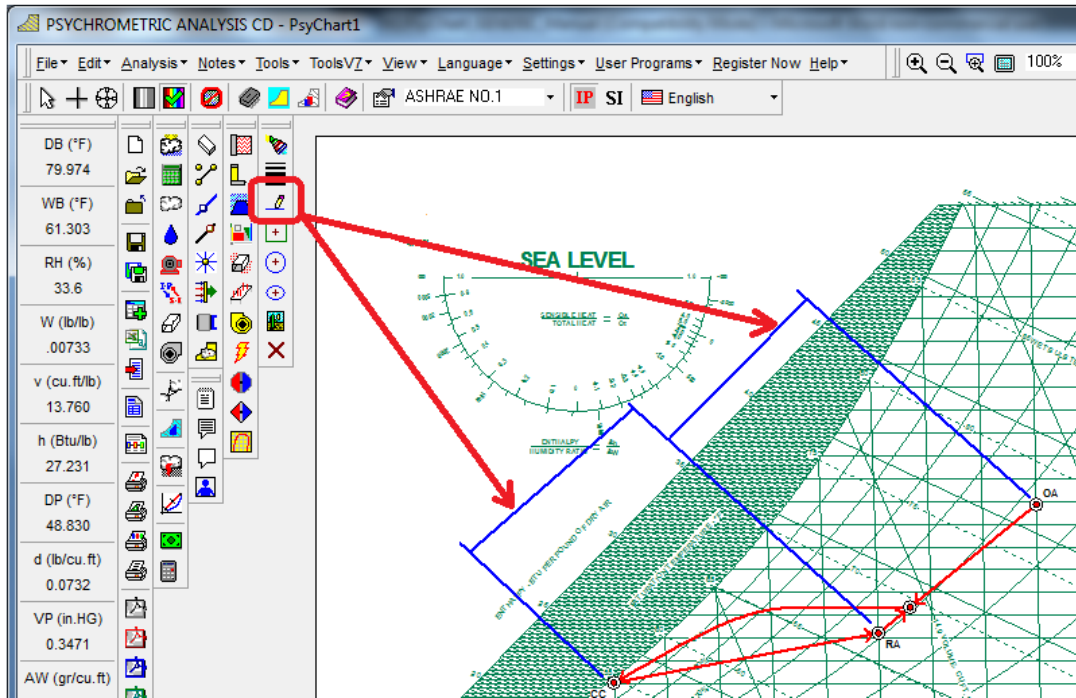
NEW !! Ability to Hide State Point Label on a Point-By-Point basis!!

Ability to Hide State Point Label on a Point-By-Point basis!!



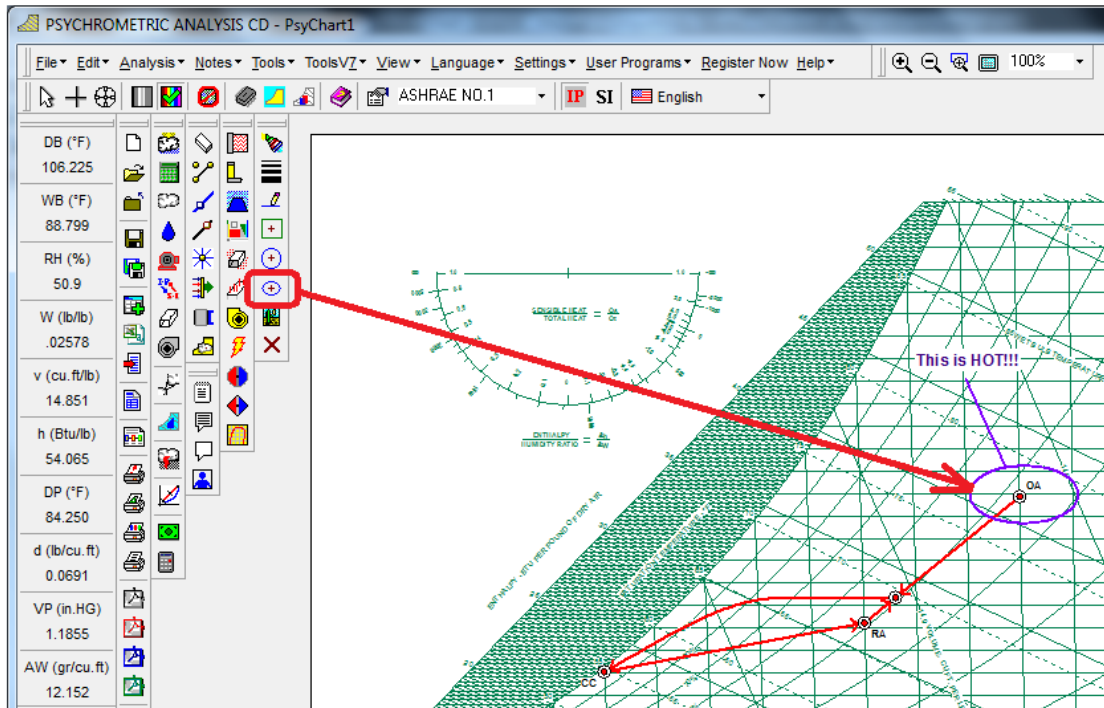
NEW !! Draw Your Own Lines Anywhere You Want!!

Draw Your Own Lines Anywhere You Want!!



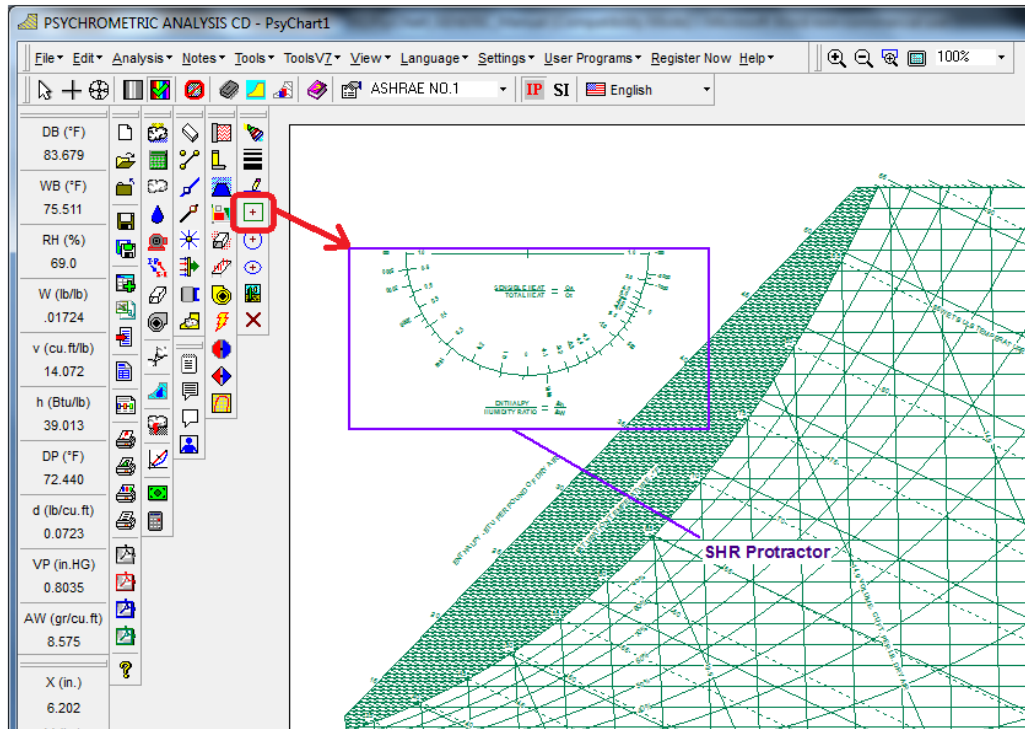
NEW !! Draw Your Own Ellipses Anywhere You Want!!

Draw Your Own Ellipses Anywhere You Want!!



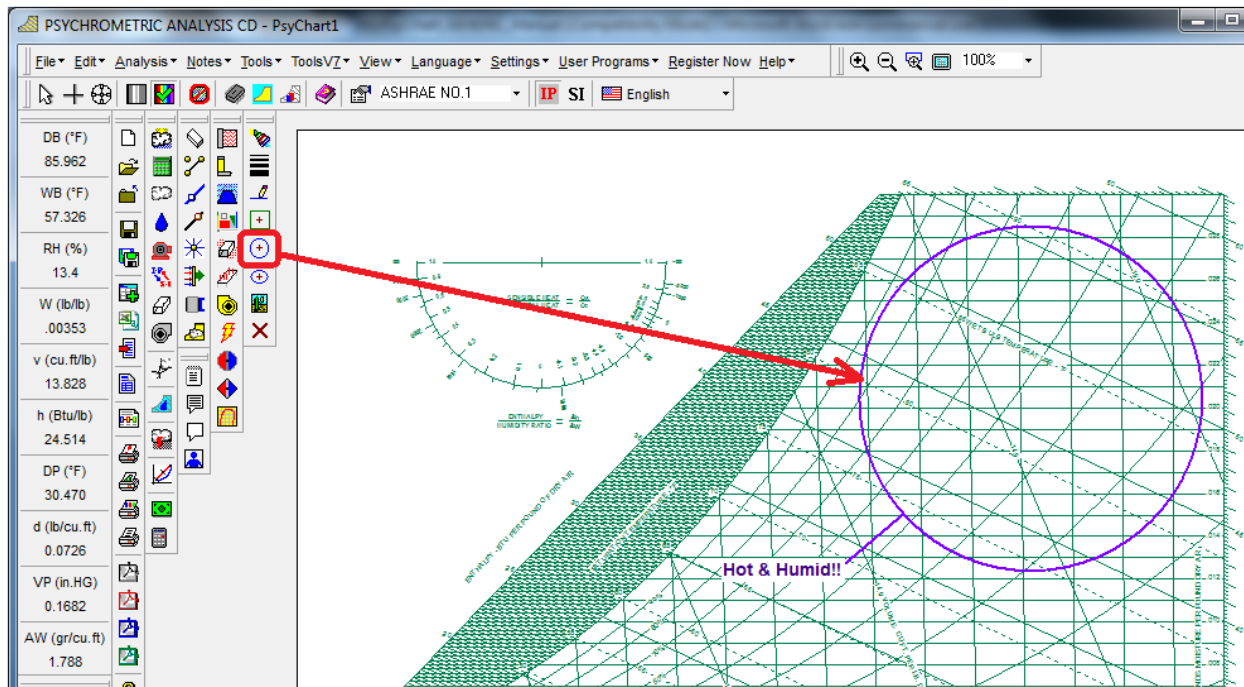
NEW !! Draw Your Own Rectangles Anywhere You Want!!

Draw Your Own Rectangles Anywhere You Want!!



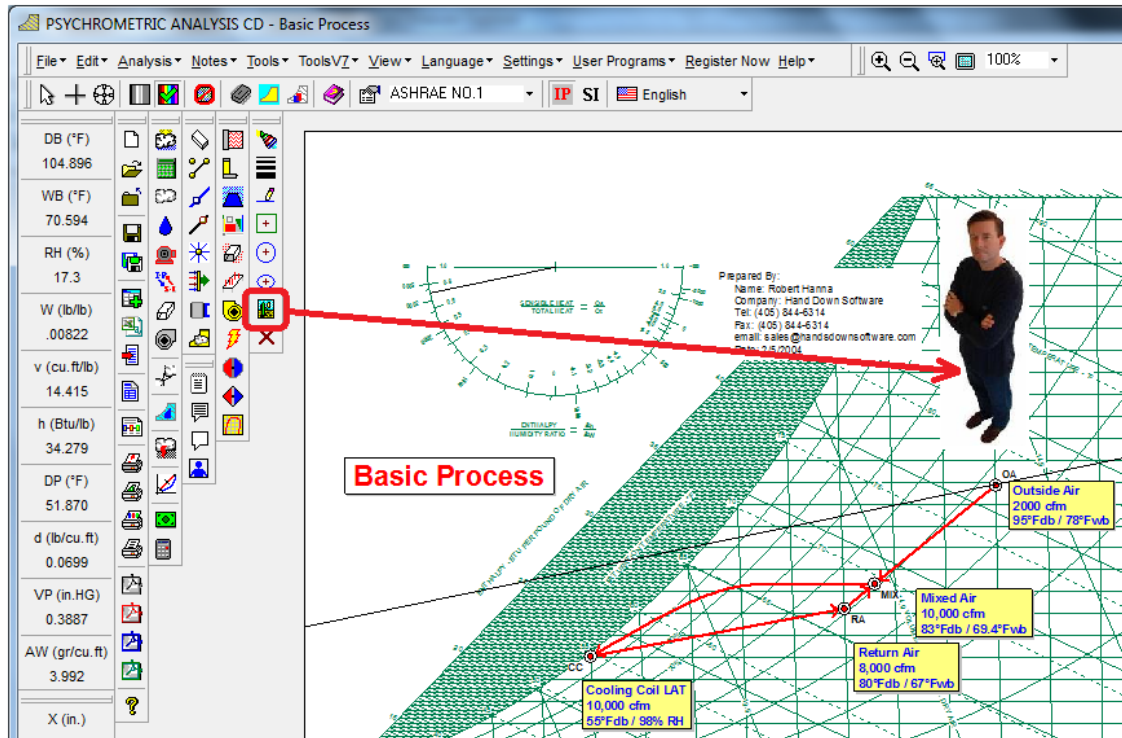
NEW !! Draw Your Own Circles Anywhere You Want!!

Draw Your Own Circles Anywhere You Want!!



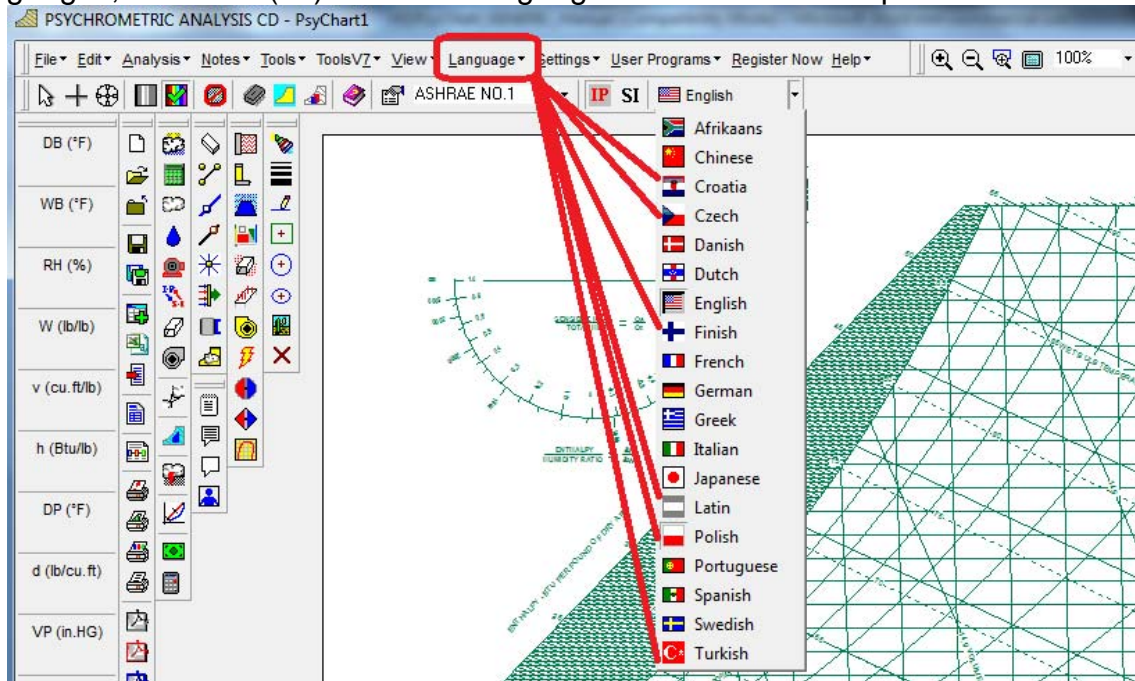
NEW !! Insert Your Own Pictures Anywhere You Want!!

Insert Your Own Pictures Anywhere You Want!!



NEW !! Languages, Now with (19) Different Languages on Charts and Reports with one button click!!

Languages, Now with (19) Different Languages on Charts and Reports with one button click!!



NEW !! Point Color Control when Importing Data from Excel (*.csv) files!!

Point Color Control when Importing Data from Excel (*.csv) files!!

NEW !! Point Size Control when Importing Data from Excel (*.csv) files!!

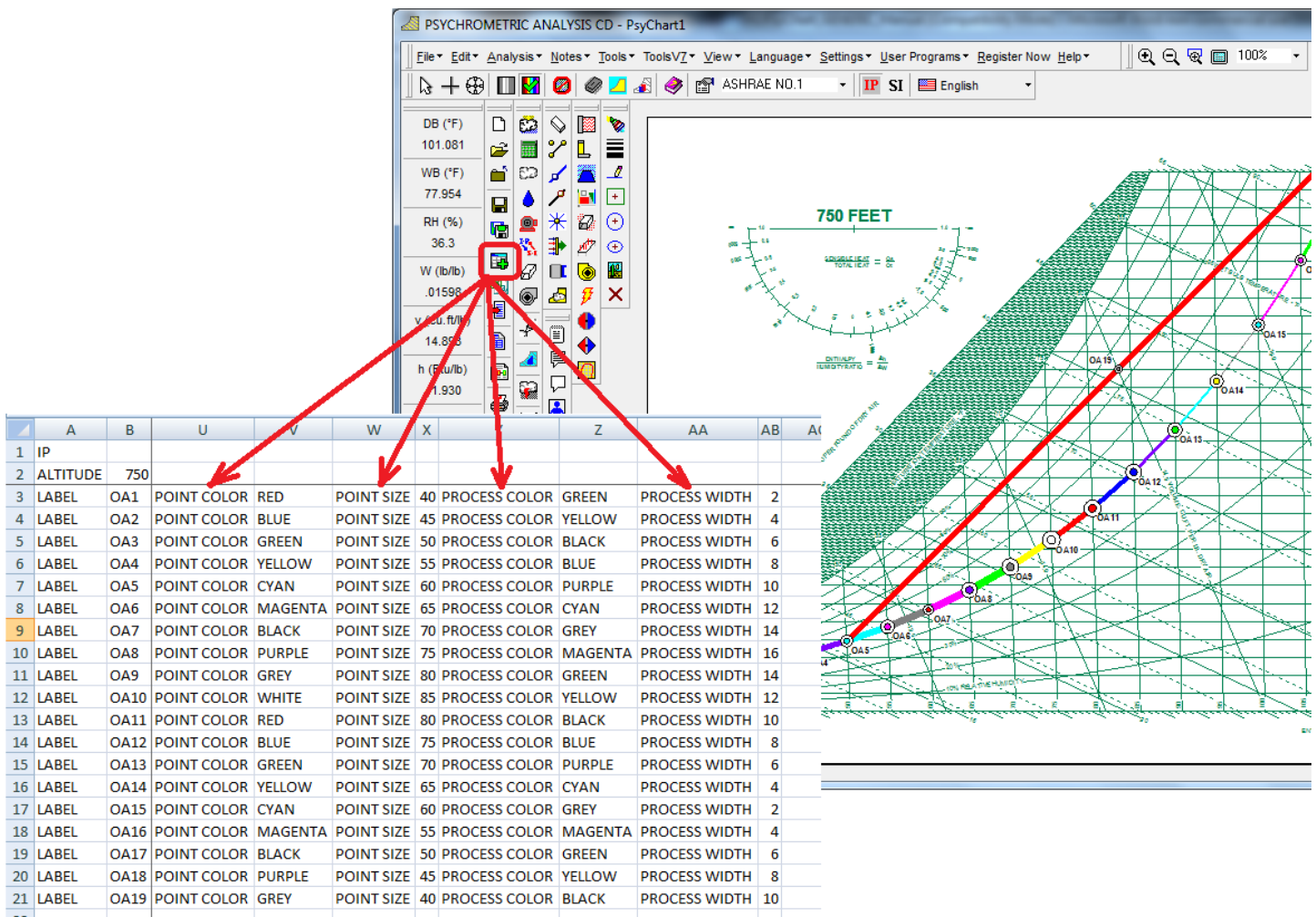
Point Size Control when Importing Data from Excel (*.csv) files!!

NEW !! Process Line Color Control when Importing Data from Excel (*.csv) files!!

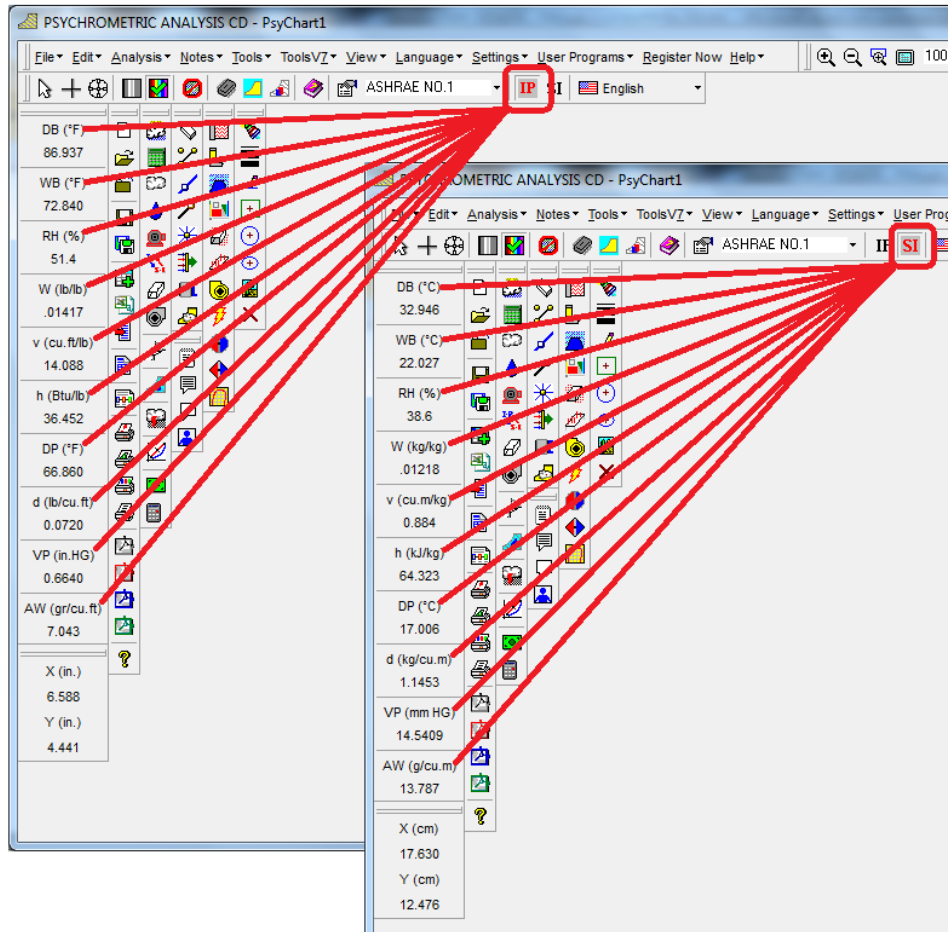
Process Line Color Control when Importing Data from Excel (*.csv) files!!

NEW !! Process Line Width Control when Importing Data from Excel (*.csv) files!!

Process Line Width Control when Importing Data from Excel (*.csv) files!!



NEW !! Point property toolbar display now includes units of measure!!
 Point property toolbar display now includes units of measure!!



NEW !! Thermal Comfort Terms Definition PDF Manual!!

Thermal Comfort Terms Definition PDF Manual!!

The screenshot displays the HDPsyChart software interface. The main window is the 'Thermal Comfort Calculator', which is divided into several sections for input and results.

Environmental Conditions:

- Air Temperature: 78.8 °F
- MRT: 78.8 °F (checked 'Link with Air')
- Air Velocity: 39 ft/min
- Relative Humidity: 50 %
- Season: Summer (selected), Winter (unselected)

Activity:

- User Defined
- Metabolic Rate: 1.0 met

Clothing:

- User Defined
- Clothing level: 0.5 clo

Other Details:

- External Work: 0.0 met
- Turbulence Intensity: 70 %
- Mean Mo. Outdoor Temp: 15.0 °C
- Exposure Time: 60 min
- Barometric Pressure: 760 torr
- Weight: 70 kg
- Surface Area: 1.2 sq.m

Results:

- ET*: 78.8 °F
- SET*: 75.9 °F
- TSENS: 0.2
- DISC: 0.2
- PMV: -0.32
- PPD: 7 %
- PD: 26 %
- PS: 53 %
- TS: 0.3 Neutral
- Trueutral: 71.5 °F (Humphreys)
- Trueutral: 74.8 °F (Auliciems)

The 'Comfortable' status is indicated by a green circle with 'In ISO'. Below the results, a 'Comfort Zone Calculation' section shows a psychrometric chart with 'Humidity Level' and 'Dry-Bulb Temperature' both marked as 'In Zone'.

Overlaid on the software window is a PDF document titled 'Thermal Comfort Terms and Definitions'. The PDF content includes:

Thermal Comfort Terms and Definitions

Below are listed a number of terms commonly used in literature, standards, etc.

Acceptable Thermal Environment
An environment that at least 80% of the occupants find acceptable. (ASHRAE 55-92)

Air Movement
Combined effect of air velocity and turbulence and flow direction.

Air Motion
Same as air movement.

Air Speed
Same as air velocity except without regard to direction.

Air Temperature
Is "the dry-bulb temperature of the air" (ASHRAE 55-92).

Air Velocity

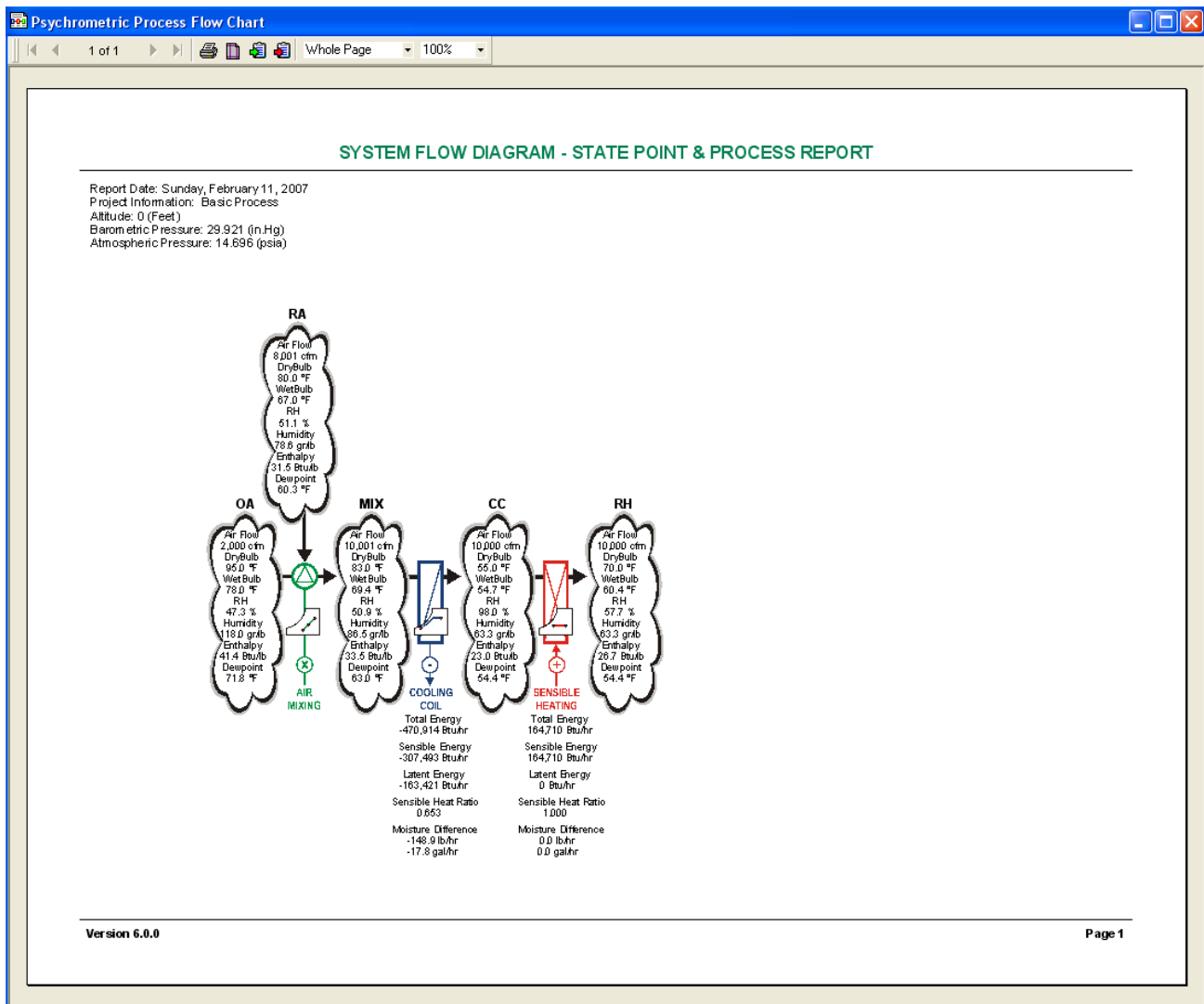


PROGRAM FEATURES

MORE PROFESSIONAL EDITION FEATURES!

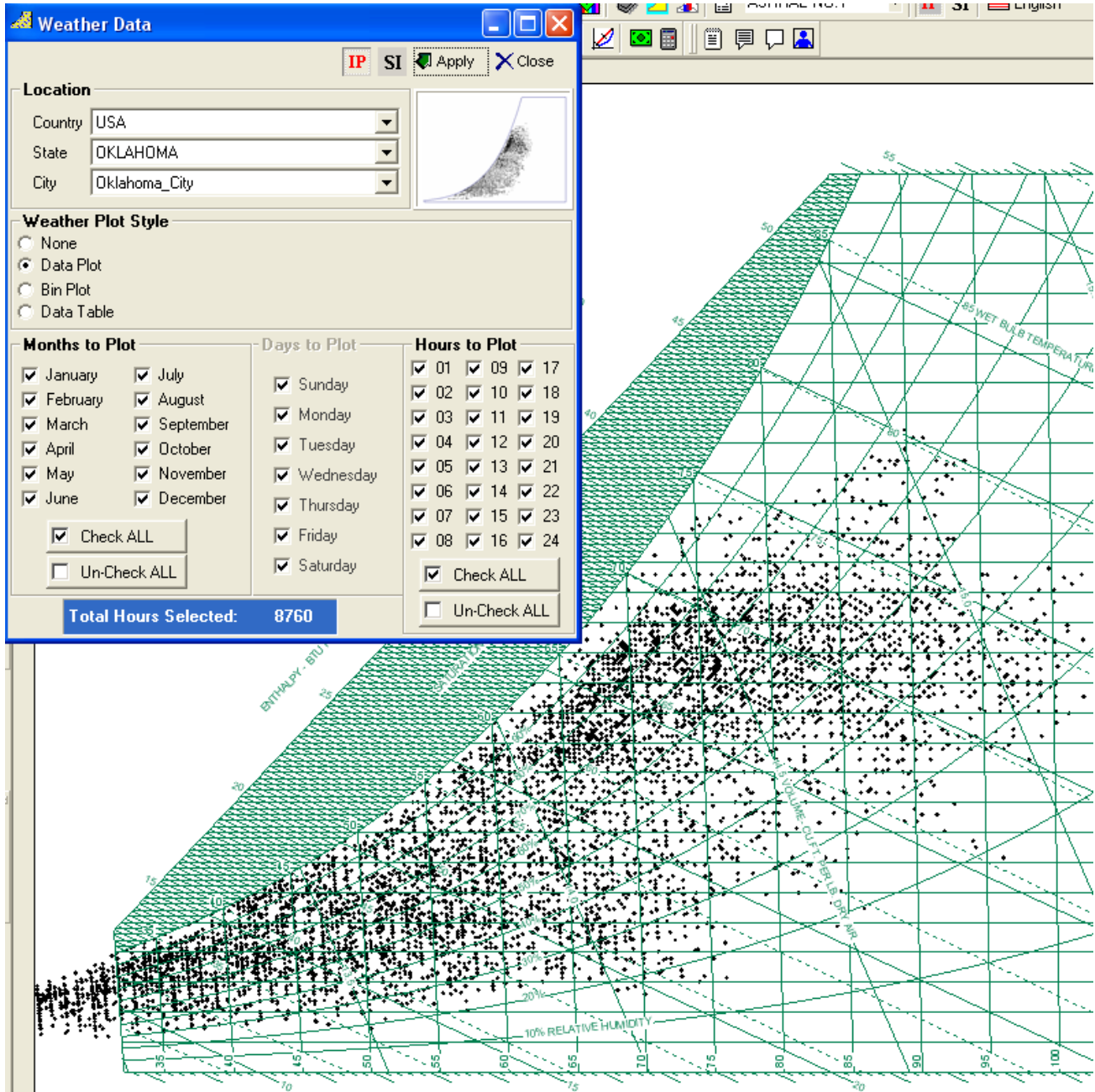
Auto Flow Chart Diagram!

Now you can get a Complete Flow Diagram Schematic with all Process and Thermo-Physical properties with One-Button-Click! Flow diagram and/or data can be copied with One-Button-Click to the clipboard for pasting into your reports and presentations!



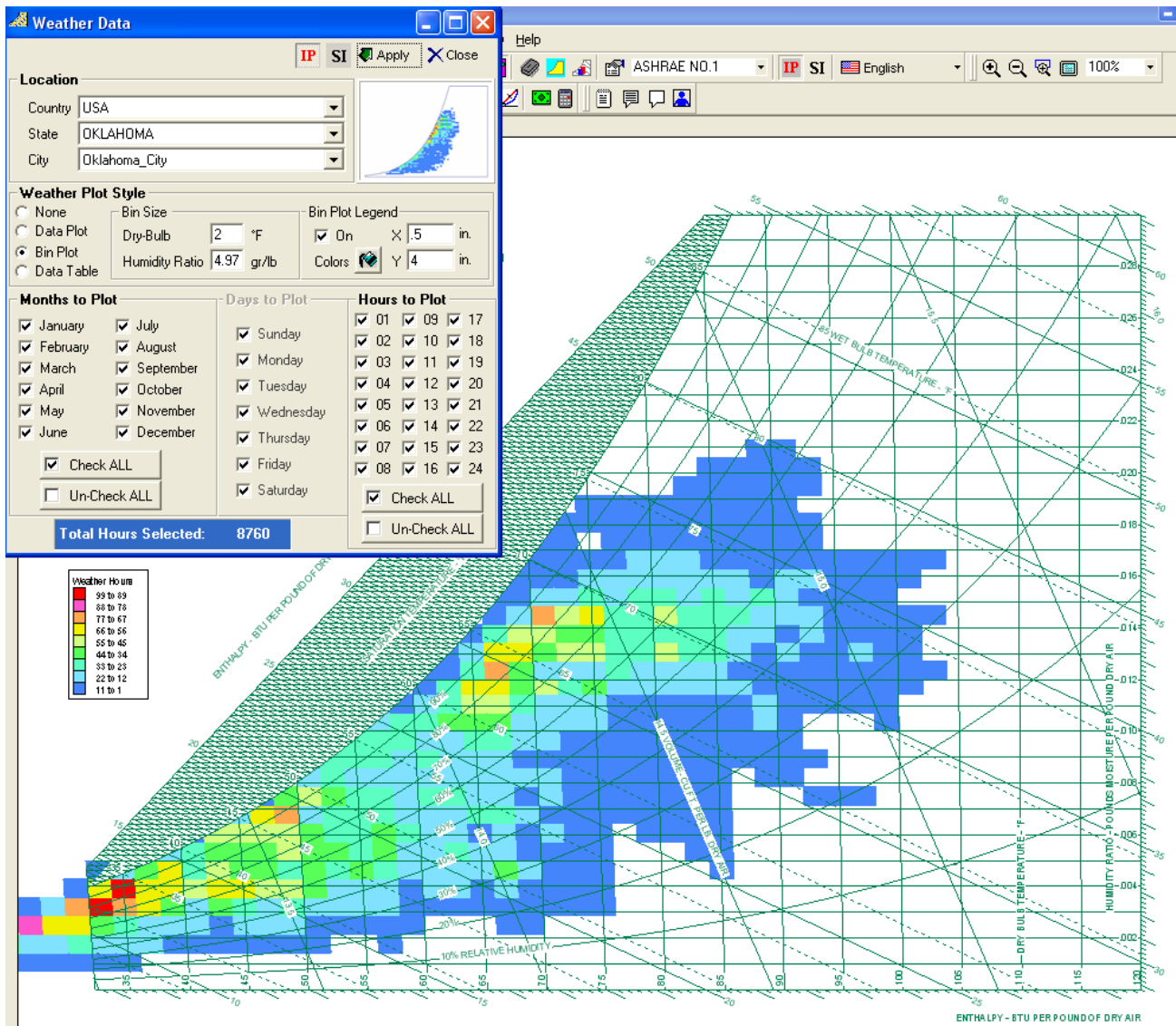
Weather Data Plotting with Complete Global Weather Files!!

Now you can see the weather data plotted right on the chart with one click!!



Weather Bin Shade Plotting with Complete Control!!

Now you can display Bin Weather data right on the chart and specify the bin size and colors!!...even displays a bin legend that you can locate where you want!!



Global Weather Data Table Access!!...CREATE YOUR OWN BIN TABLES!!

Now you have access to world-wide weather data at your fingertips!!...create a complete weather data file that you can modify, import to Excel, etc. with One-Click!!

The screenshot shows the HDPsyChart Weather Data window with the following settings:

- Location:** Country: USA, State: OKLAHOMA, City: Oklahoma_City
- Weather Plot Style:**
 - ☐ None
 - ☐ Data Plot
 - ☐ Bin Plot
 - ☒ Data Table
- Weather Data Table:**
 - ☒ Month
 - ☒ Day
 - ☒ Hour
 - ☒ Dry Bulb
 - ☒ Wet Bulb
 - ☒ Create Data Table...
 - ☒ Dew Point
 - ☒ Enthalpy
 - ☒ Density
 - ☒ Humidity Ratio
 - ☒ Vapor Pressure
 - ☒ Specific Volume
- Months to Plot:**
 - ☒ January
 - ☒ February
 - ☒ March
 - ☒ April
 - ☒ May
 - ☒ June
 - ☒ July
 - ☒ August
 - ☒ September
 - ☒ October
 - ☒ November
 - ☒ December
- Days to Plot:**
 - ☒ Sunday
 - ☒ Monday
 - ☒ Tuesday
 - ☒ Wednesday
 - ☒ Thursday
 - ☒ Friday
 - ☒ Saturday
- Hours to Plot:**
 - ☒ 01
 - ☒ 02
 - ☒ 03
 - ☒ 04
 - ☒ 05
 - ☒ 06
 - ☒ 07
 - ☒ 08
 - ☒ 09
 - ☒ 10
 - ☒ 11
 - ☒ 12
 - ☒ 13
 - ☒ 14
 - ☒ 15
 - ☒ 16
 - ☒ 17
 - ☒ 18
 - ☒ 19
 - ☒ 20
 - ☒ 21
 - ☒ 22
 - ☒ 23
 - ☒ 24
- Buttons:** Check ALL, Un-Check ALL
- Total Hours Selected:** 8760

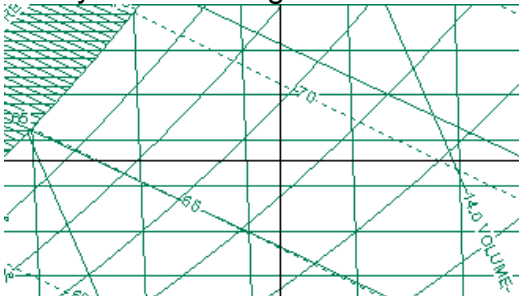
The Notepad window shows the generated weather data file:

```

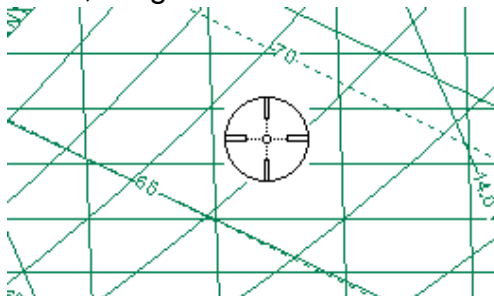
Country: USA
State: OK
City: OKLAHOMA_CITY
Altitude: 1302 ft.
Month,Day,Hour,Dry Bulb,Wet Bulb,Dew Point,Humidity Ratio,Enthalpy,Density,Vapor
... °F,°F,°F,gr/lb,btu/lb,lb/cu.ft.,in. HG,cu.ft./lb,
January,1,12AM to 1AM,28.0,26.4,24.1,19.2,9.68,0.0772,0.12,12.94
January,1,1AM to 2AM,27.0,25.8,24.1,19.2,9.42,0.0774,0.12,12.91
January,1,2AM to 3AM,26.1,24.8,23.0,18.2,9.06,0.0775,0.12,12.89
January,1,3AM to 4AM,24.1,22.9,21.0,16.6,8.33,0.0779,0.11,12.83
January,1,4AM to 5AM,24.1,22.9,21.0,16.6,8.33,0.0779,0.11,12.83
January,1,5AM to 6AM,23.0,21.9,19.9,15.8,7.94,0.0781,0.10,12.80
January,1,6AM to 7AM,23.0,21.9,19.9,15.8,7.94,0.0781,0.10,12.80
January,1,7AM to 8AM,23.0,21.9,19.9,15.8,7.94,0.0781,0.10,12.80
January,1,8AM to 9AM,26.1,24.8,23.0,18.2,9.06,0.0775,0.12,12.89
January,1,9AM to 10AM,30.0,27.9,25.0,20.0,10.29,0.0789,0.13,13.00
January,1,10AM to 11AM,34.0,30.5,26.1,21.1,11.40,0.0762,0.14,13.11
January,1,11AM to 12PM,37.9,33.3,27.0,22.0,12.50,0.0756,0.14,13.21
January,1,12PM to 1PM,42.1,35.6,27.0,22.0,13.50,0.0750,0.14,13.32
January,1,1PM to 2PM,45.0,37.9,28.9,24.1,14.52,0.0745,0.16,13.41
January,1,2PM to 3PM,48.0,39.5,28.9,24.1,15.26,0.0741,0.16,13.49
January,1,3PM to 4PM,51.1,41.5,30.0,25.4,16.19,0.0736,0.16,13.57
January,1,4PM to 5PM,50.0,41.3,30.9,26.5,16.10,0.0738,0.17,13.55
January,1,5PM to 6PM,46.0,38.9,30.0,25.4,14.98,0.0744,0.16,13.44
January,1,6PM to 7PM,43.0,36.8,28.9,24.1,14.05,0.0748,0.16,13.35
January,1,7PM to 8PM,43.0,36.8,28.9,24.1,14.05,0.0748,0.16,13.35
January,1,8PM to 9PM,39.0,34.3,28.0,23.2,12.94,0.0754,0.15,13.25
January,1,9PM to 10PM,39.0,34.3,28.0,23.2,12.94,0.0754,0.15,13.25
January,1,10PM to 11PM,37.0,32.8,27.0,22.0,12.28,0.0758,0.14,13.19
January,1,11PM to 12AM,36.0,31.5,26.1,21.1,11.88,0.0759,0.14,13.16
January,2,12AM to 1AM,35.1,31.0,26.1,21.1,11.66,0.0761,0.14,13.13
  
```

Mouse Icon Control!!

Now you can change the mouse icon to Arrow, Target or Cross-Hair!!



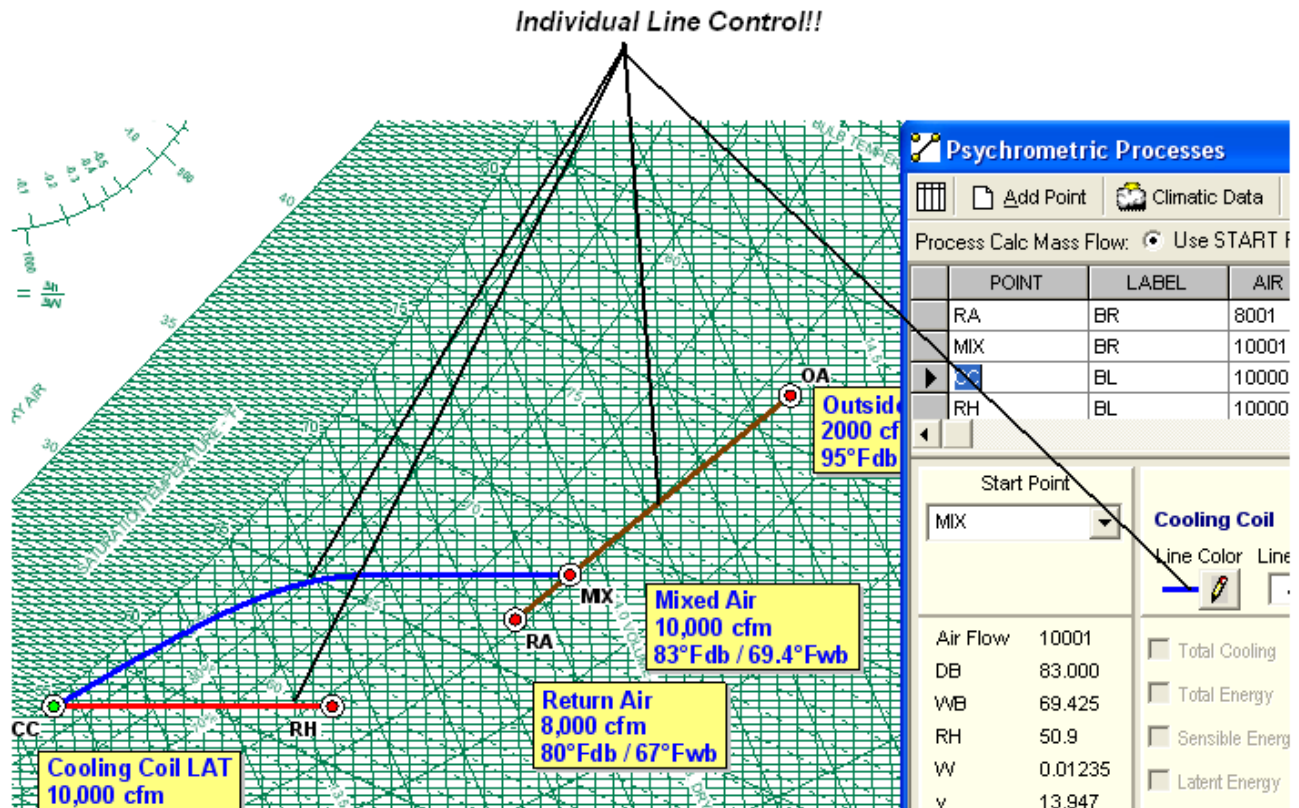
Cross-Hair Mouse (just like CAD!!)



Or Target Style!!

Individual Process Line Color Control!

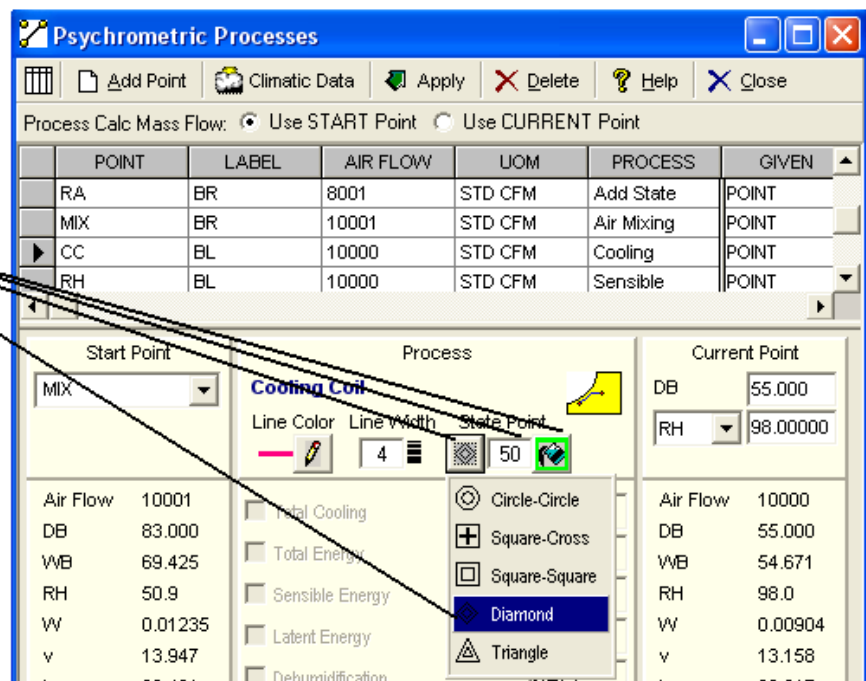
Now you can control the color and thickness of EACH Individual Process Line!!



Individual Point Color, Shape and Size Control!

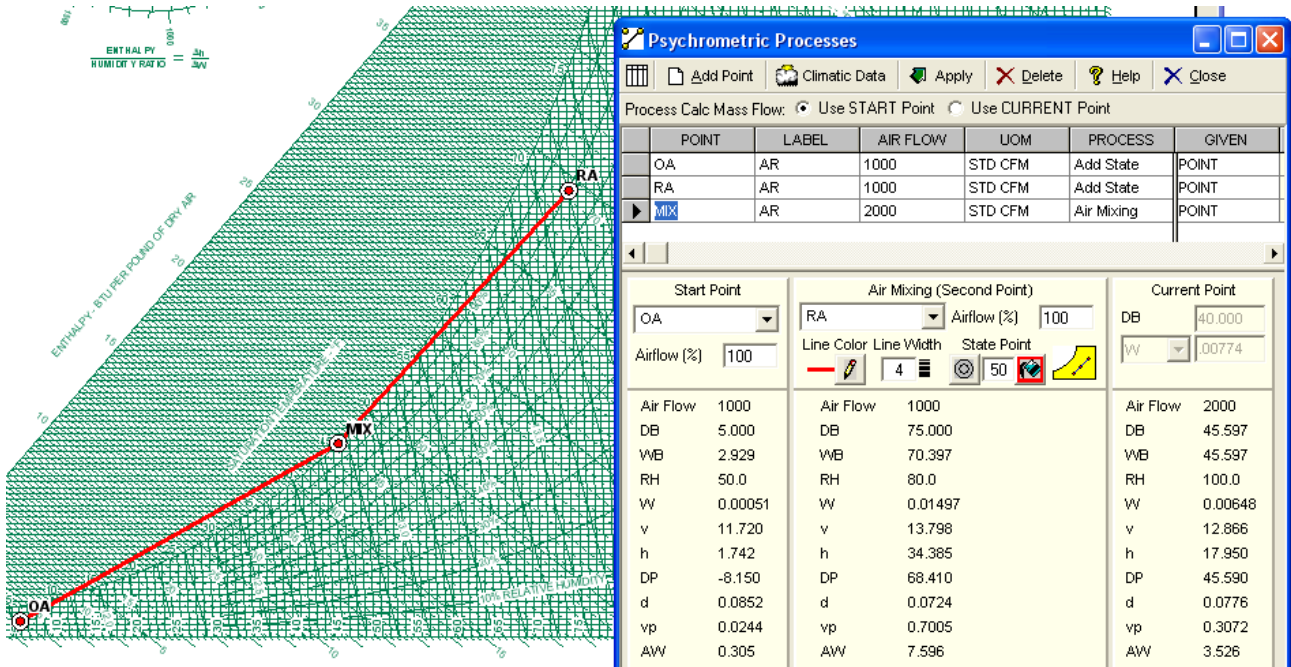
Now you can control the icon, color and size of EACH Individual State Point!!

Individual Point Icon, Color and Size Control!!



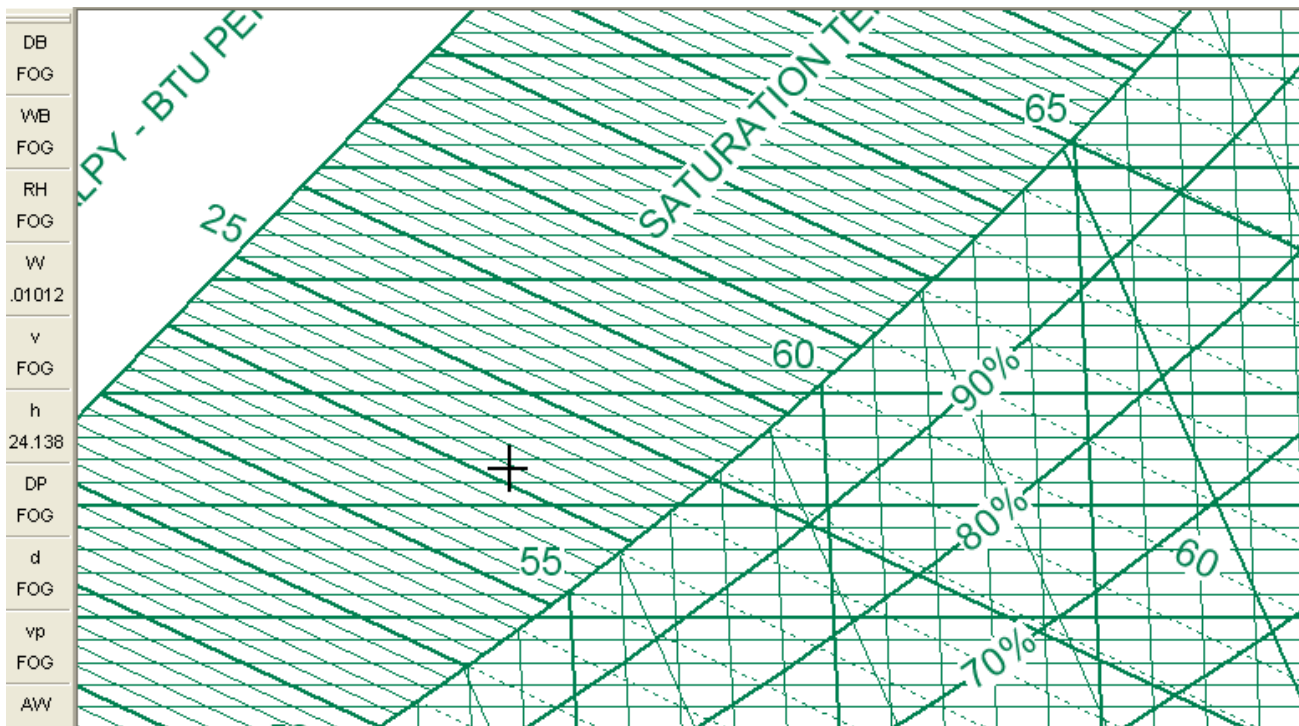
Winter "V" Air Mixing Capability!

Now you can plot mixing processes that cross the saturation line!!



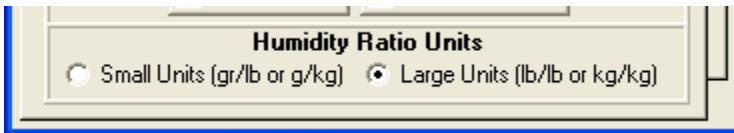
Fog Region Property Display!!

Now you can read fog region properties!!



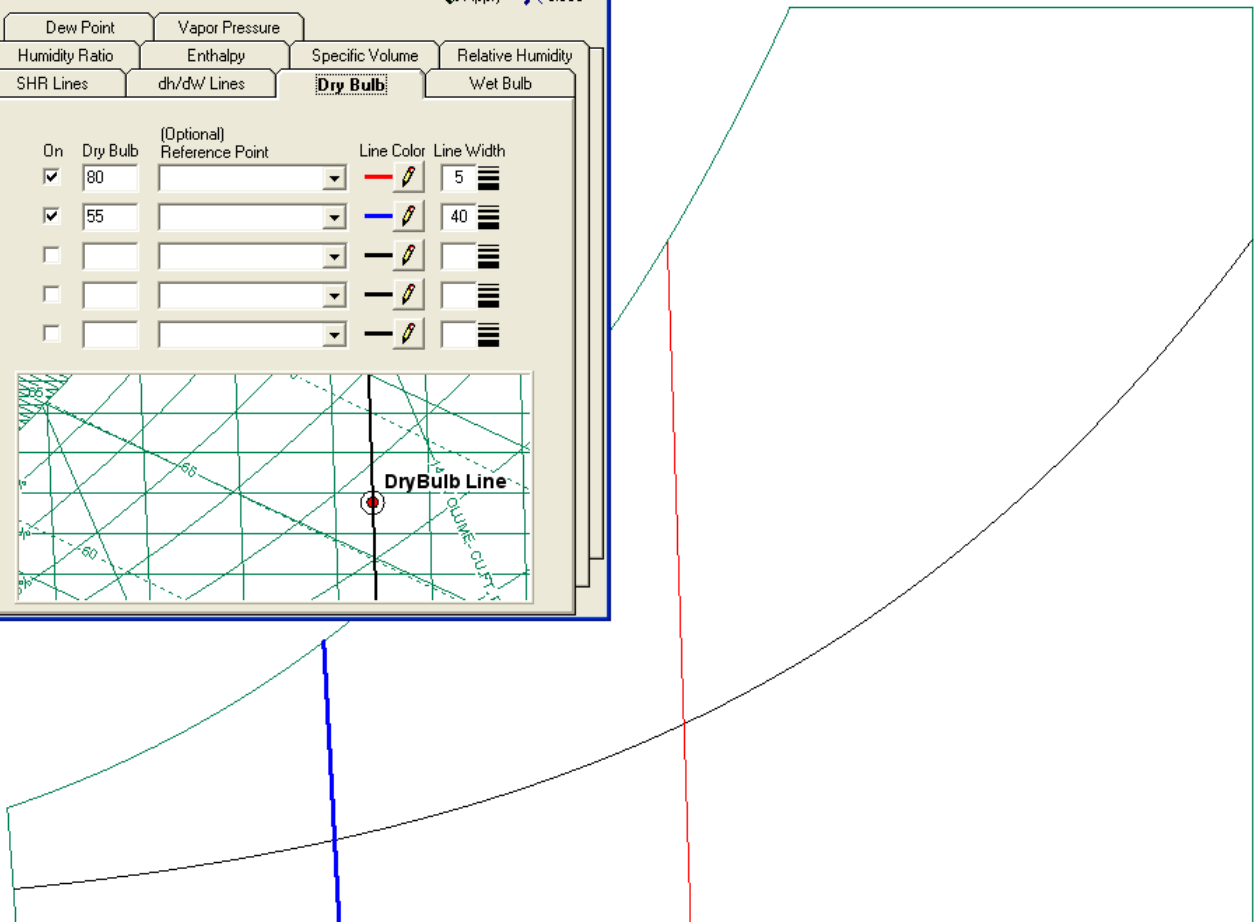
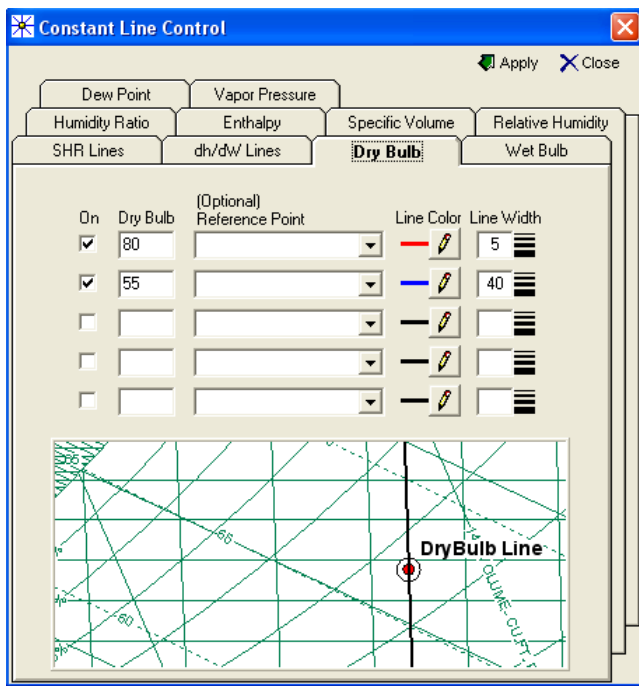
Humidity Ratio Unit of Measure Control!!

Now you can select the Humidity Ratio units displayed on the chart and used in Psychrometric Analysis with one button click!!




Constant h, WB, HR, DB, VP, DP, SHR & dW/dh Line Control!!

Now you can specify exact individual property lines to be displayed!!



Complete Thermal Comfort Calculator!!

Now you can perform thermal comfort modeling calculations on the fly!!


Thermal Comfort Calculator

Environmental Conditions

Air Temperature	<input type="text" value="78.8"/>	<input type="button" value="°F"/>
MRT <input checked="" type="checkbox"/> Link with Air	<input type="text" value="78.8"/>	<input type="button" value="°F"/>
Air Velocity	<input type="text" value="39"/>	<input type="button" value="ft/min"/>
Relative Humidity	<input type="text" value="50"/>	<input type="button" value="°"/>

☒ Summer
 ☐ Winter

Activity

Metabolic Rate

Clothing


Clothing level

Other Details

External Work	<input type="text" value="0.0"/>	<input type="button" value="met"/>
Turbulence Intensity	<input type="text" value="70"/>	<input type="button" value="°"/>
Mean Mo. Outdoor Temp	<input type="text" value="15.0"/>	<input type="button" value="°C"/>
Exposure Time	<input type="text" value="60"/>	<input type="button" value="min"/>
Barometric Pressure	<input type="text" value="760"/>	<input type="button" value="torr"/>
Weight	<input type="text" value="70"/>	<input type="button" value="kg"/>
Surface Area	<input type="text" value="1.2"/>	<input type="button" value="sq.m"/>

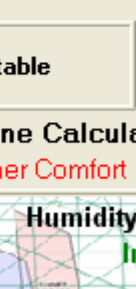
Results

ET*	<input type="text" value="78.8"/>	<input type="button" value="°F"/>
SET*	<input type="text" value="75.9"/>	<input type="button" value="°F"/>
TSENS	<input type="text" value="0.2"/>	
DISC	<input type="text" value="0.2"/>	
PMV	<input type="text" value="-0.32"/>	
PPD	<input type="text" value="7"/>	<input type="button" value="°"/>
PD	<input type="text" value="26"/>	<input type="button" value="°"/>
PS	<input type="text" value="53"/>	<input type="button" value="°"/>
TS	<input type="text" value="0.3"/>	<input type="button" value="Neutral"/>
Tnutral	<input type="text" value="71.5"/>	<input type="button" value="°F (Humphreys)"/>
Tnutral	<input type="text" value="74.8"/>	<input type="button" value="°F (Auliciems)"/>

Comfortable
 

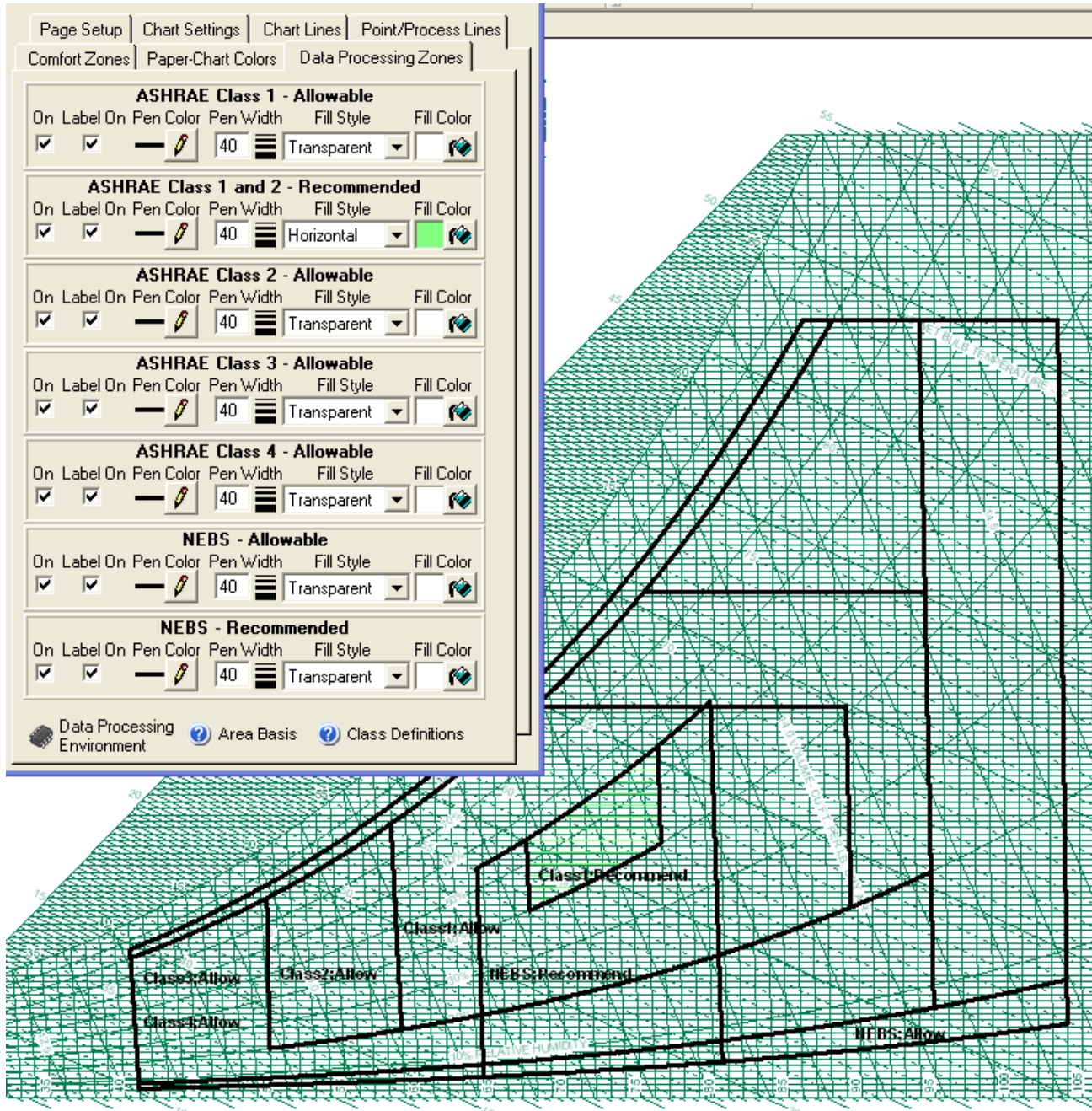
Comfort Zone Calculation

Summer Comfort



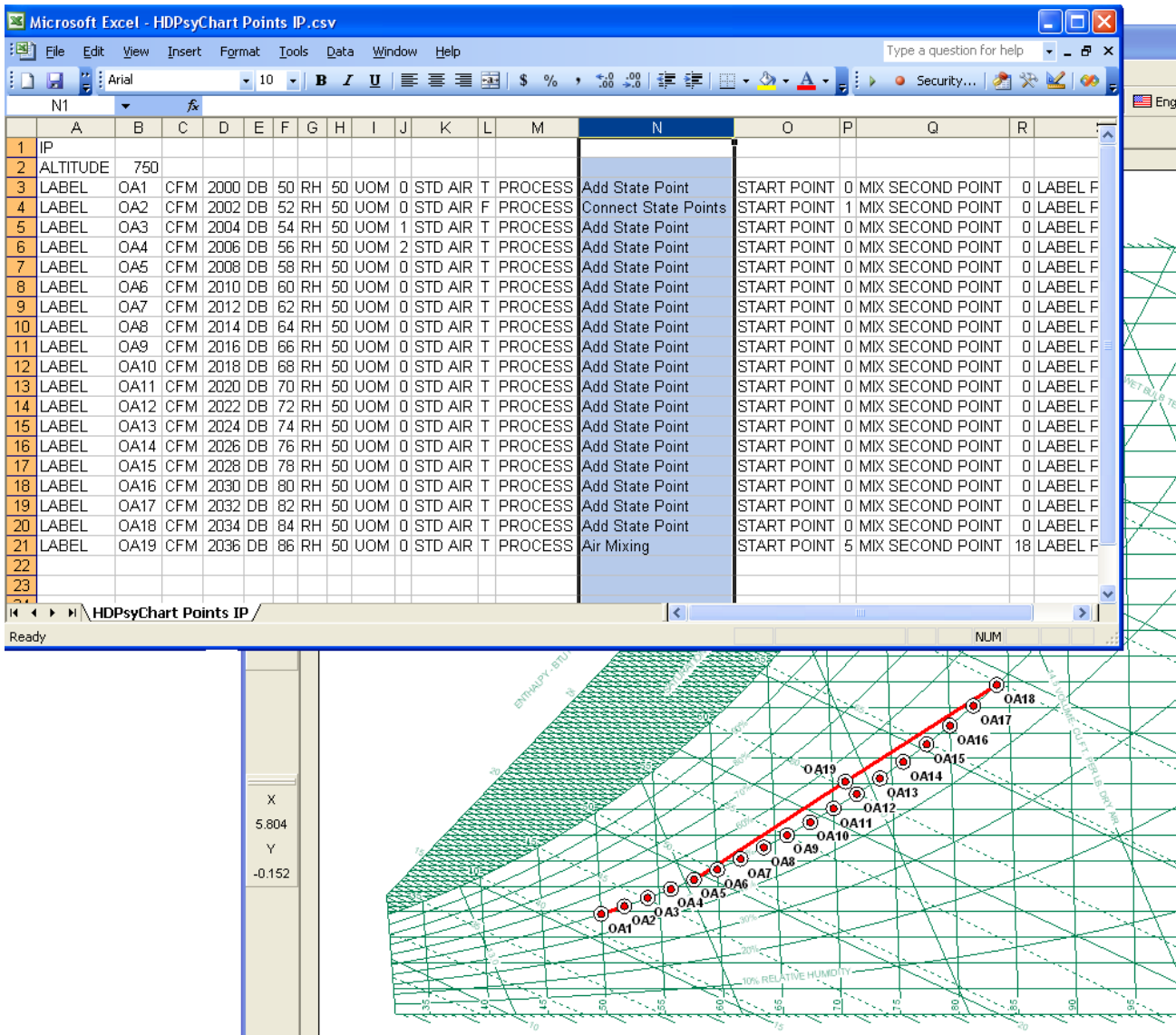
ASHRAE Class 1 through 4 Datacenter Zones (allowed & recommended) and NEBS Datacenter Zones (allowed & recommended)!!

Now you can display the Data Processing Environment regions right on the psychrometric chart!!!!...the regions are calculated and are displayed dynamically with elevation!!!



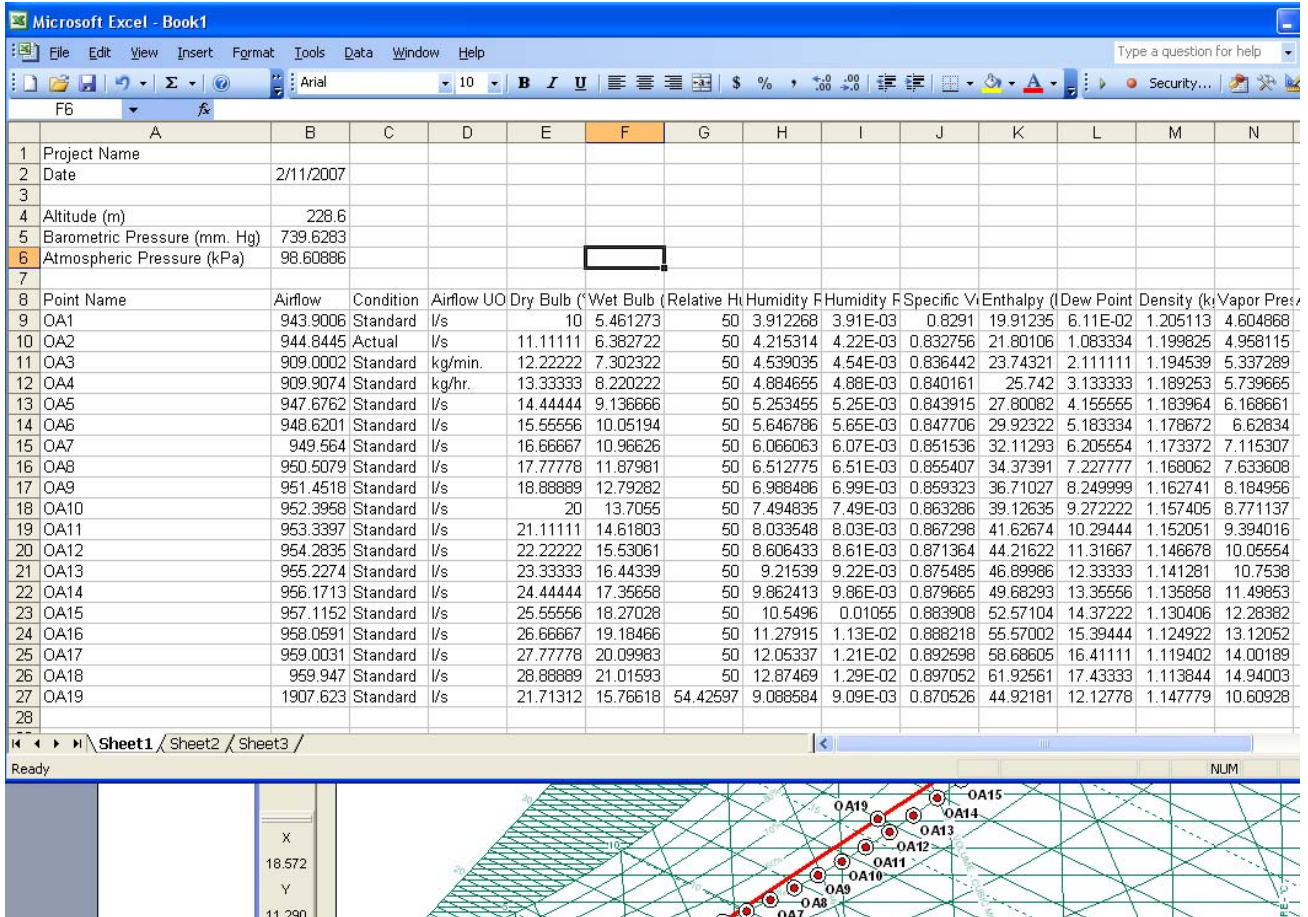
Process Control added to Data Import Function!!

Now when you're importing data text or Excel spreadsheet data, you can specify processes with the data!!



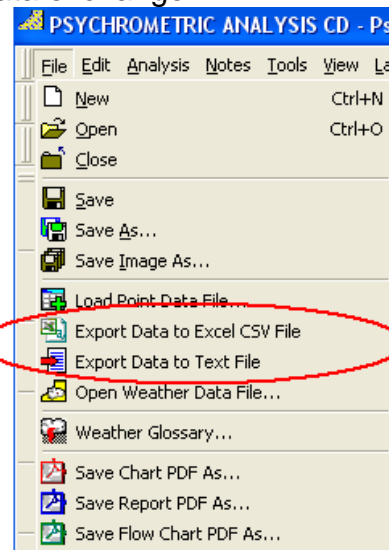
SI units added to text file & Excel Data Exchange!!

Now when you're exporting data text or Excel spreadsheet data, you can export out in SI units of measure!!



Export Data in EITHER *.txt format or *.csv format!!

Now you can export your psychrometric analysis data in either text file (*.txt) format or an Excel friendly comma delimited format (*.csv) for easy data exchange!!



Outdoor Air Estimator UPDATED to Standard 62-2004!!

Now you can quickly and easily obtain updated values from Table-16 from ASHRAE Standard 62-2004 with associated Notes and Air Classifications!!

Outside Air Estimator - RE: ASHRAE Standard 62-2004

Application Group: **Educational Facilities** **IP** **SI** **Print** **Close**

Specific Application: **Media center**

cfm per Person	10	cfm per sq.ft.	0.12
No. of People	22	Area (sq.ft.)	7500
People OA Rate	220	Area OA Rate	900
TOTAL Suggested Fresh Airflow (cfm)		1120	

AIR CLASS
Air Class = 1
[Class Definition](#)

NOTES
For high school and college libraries, use values shown for Public Spaces - Library.

GENERAL NOTES

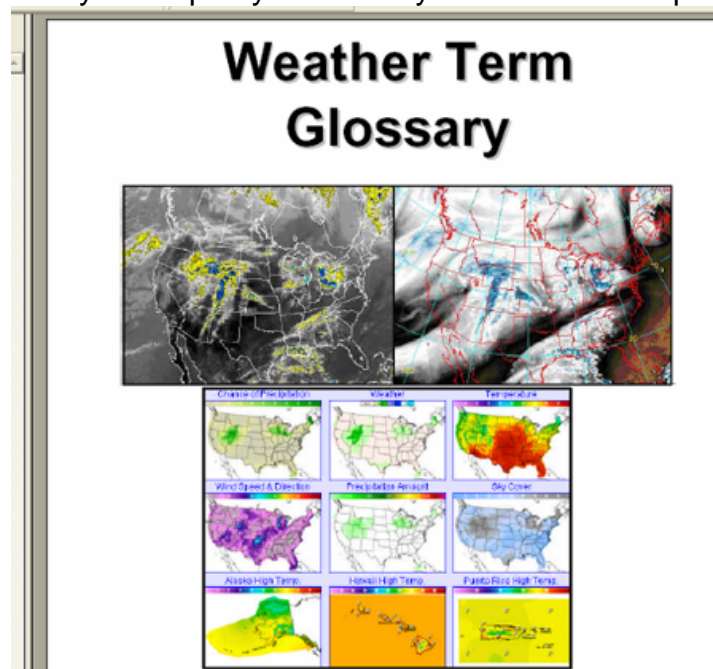
(1.) Related Requirements: The rates in this program are based on all other applicable requirements of ASHRAE Standard 62-2004 being met.

(2.) Smoking: This program applies to no-smoking areas. Rates for smoking-permitted spaces must be determined using other methods. See ASHRAE Standard 62-2004, Section 6.2.9 for ventilation requirements in smoking areas.

(3.) Air Density: Volumetric airflow rates are based on an air density of 0.075 lbda/ft³ (1.2 kgda/m³), which corresponds to dry air at a barometric pressure of 1 atm (101.3 kPa) and an air temperature of 70°F (21°C). Rates may be adjusted for actual density but such adjustment is not required for compliance with

Weather Term Glossary!!

Now you can quickly and easily look up any almost any weather term or phrase in seconds!!



Wind Chill Factor Calculator!!

Now you wind chill and frost bite times are at your fingertips and can be calculated in seconds!!

Wind Chill Calculator

Calculate Chart ? FAQ IP SI Print

Temperature and Wind Condition

Temperature: -10 °F

Wind: 45 mph

Wind Chill and Frostbite Time

Wind Chill: -44 °F

Frostbite Time: 10 minutes

Climatic Data PRINTING Capability Added!!

Instead of just viewing design data or adding it to your psychrometric system, now you can print all the design data for your location as well!!

Print Close

☒ COOLING USA 1,302 Elevation, feet ☒ English (IP)

☒ HEATING Oklahoma 35.40 North Latitude ☐ Metric (SI)

☒ WIND Oklahoma City, Will Rogers Airport 97.60 West Longitude

SUMMER COOLING				Evaporation			Dehumidification		
	DB °F	MWB °F	°F db	WB °F	MDB °F	°F db	DP °F	MDB °F	°F db
0.4%	99	74	99.14	77	91	91.04	73	83	83.12
1%	96	74	96.26	76	90	90.32	72	82	82.04
2%	94	73	93.56	75	89	89.24	71	81	81.32

Extr. Annual Max. DB °F 103 Std. Dev. °F 3 Mean Daily Range DB °F 21

WINTER HEATING				Coldest Month		Extreme Annual Daily	
	DB °F	RH %	°F db	WS mph	MCDB °F	DB °F	Std. Dev. °F
99.6%	9	50	9.32	0.4%	29	33	4
99%	15	50	14.72	1%	26	37	5

WIND

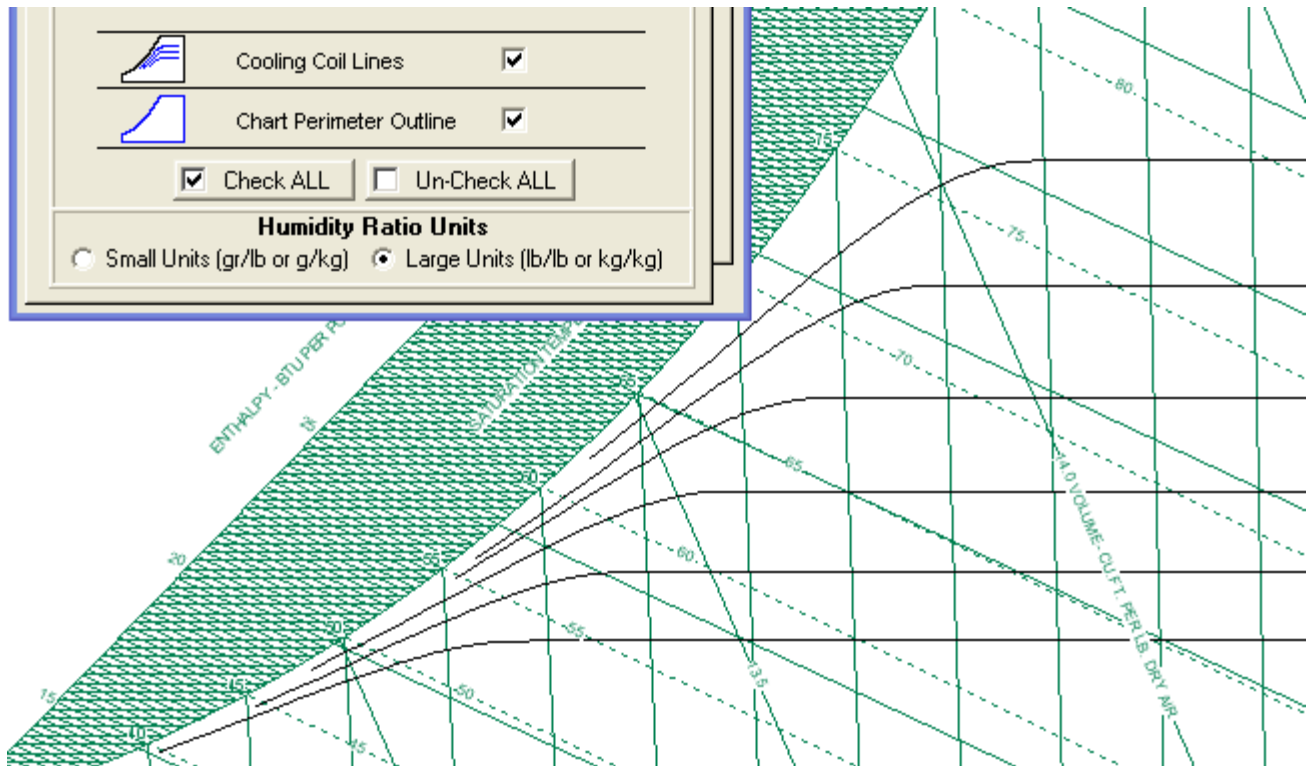
Coincident with 0.4% DB (cooling) MCWS 13 mph PWD 180 deg.

Coincident with 99.6% DB (heating) MCWS 15 mph PWD 360 deg.

Extreme Wind Speed 1% 29 mph 2.5% 25 mph 5% 23 mph

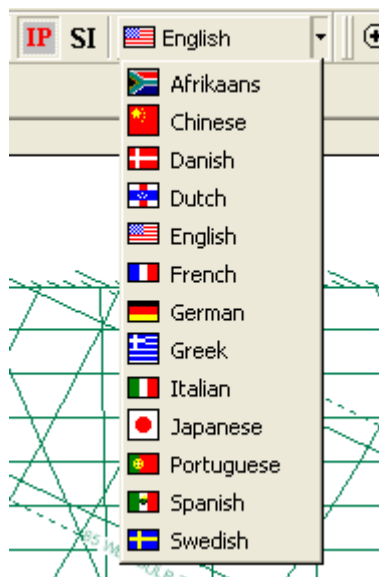
Cooling Coil Performance Line Control!!

Now you can display cooling coil modeled curves right on the psychrometric chart!!



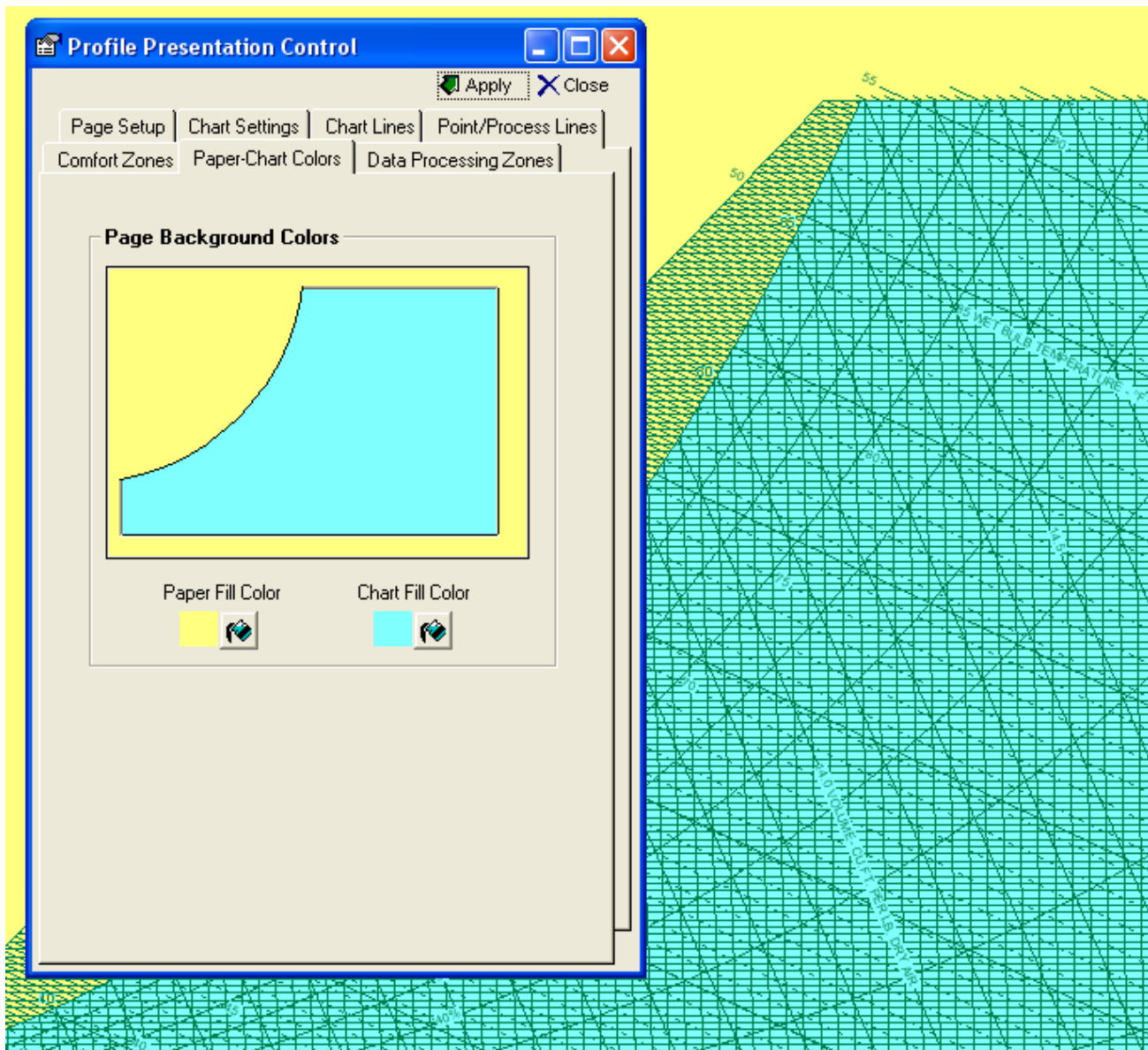
Greek, Japanese and Dutch Languages Added!!

Now Psychrometric Analysis supports (13) Languages!!



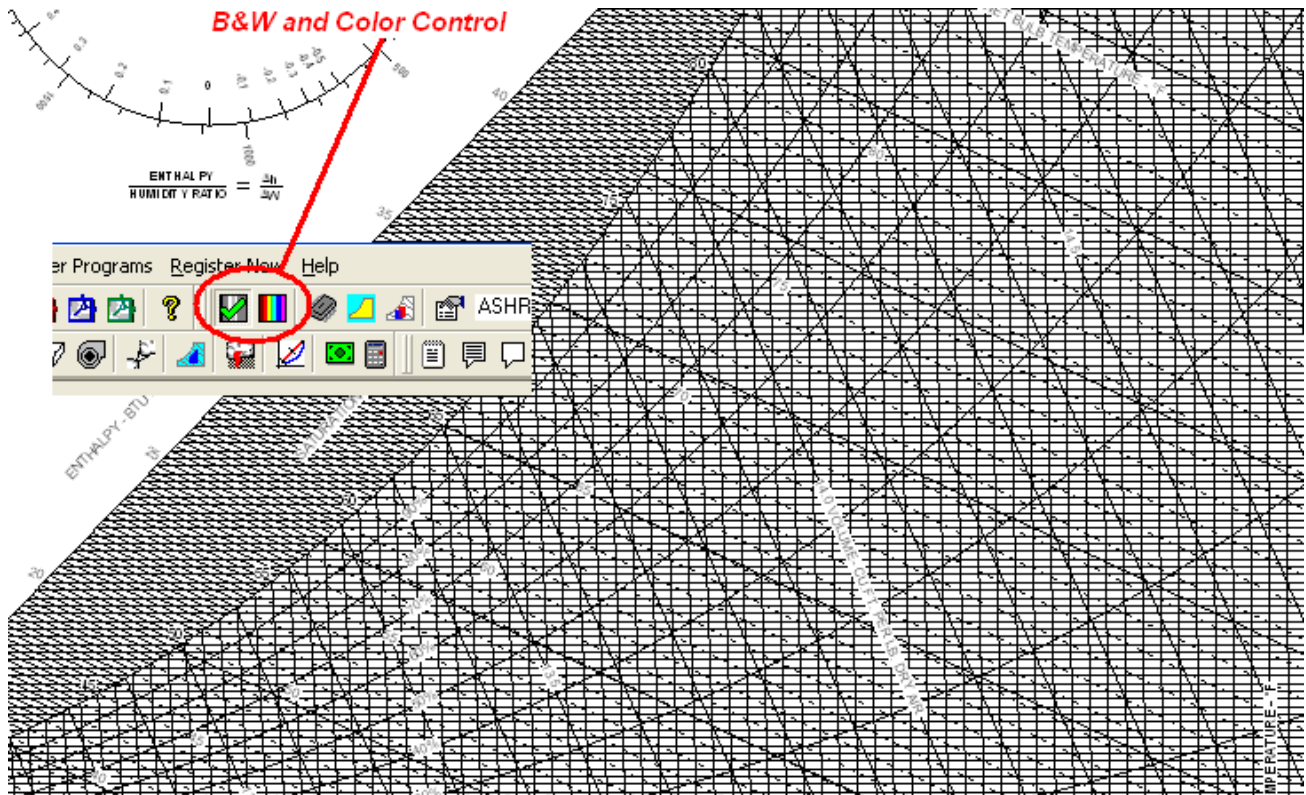
Page and Chart Area Color Control!!

Now you can customize the appearance of the psychrometric chart and select virtually any color for the page and chart area!!



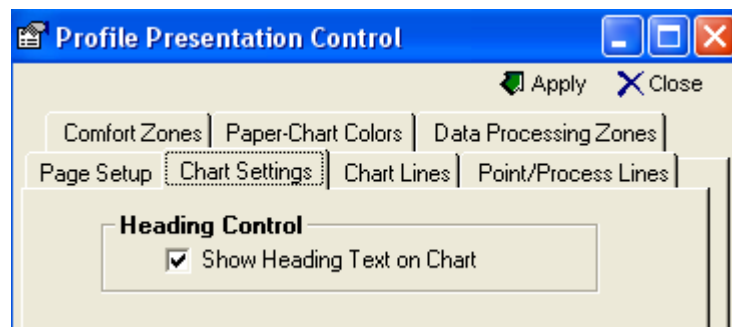
Black & White <=> Color Display & Print Control!!

Now you can select Black and White only or Color display!!



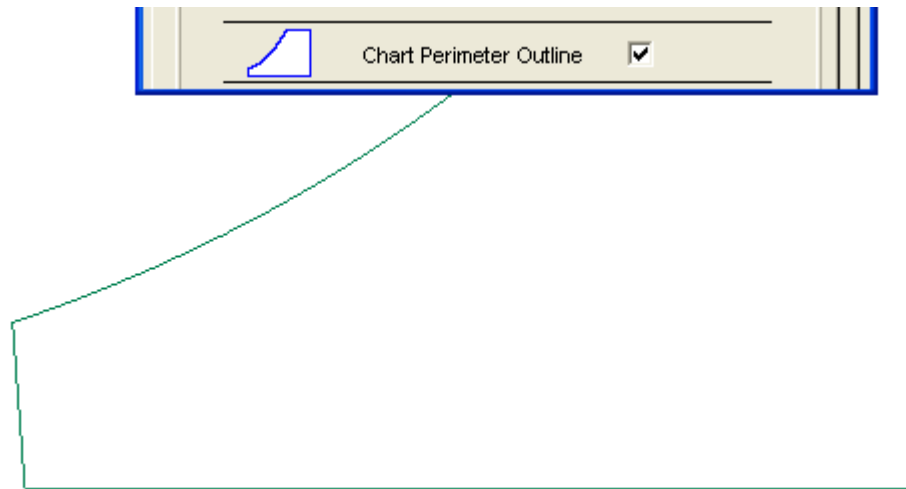
Heading On/Off Control!!

Now you can turn Headings On or Off!!



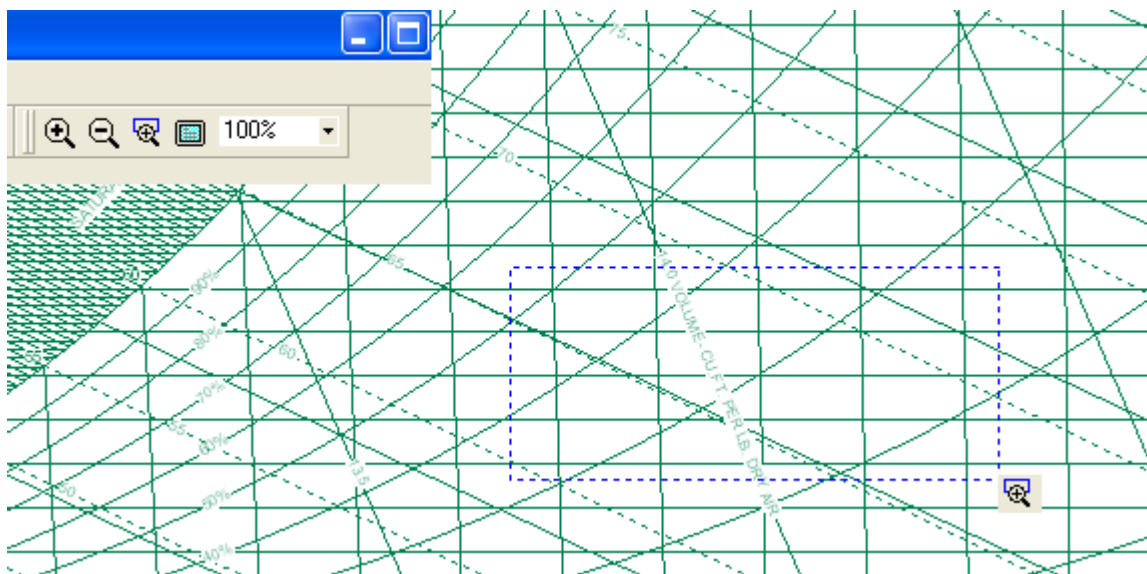
Psychrometric Chart Outline Control!!

Now you can turn the Chart Outline On or Off!!



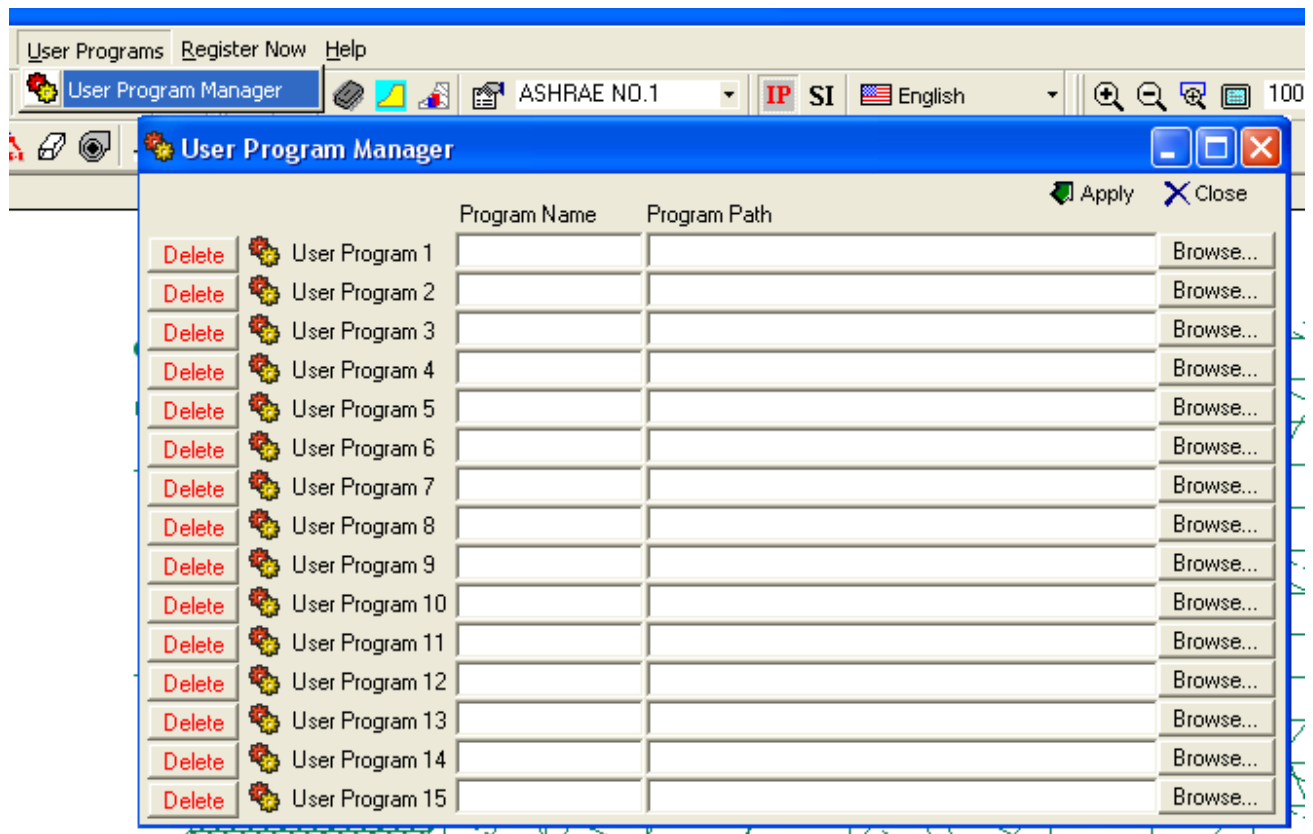
Zoom Window Control!!

Now you can Zoom using a Window to specify where you want to Zoom!!



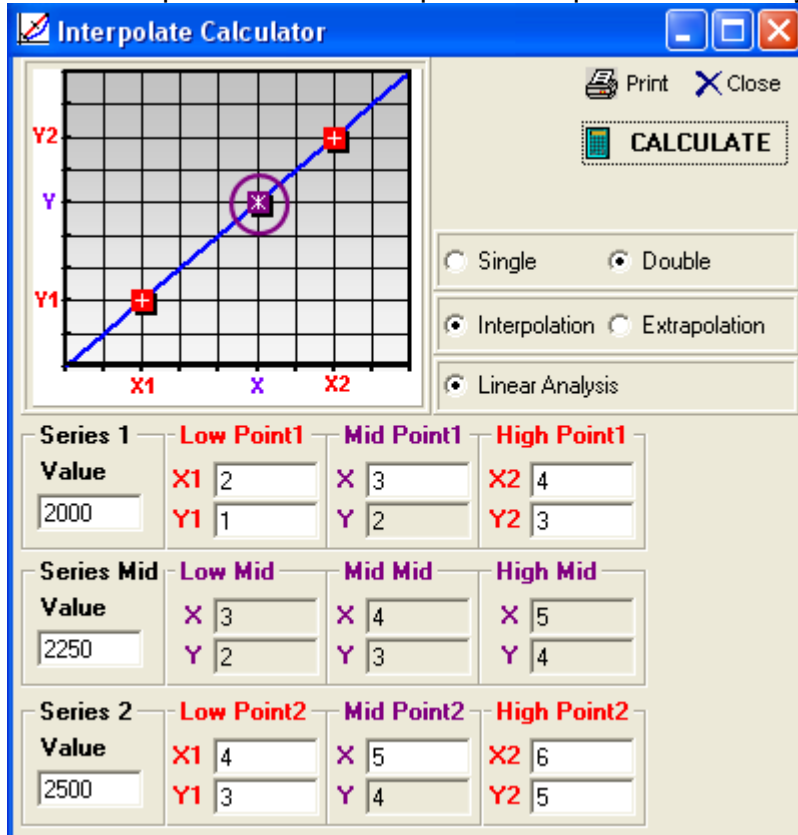
Ability to add user defined "ToolBox" Programs under menu item tools!!

Now you can ADD your other Engineering Tools to the Psychrometric Analysis menu so you can access them easily and quickly!!



Single & Double Interpolation and Extrapolation Calculator!!

Now single and even double Interpolation and Extrapolation is performed easily and quickly!!



Interpolate Calculator

Print Close

CALCULATE

☐ Single ☒ Double

☒ Interpolation ☐ Extrapolation

☒ Linear Analysis

Series 1

	Low Point1	Mid Point1	High Point1
Value	X1 2	X 3	X2 4
	Y1 1	Y 2	Y2 3

Series Mid

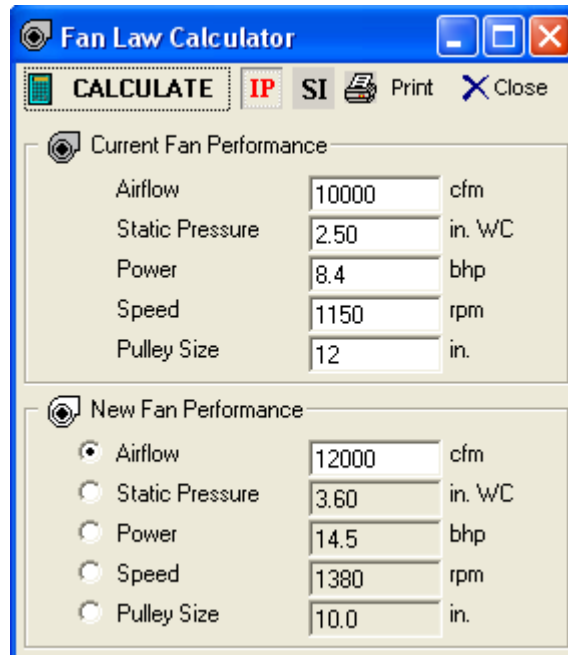
	Low Mid	Mid Mid	High Mid
Value	X 3	X 4	X 5
	Y 2	Y 3	Y 4

Series 2

	Low Point2	Mid Point2	High Point2
Value	X1 4	X 5	X2 6
	Y1 3	Y 4	Y2 5

Fan Law Calculator!!

Now when you're estimating fan motor heat for an unknown condition, you can quickly calculate the new power and heat required!!



Fan Law Calculator

CALCULATE IP SI Print Close

☒ Current Fan Performance

Airflow	10000	cfm
Static Pressure	2.50	in. WC
Power	8.4	bhp
Speed	1150	rpm
Pulley Size	12	in.

☒ New Fan Performance

<input checked="" type="radio"/> Airflow	12000	cfm
<input type="radio"/> Static Pressure	3.60	in. WC
<input type="radio"/> Power	14.5	bhp
<input type="radio"/> Speed	1380	rpm
<input type="radio"/> Pulley Size	10.0	in.

Duct Sizing Calculator!!

Now when you need to estimate duct design static pressures for fan performance, required motor power and motor heat, you can use this tool to quickly determine duct pressure drops!!

Duct Designer

CALCULATE **IP** **SI** **Print** **Close**

Air Condition

Airflow cfm

☒ STD Air ☐ ACTUAL Air

Density lb/cu.ft.

Duct Material

Roughness Factor ft

Rectangular Duct

Side 1 in. Side 2 in. Duct Length ft

Equal Diameter in. Area sq.ft. Velocity ft/min

Pressure Drop in.WC/100ft Total Pressure Drop in.WC

Round Duct

Diameter in. Duct Length ft

Area sq.ft. Velocity ft/min

Pressure Drop in.WC/100ft Total Pressure Drop in.WC

Oval Duct

Side 1 in. Side 2 in. Duct Length ft

Equal Diameter in. Area sq.ft. Velocity ft/min

Pressure Drop in.WC/100ft Total Pressure Drop in.WC

Financial Loan / Payment Calculator!!

Great for when you need to quickly estimate a payment or generate an amortization table!

LoanCalc

Loan Amount

160000

Percent Down

10

%

Maximum Years

30

Minimum Years

30

Max Interest Rate

8.0

%

Min Interest Rate

4.0

%

Show Payments

Copy

Show Amortization Table

Print

Payment	Principal Paid	Interest Paid
\$1,174.02		
1	\$107.35	\$1,066.67
2	\$108.07	\$1,065.95
3	\$108.79	\$1,065.23
4	\$109.51	\$1,064.51
5	\$110.24	\$1,063.78
6	\$110.98	\$1,063.04
7	\$111.72	\$1,062.30
8	\$112.46	\$1,061.56
9	\$113.21	\$1,060.81
10	\$113.97	\$1,060.05

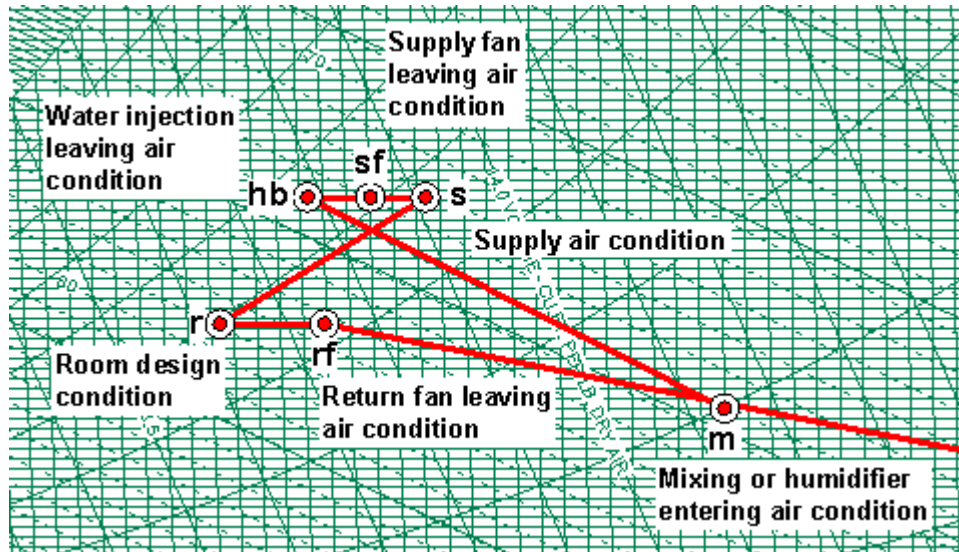
Complete State Point & Process Report!!

Complete state point and process report with the ability to copy EITHER the report IMAGE or the DATA to the clipboard so you can paste it right into your proposals, presentations or the data into spreadsheets!!

STATE POINT & PROCESS REPORT										
Report Date: Saturday, June 12, 2004 Project Information: Altitude: 0 (Feet) Barometric Pressure: 29.921 (In.Hg) Atmospheric Pressure: 14.696 (psia)						Prepared By: Robert Hanna Company: Hands Down Software Phone: (405) 844-6314 Fax: (405) 844-6314 email: sales@handsdownsoftware.com				
1. RA										
STATE POINT DATA										
Air Flow (Standard) (cfm)	Dry Bulb (°F)	Wet Bulb (°F)	Relative Humidity (%)	Humidity Ratio (lb/lb)	Specific Volume (cu.ft./lb)	Enthalpy (Btu/lb)	Dew Point (°F)	Density (lb/cu.ft.)	Vapor Pressure (in.Hg)	Absolute Humidity (gr/lb)
1.000	75.000	63.940	55.0	0.01022	13.695	29.181	57.7592	0.0729	0.4817	5.222
2. DH										
STATE POINT DATA										
Air Flow (Standard) (cfm)	Dry Bulb (°F)	Wet Bulb (°F)	Relative Humidity (%)	Humidity Ratio (lb/lb)	Specific Volume (cu.ft./lb)	Enthalpy (Btu/lb)	Dew Point (°F)	Density (lb/cu.ft.)	Vapor Pressure (in.Hg)	Absolute Humidity (gr/lb)
1.000	90.000	63.940	22.8	0.00678	14.003	29.057	45.7887	0.0713	0.3215	3.390
Process: Desiccant Dehumidification										
Start Point Name	Total Energy (Btu/hr)	Sensible Energy (Btu/hr)	Latent Energy (Btu/hr)	Dehumid- ification (lb/hr)	Sensible Heat Ratio	Enthalpy/ Humidity Ratio (Btu/lb / lb/lb)	Sensible Energy Per Dehumidification (Btu/lb)			
RA	-514	16,403	-16,917	-15.5	-31.912	33	-1.0511			
3. SC										
STATE POINT DATA										
Air Flow (Standard) (cfm)	Dry Bulb (°F)	Wet Bulb (°F)	Relative Humidity (%)	Humidity Ratio (lb/lb)	Specific Volume (cu.ft./lb)	Enthalpy (Btu/lb)	Dew Point (°F)	Density (lb/cu.ft.)	Vapor Pressure (in.Hg)	Absolute Humidity (gr/lb)
1.000	85.000	60.449	77.4	0.01622	13.439	26.735	57.7592	0.0743	0.4517	5.322
Process: Sensible Cooling										
Start Point Name	Total Cooling (tons)	Total Energy (Btu/hr)	Sensible Energy (Btu/hr)	Latent Energy (Btu/hr)	Moisture Difference (lb/hr)	Sensible Heat Ratio	Enthalpy/ Humidity Ratio (Btu/lb / lb/lb)			
RA	-0.9	-11,005	-11,005	0	0.0	1.000	N/A			
4. SH										
STATE POINT DATA										
Air Flow (Standard) (cfm)	Dry Bulb (°F)	Wet Bulb (°F)	Relative Humidity (%)	Humidity Ratio (lb/lb)	Specific Volume (cu.ft./lb)	Enthalpy (Btu/lb)	Dew Point (°F)	Density (lb/cu.ft.)	Vapor Pressure (in.Hg)	Absolute Humidity (gr/lb)
1.000	90.000	66.746	33.8	0.01022	14.079	32.846	57.7592	0.0710	0.4817	5.080
Process: Sensible Heating										
Start Point Name	Total Heating (tons)	Total Energy (Btu/hr)	Sensible Energy (Btu/hr)	Latent Energy (Btu/hr)	Moisture Difference (lb/hr)	Sensible Heat Ratio	Enthalpy/ Humidity Ratio (Btu/lb / lb/lb)			
RA	1.4	16,506	16,506	0	0.0	1.000	N/A			
5. CC										
STATE POINT DATA										
Air Flow (Standard) (cfm)	Dry Bulb (°F)	Wet Bulb (°F)	Relative Humidity (%)	Humidity Ratio (lb/lb)	Specific Volume (cu.ft./lb)	Enthalpy (Btu/lb)	Dew Point (°F)	Density (lb/cu.ft.)	Vapor Pressure (in.Hg)	Absolute Humidity (gr/lb)
1.000	55.000	54.800	98.8	0.00912	13.160	23.097	54.6642	0.0759	0.4306	4.850
Process: Cooling Coil										
Start Point Name	Total Cooling (tons)	Total Energy (Btu/hr)	Sensible Energy (Btu/hr)	Latent Energy (Btu/hr)	Dehumidification (lb/hr)	Sensible Heat Ratio	Enthalpy/ Humidity Ratio (Btu/lb / lb/lb)			
RA	-2.3	-27,379	-21,965	-5,414	-4.9	0.802	5.533			
6. EC										
STATE POINT DATA										
Air Flow (Standard) (cfm)	Dry Bulb (°F)	Wet Bulb (°F)	Relative Humidity (%)	Humidity Ratio (lb/lb)	Specific Volume (cu.ft./lb)	Enthalpy (Btu/lb)	Dew Point (°F)	Density (lb/cu.ft.)	Vapor Pressure (in.Hg)	Absolute Humidity (gr/lb)
1.000	85.000	63.940	94.5	0.01253	13.488	29.254	63.9922	0.0741	0.5885	6.503
Process: Evaporative Cooling										

Complete Project Information & Note Control!!

Complete project information and note capabilities!! Notes are individually controlled allowing for font, color, border, background, etc to all be specific to each note. Complete Drag-n-drop functionality as well as new-edit-delete note management!!



Complete User Data Control for Reports and Graphs!!

User information and auto note display capability!! User information is added only once and is automatically available for displaying on both the chart and/or the state point and process report!!

The image shows a "User Information" dialog box and a report header. The dialog box contains the following fields:

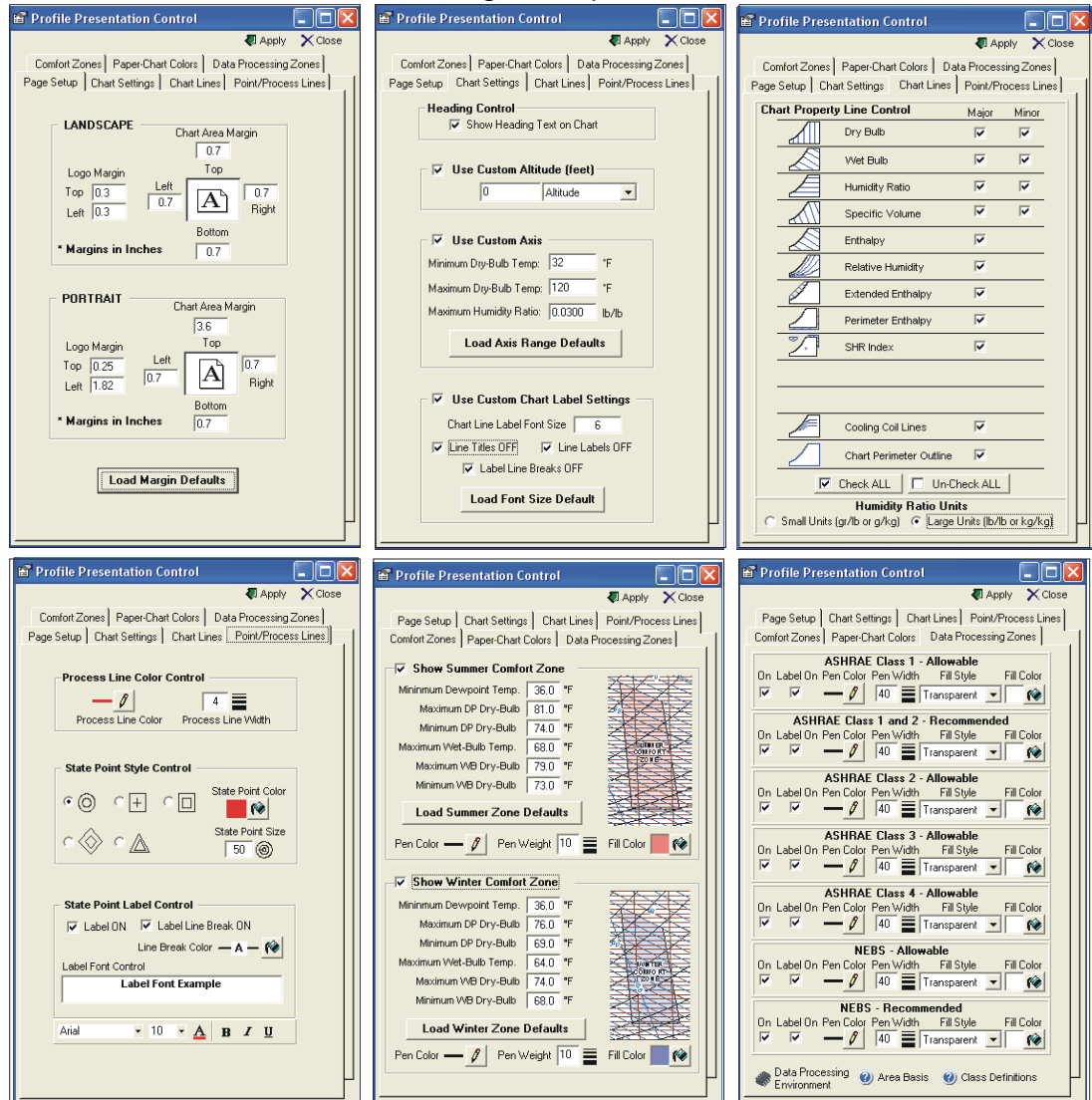
- ☐ Always ADD to Projects on Open
- ☒ Show on report
-
- User Name: Robert Hanna
- Company Name: Hands Down Software
- Telephone No.: (405) 844-6314
- Fax No.: (405) 844-6314
- email address: sales@handsdownsoftware.com

The report header, located on the right, contains the following information:

Prepared By:
 Name: Robert Hanna
 Company: Hands Down Software
 Tel: (405) 844-6314
 Fax: (405) 844-6314
 email: sales@handsdownsoftware.com
 Date: 6/12/2004

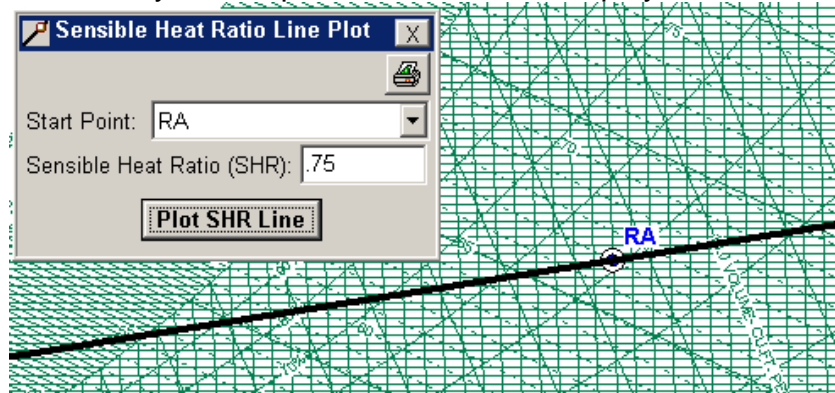
Complete Chart Presentation Control!!

Complete Chart control including virtually any Altitude or Pressure, Dry-Bulb and Humidity Ratio Axis Limit Control, turning Lines ON & OFF, Process line color and width, state point icon and size, state point label font control, Comfort & Data Center Zones, Page Setup and more!!



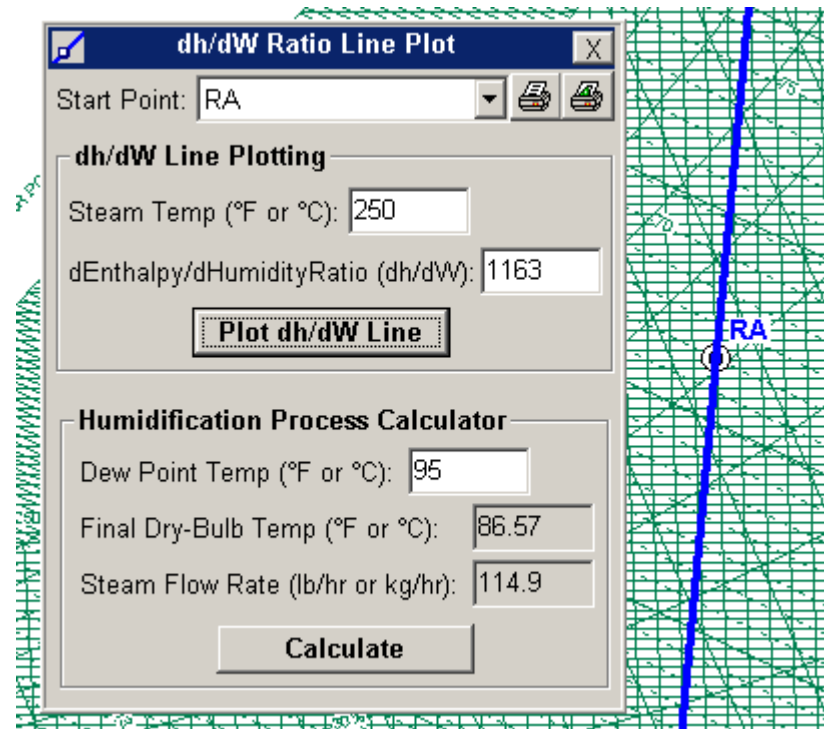
Sensible Heat Ratio Line Plotting!!

Sensible Heat Ratio Line Plotting is available with one simple button click!! Type the desired SHR and click the button and instantly, the requested SHR line is displayed on the chart!!



Humidification Delta-Enthalpy / Delta-Humidity Ratio Line Plotting!!

Humidification Delta-Enthalpy / Delta-Humidity Ratio Line Plotting is available with one simple button click!! Steam Flow rate is automatically calculated based on desired Final Dew Point Temperature!!



Complete State-Point and System Process Analysis Control!!

Complete State-Point and System Process Analysis capable. Process modeling includes AIR MIXING, COOLING COIL, EVAPORATIVE COOLING, DESICCANT DEHUMIDIFICATION, HUMIDIFICATION and SENSIBLE HEATING & COOLING!! All processes can either have END POINT specified, CALCULATING PROCESS DATA or PROCESS DATA specified, CALCULATING END POINT result!

Psychrometric Processes

Apply Add Point Climatic Data... Delete Print Help

POINT	LABEL	AIR FLOW	UOM	PROCESS	GIVEN
RA	AR	1000	STD	Add State Point	POINT
DH	AR	1000	STD	Desiccant Dehumidify	POINT
SC	AR	1000	STD	Sensible Cooling	POINT
SH	AR	1000	STD	Sensible Heating	ENERGY
CC	AR	1000	STD	Cooling Coil	POINT
EC	AR	1000	STD	Evaporative Cooling	POINT
HH	AR	1000	STD	Humidification and Heating	POINT
CS	AR	1000	STD	Connect State Points	POINT
MIX	AR	2000	STD	Air Mixing	POINT

Start Point		Process		Current Point	
RA		Sensible Heating		DB 89.999	
				WV 0.010217	
Air Flow	1000	<input type="checkbox"/> Total Heating	1.4	Air Flow	1000
DB	75.000	<input type="checkbox"/> Total Energy	16,506	DB	89.999
WB	63.940	<input checked="" type="checkbox"/> Sensible Energy	16,506	WB	68.746
RH	55.0	<input type="checkbox"/> Latent Energy	0	RH	33.8
W	0.01022	<input type="checkbox"/> Moisture Difference	0.0	W	0.01022
v	13.695	<input type="checkbox"/> Sensible Heat Ratio	1.000	v	14.079
h	29.181	<input type="checkbox"/> Enthalpy/ Humidity Ratio	N/A	h	32.849
DP	57.759			DP	57.759
d	0.0738			d	0.0718
vp	0.4817			vp	0.4817
AW	5.222			AW	5.080

Complete IP & SI Unit of Measure Control with ONE Button Click!!

All Charts, state-points and process data are converted automatically between **IP and/or SI** with the click of a button!!

PSYCHROMETRIC CHART

Normal Temperature

I-P Units

SEA LEVEL

BAROMETRIC PRESSURE: 29.921 in. HG



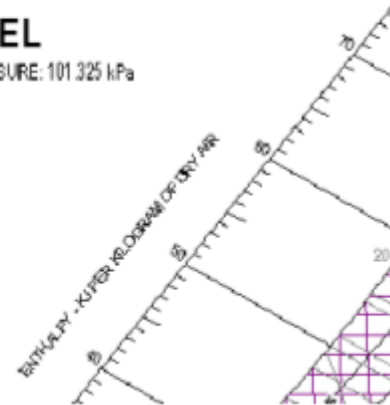
PSYCHROMETRIC CHART

Normal Temperature

SI Units

SEA LEVEL

BAROMETRIC PRESSURE: 101.325 kPa



Save Charts and Report as PDF Files that can be easily shared or emailed!!

Ability to export chart and reports out in PDF format automatically!!



Select any of (10) Different Languages for Charts and Reports!!

Automatically convert between **(10) different Languages** just by Clicking a button!!



PSYCHROMETRIC DIAGRAMME

La Température Normale
SI Unités

NIVEAU DE LA MER

PRESSION BAROMÉTRIQUE: 101.325 kPa



PSYCHROMETRIC CARTA

Temperatura Normal
SI Unidades

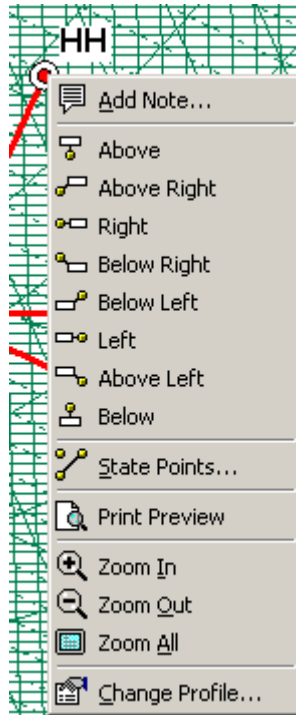
NIVEL DEL MAR

PRESIÓN BAROMÉTRICA: 101.325 kPa



Easy-to-Use Right-Click Pop-Up Menu Control!!

Right-Click Pop-Up menus allow for easy control of the chart whether it's moving state-point labels or managing chart notes!! Left Double-Click automatically ZOOMS-IN and Right Double-Click automatically ZOOMS-OUT. Hold the left bottom down and Drag allows you FULL PANNING of the chart!!



Complete Stand Alone Psychrometric Property Calculator!!

Complete Psychrometric Calculator with File-Open-Save capabilities and outputs in either IP or SI units!!

Psychrometric Calculator - New Project

SI

	Description	Dry Bulb (*F)	Wet Bulb (*F)	Relative Humidity (%)	Humidity Ratio (gr/lb)	Humidity Ratio (lb/lb)	Specific Volume (cu.ft/lb)	Enthalpy (Btu/lb)	Dew Point (*F)	Density (lb/cu.ft)	Vapor Pressure (in. Hg)	Abs. Humidity (gr)
Altitude	0											
Barometric Pressure	29.921											
Atmospheric Pressure	14.696											
Dry Bulb Temp	55	95.000	78.000	47.294	0.01686	0.00000	14.3564	41.3955	71.800	0.070850	0.78631	
Wet Bulb Temp	54.8	80.000	67.000	51.140	0.01123	0.00000	13.8453	31.5098	60.347	0.073047	0.52840	
Relative Humidity	98.784	55.000	54.800	98.784	0.00912	0.00000	13.1600	23.0967	54.664	0.076687	0.43061	
Humidity Ratio	0.00912											
Specific Volume	13.1600											
Enthalpy	23.0967											
Dew Point Temp	54.664											
Density	0.076687											
Vapor Pressure	0.43061											
Abs. Humidity	0.00069											
Parts Per Million by Weight	9,117											
Parts Per Million by Volume	14,658											

Complete World-Wide Climatic Outside Air Design Data!!

Complete Climatic Outside Air Design Data for over 1,000 cities throughout the WORLD for **either IP or SI units!!**

Climatic Data - ASHRAE 1997 Fundamentals

☒ **COOLING** USA 676 Elevation, Feet
 ☒ **HEATING** Oklahoma 36.2 North Latitude
 ☒ **WIND** Tulsa 95.9 West Longitude
 ☒ English (IP)
 ☐ Metric (SI)

SUMMER COOLING		DB °F	MWB °F	°F wb	WB °F	MDB °F	°F db	DP °F	MDB °F	°F db
0.4%	100	76		76.00	79	92	92.00	76	87	87.00
1%	97	76		76.00	78	92	92.00	74	85	85.00
2%	94	75		75.00	77	90	90.00	73	84	84.00

Average Annual Max. DB °F 103
 Std. Dev. °F 4
 Mean Daily Range DB °F 19

WINTER HEATING		DB °F	RH %	°F wb	Coldest Month	WS mph	MCDB °F	Average Annual Min.	DB °F	Std. Dev. °F
99.6%	9	50		6.72	0.4%	24	46			
99%	14	50		11.23	1%	22	40		2	6

WIND
 Coincident with 0.4% DB (cooling) MCWS 12 mph PWD 180 deg.
 Coincident with 99.6% DB (heating) MCWS 11 mph PWD 360 deg.
 Annual Design Values 1% 25 mph 2% 23 mph 5% 21 mph

Cooling Coil Design Calculator!!

Complete Cooling Coil Leaving air condition calculator!!! Automatically calculate the Leaving air temperature or the airflow for cooling coils!!

Cooling Coil Design Calculator

Calculate Apply Print Close

Room (Zone) RA			Load Data (select any two)		
Airflow	10,000	SCFM	<input checked="" type="checkbox"/> Total Heat	375000	Btu/hr
Dry-Bulb Temp	80.00	°F	<input type="checkbox"/> Sensible Heat	270000	Btu/hr
Humidity Ratio	0.01123	lb/lb	<input type="checkbox"/> Latent Heat	105000	Btu/hr
Enthalpy	31.51	Btu/lb	<input checked="" type="checkbox"/> SHR	.72	Qs/Qt
Leaving Coil CC			Leaving Coil Condition Apply		
<input checked="" type="radio"/> Airflow (use)	10,000	SCFM	Airflow	10,000	SCFM
<input type="radio"/> Dry-Bulb (use)	55.00	°F	Dry-Bulb Temp	55.414	°F
Humidity Ratio	0.00904	lb/lb	Humidity Ratio	0.00910	lb/lb
Enthalpy	23.02	Btu/lb	Enthalpy	23.18	Btu/lb

Cooling Coil Design Calculator

Calculate Apply Print Close

Room (Zone) RA			Load Data (select any two)		
Airflow	10,000	SCFM	<input checked="" type="checkbox"/> Total Heat	375000	Btu/hr
Dry-Bulb Temp	80.00	°F	<input type="checkbox"/> Sensible Heat	270000	Btu/hr
Humidity Ratio	0.01123	lb/lb	<input type="checkbox"/> Latent Heat	105000	Btu/hr
Enthalpy	31.51	Btu/lb	<input checked="" type="checkbox"/> SHR	.72	Qs/Qt
Leaving Coil CC			Leaving Coil Condition Apply		
<input type="radio"/> Airflow (use)	10,000	SCFM	Airflow	9,812	SCFM
<input checked="" type="radio"/> Dry-Bulb (use)	55.00	°F	Dry-Bulb Temp	55.00	°F
Humidity Ratio	0.00904	lb/lb	Humidity Ratio	0.00904	lb/lb
Enthalpy	23.02	Btu/lb	Enthalpy	23.02	Btu/lb

Complete Air Collection Calculator!!

Integral Air Collection Calculator!! Simply click on the combo box drop downs and select the state points desired for collection, and with one "Calculate =>" button click, your system collection point is automatically displayed, available to be added to your system, chart and report!!

Air Collection Calculator

Print Close

Selected Point	Label	Airflow	Dry-Bulb Temp	Humidity Ratio	Enthalpy
1	RA	1,000 SCFM	75.00 °F	0.01022 lb/lb	29.18 Btu/lb
2	DH	1,000 SCFM	90.00 °F	0.00678 lb/lb	29.07 Btu/lb
3	CC	1,000 SCFM	55.00 °F	0.00912 lb/lb	23.10 Btu/lb
4	EC	1,000 SCFM	65.00 °F	0.01253 lb/lb	29.26 Btu/lb
5	CS	1,000 SCFM	70.00 °F	0.00200 lb/lb	18.98 Btu/lb

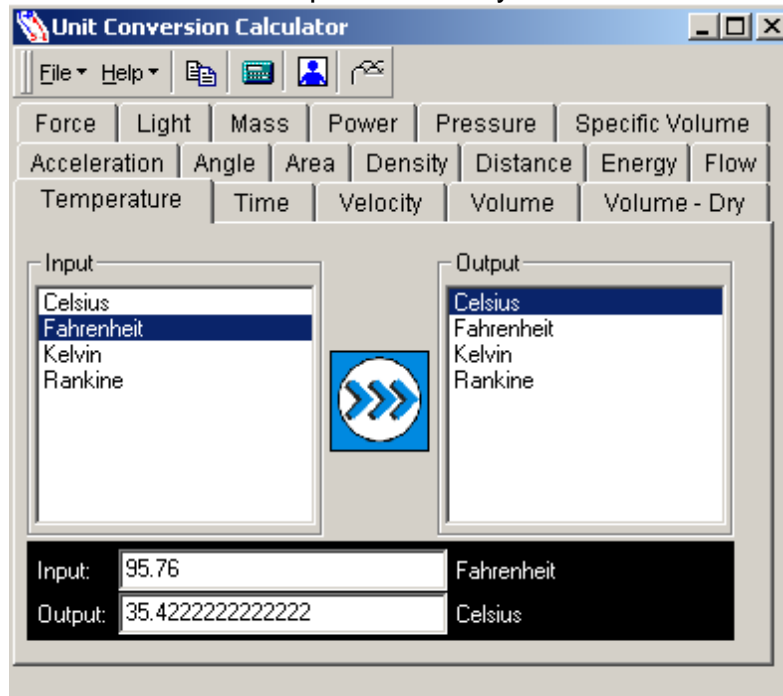
Calculate =>

Apply Point to Chart

Collection Point	Label	Airflow	Dry-Bulb Temp	Humidity Ratio	Enthalpy
Point Label Here		5,000 SCFM	71.00 °F	0.00813 lb/lb	25.92 Btu/lb

Stand Alone Universal Unit of Measure Conversion Calculator!!

Complete unit of conversion calculator for quick and easy IP<>SI unit conversions!!



Complete Data Exchange Capabilities with Microsoft Excel, Word, etc!!

Complete Data Exchange Capabilities!! You can export data, charts and reports either by Edit-Copy copying to the clip board, or by automatically exporting out to a PDF file!!

Importing of Data is accomplished with comma delimited “.csv” files which can easily be generated with any text editor or spreadsheet program such as Microsoft Excel!!!

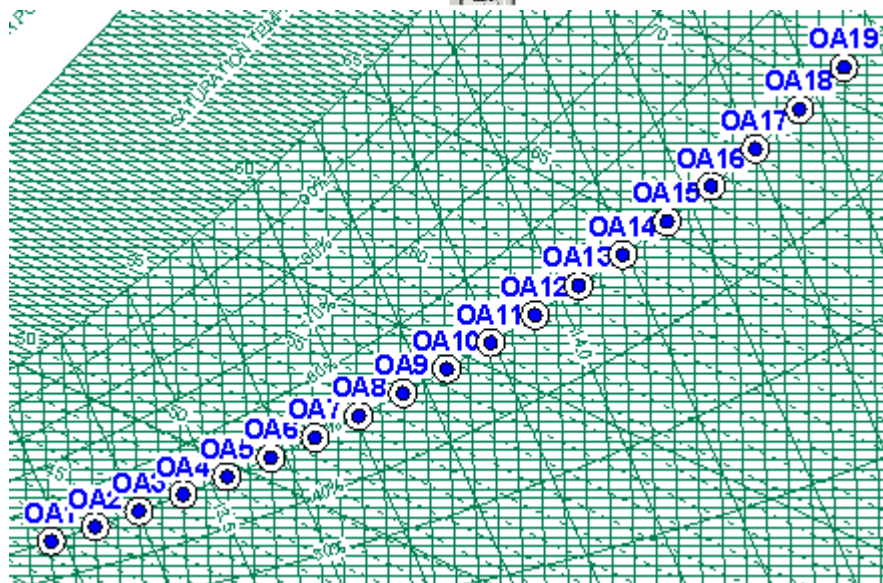
Microsoft Excel - HDPsyChart Points.csv

	A	B	C	D	E	F	G	H
1	ALTITUDE	750						
2	LABEL	OA1	CFM	2000	DB	50	RH	50
3	LABEL	OA2	CFM	2002	DB	52	RH	50
4	LABEL	OA3	CFM	2004	DB	54	RH	50
5	LABEL	OA4	CFM	2006	DB	56	RH	50
6	LABEL	OA5	CFM	2008	DB	58	RH	50
7	LABEL	OA6	CFM	2010	DB	60	RH	50

HDPsyChart Points.csv @ C:\Hands Down Software\HDP

```

ALTITUDE, 750,
LABEL, OA1, CFM, 2000, DB, 50, RH, 50
LABEL, OA2, CFM, 2002, DB, 52, RH, 50
LABEL, OA3, CFM, 2004, DB, 54, RH, 50
LABEL, OA4, CFM, 2006, DB, 56, RH, 50
LABEL, OA5, CFM, 2008, DB, 58, RH, 50
LABEL, OA6, CFM, 2010, DB, 60, RH, 50
LABEL, OA7, CFM, 2012, DB, 62, RH, 50
LABEL, OA8, CFM, 2014, DB, 64, RH, 50
LABEL, OA9, CFM, 2016, DB, 66, RH, 50
LABEL, OA10, CFM, 2018, DB, 68, RH, 50
LABEL, OA11, CFM, 2020, DB, 70, RH, 50
LABEL, OA12, CFM, 2022, DB, 72, RH, 50
LABEL, OA13, CFM, 2024, DB, 74, RH, 50
LABEL, OA14, CFM, 2026, DB, 76, RH, 50
LABEL, OA15, CFM, 2028, DB, 78, RH, 50
LABEL, OA16, CFM, 2030, DB, 80, RH, 50
LABEL, OA17, CFM, 2032, DB, 82, RH, 50
LABEL, OA18, CFM, 2034, DB, 84, RH, 50
LABEL, OA19, CFM, 2036, DB, 86, RH, 50
  
```



Motor Heat Calculator!!

Motor heat calculation is one button click away!! Simply type in the motor size (power) and the efficiency and instantly get the resulting sensible heat generated by the motor along with the corresponding temperature rise!!

Given Data		
Airflow	15000	cfm
Motor Size	10	hp
Efficiency	91.4	%

Sensible Air Heating		
Sensible Heat	27835	Btu/hr
Approx Temp Rise	1.71	°F

Steam Property Calculator!!

Complete Steam Property Calculator in both IP and SI units of measure!!!

Steam Properties		
Temperature	325	°F
Absolute Pressure	96.3000	psi
Absolute Pressure	196.0688	in. Hg
Specific Volume - vf	0.01771	cu.ft./lb
Specific Volume - vfg	4.598	cu.ft./lb
Specific Volume - vg	4.616	cu.ft./lb
Specific Enthalpy - hf	295.64	Btu/lb
Specific Enthalpy - hfg	891.47	Btu/lb
Specific Enthalpy - hg	1187.10	Btu/lb
Specific Entropy - sf	0.4706	Btu/lb · °F
Specific Entropy - sfg	1.1361	Btu/lb · °F
Specific Entropy - sg	1.6067	Btu/lb · °F



VERSION AND RELEASE HISTORY

VERSION 7 – NEW FEATURES (Release Aug-2011)

NEW PROCESS ANALYSIS CAPABILITIES

- **NEW! Updated ASHRAE Datacenter Zones to 2011 Thermal Guidelines!**
- **NEW! Updated ASHRAE 2010 Comfort Zones!**
- **NEW! Re-arrange or Re-order Points on the Fly with One Button Click!**
- **NEW! TMY2 & TMY3 Bin Weather USA Locations Added!**
- **NEW! Ability to Select Days Per Week for Bin Weather Data & Plots!**
- **NEW! HDCLimatic Updated to 2009 ASHRAE Fundamentals!**
- **NEW! Import Your Own Weather Data File Locations into the Chart!**
- **NEW! Optional Process Directional Arrowheads on Process Lines!**
- **NEW! Ability to Print-All or PDF-All (Psy+Flow+Report) into ONE File!**
- **NEW! Cooling Coil Apparatus Dew Point (ADP) Calculator!**
- **NEW! Cooling Coil Air Bypass Factor (ABF) Calculator!**
- **NEW! Improved Air Mixing Algorithm with both Mass and Energy Balance!**
- **NEW! User Program Quantity Expanded from 15 to 25 Programs!**

NEW TOOLS

- **NEW! Evaporative Cooling Detailed Performance Calculator!**
- **NEW! Electric Heater Detailed Performance Calculator!**
- **NEW! Indoor Pool Evaporation Calculator!**
- **NEW! SMACNA Air Leak Class Calculator!**
- **NEW! Center of Gravity - Corner Load Calculator!**
- **NEW! Pump Law Calculator!**
- **NEW! Complete Inter-Active Element Periodic Chart!**
- **NEW! System Efficiency COP-EER-kW/ton Calculator!**
- **NEW! Total & Sensible Wheel Energy Recovery Performance Calculator!**
- **NEW! Plate Heat Exchanger Energy Recovery Performance Calculator!**
- **NEW! Fluid & Mixture Thermo-Physical Property Calculator!**
- **NEW! Rectangle & Round Duct Fittings added to HDDuctDesigner!**
- **NEW! Duct Temp Gain/Loss Calculator added to HDDuctDesigner!**
- **NEW! Duct Pitot Airflow Calculator added to HDDuctDesigner!**

NEW PRESENTATION CONTROL

- **NEW! Ability to Turn Logo On & Off, for ASHRAE Meeting “Generic” Presentations!**
- **NEW! Customize Psychrometric Charts with your own Colors!**

- **NEW! Change Any Chart Property Lines to Any COLOR You Choose!**
- **NEW! Change Any Chart Property Lines to Any Line TYPE You Choose!**
- **NEW! Change Any Chart Property Lines to Any Line THICKNESS You Choose!**
- **NEW! Improved Toolbar and Menu Control Setup!**
- **NEW! User-Defined Custom Area Shading right on the Chart!**
- **NEW! Updated ASHRAE 2010 Comfort Zones!**
- **NEW! Optional Process Directional Arrowheads on Process Lines!**
- **NEW! Ability to Hide State Point Label on a Point-By-Point basis!!**
- **NEW! Draw Your Own Lines Anywhere You Want!**
- **NEW! Draw Your Own Ellipses Anywhere You Want!**
- **NEW! Draw Your Own Rectangles Anywhere You Want!**
- **NEW! Draw Your Own Circles Anywhere You Want!**
- **NEW! Insert Your Own Pictures Anywhere You Want!**

NEW LANGUAGES

- **NEW! Languages, Now with (19) Different Languages on Charts and Reports with one button click!**
- **NEW! Croatia Language!**
- **NEW! Czech Language!**
- **NEW! Finish Language!**
- **NEW! Latin Language!**
- **NEW! Polish Language!**
- **NEW! Turkish Language!**

NEW DATA EXCHANGE

- **NEW Point Color Control when Importing Data from Excel (*.csv) files!**
- **NEW Point Size Control when Importing Data from Excel (*.csv) files!**
- **NEW Process Line Color Control when Importing Data from Excel (*.csv) files!**
- **NEW Process Line Thickness Control when Importing Data from Excel (*.csv) files!**
- **NEW! Import Your Own Weather Data File Locations into the Chart!**

NEW NOTES

- **NEW! Improved Note Controls!**

GENERAL IMPROVEMENTS

- **NEW! Added Apparatus Dew Point (ADP) to Cooling Coil Leaving Air Calculator!**
- **NEW! Added Air Bypass Factor (ABF) to Cooling Coil Leaving Air Calculator!**
- **NEW! Point property toolbar display now includes units of measure!**
- **NEW! Thermal Comfort Terms Definition PDF Manual!**
- **NEW! Improved Air Density Property Calculation!**

- NEW! Many minor bugs and improvements implemented!

VERSION 6 – NEW FEATURES (Release Jan-2007)

NEW PROCESS ANALYSIS CAPABILITIES

- New Auto Flow Chart Diagram
- New Individual Process Line Color Control
- New Individual Point Color, Shape and Size Control
- New Winter "V" Air Mixing Capability with Condensation
- New Fog Region Property Display
- Constant *h*, *WB*, *HR*, *DB* Line Control

NEW TOOLS

- New Complete Thermal Comfort Calculator
- New Weather Data Plotting with Complete Global Weather Files
- New Weather Bin Shade Plotting with Complete Control
- New Global Weather Data Table Access
- New Weather Term Glossary
- New Wind Chill Factor Calculator
- New Climatic Data Printing Capability Added
- New Outside Air Estimator UPDATED to ASHRAE Standard 62-2004

NEW PRESENTATION CONTROL

- New Humidity Ratio Unit of Measure Control
- New Mouse Cross-Hair (Like CAD!!) or Target Control
- New Cooling Coil Performance Line Control
- New Page Color Control
- New Chart Area Color Control
- New ASHRAE Class 1 through 4 Datacenter Zones (allowed & recommended)
- New NEBS Datacenter Zones (allowed & recommended)
- New Black & White \Leftrightarrow Color Display & Print Control
- New Heading On/Off Control
- New Outline On/Off Control
- New Zoom Window Control

NEW TOOLBOX ANALYSIS

- New Ability to add user defined "ToolBox" Programs under menu item tools
- New Single & Double Interpolation Calculator
- New Fan Law Calculator
- New Duct Sizing Calculator
- New Loan Calculator

NEW ADDITIONAL CAPABILITIES

- New High Pressure Capability up to 100 PSI
- New Auto-Altitude Change with Climatic Location Selection
- New Fog Region Thermo-Physical Property Display

NEW LANGUAGES

- Now with (13) Different Languages on Charts and Reports with one button click
- New Greek Language
- New Japanese Language
- New Dutch Language

- *Improved Italian Language Updated*

NEW DATA EXCHANGE

- *New REAL-TIME Data Monitoring Capability*
- *New Process Control added to Data Import Function*
- *New Complete Weather Data Export to Excel or Text File*
- *SI units added to text file & Excel Data Exchange*
- *New Export-As Excel *.csv File*
- *New Export-As Notepad *.txt File*

NEW NOTES

- *Improved Note Control Update*

VERSION 5 – FEATURES (Release Jan-2005)

NEW PRESENTATION CONTROL

- *New Custom Axis Range Control*
- *New Chart Altitude or Pressure Control*
- *New Lines ON/OFF Control*
- *New Process Line Color & Width Control*
- *New State Point Icon, Size Control, Color & Label Control*
- *New Comfort Zone Area Plotting*
- *New User information Saved/Displayed on Charts & Reports*
- *New Page Setup Control*

NEW PROCESS ANALYSIS CAPABILITIES

- *New Sensible Heat Ratio Line Plotting*
- *New Humidification Delta-Enthalpy / Delta-Humidity Ratio Line Plotting*
- *New Partial Mixing of Airstreams Allows for Component Mixing Bypass*
- *New Cooling Coil Leaving Air Calculator / Auto-Plotting*
- *New Organized Toolbar Menu Setup*

NEW TOOLS

- *New Air Collection Calculator with Auto-Plotting*
- *New Integral IP \Leftrightarrow SI Unit of Measure Calculator*
- *New Fresh Air Estimator Updated to 62-2001*
- *New Motor Heat Calculator*
- *New Steam Property Calculator*

NEW ADDITIONAL CAPABILITIES

- *New Easy Auto-Create / Export PDF Files of Charts & Reports*

NEW LANGUAGES

- *Now (10) Languages including CHINESE*

NEW DATA EXCHANGE

- *New Complete Data Exchange Capabilities*

NEW NOTES

- *New Add/Edit/Delete Note Control with Drag-Drop Positioning*
- *New Project Information Control Displayed on Chart & Report*

VERSION 4 – FEATURES (Release Jan-2003)

NEW PRESENTATION CONTROL

- *New State Point and Process Report*
- *New Universal IP \Leftrightarrow SI Unit Control*

NEW PROCESS ANALYSIS CAPABILITIES

- *New Air Mixing Process*
- *New Cooling Coil Process (with REAL Cooling Coil Curves!)*
- *New Desiccant Dehumidification Process*
- *New Sensible Heating Process*
- *New Heating & Humidification Process*
- *New Evaporative Cooling Process*
- *New Sensible Only Cooling Process*

NEW TOOLS

- *New Stand Alone Psychrometric Calculator*
- *New Stand Alone World-Wide Climatic Data*
- *New Stand Alone Outside Air Calculator based on ASHRAE Standard 62-89*

NEW ADDITIONAL CAPABILITIES

- *New State Point Label Positioning Control*
- *New Zoom & Pan Control*
- *New Mouse-Move Thermo-Physical Property Display*

NEW LANGUAGES

- *New (7) Different Languages on Charts & Reports with one-button click*

NEW DATA EXCHANGE

- *New Ability to Copy Chart to Clipboard*
- *New Ability to Copy Report to Clipboard*