

# Process Ace Steam Properties

**Version 2.2.0**

*By Process Ace Software*

## Installation and User Guide



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[contact@processacesoftware.com](mailto:contact@processacesoftware.com)

or visit our web page at:

<http://www.processacesoftware.com/>

### Product Support

Process Ace Steam Properties comes with free support and updates for the life of the product. We currently offer support via email or through our Yahoo! user-group.

For email support, please contact us at:

[contact@processacesoftware.com](mailto:contact@processacesoftware.com)

Or, join our Yahoo! user-group via the following link:

[http://www.processacesoftware.com/contact\\_process\\_ace\\_software.html](http://www.processacesoftware.com/contact_process_ace_software.html)

**Note that the email address you provided when purchasing the product is the one used to notify you of updates. Contact us if your email address has changed to ensure the accuracy of our client list.**

## INSTALLATION ONTO YOUR Palm OS® DEVICE

### Files:

Using the installer that is included in the download file, the following files will be installed onto your PDA:

- MathLib.prc - Mathlib version 1.1
- NSBRuntime.prc - NS Basic Runtime version 4.4.1 (NOTE: This program requires version 4.4.1 or later to function properly)
- NSBSystemLib version 2.01 – Shared library for cut, copy, paste and undo commands (WARNING: Using an earlier version of NSBSystemLib will cause fatal errors on Palm Tungsten T3 devices)
- STEAM.prc – Steam properties calculation engine
- SteamProp.prc - Process Ace Steam Properties application

### Installation Procedure:

1. Create a file folder then copy all of the files from *StmPropReg.zip* to this new folder.
2. Click the install icon within Palm Desktop, select “Add” then locate the new folder that you created.
3. Add Mathlib, NSBRuntime, NSBSystemLib, STEAM and SteamProp to the installation list. Please note that MathLib, STEAM, NSBRuntime and NSBSystemLib **MUST** have “Handheld” specified as the “Install To:” destination. ***Installing MathLib, STEAM, NSBRuntime or NSBSystemLib to an expansion card will cause a fatal error when you attempt to use the application.***
4. After choosing “Done”, press the HotSync® button on your cradle to install the files.
5. An icon labelled *SteamProp* will show up in the *All* and *Unfiled* categories.

## **PROGRAM INFORMATION AND LIMITATIONS**

This program has the following limitations:

1. Pressure must be between 0.0061 and 165.37 Bar (0.08865 and 2398.45 psia)
2. Temperature must be between 0.01 and 800 °C (32.022 and 1472 °F)

The ability to calculate outside of the above limits would add considerably to the size of the application (STEAM.prc).

Process Ace Steam Properties supports the number convention set by the country setting you have selected for your device. The country setting determines if a "," or a "." will be used for the decimal point.

## RUNNING THE APPLICATION

### Menu Bar

By tapping the form title at the top of the screen a number of menu selections appear. These are described below:

#### *Edit*

Edit	Options	Units	Help
Clear All		/N	
Undo		/U	
Cut		/X	
Copy		/C	
Paste		/P	
Select All		/S	
Graffiti Help		/G	
Keyboard		/K	

The following functions are available using the Edit menu item:

- Clear All – Clears all entries and results on the main form
- Undo – undo the last cut or paste operation
- Cut – standard cut operation
- Copy – copy selection
- Paste – paste the “cut” or “copy” selection
- Select All – will select the entire field that currently has the focus (or has been “tapped”)
- Graffiti® Help
- Keyboard (note: must have a flashing cursor in a data entry field for this to work)

#### *Options*

Edit	Options	Units	Help
	Preferences	/R	

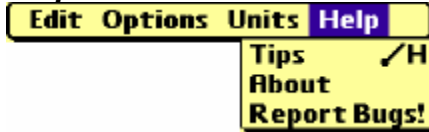
- Tap Preferences to toggle the splash screen on or off on start-up

#### *Units*

Edit	Options	Units	Help
		Bar, °C	
		kPa, °C	
		psia, °F	

- Choose from three different unit slates

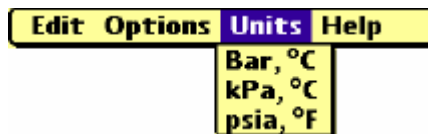
## Help



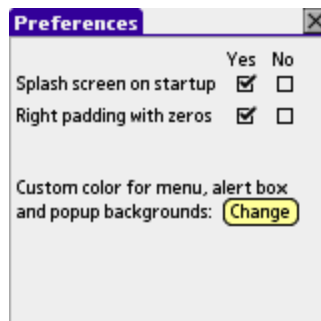
- Tips (built-in help)
- About
- Report Bugs!

## Initial Program Set-up

If you need to change the default unit set, tap the menu-bar once and select "Units". Select the combination of units that you desire from the drop-down list.



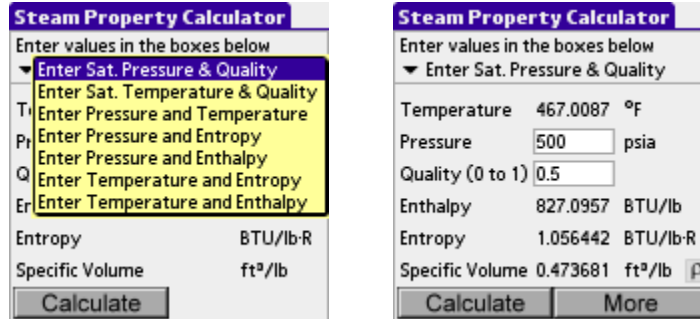
In addition to the above, a Preferences form is provided which allows you to enable or disable the splash screen on start-up, choose if you want to right pad results with zeros and select the color of menus, alert boxes, buttons and popups.



Tapping the X button at the upper right corner of the screen will return you to the previous form.

Main Form (displayed after program start-up)

On the main form choose your calculation "mode" and enter data to calculate properties for the mixed phase. This program supports seven calculation modes.



Tap the drop-down list-box on the main form and choose the calculation mode that you would like to use, i.e.:

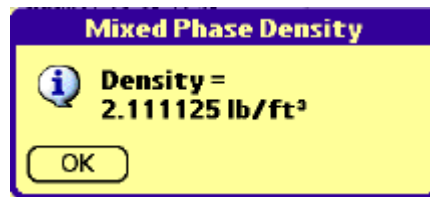
- Saturation pressure and quality
- Saturation temperature and quality
- Pressure and Temperature
- Pressure and Entropy
- Pressure and Enthalpy
- Temperature and Entropy
- Temperature and Enthalpy

Once the mode has been selected by using the dropdown list-box, simply enter appropriate values inside the boxes provided and tap the Calculate button. Depending on the calculation mode selected, the following results will be displayed on the main form:

- Temperature
- Pressure
- Phase (liquid or vapour)
- Quality
- Enthalpy
- Entropy
- Specific volume

Once the results appear a More button will appear in the lower right hand corner of the screen. Tapping this button will take you to the Phase Properties form, which provides details of the vapour and liquid phases (if two-phase).

Tap the “ $\rho$ ” button to the right of the specific volume result to display the mixed phase density.



### Phase Data Form

If you want to see additional properties for the vapour or liquid phases, tap the More button on the Main form to go to the Phase Data form.

A screenshot of a "Phase Data" window. The window title is "Phase Data" with a close button (X) on the right. The content is divided into two sections: "STEAM" and "WATER". The "STEAM" section is labeled "Sat'd @ 467.009 °F" and lists properties: Enthalpy (1204.67 BTU/lb), Specific Vol. (0.92762 ft³/lb), Viscosity (0.01728 centipoise), Thermal Cond. (0.02811 BTU/(h-ft²°F)), and Heat Capacity (0.85352 BTU/(lb-°F)). The "WATER" section lists properties: H<sub>vap</sub> (755.144 BTU/lb), Enthalpy (449.524 BTU/lb), Specific Vol. (0.01975 ft³/lb), Viscosity (0.10969 centipoise), Surface Ten. (28.0114 dyne/cm), and Heat Capacity (1.14263 BTU/(lb-°F)). Small "p" icons are visible next to the Specific Vol. values in both sections.

Phase	Property	Value	Units
STEAM	Sat'd @	467.009	°F
	Enthalpy	1204.67	BTU/lb
	Specific Vol.	0.92762	ft³/lb
	Viscosity	0.01728	centipoise
	Thermal Cond.	0.02811	BTU/(h-ft²°F)
Heat Capacity	0.85352	BTU/(lb-°F)	
WATER	H <sub>vap</sub>	755.144	BTU/lb
	Enthalpy	449.524	BTU/lb
	Specific Vol.	0.01975	ft³/lb
	Viscosity	0.10969	centipoise
	Surface Ten.	28.0114	dyne/cm
	Heat Capacity	1.14263	BTU/(lb-°F)

The Phase Data form displays saturation temperature along with:

- Enthalpy
- Specific volume
- Viscosity
- Thermal conductivity
- Heat capacity

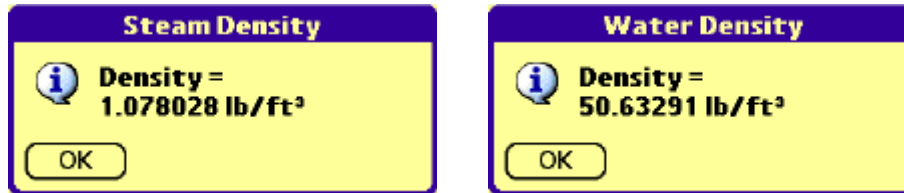
for the steam phase, and

- Enthalpy
- Specific volume
- Viscosity
- Surface tension
- Heat capacity

for the liquid water phase.

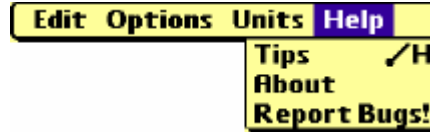
If the result is at the saturation conditions, the heat of vaporization is also displayed.

Tap the “ $\rho$ ” button to the right of the specific volume result for the steam or water phase to display the corresponding density.



Tapping the “X” button on the top right hand side of the Phase Data form returns you to the Main Form.

## Program Help



### ***Tips***

Tapping the menu-bar on each form and selecting Tips from the Help drop-down will take you to a help screen providing tips related to using your current form.

Please Note: A list of frequently asked questions (FAQ) for all of our applications can be found on our website:

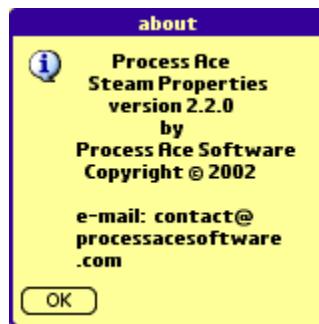
[www.processacesoftware.com](http://www.processacesoftware.com)

We also offer free support for all licensed users for the life of the product at:

[contact@processacesoftware.com](mailto:contact@processacesoftware.com)

### About

Tapping About pops up the following information form:



Tap "OK" to return to the program.

## **Graffiti® Shortcuts**

The following menu shortcuts are available for this product:

- /C – Copy
- /G - Graffiti® Help
- /H - Tips (built-in help files)
- /K - Keyboard
- /N – Clear All
- /P - Paste
- /R – Preferences
- /S – Select All
- /U - Undo
- /X – Cut

## **Using Hacks on your Palm OS® Device**

Hacks are applications that modify the functionality of the operating system. All of our applications are fully compatible with unmodified Palm OS®. However, if you are running a hack, you may experience problems. If you do, you must disable the hack before running our application.

## Troubleshooting Guide

### Problem

My Tungsten T3 crashes with a “Fatal” error when my device powers down with Process Ace Steam Properties running.

### Solution

Verify that you have NSBSystemLib version 2.01 and NSBRuntime version 4.4.1 installed on your device.

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I get a “Fatal” error:

- On start-up

or

- When the Splash Screen appears

or

- When I use a menu

These type of errors are due to one of the following:

1. A “hack” (i.e., some third party launcher programs) being installed on your device. These programs modify Palm OS, sometimes with unpredictable results.  
  
Process Ace Steam Properties will work properly with unmodified Palm OS. Disable the hack to verify if this is the problem.
2. NSBRuntime, NSBSystemLib, STEAM or MathLib being installed on a memory card instead of on the handheld itself. These files must be installed **ONLY** on the handheld.

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