Steamtables for Mathcad, v0.3

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appVersion(4) = "0.99.7691.4821"

Installation instructions

Installation is very simple, just put the 2 .dll files in the UserEFI
folder in the mathcad program folder
(ex. C:\Program Files\MathSoft\Mathcad 2001i Professional\UserEFI).
Mathcad automatically looks for plugins and loads them on startup.

I have tested this on Mathcad 2001i and Mathcad 14, so it should
probably work in any other version of mathcad, too.

This mathcad plugin makes use of XSteam, a Freeware Steam and water
properties library on the "International Association for Properties
of Water and Steam Industrial Formulation 1997 (IAPWS IF-97).
A full implementation of the IF-97 standard that provides very accurate
steam and water properties in ranges from 0-1000 bar and 0-2000°C for
use in process Engineering Industry.

Provided thermodynamic properties are:
- Temperature
- Pressure
- Enthalpy
- Specific volume
- Density
- Specific entropy

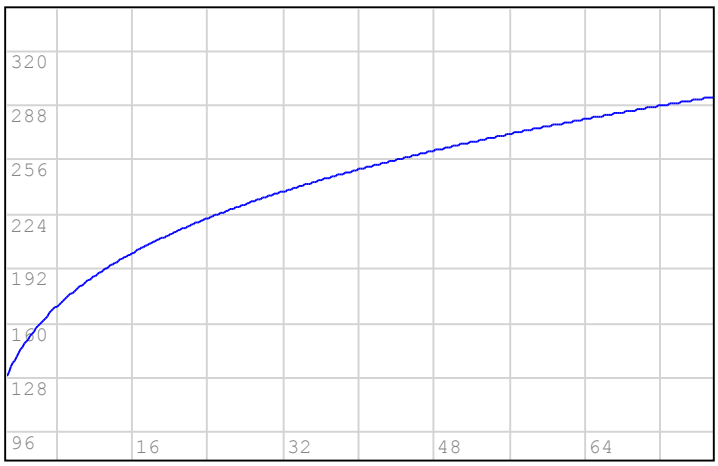
- Specific internal energy
- Specific isobaric heat capacity
- Specific isochoric heat capacity
- Speed of sound
- Viscosity
- Vapour fraction

All properties can be calculated with the inputs, p and T known,
p and h known, h and s known and some with pressure and density known.

An examples.mcd file is provided with the functions available
(or look on http://www.x-eng.com/XSteam_Information.htm for a extended
list of functions available from the xsteam library, although I haven't
implemented all of them, just the ones I required (I'm lazy, I know).

Just email me if you need any other functions from the xsteam library
I haven't implemented. Or just implement them yourself, the source code
is provided (written in Visual C++ 2005, I don't know if it will work
with any other compiler). I'll probably implement the rest of the
functions in future releases.

Saturation temperature at every pressure



Tsat_p(x)

All available functions in the XSteam DLL

1. Saturation temperature: Tsat_p(1)=99.61

2. Temperture as a function of pressure and enthalpy:
T_ph(1, 100)=23.84

3. Temperture as a function of pressure and entropy:
T_ps(1, 1)=73.71

4. Temperture as a function of enthalpy and entropy:
T_hs(100, 0.2)=13.85

5. Saturation pressure: psat_T(100)=1.01

6. Pressure as a function of h and s: p_hs(84, 0.296)=2.3

7. Pressure as a function of enthalpy and density:
p_hrho(2000, 5)=6.05

8. Saturated vapour enthalpy: hV_p(1)=2674.95

9. Saturated liquid enthalpy: hL_p(1)=417.44

10. Saturated vapour enthalpy: hV_T(100)=2725.47

11. Saturated liquid enthalpy: hL_T(100)=419.1

12. Entalpy as a function of pressure and temperature:
h_pT(1, 20)=84.01

13. Entalpy as a function of pressure and entropy:
h_ps(1, 1)=308.61

14. Entalpy as a function of pressure and vapour fraction:

```
h_px(1, 0.5)=1546.19
```

15. Entalpy as a function of temperature and vapour fraction:

```
h_Tx(100, 0.5)=1547.34
```

16. Entalpy as a function of pressure and density.
Observe for low temperatures (liquid) this equation has 2 solutions.
(Not valid!!)

```
h_prho(1, 2)=1082.77
```

17. Saturated vapour volume: `vV_p(1)=1.69`

18. Saturated liquid volume: `vL_p(1)=0`

19. Saturated vapour volume: `vV_T(100)=1.67`

20. Saturated liquid volume: `vL_T(1)=0`

21. Specific volume as a function of pressure and temperature:

```
v_pT(1, 100)=1.7
```

22. Specific volume as a function of pressure and enthalpy:

```
v_ph(1, 1)=0
```

23. Specific volume as a function of pressure and entropy:

```
v_ps(1, 1)=0
```

24. Saturated vapour density: `rhoV_p(1)=0.59`

25. Saturated liquid density: `rhoL_p(1)=958.64`

26. Saturated vapour density: `rhoV_T(100)=0.6`

27. Saturated liquid density: `rhoL_T(100)=958.35`

28. Density as a function of pressure and temperature:

```
rho_pT(1, 100)=0.59
```

29. Density as a function of pressure and enthalpy:

```
rho_ph(1, 1)=999.86
```

30. Density as a function of pressure and entropy:

```
rho_ps(1, 1)=975.62
```

31. Saturated vapour entropy: `sV_p(1)=7.36`

32. Saturated liquid entropy: `sL_p(1)=1.3`

33. Saturated vapour entropy: `sV_T(100)=7.35`

34. Saturated liquid entropy: `sL_T(100)=1.31`

35. Specific entropy as a function of pressure and temperature
(Returns saturated vapour entalpy if mixture:

`s_pT(1, 100)=7.36`

36. Specific entropy as a function of pressure and enthalpy:

`s_ph(1, 1)=0`