4. How to Use W-PROPATH

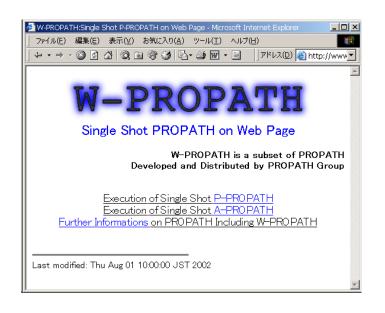
The URL of W-PROPATH is as follows.

http://www2.mech.nagasaki-u.ac.jp/PROPATH/

In this section, the words enclosed with the pair of square brackets means the menu item or clickable words in the W-PROPATH web page.

P-PROPATH on W-PROPATH

1. Access the above URL with your frames compatible web browser.

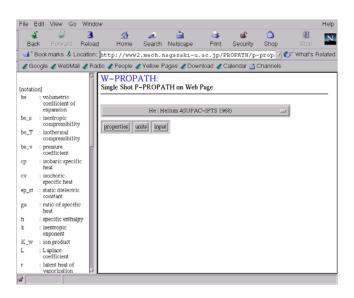


2. Set the "Character Set" to Western.

Example in the Linux Netscape browser

\$ Western (ISO-8859-1)
Western (ISO-8859-15)
Central European (ISO-8859-2)
Central European (Windows-1250)
Japanese (Auto-Detect)
Japanese (Shift_JIS)
Japanese (EUC-JP)
Traditional Chinese (Big5)
Traditional Chinese (EUC-TW)
Simplified Chinese (GB2312)
Korean (Auto-Detect)
Cyrillic (ISO-8859-5)
Cyrillic (KOI8–R)
Cyrillic (Windows-1251)
Cyrillic (CP-866)
Greek (ISO-8859-7)
Greek (Windows-1253)
Turkish (ISO-8859-9)
Unicode (UTF-8)
Unicode (UTF-7)
User-Defined
Set Default Character Set

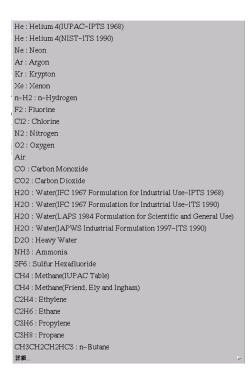
3. Click on [Execution of W-PROPATH]. The substance selection page is displayed.



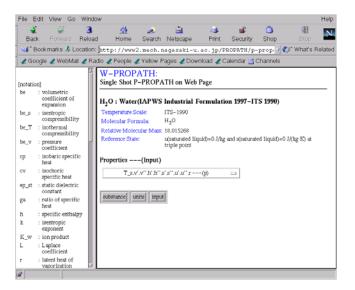
The nomenclature for W-PROPATH is shown in the left frame. Particular symbols are used in W-PROPATH such as "mu" for " μ ". Refer to the left frame when you find symbols you don't understand in the right frame.

You select a substance in the right frame. Clicking on the long horizontal bar, you get the substances pull-down list and you select a substance from the list. If you click on [Properties] or [Units], the properties selection page or the units selection page appears respectively. [Input(s)] leads you to the page for data input.

4. Select a substance from the pull-down list in the right frame.



5. Click on [Properties]. The properties selection page appears. You can select properties in the pull-down list. Clicking on [Substances] brings you back to the substance selection page.



6. Select a property, or properties, from the pull-down list.

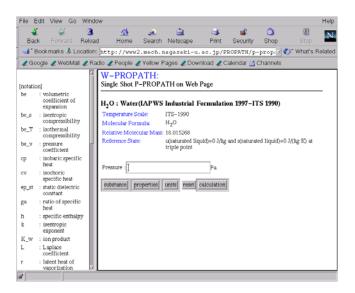
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T_s,v',v'',h',h'',s',s'',u',u'',r ---(p)
T_s,L,lam',lam'',mu',mu'' ---(p)
T_s,cp',cp'',cv'',ga'',Pr',Pr'',sig ---(p)
T_s,T_s',T_s'',T_lam,T_mel,T_m,T_sb ---(p)
P_s,v',v'',h',h'',s',s'',u',u'',r ---(T)
P_s,L,lam',lam'',mu',mu'' ---(T)
P_s,cp',cp'',cv'',ga'',Pr',Pr'',sig ---(T)
P_s,P_lam,P_mel ---(T)
v, h, s, u --- (p, T)
lam,mu,cp,cv,gam,Pr --- (p, T)
k,mu\_JT,K\_w,be,be\_s,be\_T,be\_v,ep\_st,w---(p,T)
T,x --- (p, h)
h,T,u,v,x --- (p, s)
x --- (p, u)
T,x --- (p, v)
h,s,u,v --- (p, x)
x --- (T, h)
x --- (T, s)
x --- (T, u)
x --- (T, v)
h,s,u,v --- (T, x)
cr,fc,trp
T90 --- (T68), T68 --- (T90)
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7. Click on [Units]. The units selection page appears. You can select one from listed units. Clicking on [defaults] resets all units to defaults.

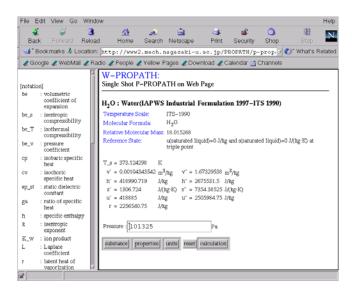
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📲 . E	Bookmarks 🎄 Li	ocation:	http://www2	.mech.r	nagasaki-u	.ac.jp/PE	ROPATH/p	-prop. 7 🕐	What's	Relate
🖊 Go	oogle 🥒 WebMa	il 🧶 Ra	idio 🥒 People 🦼	Yellow F	ages 🧶 Dov	vnload 🥒 Ca	alendar 📺	Channels		
notatio be	: volumetric	X	W-PROP		ATH on Web	Page				_
	coefficient of expansion		H2O : Water	IAPWS	Industrial	Formulatio	n 1997–I	ΓS 1990)		
e_s	: isentropic compressibilit	~	Temperature So Molecular Form		ITS-1990 H ₂ O					
e_T	: isothermal compressibilit		Relative Molec	ular Mass	18.015268					
v_s	: pressure coefficient		Reference State	c	u(saturated lis triple point	quid)=0 J/kg :	and s(satura	ted liquid)=0 J/((kg·K) at	
p	: isobaric specif heat	ic	Unit							
W.	: isochoric	- 81	Pressure(p)		Tempera	#ure(T)	Ent	halpy, Entrop5((h.s)	
p_st	specific heat : static dielectri		Pa 🗆		К 🗆			J/kg. J/(kg*l	K) :	
p=01	constant	·	Specific Volum	e(V)	Thermal	Conductivity	rílam.) Via	cosity(mu)		
a	: ratio of specifi heat	ic	m**3/kg =			n*K) =	(Pa*s 🗆		
	: specific enthal	ру	Surface Tension		Lanlasa	Coefficient(I		ic Velocity(w)		
	: isentropic exponent	- 84		a org)		- ·	· _		/	
C_w	: ion product	- 81	N/m 📼		m 🗆	-		n/s 🗆		
-	: Laplace coefficient		Joule-Thomson mu_JT)	Coefficie	nt(
	: latent heat of vaporization	X	K/Pa 🗆							
<i>a</i>	vaporization	<u>M</u> .,	К/Ра 🗆							

8. For example, the unit pull-down list for temperature looks as below. You can choose K(Kelvin), $^{\circ}C(Celsius)$, F(Fahrenheit) or R(Rankine).

9. Click on [Input]. The page for data input and calculation appears.

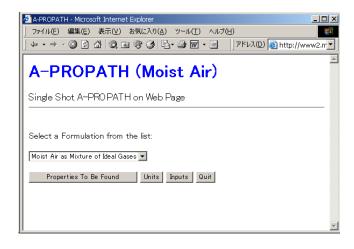


10. Input the required value from the server and click on [calculation]. Then the results page is then displayed.



A-PROPATH on W-PROPATH

1. Select [Execution of Single Shot A-PROPATH] in the first menu. The following display appears.



- [Select a formulation from the list:] Users can select a formulation for moist air. If users select [Moist Air as Mixture of Ideal Gases] in the list, properties of moist air are calculated assuming an ideal gas mixture. If users choose [Most air as Real fluid], moist air is treated as a real fluid.
- [Properties to be found] Users select calculated properties and specified properties in this menu. See the following description.
- [Units] This menu allows users to change the units of temperature and pressure. The unit of temperature is [K] or [°C], and that of pressure is [Pa] or [bar].
- [Inputs] Users specify a specified condition in this menu. See the following description.
- [Quit] This menu is used to return to the first menu.
- 2. Click [Properties to be found], the following display appears.

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t A-PROPATH o	n Web Page	Air)				
nvention]				
Dew Point Temper	ature	DS*	Degree of Saturation				
Enhancement Fact	or	H*	Specific Enthalpy				
Saturation Pressure of Pure Water		RH*	Relative Humidity				
Mole Fraction of Water Vapor		S*	Specific Entropy				
Dry-Bulb Temperature		V*	Specific Volume				
Wet-Bulb Tempera	ature	Х*	Humidity Ratio				
* stands for a character of one of A, B, C, D, E and F, and they represent the type of FUNCTIONs shown below:							
#A(P, T, WB) #B(P, T, DP) #C(P, T, RH)							
) #E(P, T, H) #F(P, X, H							
# stands for one or two alphabetical letters, such as DP, DS, H, RH, RW, S, T, V, WB and X. Select Properties from the list: DPA, RHA, DSA, RWA, XA, VA, HA, SA (P, T, WB) Type of Thermodynamic Formulation Units Inputs							
	t A-PROPATH o as Mixture of Id avention Dew Point Temper Enhancement Facto Saturation Pressure Mole Fraction of V Dry-Bulb Tempera a character of one of fs shown below: (7B) #B(P, T, DP)) #E(P, T, H) one or two alphabetic rties from the list:	t A-PROPATH on Web Page as Mixture of Ideal Gases as Mixture of Ideal Gases as Mixture of Ideal Gases as a second by the sec	t A-PROPATH on Web Page as Mixture of Ideal Gases as Mixture of Ideal Gases as Mixture of Ideal Gases as a second by the sec	as Mixture of Ideal Gases avention Dew Point Temperature DS* Degree of Saturation Enhancement Factor H* Specific Enthalpy Saturation Pressure of Pure Water RH* Relative Humidity Mole Fraction of Water Vapor S* Specific Entropy Dry-Bulb Temperature V* Specific Volume Wet-Bulb Temperature X* Humidity Ratio a character of one of A, B, C, D, E and F, and they represent the ty Is shown below: TB) #B(P, T, DP) #C(P, T, RH) D) #E(P, T, H) #F(P, X, H) Done or two alphabetical letters, such as DP, DS, H, RH, RW, S, T, rties from the list: DSA, RWA, XA, VA, HA, SA- (P, T, WE)			

Users select a group including calculated properties in the list [Select Properties from the list:]. For example, [WBC, DPC, DSC, RWC, XC, VC, HC, SC – (P, T, RH)] means that the functions of WBC, DPC, DSC, RWC, XC, VC, HC, and SC are calculated from specified P, T, and RH. All functions in A-PROPATH are named based on the rule tabulated in the table [Naming Convention].

3. If users have selected calculated properties and specified properties, users can proceed to [Inputs] menu. The following display appears.

🚈 A-PROPATH - Microsoft Internet Explorer					
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A-PROPATH (Moist Air)					
	- /				
Single Shot A-PROPATH on Web Page					
Moist Air as Mixture of Ideal Gases					
Moist All as Mixture of facta Gases					
Pressure: [Pa]					
Temperature: [K]					
Thermodynamic Wet-Bulb Temperature:	[K]				
Type of Thermodynamic Formulation	Properties To Be Found				
Units Calculation Quit					
	Y				

As shown above, if users have selected [WBC, DPC, DSC, RWC, XC, VC, HC, SC – (P, T, RH)] in the [Properties to be found], pressure, temperature, and relative humidity appear as specified values.

4. If users have completed specified values, users can click [Calculation]. Users can see the following display if the calculation has been terminated successfully.

🚈 A-PROPATH - Microsoft Internet	Explorer					
_ ファイル(E) 編集(E) 表示(⊻)	お気に入り(A) ツール(工) ヘルプ(日) 10					
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A-PROPATH (Moist Air) Single Shot A-PROPATH on Web Page						
Moist Air as Mixture of	Ideal Gases					
Wet-Bulb Temperature :						
Dew Point Temperature :	DP = 16.6998901 [C]					
Degree of Saturation :	Degree of Saturation : DS = 0.592247903 [-]					
Mole Fraction of Water Vapor : RW = 0.0190118086 [-]						
Humidity Ratio :	Humidity Ratio : X = 0.012054136 [kg/kgDA]					
Specific Volume :	V = 0.872441769 [m3/kgDA]					
Specific Enthalpy :	H = 55841.3398 [J/kgDA]					
Specific Entropy :	S = 205.737457 [J/kgDA K]					
Pressure: 1 [bar] Temperature: 25 [C] Relative Humidity: 0.6 [-] Type of Thermodynamic Formulation Properties To Be Found						
Type of Thermodynamic Formulation Properties To Be Found Units Calculation Quit						