Zittau/Goerlitz University of Applied Sciences
Department of Technical Thermodynamics
www.thermodynamic-property-libraries.com

Property Libraries for Working Fluids for Calculating Heat Cycles, Boilers, Turbines, Heat Pumps and Refrigeration Processes

Kretzschmar, H.-J., Stoecker, I., Kunick, M., and Herrmann, S.

Humid Combustion-Gas Mixtures

Calculation as ideal mixture of the real fluids:

CO_2	from Span at al.	O_2	from Schmidt et al.
H_2O	from IAPWS-95	Ar	from Span et al.
N_2	from Jacobsen et al.		

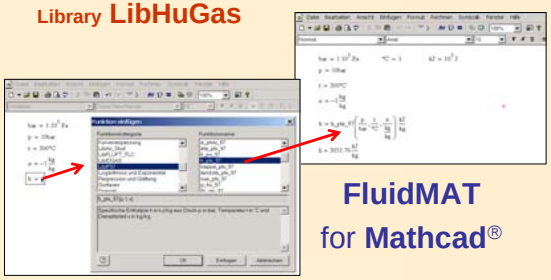
and of the ideal Gases:

SO_2	from Bücker at al.	Ne	from Bücker at al.
CO	from Bücker at al.		

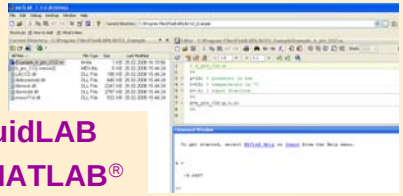
at high pressures and high water contents

Consideration of
- Condensation of steam
- Dissociation and Pointing

Library **LibHuGas**



FluidMAT for **Mathcad®**



FluidLAB for **MATLAB®**

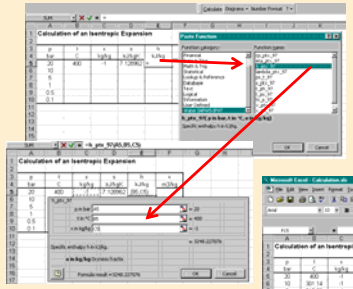
Humid Air

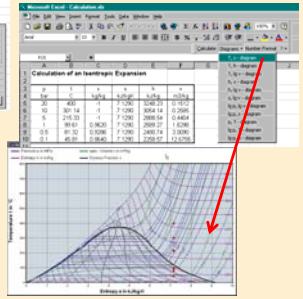
Calculation as an ideal mixture of the real fluids:
- Dry air from Lemmon at al.
- Steam and Water from IAPWS-95

at high pressures and high water contents

Consideration of
- Condensation of steam
- Dissociation and Pointing

Library **LibHuAir**





Add-In **FluidEXL** *Graphics* for **Excel®** including thermodynamic charts

Ideal-Gas Mixtures

Calculation as an ideal gas-mixture of:

Ar *	H_2O *	OH	Ethylene
Ne *	SO_2 *	He	Propylene
N_2 *	Air	F_2	Propane
O_2 *	NO	NH_3	n-Butane
CO *	H_2	Methane	Isobutane
CO_2 *	H_2S	Ethane	Benzene
*from VDI-4670			Methanol

Library **LibIdGasMix**

Ammonia / Water Mixtures

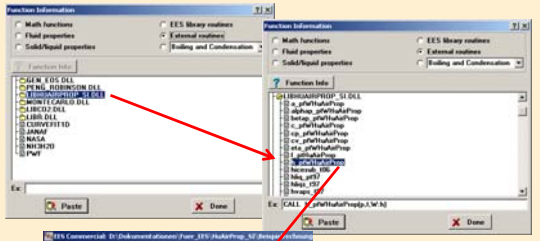
IAPWS Guideline (2005) of Tillner-Roth and Friend

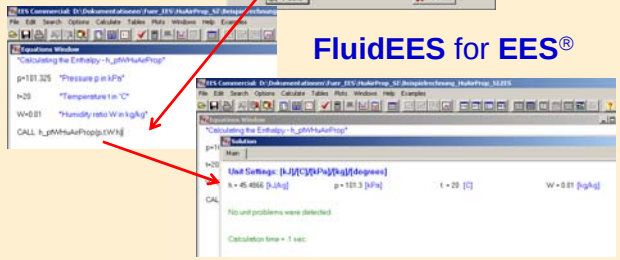
Library **LibAmWa**

Water / Lithium Bromide Mixtures

Formulation of Kim and Infante Ferrera (2004)

Library **LibWaLi**





FluidEES for **EES®**

Working Fluids for ORC-Processes

Formulation of Colonna et al. (2006)

Siloxane $C_6H_{18}OSi_2$ (MM)
Library **LibMM**

Siloxane $C_8H_{24}O_4Si_4$ (D4)
Library **LibD4**

Siloxane $C_{10}H_{30}O_5Si_5$ (D5)
Library **LibD5**

Siloxane $C_{14}H_{42}O_5Si_6$ (MD4M)
Library **LibMD4M**

Water and Steam

Industrial Formulation

IAPWS-IF97
(Revision 2007)

and supplementary standards for the backward equations
- IAPWS-IF97-S01
- IAPWS-IF97-S03rev
- IAPWS-IF97-S04
- IAPWS-IF97-S05

Library **LibIF97**

Seawater

IAPWS Formulation of Feistel (2008) and IAPWS-IF97

Library **LibSeaWa**

Hydrogen

Formulation of Leachman et al. (2007)

Library **LibH2**

Helium

Formulation of McCarty and Arp (1999)

Library **LibHe**

Ammonia

Formulation of Tillner-Roth (1995)

Library **LibNH3**

R134a

Formulation of Tillner-Roth and Baehr (1994)

Library **LibR134a**

Methanol

Formulation of de Reuck and Craven (1993)

Library **LibCH3OH**

Carbon Dioxide

Formulation of Span and Wagner (1996)

Library **LibCO2**

Iso-Butane , n-Butane

Formulations of Bücker et al. (2003)

Library **LibButane_Iso**

Library **LibButane_n**

Propane

Formulation of Lemmon et al. (2008)

Library **LibPropane**