Proposal for Poster

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

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The program libraries for calculating the thermodynamic and transport properties for water and steam, for mixtures with water and steam, and for other working fluids are designed for practical use by engineers who calculate heat cycles, steam or gas turbine, boiler, heat pump, or other thermal or refrigeration processes. They can calculate thermodynamic properties, transport properties, thermodynamic derivatives and inverse functions.

The following property libraries are presented here:

LibIF97 for water and steam, *LibIF97-META* for metastable steam, *LibICE* for ice,

LibSeaWa for seawater,

LibHuGas for humid combustion-gas mixtures also at high pressures,

LibHuAir for humid air also at high pressures and with high water content,

LibAmWa for ammonia/water mixtures in absorption processes and the Kalina process,

LibWaLi for water/lithium bromide mixtures in absorption processes,

LibIdGasMix for 25 ideal gases and their mixtures,

LibRealAir for real dry air,

LibCO2 for carbon dioxide including dry ice, *LibNH3* for ammonia,

LibPropane for propane, *LibButane_Iso* and *LibButane_n* for isobutane and n-butane,

LibD4, *LibD5*, *LibD6*, *LibMDM*, *LibMD2M*, *LibMD3M*, *LibMD4M*, and *LibMM* for
    siloxanes used in ORC processes,

LibCH3OH for methanol, *LibC2H5OH* for ethanol,

LibH2 for hydrogen, *LibN2* for nitrogen, *LibHe* for helium, and

LibSecRef for liquid coolants.

In addition, property libraries for a number of refrigerants and hydrocarbons are available. These libraries contain the most accurate algorithms currently available for calculating thermodynamic and transport properties.

For extremely fast property computations in CFD or non-stationary process simulations, the Spline-based Table Look-up Method (SBTL) property libraries are available.

The property libraries can be used in user-specific programs written in Fortran, C++, C#, Java, Pascal (Delphi), Python, Visual Basic or other programming languages under the operating systems Windows, Unix/Linux or Mac OS.

In addition, add-ons for the use of these property libraries in Excel®, MATLAB®, Mathcad®, Engineering Equation Solver® (EES), Dymola® and SimulationX® (Modelica), and LabVIEW™ are available.