**P-T thermodynamic table for general EoS**

The table is expressed as a rectangular structured rho-e mesh format, at fixed intervals of density (or log10(density)) and internal energy. Density can be given either in its actual absolute value, or in its decimal logarithm form (log10(ρ)), since it is much more accurate globally (good representation at low pressures and accurate, non-linear interpolation at high pressures).

The first line in the table is: The number of points for density sampling is *M*, the number of points for internal energy sampling is *N*, the density (or d(log10(ρ))) interval is *dρ*, the int. energy interval is *de*, the molecular weight is *MW*. The last entry of the first line is an integer representing if the table is in density mode (*logρ* = 0) or in decimal logarithm mode (*logρ* = 1).

The columns of the table are: log10(density), density (ρ), internal energy (e), pressure (p), temperature (T), enthalpy (h), entropy (s), heat capacity at p=ct (cp), speed of sound (a), thermal conductivity (k), dynamic viscosity (μ) and vapor volume fraction (vf). **Units are in SI**.

The data file containing the table should be structured as follows:

*<**# density points*> <*# temperature points*> <*dρ/dlog10ρ*> <*de*> <*MW*> <*logρ*>

<log10ρ1> <ρ1> <e1> <T1,1> <p1,1> <h1,1> <s1,1> <cp1,1> <a1,1> <k1,1> <μ1,1>  <vf1,1>

<log10ρ2> <ρ2> <e1> <T2,1> <p2,1> <h2,1> <s2,1> <cp2,1> <a2,1> <k2,1> <μ2,1> <vf2,1>

.....

<log10ρM>  <ρM> <e1> <TM,1> <pM,1> <hM,1> <sM,1> <cpM,1> <aM,1> <kM,1> <μM,1> <vfM,1>

<log10ρ1> <ρ1> <e2> <T1,2> <p1,2> <h1,2> <s1,2> <cp1,2> <a1,2> <k1,2> <μ1,2> <vf1,2>

<log10ρ2> <ρ2> <e2> <T2,2> <p2,2> <h2,2> <s2,2> <cp2,2> <a2,2> <k2,2> <μ2,2> <vf2,2>

.....

<log10ρM> <ρM> <e2> <TM,2> <pM,2> <hM,2> <sM,2> <cpM,2> <aM,2> <kM,2> <μM,2> <vfM,2>

<log10ρ1> <ρ1> <e3> <T1,3> <p1,3> <h1,3> <s1,3> <cp1,3> <a1,3> <k1,3> <μ1,3> <vf1,3>

...

...

...

<log10ρM> <ρM> <eN> <TM,N> <pM,N> <hM,N> <sM,N> <cpM,N> <aM,N> <kM,N> <μM,N> <vfM,N>

If (*logρ* = 0) then the fixed interval applies for density and interpolation is done using density.

If (logρ = 1) then the fixed interval applies for log10(ρ) and interpolation should be done by converting flow solver density to log10(ρ) and interpolating from table (non-linear interpolation).