

# PHAST™ and SAFETI

## Multi Component add-on

Advanced modelling of mixtures



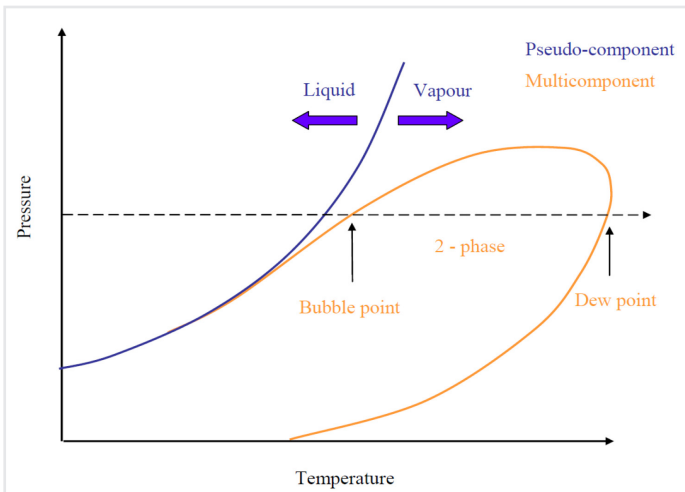
The Multi Component add-on provides improved consequence and risk results for mixtures compared with the traditional “pseudo-component” approach. Multi Component modelling, as currently implemented in Phast, comprises enhancements to the physical property system and consequence models.

### **Improved modelling of mixtures**

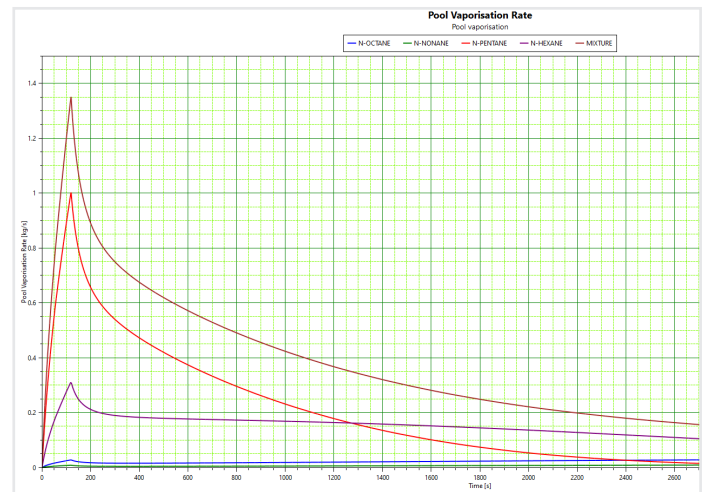
The Phast and Safeti Multi Component (MC) add-on provides improved consequence and risk results for mixtures compared with the traditional “pseudo-component” (PC) approach.

In the “pseudo-component” approach the composition, thermodynamic behaviour and properties of a mixture are calculated using simple averaging equations, whereas in the multi component approach modelling of mixtures involves more rigorous enhancements to the physical property system.

The Multi Component add-on supports the core steady-state discharge models, dispersion modelling via the unified dispersion model (UDM), and the standalone multi component pool vapourisation modelling.



An illustration of phase equilibrium



Graph of Pool vapourisation rates over time of multiple components for a mixture

### More accurate modelling of phase equilibrium

For a pure component, the bubble point and the dew point are the same temperature; there is no region in which the material is two-phase across a range of temperatures.

The pseudo-component approach treats mixtures as pure components and does not model the two-phase region. On the other hand, the multi component approach models the phase equilibrium in a more rigorous manner, and both phases will be modelled when the conditions are in the two-phase region.

The composition in the liquid and in the vapour phase differ when a mixture is under two-phase conditions and, as conditions change, the equilibrium and composition in each phase will change. This behaviour is modelled in the multi component approach

### Key capabilities of the Multi Component add-on

- Integrated multi component property system with built-in chemical database and flash calculator.
- Improved source term modelling of two-phase mixtures for models including catastrophic rupture, leak, line rupture, relief valve and disc rupture.
- Calculate vapourisation rates of multiple components for a mixture vapourising from a pool (using the standalone multi component pool vapourisation model).
- Supports most frequently used equations of state including Redlich-Kwong, Soave-Redlich-Kwong and Peng-Robinson.

The results using the extension include mixture composition as release expands from storage to atmospheric conditions, as well as graphs of phase composition during dispersion.

Short and long term lease options available.

Please visit [store.veracity.com/multicomponent](https://store.veracity.com/multicomponent) or scan the code for more details:

