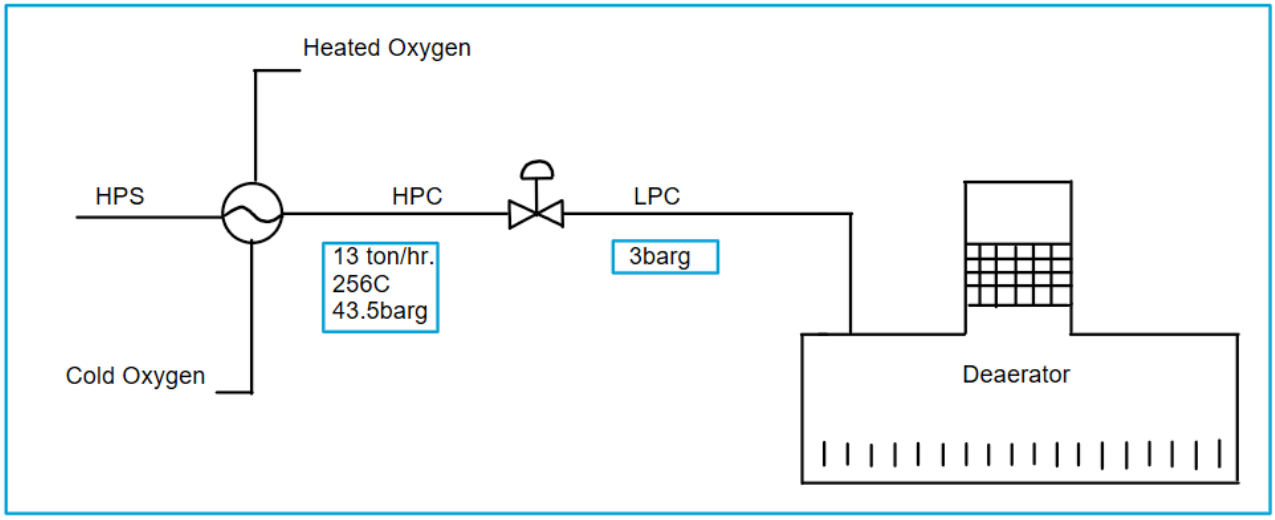
Control Valve Simulation

Example 1: In order to perform optimization during basic design, a process designer decides to reuse HP condensate of a heat exchanger as the make-up of deaerator. Here is the PFD-like sketch:



Calculate the amount of liquid flashed at the outlet of the control valve.

The process designer at first does the calculation using manual way; then to verify and finalized his result, he uses Aspen Hysys. Here is his manual calculation:

$$M_1 H_1 = M_v H_v + M_l H_l$$

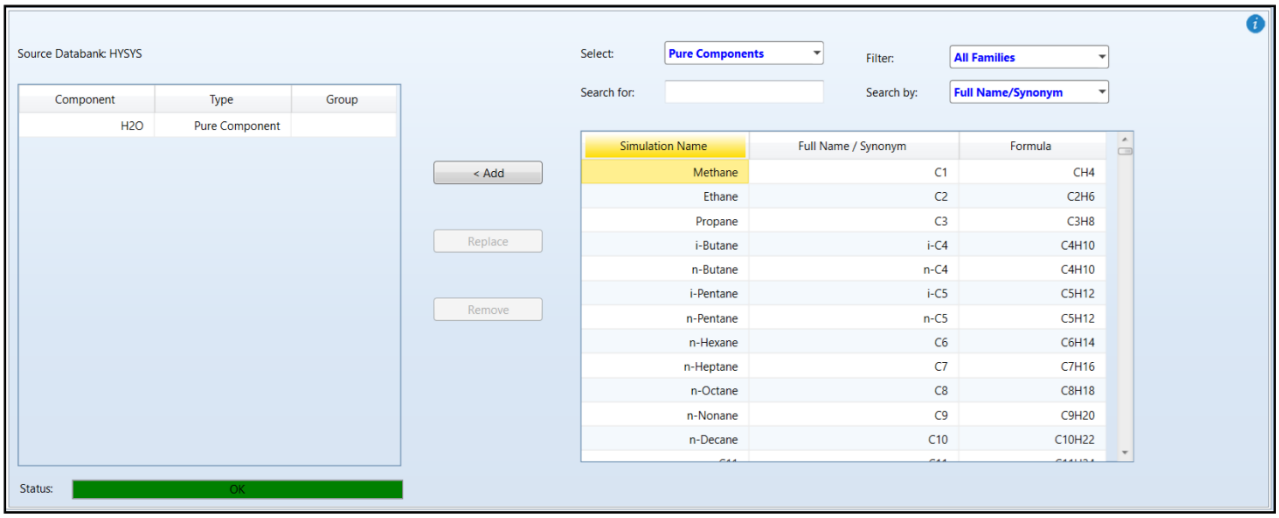
$$13000 \times 1114 = M \times 2723 + (13000 - M) \times 560.5$$

M = 3327.4 kg

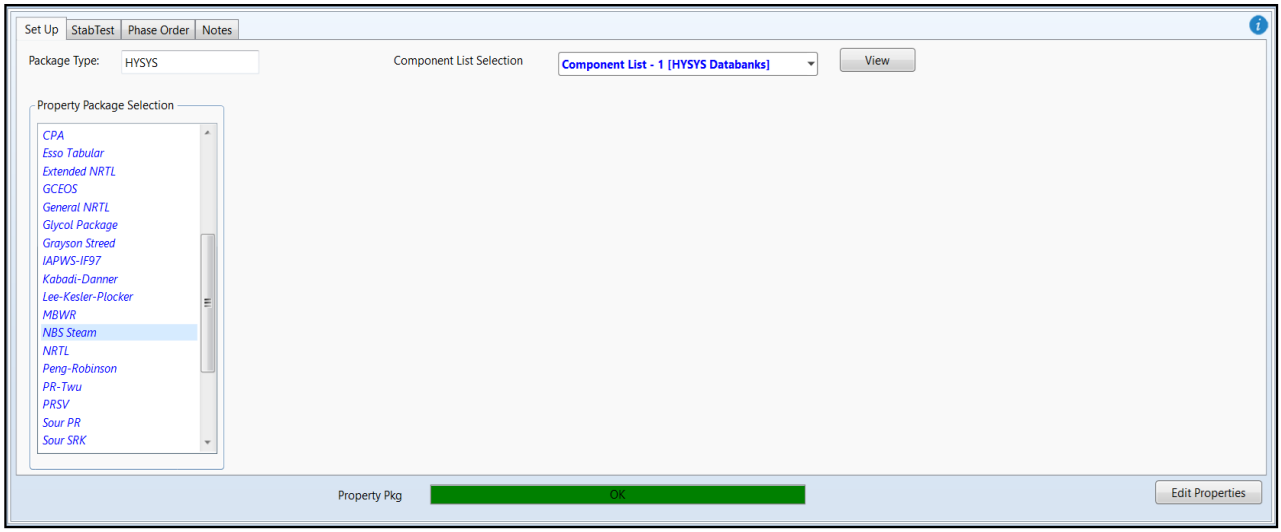
Flashing = 26%

How to simulate:

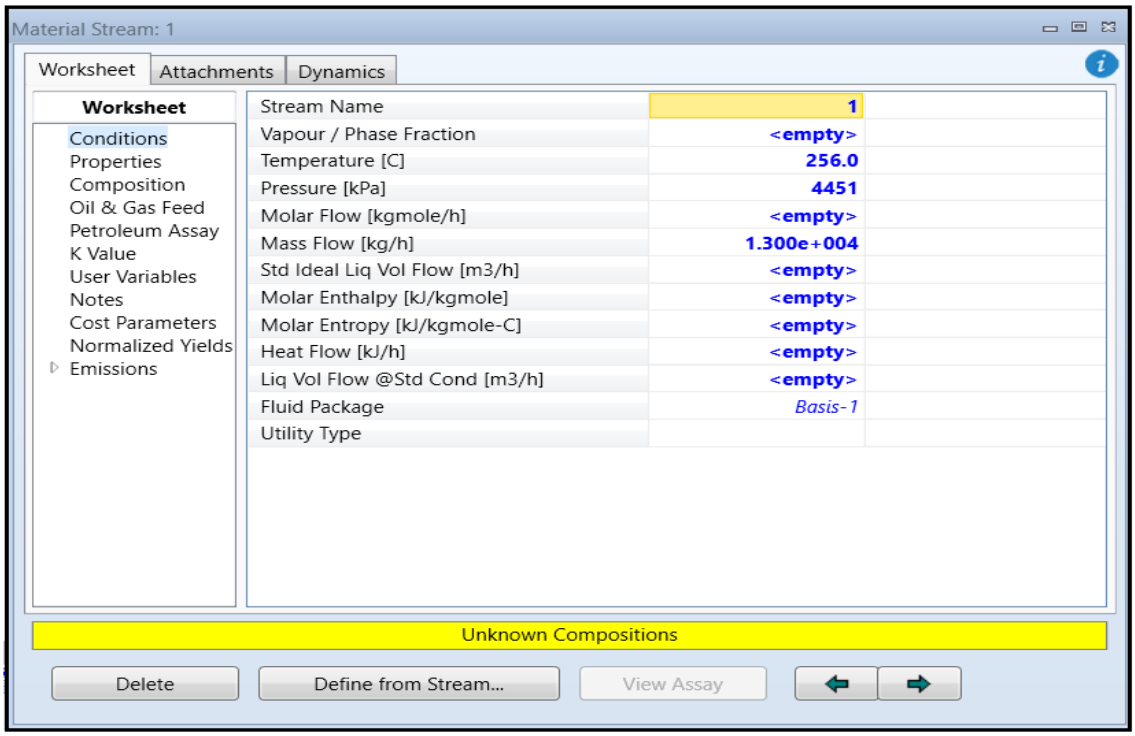
1.Select water as the component in component list.

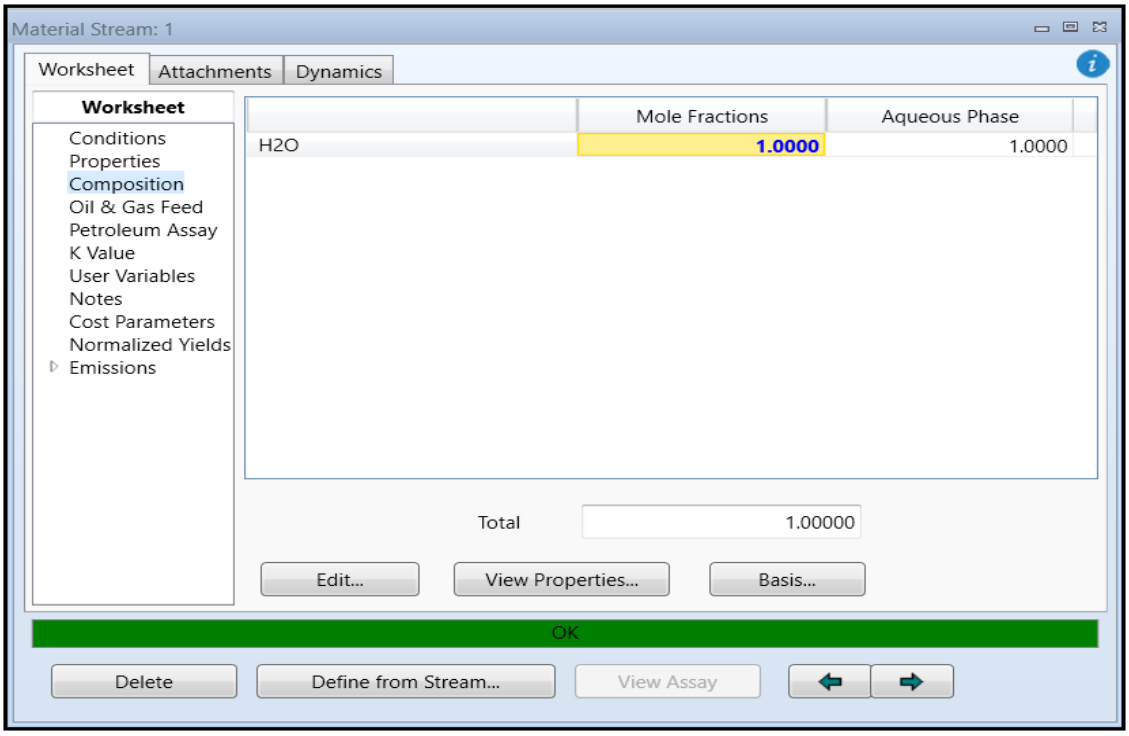


2. Select NBS Steam as Fluid Package.

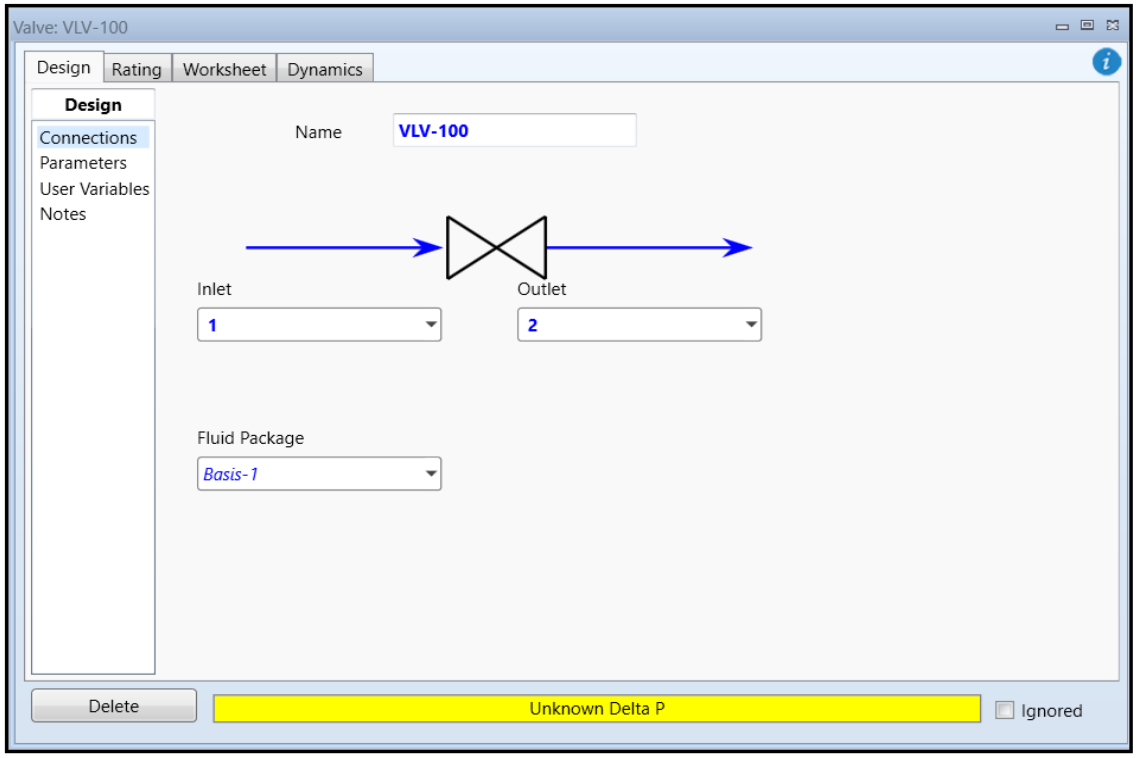


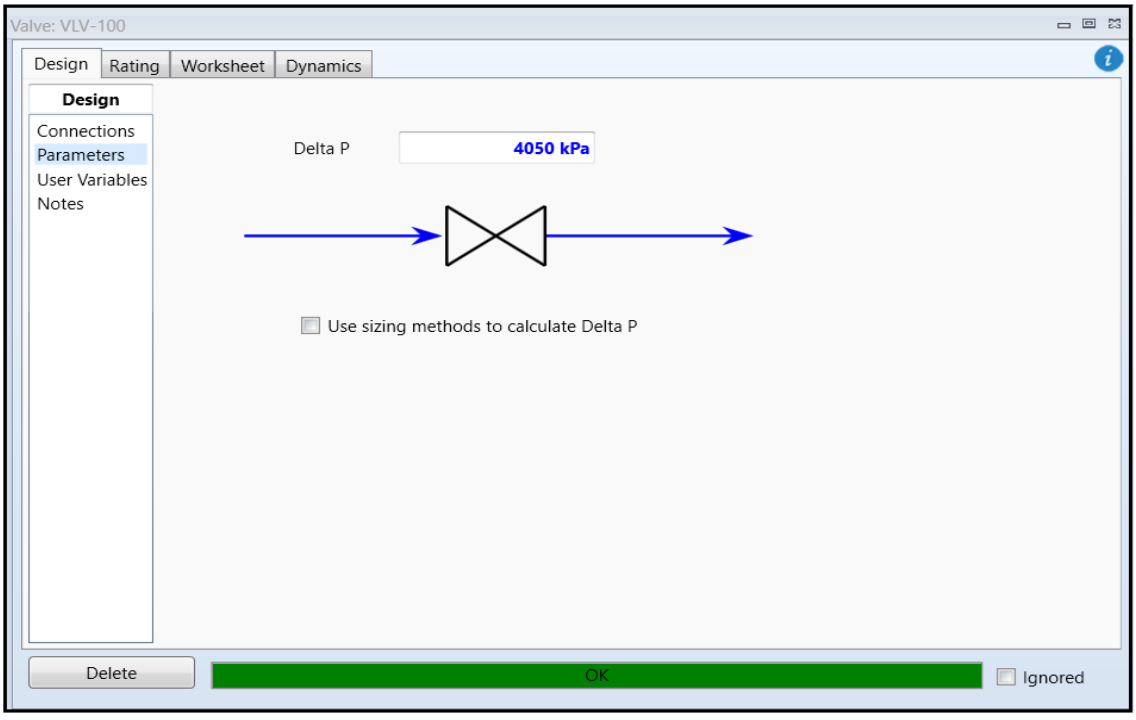
3.Enter Simulation Environment and define stream 1 with aforementioned condition:





4.Select control valve from Model Pallete/Pressure Change and put in the flowsheet. Then, connect stream 1 to the inlet and define stream 2 as the outlet. Set pressure drop to 40.5 bar.





5.Based on the result, the flashing is 24%.