
Honeywell UNISIM R390 – getting started

- Introduction to the UniSim Design interface.

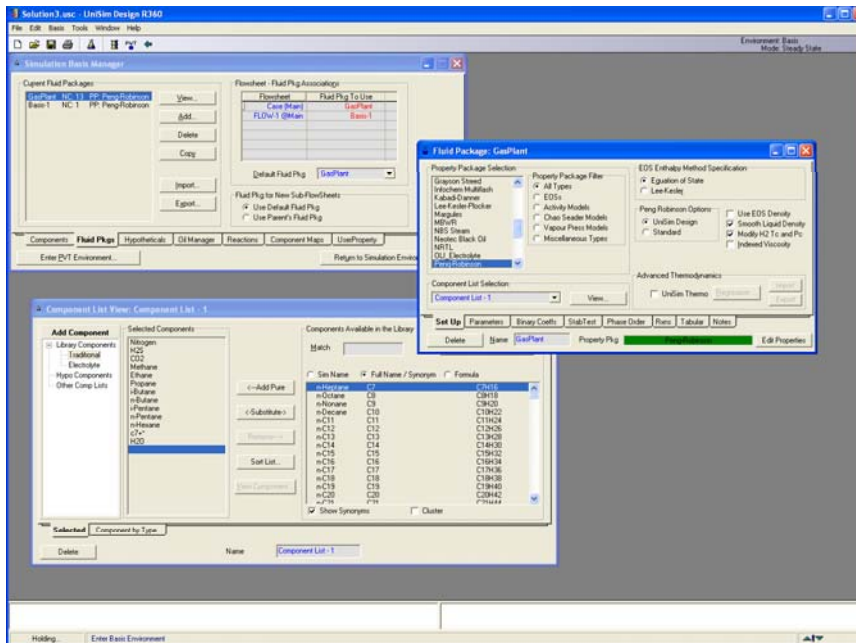
 - In the Basis Environment, you will...
 - Select an appropriate property package
 - Create a component list
 - Export the Fluid Package (Prop. Pkg and Comp. List) for use later.

 - In the Simulation Environment, you will...
 - Create streams
 - Perform stream analysis
 - Work with stream flash calculations
 - Attach stream utilities
 - Customize the workbook
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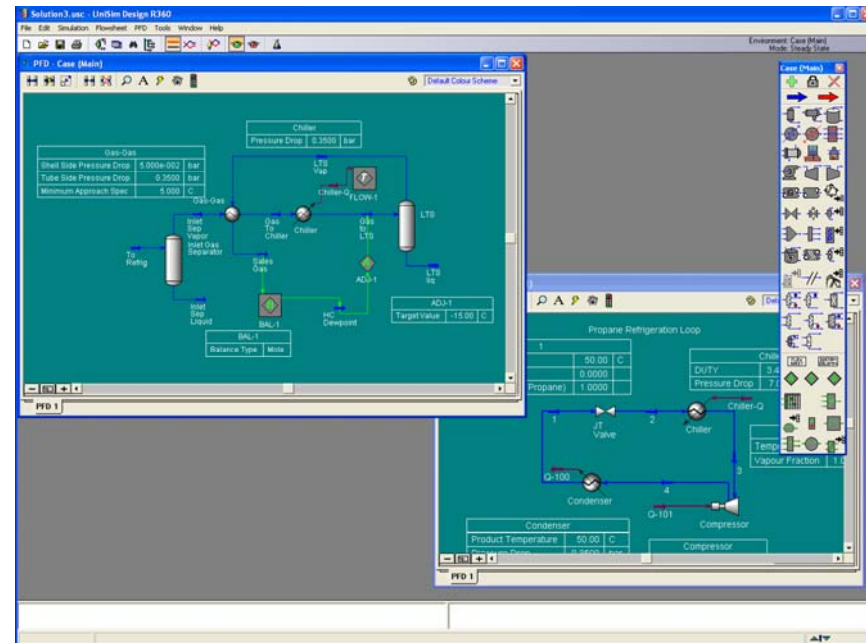
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- Via the two main USD Environments

Basis Environment



Flowsheet Environment



Process Simulation

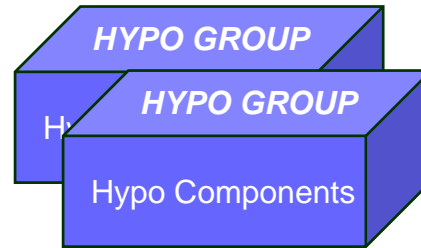
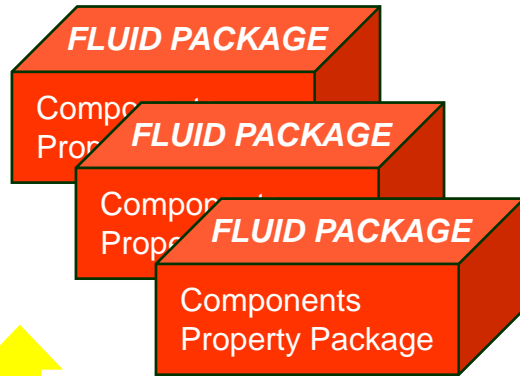
- What information do we need to enter?

 - Thermodynamic Information
 - A list of all the components that are needed.
 - Selection of an appropriate model.
 - Could be an EOS (PR or SRK) or an Activity Model (NTRL or UNIQUAC)

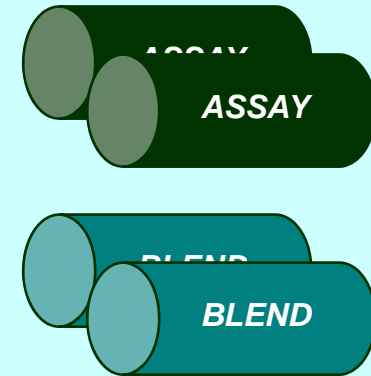
 - Process Information
 - Feed stream conditions. (T, P, Flow, Composition)
 - Unit operation information.
 - What unit operations are needed?
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UniSim Design Architecture

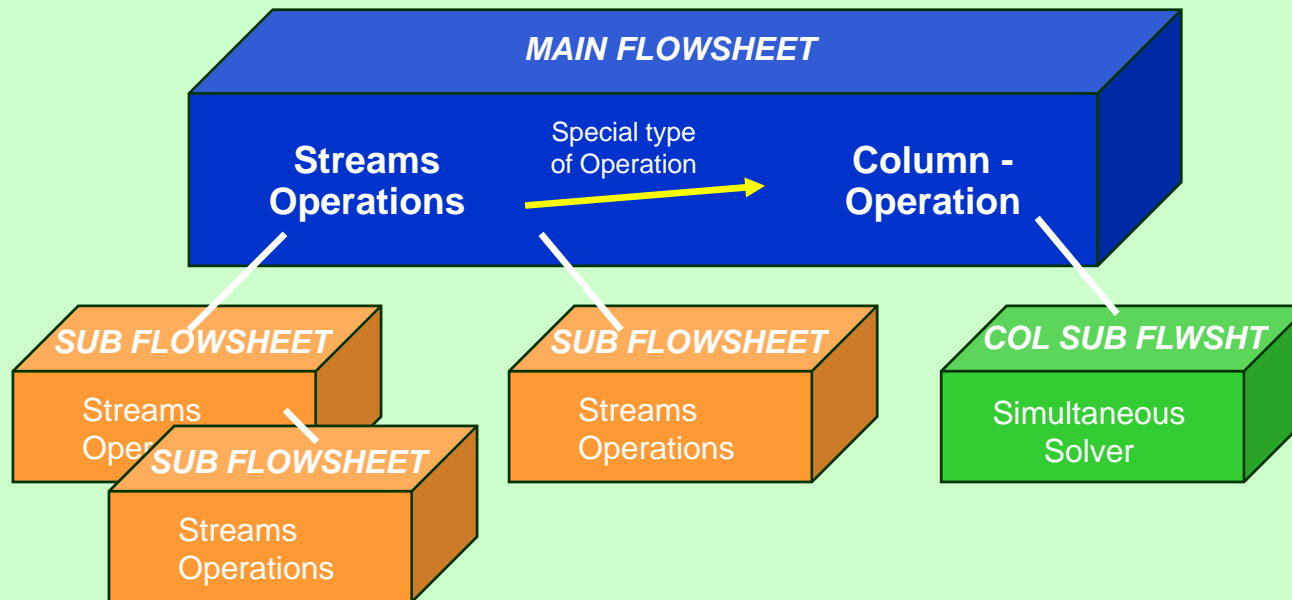
Basis Environment



Oil Environment



Simulation Environment



Each Sub flowsheet has its own "Environment"

UniSim Design

- USD Key Features
 - ❑ Calculates Bi-Directionally
 - ❑ Calculates as much as it can, as soon as it can
- Primary Interface Elements
 - ❑ PFD
 - ❑ Workbook
 - ❑ Object Property Views

The image displays three overlapping windows from the UniSim Design software interface:

- PFD - Case (Main):** Shows a Process Flow Diagram (PFD) with a central 'Chiller' unit. A table within the PFD window provides the following data:

Gas-Gas	
Shell Side Pressure Drop	5.000e-002 bar
Tube Side Pressure Drop	0.3500 bar
Minimum Approach Spec	5.000 C
- Workbook - Case (Main):** Displays a data table with the following content:

Name	To Retrig	Inlet Sep Vapor	Inlet Sep Liquid	Gas To Chiller	LTS Vap
Vapour Fraction	1.0000	1.0000	0.0000	0.9677	1.0000
Temperature [C]	15.00	15.00	15.00	-4.332	-15.18
Pressure [bar]	62.00	62.00	62.00	61.65	61.30
Molar Flow [kgmole/h]	1440	1440	0.0000	1440	1310
Mass Flow [kg/h]	2.990e+004	2.990e+004	0.0000	2.990e+004	2.581e+004
Liquid Volume Flow [m3/h]	88.31	88.31	0.0000	88.31	78.49
Heat Flow [kcal/h]	-2.797e+007	-2.797e+007	0.0000	-2.845e+007	-2.553e+007
- Chiller:** Shows the 'Design' view of the Chiller object. It includes:
 - Name:** Chiller
 - Inlet:** Gas To Chiller
 - Energy:** Chiller-Q
 - Outlet:** Gas to LTS
 - Fluid Package:** GasPlant

Tips for working in the Basis Environment

- Every Fluid Package needs a component list and a property package.
 - The Peng-Robinson EOS has been optimized for use with most “Oil & Gas” applications in UniSim Design.
 - It is very important the right property package is chosen. The accuracy of the model depends on this choice.
 - The “Master” component list is a superset of all components in the other lists. It can not be selected as the component list for use in a fluid package.
 - Fluid Packages can be exported and shared with colleagues.
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Degrees of Freedom in UniSim Design

- For streams, only two of the five “state” variables can be specified. (P, T, H, S, or VF).
 - Normally, the user will specify T-P, T-VF, or P-VF.
 - For dewpoint calculations, Set the VF = 1, and enter T or P. UniSim Design will calculate the other parameters based on the thermo model that has been chosen.
 - Likewise, the bubble point can be found by setting the VF to 0.
 - Never specify more than one type of flow.
 - Mole, Mass, Liquid Volume @ std. cond. or Std. Ideal Liquid Volume
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Tips for adding streams and operations

- There are four methods for adding objects
 - Flowsheet Menu, F11 or F12, Object Palette, Workbook
 - Streams can also be added by typing their name into the connections page for a unit operation.
 - Use this option carefully as a simple typo will result in a undesired result.
 - To connect objects, use the drop-down lists or the PFD attach mode. Hold down the Ctrl key to access this mode.
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Utilities in UniSim Design

- There are two main types of Utilities in UniSim Design:
 - Stream Utilities
 - Operation Utilities
 - Stream utilities are attached to streams and include items like: envelopes, property tables, hydrate, etc.
 - Operation utilities are attached to operations and include: tray sizing, vessel sizing, and pipe sizing.
 - There are other utilities that do not attach to either streams or operations. These include the property balance utility and the optimization utilities.
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